



आईएफटीएम विश्वविद्यालय, मुरादाबाद, उत्तर प्रदेश

IFTM University, Moradabad, Uttar Pradesh

NAAC ACCREDITED

SCHOOL OF AGRICULTURAL SCIENCES & ENGINEERING

DEPARTMENT OF AGRICULTURAL SCIENCES

BACHELOR OF SCIENCE (HONS.) AGRICULTURE

[w.e.f. ACADEMIC SESSION 2021 – 22]

IFTM UNIVERSITY, MORADABAD

N.H.-24, Lodhipur Rajput, Delhi Road, Moradabad, Uttar Pradesh-244102

Website: www.iftmuniversity.ac.in

Sanjeev
Director

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SCHOOL OF AGRICULTURAL SCIENCES & ENGINEERING
DEPARTMENT OF AGRICULTURAL SCIENCES

CBCS Based Course Structure and Syllabi
(As per New Education Policy 2020)
of
Bachelor of Science (Hons.) Agriculture
[w.e.f. Academic Session 2021 – 22]

Summary

| | |
|------------------------------------|--|
| Programme | : Bachelor of Science (Hons.) Agriculture |
| Programme Level | : Degree (Under Graduation) |
| Duration | : Four Years (Eight semesters) Full time |
| Medium of Instruction | : English |
| Minimum Required Attendance | : 75% |
| Maximum Credits | : 197 |

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N.H-24 Lodhipur Rajput, Delhi Road, Moradabad, Uttar Pradesh-244001

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(Effective from 2021-22)

Programme: B.Sc. (Hons.) Agriculture

Programme Outcomes (POs):

Students completing this programme will be able to-

1. Apply the conceptual knowledge of agriculture in practical situation for national and international prospects.
2. Ability to understand the effect of various biotic factors on the growth of crop plants for local and national level.
3. Ability to understand different components of agriculture i.e. dairy, poultry, fisheries, piggery, horticulture, plant protection etc & their interaction with crop husbandry for national, international and global needs.
4. Develop entrepreneurial skills for local, national and international standards.
5. Choose the best possible agri-enterprise for an agro-ecosystem for local and national concern.

Programme Specific Outcomes (PSOs)

On completion of four year B.Sc. (Hons.) Agriculture degree programme, the students will be able to:

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PSO-1: Understand the fundamental aspects of agriculture such as agronomy, horticulture, vegetable science, forestry, livestock production, pathology, entomology, extension and agricultural economics.

PSO-2: Applying the latest technologies, advancements, tools and techniques of agronomy, soil science, entomology, plant pathology and dairy technology in order to enhance the agriculture productivity and achieve the ultimate goal of farmers' benefit.


PSO-3: Able to collect data related to different aspects of agriculture such as crop production, rural surveys, status of mechanization etc and analyze this data using statistical tools to draw valid interpretation and recommendations.

PSO-4: Collaborating with farmers, agro-industries and different types of public and private institutions and to give them useful suggestions for their betterment.

PSO-5: Able to compare and evaluate different agro-techniques such as efficiency of different fertilizers and plant protection measures, different varieties of a crop, suitability of crops for the given agro-climatic zone and will be able to decide and suggest how to run an effective crop management system.

PSO-6: Able to gain the knowledge required for extension of agricultural services and shall be able to disseminate the beneficial technology at a better pace.

PSO-7: Developing entrepreneurial and business development skills in different aspects of agriculture such as dairy, nursery raising, bee keeping, sericulture, mushroom production etc. to create the cash economic agricultural enterprise.


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ORDINANCE

Eligibility Criteria for Admission:

The candidates possess minimum 45% (40 % for SC/ST) in 10+2 with PCM/PCB/Agriculture for the admission in B. Sc. (Hons.) Agriculture.

Examination:

Question Paper Structure

Question paper shall have two sections and examiner shall set questions specific to respective sections. Section wise details shall be as under:-

Section-A: It will contain twenty MCQ type questions. Each question has one mark and the total weightage of this section shall be 20 marks. This section must have to compulsory. Every question shall have four options with a correct option.

Section-B: It shall consist of ten long answer type questions out of which five questions shall be attempt. Each question will have equal weightage of 10 marks and total weightage of this section shall be 50 marks.

Evaluation and Assessment:

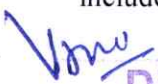
| Assessment: | | | | | |
|---------------------------------------|--------------|--------------|---------------|----------------------------|-------|
| Evaluation | | | Internal | External | Total |
| Theory | | | 30 | 70 | 100 |
| Practical/ Project Reports/ Viva-Voce | | | 30 | 70 | 100 |
| Class Test-1 | Class Test-2 | Class Test-3 | Assignment(s) | Attendance & Participation | Total |
| Best two out of three | | | | | |
| 10 | 10 | 10 | 5 | 5 | 30 |
| Duration of Examination | | | Internal | External | |
| | | | 1 Hour | 3 Hours | |

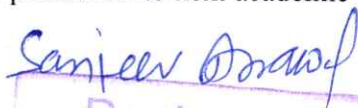
Grade:

- a) The minimum Grade required to pass in each Theory & Practical paper is 'GRADE D'.
- b) A candidate, in order to pass must satisfy the followings:
 - i) Minimum CGPA of 4.50 is required in a particular academic year inclusive of both semesters of that academic year subject to conditions of carry over system.
 - ii) In non- gradial courses, the students have to pass separately, but grade obtained in Non Gradial (NG) courses shall not be included in SGPA.

*Grade, Semester Grade Point Average (SGPA), Cumulative Grade Point Average (CGPA) , Final CGPA and Percentage equivalence of CGPA/ Final CGPA will be awarded as per University norms.

Carry Over System: The student will be permitted maximum 08 carry over papers included theory/ practicals/projects for promotion to next academic year.


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***All the following will be governed as per university norms and regulations.**

- i) Promotion,
- ii) Change of grade already awarded,
- iii) Award of division,
- iv) Unfair means,
- v) Results,
- vi) Improvement,
- vii) Grade card,
- viii) Ex- studentship,
- ix) Re- admission,
- x) Convocation



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B.Sc. (Hons.) Agriculture, Effective from Session 2021-22

| B. Sc. (Hons.) Agriculture | | | |
|---|--|-----------------------|----------------|
| Basic Structure: Distribution of Courses | | | |
| S. No. | Type of Course | No. of Courses | Credits |
| 1 | Core Courses | 54 | 134 |
| 2 | Remedial courses | 03 | 05 |
| 3 | Common Courses | 04 | 08 |
| 4 | Elective Courses | 02 | 06 |
| 5 | Non Gradiual | 03 | 04 |
| 6 | Skill Development and Entrepreneurship Modules | 02 | 20 |
| 7 | RAWE | | 20 |


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B. Sc. (Hons.) Agriculture
Department wise list of Courses

| 1. Agronomy | | | | |
|---|----------|-------------|---|---------|
| S. No. | Semester | Course Code | Course Title | Credits |
| 1. | I | AG-101 | Fundamentals of Agronomy | 3 (2+1) |
| 2. | IV | AG-409 | Introductory Agro-meteorology & Climate Change | 2 (1+1) |
| 3. | III | AG-301 | Crop Production Technology – I (<i>Kharif</i> crops) | 2 (1+1) |
| 4. | IV | AG-401 | Crop Production Technology – II (<i>Rabi</i> crops) | 2 (1+1) |
| 5. | VI | AG-601 | Farming System, Precision farming and Sustainable Agriculture | 2 (1+1) |
| 6. | III | AG-302 | Practical Crop Production - I (<i>Kharif</i> crops) | 2 (0+2) |
| 7. | III | AG-402 | Practical Crop Production - II (<i>Rabi</i> crops) | 2 (0+2) |
| 8. | II | AG-205 | Principles of Organic Farming | 2 (1+1) |
| 9. | V | AG-511 | Geoinformatics and Nanotechnology | 2 (1+1) |
| 10. | V | AG-501 | Rainfed and Dryland Agriculture | 2 (1+1) |
| 2. Genetics and Plant Breeding | | | | |
| 1. | I | AG-102 | Fundamentals of Genetics | 3(2+1) |
| 2. | IV | AG-403 | Principles of Seed Technology | 3 (2+1) |
| 3. | III | AG-303 | Fundamentals of Plant Breeding | 3 (2+1) |
| 4. | V | AG-502 | Crop Improvement-I (<i>Kharif</i> crops) | 2 (1+1) |
| 5. | VI | AG-602 | Crop Improvement-II (<i>Rabi</i> crops) | 2 (1+1) |
| 3. Soil Science & Agricultural Chemistry | | | | |
| 1. | I | AG-103 | Fundamentals of Soil Science | 3 (2+1) |
| 2. | VI | AG-603 | Manures, Fertilizers and Soil Fertility Management | 3 (2+1) |
| 3. | IV | AG-404 | Problematic soils and their Management | 2 (1+1) |
| 4. | VI | AG-607 | Watershed and Wasteland Management | 2 (1+1) |

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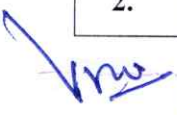
| | | | | |
|----------------------------------|-----|--------|---|---------|
| 4. Entomology | | | | |
| 1. | II | AG-203 | Fundamentals of Entomology -I | 3 (2+1) |
| 2. | III | AG-312 | Fundamentals of Entomology -II | 2 (1+1) |
| 3. | V | AG-503 | Pests of Crops, Stored Grains and their Management | 3 (2+1) |
| 4. | VI | AG-608 | Beneficial Insects and pest of Horticultural Crops and their Management | 3 (2+1) |
| 5. Agricultural Economics | | | | |
| 1. | II | AG-204 | Fundamentals of Agricultural Economics | 2 (2+0) |
| 2. | III | AG-305 | Agricultural Finance and Co-Operation | 3 (2+1) |
| 3. | V | AG-504 | Agricultural Marketing Trade & Prices | 3 (2+1) |
| 4. | VI | AG-604 | Farm Management, Production & Resource Economics | 2 (1+1) |
| Agricultural Engineering | | | | |
| 1. | III | AG-310 | Fundamentals of Soil and Water Conservation | 2 (1+1) |
| 2. | III | AG-306 | Farm Machinery and Power | 3(2+1) |
| 3. | IV | AG-406 | Renewable Energy and Green Technology | 2 (1+1) |
| 4. | V | AG-505 | Protected Cultivation and Secondary Agriculture | 3 (2+1) |
| Plant Pathology | | | | |
| 1. | II | AG-206 | Fundamentals of Plant Pathology | 4 (3+1) |
| 2. | V | AG-506 | Diseases of Field and Horticultural Crops and their Management-I | 3 (2+1) |
| 3. | VI | AG-605 | Diseases of Field and Horticultural Crops and their Management-II | 3 (2+1) |
| 4. | III | AG-307 | Principles of Integrated Disease Management | 3 (2+1) |
| Horticulture | | | | |
| 1. | I | AG-104 | Fundamentals of Horticulture | 2 (1+1) |
| 2. | V | AG-507 | Production Technology for Fruit and Plantation Crops | 2 (1+1) |
| 3. | II | AG-207 | Production Technology for Vegetables and Spices | 2 (1+1) |
| 4. | IV | AG-407 | Production Technology for Ornamental Crops, MAP and | 2 (1+1) |

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| | | | | |
|---|-----|-------------------|---|---------|
| | | | Landscaping | |
| 5. | VI | AG-606 | Post-harvest Management and Value Addition of Fruits and Vegetables | 2 (1+1) |
| Food Science & Technology | | | | |
| 1 | V | AG-510 | Principles of Food Science & Nutrition | 3 (2+1) |
| Agricultural Extension and Communication | | | | |
| 1. | II | AG-208 | Fundamentals of Agricultural Extension Education | 3 (2+1) |
| 2. | I | AG-105 | Rural Sociology & Educational Psychology | 2 (1+1) |
| Biochemistry / Physiology / Microbiology/ Environmental Sciences | | | | |
| 1. | II | AG-202 | Fundamentals of Plant Biochemistry | 3 (2+1) |
| 2. | II | AG-201 | Fundamentals of Crop Physiology | 3 (2+1) |
| 3. | III | AG-304 | Agricultural Microbiology | 2 (1+1) |
| 4. | I | AG-106 | Introduction to Forestry | 2 (1+1) |
| Statistics, Computer Application and I.P.R. | | | | |
| 1. | III | AG-309 | Statistical Methods | 2 (1+1) |
| 2. | IV | AG-410 | Agri- Informatics | 2 (1+1) |
| 3. | V | AG-509 | Intellectual Property Rights | 1 (1+0) |
| Animal Production & Dairy Science | | | | |
| 1. | I | AG-107 | Introductory Animal Husbandry | 3(2+1) |
| 2. | II | AG-209 | Dairy Processing and Safety Issues | 3 (2+1) |
| 3. | III | AG-311 | Dairy Science | 3 (2+1) |
| 4. | IV | AG-411 | Poultry Production and Management | 3 (2+1) |
| Remedial Courses | | | | |
| 1. | I | AG110A/ AG110B | Basic Agriculture-I/ Introductory Biology | 2 (1+1) |
| 2. | I | AG111A/ AG111B | Basic Agriculture-II/ Elementary Mathematics | 2 (2+0) |


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| | | | | |
|----------------------------|-----|----------------------------------|--|---------|
| 3. | I | AG-109 | Agricultural Heritage | 1(1+0) |
| Non-Gradual Courses | | | | |
| 1. | I | AG-112A/ AG-112B/ AG-112C/ | NSS/NCC/Physical Education & Yoga Practices | 2 (0+2) |
| 2. | II | AG-210 | Human Values & Ethics | 1 (1+0) |
| 3. | VI | AGT | Educational Tour | 2 (0+2) |
| Common Courses | | | | |
| 1. | I | AG-108 | Comprehension & Communication Skills in English | 2 (1+1) |
| 2. | III | AG-308 | Environmental Studies & Disaster Management | 2 (1+1) |
| 3. | IV | AG-408 | Entrepreneurship Development and Business Communication | 2 (1+1) |
| 4. | V | AG-508 | Communication Skills and Personality Development | 2 (1+1) |

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School of Agricultural Sciences & Engineering
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STUDY & EVALUATION SCHEME
 Effective from Session 2021-22
B.Sc. (Hons.) Agriculture
Semester I

| S.N. | Course Code | Course Name | Periods | | | EVALUATION SCHEME | | | | | Course Total | Credits | | Total credits |
|-------|---------------------|---|---------|---|---|-------------------|--------|-------|---------------|--------|--------------|-----------|----|---------------|
| | | | L | T | P | Mid Term Exam | | | External Exam | Theory | | Practical | | |
| | | | | | | CT | AS+ AT | Total | | | | | | |
| 1. | AG-101 | Fundamentals of Agronomy | 2 | 0 | 1 | 20 | 10 | 30 | 70 | 100 | 2 | 1 | 3 | |
| 2. | AG-102 | Fundamentals of Genetics | 2 | 0 | 1 | 20 | 10 | 30 | 70 | 100 | 2 | 1 | 3 | |
| 3. | AG-103 | Fundamentals of Soil Science | 2 | 0 | 1 | 20 | 10 | 30 | 70 | 100 | 2 | 1 | 3 | |
| 4. | AG-104 | Fundamentals of Horticulture | 1 | 0 | 1 | 20 | 10 | 30 | 70 | 100 | 1 | 1 | 2 | |
| 5. | AG-105 | Rural Sociology & Educational Psychology | 1 | 0 | 1 | 20 | 10 | 30 | 70 | 100 | 1 | 1 | 2 | |
| 6. | AG-106 | Introduction to Forestry | 1 | 0 | 1 | 20 | 10 | 30 | 70 | 100 | 1 | 1 | 2 | |
| 7. | AG-107 | Introductory Animal Husbandry | 2 | 0 | 1 | 20 | 10 | 30 | 70 | 100 | 2 | 1 | 3 | |
| 8. | AG-108 | Comprehension & Communication Skills in English | 2 | 0 | 0 | 20 | 10 | 30 | 70 | 100 | 1 | 1 | 2 | |
| 9. | AG-109 | Agricultural Heritage* | 1 | 0 | 0 | 20 | 10 | 30 | 70 | 100 | 1 | 0 | 1 | |
| 10. | AG110A/ AG-110B | Basic Agriculture-I / Introductory Biology* | 2 | 0 | 0 | 20 | 10 | 30 | 70 | 100 | 1 | 1 | 2 | |
| 11. | AG-111A/ AG-111B | Basic Agriculture-II/ Elementary Mathematics * | 2 | 0 | 0 | 20 | 10 | 30 | 70 | 100 | 2 | 0 | 2 | |
| 12. | AG-112A/ AG112C | NSS/Physical Education & Yoga Practices** | 0 | 0 | 2 | 20 | 10 | 30 | 70 | 100 | 0 | 2 | 2 | |
| Total | | | | | | | | | | | 16 | 11 | 27 | |

* Remedial Courses

** Non – gradial courses

Note: Letter received from 9UP(G) BN NCC, Parker Inter College, Court Road, Moradabad-244001, Letter No. 472/Elective subject/Trg, Dated 02 Sept. 2021, regarding inclusion of NCC as an elective subject with 12 credits course, in this regard distribution of credit and syllabi will be finalized after receiving the information from NCC HQs.

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School of Agricultural Sciences & Engineering
IFTM UNIVERSITY, MORADABAD
STUDY & EVALUATION SCHEME
 Effective from Session 2021-22
B.Sc. (Hons.) Agriculture
Semester – II

| S.N. | Course Code | Course Name | Periods | | | EVALUATION SCHEME | | | | | Course Total | Credits | | Total credits |
|-------|-------------|--|---------|---|---|-------------------|----|----|---------------|--------|--------------|-----------|-------|---------------|
| | | | L | T | P | Mid Term Exam | | | External Exam | Theory | | Practical | | |
| | | | | | | CT | AS | AT | | | | | Total | |
| 1. | AG-201 | Fundamentals of Crop Physiology | 2 | 0 | 1 | 20 | 10 | 30 | 70 | 100 | 2 | 1 | 3 | |
| 2. | AG-202 | Fundamentals of Plant Biochemistry | 2 | 0 | 1 | 20 | 10 | 30 | 70 | 100 | 2 | 1 | 3 | |
| 3. | AG-203 | Fundamentals of Entomology-I | 2 | 0 | 1 | 20 | 10 | 30 | 70 | 100 | 2 | 1 | 3 | |
| 4. | AG-204 | Fundamentals of Agricultural Economics | 2 | 0 | 0 | 20 | 10 | 30 | 70 | 100 | 2 | 0 | 2 | |
| 5. | AG-205 | Principles of Organic Farming | 1 | 0 | 1 | 20 | 10 | 30 | 70 | 100 | 1 | 1 | 2 | |
| 6. | AG-206 | Fundamentals of Plant Pathology | 3 | 0 | 1 | 20 | 10 | 30 | 70 | 100 | 3 | 1 | 4 | |
| 7. | AG-207 | Production Technology for Vegetables and Spices | 1 | 0 | 1 | 20 | 10 | 30 | 70 | 100 | 1 | 1 | 2 | |
| 8. | AG-208 | Fundamentals of Agricultural Extension Education | 2 | 0 | 1 | 20 | 10 | 30 | 70 | 100 | 2 | 1 | 3 | |
| 9. | AG-209 | Dairy Processing and Safety Issues | 2 | 0 | 1 | 20 | 10 | 30 | 70 | 100 | 2 | 1 | 3 | |
| 10. | AG210 | Human Values & Ethics** | 1 | 0 | 0 | 20 | 10 | 30 | 70 | 100 | 1 | 0 | 1 | |
| Total | | | | | | | | | | | | 18 | 8 | 26 |

** Non – gradial courses

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STUDY & EVALUATION SCHEME
 Effective from Session 2021-22
B.Sc. (Hons.) Agriculture
Semester – III

| S.N. | Course Code | Course Name | Periods | | | EVALUATION SCHEME | | | | | | Course Total | Credits | | Total credits |
|-------|-------------|---|---------|---|---|-------------------|----|----|---------------|----|-----|--------------|---------|--------|---------------|
| | | | | | | Mid Term Exam | | | External Exam | | | | | | |
| | | | L | T | P | CT | AS | AT | Total | | | | | Theory | |
| 1. | AG-301 | Crop Production Technology -I (Kharif crops) | 1 | 0 | 1 | 20 | 10 | 10 | 30 | 70 | 100 | 1 | 1 | 2 | |
| 2. | AG-302 | Practical Crop Production -I (Kharif crops) | 0 | 0 | 2 | 20 | 10 | 10 | 30 | 70 | 100 | 0 | 2 | 2 | |
| 3. | AG-303 | Fundamentals of Plant Breeding | 2 | 0 | 1 | 20 | 10 | 10 | 30 | 70 | 100 | 2 | 1 | 3 | |
| 4. | AG-304 | Agricultural Microbiology | 1 | 0 | 1 | 20 | 10 | 10 | 30 | 70 | 100 | 1 | 1 | 2 | |
| 5. | AG-305 | Agricultural Finance and Co-Operation | 2 | 0 | 1 | 20 | 10 | 10 | 30 | 70 | 100 | 2 | 1 | 3 | |
| 6. | AG-306 | Farm Machinery and Power | 2 | 0 | 1 | 20 | 10 | 10 | 30 | 70 | 100 | 2 | 1 | 3 | |
| 7. | AG-307 | Principles of Integrated Disease Management | 2 | 0 | 1 | 20 | 10 | 10 | 30 | 70 | 100 | 2 | 1 | 3 | |
| 8. | AG-308 | Environmental Studies & Disaster Management | 1 | 0 | 1 | 20 | 10 | 10 | 30 | 70 | 100 | 1 | 1 | 2 | |
| 9. | AG-309 | Statistical Methods | 1 | 0 | 1 | 20 | 10 | 10 | 30 | 70 | 100 | 1 | 1 | 2 | |
| 10. | AG-310 | Fundamental of Soil and Water Conservation | 1 | 0 | 1 | 20 | 10 | 10 | 30 | 70 | 100 | 1 | 1 | 2 | |
| 11. | AG-311 | Dairy Science | 2 | 0 | 1 | 20 | 10 | 10 | 30 | 70 | 100 | 2 | 1 | 3 | |
| 12. | AG-312 | Fundamentals of Entomology-II | 1 | 0 | 1 | 20 | 10 | 10 | 30 | 70 | 100 | 1 | 1 | 2 | |
| Total | | | | | | | | | | | 16 | 13 | 29 | | |

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STUDY & EVALUATION SCHEME
 Effective from Session 2021-22
B.Sc. (Hons.) Agriculture
Semester – IV

| S.N. | Course Code | Course Name | Periods | | | EVALUATION SCHEME | | | | | Course Total | Credits | | Total credits |
|-------|-------------|--|---------|---|---|-------------------|---------------|----|-------|---------------|--------------|---------|-----------|---------------|
| | | | L | T | P | CT | Mid Term Exam | | | External Exam | | Theory | Practical | |
| | | | | | | | AS | AT | Total | | | | | |
| 1. | AG-401 | Crop Production Technology - II (Rabi crops) | 1 | 0 | 1 | 20 | 10 | 30 | 70 | 100 | 1 | 1 | 2 | |
| 2. | AG-402 | Practical Crop Production - II (Rabi crops) | 0 | 0 | 2 | 20 | 10 | 30 | 70 | 100 | 0 | 2 | 2 | |
| 3. | AG-403 | Principles of Seed Technology | 2 | 0 | 1 | 20 | 10 | 30 | 70 | 100 | 2 | 1 | 3 | |
| 4. | AG-404 | Problematic soils and their Management | 1 | 0 | 1 | 20 | 10 | 30 | 70 | 100 | 1 | 1 | 2 | |
| 5. | AG-406 | Renewable Energy and Green Technology | 1 | 0 | 1 | 20 | 10 | 30 | 70 | 100 | 1 | 1 | 2 | |
| 6. | AG-407 | Production Technology for Ornamental Crops, MAPs and Landscaping | 1 | 0 | 1 | 20 | 10 | 30 | 70 | 100 | 1 | 1 | 2 | |
| 7. | AG-408 | Entrepreneurship Development and Business Communication | 1 | 0 | 1 | 20 | 10 | 30 | 70 | 100 | 1 | 1 | 2 | |
| 8. | AG-409 | Introductory Agro-meteorology & Climate Change | 1 | 0 | 1 | 20 | 10 | 30 | 70 | 100 | 1 | 1 | 2 | |
| 9. | AG-410 | Agri- Informatics | 1 | 0 | 1 | 20 | 10 | 30 | 70 | 100 | 1 | 1 | 2 | |
| 10. | AG-411 | Poultry Production & Management | 2 | 0 | 1 | 20 | 10 | 30 | 70 | 100 | 2 | 1 | 3 | |
| Total | | | | | | | | | | | 11 | 11 | 22 | |

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AG-101

Fundamentals of Agronomy

L: T: P 2:0:0

Objective: To study about agronomic principles and practices which aims at improving the overall efficiency of agriculture **and improve the skill, employability and entrepreneurship.**

UNIT-I

Agronomy and its scope. Seeds and sowing, tillage and tilth, crop density and geometry **for skill development.**

UNIT-II

Crop nutrition, manures and fertilizers, nutrient use efficiency **to provide employability and entrepreneurship.**

UNIT-III

Water resources, soil-plant-water relationship, crop water requirement, water use efficiency, irrigation- scheduling criteria and methods, quality of irrigation water **knowledge for better employability in industry.**

UNIT-IV

Weeds- importance. classification, crop weed competition, concepts of weed management- principles and methods, herbicides- classification, selectivity and resistance, allelopathy **for provide employability and entrepreneurship.**

UNIT-V

Growth and development of crops, factors affecting growth and development, plant ideotypes, crop rotation and its principles, adaptation and distribution of crops, harvesting and threshing of crops **for skill development.**


Course Outcomes:

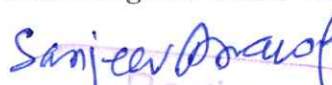
Students completing this course will be able to:

CO1: Understand the basic concepts of field and crop management starting from field preparation, seed sowing, till harvesting and threshing of crop **for skill development.**

CO2: Define the importance of water in agriculture and ways to improve water use efficiency **to provide employability and entrepreneurship.**

CO3: Understand the nutritional requirements of crops and also about sources available to fulfill the nutritional requirement **knowledge for better employability in industry.**


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CO4: Understand the importance of weed management in agriculture and also about advantages and disadvantages of herbicide usage **for provide employability and entrepreneurship.**

CO5: Understand the concept of plant growth and development **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

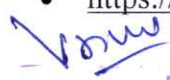
| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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AGP-101

Fundamentals of Agronomy Lab

L: T: P 0:0:1

List of Experiment

1. Identification of crops, seeds, fertilizers, pesticides and tillage implements.
2. Identification of weeds in crops.
3. Methods of herbicide and fertilizer application.
4. Study of yield contributing characters and yield estimation.
5. Numerical exercises on fertilizer requirement, plant population, herbicides and water requirement.
6. Study of soil moisture measuring devices.
7. Measurement of irrigation water.

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AG-102

Fundamentals of Genetics

L:T: P 2:0:0

Objective: This course is aimed at understanding the basic concepts of genetics, helping students to develop their analytical, quantitative and problem-solving skills from classical to molecular genetics **for skilling and employability.**

UNIT-I

Pre and Post Mendelian concepts of heredity, Mendelian principles of heredity. Architecture of chromosome; special types of chromosomes. Chromosomal theory of inheritance; cell cycle and cell division - mitosis and meiosis **to provide the skill.**

UNIT-II

Chi-square test; Dominance relationships, pistatic interactions; Multiple alleles, pleiotropism and pseudoalleles. Sex determination and sex linkage, sex limited and sex influenced traits, Blood group genetics. Linkage and its estimation. crossing over mechanisms, chromosome mapping **for better skilling of employability.**

UNIT-III

Structural and numerical variations in chromosome and their implications, use of haploids, di-haploids and doubled haploids in Genetics. Mutation, classification, Methods of inducing mutations & CLB technique, mutagenic agents and induction of mutation knowledge **for better employability in industry.**

UNIT-IV

Qualitative & Quantitative traits. Polygenes and continuous variations, multiple factor hypothesis. Cytoplasmic inheritance. Genetic disorders. Nature, structure & replication of genetic material (DNA) **for skill development and employability.**

UNIT-V

Protein synthesis. Transcription and translational mechanism of genetic material. Gene concept: Gene structure, function and regulation **for employability.**

Course Outcomes:

CO1: Students will be taught Mendelian genetics, their principles and gene interaction, significance of mitosis and meiosis and cell division **to provide the skill.**

CO2: To understand the process of genetic inheritance (the transmission of characteristics or qualities from parents to offspring) **for better skilling of employability.**

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CO3: The main outcome of genetics; Genetic manipulation is a process of transferring (genes) characters which are desirable from one generation to another generation **for better employability in industry** .

CO4: They learn about chromosomal aberration and structure of chromosomes and mutation and its methods of inducing mutations **for skill development and employability**.

CO5: The students will gain the basic understanding of nature, structure, replication of genetic materials and protein synthesis, transcription, translation and gene structure **for employability**.

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 1 | 1 | 1 | 1 |
| CO2 | 3 | 1 | 2 | 1 | 2 |
| CO3 | 3 | 2 | 3 | 2 | 1 |
| CO4 | 3 | 1 | 1 | 1 | 1 |
| CO5 | 2 | 1 | 1 | 1 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 3 | 3 | 1 |
| CO3 | 1 | 3 | 1 |
| CO4 | 3 | 3 | 1 |
| CO5 | 1 | 3 | 2 |

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AGP-102

Fundamentals of Genetics Lab

L:T: P 0:0:1

List of Experiment

1. Study of microscope.
2. Study of cell structure.
3. Experiments on monohybrid, dihybrid, trihybrid. test cross and back cross,
4. Experiments on epistatic interactions including test cross and back cross
5. Practice on mitotic and meiotic cell division.
6. Experiments on probability and Chi-square test.
7. Determination of linkage and cross-over analysis (through two point test cross and three point test cross data).
8. Study on sex linked inheritance in Drosophila.
9. Study of models on DNA and RNA structures.



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AG-103

Fundamentals of Soil Science

L: T: P 2:0:1

Objective: The course is to provide the student with a formalized way to build their fundamental knowledge and skills within the different areas of soil science to enhance their professional **skills and employability**.

UNIT-I

Soil as a natural body, Pedological and edaphological concepts of soil; Soil genesis: soil forming rocks and minerals; weathering, processes and factors of soil formation; Soil Profile, components of soil **to enhance the basic understanding and skill development**.

UNIT-II

Soil physical properties: soil-texture, structure, density and porosity, soil colour, consistence and plasticity; Elementary knowledge of soil taxonomy. Classification of soils of India; Soil water retention, movement and availability **for better skilling**.

UNIT-III

Soil air, composition, gaseous exchange problem and plant growth. Soil temperature; source, amount and flow of heat in soil: effect on plant growth. Soil reaction-pl I. EC, soil acidity and alkalinity, buffering, effect of pH on nutrient availability **for better skill development and employability**.

UNIT-IV

Soil colloids - inorganic and organic; silicate clays: constitution and properties; sources of charge; ion exchange, cation exchange capacity, base saturation; soil organic matter: composition, properties and its influence on soil properties **for skill development**.

UNIT-V

Humic substances - nature and properties. Soil pollution-behaviour of pesticides and inorganic contaminants, prevention and mitigation of soil pollution **for better skill development**.

Course Outcomes:

Students completing this course will be able to:


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CO1: Students will gain knowledge on concepts and principles of Soil Science **to enhance the basic understanding and skill development.**

CO2: Comprehensive knowledge on rocks and minerals, their composition and the types of soils formed from different parent materials **for better skilling.**

CO3: Understand the role of soil forming factors and processes in soil formation **for better skill development and employability.**

CO4: Understand various soil physical, chemical and biological properties and their impact on plant growth **for skill development.**

CO5: The knowledge gained in this course will be useful in understanding the behavior of soils in crop production and management **for better skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 3 | 1 | 3 |
| CO2 | 3 | 2 | 3 | 2 | 1 |
| CO3 | 3 | 3 | 1 | 1 | 3 |
| CO4 | 3 | 3 | 3 | 1 | 2 |
| CO5 | 3 | 3 | 1 | 1 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 3 | 1 | 1 |
| CO3 | 3 | 3 | 1 |
| CO4 | 3 | 1 | 1 |
| CO5 | 3 | 1 | 1 |

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AGP-103

Fundamentals of Soil Science Lab

L: T: P 0:0:1

List of Experiment

1. Study of soil profile in field.
2. Study of soil sampling tools, collection of representative soil sample, its processing and storage.
3. Study of soil forming rocks and minerals.
4. Determination of soil density, moisture content and porosity.
5. Determination of soil texture by feel method.
6. Determination of soil pH and electrical conductivity.
7. Study of soil map.
8. Estimation of organic matter content of soil. Estimation of CO_3 and HCO_3 in soil water.

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AG-104

Fundamentals of Horticulture

L: T: P 1:0:0

Objectives: To Study about the different aspects of horticulture in a brief and prescribed manner, also to apprise students about various facets of methods and practices involved in horticulture **to develop skill and entrepreneurship.**

UNIT-I

Horticulture-Its definition and branches, importance and scope **to improve the basic skills.**

UNIT-II

Horticultural and botanical classification; climate and soil for horticultural crops **for skill development.**

UNIT-III

Plant propagation-methods and propagating structures; principles of orchard establishment; Principles and methods of training and pruning **for better skilling, entrepreneurship and employability.**

UNIT-IV

Juvenility and flower bud differentiation; unfruitfulness; pollination, pollinizers and pollinators; fertilization and parthenocarpy **for entrepreneurship and employability.**

UNIT-V

Use of plant bioregulators in horticulture, irrigation and fertilizers applications-method and quality **for employability and entrepreneurship.**

Course Outcomes:

Students completing this course will be able to:

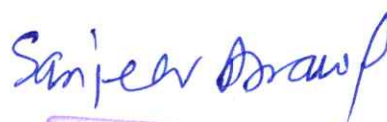
CO1: Define horticulture and its branches **to improve the basic skills.**

CO2: Understand classification, soil and climate requirement of horticultural crops **for skill development.**

CO3: Understand the various propagation methods, structures, techniques of orchard establishment & training and pruning methods **for better skilling, entrepreneurship and employability.**



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CO4: Better understanding of Juvenility and flower bud differentiation, unfruitfulness, pollination, pollinizers and pollinators, fertilization and parthenocarp for **entrepreneurship and employability.**

CO5: Understand the use and application of plant bioregulators, irrigation and fertilizers in horticultural crops **for employability and entrepreneurship.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 | 2 | 3 |
| CO3 | 1 | 2 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 1 | 1 |
| CO5 | 3 | 1 | 3 | 3 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|--------------------------|----------------------|-------------------------------------|
| CO1 | 3 | 1 | 2 |
| CO2 | 3 | 2 | 1 |
| CO3 | 3 | 3 | 3 |
| CO4 | 2 | 3 | 3 |
| CO5 | 1 | 3 | 3 |

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AGP-104

Fundamentals of Horticulture Labs

L: T: P 0:0:1

List of Experiments:

1. Identification of garden tools.
2. Identification of horticultural crops.
3. Preparation of seed bed/nursery bed.
4. Practice of sexual and asexual methods of propagation.
5. Layout and planting of orchard plants.
6. Training and pruning of fruit trees.
7. Transplanting and care of vegetable seedlings.
8. Making of herbaceous and shrubby borders.
9. Preparation of potting mixture potting and repotting.
10. Fertilizer application in different crops.
11. Visits to commercial nurseries/orchard.

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AG-105

Rural Sociology & Educational Psychology

L: T: P 1:0:0

Objective: To inculcate the principles, elements of rural sociology and educational psychology in order to extend science and technology among farmers and to study the students about scientific and systematic manner of the Rural Society **for better skilling.**

UNIT-I

Sociology and Rural sociology: Definition and scope. Its significance in agriculture extension **and understanding for skill development.**

UNIT-II

Social Ecology, Rural society, Social Groups, Social Stratification, Culture concept, Social Institution, Social Change & Development **for better skilling.**

UNIT-III

Rural Leadership: concept and definition, types of leaders in rural context **to develop the skill.**

UNIT-IV

Educational psychology: Meaning & its importance in agriculture extension **for skill development.**

UNIT-V

Behavior: Cognitive, affective. Psychomotor domain, Personality, Learning, Motivation, Theories of Motivation, Intelligence **for skill and entrepreneurship development.**

Course Outcomes:

CO1: Acquisition of knowledge on basic concepts of rural sociology and educational psychology and its practical applications **and understanding for skill development.**

CO2: Understanding the Social Structure and Social Stratification and Social groups: their types and characteristics **for better skilling.**

CO3: Knowledge on the concepts of Migration and the impact it has created in society **to develop the skill.**

CO4: Understanding the characteristics of rural society, social institutions, culture, social values and relevance in Agricultural Extension **for skill development.**

CO5: Knowledge on Teaching–Learning Process and Basic principles of Human behaviour and Personality **for skill and entrepreneurship development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 1 | 1 | 1 | 2 |
| CO2 | 3 | 1 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 1 | 3 | 1 |
| CO4 | 3 | 1 | 1 | 3 | 1 |
| CO5 | 3 | 1 | 1 | 3 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated


| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | |
| CO2 | 3 | 2 | 1 |
| CO3 | 3 | 1 | 1 |
| CO4 | 3 | 1 | 1 |
| CO5 | 3 | 1 | 3 |

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AGP-105

Rural Sociology & Educational Psychology Lab

L: T: P 0:0:1

List of Experiments:

1. Socio-economic survey of village communities.
2. Developing schedules and questionnaires.
3. Visit and gaining of Practical knowledge about the working of basic rural institutions.
4. Identification of important value systems in the rural setting as a means of social control.
5. Identification of rural personality traits that affect the development of personality in rural situation.



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AG-106

Introduction to Forestry

L: T: P 1:0:0

Objectives:

- To identify the tree species and the uses of forests.
- To gain knowledge about various practices of forest regeneration and the choice of tree species for agro forestry purpose.
- To estimate the quantity of timber using height and volume measuring equipments.
- To manage the forest nursery by applying nursery techniques **for development of skill and entrepreneurship.**
- To apply the required cultivation practices for different tree species.

UNIT-I

Introduction - definitions of basic terms related to forestry, objectives of silviculture, forest classification, and salient features of Indian Forest Policies **for skilling development.**

UNIT-II

Forest regeneration, Natural regeneration - natural regeneration from seed and vegetative parts, coppicing, root suckers; Artificial regeneration - objectives. Choice between natural and artificial regeneration. Essential preliminary considerations **for better skilling and employability.**

UNIT-III

Crown classification. Tending operations - weeding, cleaning. thinning - mechanical, ordinary, crown and advance thinning **to enhance the skill and entrepreneurship.**

UNIT-IV

Forest mensuration - objectives, diameter measurement, instruments used in diameter measurement; measurement of volume of felled and standing trees, age determination of trees **for skill development.**

UNIT-V

Agroforestry – definitions, importance, criteria of selection of trees in agroforestry, different agroforestry systems prevalent in the country, shifting cultivation, taungya, alley cropping, wind breaks and shelter belts, home gardens. Cultivation practices of two important fast growing tree species of the region **for better skilling, entrepreneurship and employability.**

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Course Outcomes:

Students completing this course will be able to:

CO1: Define forestry and various terms related to forestry **for skilling development.**

CO2: Understand forest classification, silviculture and features of Indian Forest Policies and methods of forest regeneration **for better skilling and employability.**

CO3: Understand the classification and various tending operations. Estimation of timber quantity by applying forest mensuration **to enhance the skill and entrepreneurship.**

CO4: Understand about agroforestry, its importance, different systems **for skill development.**

CO5: Understand the cultivation practices of tree species **for better skilling, entrepreneurship and employability.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 1 | 3 | 1 | 3 | 1 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 3 | 1 | 1 | 1 | 1 |
| CO4 | 3 | 1 | 2 | 1 | 1 |
| CO5 | 3 | 2 | 1 | 1 | 3 |


CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

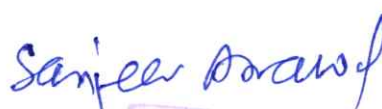
Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 2 |
| CO2 | 3 | 3 | 1 |
| CO3 | 3 | 1 | 3 |
| CO4 | 3 | 1 | 1 |
| CO5 | 3 | 3 | 3 |

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AGP-106

Introduction to Forestry Lab

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List of Experiments:

1. Identification of tree-species.
2. Diameter measurements using calipers and tape.
3. Volume measurement of logs using various formulae.
4. Preparation of Nursery lay out,
5. Techniques of seed sowing,
6. Various techniques of vegetative propagation
7. Forest plantations and their management.
8. Visits of nearby forest-based industries.



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AG-107

Introductory Animal Husbandry

L: T: P 2:0:0

Objective: To impart knowledge about livestock production and management to understand the animal husbandry **to provide employability, skilling and entrepreneurship.**

UNIT-I

General: Importance of livestock in Agriculture and Economy. Dairying under specialized and mixed farming. Livestock and milk production statistics **to develop the skill.**

UNIT-II

Dairy cattle and buffaloes management: Cattle and buffalo Breeds. Breeding methods & systems, Care and Management of pregnant and milch cow, Raising of calves, Management of heifers and bulls. Maintenance of livestock records, Milking methods and principles, Clean milk production, Feeds and feeding, Conservation of fodder, Housing for dairy animals **for better skilling and employability.**

UNIT-III

Pig management: Importance, Important breeds, rising of piglets up to age of slaughter. General aspects of breeding, Care of sow and boar **to develop the skill and entrepreneurship.**

UNIT-IV

Sheep and goat management: Importance, Important breeds, rising of kids and lambs, Breeding, Feeding of goats and sheep **to develop the skill and entrepreneurship.**

UNIT-V

Health management: Common animal diseases of cattle, buffalo, goat, sheep and swine viz. Anthrax. BQ, HS, Brucellosis, Mastitis, Milk fever. Bloat. Swine fever and Enterotoxemia **for better skilling to employ in the industry, Vaccination schedule.**

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the importance of livestock in single and mixed farming and its contribution to economy **to develop the skill.**


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CO2: Become familiar with cattle and buffalo breeds, breeding methods & systems, care and management of them at different ages and purposes **for better skilling and employability.**

CO3: Get knowledge of maintenance of livestock records, milking methods and clean milk production **to develop the skill and entrepreneurship.**

CO4: Study of Feeds and feeding, Conservation of fodder, Housing for dairy animals **to develop the skill and entrepreneurship.**

CO5: Introduce with breeds of pigs, goats and sheep, general aspects of breeding, care of kids, lambs piglets, sow and boar. Knowledge of animal diseases of cattle, buffalo, goat, sheep and swine **for better skilling to employ in the industry.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 1 | 3 | 3 | 1 |
| CO2 | 3 | 2 | 3 | 3 | 1 |
| CO3 | 3 | 2 | 3 | 3 | 1 |
| CO4 | 3 | 1 | 3 | 3 | 2 |
| CO5 | 3 | 2 | 3 | 3 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 3 | 3 | 1 |
| CO3 | 3 | 1 | 3 |
| CO4 | 3 | 2 | 3 |
| CO5 | 3 | 3 | 1 |

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AGP-107

Introductory Animal Husbandry Lab

L: T: P 0:0:1

List of Experiments

1. Study of external body parts.
2. Study of phenotypic and physiological difference between cow and buffaloes.
3. Estimation of body weight by measurements.
4. Identification of animals.
5. Castration and Dehorning.
6. Estimation of cost of milk production.
7. Problems on computation of ration.
8. Casting and throwing, Grooming.
9. Scheme of fodder production round the year.
10. Recording temperature, pulse rate and respiration rate of animals.


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AG-108 Comprehension & Communication Skills in English L: T: P 1:0:0

Course Objectives:

The objectives of this course are:

- To increase understanding of what is being read and listen.
- To build vocabulary and to enhance the ability to correct the sentences.
- To develop knowledge and abilities to make correct use of functional grammar.
- To enhance competencies in writing paragraph, gist or abstract/précis of the passage in own words/ language and in writing letters and applications of different kinds.
- To write resumes, Curriculum Vitae, bio-data, letters and applications of different kinds and to attend job interviews confidently **for better skilling and employability.**

UNIT-I

War Minus Shooting- The sporting Spirit. A Dilemma- A layman looks at science Raymond B. Fosdick. You and Your English - Spoken English and broken English G.B. Shaw **to develop the skill.**

UNIT-II

Reading Comprehension, Vocabulary- Antonym, Synonym, Homophones, Homonyms. often confused words. Exercises to help the students in the enrichment of vocabulary based on TOEFL and other competitive examinations **for better skilling and employability.**

UNIT-III

Functional grammar: Articles, Prepositions, Verb, Subject verb Agreement, Transformation, Synthesis. Direct and Indirect Narration **for skill development.**

UNIT-IV

Written Skills: Paragraph writing, Precise writing, Report writing and Proposal writing. The Style: Importance of professional writing **for skill development.**

UNIT-V

Preparation of Curriculum Vitae and Job applications. Synopsis Writing. Interviews: kinds. Importance and process **for better skilling and employability.**

Course Outcomes:

The students completing this course will be able to:

CO1: Increase understanding and recall of what is being read and listen including facts and main idea **to develop the skill.**



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CO2: Build vocabulary and enhance the ability to correct the sentences **for better skilling and employability.**

CO3: Use grammar in their own writing in English correctly **for skill development.**

CO4: Enhance competencies in writing paragraph, report, proposal, and gist or abstract/ précis of the passage in their own words/ language **for skill development.**

CO5: Write resumes, Curriculum Vitae, bio-data, letters and applications of different kinds and to attend job interviews confidently **for better skilling and employability.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 1 | 1 | 1 | 3 | 1 |
| CO2 | 1 | 1 | 1 | 3 | 1 |
| CO3 | 2 | 1 | 2 | 3 | 2 |
| CO4 | 1 | 1 | 1 | 3 | 1 |
| CO5 | 1 | 1 | 1 | 3 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 3 | 3 | 1 |
| CO3 | 3 | 1 | 1 |
| CO4 | 3 | 1 | 1 |
| CO5 | 3 | 3 | 1 |

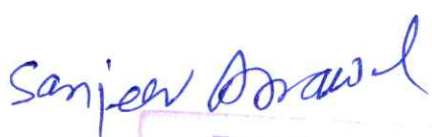
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- www.skillneed.com

me

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Sanjay Dhand

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AGP-108 Comprehension & Communication Skills in English Lab L: T: P 0:0:1

List of Experiments

1. Listening Comprehension: Listening to short talks lectures, speeches (scientific, commercial and general in nature).
2. Oral Communication: Phonetics, stress and intonation.
3. Conversation practice. Conversation: rate of speech, clarity of voice, speaking and Listening, politeness.
4. Reading skills: reading dialogues, rapid reading, intensive reading, improving reading skills.
5. Mock Interviews: testing initiative, team spirit, leadership, intellectual ability.
6. Group Discussions.



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AG-109

Agricultural Heritage

L:T: P 1:0:0

Objectives:

- To create awareness of the Indian agricultural heritage.
- To understand relevance of heritage to present day agriculture **for better skilling.**

UNIT-I

Introduction of Indian agricultural heritage; Ancient agricultural practices.

UNIT-II

Relevance of heritage to present day agriculture; Past and present status of agriculture and farmers in society; Journey of Indian agriculture and its development from past to modern era **to develop basic skill.**

UNIT-III

Plant production and protection through indigenous traditional knowledge.

UNIT-IV

Crop voyage in India and world; Agriculture scope; Importance of agriculture and agricultural resources available in India; Crop significance and classifications; National agriculture setup in India **for skilling.**

UNIT-V

Current scenario of Indian agriculture; Indian agricultural concerns and future prospects **for better skilling.**

Outcomes:

After completing this course students would be able to

CO1: familiar with the Indian agriculture heritage and ancient agricultural practices

CO2: Understand the relevance of heritage to present day agriculture and journey of Indian agriculture and its development from past to modern era **to develop basic skill.**

CO3: Know the techniques of plant protection through indigenous traditional methods

CO4: To understand Importance of agriculture and agricultural resources available in India **for skilling.**



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CO5: Understand the Indian agricultural concern and future prospects **for better skilling.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 1 | 1 | 1 | 1 |
| CO2 | 3 | 1 | 1 | 1 | 1 |
| CO3 | 3 | 2 | 3 | 1 | 1 |
| CO4 | 3 | 1 | 3 | 1 | 3 |
| CO5 | 3 | 1 | 3 | 1 | 3 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated


| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 1 | 1 | 1 |
| CO2 | 3 | 1 | 1 |
| CO3 | 1 | 1 | 1 |
| CO4 | 3 | 1 | 1 |
| CO5 | 1 | 1 | 1 |

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AG-110A

Introductory Biology

L: T: P 1:0:0

Objectives: Identify the characteristics and basic needs of living organisms **for better skilling.**

UNIT-I

Introduction to the living world, diversity and characteristics of life, origin of life, Evolution and Eugenics **to develop the skill.**

UNIT-II

Binomial nomenclature and classification **for skill development.**

UNIT-III

Cell and cell division **for develop the skill.**

UNIT-IV

Morphology of plants. Seed and seed germination **to develop the skill.**

UNIT-V

Plant systematic- viz; Brassicaceae, Fabaceae and Poaceae. Role of animals in agriculture **for develop the skill**

Course Outcomes:

After completion of this course students will be able to

CO1: Understand the fundamental of biology **to develop the skill.**

CO2: Understand the system of binominal nomenclature and classification of living beings **for skill development.**

CO3: Know about the body's basic unit cell and its division **to develop the skill.**

CO4: Understand the morphology of the plants and role of animal in agriculture **for develop the skill**

CO5: Know about plant systematic **for develop the skill**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 3 | 1 | 1 |
| CO2 | 3 | 3 | 3 | 1 | 1 |
| CO3 | 3 | 3 | 3 | 1 | 1 |


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| | | | | | |
|-----|---|---|---|---|---|
| CO4 | 3 | 3 | 3 | 1 | 3 |
| CO5 | 3 | 3 | 3 | 1 | 3 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 3 | 1 | 1 |
| CO3 | 3 | 1 | 1 |
| CO4 | 3 | 1 | 3 |
| CO5 | 3 | 1 | 1 |

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AGP-110A

Introductory Biology Lab

L: T: P 0:0:1

List of Experiment:

1. To study morphology of flowering plants and their modifications: Root.
2. To study of internal structure of root.
3. To study morphology of flowering plants and their modifications: Stem.
4. To study of internal structure of stem.
5. To study morphology of flowering plants and their modifications: Leaf.
6. To study of internal structure of leaf.
7. To study of different parts of flower.
8. To study of different types of fruit.
9. To study of Cell, tissues & cell division.
10. Description of plants - Brassicaceae. Fabaceae and Poaceae.



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AG-110B

General Agriculture-I

L: T: P 1:0:1

Agriculture of Intermediate standard including Agronomy, Soil Science, Horticulture,
Plant Pathology

Vnu

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Sanjeev Drazaf

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AG-111A

Elementary Mathematics

L: T: P 2:0:0

Objective: - The main aims of this course are to recall and remember basics of coordinate geometry, calculus, matrices and determinant. The focus of the course to understand the concepts of basic mathematical methods to solve problems and analyze in agriculture problems and evaluate the results **for provide employability, skill and entrepreneurship.**

UNIT-I

Straight lines: Distance formula, section formula (internal and external division), Change of axes (only origin changed). Equation of co-ordinate axes, Equation of lines parallel to axes, Slope- intercept form of equation of line, Slope-point form of equation of line. Two point form of equation of line, Intercept form of equation of line, Normal form of equation of line, General form of equation of line, Point of intersection of two st. lines, Angles between two st. lines, Parallel lines, Perpendicular lines, Angle of bisectors between two lines. Area of triangle and quadrilateral **for provide employability and entrepreneurship.**

UNIT-II

Circle: Equation of circle whose centre and radius is known, General equation of a circle, Equation of circle passing through three given points, Equation of circle whose diameters is line joining two points (x_1, y_1) & (x_2, y_2) Tangent and Normal to a given circle at given point (Simple problems), Condition of tangency of a line $y = mx + c$ to the given circle $x^2 + y^2 = a^2$, **for provide employability and skill.**

UNIT-III

Differential Calculus: Definition of function, limit and continuity, Simple problems on limit, Simple problems on continuity, Differentiation of x^n , e^n , $\sin x$ & $\cos x$ from first principle, Derivatives of sum, difference, product and quotient of two functions, Differentiation of functions of functions (Simple problem based on it), Logarithmic differentiation (Simple problem based on it), Differentiation by substitution method and simple problems based on it. Differentiation of Inverse Trigonometric functions. Maxima and Minima of the functions of the form $y=f(x)$ (Simple problems based on it) **provide better skill.**

UNIT-IV

Integral Calculus: Integration of simple functions, Integration of Product of two functions, Integration by substitution method, Definite Integral (simple problems based on it), Area


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under simple well-known curves (simple problems based on it) **for provide employability and skill.**

UNIT-V

Matrices and Determinants: Definition of Matrices, Addition, Subtraction, Multiplication, Transpose and Inverse up to 3rd order. Properties of determinants up to 3rd order and their evaluation **for provide employability and skill.**

Course Outcomes:

The student is able to

CO1: Remember terminologies and formulae of Coordinate Geometry, calculus and matrices **for provide employability and entrepreneurship.**

CO2: Understand and interpret the concepts of Coordinate Geometry, calculus and matrices **for provide employability and skill.**

CO3: Compare and analyze the methods in Coordinate Geometry, calculus and matrices **provide better skill.**

CO4: Predict and evaluate the problems in Coordinate Geometry, calculus and matrices **for provide employability and skill.**

CO5: Students able to know Matrices and Determinants **for provide employability and skill.**

PO-CO Mapping (Please write 3,2,1 wherever required)

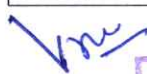
Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 1 | 1 | 3 | 1 |
| CO2 | 3 | 1 | 1 | 3 | 1 |
| CO3 | 3 | 1 | 2 | 3 | 1 |
| CO4 | 3 | 2 | 1 | 3 | 1 |
| CO5 | 3 | 2 | 2 | 3 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 1 | 3 | 3 |
| CO2 | 3 | 3 | 1 |
| CO3 | 3 | 1 | 1 |
| CO4 | 3 | 3 | 1 |
| CO5 | 3 | 3 | 1 |


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AG-111B

General Agriculture-II

L: T: P 2:0:0

Agriculture of Intermediate standard including Ag Engg. Animal Husbandry and economics

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AGP-112A/C

NSS/Physical Education & Yoga Practices

L: T: P 0:0:2

Theory

Course aims at evoking social consciousness among students through various activities viz., working together, constructive and creative social work, to be skilful in executing democratic leadership, developing skill in programme development to be able for self-employment, reducing gap between educated and uneducated, increasing awareness and desire to help sections of society. Following activities are to be taken up under the NSS course:

- Introduction and basic components of NSS: Orientation
- NSS programmes and activities
- Understanding youth
- Community mobilization
- Social harmony and national integration
- Volunteerism and shramdan
- Citizenship, constitution and human rights
- Family and society
- Importance and role of youth leadership
- Life competencies
- Youth development programmes
- Health, hygiene and sanitation
- Youth health, lifestyle, HIV AIDS and first aid
- Youth and yoga
- Vocational skill development
- Issues related environment
- Disaster management
- Entrepreneurship development
- Formulation of production-oriented project
- Documentation and data reporting
- Resource mobilization
- Additional life skills
- Activities directed by the Central and State Government


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All the activities related to the National Service Scheme course is distributed under four different courses viz., National Service Scheme I, National Service Scheme II, National Service Scheme III and National Service Scheme IV each having one credit load. The entire four courses should be offered continuously for two years. A student enrolled in NSS course should put in at least 60 hours of social work in different activities in a semester other than live regular one day camp in a year and one special camp for duration of 7 days at any semester break period in the two year. Different activities will include orientation lectures and practical works. Activities directed by the Central and State Government have to be performed by all the volunteers of NSS as per direction



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AGP-112A National Service Scheme 1 Introduction and basic components of NSS L: T: P 0:0:2

Orientation: history, objectives, principles. Symbol, badge; regular programmes under NSS, organizational structure of NSS, code of conduct for NSS volunteers, points to be considered by NSS volunteer's awareness about health

NSS programmes and activities

Concept of regular activities, special camping, day camps, basis of adoption of village/slums, conducting survey, analysing guiding financial patterns of scheme, youth programme/schemes of GUI, coordination with different agencies and maintenance of diary

Understanding youth

Definition, profile. profile, categories, issues and challenges of youth; and opportunities for youth who is agent of the social change

Community mobilisation

Mapping of community stakeholders, designing the message as per problems and their culture; identifying methods of mobilisation involving youth-adult partnership

Social harmony and national integration

Indian history and culture, role of youth in nation building, conflict resolution and peace-building

Volunteerism and shramdan

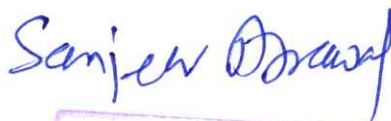
Indian tradition of volunteerism, its need, importance, motivation and constraints; shramdan as part of volunteerism

Citizenship, constitution and human rights

Basic features of constitution of India, fundamental rights and duties, human rights, consumer awareness and rights and rights to information Family and society

Concept of family, community (PRIs and other community-based organisations) and society


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AGP-112C

Physical Education and Yoga Practices

2(0+2)

1. Teaching of skills of Football - demonstration, practice of the skills, correction, involvement in gamesituation (For girls teaching of Tennikoit)
2. Teaching of different skills of Football - demonstration, practice of the skills, correction, involvement in game situation (For girls teaching of Tennikoit)
3. Teaching of advance skills of Football - involvement of all the skills in game situation with teachingof rules of the game
4. Teaching of skills of Basketball - demonstration, practice of the skills, correction of skills, involvement in game situation
5. Teaching of skills of Basketball - demonstration, practice of the skills, involvement in game situation
6. Teaching of skills of Basketball - involvement of all the skills in game situation with teaching of rule of the game
7. Teaching of skills of Kabaddi - demonstration, practice of the skills, correction of skills, involvementin game situation
8. Teaching of skills of Kabaddi - demonstration, practice of the skills, correction of skills, involvementin game situation
9. Teaching of advance skills of Kabaddi - involvement of all the skills in game situation with teachingof rule of the game
10. Teaching of skills of Ball Badminton - demonstration, practice of the skills, correction of skills,involvement in game situation
11. Teaching of skills of Ball Badminton - involvement of all the skills in game situation with teachingof rule of the game
12. Teaching of some of Asanas - demonstration, practice, correction and practice
13. Teaching of some more of Asanas - demonstration_ practice, correction and practice
14. Teaching of skills of Table Tennis - demonstration, practice of skills, correction and practice andinvolvement in game situation
15. Teaching of skills of Table Tennis - demonstration, practice of skills, correction and practice andinvolvement in game situation
16. Teaching of skills of Table Tennis - involvement of all the skills in game situation with teaching ofrule of the game

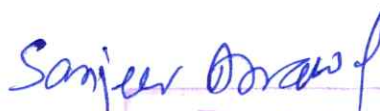

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17. Teaching - Meaning, Scope and importance of Physical Education
18. Teaching - Definition, Type of Tournaments
19. Teaching - Physical Fitness and Health Education
20. Construction and laying out of the track and field (*The girls will have Tennikoit and Throw Ball).
1. Teaching of skills of Hockey - demonstration practice of the skills and correction.
2. Teaching of skills of Hockey - demonstration practice of the skills and correction. And involvement of skills in games situation
3. Teaching of advance skills of Hockey - demonstration practice of the skills and correction. Involvement of all the skills in games situation with teaching of rules of the game
4. Teaching of skills of Kho-Kho - demonstration practice of the skills and correction.
5. Teaching of skills of Kho-Kho - demonstration practice of the skills and correction. Involvement of the skills in games situation
6. Teaching of advance skills of Kho-Kho - demonstration practice of the skills and correction. Involvement of all the skills in games situation with teaching of rules of the game
7. Teaching of different track events - demonstration practice of the skills and correction.
8. Teaching of different track events - demonstration practice of the skills and correction.
9. Teaching of different track events - demonstration practice of the skills and correction with competition among them.
10. Teaching of different field events - demonstration practice of the skills and correction.
11. Teaching of different field events - demonstration practice of the skills and correction.
12. Teaching of different field events - demonstration practice of the skills and correction.
13. Teaching of different field events - demonstration practice of the skills and correction with -competition among them.
14. Teaching of different asanas - demonstration practice and correction.
15. Teaching of different asanas - demonstration practice and correction.
16. Teaching of different asanas - demonstration practice and correction.
17. Teaching of different asanas - demonstration practice and correction.
18. Teaching of weight training - demonstration practice and correction.
19. Teaching of circuit training - demonstration practice and correction.
20. Teaching of calisthenics - demonstration practice and correction.



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Note:

- Compulsory Uniform: Half pants, Tee Shirts, Shoes and socks all white (Girls will have white TeeShirt and Track pants)
- The games mentioned in the practical may be inter changed depending on the season and facilities.



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AG-201

Fundamentals of Crop Physiology

L: T: P 2:0:0

Objective: To study the physiological aspects of crops, contribute a major role in growth and development in plants **for provide employability and skill.**

UNIT-I

Introduction to crop physiology and its importance in Agriculture; Plant cell: an Overview: Diffusion and osmosis; Absorption of water, transpiration and Stomatal Physiology; **for provide skill.**

UNIT-II

Mineral nutrition of Plants: Functions and deficiency symptoms of nutrients, nutrient uptake mechanisms; Photosynthesis: Light and Dark reactions, C₃, C₄ and CAM plants; **for provide skill.**

UNIT-III

Respiration: Glycolysis. TCA cycle and electron transport chain; Fat Metabolism: Fatty acid synthesis and Breakdown; **for provide employability and skill.**

UNIT-IV

Plant growth regulators: Physiological roles and agricultural uses. Physiological aspects of growth and development of major crops: **for provide skill.**

UNIT-V

Growth analysis, Role of Physiological growth parameters in crop productivity. **for provide skill**

Course Outcomes:

Students completing this course will be able to:

CO1: Define plant cell and its physiological functions **for provide employability and skill.**

CO2: Understand different physiological functions in a cell such as photosynthesis, respiration, osmosis, diffusion, fatty acid synthesis and breakdown **for provide skill.**

CO3: Understand the physiological roles and commercial use of Plant Growth Regulators in agriculture **for provide employability and skill.**

CO4: Understand the methods and formulas used for growth analysis in crops **for provide skill.**

CO5: Apply the knowledge of plant physiology to have better understanding science behind agronomic practices in different crops **for provide skill**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 1 | 1 | 3 | 1 | 1 |
| CO2 | 3 | 3 | 3 | 1 | 1 |
| CO3 | 3 | 3 | 3 | 1 | 1 |
| CO4 | 3 | 1 | 1 | 3 | 1 |
| CO5 | 3 | 3 | | 1 | 1 |

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CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 3 | 1 |
| CO2 | 3 | 1 | 1 |
| CO3 | 3 | 3 | 1 |
| CO4 | 3 | 1 | 1 |
| CO5 | 3 | 1 | 1 |

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AGP-201

Fundamentals of Crop Physiology

L: T: P 0:0:1

List of Experiments

1. Study of plant cell.
2. Study of imbibition, osmosis and plasmolysis.
3. Study of structure and distribution of stomata.
4. Measurement of root pressure.
5. Measurement of rate of transpiration.
6. Separation of photosynthetic pigments through paper chromatography.
7. Rate of transpiration, photosynthesis, respiration, tissue test for mineral nutrients.
8. Estimation of relative water content.
9. Measurement of photosynthetic CO₂ assimilation by Infra-Red Gas Analyzer (IRGA).



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AG-202

Fundamentals of Plant Biochemistry

L: T: P 2:0:0

Objective: Understand the biochemistry plant defence mechanism, identify the toxic compounds in plants, describe the kinetics and characterization of enzymes, and identify the detoxification mechanisms. To provide education that leads to comprehensive understanding of the principles and practices of biochemistry **for skill development and Employability.**

UNIT-I

Biochemistry- introduction, scope and Importance in agriculture. Carbohydrate: Importance and classification of Monosaccharides, Disaccharides and Polysaccharides **for provide skill and Employability.**

UNIT-II

Lipid: Importance and classification; Structures and properties of fatty acids; lipids. Proteins: Importance of proteins and classification; Structures **for provide skill and Employability.**

UNIT-III

Amino acid-definition, classification and important function. Structural organization of proteins.

UNIT-IV

Enzymes: General properties; Classification; Mechanism of action; classification of vitamin structure role and its deficiency symptoms **for provide skill, employability and entrepreneurship.**

UNIT-V

Introduction to allosteric enzymes. Nucleic acids: Importance and classification; Structure of Nucleotides. Metabolism of carbohydrates: Glycolysis **for skill development.**

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the significance of Biochemistry **for provide skill and Employability.**

CO2: Describe the chemistry of carbohydrates, lipids, proteins and amino acids **for provide skill and Employability.**

CO3: Describe the classification and structural organization of proteins

CO4: Describe the mechanism of enzyme action and identify the classes of enzymes and factors affecting action **for provide skill, employability and entrepreneurship.**


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CO5: Describe the catabolic reactions of carbohydrates, lipids and amino acids **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 1 | 3 | 1 | 1 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 3 | 1 | 3 | 1 | 1 |
| CO4 | 3 | 1 | 3 | 1 | 1 |
| CO5 | 3 | 1 | 3 | 1 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 3 | 1 |
| CO2 | 3 | 3 | 1 |
| CO3 | 1 | 1 | 2 |
| CO4 | 3 | 3 | 3 |
| CO5 | 3 | 1 | 1 |

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AGP-202

Fundamentals of Plant Biochemistry Lab

L: T: P 0:0:1

1. To study the Qualitative tests of carbohydrates and amino acids.
2. To study the Quantitative estimation of glucose.
3. To study the Quantitative estimation of proteins
4. To study the Titration methods for estimation of amino acids/lipids,
5. To study the paper chromatography Monosaccharides.
6. Estimation of Ca, Cao.
7. Estimation of CaCO₃ in Hcl extract.
8. Estimation of reducing and non-reducing in cane sugar and jaggary.



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AG-203

FUNDAMENTALS OF ENTOMOLOGY-I

L: T: P 2:0:0

(INSECT MORPHOLOGY & TAXONOMY)

Objective: To impart knowledge on classification and identification of insects based on their morphology **to enhance the basic understanding, skill development and employability.**

UNIT-I

Classification of phylum Arthropoda upto classes. Relationship of class Insecta with other classes of Arthropoda **to enhance the basic understanding and skill development.**

UNIT-II

Morphology: Structure and functions of insect cuticle and moulting. Bodysegmentation. Structure of Head, thorax and abdomen. Structure and modifications of insect antennae, mouth parts, legs, wing venation, modifications and wing coupling apparatus. Structure of male and female genital organs. Metamorphosis and diapause in insects. Types of larvae and pupae **to enhance the skill development and entrepreneurship.**

UNIT-III

Structure and functions of digestive, circulatory, excretory, respiratory, nervous, secretory (Endocrine) and reproductive systems in insects. Types of reproduction in insects. Major sensory organs like simple and compound eyes and chemoreceptors **for provide the skill.**

UNIT-IV

Systematics: Taxonomy- -importance, history and development and binomial nomenclature. Definitions of Biotype, Sub-species, Species, Genus, Family and Order **for provide the skill and employability.**

UNIT-V

Classification of class Insecta upto Orders, basic groups of present day insects with special emphasis to orders and families of Agricultural importance like Orthoptera: Acrididae. Dictyoptera: Mantidae, Odonata; Isoptera: Termitidae; Thysanoptera: Thripidae; Hemiptera: Pentatomidae, Coreidae, Cimicidae, Pyrrhocoridae. Lygaeidae, Cicadellidae, Delphacidae, Aphididae, Coccidae, Lophophidac, Alcuroididac, Pseudococcidae; Neuroptera: Chrysopidae; Lepidoptera: Pieridae, Papiloinidae, Noctuidae, Sphingidae, Pyralidae, Gelechiidae, Arctiidae, Saturnidae, Bombycidae; Coleoptera: Coccinellidae, Chrysomelidae, Cerambycidae, Curculionidac, Bruchidae, Scarabaeidae; Hymenoptera: Tenthridinidae, Apidae. Trichogrammatidae, ichneumonidae, Braconidae, Chalcididae; Diptera:

Cecidomyiidae, Tachinidae, Agromyziidae, Culicidae, Muscidae, Tephritidae for provide the skill and employability.

Course Outcomes:

Students completing this course will be able to:

CO1. Thorough knowledge on insects Collection and preservation enhance the basic understanding and skill development

CO2. Developing skill to identify insects to enhance the skill development and entrepreneurship

CO3. Knowledge on physiological systems in insect through dissections for provide the skill

CO4. Knowledge on the students on morphology of Insects for provide the skill and employability.

CO5. for provide the Skill

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 1 | 3 | 1 | 1 |
| CO2 | 3 | 1 | 3 | 1 | 1 |
| CO3 | 3 | 1 | 3 | 1 | 1 |
| CO4 | 3 | 1 | 3 | 1 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

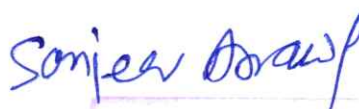
| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 1 | 3 |
| CO3 | 3 | 1 | 1 |
| CO4 | 1 | 3 | 1 |
| CO5 | 3 | 1 | 1 |

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AGP-203

Fundamentals of Entomology-I Lab

L: T: P 0:0:1

(INSECT MORPHOLOGY & TAXONOMY)

List of Experiments

1. Methods of collection and preservation of insects including immature stages.
2. External features of Grasshopper/Blister beetle.
3. Types of insect antennae, mouthparts and legs.
4. Wing venation, types of wings and wing coupling apparatus.
5. Types of insect larvae and pupae.
6. Dissection of digestive system in insects (Grasshopper).
7. Dissection of male and female reproductive systems in insects (Grasshopper).
8. Study of characters of orders Orthoptera, Dictyoptera, Odonata, Isoptera, Thysanoptera, Hemiptera, Lepidoptera, Neuroptera, Coleoptera, Hymenoptera, Diptera and their families of agricultural importance.



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AG-204

Fundamentals of Agricultural Economies

L: T: P 2:0:0

Objective: To provide students and understanding about the economics **to enhance the basic understanding, skill development and employability**

UNIT-1

Economics Meaning, scope and subject matter, definitions, activities, approaches to economic analysis; micro and macro economics, positive and normative analysis **for provide the skill development.**

UNIT-II

Nature of economic theory: rationality assumption, concept of equilibrium, economic laws as generalization of human behavior. Basic concepts: Goods and services, desire, want, demand, utility, cost and price, wealth, capital, income and welfare **for provide the skill and employability.**

UNIT-III


Agricultural economics: meaning, definition, characteristics of agriculture, importance and its role in economic development. Agricultural planning and development in the country. Demand meaning, law of demand, demand schedule and demand curve, determinants, utility theory: law of diminishing marginal utility, equimarginal utility principle **for provide the employability and entrepreneurship.**

UNIT-IV

Consumer's equilibrium and derivation of demand curve, concept of consumer surplus. Elasticity of demand: concept and measurement of price elasticity, income elasticity and cross elasticity. Production: process, creation of utility, factors of production. input output relationship. Supply: Stock Vs supply, law of supply, supply schedule, supply curve, determinants of supply, elasticity of supply. Concepts of rent, wage, interest and profit, **for provide the employability and entrepreneurship**

UNIT-V

National income' Meaning and importance, circular flow, concepts of national income accounting and approaches to measurement, difficulties in measurement. Population: Importance. Malthusian and Optimum population theories, natural and socio-economic determinants, current policies and programmes on population control. Money: Barter system


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of exchange and its problems, evolution. meaning and functions of money, classification of money, money supply, general price index, inflation and deflation, public revenue and public expenditure. Tax: meaning. direct and indirect taxes, agricultural taxation, VAT. Economic systems: Concepts of economy and its functions, important features of capitalistic, socialistic and mixed economies, elements of economic planning **for provide the employability and entrepreneurship.**

Course Outcomes:

Students completing this course will be able to:

CO1: Introduce the students to the evolution of economic thought over a period of time, the background of emanation of thoughts and approaches as acts of balancing and counter balancing events and criticisms **for provide the skill development.**

CO2: . A comprehensive way to know and appreciate the contributions of the Galaxy of Economists **for provide the skill and employability**

CO3: Provide an overview o micro economic theory and its applications **for provide the employability and entrepreneurship.**

CO4: Learning the consumer behavior consisting of consumer's utility maximization problem and demand theory **for provide the employability and entrepreneurship**

CO5: . Gaining Knowledge on fundamental concepts and models in the theory of production and costs and sets out to provide a basic understanding of price and or output determination under different types of market structures including factor markets **for provide the employability and entrepreneurship.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 1 | 1 | 3 | 1 |
| CO2 | 3 | 1 | 1 | 3 | 1 |
| CO3 | 3 | 1 | 1 | 3 | 1 |
| CO4 | 3 | 1 | 1 | 3 | 1 |
| CO5 | 3 | 1 | 1 | 3 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated


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| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 3 | 3 | 1 |
| CO3 | 1 | 3 | 3 |
| CO4 | 1 | 3 | 3 |
| CO5 | 1 | 1 | 1 |

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AG-205

Principles of Organic Farming

L: T: P 1:0:0

Objective: Aims of organic farming:-

- Maintain soil health, ecological balance
- Maintain soil and crop productivity Organic farming as a system of crop production is to feed the soil rather than feed the plant.
- Avoid Ground water and air pollution
- **To provide the skill, employability and entrepreneurship**

UNIT I

Organic farming, principles and its scope in India; **for provide the basic knowledge and skill.**

UNIT II

Initiatives taken by Government (central/state), NGOs and other organizations for promotion of organic agriculture **for provide skill.**

UNIT III

Organic nutrient resources and its fortification; **for provide skill.**

UNIT IV

Restrictions to nutrient use in organic farming; Choice of crops and varieties in organic farming; **for provide skill and entrepreneurship.**

UNIT V

Fundamentals of insect, pest, disease and weed management under organic mode of production: Certification process and standards of organic farming **for provide skill and entrepreneurship.**


Course Outcomes:


Students completing this course will be able to:

CO1: Understand the how to conserve the soil against chemicals **for provide the basic knowledge and skill.**

CO2: Understand the how to take qualitative and quantitative crop production **for provide skill.**

CO3: Understand the how to conserves the farm resources **for provide skill.**


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CO4: Awareness will come about the ongoing government schemes for provide skill and entrepreneurship.

CO5: Understand the better utilization of farm wastes for provide skill and entrepreneurship.

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 1 | 3 | 1 | 3 |
| CO2 | 3 | 1 | 3 | 1 | 3 |
| CO3 | 3 | 1 | 1 | 3 | 3 |
| CO4 | 3 | 1 | 1 | 3 | 3 |
| CO5 | 3 | 1 | 1 | 3 | 3 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated


| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 3 | 1 | 1 |
| CO3 | 3 | 1 | 1 |
| CO4 | 3 | 1 | 3 |
| CO5 | 3 | 1 | 3 |

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AGP-205

Principles of Organic Farming Lab

L: T: P 0:0:1

List of Experiments

1. To study of various components of Organic Farming and their utilization.
2. Preparation of enrich compost and quality analysis.
3. Preparation of enrich Vermi-compost and quality analysis.
4. Indigenous technology knowledge (ITK) for Nutrient management.
5. Indigenous technology knowledge (ITK) for Insect-Pest and Disease management.
6. Indigenous technology knowledge (ITK) for Weed management.
7. To assessment cost of organic production system.
8. To study of grading, packaging and handling of organic product.


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AG-206

Fundamentals of Plant Pathology

L: T: P 3:0:0

Objective: To introduce concepts and principles of plant pathology. **To provide skill, employability and entrepreneurship.**

UNIT-I

Introduction: Importance of plant diseases, scope and objective of Plant Pathology. History of Plant Pathology with special reference to Indian work. Terms and concept in Plant Pathology, **for provide the basic knowledge and skill.**

UNIT-II

Pathogenesis. diseases triangle and tetrahedron and classification of plant diseases. Important Plant pathogenic organism fungi. bacteria. fastidious vesicular bacteria. Phytoplasmas, Spiroplasmas, viruses. viroids, algae. protozoa, phanerogamic parasite and nematodes with example of diseases caused by them, **to enhance the basic knowledge and skill.**

UNIT-III

Diseases due to abiotic causes. Fungi: general character, definition of fungus, somatic structures, type of fungus thalli, fungal tissues. modifications of thallus, reproduction (Asexual and Sexual). Nomenclature, Binomial system of nomenclature. rules of nomenclature, classification of fungi, key to divisions, sub-divisions. Orders and classes **for provide the employability and skill.**

UNIT-IV

Bacteria and mollicutes: general morphological characters, basic methods reproduction. Viruses: nature of properties, structure and transmission **for provide the employability and skill.**

UNIT-V

Study of phanerogamic plant parasites. Epidemiology: Factors affecting disease development **for provide the employability and skill.**

Course Outcomes

CO1: Students will know the introduction, history, concept and terms of Plant Pathology **for provide the basic knowledge and skill.**

CO2: Students will know the disease and important plant pathogenic organism **to enhance the basic knowledge and skill.**


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CO3: Students will know the fungi and abiotic causes **for provide the employability and skill**

CO4: . Students will know the bacteria and viruses **for provide the employability and skill.**

CO5: Students will know the phanerogamic plant parasites and Epidemiology **for provide the employability and skill.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 3 | 1 | 1 |
| CO2 | 3 | 3 | 3 | 1 | 1 |
| CO3 | 3 | 3 | 3 | 1 | 1 |
| CO4 | 3 | 3 | 3 | 1 | 1 |
| CO5 | 3 | 3 | 3 | 1 | 1 |


CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 3 | 1 | 1 |
| CO3 | 3 | 3 | 1 |
| CO4 | 3 | 3 | 1 |
| CO5 | 3 | 3 | 1 |

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AGP-206

Fundamentals of Plant Pathology Lab

L: T: P 0:0:1

List of Experiments

1. Acquaintance with various laboratory equipments and microscopy.
2. Collection and preservation of disease specimen.
3. Preparation of media.
4. Isolation and Koch's postulates.
5. General study of different structure of fungi.
6. Study of symptoms of various plant diseases.
7. Study of representative fungal genera.
8. Staining and identification of plant pathogenic bacteria.
9. Study of phanerogamic plant parasites.
10. Identification of plant parasitic nematodes.


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AG-207

Production Technology for Vegetable and Spices

L: T: P 1:0:0

Objective: To become aware about importance of vegetables and spices for human consumption with study of about production technology of important vegetables and spices. To **provide the skill, employability and Entrepreneurship.**

UNIT-I

Importance of vegetables & spices in human nutrition and national economy, types of vegetable gardening, to **provide the basic knowledge and provide skill.**

UNIT-II

Brief about origin, area, production improved varieties and cultivation practices such as time of sowing, transplanting techniques, planting distance, fertilizer requirements, irrigation, weed management, harvesting storage, physiological disorders, disease and seed production of important vegetables Potato, tomato, cauliflower **for provide the skill, employability and entrepreneurship.**

UNIT-III

Onion, okra, bottle guard and bitter guard **for provide the skill and entrepreneurship.**

UNIT-IV

Brief about origin, area, production improved varieties and cultivation practices such as time of sowing, transplanting techniques, planting distance, fertilizer requirements, irrigation, weed management, harvesting storage, physiological disorders, disease and seed production of spices and condiments- Ginger, turmeric, **to provide the skill and entrepreneurship**

UNIT-V

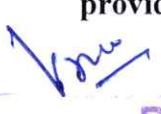
Coriander, cumin, funnel, black pepper, ilaichi **to provide the skill and entrepreneurship.**

Course Outcomes:

Students completing this course will be able to:

CO1: To know importance of vegetable and spice crops to **provide the basic knowledge and provide skill**

CO2: Lay out types of vegetable gardening with special reference to kitchen gardening **for provide the skill, employability and entrepreneurship.**


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CO3: To know more about origin, area, climate, soil, improved varieties and cultivation practices of important vegetables and spices **for provide the skill and entrepreneurship.**

CO4: Diagnose and control physiological disorders and diseases of important vegetable and spices **to provide the skill and entrepreneurship.**

CO5: Understand the seed production and extraction of vegetables and spices **to provide the skill and entrepreneurship.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 1 | 3 | 1 | 1 |
| CO2 | 3 | 1 | 3 | 1 | 1 |
| CO3 | 3 | 3 | 3 | 1 | 1 |
| CO4 | 3 | 3 | 3 | 1 | 1 |
| CO5 | 3 | 3 | 3 | 3 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated


| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 3 |
| CO2 | 3 | 3 | 3 |
| CO3 | 3 | 1 | 3 |
| CO4 | 3 | 1 | 3 |
| CO5 | 3 | 1 | 3 |

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AGP-207 Production Technology for Vegetable and Spices Lab L: T: P 0:0:1

List of Experiments

1. Identification of vegetables & spice crops and their seeds.
2. Nursery raising techniques.
3. Direct seed sowing and transplanting.
4. Study of morphological characters of different vegetables & spices.
5. Fertilizers applications raising of nursery of vegetable & spices,
6. Vegetable and spices seed extraction.
7. Harvesting & preparation for market.
8. Economics of vegetables and spices cultivation.


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AG-208 Fundamentals of Agricultural Extension Education L: T: P 2:0:0

Objective: To inculcate the fundamental knowledge of agricultural extension education in order to extend science and technology of Agriculture amongst farmers and this course is to educate the students about how develop the rural people economically, socially and culturally and different developmental programme. **To provide the skill, employability and Entrepreneurship.**

UNIT I

Education: Meaning, definition & Types: Extension Education- meaning, definition, scope and process; objectives and principles of Extension Education; Extension Programme planning- Meaning, Process, Principles and Steps in Programme Development **to enhance the basic knowledge and skill.**

UNIT II

Extension systems in India: extension efforts in. pre-independence era (Sriniketan, Martbandam, Firka Development Scheme, Gurgaon Experiment, etc.) and post-independence era (Etawah Pilot Project, Nilokheri Experiment, etc.); various extension/ agriculture development programmes launched by ICAR/ Govt. of India (IADP, IAAP, HYVP, KVK, IVLP, ORP, ND, NATP, NAIP, etc.) **to enhance the basic knowledge and skill.**

UNIT III

New trends in agriculture extension: privatization extension, cyber extension/ e-extension, market-led extension, farmer-led extension, expert systems, etc. Rural Development: concept, meaning, definition: various rural development programmes launched by Govt. of India **for provide the skill, employability and entrepreneurship.**

UNIT IV

Community Dev-meaning, definition, concept & principles, Philosophy of C.D. extension administration: meaning and concept, principles and functions. Monitoring and evaluation: concept and definition, **for provide the skill, employability and entrepreneurship.**

UNIT V

Transfer of technology: concept and models, capacity building of extension personnel; extension teaching methods: meaning, classification, individual, group and mass contact methods, ICT Applications in TOT. **to provide the skill, employability and entrepreneurship.**


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Course outcomes: II.

CO1: Understanding the fundamentals of extension education, extension systems in India to **enhance the basic knowledge and skill**

CO2: Insight in to programme planning and rural development efforts, extension administration to **enhance the basic knowledge and skill.**

CO3: Knowledge on different extension methods and approaches used for transfer of agricultural technology **for provide the skill, employability and entrepreneurship.**

CO4: Provide an opportunity to visit different organizations involved in extension activities and rural development work **for provide the skill, employability and entrepreneurship.**

CO5: Acquaintance on practical skills in preparation of different extension teaching methods to **provide the skill, employability and entrepreneurship.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 1 | 1 | 3 | 1 |
| CO2 | 3 | 1 | 1 | 3 | 1 |
| CO3 | 3 | 1 | 1 | 3 | 1 |
| CO4 | 3 | 1 | 1 | 3 | 1 |
| CO5 | 3 | 1 | 1 | 3 | 1 |


CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 3 | 1 | 1 |
| CO3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 |

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AGP-208 Fundamentals of Agricultural Extension Education Lab L: T: P :0:0:1

List of Experiments

1. To get acquainted with university extension system.
2. Group discussion-exercise.
3. Handling and use of audio visual equipments and digital camera and LCD projector.
4. Preparation and use of AV aids preparation of extension literature – leaflet, booklet, folder, pamphlet news stories and success stories.
5. Presentation skills exercise; micro teaching exercise.
6. To study organization and functioning of DRDA and other development departments at district level.
7. Exposure to mass media: visit to community radio and television studio for understanding the process of programme production.
8. Script writing, writing for print and electronic media, developing script for radio and television.
9. A visit to village to understand the problems being encountered by the villagers/farmers.
10. Visit to NGO and learning from their experience in rural development; understanding PRA techniques and their application in village development planning.


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AG-209

Dairy Processing and Safety Issues

L: T: P 2:0:0

Objective: To impart knowledge about basics of dairy engineering and technology and different aspects of safety issues and practices followed by industrial level **for provide the skill, employability and entrepreneurship.**

UNIT I

General: Definition of food, Constituents of foods: Water, Carbohydrate, Fat, Protein, Vitamins and Minerals with reference to milk, Detailed composition of milk and colostrum **for provide the skill.**

UNIT II

Food processing: Pasteurization, Sterilization, Bactofugation, Uperization, Stassanization. U.H.T. pasteurization and Homogenization of milk, Neutralization of milk, Cream, Cooling and chilling of milk **for provide the employability and entrepreneurship.**

UNIT III

Manufacturing of common dairy product viz. Cream, Butter, Ghee, Dahi, Yoghurt, Shrikhand & Ice-cream. Manufacturing of Khoa **for provide the employability and entrepreneurship.**

UNIT IV

Evaporated milk, condensed milk, WMP, SMP, Paneer, Cheese, Chhena, Cheddar cheese and. Mozzarella cheese (Pizza cheese) **for provide the employability and entrepreneurship.**

UNIT V

Food safety: Definition, Importance, Scope, Hazards and risks. Food safety management, HACCP, ISO Series, TQM-Concept and need for quality component of TQM. Basic water tests **for provide the skill.**

Course outcomes:

Students completing this course will be able to

CO1: Understand the basic science and composition of milk, sources of milk and its healthy importance **for provide the skill**

CO2: Understand different thermal treatment used to enhance the shelf life of milk food **for provide the employability and entrepreneurship**

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CO3: Understand the cooling and chilling of milk and making different value added products derived from milk **for provide the employability and entrepreneurship.**

CO4: Understand the evaporated milk, condensed milk, flavored milk, paneer and different water tests **for provide the employability and entrepreneurship.**

CO5: Understand the Food safety management, HACCP, ISO Series, TQM-Concept **for provide the skill.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 1 | 3 | 1 | 1 |
| CO2 | 3 | 1 | 3 | 1 | 1 |
| CO3 | 3 | 1 | 3 | 1 | 1 |
| CO4 | 3 | 1 | 3 | 3 | 1 |
| CO5 | 3 | 1 | 1 | 3 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|--------------------------|----------------------|-------------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 3 |
| CO4 | 1 | 3 | 3 |
| CO5 | 3 | 1 | 1 |

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AGP-209

Dairy Processing and Safety Issues Lab

L: T: P 0:0:1

List of Experiments

1. Demonstration of Cream separation.
2. Preparation of Dahi.
3. Preparation of Chhena.
4. Preparation of Khoa.
5. Preparation of Paneer.
6. Preparation of Cream.
7. Preparation of Ghee and shrikhand.
8. Estimation of problem on neutralization of milk and cream.
9. Preparation of plants for implementation of HACCP and ISO series,
10. Calculation of Ice cream mix.



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AG-210

Human Value and Ethics

L: T: P 1:0:0

Objective: To enable the students to imbibe and internalize the values and ethical behavior in the personal and professional lives **for provide the skill, employability and entrepreneurship.**

UNIT-I

Values and Ethics-An Introduction. Goal and Mission of Life. Vision of Life **for enhancing the skill and employability.**

UNIT-II

Principles and Philosophy. Self-Exploration, Self-Awareness, Self-Satisfaction. Decision Making **for provide the skill and employability.**

UNIT-III

Motivation. Sensitivity. Success. Selfless Service **for provide the skill.**

UNIT-IV

Case Study of Ethical Lives. Positive Spirit. Body, Mind and Soul **for provide the skill and employability.**

UNIT-V

Attachment and Detachment. Spirituality Quotient. Examination **for provide the skill and employability.**

Course outcome:

Students completing this course will be able to:

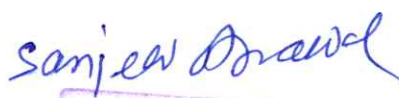
CO1: The student will understand the importance of values and ethics in their personal lives and professional careers **for enhancing the skill and employability**

CO2: The students will learn the rights and responsibilities as an employee, team member and a global citizen **for provide the skill and employability.**

CO3: Students able to know Motivation. Sensitivity. Success. Selfless Service **for provide the skill**

CO4: Students able to know Case Study of Ethical Lives and Positive Spirit **for provide the skill and employability.**


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CO5: Students able to know Attachment and Detachment and also Spirituality Quotient **for provide the skill and employability.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 1 | 1 | 3 | 1 |
| CO2 | 3 | 1 | 1 | 3 | 1 |
| CO3 | 3 | 1 | 1 | 3 | 1 |
| CO4 | 3 | 1 | 1 | 3 | 1 |
| CO5 | 3 | 1 | 1 | 3 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 3 | 1 |
| CO2 | 3 | 3 | 1 |
| CO3 | 3 | 3 | 1 |
| CO4 | 3 | 3 | 1 |
| CO5 | 3 | 3 | 1 |

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AG-301

Crop Production Technology-1 (*Kharif Crops*)

L: T: P 1:0:0

Objective:

- To study about the origin, geographical distribution, economic importance, soil and climatic requirements, varieties, cultural practices and yield of Kharif crops.
- To study about package and practices of Rabi crops.
- Origin, geographical distribution, economic importance, soil and climatic requirements, varieties, cultural practices and yield of following Kharif crops-
- **To provide the skill, employability and entrepreneurship.**

UNIT-1

Cereals - rice, maize, sorghum, pearl millet and finger millet **for provide the skill.**

UNIT-II

Pulses-pigeonpea, mungbean and Urdbean **for provide the skill.**

UNIT-III

Oilseeds- til, groundnut. and soybean **for provide the skill.**

UNIT-IV

Fibre crops- cotton & jute **for provide the skill and entrepreneurship.**

UNIT-V

Forage crops-sorghum. cowpea, cluster bean and napier **for provide the skill and entrepreneurship.**


Course Outcomes:

CO1: In the course study the students will be able to know about Soil and climatic requirements, varieties, cultural practices and yield of Kharif crops **for provide the skill.**

CO2: Student will able to understand the preparation field for rising crop **for provide the skill.**

CO3: Student will able to understand the package and practices of Rabi crops **for provide the skill.**

CO4: Constraints in production of oilseeds and pulses maybe identified through course content **for provide the skill and entrepreneurship.**


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CO5: Students will be able to understand the marketing of agricultural produce **for provide the skill and entrepreneurship.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 3 | 1 | 1 |
| CO2 | 3 | 3 | 3 | 1 | 1 |
| CO3 | 3 | 3 | 3 | 1 | 1 |
| CO4 | 3 | 3 | 3 | 1 | 1 |
| CO5 | 3 | 3 | 3 | 3 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 3 | 1 | 1 |
| CO3 | 3 | 1 | 1 |
| CO4 | 3 | 1 | 3 |
| CO5 | 3 | 1 | 3 |

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AGP-301

Crop Production Technology-1 (*Kharif* Crops) Lab

L: T: P 0:0:1

List of Experiments

1. Nursery preparation and transplanting of rice.
2. Sowing methods of soybean, pigeon pea and mung bean, maize, groundnut and cotton.
3. Effect of seed size on germination and seedling vigor of *kharif* season crops.
4. Effect of sowing depth on germination of *kharif* crops.
5. Identification of weeds in *kharif* season crops.
6. Top dressing and foliar feeding of nutrients.
7. Study of yield contributing characters and yield calculation of *kharif* season crops.
8. Study of crop varieties and important agronomic experiments at experimental farm.
9. Study of morphological description from experiments on forage crops.
10. Visit to research centers of related crops.



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AGP-302

Practical Crop Production-I (Kharif Crops)

L: T: P 0:0:2

List of experiments

1. Crop planning, raising field crops in multiple cropping systems.
2. Field preparation for raising field crops.
3. Seed treatment methods of different kharif crops.
4. Nursery raising methods of different field crops.
5. Sowing methods of kharif crops.
6. Nutrient management in kharif crops.
7. Water management in kharif crops.
8. Weed management methods in kharif crops.
9. Management of insect pests diseases of crops.
10. Harvesting, threshing, drying winnowing, storage and marketing of produce.
11. Effects of mechanization, resource conservation and integrated nutrient, insect-pest and disease management technologies on seed production.
12. Preparation of balance sheet including cost of cultivation, net returns per student as well as per team of 8-10 students.

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AG-303

Fundamentals of Plant Breeding

L: T: P 2:0:0

Objective: To impart theoretical knowledge and practical skills about plant breeding objectives, modes of reproduction and genetic consequences, breeding methods for crop improvement **for provide the skill, employability and entrepreneurship.**

UNIT-I

Historical development, concept. nature and role of plant breeding, major achievements and future prospects; Genetics in relation to plant breeding, modes of reproduction and apomixes, self-incompatibility and male sterility-genetic consequences **to provide the basic knowledge and skill.**

UNIT-II

Domestication, Acclimatization and Introduction: Centers of origin/diversity, components of Genetic variation; Heritability and genetic advance; **to provide the basic knowledge and skill.**

UNIT-III

Genetic basis and breeding methods in self- pollinated crops -mass and pure line selection, hybridization techniques and handling of segregating population; Multiline concept. Concepts of population genetics and Hardy-Weinberg Law; Genetic basis and methods of breeding cross pollinated crops. modes of selection; Population improvement Schemes-Ear to row method, Modified Ear to Row. recurrent selection **for provide skill and employability.**

UNIT-IV

Heterosis and inbreeding depression. development of inbred lines and hybrids, composite and synthetic varieties; Breeding methods in asexually propagated crops. clonal selection and hybridization: Maintenance of breeding records and data collection; Wide hybridization and pre-breeding; Polyploidy in relation to plant breeding. mutation breeding-methods and uses; **for provide skill and employability.**

UNIT-V

Breeding for important biotic and abiotic stresses; Biotechnological tools-DNA markers and marker assisted selection **for provide skill and employability.**

Course Outcomes:

CO1: Students will able to understand the historiological development, achievements and future prospects of Plant breeding **to provide the basic knowledge and skill.**


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CO2: Students will understand about the different plant breeding methods uses in crop improvement **to provide the basic knowledge and skill.**

CO3: Students will be learning to emasculation and pollination techniques in self, cross and asexual propagated crops **for provide skill and employability.**

CO4: Students will gain the knowledge of hybridization, Wide hybridization, Polyploidy and mutation breeding-methods uses in crop improvement program **for provide skill and employability.**

CO5: Students will able to understand the breeding for biotic and abiotic stresses **for provide skill and employability.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 1 | 3 | 1 | 1 |
| CO2 | 3 | 1 | 3 | 1 | 1 |
| CO3 | 3 | 1 | 3 | 1 | 1 |
| CO4 | 3 | 1 | 3 | 1 | 1 |
| CO5 | 3 | 3 | 3 | 1 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 3 | 1 | 1 |
| CO3 | 3 | 3 | 1 |
| CO4 | 3 | 3 | 1 |
| CO5 | 3 | 3 | 1 |

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AGP-303

Fundamentals of Plant Breeding Lab

L: T: P 0:0:1

List of Experiments

1. Plant Breeder's kit
2. Study of germplasm of various crops.
3. Study of floral structure of self-pollinated and cross-pollinated crops.
4. To work out the mode of pollination in a given crop and extent of natural out-crossing.
5. Prediction of performance of double cross hybrids.
6. Emasculation and hybridization techniques in self & cross-pollinated crops.
7. Consequences of inbreeding on genetic structure of resulting populations.
8. Study of male sterility system. Handling of segregation populations.
9. Methods of calculating mean, range, variance, standard deviation, heritability.
10. Designs and their analysis in plant breeding experiments


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AG-304

Agricultural Microbiology

L: T: P 1:0:0

Objective-Agricultural microbiology is one among them, concerned with the relationships between microbes and crops, with an emphasis on improving yields and combating plant diseases **for provide the skill, employability and entrepreneurship.**

UNIT-I

Introduction of Microbial world: Prokaryotic and eukaryotic microbes. Bacteria: cell structure, chemoautotrophy, photo autotrophy, growth **for provide the skill.**

UNIT-II

Bacterial genetics: Genetic recombination- transformation, conjugation and transduction. plasmids, transposon. Role of microbes in soil fertility and crop production: Carbon, Nitrogen, Phosphorus and Sulphur cycles **for provide the skill.**

UNIT-III

Biological nitrogen fixation- symbiotic, associative and a symbiotic. Azolla, blue green algae and mycorrhiza. Rhizosphere and phyllosphere **for provide the skill and employability.**

UNIT-IV

Microbes in human welfare: biofertilizers, biopesticides, biofuel production and biodegradation. Microbial degradation of organic matter in soil **for provide the skill, employability and entrepreneurship.**

UNIT-V

Cellulose decomposing micros for composed preparation & vermin composed. Soil organisms: macro and micro-organisms, their beneficial and harmful effects **for provide the skill, employability and entrepreneurship.**

Course outcomes:

CO1: Learners will gain detailed idea on various micro-organisms **for provide the skill**

CO2: Its harmful or beneficial effects on Agriculture **for provide the skill**

CO3: How to use them in a safer way for creating a better agriculture **for provide the skill and employability**

CO4: System like using as Biofertilizer, bio pesticide, Silage production **for provide the skill, employability and entrepreneurship.**


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CO5: Plant disease management etc for provide the skill, employability and entrepreneurship.

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 1 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 3 | 3 | 1 | 1 | 1 |
| CO4 | 3 | 3 | 1 | 3 | 1 |
| CO5 | 3 | 3 | 3 | 1 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

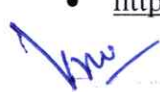
| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 3 | 1 | 1 |
| CO3 | 3 | 3 | 1 |
| CO4 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 |

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AGP-304

Agricultural Microbiology Lab

L: T: P 0:0:1

List of Experiments

1. Study of Introduction to microbiology laboratory and its equipments; principles of microscopy.
2. Study of Methods of sterilization.
3. Study of nutritional media and their preparations.
4. Study of Enumeration of microbial population in soil bacteria. Fungi, actinomycetes.
5. Study of Methods of isolation and purification of microbial cultures.
6. Study of Isolation of Rhizobium from legume root nodule.
7. Study of Isolation of Azotobacter from soil.
8. Study of Isolation of Azospirillum from roots.
9. Study of Isolation of BGA.
10. Staining and microscopic examination of microbes.



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AG-305

Agricultural Finance and Co-Operation

L: T: P 2:0:0

Objective: To impart knowledge about agricultural finance and cooperation and micro financing **for provide the skill, employability and entrepreneurship.**

UNIT-I

Agricultural Finance- meaning, scope and significance, credit needs and its role in Indian agriculture **for provide the skill.**

UNIT-II

Agricultural credit: meaning, definition, need, classification. Credit analysis; 4 R's, and 3C's of credits. Sources of agricultural finance: institutional and non-institutional sources, commercial banks, social control and nationalization of commercial banks. Micro financing including KCC. Lead bank scheme, RRBs, Scale of finance and unit cost. **To provide the skill and employability.**

UNIT-III

An introduction to higher financing institutions - RBI. NABARD. ADB, IMF, world bank. Insurance and Credit Guarantee Corporation of India. Cost of credit **for provide the skill and employability.**

UNIT-IV

Recent development in agricultural credit. Preparation and analysis of financial statements – Balance Sheet and Income Statement. Basic guidelines for preparation of project reports- Bank norms – SWOT analysis **for provide the skill.**

UNIT-V

Agricultural Cooperation - Meaning, brief history of cooperative development in India, objectives, principles of cooperation, significance of cooperatives in Indian agriculture. Agricultural Cooperation in India- credit, marketing, consumer and multi-purpose cooperatives, farmers' service cooperative societies, processing cooperatives, Farming cooperatives, cooperative warehousing; role of ICA, NCUI, NCDC, NAFED **for provide the skill.**


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Course Outcome:

CO1: Learn sources of Agricultural Micro-Macro financing and credit systems **for provide the skill.**

CO2: Understand History of financing agriculture in India. **To provide the skill and employability.**

CO3: Learn about Significance and limitations of Crop insurance **for provide the skill and employability.**

CO4: Significance of Farming Cooperatives **for provide the skill**

CO5: To acquire Knowledge of successful cooperative systems in India and newly launched crop insurance schemes **for provide the skill.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 1 | 1 | 3 | 3 |
| CO2 | 3 | 1 | 1 | 3 | 3 |
| CO3 | 3 | 1 | 1 | 3 | 3 |
| CO4 | 3 | 1 | 1 | 3 | 3 |
| CO5 | 3 | 1 | 1 | 3 | 3 |


CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 3 | 3 | 1 |
| CO3 | 3 | 3 | 1 |
| CO4 | 3 | 1 | 1 |
| CO5 | 3 | 1 | 1 |

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AGP-305

Agricultural Finance and Co-Operation Lab

L: T: P 0:0:1

List of Experiments

1. Determination of most profitable level of capital use, optimum allocation of limited amount of capital among different enterprise
2. Analysis of progress and performance of cooperatives using published data.
3. Analysis of progress and performance of commercial banks and RRBs using published data. Visit to a commercial bank, cooperative bank and cooperative society to acquire firsthand knowledge of their management. schemes and procedures.
4. Estimation of credit requirement of farm business - A case study.
5. Preparation and analysis of balance sheet - A case study.
6. Preparation and analysis of income statement - A case study.
7. Appraisal of a loan proposal - A case study.
8. Techno economic parameters for preparation of projects.
9. Preparation of Bankable projects for various agricultural products and its value-added products.
10. Seminar on selected topics



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AG-306

Farm Machinery and Power

L: T: P 1:0:0

Objective: To impart knowledge about farm Machinery and power engineering. **To provide the skill, employability and entrepreneurship.**

UNIT-I

Status of Farm Power in India, Sources of Farm Power, I.C. engines, working principles of I.C. engines. comparison of two stroke and four stroke cycle engines Study of different components of I.C. engine. **To provide the skill and employability.**

UNIT-II

I.C. engine terminology and solved problems, Familiarization with different systems of I.C. engines: Air cleaning, cooling, lubrication, fuel supply and hydraulic control system of a tractor. **To provide the skill, employability and entrepreneurship.**

UNIT-III

Familiarization with Power transmission system : clutch, gear box, differential and final drive of a tractor, Tractor types **for provide the skill.**

UNIT-IV

Cost analysis of tractor power and attached implement, Familiarization with Primary and Secondary Tillage implement, Implement for hill agriculture, implement for intercultural operations **for provide the skill.**

UNIT-V

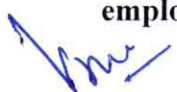
Familiarization with sowing and planting equipment, calibration of a seed drill and solved examples, Familiarization with Plant Protection equipment. Familiarization with harvesting and threshing equipment **for provide the skill and entrepreneurship.**

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the farm power in India & Understand different components of I.C. engine, I.C. **To provide the skill and employability**

CO2: Understand the Engine terminology and solved problems **to provide the skill, employability and entrepreneurship**


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CO3: Understand the Power transmission system **for provide the skill.**

CO4: Understand the Cost analysis of tractor power and attached implement **for provide the skill**

CO5: Understand the Familiarization with sowing and planting equipment **for provide the skill and entrepreneurship**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO41 | PO5 |
|-----|-----|-----|-----|------|-----|
| CO1 | 3 | 1 | 1 | 1 | 1 |
| CO2 | 3 | 1 | 1 | 1 | 1 |
| CO3 | 3 | 1 | 1 | 1 | 1 |
| CO4 | 3 | 1 | 1 | 1 | 1 |
| CO5 | 3 | 1 | 3 | 1 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 3 | 1 |
| CO2 | 3 | 3 | 3 |
| CO3 | 3 | 1 | 1 |
| CO4 | 3 | 1 | 1 |
| CO5 | 3 | 1 | 3 |

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AGP-306

Farm Machinery and Power Lab

L: T: P 0:0:1

Practical Objective

1. To Study of different components of I.C. engine.
2. To study air cleaning and cooling system of engine.
3. To Familiarization with clutch, transmission, differential and final drive of a tractor
4. Familiarization with lubrication and fuel supply system of engine.
5. Familiarization with brake, steering, hydraulic control system of engine, Learning of tractor driving.
6. Familiarization with operation of power tiller, Implements for hill agriculture.
7. Familiarization with different types of primary and secondary tillage implements: mould plough, disc plough and disc harrow.
8. Familiarization with seed-cum-fertilizer drills their seed metering mechanism and calibration.
9. Familiarization with Planters and transplanter.
10. Familiarization with different types of sprayers and dusters.
11. Familiarization with different inter-cultivation equipment.
12. Familiarization with harvesting and threshing machinery.


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AG-307 Principles of Integrated Disease Management L: T: P 2:0:0

Objective: To impart the knowledge of Integrated Disease Management and Methods of detection and diagnosis of crop diseases. **To develop the skill, employability and entrepreneurship.**

UNIT-I

Categories of diseases, IDM: Introduction, history, importance, concepts, principles and tools of IDM **for enhance the basic knowledge and skill.**

UNIT-II

Economic importance of. diseases and Methods of detection and diagnosis of and diseases. Calculation and dynamics of economic injury level and importance of Economic threshold level **for provide the skill and employability.**

UNIT-III

Methods of control: Host plant resistance, cultural, mechanical, physical, and legislative. Biological and chemical control **for provide the skill.**

UNIT-IV

Survey surveillance and forecasting of diseases **for provide the skill and employability.**

UNIT-V

Safety issues in fungicide uses. Political, social and legal implication of IDM **for provide the skill.**

Course Outcomes:

The student will be able to understand:

CO1: Concepts, Introduction, history, importance, principles and tools of IDM **for enhance the basic knowledge and skill.**

CO2: Methods of detection and diagnosis of diseases and Calculation and dynamics EIL and ETL **for provide the skill and employability.**

CO3: Methods of control and Host plant resistance (HPR) **for provide the skill.**

CO4: Survey surveillance and forecasting of diseases **for provide the skill and employability.**



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CO5: Safety issues in fungicide uses. Political, social and legal implication of IDM **for provides the skill.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 3 | 1 | 1 |
| CO2 | 3 | 3 | 3 | 1 | 1 |
| CO3 | 3 | 3 | 3 | 1 | 1 |
| CO4 | 3 | 3 | 3 | 1 | 1 |
| CO5 | 3 | 3 | 3 | 3 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated


| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 3 | 3 | 1 |
| CO3 | 3 | 1 | 1 |
| CO4 | 3 | 3 | 1 |
| CO5 | 3 | 1 | 1 |

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AGP-307

Principles of Integrated Disease Management Lab

L: T: P 0:0:1

List of Experiments

1. Methods of diagnosis and detection of plant diseases.
2. Methods of plant disease measurement.
3. Assessment of crop yield losses, calculations based on economics of IDM.
4. Identification of biocontrol agents, different predators and natural enemies.
5. Identification and nature of damage of important diseases and their management.
6. Plan & assess preventive strategies (IDM module) and decision making.
7. Crop monitoring attacked by diseases.
8. Farmers fields visit.



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AG-308

Environmental Studies and Disaster Management

L: T: P 1:0:0

Objective:

- To provide students an understanding to the concepts and aspects of disaster and its relationship with development
- To ensure awareness of Disaster Risk Reduction (DRR) approaches among students.
- To assist students develop ability to respond to their environment with potential response to disaster.
- **To provide the skill, employability and entrepreneurship.**

UNIT-I

Multidisciplinary nature of environmental studies Definition, scope and importance. Natural Resources: Renewable and non-renewable resources. Natural resources and associated problems. a) Forest resources: Use and over-exploitation, deforestation. case studies. Timber extraction, mining. dams and their effects on forest and tribal people. b) Water resources: Use and over-utilization of surface and ground water. floods. drought. conflicts over water, dams-benefits and problems. c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture. fertilizer-pesticide problems, water logging, salinity, case studies. e) Energy resources: Growing energy needs, renewable and nonrenewable energy sources, use of alternate energy Sources **for provide the skill, employability and entrepreneurship.**

UNIT-II

Case studies. f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles. Ecosystems: Concept of an ecosystem, Structure and function of an ecosystem. Producers, consumers and decomposers, Energy flow in the ecosystem. Ecological succession, Food chains. food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the following ecosystem: a. Forest ecosystem b. Grassland ecosystem c. Desert ecosystem d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries), **for provide the skill and employability.**

UNIT-III



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Biodiversity and its conservation: - Introduction, definition, genetic, species & ecosystem diversity and bio geographical classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. Biodiversity at global. National and local levels. India as a mega-diversity nation. Hot-spots of biodiversity. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity **for provide the skill and employability.**

UNIT-IV

Environmental Pollution: definition, cause, effects and control measures of: a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards. Solid Waste Management: causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Social Issues and the Environment: Water conservation, rain water harvesting, watershed management.

Environmental ethics: Issues and possible solutions, climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, desert, Wasteland reclamation, Consumerism and waste products. Environment Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act. Issues involved in enforcement of environmental legislation. Public awareness. Human Population and the Environment: population growth, variation among nations, population explosion, Family Welfare Programme . Environment and human health: Human Rights, Value Education. HIV/AIDS. Women and Child Welfare. Role of Information Technology in Environment and human health **for provide the skill and employability.**

UNIT-V

Disaster Management

Natural Disasters- Meaning and nature of natural disasters, their types and effects. Floods, drought, cyclone, earthquakes, landslides, avalanches, volcanic eruptions, Heat and cold waves, Climatic change: global warming, ozone depletion. Man Made Disasters- Nuclear disasters, chemical disasters, biological disasters. building fire, coal fire, forest fire, oil fire, air pollution, water pollution, deforestation, industrial waste, water pollution. Disaster Management- Effect to migrate natural disaster at national and global levels. International


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strategy for disaster reduction. Concept of disaster management, national disaster management framework; financial arrangements; role of N(it)s, community - based organizations and media. Central, state, district and local administration **for provide the skill and employability.**

Course outcome:

CO1: The students will be able to identify the nature and causes of disaster. Also the students will be able to apply the disaster risk reduction mechanism **for provide the skill, employability and entrepreneurship.**

CO2: Explain disaster management theory (cycle, phases, risk, crisis, emergency, disasters, resilience) **for provide the skill and employability.**

CO3: Compare hazards, disasters and associated natural phenomena and their interrelationships, causes and their effects - developing humanitarian Assistance before and after disaster **for provide the skill and employability.**

CO4: Apply knowledge about existing global frameworks and existing agreements and role of community in successful Disaster Risk Reduction **for provide the skill and employability.**

CO5: Create Technological innovations in Disaster Risk Reduction: Advantages and problems **for provide the skill and employability.**

PO-CO Mapping (Please write 3,2,1 wherever required)

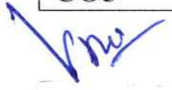
Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 3 | 1 |
| CO2 | 3 | 3 | 1 | 3 | 1 |
| CO3 | 3 | 3 | 1 | 3 | 1 |
| CO4 | 3 | 3 | 1 | 3 | 1 |
| CO5 | 3 | 3 | 1 | 3 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 1 |
| CO3 | 3 | 3 | 1 |
| CO4 | 3 | 3 | 1 |
| CO5 | 3 | 3 | 1 |


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4. [www,fema.gov](http://www.fema.gov) for updates - and their publications
5. <http://nidm.gov.in/pdf/pubs/ukd-p1.pdf>



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AGP-308 Environmental Studies and Disaster Management Lab L: T: P 0:0:1

List of Experiments:

1. Pollution case studies.
2. Case Studies- Field work: Visit to a local area to document environmental assets river/ forest.' grassland/ hill/ mountain,
3. Visit to a local polluted site- Urban/Rural/Industrial/Agricultural,
4. Study of common plants, insects, birds and study of simple ecosystems-pond, river, hill slopes, etc.



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AG-309

Statistical Methods

L: T: P 1:0:0

Objective: - - The main aims of this course Statistical Methods are to defining the type and quantity of data need to be collected, analyzing the data and drawing conclusions from it. Statistics is to equip students with consequently requisite quantitative skills that they can employ and build on in flexible ways in agriculture **for provide the skill, employability and entrepreneurship.**

UNIT-I

Introduction to Statistics and its Applications in Agriculture, Graphical Representation of Data., Measures of Central Tendency & Dispersion **for know the emphasis of statistics and skill.**

UNIT-II

Definition of Probability. Addition and Multiplication Theorem (without proof). Simple Problems Based on Probability. Binomial & Poisson Distributions, **for provide the skill and employability.**

UNIT-III

Definition of Correlation. Scatter Diagram. Karl Pearson's Coefficient of Correlation. Linear Regression Equations. **for provide the skill, employability.**

UNIT-IV

Introduction to Test of Significance, One sample & two sample test t for Means. Chi-Square Test of Independence of Attributes in 2 x2 Contingency Table. Introduction to Analysis of Variance. Analysis of One Way Classification **for provide the skill, employability.**

UNIT-V


Introduction to Sampling Methods. Sampling versus Complete Enumeration, Simple Random Sampling with and without replacement. Use of Random Number Tables for selection of Simple Random Sample **for provide the employability and entrepreneurship.**

Course Outcomes:

CO1: Understand basic theoretical and applied principles of statistics needed to enter in agriculture **for know the emphasis of statistics and skill.**



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CO2: Demonstrate an understanding of the basic concepts of probability and random variables **for provide the skill and employability.**

CO3: Understand and interpret the concepts of descriptive statistics from the obtained data **for provide the skill, employability.**

CO4: Communicate key statistical concepts to non- statisticians **for provide the skill, employability.**

CO5: Gain proficiency in using statistical software for data analysis **for provides the employability and entrepreneurship.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 1 | 1 | 3 | 1 |
| CO2 | 3 | 1 | 1 | 3 | 1 |
| CO3 | 3 | 1 | 1 | 3 | 1 |
| CO4 | 3 | 1 | 1 | 3 | 1 |
| CO5 | 3 | 1 | 1 | 3 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 3 | 3 | 1 |
| CO3 | 3 | 3 | 1 |
| CO4 | 3 | 3 | 1 |
| CO5 | 1 | 1 | 3 |

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AG-309

Statistical Methods Lab

L: T: P 0:0:1

List of Experiments:

1. Graphical Representation of Data.
2. Measures of Central Tendency (Ungrouped data) with Calculation of Quartiles, Deciles & Percentiles.
3. Measures of Central Tendency (Grouped data) with Calculation of Quartiles, Deciles & Percentiles.
4. Measures of Dispersion (Ungrouped Data).
5. Measures of Dispersion (Grouped Data).
6. Moments, Measures of Skewness & Kurtosis (Ungrouped Data).
7. Moments, Measures of Skewness & Kurtosis (Grouped Data).
8. Correlation & Regression Analysis.
9. Application of One Sample t-test.
10. Application of Two Sample Fisher's t- test.
11. Chi-Square test of Goodness of Fit.
12. Chi-Square test of Independence of Attributes for 2x2 contingency table.
13. Analysis of Variance One Way Classification. Analysis of Variance Two Way Classification.
14. Selection of random sample using Simple Random Sampling



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AG-310

Fundamental of Soil and Water Conservation

L: T: P 2:0:0

Objective: To develop skills about Soil and Water Conservation techniques for proper agricultural practices and land management and erosion control. **To provide the skill, employability and entrepreneurship.**

UNIT-I

Introduction to Soil and Water Conservation. causes of soil erosion. Definition and agents of soil erosion **for the understanding and improve skill.**

UNIT-II

Water erosion: Forms of water erosion. Gully classification and control measures. Soil loss estimation by universal Loss Soil Equation. **To improve the skill.**

UNIT-III

Soil loss measurement techniques. Principles of erosion control: Introduction to contouring. strip cropping. Contour bund. Graded bund and bench terracing. **To provide the employability and skill.**

UNIT-IV

Grassed water ways and their design. Water harvesting and its techniques, **to provide the skill.**

UNIT-V

Wind erosion: mechanics of wind erosion, types of soil movement. Principles of wind erosion control and its control measures **to provide the skill.**

Course outcomes:

Students completing this course will be able to:

CO1: Understand the concept of Soil and Water Conservation and soil erosion **for the understanding and improve skill.**

CO2: Analyze the water erosion and Gully control measures, **To improve the skill.**

CO3: Evaluate the soil loss and understand soil loss measurement techniques. **To provide the employability and skill.**


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CO4: Understand the concept of grassed waterways and water harvesting **to provide the skill.**

CO5: Wind erosion and its control measures design techniques **to provide the skill**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 1 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 3 | 3 | 1 | 1 | 1 |
| CO4 | 3 | 3 | 1 | 1 | 1 |
| CO5 | 3 | 3 | 1 | 1 | 3 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated


| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 3 | 1 | 1 |
| CO3 | 3 | 3 | 1 |
| CO4 | 3 | 1 | 1 |
| CO5 | 3 | 1 | 1 |

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AGP-310 Fundamental of Soil and Water Conservation Lab L:T: P 0:0:1

List of Experiments:

1. Study of General status of soil conservation in India.
2. Calculation of erosion index.
3. Estimation of soil loss.
4. Measurement of soil loss.
5. Preparation of contour maps.
6. Design of grassed water ways.
7. Design of contour bunds.
8. Design of graded bunds.
9. Design of bench terracing system.
10. Problem on wind erosion.



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AG-311

Dairy Science

L: T: P 2:0:0

Objective: To impart knowledge about basics of dairy science and operations, cleaning, sanitization, legal standards of milk, adulteration and its detection. **To provide the skill, employability and entrepreneurship.**

UNIT-I

General: Concept of Dairying, Dairying in India, Dairy development in different five year plans. Dairy production statistics. Cleaning and sanitization of dairy equipment **for provide the skill and employability.**

UNIT-II

Dairy cooperatives, functioning of dairy cooperatives societies, Functioning of Arland Pattern, White revolution, Objectives and achievements of operation flood. Milk and its secretion **for provide the skill.**

UNIT-III

Transportation and milk distribution, pricing policy of milk. Platform tests, Filtration. Straining and Clarification of milk. Standardization, Milk adulteration and its detection, Common preservatives of milk and their detection **for provide the skill and employability.**

UNIT-IV

Legal standards of milk. Factors affecting the quality and quantity of milk, Nutritive value of milk and milk product **for provide employability and entrepreneurship.**

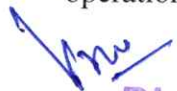
UNIT-V

Basic principles of refrigeration and cold storage of milk and milk product. Common adulterants of ghee, khoa and their detection **for provide employability and entrepreneurship.**

Course outcomes: Students completing this course will be able to

CO1: Understand the concept of dairying status in India, dairy development stages **for provide the skill and employability.**

CO2: Understand different functioning of dairy cooperatives societies and objectives of operation flood **for provide the skill.**


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CO3: Understand the straining , clarification and standardization of milk **for provide the skill and employability.**

CO4: Understand the milk adulteration and its detection, common preservatives of milk and their detection **for provide employability and entrepreneurship.**

CO5: Understand the legal standard of milk, factor affecting quality and quantities of milk for provide **employability and entrepreneurship.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 1 | 3 | 1 | 1 |
| CO2 | 3 | 1 | 3 | 3 | 1 |
| CO3 | 3 | 1 | 3 | 3 | 1 |
| CO4 | 3 | 1 | 3 | 3 | 1 |
| CO5 | 3 | 1 | 3 | 3 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 3 | 1 |
| CO2 | 3 | 1 | 1 |
| CO3 | 3 | 3 | 1 |
| CO4 | 1 | 3 | 3 |
| CO5 | 1 | 3 | 3 |

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AGP-311

Dairy Science Lab

L: T: P 0:0:1

List of Experiments:

1. To study the sampling of milk
2. To study the clot on bottling of milk.
3. Testing of milk by sediment test.
4. Preparation of problems on standardization
5. To study the adulteration in milk (i.e. urea, sucrose, starch etc)
6. Problems on adulteration
7. To study the detergent present in milk
8. Detection of preservatives present in milk
9. To study the acidity of milk
10. Testing of alcohol present in milk



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AG-312

FUNDAMENTALS OF ENTOMOLOGY-II

L: T: P 1:0:0

(INSECT ECOLOGY & CONCEPTS OF IPM)

Objective: To disseminate the knowledge on insect/pest behavior and controlling them by integrated manner. **To provide the skill, employability and entrepreneurship.**

UNIT-I

Insect Ecology: Introduction, Environment and its components. **To provide the skill.**

UNIT-II

Effect of abiotic factors temperature, moisture, humidity, rainfall, light, atmospheric pressure and air currents. Effect of biotic factors - food competition, natural and environmental resistance. **To provide the skill.**

UNIT-III

IPM: Categories of pests. Concept of IPM, Practices, scope and limitations of IPM. Classification of insecticides, toxicity of insecticides and formulations of insecticides. Chemical control- importance, hazards and limitations **for employability and entrepreneurship.**

UNIT-IV

Recent methods of pest control, repellents, anti feed ants, hormones. attractants, gamma radiation. Insecticides Act 1968- Important provisions. Application techniques of spray fluids **for develop the skill.**

UNIT-V

Symptoms of poisoning, first aid and antidotes. Survey, surveillance and forecasting of insect pests. Safety issues of pesticides uses **for provide skill.**

Course outcomes:

Students completing this course will be able to:



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CO1: On successful completion of this course a student will be able to: Understand the basics of insect ecology and integrated pest management practices. **To provide the skill.**

CO2: Reflect on the importance of agriculture sector in Indian economy, agricultural intensification and the development of the need for integrated approaches to crop protection. **To provide the skill.**

CO3: Characterize the major components of pest management strategies and compare their relative merits for different pests and crops **for provide employability and entrepreneurship.**

CO4: Critically reflect on use of newer technology, emerging trends and advances in insects/ pest management **To provide the skill.**

CO5: Students able to know Symptoms of poisoning and antidotes. Survey, surveillance **for provide skill.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 3 | 1 | 1 |
| CO2 | 3 | 3 | 3 | 1 | 1 |
| CO3 | 3 | 3 | 3 | 3 | 1 |
| CO4 | 3 | 3 | 3 | 3 | 1 |
| CO5 | 3 | 3 | 3 | 3 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 3 | 1 | 1 |
| CO3 | 1 | 3 | 3 |
| CO4 | 3 | 1 | 1 |
| CO5 | 3 | 1 | 1 |

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AGP-312

FUNDAMENTALS OF ENTOMOLOGY-II

L: T: P 0:0:1

(INSECT ECOLOGY & CONCEPTS OF IPM)

List of Experiments:

1. Sampling techniques for estimation of insect population and damage.
2. Insecticides and their formulations.
3. Pesticide appliances and their maintenance.



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AG-401 Crop Production Technology-II (*Rabi* crops)

L: T: P 1:0:0

Objective: To study about the origin, geographical distribution, economic importance, soil and climatic requirements, varieties, cultural practices and yield of rabi crops. To study about package and practices of Rabi crops.

Origin, geographical distribution, economic importance, soil and climatic requirements, varieties, cultural practices and yield of *Rabi* crops to **develop the skill, employability and entrepreneurship.**

UNIT-I

Cereals -wheat, barley and oat.

UNIT-II

Pulses-chickpea, lentil, peas.

UNIT-III

Oilseeds-rapeseed, mustard, linseed and sunflower.

UNIT-IV

Sugar crops-sugarcane; and other crop- Potato.

UNIT-V

Forage crops-berseem, lucerne and oat.

Course Outcomes:

CO1: In the course study the students will be able to know about Soil and climatic requirements, varieties, cultural practices and yield of Rabi crops **for provide the skill.**

CO2: Student will able to understand the preparation field for rising crop **to provide the basic knowledge and skill.**

CO3: Student will able to understand the package and practices of Rabi crops **for provide the skill.**

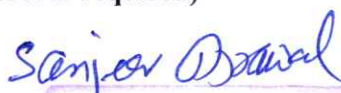
CO4: Constraints in production of oilseeds and pulses maybe identified through course content **for provide the skill.**

CO5: Students will able to understand the marketing of agricultural produces.

PO-CO Mapping (Please write 3,2,1 wherever required)



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Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 1 | 3 | 1 | 1 |
| CO2 | 3 | 1 | 3 | 1 | 3 |
| CO3 | 3 | 1 | 3 | 1 | 1 |
| CO4 | 3 | 1 | 1 | 3 | 1 |
| CO5 | 3 | 1 | 1 | 3 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|--------------------------|----------------------|-------------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 3 | 1 | 1 |
| CO3 | 3 | 1 | 1 |
| CO4 | 3 | 1 | 1 |
| CO5 | 3 | 1 | 1 |

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AGP-401

Crop Production Technology-II (Rabi crops)

L: T: P 1:0:0

List of Experiments:

1. Sowing methods of wheat and sugarcane.
2. Identification of weeds in *rabi* season Crops.
3. Study of morphological characteristics of *rabi* crops.
4. Study of yield contributing characters of *rabi* season crops.
5. Juice quality analysis of sugarcane.
6. Study of important *rabi* crops at experimental farms.
7. Study of *rabi* forage crop's experiments.
8. Methods of oil extraction of medicinal crops.
9. Visit to research stations of related crops.



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AGP-402

Practical Crop Production-II (Rabi Crops)

L: T: P 0:0:2

List of Practical:

1. Crop planning, raising field crops in multiple cropping systems.
2. Field preparation technologies for cultivating rabi crops.
3. Seed treatment methods of different rabi crops.
4. Nursery raising of different rabi crops,
5. Sowing methods of rabi crops.
6. Nutrient management in rabi crops.
7. Water management in rabi crops.
8. Weed management in rabi crops.
9. Management of insect, pests and diseases of rabi crops.
10. Harvesting, threshing, drying winnowing, storage and marketing of produce.
11. Effect of mechanization, resource conservation and integrated nutrient, insect-pest and disease management technologies on seed production.
12. Preparation of balance sheet including cost of cultivation, net returns per student as well as per team of 8-10 students.



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AG-403

Principles of Seed Technology

L: T: P 2:0:0

Objective: To provide insight into recent advances technology of seed production, testing, packing and storage and hybrid seed production technology. **To provide the skill, employability and entrepreneurship.**

UNIT-I

Seed and seed production technology: introduction, definition and importance. Deterioration Causes of crop varieties and their control; Maintenance of genetic purity during seed production. Seed quality; Definition and Characters of good quality seed, different classes of seed. **To develop the skill and entrepreneurship.**

UNIT-II

Foundation and certified seed production of important cereals, pulses. oilseeds, fodder and vegetables. Seed certification. phases of certification, procedure for seed certification, field inspection. Seed Act and Seed Act enforcement. Duty and powers of seed inspector, offences and penalties. Seeds Control Order 1983. **To develop the skill and employability.**

UNIT-III

Varietal identification through Grow Out Test. History and development of Seed Industry in India **for provide the skill and employability.**

UNIT-IV


Seed drying, processing and their steps, seed testing for quality assessment, seed treatment, its importance, method of application and seed packing. Seed storage; general principles, stages and factors affecting seed longevity during storage. Measures for pest and disease control during storage. **To provide the skill and entrepreneurship.**

UNIT-V

Seed marketing, Private and public sectors and their production and marketing strategies. **To provide the employability and entrepreneurship.**

Course outcomes:

CO1: The students will able to understand the classes of seed and its production technology **to provide the skill and entrepreneurship.**


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CO2: Understand the improved seed, supply of good quality seeds of improved varieties **to provide the skill and employability.**

CO3: How to increase the farm income by producing high yielding disease free quality seed, production of hybrid seed of different crop and decrease the cost of cultivation also **for provide the skill and employability.**

CO4: Student learns practical knowledge to estimates of genetic purity, physical purity, and viability test and germination percentage of different crop **to provide the skill and entrepreneurship.**

CO5: Students will be learning Seed marketing, Role of WTO and OECD in seed marketing. and Seed drying, seed treatment, Seed storage and Measures for pest and disease control during storage **to provide the employability and entrepreneurship.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 1 | 1 | 3 | 1 |
| CO2 | 3 | 1 | 1 | 3 | 1 |
| CO3 | 3 | 3 | 3 | 1 | 1 |
| CO4 | 3 | 3 | 1 | 1 | 1 |
| CO5 | 3 | 1 | 1 | 3 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

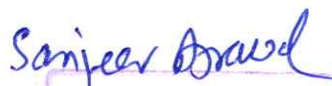
| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 3 |
| CO2 | 3 | 3 | 1 |
| CO3 | 3 | 3 | 1 |
| CO4 | 3 | 1 | 3 |
| CO5 | 1 | 3 | 3 |

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AGP-403

Principles of Seed Technology

L: T: P 0:0:1

List of Experiments:

1. Seed production in major cereals: Wheat, Rice, Maize, Sorghum and Bajra.
2. Seed production in major pulses: Urd, Mung, Pigeonpea, Lentil, Gram, field bean, pea.
3. Seed production in major oilseeds: Rapeseed and Mustard.
4. Seed production in important vegetable crops.
5. Seed sampling and testing: Physical purity, germination, viability. etc.
6. Seed and seedling vigour test. Genetic purity test: Grow out test.
7. Seed certification: Procedure. Field inspection, Preparation of field inspection report.
8. Visit to seed production farms, seed testing laboratories and seed processing plant.



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AG-404

Problematic Soils and their Management

L: T: P 1:0:0

Objective- The reclamation and development of wasteland has four objectives: To improve the physical structure and the quality of the soil, To improve the availability and quality of water, To prevent the shifting of soil, landslides and flooding, **for provide the skill, employability and entrepreneurship.**

UNIT-I

Soil quality and health, Distribution of Waste land and problem soils in India. Their categorization based on properties, **for provide basic knowledge and skill.**

UNIT-II

Reclamation and management of Saline and sodic soils, Acid soils. Acid Sulphate soils. Eroded and Compacted soils. Flooded soils, & polluted soils **to provide employability.**

UNIT-III

Irrigation water - quality and standards, utilization of saline water in agriculture. Remote sensing and GIS in diagnosis and management of problem soils **to develop the skill.**

UNIT-IV

Multipurpose tree species, bio remediation through MPTs of soils. land capability and classification, **for provide skill.**

UNIT-V

Land suitability classification. Problematic soils under different Agro ecosystems **for provide skill.**

Course Outcomes:

At the end of the course, students will be able to:

CO1: Demonstrate fundamental knowledge to identify problematic soils and associated problems **for provide basic knowledge and skill.**

CO2: The objectives of this course are to introduce students to problematic soils, identify processes resulting in deterioration of soil physical and chemical properties, and to use the fundamentals of soil science disciplines for the reclamation of degraded soils **to provide employability.**

CO3: At the end of the course, the student will be able to identify problematic soils, set up a plan for their reclamation, and their post-reclamation management in a manner that is sustainable **to develop the skill.**



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CO4: The course is designed to shed light on the local Jordanian environment so that students are equipped to handle, reclaim, and manage problematic soils **for provide skill.**

CO5: Students able to know multipurpose tree species **for provide skill.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 1 | 1 | 1 | 1 |
| CO2 | 3 | 3 | 1 | 1 | 3 |
| CO3 | 3 | 1 | 3 | 3 | 1 |
| CO4 | 3 | 3 | 1 | 1 | 3 |
| CO5 | 3 | 3 | 1 | 1 | 3 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

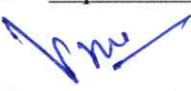
| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 1 |
| CO3 | 3 | 1 | 1 |
| CO4 | 3 | 1 | 1 |
| CO5 | 3 | 1 | 1 |

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Problematic Soils and their Management

L: T: P 0:0:1

Lists of Experiments

1. Determination of pH.
2. Determination of Ec in soil and water.
3. Study of Lime and gypsum requirement in soil,
4. Determination of ESP.
5. Determination of SAR in Soils.
6. Study of Application of remote sensing.
7. Study of Application GIS in delineating problematic soil in LIP.



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AG-406

Renewable Energy and Green Technology

L: T: P 1:0:0

Objective:

Students in this course will be provided with the information to use Agricultural waste, solar energy, Wind energy and Bio-fuel for their daily needs with low cost production. **To develop the skill, employability and entrepreneurship.**

UNIT I

Classification of energy sources, contribution of these of sources in agricultural sector, **for provide the skill.**

UNIT II

Familiarization with biomass utilization for biofuel production and their application, Familiarization with types of biogas plants and gasifiers. biogas. **To provide the employability and entrepreneurship.**

UNIT III

Bio alcohol, biodiesel and bio oil production and their utilization as bio energy resource, introduction of solar energy, collection and their application, **for provide the employability and entrepreneurship.**

UNIT IV

Familiarization with solar energy gadgets: solar cooker, solar water heater, **for provide the skill.**

UNIT V

Application of solar energy: solar drying, solar pond, solar distillation, introduction of wind energy and their application. **To provide the skill.**

Course Outcomes:

CO1: Understand the various forms of conventional energy resources **for provide the skill.**

CO2: Explain the concept of various forms of renewable energy **to provide the employability and entrepreneurship.**

CO3: Outline division aspects and utilization of renewable energy sources for both domestics and Agricultural application **for provide the employability and entrepreneurship.**


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CO4: Appreciate the need of Wind Energy and the various components used in energy generation and know the classifications **for provide the skill.**

CO5: Understand the concept of Biomass energy resources and their classification, types of biogas Plants- applications **to provide the skill.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|----------|
| CO1 | 3 | 1 | 1 | 1 | 3 |
| CO2 | 3 | 1 | 1 | 3 | 3 |
| CO3 | 3 | 1 | 1 | 3 | 3 |
| CO4 | 3 | 1 | 1 | 3 | 3 |
| CO5 | 3 | 1 | 1 | 3 | 3 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 1 | 3 | 3 |
| CO2 | 1 | 3 | 3 |
| CO3 | 3 | 1 | 1 |
| CO4 | 3 | 1 | 1 |
| CO5 | 3 | 1 | 1 |

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AGP-406

Renewable Energy and Green Technology Lab

L: T: P 1:0:0

List of Experiments

1. Familiarization with renewable energy gadgets.
2. To study biogas plants,
3. To study gasifier,
4. To study the production process of biodiesel,
5. To study briquetting machine,
6. To study the production process of bio-fuels.
7. Familiarization with different solar energy gadgets.
8. To study solar photovoltaic system: solar light, solar pumping, solar fencing.
9. To study solar cooker,
10. To study solar drying system.
11. To study solar distillation and solar pond.
12. Visit



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AG-407 Production Technology for Ornamental Crops, MAPs and Landscaping L:T:P 1:0:0

Objective: To impart comprehensive knowledge about the cultivation of commercial flowering, medicinal crops and landscape gardening. **To provide the skill, employability and entrepreneurship.**

UNIT-I

Importance and scope of ornamental crops. medicinal and aromatic plants and landscaping **for enhancing the basic skill.**

UNIT-II

Principles of landscaping. Landscape uses of trees, shrubs and climbers. Style of gardening and lawn making and maintenance **for provide the skill.**

UNIT-III

Production technology of important cut flowers like rose, Gerbera, carnation, liliun and orchids under protected conditions and gladiolus, tuberose, chrysanthemum under open conditions **for provide the employability and entrepreneurship.**

UNIT-IV

Package of practices for loose flowers like marigold and jasmine under open conditions **for provide the employability and entrepreneurship.**

UNIT-V

Production technology of important medicinal plants like- Isabgol, Ashwagandha, Asparagus, Aloe and aromatic plants like mint, lemongrass, citronella, palmarosa, ocimum, geranium, vetiver. Processing and value edition in ornamental crop and MAPs produce **for provide the employability and entrepreneurship.**

Course outcomes


CO1: Understand the importance of floriculture, landscaping medicinal and aromatic crops **for enhancing the basic skill.**

CO2: Understand the scientific production of technology of commercial flowers under protected condition **for provide the skill.**

CO3: Understand the commercial production of flowers under open condition **for provide the employability and entrepreneurship.**

CO4: Understand the production technology of important medicinal and aromatic crops **for provide the employability and entrepreneurship.**


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CO5: Understand the post-harvest management of flowers and medicinal plants for provide the employability and entrepreneurship.

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 1 | 1 | 3 | 1 |
| CO2 | 3 | 3 | 3 | 1 | 1 |
| CO3 | 3 | 3 | 3 | 1 | 1 |
| CO4 | 3 | 3 | 3 | 1 | 1 |
| CO5 | 3 | 3 | 3 | 1 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 3 | 1 | 1 |
| CO3 | 1 | 3 | 3 |
| CO4 | 1 | 3 | 3 |
| CO5 | 1 | 3 | 3 |

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- <https://dfr.icar.gov.in/>

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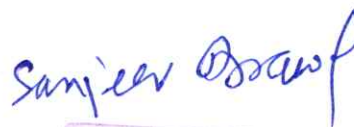
AGP-407 Production Technology for Ornamental Crops, MAPs and Landscaping L:T:P 0:0:1

List of Experiments

1. Identification of Ornamental plants.
2. Identification of Medicinal and Aromatic Plants.
3. Nursery bed preparation and seed sowing.
4. Training and pruning of Ornamental plants.
5. Planning and layout of garden.
6. Bed preparation and planting of MAP.
7. Protected structures - care and maintenance.
8. Intercultural operations in flowers and MAP.
9. Harvesting and post harvest handling of cut and loose flowers.
10. Extraction of essentials oils.



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AG-408 Entrepreneurship Development and Business Communication L: T: P 1:0:0

Objective: To impart knowledge about entrepreneurship development and business communication. **To provide the skill, employability and entrepreneurship.**

UNIT-I

Concept of Entrepreneur, Entrepreneurship Development, Characteristics of entrepreneurs; SWOT Analysis & achievement motivation, **for provide the skill.**

UNIT-II

Government policy and programs and institutions for entrepreneurship development Impact of economic reforms on Agribusiness/ Agri enterprises. **To provide the skill.**

UNIT-III

Entrepreneurial Development Process: Business Leadership Skills; Developing organizational skill (controlling, supervising, problem solving, monitoring & evaluation), **to provide the employability and entrepreneurship.**

UNIT-IV

Developing Managerial skills, Business Leadership Skills (Communication, direction and motivation Skills), Problem solving skill, **to provide the employability and entrepreneurship.**

UNIT-V

Supply chain management and Total quality management, Project Planning Formulation and report preparation; Financing of enterprise, Opportunities for agri-entrepreneurship and rural enterprise. **To develop the entrepreneurship.**

Course outcome:

Students completing this course will be able to:


CO1: Understand the problem solving skills and managerial skills **for provide the skill.**

CO2: Understand the preparation of business plan **to provide the skill.**

CO3: Understand how to identify the business idea **to provide the employability and entrepreneurship.**

CO4: This course makes able to develop entrepreneurial competencies among students. **To provide the employability and entrepreneurship.**

CO5: Students able to know Financing of enterprise and Opportunities for agri-entrepreneurship. **To provide the employability and entrepreneurship.**


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PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 1 | 1 | 3 | 3 |
| CO2 | 3 | 1 | 1 | 3 | 3 |
| CO3 | 3 | 1 | 1 | 3 | 3 |
| CO4 | 3 | 1 | 1 | 3 | 3 |
| CO5 | 3 | 1 | 1 | 3 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 3 | 1 | 1 |
| CO3 | 1 | 3 | 3 |
| CO4 | 1 | 3 | 3 |
| CO5 | 1 | 3 | 3 |

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AGP-408 Entrepreneurship Development and Business Communication Lab L: T: P 0:0:1

List of Experiments

1. Assessing entrepreneurial traits,
2. Problem solving skills, managerial skills and achievement motivation,
3. Exercise in creativity, time audit through planning, monitoring and supervision,
4. Identification and selection of business idea,
5. Preparation of business plan and proposal writing,
6. Visit to entrepreneurship development institute and entrepreneurs.



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AG-409 Introductory Agro-meteorology & Climate Change L: T: P 1:0:0

Objective: To impart knowledge about agro-metrology and crop weather forecasting to meet the challenges of aberrant weather condition. **To provide the skill, employability and entrepreneurship.**

UNIT-I

Meaning and scope of agricultural meteorology; Earth atmosphere- its composition, extent and structure; Atmospheric weather variables; Atmospheric pressure, its variation with height; Wind, types of wind, daily and seasonal variation of wind speed, cyclone, anticyclone, land breeze and sea breeze; . **To provide the skill.**

UNIT-II

Nature and properties of solar radiation, solar constant, depletion of solar radiation, short wave. Long wave and thermal radiation, net radiation, albedo: Atmospheric temperature, temperature inversion, lapse rate, daily and seasonal variations of temperature, vertical profile of temperature, to **increase basic the skill.**

UNIT-III

Energy balance of earth; Atmospheric humidity, concept of saturation, vapor pressure, process of condensation, formation of dew, fog, mist, frost, cloud; Precipitation. process of precipitation. types of precipitation such as rain, snow, sleet, and hail, cloud formation and classification: Artificial rainmaking. Monsoon mechanism and importance in Indian agriculture, **to provide the employability.**

UNIT-IV


Weather hazards - drought, floods, frost, tropical cyclones and extreme weather conditions such as heat-wave and cold-wave. Agriculture and weather relations; Modifications of crop microclimate, climatic normals for crop and livestock production. **To provide the employability.**

UNIT-V

Weather forecasting- types of weather forecast and their uses. Climate change. climatic variability, global warming, causes of climate change and its impact on regional and national Agriculture **to provide the skill and employability.**

Course Outcomes: Students completing this course will be able to:

CO1: Understand the atmosphere of earth and its various components. **To provide the skill.**


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CO2: Understand weather variables such as pressure, temperature, wind, solar radiation and their impact on agricultural crop production. **To increase basic the skill.**

CO3: Understand the precipitation and its different forms and concept of artificial rain making. **To provide the employability.**

CO4: Understand different weather hazards and their impact on agricultural crop production. **To provide the employability.**

CO5: Understand the concept of weather forecasting and climate change and its application for successful crop production. **To provide the skill and employability.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 3 |
| CO3 | 3 | 3 | 1 | 1 | 3 |
| CO4 | 3 | 3 | 1 | 1 | 3 |
| CO5 | 3 | 3 | 1 | 1 | 3 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 3 | 1 | 1 |
| CO3 | 1 | 3 | 1 |
| CO4 | 1 | 3 | 1 |
| CO5 | 3 | 3 | 1 |

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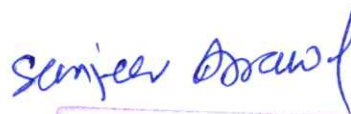

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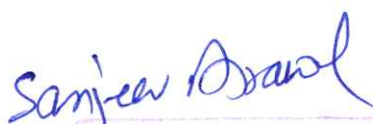
AGP-409 Introductory Agro-meteorology & Climate Change Lab L: T: P 0:0:1

List of Experiments

1. Visit of Agro Meteorological Observatory, site selection of observatory, exposure of instruments and weather data recording.
2. Measurement of total, shortwave and long wave radiation, and its estimation using Planck's intensity law.
3. Measurement of albedo and sunshine duration, computation of Radiation Intensity using BSS.
4. Measurement of maximum and minimum air temperatures, its tabulation, trend and variation analysis.
5. Measurement of soil temperature and computation of soil heat flux.
6. Determination of dew point temperature, vapor pressure and relative humidity.
7. Measurement of atmospheric pressure and analysis of atmospheric conditions.
8. Measurement of wind speed and wind direction, preparation of wind rose.
9. Measurement, tabulation and analysis of rainfall.
10. Measurement of open pan evaporation and evapo - transpiration.
11. Computation of PET and AET.



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AG-410

Agri-Informatics

L: T: P 1:0:0

Objective: To impart knowledge about the computer. **To provide the skill, employability and entrepreneurship.**

UNIT-I

Introduction to Computers. Operating Systems. definition and types, Applications of MS-Office for document creation & Editing. Data presentation, interpretation and graph creation, statistical analysis, mathematical expressions **for provide the skill.**

UNIT-II

Database, concepts and types, uses of DBMS in Agriculture, World Wide Web (WNW): Concepts and components. Introduction to computer programming languages, concepts and standard input/output operations **for provide the skill.**

UNIT-III

e-Agriculture, concepts and applications. Use of ICT in Agriculture. Computer Models for understanding plant processes. IT application for computation of water and nutrient requirement of crops, Computer-controlled devices (automated systems) for Agri-input management, **for provide the employability.**

UNIT-IV

Smartphone Apps in Agriculture for farm advises, market price. postharvest management etc; Geospatial technology for generating valuable agri-information. Decision support systems, **for provide the employability and entrepreneurship.**

UNIT-V

Concepts, components and applications in Agriculture, Agriculture Expert System, Soil Information Systems etc for supporting Farm decisions. Preparation of contingent crop-planning using IT tools **for provide the employability and entrepreneurship.**

Course outcomes:

CO1: Understanding basic concept of computer **for provide the skill.**

CO2: Fundamentals of MS Office **for provide the skill.**

CO3: Basic concept database, Internet and WWW, **for provide the employability.**

CO4: Use of IT application and different IT tools in Agriculture **for provide the employability and entrepreneurship.**

CO5: Understand statistical tools **for provide the employability and entrepreneurship**


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PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 1 | 1 | 3 | 3 |
| CO2 | 3 | 1 | 1 | 3 | 3 |
| CO3 | 3 | 1 | 1 | 3 | 3 |
| CO4 | 3 | 1 | 1 | 3 | 3 |
| CO5 | 3 | 1 | 1 | 3 | 3 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 3 | 1 | 1 |
| CO3 | 1 | 3 | 1 |
| CO4 | 1 | 3 | 3 |
| CO5 | 1 | 3 | 3 |

References:

- Fundamentals of computer-P.K. Sinha, BPB Publications, Agra
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- Decision support system-V.S. Jankiraman & K. Saruksi, PHJ Publication

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AGP-410

Agri-Informatics Lab

L: T: P 0:0:1

List of Experiments

1. Study of Computer Components, accessories, practice of important DOS Commands. Introduction of different operating systems such as windows, Unix/ Linux, Creating, Files & Folders, File Management.
2. Use of MS-WORD and MS Power-point for creating, editing and presenting a scientific Document
3. MS-EXCEL - Creating a spreadsheet, use of statistical tools, writing expressions. creating graphs, analysis of scientific data.
4. MS-ACCESS: Creating Database, preparing queries and reports, demonstration of Agri-information system.
5. Introduction to World Wide Web (WWW).
6. Introduction of programming languages. Hands on Crop Simulation Models (CSM) such as DSSAT/Crop-Info/CropSyst/ Wofost;
7. Computation of water and nutrient requirements of crop using CSM and IT tools. Introduction of Geospatial Technology for generating valuable information for Agriculture. Hands on Decision Support System. Preparation of contingent crop planning.



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AG-411

Poultry production and management

L: T: P 2:0:0

Objective: Knowledge of raising different kinds of poultry birds to provide feathers, eggs, and meat, wherein you can earn some money. **To provide the skill, employability and entrepreneurship.**

UNIT-I

General: Importance of poultry industry in India, Poultry production and marketing statistics of eggs and chicken. Historical development in poultry birds potential. **To provide the skill.**

UNIT-II

Breeding: Male and female reproductive system of chicken, Breeds and strains of broilers and layers of chicken, duck and quails, General aspects of breeding for better egg production and body weight gain. Selection and culling, Artificial insemination. **To provide the employability and entrepreneurship.**

UNIT-III

General management: Establishment of poultry farm. Housing and equipment, incubation and hatching of eggs, Broiler and layer management. Lighting schedule for poultry.

Feeds and feeding: Digestion, Digestive system of chicken. Feed ingredients, Availability of CP and ME in ingredients. Feed processing. Formulation of feed viz. Starter, Grower, Layer, Finisher and Breeder ration, FCR, CP ratio, Nutritional deficiency conditions. **To provide entrepreneurship.**

UNIT-IV

Health management: Vaccination schedule for poultry, Common poultry diseases, i.e. Ranikhet, Marex, Chicken pox, Gumboro, Infectious bronchitis and CRD. Control of internal and external parasites. **To provide the employability.**

UNIT-V

Poultry products: Preservation and storage of eggs, Grading of eggs, AGMARK standard of egg. Egg powder, Slaughtering and processing of chicken, Marketing of poultry products. **To provide the entrepreneurship.**

Course outcomes: At the end of the course the student acquires the basic knowledge about-

CO1: The techniques of production of poultry meat and table eggs including artificial incubation of eggs. **To provide the skill.**

CO2: Genetic selection of commercial breeds/hybrids. **To provide the employability and entrepreneurship.**


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CO3: To deal responsibly with the management of the rearing environment, the laying hens of laying hens and chicken meat, **To provide entrepreneurship.**

CO4: The management the different feeding phases of the birds. **To provide the employability.**

CO5: The issues related to poultry health and their control; preservation, storage, processing and marketing of poultry products. **To provide the entrepreneurship.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 1 | 3 | 3 | 3 |
| CO2 | 3 | 1 | 3 | 3 | 3 |
| CO3 | 3 | 1 | 3 | 3 | 3 |
| CO4 | 3 | 1 | 3 | 3 | 3 |
| CO5 | 3 | 1 | 3 | 3 | 3 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 1 | 3 |
| CO4 | 1 | 3 | 3 |
| CO5 | 1 | 1 | 3 |

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1. Prasad, J. 2015. Poultry Production and Management. Kalyani Publishers, New Delhi.
2. Ghosh, N. 2015. Poultry Science and Practice: A Textbook. CBS Publishers & Distributors, Delhi.
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AGP-411

Poultry production and management Lab

L: T: P:0:0:1

List of Experiments

1. Neat and clean diagram of hen showing external body parts.
2. Structure of egg.
3. Formulation of ration viz. Broiler starter ration, Broiler finisher ration. Chick starter ration, Grower ration, Layer ration and Breeder ration.
4. Vaccination schedule for broiler and layers.
5. Debeaking.
6. Candling of eggs.
7. Dissection of bird fir showing internal body parts.



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YEAR III, SEMESTER-V

| S.N. | Course Code | Course Name | Periods | | | EVALUATION SCHEME | | | | | Course Total | Credits |
|----------------------|-------------|--|---------|---|----|-------------------|---------------|-----|---------------|------|--------------|---------|
| | | | L | T | P | CT | Mid Term Exam | | External Exam | | | |
| | | | | | | | AS | +AT | | | | |
| THEORY | | | | | | | | | | | | |
| 1. | BAG507 | Diseases of Field & Horticultural Crops & their Management-I | 3 | 0 | 0 | 20 | 10 | 30 | 70 | 100 | 3 | |
| 2. | BAG508 | Production Technology for Ornamental Crops, MAP and Landscaping | 3 | 0 | 0 | 20 | 10 | 30 | 70 | 100 | 3 | |
| 3. | BAG509 | Principles of Seed Technology | 3 | 0 | 0 | 20 | 10 | 30 | 70 | 100 | 3 | |
| 4. | BAG510 | Livestock and Poultry Management | 3 | 0 | 0 | 20 | 10 | 30 | 70 | 100 | 3 | |
| 5. | EHU501 | Human Values and Professional Ethics | 3 | 0 | 0 | 20 | 10 | 30 | 70 | 100 | 3 | |
| PRACTICALS / PROJECT | | | | | | | | | | | | |
| | | | | | | IA | AT | | | | | |
| 6. | BAG557 | Diseases of Field & Horticultural Crops & their Management-I Lab | 0 | 0 | 2 | 20 | 10 | 30 | 70 | 100 | 1 | |
| 7. | BAG558 | Ornamental Crops, MAP and Landscaping Lab | 0 | 0 | 2 | 20 | 10 | 30 | 70 | 100 | 1 | |
| 8. | BAG559 | Principles of seed Technology Lab | 0 | 0 | 2 | 20 | 10 | 30 | 70 | 100 | 1 | |
| 9. | BAG560 | Livestock and poultry Management Lab | 0 | 0 | 2 | 20 | 10 | 30 | 70 | 100 | 1 | |
| 10. | BAG562 | Practical Crop Production - I (Kharif) | 0 | 0 | 4 | 20 | 10 | 30 | 70 | 100 | 2 | |
| | | TOTAL | 15 | 0 | 12 | - | - | - | - | 1000 | 21 | |

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School of Agricultural Sciences & Engineering
IFTM UNIVERSITY, MORADABAD
STUDY & EVALUATION SCHEME
B. Sc. (Hons.) Agriculture

Effective from Session 2018 - 19

YEAR III, SEMESTER-VI

| S.N. | Course Code | Course Name | Periods | | | EVALUATION SCHEME | | | | | Course Total | Credits |
|----------------------|----------------|---|---------|---|----|-------------------|---------------|-------|---------------|------|--------------|---------|
| | | | L | T | P | CT | Mid Term Exam | | External Exam | | | |
| | | | | | | | AS | Total | | | | |
| THEORY | | | | | | | | | | | | |
| 1. | BAG607 | Rainfed Agriculture and Watershed Management | 3 | 0 | 0 | 20 | 10 | 30 | 70 | 100 | 3 | |
| 2. | BAG608 | Insect Ecology and Integrated Pest Management | 3 | 0 | 0 | 20 | 10 | 30 | 70 | 100 | 3 | |
| 3. | BAG609 | Diseases of Field & Horticultural Crops and their Management-II | 3 | 0 | 0 | 20 | 10 | 30 | 70 | 100 | 3 | |
| 4. | BAG610 | Protected Cultivation and Secondary Agriculture | 3 | 0 | 0 | 20 | 10 | 30 | 70 | 100 | 3 | |
| 5. | BAG611 (A/B/C) | Elective I | 3 | 0 | 0 | 20 | 10 | 30 | 70 | 100 | 3 | |
| 6. | EHU601 | Disaster Management | 3 | 0 | 0 | 20 | 10 | 30 | 70 | 100 | 3 | |
| PRACTICALS / PROJECT | | | | | | | | | | | | |
| 7. | BAG657 | Rainfed Agriculture and Watershed Management Lab | 0 | 0 | 2 | 20 | 10 | 30 | 70 | 100 | 1 | |
| 8. | BAG658 | Insect Ecology and Integrated Pest Management Lab | 0 | 0 | 2 | 20 | 10 | 30 | 70 | 100 | 1 | |
| 9. | BAG659 | Diseases of Field & Horticultural Crops & their Management-II Lab | 0 | 0 | 2 | 20 | 10 | 30 | 70 | 100 | 1 | |
| 10. | BAG660 | Protected Cultivation and Secondary Agriculture Lab | 0 | 0 | 2 | 20 | 10 | 30 | 70 | 100 | 1 | |
| 12. | BAG662 | Practical Crop Production - II (Rabi) | 0 | 0 | 4 | 20 | 10 | 30 | 70 | 100 | 2 | |
| | | TOTAL | 18 | 0 | 10 | - | - | - | - | 1100 | 24 | |

Note: Industrial Training of 4 – 6 Weeks after VI Semester which will be evaluated in VII Semester. Skill Development Training-II in summer breaks June-July after 6th Semester (Student READY)

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YEAR IV, SEMESTER-VII

| S.N. | Course Code | Course Name | Periods | | | EVALUATION SCHEME | | | | | Course Total | Credits |
|----------------------|----------------|--|---------|---|----|-------------------|---------------|-----------|---------------|-----|--------------|---------|
| | | | L | T | P | CT | Mid Term Exam | | External Exam | | | |
| | | | | | | | AS | Total +AT | | | | |
| THEORY | | | | | | | | | | | | |
| 1. | BAG704 | Farming Systems, Sustainable Agriculture and Organic Farming. | 3 | 0 | 0 | 20 | 10 | 30 | 70 | 100 | 3 | |
| 2. | BAG705 | Post-Harvest Management and Value Addition of Fruits and Vegetable | 3 | 0 | 0 | 20 | 10 | 30 | 70 | 100 | 3 | |
| 3. | BAG 706(A/B/C) | Elective II | 3 | 0 | 0 | 20 | 10 | 30 | 70 | 100 | 3 | |
| PRACTICALS / PROJECT | | | | | | | | | | | | |
| 7. | BAG754 | Farming Systems, Sustainable Agriculture and Organic Farming Lab | 0 | 0 | 2 | 20 | 10 | 30 | 70 | 100 | 1 | |
| 8. | BAG755 | Post-Harvest Management and Value Addition of Fruits and Vegetable Lab | 0 | 0 | 2 | 20 | 10 | 30 | 70 | 100 | 1 | |
| 10 | BAG757 | Experiential Learning Programme | 0 | 0 | 4 | 80 | 20 | 100 | 100 | 200 | 2 | |
| 11 | BAG758 | Experiential Learning Programme | 0 | 0 | 4 | 80 | 20 | 100 | 100 | 200 | 2 | |
| | | TOTAL | 9 | 0 | 12 | - | - | - | - | 900 | 15 | |

*Educational tour during winter/January break

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YEAR IV, SEMESTER-VIII

| S.N. | Course Code | Course Name | Periods | | | EVALUATION SCHEME | | | | | Course Total | Credits |
|--------|-----------------|------------------------------|---------|---|----|-------------------|---------------|-----------|---------------|------|--------------|---------|
| | | | L | T | P | CT | Mid Term Exam | | External Exam | | | |
| | | | | | | | AS | Total +AT | | | | |
| THEORY | | | | | | | | | | | | |
| 1. | BAG805 | Elective – III | 3 | 0 | 0 | 20 | 10 | 30 | 70 | 100 | 3 | |
| 2. | BAG 804/BAG 806 | Elective IV | 3 | 0 | 0 | 20 | 10 | 30 | 70 | 100 | 3 | |
| 3. | BAG807 | Farm Machinery and Power | 3 | 0 | 0 | 20 | 10 | 30 | 70 | 100 | 3 | |
| 4. | BAG854/BAG856 | Elective IV | 0 | 0 | 2 | 20 | 10 | 30 | 70 | 100 | 1 | |
| 5. | BAG857 | Farm Machinery and Power Lab | 0 | 0 | 2 | 20 | 10 | 30 | 70 | 100 | 1 | |
| 6. | BAG 858 | RAWE | 0 | 0 | 20 | - | - | 300 | 200 | 500 | 20 | |
| TOTAL | | | 09 | 0 | 24 | - | - | - | - | 1000 | 31 | |

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List of Electives

BAG 611 Elective I

- A. Mushroom Cultivation
- B. Agri Informatics
- C. Food Safety and Standards
- D. Baby Corn Production Techniques
- E. Piggery Science
- F. Administration and Supervision in Extension education
- G. Fundamental of Cytogenetics
- H. Environmental genetics
- I. Agricultural Finance and Business Management
- J. Storage Pest Management of Tobacco
- K. Forest Protection
- L. Health and Disease Management of Poultry
- M. Fisheries Science
- N. Management of Waste Land
- O. Commercial production of organic Inputs
- P. Management of Beneficial Insects
- Q. Introduction of Nanotechnology in Agriculture
- R. Applied Agribusiness Economics
- S. International Trade for Agriculture Product
- T. Management of Agro Chemical Industry

BAG 706 Elective II

- A. Agricultural Journalism
- B. Fundamentals of Soil and Water Conservation Techniques

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- C. Micro- Irrigation Techniques
- D. Production Technology of Vegetable Crops
- E. General Awareness in Agriculture
- F. Theory and Practice of Training
- G. Soil Chemistry
- H. Cytology
- I. Stored Grain Pest Management of Spices
- J. Forest Ecology, Biodiversity and Conservation
- K. Lac Cultivation
- L. Elementary Nematology and Mushroom Cultivation
- M. Mass Production of Bioagents & Biopesticides
- N. Tea Husbandry
- O. Germplasm characters ion and evaluation
- P. Organic Crop Production System
- Q. Farm System Suitable for Organic Management
- R. ICTs for Agriculture Extension
- S. Organizational Behavior and Development
- T. Risk Management and Climate Change Adoption


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BAG 805 Elective III

- A. Agrochemicals
- B. Biopesticides & Biofertilizers
- C. Agro Waste Management
- D. Vermicompost Production Technology
- E. Hatchery Management)
- F. Methods of Extension Research & Evaluation
- G. Introduction of Sericulture
- H. Genetic Engineering
- I. Bio floe Farming
- J. Pesticides and plant protection equipment
- K. Economic entomology
- L. Silkworm cocoon production technology
- M. Agriculture Chemistry
- N. General Climatology
- O. Organic Certification, Standards and Regulation
- P. Fundamentals of Plant Prorogations
- Q. Seed Quality Testing
- R. Indian Economy, History and Contemporary: Issues
- S. Computer Application in Agribusiness and Economics
- T. ENVIRONMENTAL ECONOMICS

BAG 804 Elective IV

- A. Seed Production and Certification
- B. Mushroom Cultivation
- C. Soil Management
- D. Adoption and Diffusion of innovations

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- E. Group Dynamics and Leadership
- F. Agricultural Price Analysis
- G. Computer and its application in Agriculture
- H. Plant Cell Culture Technology
- I. Stored Grain Pest Managements of Cereals
- J. Rural Journalism
- K. Tree Seed Technology
- L. Health and Diseases Management of Livestock
- M. Economic Botany
- N. Livelihood Development
- O. Rural marketing
- P. Management of Agribusiness Co-operatives

BAG 854

- A. Seed Production and Certification Lab
- B. Mushroom Cultivation Lab
- C. Soil Management Lab
- D. Adoption and Diffusion of Innovation Lab
- E. Group Dynamics and Leadership Lab
- F. Agricultural Price Analysis Lab
- G. Computer and its application in Agriculture Lab
- H. Plant Cell Culture Technology Lab
- I. Stored Grain Pest Management of Cereals Lab
- J. Rural Journalism
- K. Tree Seed Technology Lab
- L. Health and Diseases Management of Livestock
- M. Economic Botany Lab
- N. Livelihood Development Lab

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- O. Rural Marketing Lab
- P. Management of Agribusiness Co-operatives Lab

BAG 806 Dairy Technology
BAG856 Dairy Technology Lab



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BAG507 Diseases of Field & Horticultural Crops and their Management-I L:T:P 3:0:0

Objective: To facilitate the students for diagnosing and controlling the important diseases of crops.

Symptoms, etiology, disease cycle and management of major diseases of following crops:

UNIT-I

Field Crops: Rice: blast, brown spot, bacterial blight, sheath blight, false smut, khaira and tungro; Maize: stalk rots, downy mildew, leaf spots; Sorghum: smuts, grain mold, Bajra: downy mildew and ergot crops **for Skill Development.**

UNIT-II

Groundnut: early and late leaf spots, wilt Soybean: Rhizoctonia blight, bacterial spot and mosaic; Pigeonpea: Phytophthora blight, wilt and sterility mosaic; Finger millet: leaf spot; black & green gram: Cercospora leaf spot and anthracnose, web blight and yellow mosaic, Tobacco: black root rot and TMV for **Skill Development and employability.**

UNIT-III

Horticultural Crops:

Guava: wilt and anthracnose; Banana: Panama wilt, bacterial wilt, Sigatoka and bunchy top; Papaya: foot rot, leaf curl and mosaic, Pomegranate: bacterial blight for skill **development and entrepreneurship.**

UNIT-IV

Cruciferous vegetables: Alternaria leaf spot and black rot; Brinjal: Phomopsis blight and fruit rot and Sclerotinia blight; Tomato: damping off, wilt, early and late blight, buck eye rot and leaf curl and mosaic; Okra: Yellow Vein Mosaic; Beans: anthracnose and bacterial blight for skill **development and entrepreneurship.**


UNIT-V

Ginger: soft rot; Colocasia: Phytophthora blight; Coconut: wilt and bud rot; Tea: blister blight; Coffee: rust for **Skill Development.**

Couse Outcomes

CO1: Student understands about the diagnosing and controlling the important diseases of crops **for Skill Development.**


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CO2: Students understands the Groundnut: early and late leaf spots, wilt Soybean: Rhizoctonia blight, bacterial spot and mosaic for **skill development**.

CO3: To know about the Horticultural Crops Guava: wilt and anthracnose for **Skill Development and employability**.

CO4: Students able to Cruciferous vegetables: Alternaria leaf spot and black rot; Brinjal: Phomopsis blight and fruit rot and Sclerotinia blight for **skill development and entrepreneurship**.

CO5: Students able to Ginger: soft rot; Colocasia: Phytophthora blight for **Skill Development**.

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-------------|-----|-----|-----|-----|-----|-----|-----|
| CO:1 | 3 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO:2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| CO:3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO:4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |
| CO:5 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------|-------------------|---------------|------------------------------|
| CO:1 | 3 | 1 | 1 |
| CO:2 | 3 | 2 | 1 |
| CO:3 | 3 | 2 | 1 |
| CO:4 | 3 | 1 | 3 |
| CO:5 | 3 | 2 | 2 |

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**BAG557 Diseases of Field & Horticultural Crops and their Management-I Lab L:T:
P 0:0:1**

List of Experiments: Minimum 08 of the followings-

1. Identification and histopathological studies of Paddy diseases.
2. Identification and histopathological studies of bajra diseases.
3. Identification and histopathological studies of okra diseases.
4. Identification and histopathological studies of tomato diseases.
5. Identification and histopathological studies of beans disease.
6. Identification and histopathological studies of brinjal disease.
7. Identification and histopathological studies of mango/guava disease.
8. Collection and preservation of diseased plant specimens for Herbarium.
9. Field visit for the diagnosis of diseases.

Note: Students should submit 50 pressed and well mounted specimens



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BAG508 Production Technology for Ornamental Crops, MAP and Landscaping

L:T:P 3:0:0

Objective: To impart comprehensive knowledge about the cultivation of commercial flowering, medicinal crops and landscape gardening.

UNIT-I

Importance and scope of ornamental crops, medicinal and aromatic plants and landscaping. Principles of landscaping. Landscape uses of trees, shrubs and climbers **for Skill Development.**

UNIT-II

Production technology of important cut flowers like rose, gerbera, carnation, lily and orchids under protected conditions and gladiolus, tuberose, chrysanthemum under open conditions **for skill development.**

UNIT-III

Package of practices for loose flowers like marigold and jasmine under open conditions **for Skill Development and employability.**

UNIT-IV

Production technology of important medicinal plants like ashwagandha, asparagus, aloe, costus, Cinnamomum, periwinkle, isabgol and aromatic plants like mint, lemongrass, citronella, palmarosa, oregano, rose, geranium, vetiver **for skill development and entrepreneurship.**

UNIT-V

Processing and value addition in ornamental crops and MAPs produce **for Skill Development.**

Course Outcomes

CO1: Student understands about the Importance and scope of ornamental crops, medicinal and aromatic plants **for Skill Development.**

CO2: Students understand the Production technology of important cut flowers **for skill development.**

CO3: To know about the Package of practices for loose flowers **for Skill Development and employability.**



CO4: Students able to understand the Production technology of important medicinal plants for **skill development and entrepreneurship.**

CO5: Students able to understand Production technology of important medicinal plants for **Skill Development.**

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-------------|-----|-----|-----|-----|-----|-----|-----|
| CO:1 | 3 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO:2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| CO:3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO:4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |
| CO:5 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated


| | Skill Development | Employability | Entrepreneurship Development |
|------|-------------------|---------------|------------------------------|
| CO:1 | 3 | 1 | 1 |
| CO:2 | 3 | 2 | 1 |
| CO:3 | 3 | 2 | 1 |
| CO:4 | 3 | 1 | 3 |
| CO:5 | 3 | 2 | 2 |

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BAG558

Ornamental Crops, MAP and Landscaping Lab

L:T: P 0:0:1

List of Experiments: Minimum 08 of the followings-

1. Identification of ornamental and medicinal plants.
2. Nursery bed preparation and seed sowing.
3. Training and pruning of Ornamental plants.
4. Preparation of herbaceous border.
5. Preparation of shrubby border.
6. Planning and layout of garden.
7. Protected structures – care and maintenance.
8. Intercultural operations in flowers.
9. Harvesting and post harvest handling of cut and loose flowers.
10. Distillation process in important aromatic plants.
11. Visit to commercial production unit of flower/medicinal plants



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BAG509

Principles of Seed Technology

L:T:P 3:0:0

Objective: To provide insight into recent advances technology of seed production, testing, packing and storage.

Unit-I

Seed and seed technology: introduction, definition and importance. Deterioration causes of crop varieties and their control; Maintenance of genetic purity during seed production, seed quality; Characters of good quality seed, different classes of seed **for Skill Development.**

Unit-II

Foundation and certified seed production of important cereals, pulses, oilseeds, fodder and vegetables.,phases of certification, procedure for seed certification, field inspection. Seed Act and Seed Act enforcement. Duty and powers of seed inspector, offences and penalties. Seeds Control Order 1983 for **skill development.**

Unit-III

Varietal Identification through Grow Out Test and Electrophoresis, Molecular and Biochemical test. Detection of genetically modified crops, Transgene contamination in non-GM crops, GM crops and organic seed production **for Skill Development and employability.**

Unit-IV

Seed drying, processing and their steps, seed testing for quality assessment, seed treatment, its importance, method of application and seed packing. Seed storage; general principles, stages and factors affecting seed longevity during storage. Measures for pest and disease control during storage **for Skill Development and employability.**

Unit-V

Seed marketing: structure and organization, sales generation activities, promotional media. Factors affecting seed marketing, Role of WTO and OECD in seed marketing. Private and public sectors and their production and marketing strategies for **Skill Development.**

Couse Outcomes

CO1: Student understands about the Seed and seed technology **for Skill Development.**

CO2: Students understands the Foundation and certified seed production of important cereals for **skill development.**

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CO3: To know about the Remotesensing concepts and application in agriculture for **Skill Development and employability.**

CO4: Students able to Seed drying, processing and their steps for **skill development and entrepreneurship.**

CO5: Students able to understand Seed marketing: structure and organization for **Skill Development.**

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-------------|-----|-----|-----|-----|-----|-----|-----|
| CO:1 | 3 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO:2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| CO:3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO:4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |
| CO:5 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------|-------------------|---------------|------------------------------|
| CO:1 | 3 | 1 | 1 |
| CO:2 | 3 | 2 | 1 |
| CO:3 | 3 | 2 | 1 |
| CO:4 | 3 | 1 | 3 |
| CO:5 | 3 | 2 | 2 |

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BAG559

Seed Technology Lab

L:T: P 0:0:1

List of Experiments: Minimum 08 of the followings-

1. Seed production in major cereals: Wheat, Rice, Maize and Bajra.
2. Seed production in major pulses: Urd, Mung, Pigeonpea, Gram and lentil.
3. Seed production in major oilseeds: Soybean, Sesame, Groundnut, and Mustard.
4. Seed production in important vegetable crops.
5. Seed sampling and testing: Physical purity, germination, viability.
6. Seed and seedling vigour test.
7. Genetic purity test.
8. Grow - out test and electrophoresis.
9. Seed certification: Procedure, Field inspection, Preparation of field inspection report.
10. Visit to seed production farms, seed testing laboratories and seed processing plant.


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BAG510

Livestock and Poultry Management

L:T:P 3:0:0

Objective: To make the students able to identify important breeds of cattle, feeding management and controlling of diseases of livestock and poultry.

Unit-I

Role of livestock in the national economy. Housing principles, space requirements for different species of livestock and poultry **for Skill Development.**

Unit-II

Management of calves, growing heifers and milch animals. Management of sheep, goat and poultry. Incubation, hatching and brooding. Management of growers and layers for **skill development.**

Unit-III

Important Indian and exotic breeds of cattle, buffalo, sheep, goat and poultry. Reproduction in farm animals and poultry. Improvement of farm animals and poultry **for Skill Development and employability.**

Unit-IV

Digestion in livestock and poultry. Classification of feed stuffs. Proximate principles of feed. Nutrients and their functions. Feed ingredients for ration for livestock and poultry. Feed supplements and feed additives. Feeding of livestock and poultry for **skill development and entrepreneurship.**

Unit-V

Introduction of livestock and poultry diseases. Prevention (including vaccination schedule) and control of important diseases of livestock and poultry for **Skill Development.**

Couse Outcomes

CO1: Student understands about the Role of livestock in the national economy **for Skill Development.**

CO2: Students understands the Management of calves for **skill development.**

CO3: To know about the Important Indian and exotic breeds of cattle, buffalo, sheep, goat and poultry **for Skill Development and employability.**

CO4: Students able to understand the Introduction of livestock and poultry diseases for **skill development and entrepreneurship.**

CO5: Students able to understand Digestion in livestock and poultry for **Skill Development.**


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PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|------|-----|-----|-----|-----|-----|-----|-----|
| CO:1 | 3 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO:2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| CO:3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO:4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |
| CO:5 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------|-------------------|---------------|------------------------------|
| CO:1 | 3 | 1 | 1 |
| CO:2 | 3 | 2 | 1 |
| CO:3 | 3 | 2 | 1 |
| CO:4 | 3 | 1 | 3 |
| CO:5 | 3 | 2 | 2 |

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BAG560

Livestock and Poultry Management Lab

L:T: P 0:0:1

List of Experiments: Minimum 08 of the followings-

1. Study and identification of external body parts of cattle, buffalo, goat, swine and poultry.
2. Study of different breeds of cows and buffaloes.
3. Visit to IDF and IPF to study breeds of livestock and poultry and daily routine farm operations and farm records.
4. Culling and Judging of cattle, buffalo and poultry.
5. Handling and restraining of livestock.
6. Planning and layout of housing for different types of livestock.
7. Computation of rations for livestock.
8. Formulation of concentrate mixtures.
9. Clean milk production, milking methods.
10. Hatchery operations, incubation and hatching equipments.
11. Debeaking, dusting and vaccination.
12. Economics of cattle, buffalo, sheep, goat and poultry production.


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BAG562


Practical Crop Production - I (Kharif)

L:T: P 0:0:1

List of Experiments: Minimum 08 of the followings-

Crop planning, raising field crops in multiple cropping systems:

1. Field preparation.
2. Seed treatment.
3. Nursery rising.
4. Sowing time.
5. Nutrient, INM.
6. Water management.
7. Weed management, IWM.
8. Management of insect-pestsdiseasesof crops and IPM.
9. Harvesting,threshing,drying and winnowing.
10. Storageandmarketing ofproduce.
11. Preparation of balance sheet including cost of cultivation, net returns per student as well as per team of 8-10students.


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BAG607 Rainfed Agriculture and Watershed Management L:T:P 3:0:0

Objective: To teach the basic concepts and practices of rainfed agriculture, soil moisture conservation and watershed management.

Unit-I

Rainfed agriculture: Introduction, types, History of rainfed agriculture and watershed in India; Problems and prospects of rainfed agriculture in India **for Skill Development**

Unit-II

Soil and climatic conditions prevalent in rainfed areas; Soil and water conservation techniques for **development of skill.**

Unit-III

Drought: types, effect of water deficit on physio-morphological characteristics of the plants, Crop adaptation and mitigation to drought **for Skill Development and employability.**

Unit-IV

Water harvesting: importance, its techniques, Efficient utilization of water through soil and crop management practices, Management of crops in rainfed areas, for **skill development and entrepreneurship**

Unit-V

Contingent crop planning for aberrant weather conditions, Concept, objective, principles and components of watershed management, factors affecting watershed management techniques for **Skill Development.**

Couse Outcomes

CO1: Student understands about the Rainfed agriculture **for Skill Development.**

CO2: Students understands the Soil and climatic conditions prevalent in rainfed areas for **development of skill.**

CO3: To know about the Drought: types, effect of water deficit on physio-morphological characteristics of the plants **for Skill Development and enploability.**

CO4: Students able to understand Water harvesting: importance, its techniques for **skill development and entrepreneurship.**

CO5: Students able to know the Contingent crop planning for aberrant weather conditions for **Skill Development**.

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-------------|-----|-----|-----|-----|-----|-----|-----|
| CO:1 | 3 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO:2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| CO:3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO:4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |
| CO:5 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------|-------------------|---------------|------------------------------|
| CO:1 | 3 | 1 | 1 |
| CO:2 | 3 | 2 | 1 |
| CO:3 | 3 | 2 | 1 |
| CO:4 | 3 | 1 | 3 |
| CO:5 | 3 | 2 | 2 |

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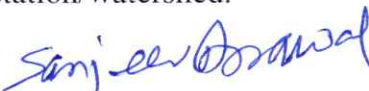
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BAG657 Rainfed Agriculture and Watershed Management Lab L:T: P 0:0:1

List of Experiments: Minimum 08 of the followings-

1. Studies on climate classification.
2. Studies on rainfall pattern in rainfed are as of the country and pattern of onset and withdrawal of monsoons.
3. Studies on cropping pattern of different rainfed areas in the country and demarcation of rainfed area on map of India.
4. Interpretation of meteorological data and scheduling of supplemental irrigation on the basis of evapo-transpiration demand of crops.
5. Critical analysis of rainfall and possible drought period in the country, effective rainfall and its calculation.
6. Studies on cultural practices for mitigating moisture stress.
7. Characterization and delineation of model watershed.
8. Field demonstration on soil & moisture conservation measures.
9. Field demonstration on construction of water harvesting structures.
10. Visit to rainfed research station/watershed.


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BAG608

Insect Ecology and Integrated Pest Management

L:T:P 3:0:0

Objective: To disseminate the knowledge on insect/pest behavior and controlling them by integrated manner.

Unit I

Insect ecology: introduction, environment and its components; effect of abiotic factors: temperature, moisture, humidity, rainfall, light, atmospheric pressure and air currents; effect of biotic factors: food, competition, natural and environmental resistance. Concepts of balance of life in nature, biotic potential and environmental resistance and causes for outbreak of pests in agro-ecosystem; pest surveillance and pest forecasting; categories of pests **for Skill Development.**

Unit II

Integrated Pest Management (IPM): introduction, importance, concepts and tools of IPM - host plant resistance, cultural, mechanical, physical, legislative, biological (parasites, predators and pathogens such as bacteria, fungi and viruses) methods of control; chemical control **for skill development**

Unit III

Importance, hazards and limitations; classification of insecticides, toxicity of insecticides and formulations of insecticides; study of important insecticides; recent methods of pest control: repellents, anti feedants, hormones, attractants, gamma radiation and genetic control **for Skill Development and employability.**

Unit IV

Insecticide Act 1968: important provisions; application techniques of spray fluids; phytotoxicity of insecticides; symptoms of poisoning, first aid and antidotes; non-insect pests: mites, nematodes, rodents and birds; beneficial insect :silk worms, honey bees and lac insects **for skill development and entrepreneurship.**

Unit V

Stored grain pests: Coleopteran and Lepidopteran pests, their biology and damage, preventive and curative methods. Distribution, biology, nature and symptoms of damage, and management strategies of insect and non insect pests. of rice, sorghum, maize, ragi (*Eleusinecoracana*), wheat, sugarcane, cotton, mesta, sunhemp, pulses, groundnut, castor, safflower, sunflower, mustard, brinjal, bhendi, tomato, cruciferous and cucurbitaceous vegetables, potato, colacasia, amaranthus, chillies, mango,

citrus, grapevine, banana, pomegranate, guava, ber, aonla, tobacco, turmeric, betelvine, onion, coriander, garlic, ginger and ornamental plants for **Skill Development and employability.**

Couse Outcomes

CO1: Student understands about the Insect ecology: introduction, environment and its components **for Skill Development.**

CO2: Students understands the concept Integrated Pest Management (IPM) for **skill development.**

CO3: To know about the Importance, hazards and limitations; classification of insecticides **for Skill Development and enploability.**

CO4: Students able to understand the Insecticide Act 1968: important provisions for **skill development and entrepreneurship.**

CO5: Students able to understand about the Stored grain pests: Coleopteran and Lepidopteran pest for **Skill Development and employability.**

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-------------|-----|-----|-----|-----|-----|-----|-----|
| CO:1 | 3 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO:2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| CO:3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO:4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |
| CO:5 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

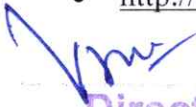
| | Skill Development | Employability | Entrepreneurship Development |
|------|-------------------|---------------|------------------------------|
| CO:1 | 3 | 1 | 1 |
| CO:2 | 3 | 2 | 1 |
| CO:3 | 3 | 2 | 1 |
| CO:4 | 3 | 1 | 3 |
| CO:5 | 3 | 3 | 2 |

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- <https://tnau.ac.in/>
- <http://ecoursesonline.iasri.res.in/>

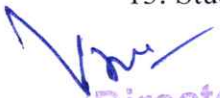

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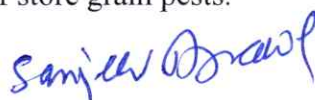

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BAG658 Insect Ecology and Integrated Pest Management Lab L:T: P 0:0:1

List of Experiments. Minimum 08 of the followings-

1. Identification of different types of insect damages on crop plants.
2. Sampling techniques for the estimation of insect population in selected crops.
3. Estimation of insect damage in selected crops.
4. Pest monitoring through light traps, pheromone traps and field incidence.
5. Familiarization with mechanical methods of pest control.
6. Familiarization with cultural methods of pest control.
7. Familiarization with plant protection equipment.
8. Familiarization with different formulations of insecticides.
9. Familiarization with different insecticides.
10. Calculation of doses/concentrations of insecticides.
11. Preparation of spray fluid for field application.
12. Familiarization with plant protection equipment.
13. Study of identification of store grain pests.


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BAG609 Diseases of Field & Horticultural Crops & Their Management-II L:T:P 3:0:0

Objective: To facilitate the students for diagnosing and controlling the important diseases of crops

Symptoms, etiology, disease cycle and management of following diseases:

Unit I

Field Crops:

Wheat: rusts, loose smut, karnal bunt and ear cockle; Sugarcane: red rot, smut, grassy shoot and ratoon stunting; Sunflower: Sclerotinia stem rot and Alternaria blight; Mustard: Alternaria blight, white rust, downy mildew and Sclerotinia stem rot;

Unit II

Gram: wilt, grey mould and Ascochyta blight; Lentil: rust and wilt; Cotton: anthracnose, and black arm; Pea: downy mildew, powdery mildew and rust.

Unit III

Horticultural Crops:

Mango: anthracnose, malformation, black tip and powdery mildew; Citrus: canker and gummosis; Grape vine: downy mildew and Powdery mildew; Apple: scab, powdery mildew and fire blight; Peach: leaf curl. Strawberry: leaf spot, Potato: early and late blight, black scurf, leaf roll, and mosaic;

Unit IV

Cucurbits: downy mildew, powdery mildew, wilt; Onion and garlic: purple blotch, and Stemphylium blight; Chillies: anthracnose, wilt and leaf curl;

Unit V

Turmeric: leaf spot Coriander: stem gall, Marigold: Botrytis blight; Rose: dieback, and black leafspot.

Couse Outcomes

CO1: Student understands about the diagnosing and controlling the important diseases of crops **for Skill Development.**

CO2: Students understands the concept Gram: wilt, grey mould and Ascochyta blight; Lentil: rust and wilt **for skill development.**


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CO3: To know about the Mango: anthracnose, malformation, black tip and powdery mildew for **Skill Development and employability.**

CO4: Students able to understand the Cucurbits: downy mildew, powdery mildew, wilt; Onion and garlic for **skill development and entrepreneurship.**

CO5: Students able to understand Nanotechnology, definition, concepts and techniques for **Skill Development.**

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-------------|-----|-----|-----|-----|-----|-----|-----|
| CO:1 | 3 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO:2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| CO:3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO:4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |
| CO:5 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------|-------------------|---------------|------------------------------|
| CO:1 | 3 | 1 | 1 |
| CO:2 | 3 | 2 | 1 |
| CO:3 | 3 | 2 | 1 |
| CO:4 | 3 | 1 | 3 |
| CO:5 | 3 | 2 | 2 |

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**BAG659 Diseases of Field & Horticultural Crops & their Management-II Lab L:T: P
0:0:1**

List of Experiments: Minimum 08 of the followings-

1. Identification and histopathological studies of Wheat and barley diseases.
2. Identification and histopathological studies of Mustard diseases.
3. Identification and histopathological studies of cucurbitaceous diseases.
4. Identification and histopathological studies of potato disease.
5. Identification and histopathological studies of chilli disease.
6. Identification and histopathological studies of guava disease.
7. Identification and histopathological studies of citrus disease
8. Field visit for the diagnosis of field problems.
9. Collection and preservation of plant diseased specimens for Herbarium;

Note: Students should submit 50 pressed and well mounted specimens


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BAG610

Protected Cultivation and Secondary Agriculture

L:T:P

3:0:0

Objective: To impart the scientific technology on off season production of horticultural crops especially flowers and vegetables, is a emerging industry.

Unit- I

Protected cultivation- importance and scope, Status of protected cultivation in India and World, types of protected structure based on site and climate. Cladding material involved in greenhouse/ poly house. Greenhouse design, environment control, artificial lights, Automation.

Unit- II

Soil preparation and management, Substrate management. Types of benches and containers. Irrigation and fertigation management.

Unit- III

Propagation and production of quality planting material of horticultural crops.

Unit- IV

Greenhouse cultivation of important horticultural crops – rose, carnation, chrysanthemum, gerbera, orchid, anthurium, lily, tulip, tomato, bell pepper, cucumber, strawberry, pot plants, etc.

Unit- V

Cultivation of economically important medicinal and aromatic plants. Off-season production of flowers and vegetables. Insect pest and disease management.

Couse Outcomes

CO1: Student understands about the Protected cultivation- importance and scope **for Skill Development.**

CO2: Students understands the concept Soil preparation and management **for skill development.**

CO3: To know about the Propagation and production of quality planting material of horticultural crops **for Skill Development and enploability.**

CO4: Students able to understand the Cultivation of economically important medicinal and aromatic plants **for skill development and entrepreneurship.**

CO5: Students able to understand Cultivation of economically important medicinal and aromatic plants for **Skill Development**.

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-------------|-----|-----|-----|-----|-----|-----|-----|
| CO:1 | 3 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO:2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| CO:3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO:4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |
| CO:5 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated


| | Skill Development | Employability | Entrepreneurship Development |
|------|-------------------|---------------|------------------------------|
| CO:1 | 3 | 1 | 1 |
| CO:2 | 3 | 2 | 1 |
| CO:3 | 3 | 2 | 1 |
| CO:4 | 3 | 1 | 3 |
| CO:5 | 3 | 2 | 2 |

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BAG660 Protected Cultivation and Secondary Agriculture Lab L:T: P 0:0:1

List of Experiments: Minimum 08 of the followings-

1. Raising of seedlings and saplings under protected conditions.
2. Use of protrays in quality planting material production.
3. Study of different growing media.
4. Study of bed preparation and planting for crop production.
5. Study of Inter cultural operations in protected cultivation.
6. Measurement of Soil pH in protected structures.
7. Measurement of Soil EC in protected structures.
8. Regulation of irrigation and fertilizers through drip.
9. Preparation of plastic tunnels and hydroponic structure.
10. Regulation of fogging and misting in protected structures.
11. Visit to protected cultivation unit.



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BAG611A

Mushroom Cultivation

L:T:P 3:0:0

Objective: To know nutritional value, Medicinal value, Consumption of mushrooms, income generation and employment creation.

Unit-I

Importance of mushroom cultivation – definition of mushroom - its importance – present scenario of mushroom cultivation in India.

Unit II

General morphological features, taxonomy and identification of different mushrooms-poisonous, hallucinogenic and medicinal mushrooms. Pure culture of mushrooms and their nutritional requirements

Unit III

Definition of spawn, substrate for spawn, types of spawn, methods of spawn production, characteristic of a good spawn, storage of spawn

Unit IV

Cultivation of *Agaricus* species – composting – its formulation, casing, preparation of casing mixture, sterilization, cultivation of *pleurotus*, *Volvariella*, *Lentinus*, *Calocybe* and *Auricularia*. Different types of substrates, substrate preparation and sterilization, Spawning, methods of spawning, spawn run phase, cropping

Unit V

Identification and management of different pests and diseases of mushrooms. Methods of harvesting mushrooms, post harvest treatments and preservation of mushrooms. Packing and processing – Different methods of processing, canning and dehydration. Nutritive value of mushrooms and preparation of different recipes

Couse Outcomes

CO1: Student understands about the Importance of mushroom cultivation **for Skill Development.**

CO2: Students understands the General morphological features, taxonomy and identification of different mushrooms for **skill development.**

CO3: To know about the Definition of spawn, substrate for spawn, types of spawn **for Skill Development and employability.**

CO4: Students able to understand the Cultivation of Agaricus species for **skill development and entrepreneurship.**

CO5: Students able to understand Identification and management of different pests and diseases of mushrooms for **Skill Development.**

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-------------|-----|-----|-----|-----|-----|-----|-----|
| CO:1 | 3 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO:2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| CO:3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO:4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |
| CO:5 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------|-------------------|---------------|------------------------------|
| CO:1 | 3 | 1 | 1 |
| CO:2 | 3 | 2 | 1 |
| CO:3 | 3 | 2 | 1 |
| CO:4 | 3 | 1 | 3 |
| CO:5 | 3 | 2 | 2 |


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- <http://www.agriglance.com>


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BAG611B

Agri – Informatics and IPR

L:T:P 3:0:0

Objectives: To disseminate the information technology among the agricultural graduates and be aware about IPRs

Unit-I

Introduction to Computers, Operating Systems, definition and types, Applications of MSOffice for document creation & Editing, Data presentation, interpretation and graph creation, statistical analysis, mathematical expressions, Database, concepts and types, uses of DBMS in Agriculture, World Wide Web (www): Concepts and components.

Unit-II

e-Agriculture, concepts and applications, Use of ICT in Agriculture. Computer Models for understanding plant processes. IT application for computation of water and nutrient requirement of crops, Computer-controlled devices (automated systems) for Agri-input management, Smartphone Apps in Agriculture for farm advisory, e-banking markets market price, postharvest management etc;

Unit-III

Geospatial technology for generating valuable agri-information. Decision support systems, concepts, components and applications in Agriculture, Agriculture Expert System.

Unit-IV

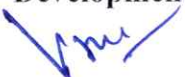
Introduction and meaning of intellectual property, brief introduction to GATT, WTO, TRIPS and WIPO, Types of Intellectual Property and legislations covering IPR in India:- Patents, Copyrights, Trademark, Industrial design, Geographical indications, Integrated circuits, Trade secrets.

Unit-V

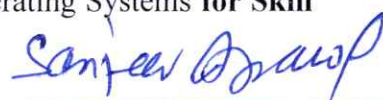
Patents Act 1970 and Patent system in India, patentability, process and product patent, filing of patent, patent specification, patent claims, Patent opposition and revocation, infringement, Plant breeders rights, researcher and farmers rights. Indian Biological Diversity Act, 2002 and its salient features, access and benefit sharing.

Couse Outcomes

CO1: Student understands about the introduction to Computers, Operating Systems for Skill Development.



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CO2: Students understands the concept e-Agriculture, concepts and applications, Use of ICT in Agriculture for **skill development**.

CO3: To know about the Geospatial technology for generating valuable agri-information for **Skill Development and employability**.

CO4: Students able to understand the Introduction and meaning of intellectual property, brief introduction to GATT, WTO, TRIPS and WIPO for **skill development and entrepreneurship**.

CO5: Students able to understand Patents Act 1970 and Patent system in India for **Skill Development**.

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-------------|-----|-----|-----|-----|-----|-----|-----|
| CO:1 | 3 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO:2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| CO:3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO:4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |
| CO:5 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)


Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------|-------------------|---------------|------------------------------|
| CO:1 | 3 | 1 | 1 |
| CO:2 | 3 | 2 | 1 |
| CO:3 | 3 | 2 | 1 |
| CO:4 | 3 | 1 | 3 |
| CO:5 | 3 | 2 | 2 |

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- <https://www.wipo.int/>
- <http://www.caaa.in/>
- <http://www.gpcet.ac.in/>
- <https://www.iare.ac.in/>
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BAG611C

Food Safety and Standards

L:T:P 3:0:0

Objective: To acquaint with food quality parameters and control systems, food standards, regulations, specifications.

UNIT-I

Basics of Food Science and Food Analysis, Concept, objectives and need of food quality. Measurement of colour, flavour, consistency, viscosity, texture and their relationship with food quality and composition.

UNIT-II

Sampling; purpose, sampling techniques, sampling procedures for liquid, powdered and granular materials. Food adulteration and food safety.

UNIT-III

Quality control, Quality control tools, Statistical quality control, Sensory evaluation methods, panel selection methods, Interpretation of sensory results. Instrumental method for testing quality.

UNIT-IV

TQM and TQC, consumer preferences and acceptance, Food Safety Management Systems GAP, GHP, GMP, Hazards and HACCP (Hazard analysis and critical control point), Sanitation in food industry (SSOP),

UNIT-V

Food Laws and Regulations in India, FSSAI, Food grades and standards BIS, AGMARK, PFA, FPO, ISO 9000, 22000 Series. CAC (Codex Alimentarius Commission), Traceability and Quality Assurance system in a process plant, Bio safety and Bioterrorism.

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BAG-611 (D)

Baby Corn Production Techniques

L: T: P 1:0:0

Objective: To disseminate the knowledge of baby corn production and its uses.

UNIT-I

Introduction and importance of baby corn production in India and world **for development of skills.**

UNIT-II

Agronomical package of practices of baby corn production **for development of skill and employability.**

UNIT-III

Post harvest management of baby corn **for skill development and employability.**

UNIT-IV

Major uses of baby corn and it's value addition to increase the self life and market value **skill development and employability.**

UNIT-V

Marketing of baby corn products **for skill development, entrepreneurship and employability.**

Course outcomes:

Students completing this course will be able to:

CO1: CO1: On successful completion of this course a student will be able to: Understand the basics of about baby corn **for development of skills.**

CO2: Understand all about the production of baby corn **for development of skill and employability.**

CO3: Understand all about the post harvest management of baby corn **for skill development and employability.**

CO4: Understand about the uses and value addition in baby corn products **for skill development and employability.**

CO5: Understand the marketing of products **for skill development, entrepreneurship and employability.**

PO-CO Mapping (Please ✓ wherever required)

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|--|-----|-----|-----|-----|-----|
|--|-----|-----|-----|-----|-----|

| | | | | | |
|------------|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | 1 | 1 |
| CO2 | 3 | 3 | 3 | 1 | 1 |
| CO3 | 3 | 3 | 3 | 3 | 1 |
| CO4 | 3 | 3 | 3 | 3 | 1 |

CO-Curriculum Enrichment Mapping (Please ✓ wherever required)

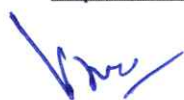
| | Skill Development | Employability | Entrepreneurship Development |
|------------|--------------------------|----------------------|-------------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 3 | 3 | 1 |
| CO3 | 3 | 3 | 1 |
| CO4 | 3 | 3 | 3 |

References:

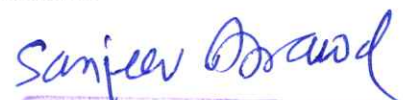
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BAG-611(E)

Piggery Science

L: T: P 1:0:0

Objectives: To produce crossbred by crossing indigenous gilts with exotic boars and to assess their performance in respect of their efficiency of feed conversion, production and reproduction. To evolve economic pig ration with locally available feed ingredients, conventional and unconventional.

UNIT -I

Scope and opportunities for piggery in India. Various steps involved in setting up a Pig farm. Income & employment opportunities Composite farming. For **Skill Development**

UNIT -II

Support available for piggery from State and Central Governments. Schemes of NABARD for development of Piggery. For **Employability**

UNIT –III

Housing sheds for pigs. Maintenance of cleanliness & hygiene. Basic bio security practices carried out. **Skill Development**

UNIT –IV

Care and management of Pigs measures and disease prevention. Common diseases in Goat & their control, vaccination, disease prevention. Disaster Management – livestock insurance, personal insurance, PMBY. **Skill Development**

UNIT –V

Requirement & nutrition content, Age wise feed consumption, Feeding methodologies, Creep feeding, flush feeding and correct feeding practices, Unconventional feeding practices. Feed to fat conversion rate. Maintenance of Cleanliness & Hygiene Common diseases, symptoms Vaccination & disease prevention Waste Management. For **Entrepreneurship Development**

Course Outcomes:

CO1: To understand the science underlying the genetics, reproduction, nutrition, environment & health of pigs. **Skill Development**

CO2: To understand how these inputs can be manipulated to improve the efficiency of a pork production enterprise. For **Employability**

CO3: To understand how these inputs fit together into a complete enterprise that can be analyzed. **Skill Development**

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CO4: To understand the impact of contemporary issues (e.g. animal welfare, antibiotic use & effluent pollution of the local environment) on the pork enterprise. **Skill Development**

CO5: To understand the Maintenance of Cleanliness & Hygiene Common diseases, symptoms Vaccination & disease prevention Waste Management. **For Entrepreneurship Development**

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-------------|-----|-----|-----|-----|-----|-----|-----|
| CO:1 | 3 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO:2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| CO:3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO:4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |
| CO:5 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-------------|-------------------|---------------|------------------------------|
| CO:1 | 3 | 1 | 2 |
| CO:2 | 1 | 3 | 2 |
| CO:3 | 3 | 2 | 1 |
| CO:4 | 3 | 2 | 1 |
| CO:5 | 1 | 2 | 3 |


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BAG-611(F) Administration and Supervision in Extension education L: T: P 1:0:0

Objectives: Extension administration is an important factor for the working of any organization. it helps in smooth working of an organization. Extension administration is an important factor for the working of any organization. it helps in smooth working of an organization.

UNIT –I

The administrative scope, functions, philosophy and general objectives of different types of systems. Cooperative Extension or other formal and nonformal education settings, particularly those with administrative aspirations. **For Skill Development & Employability**

UNIT –II

Differences between management, administration and leadership and management principles, administrative and supervisory responsibilities. **For Entrepreneurship Development**

UNIT –III

Organizational management, and issues and trends facing organizations and institutions. **For Skill Development**

UNIT –IV

Management principles and practices of planning, organizing, directing, staffing and evaluating as applied to management and supervision. **For Employability**

UNIT –V

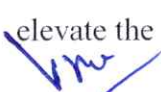
Administrative/supervisory responsibilities, including policies and procedures, program development and management, fiscal management, human resource management, office/facility management; and, relationship and liaisons. **For Skill Development**

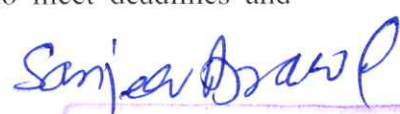
Course Outcomes:

CO1: Student learning to administrative scope, functions, philosophy and general objectives of different types of systems. **For Skill Development & Employability**

CO2: Student how to administration and leadership and management principles, administrative and supervisory responsibilities. **For Entrepreneurship Development**

CO3: Demonstrate professionalism by managing time and media to meet deadlines and elevate the quality of works produced. **For Skill Development**


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CO4: To impart better education with values and transformation of knowledge from class room to common man. For **Employability**

CO5: Inculcate critical thinking to carry out scientific investigation objectively without being biased with preconceived notions. For **Skill Development**

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-------------|-----|-----|-----|-----|-----|-----|-----|
| CO:1 | 3 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO:2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| CO:3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO:4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |
| CO:5 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------|-------------------|---------------|------------------------------|
| CO:1 | 3 | 1 | 3 |
| CO:2 | 1 | 2 | 3 |
| CO:3 | 3 | 2 | 1 |
| CO:4 | 2 | 3 | 1 |
| CO:5 | 3 | 2 | 2 |

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- <http://www.ignouhelp.in/>
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BAG-611 (G)

Fundamental of Cytogenetics

L: T: P 1:0:0

Objectives: The purpose of Cytogenetics is to study the structure and normal and pathological functioning of chromosomes (condensation, recombination, repair, segregation, transmission) and chromatin (organization and role in the regulation of gene expression)

UNIT- I

Ultra structure of cell, cell organelles and their functions, structure of chromosome; chromonemata, chromosome matrix, chromomeres, centromere, secondary constriction and telomere; special types of chromosomes. **For Skill Development**

UNIT-II

Chromosomal theory of inheritance cell cycle and cell division- mitosis and meiosis and their significance. **For Skill Development**

UNIT-III

DNA: types, structure, replication, function, RNA: structure, types and function. **For Employability**

UNIT-IV

Life cycle of angiosperms: megasporogenesis and microsporogenesis and fertilization. **For Entrepreneurship Development**

UNIT-IV

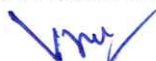
Structural and numerical variations in chromosome and their implications. **For Skill Development & Employability**

Course Outcomes:

CO1: Evolution of various chromosomal aberrations (structural and numerical), their applications in alien gene transfer and hybrid seed development. **For Skill Development**

CO2: pollen culture in haploid development and development of diploid inbreds or hybrids or doubled isogenic lines from haploids that has got important applications in plant breeding.

For Skill Development



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CO3: With cytogenetic tools such as FISH and GISH (Genomic In Situ Hybridization) techniques, **For Employability**

CO4: Another important application of plant Cytogenetics is in validation of physical maps **For Entrepreneurship Development**

CO5: Students gain to knowledge of structure, replication, function, RNA: structure, types and function. **For Skill Development & Employability**

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-------------|-----|-----|-----|-----|-----|-----|-----|
| CO:1 | 3 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO:2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| CO:3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO:4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |
| CO:5 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-------------|-------------------|---------------|------------------------------|
| CO:1 | 3 | 1 | 2 |
| CO:2 | 3 | 2 | 2 |
| CO:3 | 2 | 3 | 1 |
| CO:4 | 1 | 2 | 3 |
| CO:5 | 3 | 3 | 2 |

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BAG-611 (H)

ENVIRONMENTAL GENETICS

L: T: P 1:0:0

Objectives: Based on this concept, gene–environment interaction can be defined as “a different effect of an environmental exposure on disease risk in persons with different genotypes,” or, equivalently, “a different effect of a genotype on disease risk in persons with different environmental exposures.

UNIT -I

Environmental factors affecting genes and their expression: Heritable changes: Spontaneous and induced mutations Luria Delbruck fluctuation Test, Somatic mutation and germinal mutation, genetic mosaics. **For Skill Development**

UNITS -II

Environmental Mutagens: Physical- Corpuscular radiations-Alpha particles, Beta particles, and Neutrons. Electromagnetic radiations - Gamma rays, X rays and ultra violet radiations, Interaction of radiations with matter ionization and excitation, Photoelectric effect, Compton effect, Pair production, Properties of radio nucleotides, Radiation. **For Entrepreneurship Development**

UNITS- III

Chemical- Alkylating agents, Base analogues, Acridines, deaminating agents and miscellaneous. Environmental impact on genetic organization of organisms. **For Entrepreneurship Development**

UNITS- IV.

Chromosomal mutations: Variation in chromosome number -Monosomy, Cri-du-Chat syndrome, Trisomy, Down syndrome, Patau Syndrome, Edward syndrome. **For Employability**

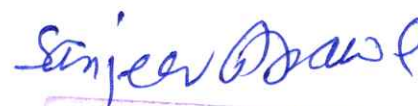
UNITS –V

Chromosome structure mutations- Deletion, Duplication- Bar eye in *Drosophila*, Inversion- Consequences of inversions, Translocation- Familial Down syndrome, Fragile sites in Humans. **For Skill Development**

Course Outcomes:



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CO1: Comprehensive, detailed understanding of the chemical basis of heredity. **For Skill Development**

CO2: Comprehensive and detailed understanding of genetic methodology and how quantification of heritable traits in families and populations provides insight into cellular and molecular mechanisms. **For Entrepreneurship Development**

CO3: Understanding of how genetic concepts affect broad societal issues including health and disease, food and natural resources, environmental sustainability, etc. **For Entrepreneurship Development**

CO4: Insight into the mathematical, statistical, and computational basis of genetic analyses that use genome-scale data sets in systems biology settings. **For Employability**

CO5: Understanding the role of genetic technologies in industries related to biotechnology, pharmaceuticals, energy, and other fields. **For Skill Development**

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-------------|------------|------------|------------|------------|------------|------------|------------|
| CO:1 | 3 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO:2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| CO:3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO:4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |
| CO:5 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-------------|--------------------------|----------------------|-------------------------------------|
| CO:1 | 3 | 1 | 2 |
| CO:2 | 1 | 2 | 3 |
| CO:3 | 2 | 2 | 3 |
| CO:4 | 2 | 3 | 1 |
| CO:5 | 3 | 2 | 2 |

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- <http://www.ignouhelp.in/>
- <https://hau.ac.in/>


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BAG-611 (I) Agricultural Finance and Business Management L: T: P 1:0:0

Objectives: The principal objective of this course is to impart knowledge and expertise in the field of agricultural finance. It enables the student to understand the business planning and financial management of an agri-business; become aware of the international models for gauging agricultural debt and the role of the regulator in agricultural financing.

UNIT-I

Agricultural Finance: Meaning, scope and significance, credit needs and its role in Indian agriculture; Agricultural credit: Meaning, definition, need, classification. Credit analysis: 3 R's, 5 C's and 7 P's of credits, loan repayment plans; Banking: Role in modern economy, types of banks, functions of commercial banks, credit creation policy. **For Skill Development**

UNIT-II

Sources of agricultural finance: Institutional and non-institutional sources, commercial banks, social control and nationalization of commercial banks, Micro financing including SHGs, KCC. Lead bank scheme, RRBs, Scale of finance and unit cost. **For Entrepreneurship Development**

UNIT-III

An introduction to higher financing institutions (RBI, NABARD, ADB, IMF, World Bank, Deposit Insurance and Credit Guarantee Corporation of India): Genesis, objectives, and functions, Recent development in agricultural credit. Concept of financial statements – Balance Sheet and Income and expenditure statement, profit and loss account. Basic guidelines for preparation of project reports, bank norms. **For Skill Development & Employability**

UNIT-IV

Time value of money; Project appraisal techniques-PBP, BCR, NPV, IRR, Break even analysis, SWOT analysis; Agricultural Cooperation – Meaning, brief history of cooperative development in India, objectives, principles of cooperation, significance of cooperatives in Indian agriculture. **For Entrepreneurship Development**


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UNIT-V

Agricultural Cooperation in India- credit, marketing, consumer and multi-purpose cooperatives, farmers' service cooperative societies, processing cooperatives, farming cooperatives, cooperative warehousing; role of ICA, NCUI, NCDC, NAFED. **For Skill Development & Employability**

Course Outcomes:

CO1: Define Agricultural business, finance, credit, marketing, planning, farm records and accounts. **For Skill Development**

CO2: Explain the components and various sectors of Agricultural management and management decisions. **For Entrepreneurship Development**

CO3: List and explain the types of production and planning, advantages and guiding principles of production planning. **For Skill Development & Employability**

CO4: Identify the types of Agricultural business management and organisations and list their characteristics, advantages and disadvantages. **For Entrepreneurship Development**

CO5: Calculate and explain the implications of the common financial ratios to agricultural business management **For Skill Development & Employability**

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-------------|------------|------------|------------|------------|------------|------------|------------|
| CO:1 | 3 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO:2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| CO:3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO:4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |
| CO:5 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-------------|--------------------------|----------------------|-------------------------------------|
| CO:1 | 3 | 1 | 2 |

| | | | |
|-------------|---|---|---|
| CO:2 | 1 | 3 | 2 |
| CO:3 | 3 | 3 | 1 |
| CO:4 | 2 | 3 | 1 |
| CO:5 | 3 | 3 | 2 |

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BAG-611 (J)

Storage Pest Management of Tobacco

L: T: P 1:0:0

Objective: To disseminate the knowledge of stored insect/pest of tobacco and their behavior, lifecycle and management.

UNIT-I

Major Insect of Tobacco: Introduction, Identification and habitat **for development of skills.**

UNIT-II

The cigarette beetle: Description and life history, Seasonal occurrence and habits **for development of skill and employability.**

UNIT-III

The tobacco moth: Description and life history, Seasonal occurrence and habits and other insects of tobacco **for skill development and employability.**

UNIT-IV

Control masseurs for tobacco stored insect pests. Preventive and curative methods of pest control in stored tobacco. Control of tobacco insect pest in warehouse **for skill development and employability.**

UNIT-V

Control by chamber fumigation of stored insect pest of tobacco **for skill development, entrepreneurship and employability.**

Course outcomes:

Students completing this course will be able to:

CO1: On successful completion of this course a student will be able to: Understand the basics of insect and identification **for development of skills.**

CO2: Understand all about the cigarette beetle **for development of skill and employability.**

CO3: Understand all about the tobacco moth **for skill development and employability.**

CO4: Control masseurs for tobacco stored insect pests **for skill development and employability.**

CO5: Control by chamber fumigation of stored insect pest of tobacco **for skill development, entrepreneurship and employability.**

PO-CO Mapping (Please ✓ wherever required)

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 3 | 1 | 1 |
| CO2 | 3 | 3 | 3 | 1 | 1 |
| CO3 | 3 | 3 | 3 | 3 | 1 |
| CO4 | 3 | 3 | 3 | 3 | 1 |


CO-Curriculum Enrichment Mapping (Please √ wherever required)

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 3 | 3 | 1 |
| CO3 | 3 | 3 | 1 |
| CO4 | 3 | 3 | 3 |


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BAG-611 (K)

Forest Protection

L: T: P 1:0:0

Objectives: Reverse Forest Loss: Reverse the loss of forest cover worldwide through sustainable forest management, including protection, restoration, a forestation and reforestation, and increase efforts to prevent forest degradation.

UNIT-I

Definition, role of forests in relation to environment and human welfare, historical evidence of damage, factors effecting forest protection, history of forest protection in India and classification of protection measures. **For Skill Development**

UNIT-II

Man as a source of injury to forests: deforestation, shifting cultivation, encroachment, mining and felling. Forest fire: Classification of forest fire, damage, controlled use of fire, protective and remedial measures, fire control policy and economics of fire protection. Protection against injuries by animals:

For Skill Development

UNIT-III

Grazing and browsing, rotational and controlled grazing, effect of wild animal on forest regeneration. Protection against injuries by diseases: classification of forest ree diseases and their control; common diseases in forests- root rot, heart rot, wilt, stem canker, stem rust, die-back galls, leaf spots, leaf blight, powdery mildew and leaf rust. **For Employability**

UNIT-IV

Protection against injuries by plants: defoliation, sap suckers and mites, shoot twig and root insects, seed and cone insects, wood boring insects and gall makers. Methods of control against insects and pests- silvicultural, biological and chemical control. **For Skill Development & Employability**

UNIT-V

Diseases caused by phanerogamic plant parasite like dendrophthoe, acanthobium, loranthus. Protection against adverse climatic factors- Temperature, Rainfall, and winds. **For Skill Development & Employability**

Course Outcomes:

CO1: Students will demonstrate understanding of the complex interactions of humans and forest ecosystems in a global context. **For Skill Development**

CO2: Students will be able to exhibit forest menstruation skills, techniques for ecological measurements, and other quantitative and analytical skills for data collection, analysis, and interpretation of forest ecology and management. **For Skill Development**

CO3: Students will be able to independently locate and apply relevant forest ecology and management literature to assigned problems or research and management issues. **For Employability**

CO4: Students will be able to interpret a wide range of scientific and popular literature related to forest ecology and management and apply this information to problem-solving analysis in the conservation and management of forest ecosystems. **For Skill Development & Employability**

CO5: Students will be able to prepare analyses and present both written and verbal technical reports of forest conservation, ecology, and management as appropriate for either scientific or popular audiences. **For Skill Development & Employability**

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-------------|------------|------------|------------|------------|------------|------------|------------|
| CO:1 | 3 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO:2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| CO:3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO:4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |
| CO:5 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-------------|--------------------------|----------------------|-------------------------------------|
| CO:1 | 3 | 1 | 2 |
| CO:2 | 3 | 2 | 2 |
| CO:3 | 2 | 3 | 2 |
| CO:4 | 3 | 3 | 2 |
| CO:5 | 3 | 3 | 2 |

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BAG-611 (L)

Health and Disease Management of Poultry

L: T: P 1:0:0

Objectives: Storage facilities for feed ingredients/feeds must be managed in a hygienic manner. Sheds having infected flocks should be served with feed at the end of a delivery day. Always ensure the supply of clean and potable water. If necessary use appropriate sanitizers.

UNIT-I

Definition of poultry, importance of poultry farming and poultry development in India. Present status and future prospectus of poultry industry. Origin of the chicken and classification of poultry based on genetics utility. Classification of chicken. **For Skill Development**

UNIT-II

Modern breeds breeds of chicken-varieties used for modern breeding. Present day egg and meat production lines. The mini breeds dwarfism in mini-leghorns. **For Skill Development & Employability**

UNIT-III

Ducks and geese- Introduction- Advantage- classification- duck rearing system. Quails-origin and domestication-Advantage of quail farming. **For Skill Development & Employability**

UNIT-IV

Ratites- classification- economical aspects. Emu based commercial products and ostrich products, yield and their uses. Desi- chicken- introduction- indigenous breeds and economical aspects of desi chicken. **For Entrepreneurship Development**

UNIT-V

Glossary: Necrosis-gangrene- Atrophy- Inflammation-Nephritis-Hepatic opharitis- Encephalitis-Pneumonia-Salpingitis Rhinitis- enteritis-Stomatitis- peritonitis petechial. Prevention and control of contagious. **For Entrepreneurship Development**

Course Outcomes:

CO1: Have advanced knowledge in poultry embryology, anatomy, physiology, immunology, genetics, and behavior. **For Skill Development**

CO2: Master basic principles of poultry production methods, housing, biosecurity and economics of poultry health sciences. **For Skill Development & Employability**

CO3: Have knowledge and insight in the pathogenesis, epidemiology, diagnostics, prevention and treatment of infectious and non-infectious poultry diseases. **For Skill Development & Employability**

CO4: Developed critical thinking skills and insights in hot topics in poultry production such as responsible use of antimicrobials, sustainability in livestock production, animal welfare, and public perception of poultry production. **For Entrepreneurship Development**

CO5: Have knowledge of guidelines to maintain and assure food quality and food safety of poultry products. **For Entrepreneurship Development**

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-------------|------------|------------|------------|------------|------------|------------|------------|
| CO:1 | 3 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO:2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| CO:3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO:4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |
| CO:5 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated


| | Skill Development | Employability | Entrepreneurship Development |
|-------------|--------------------------|----------------------|-------------------------------------|
| CO:1 | 3 | 1 | 1 |
| CO:2 | 3 | 3 | 2 |
| CO:3 | 3 | 3 | 1 |
| CO:4 | 2 | 2 | 3 |
| CO:5 | 1 | 2 | 3 |

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2. Ghosh, N. 2015. Poultry Science and Practice: A Textbook. CBS Publishers & Distributors, Delhi.
3. Chauhan, H.V.S. 2018. Poultry Diseases, Diagnosis and Treatment. New Age International Private Limited, Delhi.
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BAG-611(M)

Fisheries Science

L: T: P 1:0:0

Objectives: Some of the most commonly declared objectives of fisheries management are: (i) resource conservation; (ii) food production; (iii) generation of economic wealth; (iv) generation of reasonable income for fishers; (v) maintaining employment for fishers; and (vi) maintaining the viability of fishing communities

UNIT-I

Definition and morphometric characteristics of fishes. Commercially important fin fishes and shellfishes of Indian water. **For Skill Development & Employability**

UNIT-II

Basics of aquaculture - definition and scope. Aims and objectives of aquaculture, benefits of aquaculture from human prospective. Present global and national scenario. **For Skill Development & Employability**

UNIT-III

Aquaculture vs Agriculture. Aquatic resources of India and their conservation and management in different water bodies. **For Entrepreneurship Development**

UNIT-IV

Systems of aquaculture - pond culture, pen culture, tank culture, cage culture, running water culture, Sewage fed aquaculture etc. **For Entrepreneurship Development**

UNIT-V

Management of aquaculture pond. Monoculture and polyculture. Integrated culture systems. Different varieties of exotic and indigenous ornamental fishes. Culture of freshwater and saline water ornamental fishes **For Skill Development**

Course outcome: The course content prepared for the CBCS student of different department to get idea about the basic information regarding fishes and their importance, gathering knowledge about importance of aquaculture.

Course Outcomes:

CO1: To understand the detailed knowledge on major fisheries of India. **For Skill Development & Employability**

CO2: To understand the clear understanding on demersal and deep sea fisheries. **For Skill Development & Employability**

CO3: To understand the knowledge on shell fish and seaweed resources of India. **For Entrepreneurship Development**

CO4: Understand the basic nutritional requirements of fishes; recognize different prescription diets on the animals basic indications for use. **For Entrepreneurship Development**

CO5: Distinguish between the main stages of embryonic & larval development & behavioral changes that occur across the breeding period **For Skill Development**

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-------------|------------|------------|------------|------------|------------|------------|------------|
| CO:1 | 3 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO:2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| CO:3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO:4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |
| CO:5 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-------------|--------------------------|----------------------|-------------------------------------|
| CO:1 | 3 | 3 | 2 |
| CO:2 | 3 | 3 | 2 |
| CO:3 | 2 | 2 | 3 |
| CO:4 | 1 | 2 | 3 |
| CO:5 | 3 | 2 | 2 |

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2. Stahl, E. and Chambers, J. 2015. Commercial Rabbit Farming. Createspace Independent Publishing company, South Carolina, United States.

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BAG-611 (N)

Management of Waste Land

L: T: P 1:0:0

Objectives: The main objective of proposed wasteland management is to meet: The domestic requirements of fuel wood, fodder, timber forest produces in rural areas. NTFP (non-timber forest produce) for rural population. Soil conservation, to create shelter belts or wind breaks and to reclaim ravine and gullies.

UNIT-I

Definition, sources- point and non- point, soil pollutants effect on soil; - types and characteristics and their -and' degradation. **For Skill Development**

UNIT-II

Effect crop responses' Industrial of sewage precaution on soil characteristics and effluents and soil pollution, metal contaminants and pesticides in fertilizers as soil pollutants. **For Skill Development**

UNIT-III

Strategies for soil conservation, conservation of arable restoration of terminated soil, wasteland reclamation, reassures for soil pollution. Bio remediation conservation at national and international level. **For Entrepreneurship Development**

UNIT-IV

Management of salt-affected soils; salt tolerance of crops - mechanism and ratings; monitoring of soil salinity in the field; management principles for sandy, clayey, red lateritic and dry land soils. **For Entrepreneurship Development**

UNIT-V

Quality of irrigation water; management of brackish water for irrigation; characterization of brackish waters; relationship in water use and quality.

Course Outcomes:

CO1: Definition, sources- point and non- point, soil pollutants effect on soil. **For Skill Development**

CO2: students will be able to learn basic concepts of solid waste management, beginning from source generation to waste disposal in a system of municipality organizational structure.

For Skill Development

CO3: Student learning to Strategies for soil conservation, conservation of arable restoration of terminated soil, wasteland reclamation, reassures for soil pollution. **For Entrepreneurship Development**

CO4: Student learning to Bio remediation conservation at national and international level. **For Entrepreneurship Development**

CO5: Student learning to Quality of irrigation water; management of brackish water for irrigation; characterization of brackish waters; relationship in water use and quality.

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|------|-----|-----|-----|-----|-----|-----|-----|
| CO:1 | 3 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO:2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| CO:3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO:4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |
| CO:5 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------|-------------------|---------------|------------------------------|
| CO:1 | 3 | 1 | 2 |
| CO:2 | 3 | 2 | 2 |
| CO:3 | 2 | 3 | 1 |
| CO:4 | 2 | 3 | 1 |
| CO:5 | 3 | 3 | 2 |


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2. Richards L.A USDA Handbook No. 60. 1954. Diagnosis and improvement of Saline and Alkali Soils. Oxford & IBH.
3. ISSS (2009) Fundamentals of Soil Science, Div. of Soil Science, IARI, New Delhi.

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BAG-611 (O)

Commercial production of organic Inputs

L: T: P 1:0:0

Objectives: To promote organic farming in the country by making available the organic inputs such as biofertilizers, Biopesticides and fruit & vegetable market waste compost and thereby better return for the produce. To increase the agricultural productivity while maintaining the soil health and environmental safety.

UNIT-I

Organic farming, principles and its scope in India; Initiatives taken by Government (central/state), NGOs and other organizations for promotion of organic agriculture. **For Skill Development**

UNIT-II

Organic ecosystem and their concepts; Organic nutrient resources and its fortification; Restrictions to nutrient use in organic farming; Choice of crops and varieties in organic farming. **For Skill Development**

UNIT-III

Fundamentals of insect, pest, disease and weed management under organic mode of production. **For Entrepreneurship Development**

UNIT-IV

Operational structure of NPOP; Certification process and standards of organic farming; Processing, leveling. **For Employability**

UNIT-V

Economic considerations and viability, marketing and export potential of organic products. **For Employability**

Course Outcomes:

CO.1. Initiative from Government for organic produce. **For Skill Development**

CO.2. Role of NGOs in producing organic products. **For Skill Development**

CO.3 Selection of crops and varieties for organic produce **For Entrepreneurship Development**

CO.4. Certification of organic produce. **For Employability**

CO.5 About knowledge operational structure of NPOP; **For Employability**

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-------------|-----|-----|-----|-----|-----|-----|-----|
| CO:1 | 3 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO:2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| CO:3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO:4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |
| CO:5 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-------------|-------------------|---------------|------------------------------|
| CO:1 | 3 | 1 | 2 |
| CO:2 | 3 | 2 | 2 |
| CO:3 | 2 | 2 | 3 |
| CO:4 | 2 | 3 | 1 |
| CO:5 | 2 | 3 | 2 |

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- 1) Organic Farming for Sustainable Agriculture by Dahama A. K. Agrobios Publication.
- 2) Organic Farming: Theory and Practices by Palanippan, S.P. and Anaadurai, K.
- 3) Organic Farming in India, Problems and Prospects by Thapa, U. and Tripathi, P.
- 4) Trends in Organic Farming in India by Agrobios Publication
- 5) Handbook of Organic Farming.
- 6) Recent Developments in Organic farming by Gulati and Barik

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BAG-611(P)

Management of Beneficial Insects

L: T: P 1:0:0

Objectives: Beneficial insects provide natural ecosystem services such as biological control of pests, soil formation, nutrient cycling and pollination of plants.

UNIT-I

Importance of beneficial Insects, Beekeeping, pollinating plant and their cycle, bee biology, species of honey bees, commercial methods of rearing, equipment used, seasonal management, bee enemies and diseases **For Skill Development**

UNIT-II

Bee pasturage, bee foraging and communication. Division and uniting of honey bee boxes. Toxicity of pesticides to honey bees **For Entrepreneurship Development**

UNIT-III

Types of silkworm, voltinism and biology of silkworm. Mulberry/castor cultivation, mulberry varieties and methods of harvesting and preservation of leaves. Rearing and mounting larvae and harvesting of cocoons. Pest and diseases of silkworm and management. Rearing appliances of mulberry silkworm and methods of disinfection **For Skill Development**

UNIT-V

Species of lac insect, morphology, biology, host plant, lac production – seed lac, button lac, shellac, lac- products. Enemies of lac insects **For Skill Development & Employability**

UNIT-V

Identification of major parasitoids and predators commonly being used in biological control. Insect orders bearing predators and parasitoids used in pest control and their mass multiplication techniques. Important species of pollinator, weed killers and scavengers with their importance **For Skill Development & Employability**

CO: 1 Students understand Importance of beneficial Insects, seasonal management, bee enemies and diseases **For Skill Development**

CO: 2 Students understand bee pasturage, bee foraging and communication **For Entrepreneurship Development**

CO: 3 Students understand Types of silkworm, voltinism and biology of silkworm. Mulberry/castor cultivation, mulberry varieties and methods of harvesting and preservation of leaves **For Skill Development**

CO: 4 Students understand Species of lac insect, morphology, biology, host plant, lac production **For Skill Development & Employability**

CO: 5 Students understand Identification of major parasitoids and predators commonly being used in biological control and techniques **For Skill Development & Employability**

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|------|-----|-----|-----|-----|-----|-----|-----|
| CO:1 | 3 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO:2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| CO:3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO:4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |
| CO:5 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------|-------------------|---------------|------------------------------|
| CO:1 | 3 | 1 | 2 |
| CO:2 | 1 | 2 | 3 |
| CO:3 | 3 | 2 | 1 |
| CO:4 | 3 | 3 | 1 |
| CO:5 | 3 | 3 | 2 |

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2. Elements of Economic Entomology by B. V. David and V. V. Rammurthy. Namrutha— Publications (7th Edition)
3. Principles of Applied Entomology by K. N. Ragumoorthy, M. R. Srinivasan, V.— Balasubramani and N. Natarajan Published by A. E. Publication, Coimbatore
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BAG-611(Q)

Introduction of Nanotechnology in Agriculture L: T: P 1:0:0

Objectives: One of the main objectives of the environmental nanotechnology is safe design and sustainable development of nonmaterials with potential environmental benefits.

UNIT-I

Basics of Nano science Introduction to nano science and technology, history, definition, classification of nanomaterials based on origin, dimension - Unique properties of nanomaterials - mechanical, magnetic, thermal, optical and electrical properties **for Skill Development.**

UNIT –II

Synthesis of Nanomaterials Physical, Chemical and Biological synthesis of nano-materials **for Skill Development**

Unit-III

Properties and Characterization of Nanomaterials Size (particle size analyzer), morphological (scanning electron microscope and transmission electron microscope), optical (UV-VIS and FT-IR) and structural (XRD) properties of nano-materials. **For Entrepreneurship Development**

Unit –IV

Application of Nanotechnology Biosensor (principle, component, types, applications) agriculture (nano-fertilizers, herbicides, nano-seed science, nanopesticides) and food Systems (encapsulation of functional foods, nano-packaging) **For Skill Development & Employability**

UNIT-V


Application of Nanotechnology Energy, Environment, Health and Nanotoxicology. **For Skill Development & Employability**

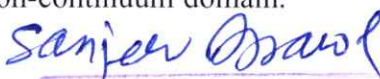
Course Outcomes:

CO1: Explain the fundamental principles of nanotechnology and their application to biomedical engineering. **For Skill Development**

CO2: Apply engineering and physics concepts to the nano-scale and non-continuum domain.

For Skill Development


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CO3: Identify and compare state-of-the-art nanofabrication methods and perform a critical analysis of the research literature. **For Entrepreneurship Development**

CO4: Design processing conditions to engineer functional nonmaterials. **For Skill Development & Employability**

CO5: Evaluate current constraints, such as regulatory, ethical, political, social and economical, encountered when solving problems in living systems. **For Skill Development & Employability**

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-------------|-----|-----|-----|-----|-----|-----|-----|
| CO:1 | 3 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO:2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| CO:3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO:4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |
| CO:5 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-------------|-------------------|---------------|------------------------------|
| CO:1 | 3 | 1 | 2 |
| CO:2 | 3 | 2 | 2 |
| CO:3 | 2 | 2 | 3 |
| CO:4 | 3 | 3 | 1 |
| CO:5 | 3 | 3 | 2 |

1. Geoinformatics and NanoTechnology for Precision Farming by SR Reddy
2. Textbook on Geo-informatics, Nanotechnology and Precision Farming by Tarun Kumar.3.Upadhyay and Sushil Kumar Sharma.
3. Geo-Informatics by A.M. Chandra.


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BAG-611 (R)

Applied Agribusiness Economics

L: T: P 1:0:0

Objectives: The primary goal of agribusiness is to maximize profit while sustainably satisfying the needs of consumers for products related to natural resources such as biotechnology, farms, food, forestry, fisheries, fuel, and fiber — usually with the exclusion of non-renewable resources such as mining.

UNIT-I

Introduction to Time Series Analysis: The nature of time Series data; Examples of time Series Regression Models: Static Models: Finite Distributed Lag Models. Trends and Seasonality: Characterizing Trending Time Series, Using Trending Variables in Regression Analysis. A Detrending Interpretation of Regressions with a Time Trend, Computing R-Squared when the Dependent Variable Is Trending Seasonality. **For Skill Development**

UNIT-II

Stationary Time-Series Models: Stochastic Difference Equation Models, ARMA Models, Stationarity, Stationarity Restrictions for an ARMA(p, q) Model, The Autocorrelation Function, The Partial Autocorrelation Function, Sample Autocorrelations of Stationary Series, Box-Jenkins Model Selection, Properties of Forecasts, A Model of the Interest Rate Spread, Seasonality, Parameter Instability and Structural Change. **For Skill Development**

UNIT-III

Models with Trend: Deterministic and Stochastic Trends, Removing the Trend, Unit Roots and Regression Residuals, The Monte Carlo Method, Dickey-Fuller Tests, Examples of the ADF Test, Extensions of the Dickey-Fuller Test, Structural Change, Power and the Deterministic Regressors, Panel Unit Root Tests, Trends and Univariate Decompositions. **For Skill Development & Employability**

UNIT-IV

Multiequation Time-Series Models: Intervention Analysis, Transfer Function Models, Estimating a Transfer Function, Limits to Structural Multivariate Estimation, Introduction to VAR Analysis, Estimation and Identification, The Impulse Response Function, Testing Hypothesis, Structural VARs., The Blanchard and Quah Decomposition. **For Skill Development & Employability**

UNIT-V

Cointegration and Error-correction Models: Linear Combinations of Integrated Variables, Cointegration and Common Trends, Cointegration and Error Correction, Testing for Cointegration -The Engle-Granger Methodology, Illustrating the Engle-Granger Methodology, Cointegration and Purchasing-Power Parity, Characteristic Roots, Rank, and Cointegration, Hypothesis Testing, Illustrating the Johansen Methodology, Error-Correction and ADL Tests, Comparing the Three Methods. **For Entrepreneurship Development**

Course outcomes:

CO1: Understanding the scope and methodology of econometric analysis. **For Skill Development**

CO2: Nature and scope of data for econometric analysis. **For Skill Development**

CO3: Standing the method of Ordinary Least Square. **For Skill Development & Employability**

CO4: Understanding the assumption of OLS method. **For Skill Development & Employability**

CO5: Estimation of regression models and hypothesis testing. **For Entrepreneurship Development**

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-------------|------------|------------|------------|------------|------------|------------|------------|
| CO:1 | 3 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO:2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| CO:3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO:4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |
| CO:5 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-------------|--------------------------|----------------------|-------------------------------------|
| CO:1 | 3 | 1 | 2 |
| CO:2 | 3 | 2 | 2 |
| CO:3 | 3 | 2 | 1 |
| CO:4 | 3 | 2 | 1 |


| | | | |
|------|---|---|---|
| CO:5 | 2 | 2 | 3 |
|------|---|---|---|

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4. Hsiao, C. (2003), Analysis of Panel Data, Cambridge University Press, Cambridge.
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International Trade for Agriculture Product

L: T: P 1:0:0

Objective: International trade allows countries to expand their markets and access goods and services that otherwise may not have been available domestically. As a result of international trade, the market is more competitive. This ultimately results in more competitive pricing and brings a cheaper product home to the consumer.

UNIT-I

Importance of Agriculture in development, trade and agriculture, Inter-regional verses international trade importance of trade, case for free trade and for protectionism- globalization and agriculture – case of free trade and for protectionism in case of agriculture. **For Skill Development**

UNIT-II

Mercantilist doctrine of balance of trade - Adam Smith and absolute advantage theory of trade - Ricardo and comparative advantage, its limitations - Comparative advantage in Heckscher Ohlin Model - Factor price equilisation theorem - Factor intensity reversal - the empirical evidence on Heckscher Ohlin theory - the Leontief Paradox. Stolper-Samuelson Theorem – Rybczynski Theorem- Trade theories and empirical evidence relating to trade patterns, applicability to India. Recent explanations of the basis of trade in terms of technological lead, domestic market size and product cycle approach – Linder's hypothesis – Gravity model empirical evidence. **For Skill Development**

UNIT-III

Instruments of trade policy- Economic rationale and impact of tariffs - optimum tariff rate - quotas and subsidies – other instruments of trade policy - effective rates of protection. Trade policy of developing economies- Import substituting industrialization and export oriented industrialization. **For Entrepreneurship Development**

UNIT-IV

Brief history of GATT- provisions relating to agri trade- factors leading to establishment of WTO- basic principles- functions and organization - Agreement on agriculture - main provisions - market access- domestic support - export subsidies-special and differential treatment, sanitary and phytosanitary provisions, export standards, TRIPS, various rounds and Doha impasse - emergence of various country groups /alliances and their participation in negotiations -Issues for further negotiations- implications of WTO provisions on Indian

Agriculture - reduction commitments for India. Formation of regional trade blocks- reasons, types and performance – impact on trade. **For Skill Development &Employability**

UNIT-V

Overview of Foreign Trade and trade policy of India, Indian agricultural trade-trends and features, Agricultural Trade policy- objectives, instruments of trade policy, trade policy for various commodities, Competitiveness of Indian Agriculture, measures of competitiveness, competitiveness of various crops, domestic and international prices, competitiveness and commodity trade flows, measures for improving competitiveness of Indian exports- policy recommendations. **For Skill Development &Employability**

Course Outcomes:

CO1: Main provisions of the WTO AoA on market access, domestic support and export competition **For Skill Development**

CO2: Key concerns in the agriculture negotiations of the Doha Round, focusing on the outcomes from previous WTO Ministerial Conferences **For Skill Development**

CO3: Significance of non-tariff measures (NTMs) for international trade and the WTO agreements that deal with such measures, particularly Sanitary and Phytosanitary (SPS) measures and Technical Barriers to Trade (TBT) **For Entrepreneurship Development**

CO4: Trends in RTAs and their provisions on policy areas relevant to agricultural trade. **For Skill Development &Employability**

CO5: Compared to those of multi-lateral trade agreements **For Skill Development & Employability**

PO-CO Mapping

Note: 3= Highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-------------|------------|------------|------------|------------|------------|------------|------------|
| CO:1 | 3 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO:2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| CO:3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO:4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |
| CO:5 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-------------|--------------------------|----------------------|-------------------------------------|
| CO:1 | 3 | 1 | 2 |
| CO:2 | 3 | 2 | 2 |
| CO:3 | 3 | 3 | 1 |
| CO:4 | 3 | 3 | 2 |
| CO:5 | 3 | 3 | 2 |

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- <http://www.ignouhelp.in/>
- <https://hau.ac.in/>

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BAG-611(T)

Management of Agro Chemical Industry

L: T: P 1:0:0

Objectives: Ensuring environmental and ecological compliance. Identifying non-target species for each region and protecting them. Mandating the monitoring of toxic remains in plant parts, animal-based food and environment. Defining Good Agricultural Practices (GAP) for each crop with respect to the agrochemical usage

UNIT- I

Current status of plant production and plant protection agro-chemicals, Fertilizer Control Order, The Insecticides Act, laws, acts **For Skill Development**

UNIT- II

Regulations for the social security and welfare of industrial labour, Acts relating to protection of air, water and the general environment. **For Skill Development**

UNIT- III

Quality, quality control, role of industry, government, etc., imitation and adulteration in the developing world, hints for the set up of a quality control laboratory in pesticide formulation as per BIS specifications. **For Entrepreneurship Development**

UNIT- IV

Business management including market, budget and financial management, manpower planning, etc. **For Skill Development & Employability**

UNIT- V

Interaction with industry for practical knowledge on the above topics. **For Skill Development & Employability**

Course Outcomes:

CO1. Synthesis of new lead molecules as pesticides **For Skill Development**

CO2. Development of the methods for Agrochemical residue analysis **For Skill Development**

CO3. Development of new Bio pesticides **For Entrepreneurship Development**

CO4. Rearing of Bio control agents for Insect Pest Management Micronutrient Research **For Skill Development & Employability**

CO5. Students learning to Business management including market and planning of financial budget **For Skill Development & Employability**

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-------------|-----|-----|-----|-----|-----|-----|-----|
| CO:1 | 3 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO:2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| CO:3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO:4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |
| CO:5 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-------------|-------------------|---------------|------------------------------|
| CO:1 | 3 | 1 | 2 |
| CO:2 | 3 | 2 | 2 |
| CO:3 | 2 | 3 | 1 |
| CO:4 | 3 | 3 | 1 |
| CO:5 | 3 | 3 | 2 |

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BAG662

Practical Crop Production - II (Rabi)

L:T: P 0:0:1

List of Experiments: Minimum 08 of the followings-


Crop planning, raising field crops in multiple cropping systems:

1. Field preparation.
2. Seed, treatment.
3. Nursery raising.
4. Sowing time.
5. Nutrient, INM.
6. Water management.
7. Weed management, IWM.
8. Management of insect-pests diseases of crops and IPM.
9. Harvesting, threshing, drying and winnowing.
10. Storage and marketing of produce.
11. Preparation of balance sheet.



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BAG704 Farming Systems, Sustainable Agriculture and Organic Farming L:T:P 3:0:0

Objective: To acquaint the students about prevailing sustainable agriculture in the country and practices to improve productivity

Unit- I

Sustainable agriculture-problems and its impact on agriculture, indicators of sustainability, adaptation and mitigation, conservation agriculture strategies in agriculture, HEIA, LEIA and LEISA and its techniques for sustainability. Resource use Efficiency and optimization techniques, Resource cycling and flow of energy in different farming system.

Unit-II

Farming System-scope, importance, and concept, Types of farming system and factors affecting types of farming, Farming system components and their maintenance. Integrated farming system-historical background, objectives and characteristics, components of IFS and its advantages, Site specific development of IFS model for different agro-climatic zones.

Unit-III

Cropping system and pattern, multiple cropping system, Efficient cropping system and their evaluation, allied enterprises and their importance. Tools for determining production and efficiencies in cropping and farming system.

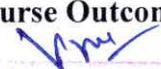
Unit-IV

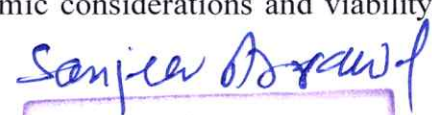
Organic farming, principles and its scope in India; Initiatives taken by Government (central/state), NGOs and other organizations for promotion of organic agriculture; Organic ecosystem and their concepts; Organic nutrient resources and its fortification; Restrictions to nutrient use in organic farming; Choice of crops and varieties in organic farming.

Unit-V

Fundamentals of insect, pest, disease and weed management under organic mode of production. Operational structure of NPOP; Certification process and standards of organic farming. Processing, leveling, economic considerations and viability, marketing and export potential of organic products.

Course Outcomes:


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CO1. To know about the Farming System-scope, importance, and concept **For Skill Development**

CO2. To understand for the Sustainable agriculture-problems and its impact on agriculture **For Skill Development**

CO3. Development of new Bio pesticides **For Entrepreneurship Development**

CO4. Rearing of Bio control agents for Insect Pest Management Micronutrient Research **For Skill Development & Employability**

CO5. Students learning to Business management including market and planning of financial budget **For Skill Development & Employability**

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
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| CO:2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| CO:3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO:4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |
| CO:5 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-------------|-------------------|---------------|------------------------------|
| CO:1 | 3 | 1 | 2 |
| CO:2 | 3 | 2 | 2 |
| CO:3 | 2 | 3 | 1 |
| CO:4 | 3 | 3 | 1 |
| CO:5 | 3 | 3 | 2 |

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BAG754 Farming Systems, Sustainable Agriculture and Organic FarmingLab L:T: P

0:0:1

List of Experiments: Minimum 08 of the followings

1. Preparation of enrich compost & quality analysis.
2. Preparation of vermi-compost & quality analysis.
3. Perorationof bio-fertilizers/bio-inoculants & quality analysis.
4. Study of methods of indigenous technology knowledge (ITK) for nutrient management.
5. Study of methods of indigenous technology knowledge (ITK) for insect and pestmanagement.
6. Study of methods of indigenous technology knowledge (ITK) for disease management.
7. Study of methods of indigenous technology knowledge (ITK) for weed management.
8. Estimation of Cost of organic production system.
9. Post-harvest management.
10. Quality aspect, grading, packaging and handling.
11. Visit of organic farms to study the various components and their utilization.
12. Visit to IFS module in different agroclimatic zones of near by state university/ Institute and farmers.


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BAG705 Post-Harvest Management and Value Addition of Fruits and Vegetable L:T:P

3:0:0

Objective: To acquaint with the proper handling technologies of fruits and vegetables to reduce post harvest losses.

Unit- I

Importance of post-harvest processing of fruits and vegetables.

Unit- II

Possible causes of post harvest losses; Pre-harvest factors affecting postharvest quality, maturity, ripening and changes occurring during ripening; Respiration and factors affecting respiration rate; Harvesting and field handling; Storage (ZECC, cold storage, CA, MA, and hypobaric);

Unit- III

Value addition concept; Principles and methods of preservation; Intermediate moisture food- Jam, jelly, marmalade, preserve, candy – Concepts and Standards; Fermented and non-fermented beverages. Tomato products- Concepts and Standards;

Unit- IV

Drying/ Dehydration of fruits and vegetables – Concept and methods, osmotic drying.

Unit- V

Canning — Concepts and Standards, packaging of products.

Course Outcomes:

CO1. To know about the Importance of post-harvest processing of fruits and vegetables **For Skill Development**

CO2. To understand for the Possible causes of post harvest losses **For Skill Development**

CO3. Development of Value addition concept; Principles and methods of preservation **For Entrepreneurship Development**

CO4. Understand the concept of Drying/ Dehydration of fruits and vegetables **For Skill Development & Employability**

CO5. Students learning to Canning — Concepts and Standards **For Skill Development & Employability**

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= moderately correlated, 1= Less correlated

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| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
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| CO:1 | 3 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO:2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| CO:3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO:4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |
| CO:5 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-------------|-------------------|---------------|------------------------------|
| CO:1 | 3 | 1 | 2 |
| CO:2 | 3 | 2 | 2 |
| CO:3 | 2 | 3 | 1 |
| CO:4 | 3 | 3 | 1 |
| CO:5 | 3 | 3 | 2 |

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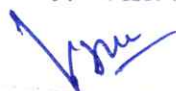
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BAG755 Post-Harvest Management and Value Addition of Fruits and Vegetable Lab

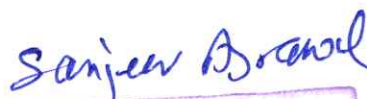
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List of Experiments: Minimum 08 of the followings-

1. Applications of different types of packaging, containers for shelf life extension.
2. Effect of temperature on shelf life and quality of produce.
3. Demonstration of chilling and freezing injury in vegetables and fruits.
4. Extraction and preservation of pulps and juices.
5. Preparation of jam and jelly.
6. Preparation of squash.
7. Study of value added product of tomato.
8. Quality evaluation of products - physico-chemical and sensory.
9. Visit to processing unit/ industry.



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BAG706A

Agricultural Journalism

L:T:P 3:0:0

Objective: To facilitate understanding on the importance, coverage, and broadcasting agriculture through print and electronic media.

UNIT I

Agricultural Journalism: The nature and scope of agricultural journalism characteristics and training of the agricultural journalist, how agricultural journalism is similar to and different from other types of journalism.

UNIT II

Newspapers and magazines as communication media: Characteristics; kinds and functions of newspapers and magazines, characteristics of newspaper and magazine readers. Form and content of newspapers and magazines: Style and language of newspapers and magazines, parts of newspapers and magazines.

UNIT III

Writing the story: Organizing the material, treatment of the story, writing the news lead and the body, readability measures. Illustrating agricultural stories: Use of photographs, use of artwork (graphs, charts, maps, etc.), writing the captions. The agricultural story: Types of agricultural stories, subject matter of the agricultural story, structure of the agricultural story. Gathering agricultural information: Sources of agricultural information, interviews, coverage of events, abstracting from research and scientific materials, wire services, other agricultural news sources.

UNIT IV

Editorial mechanics: Copy reading, headline and title writing, proofreading, lay outting. Practical Practice in interviewing. Covering agricultural events. Abstracting stories from research and scientific materials and from wire services. Writing different types of agricultural stories. Selecting pictures and artwork for the agricultural story.

UNIT V

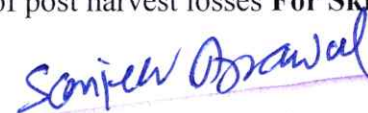
Practice in editing, copy reading, headline and title writing, proofreading, layouting. Testing copy with a readability formula. Visit to a publishing office.

Course Outcomes:

CO1. To know about the Importance of post-harvest processing of fruits and vegetables **For Skill Development**

CO2. To understand for the Possible causes of post harvest losses **For Skill Development**


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CO3. Development of Value addition concept; Principles and methods of preservation For Entrepreneurship Development

CO4. Understand the concept of Drying/ Dehydration of fruits and vegetables For Skill Development & Employability

CO5. Students learning to Canning -- Concepts and Standards For Skill Development & Employability

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-------------|-----|-----|-----|-----|-----|-----|-----|
| CO:1 | 3 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO:2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| CO:3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO:4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |
| CO:5 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-------------|-------------------|---------------|------------------------------|
| CO:1 | 3 | 1 | 2 |
| CO:2 | 3 | 2 | 2 |
| CO:3 | 2 | 3 | 1 |
| CO:4 | 3 | 3 | 1 |
| CO:5 | 3 | 3 | 2 |

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BAG706B Fundamentals of Soil and Water Techniques

L:T:P 3:0:0

Objective: The aims of soil conservation strategies for cultivated land are too established and maintain a good ground cover for controlling the soil erosion.

Unit I

Surveying: survey equipment, chain survey, cross staff survey, plotting procedure, calculations of area of regular and irregular fields

Unit II

Levelling – levelling equipment, terminology, methods of calculation of reduced levels, types of levelling, contouring.

Unit III

Irrigation: methods, projects, flow irrigation, lift irrigation. Water use efficiency, Water source, Water lifting devices – pumps.

Unit IV

Irrigation water measurement – weirs, flumes and orifices and methods of water measurement and instruments.

Unit V

Soil and water conservation – soil erosion, types and engineering control measures.

Course Outcomes:

CO1. To know about the Surveying: survey equipment, chain survey, cross staff survey **For Skill Development**

CO2. To understand for the Levelling – levelling equipment, terminology **For Skill Development**

CO3. Understand the Irrigation: methods, projects, flow irrigation, lift irrigation **For Entrepreneurship Development**

CO4. Understand the concept Irrigation water measurement **For Skill Development & Employability**

CO5. Students learning to Soil and water conservation

For Skill Development & Employability

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-------------|-----|-----|-----|-----|-----|-----|-----|
| CO:1 | 3 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO:2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| CO:3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO:4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |
| CO:5 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

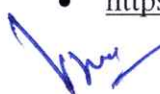
| | Skill Development | Employability | Entrepreneurship Development |
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| CO:2 | 3 | 2 | 2 |
| CO:3 | 2 | 3 | 1 |
| CO:4 | 3 | 3 | 1 |
| CO:5 | 3 | 3 | 2 |

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BAG706C

Micro – Irrigation Techniques

L:T:P 3:0:0

Objectives: To introduce the concept and designing of micro – irrigation systems

UNIT 1

Irrigation projects in India– their comparative performance; development and utilization of water resources through different major/minor irrigation schemes. Basic concepts of command area – definition, need, scope, and development

UNIT II

Past, present and future need of micro-irrigation systems, Role of Govt. for the promotion of micro-irrigation in India, Merits and demerits of micro-irrigation system. Types and components of micro-irrigation system,

UNIT III

Micro-irrigation system-design, installation and irrigation water use efficiency and agricultural production. Fertigation–Fertilizer application criteria, suitability of fertilizer compounds, merits and demerits of fertigation.

UNIT IV

Quality control in micro-irrigation components, water quality parameters for micro irrigation, design and maintenance of polyhouse, importance and application of micro irrigation in poly-houses.

UNIT V

Prospects of waste land development –hills, semi-arid, coastal areas, water scarce areas, Benefit and Cost analysis.

Course Outcomes:

CO1. To know about the Importance of Irrigation projects in India– their comparative performance **For Skill Development**

CO2. To understand for the Past, present and future need of micro-irrigation systems **For Skill Development**

CO3. Micro-irrigation system-design, installation and irrigation water use efficiency and agricultural production **For Entrepreneurship Development**

CO4. Understand the concept Quality control in micro-irrigation components, water quality parameters for micro irrigation **For Skill Development & Employability**

CO5. Students learning to Prospects of waste land development **For Skill Development & Employability**

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-------------|-----|-----|-----|-----|-----|-----|-----|
| CO:1 | 3 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO:2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| CO:3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO:4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |
| CO:5 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-------------|-------------------|---------------|------------------------------|
| CO:1 | 3 | 1 | 2 |
| CO:2 | 3 | 2 | 2 |
| CO:3 | 2 | 3 | 1 |
| CO:4 | 3 | 3 | 1 |
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BAG706(D) Production Technology of Vegetable Crops L: T: P 2:0:0

Objective: To impart knowledge and skills on advancement in production technology of vegetable crops **and improve the skill, employability and entrepreneurship.**

UNIT I

Bulb and tuber crops—Onion, garlic and potato **for skill development.**

UNIT II

Cole crops—Cabbage, cauliflower, kohlrabi, broccoli, Brussels sprouts and kale **knowledge for better employability in industry.**

UNIT III

Root crops—Carrot, radish, turnip and beetroot **to provide employability and entrepreneurship.**

UNIT IV

Peas and beans—Garden peas and broad bean **for skill development.**

UNIT V

Leafy vegetables—Beet leaf, fenugreek, coriander and lettuce **to provide employability and entrepreneurship.**

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Bulb and tuber crops **for skill development.**

CO2: Assessing site and plants adaptability for Cole crops **to provide employability and entrepreneurship.**

CO3: Appreciate the scope and scenario of vegetable crops in India **knowledge for better employability in industry.**

CO4: Understand Acquire knowledge about the production technology and post-harvest handling of vegetable crops **for provide employability and entrepreneurship.**

CO5: Understand the Calculate the economics of vegetable production in India **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

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| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG706(E)

General Awareness in Agriculture

L: T: P 2:0:0

Objective: To impart knowledge and skills on advancement Agriculture **and improve the skill, employability and entrepreneurship.**

UNIT I

Entrepreneurship Development: Assessing overall business environment in the Indian economy. Overview of Indian social, political and economic systems and their implications for decision making by individual entrepreneurs **knowledge for better employability in industry.**

UNIT II

Globalisation and the emerging business / entrepreneurial environment. Concept of entrepreneurship; entrepreneurial and managerial characteristics; entrepreneurial motivation, enterprise launching and management **for skill development.**

UNIT III

Entrepreneurship development programmes for women. Government schemes and incentives for promotion of entrepreneurship. Government policy on Small and Medium Enterprises (SMEs) / SSIs. Venture capital. Contract farming and joint ventures, public-private partnerships. Overview of agri inputs industry **knowledge for better employability in industry.**

UNIT IV

Social Responsibility of Business. Social auditing. Project Preparation and Appraisal. CB ratio NPV and IRR. Nature, scope, principles of management and administration with special reference to agriculture. POSDCoRB, MBO **for skill development.**

UNIT V

Result Based Management (RBM), Six sigma, TQM, Decision making process, MIS, PERT/CPM **for skill development.**

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Entrepreneurship Development: Assessing overall business environment in the Indian economy **for skill development.**


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CO2: Globalisation and the emerging business / entrepreneurial environment **to provide employability and entrepreneurship.**

CO3: Social Responsibility of Business. Social auditing. Project Preparation and Appraisal. CB ratio NPV and IRR **knowledge for better employability in industry.**

CO4: Understand Acquire knowledge about the Contract farming and joint ventures, public-private partnerships. Overview of agri inputs industry **for provide employability and entrepreneurship.**

CO5: Understand the Result Based Management(RBM), Six sigma **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG706(F)

Theory and Practice of Training

L: T: P 2:0:0

Objective: To impart knowledge and skills on Training for Agriculture and improve the skill, employability and entrepreneurship.

UNIT I

Globalisation and the emerging business / entrepreneurial environment. Concept of entrepreneurship; entrepreneurial and managerial characteristics; entrepreneurial motivation, enterprise launching and management **for skill development.**

UNIT II

Entrepreneurship Development: Assessing overall business environment in the Indian economy. Overview of Indian social, political and economic systems and their implications for decision making by individual entrepreneurs **knowledge for better employability in industry.**

UNIT III

Entrepreneurship development programmes for women. Government schemes and incentives for promotion of entrepreneurship. Government policy on Small and Medium Enterprises (SMEs) / SSIs. Venture capital. Contract farming and joint ventures, public-private partnerships. Overview of agri inputs industry **knowledge for better employability in industry.**

UNIT IV

Social Responsibility of Business. Social auditing. Project Preparation and Appraisal. CB ratio NPV and IRR. Nature, scope, principles of management and administration with special reference to agriculture. POSDCoRB, MBO **for skill development.**

UNIT V

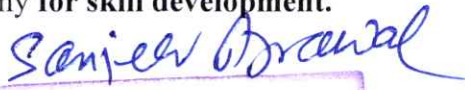
Result Based Management(RBM), Six sigma, TQM, Decision making process, MIS, PERT/CPM **for skill development.**

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Entrepreneurship Development: Assessing overall business environment in the Indian economy **for skill development.**


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CO2: Globalisation and the emerging business / entrepreneurial environment **to provide employability and entrepreneurship.**

CO3: Social Responsibility of Business. Social auditing. Project Preparation and Appraisal. CB ratio NPV and IRR **knowledge for better employability in industry.**

CO4: Understand Acquire knowledge about the Contract farming and joint ventures, public-private partnerships. Overview of agri inputs industry **for provide employability and entrepreneurship.**

CO5: Understand the Result Based Management(RBM), Six sigma **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG706(G)

Soil Chemistry

L: T: P 2:0:0

Objective: To study about different approaches for soil fertility evaluation **and improve the skill, employability and entrepreneurship.**

UNIT I

Soil as a source of plant nutrients - essential and beneficial elements - criteria of essentiality - forms of nutrients in soil - mechanisms of nutrient transport to plants- factors affecting nutrient availability to plants. Nutrient uptake mechanisms **for skill development.**

UNIT II

Metabolic functions - deficiency and toxicities of nutrients - measures to overcome deficiencies and toxicities. Problem soils – acid, salt affected and calcareous soils, characteristics, nutrient availabilities **to provide employability and entrepreneurship.**

UNIT III

Reclamation – mechanical, chemical and biological methods. Fertilizer and insecticides and their effect on soil water and air. Irrigations water – quality of irrigation water and its appraisal - Indian standards for water quality. Use of saline water for agriculture. Soil fertility – Different approaches for soil fertility evaluation. Methods - Soil testing – Chemical methods - critical levels of different nutrients in soil. Plant analysis – DRIS methods - critical levels in plants - rapid tissue tests - Indicator plants - biological method of soil fertility evaluation **for skill development.**

UNIT IV

Soil test based fertilizer recommendations to crops. Factors influencing nutrient use efficiency (NUE) in respect of N, P, K, S, Fe and Zn fertilizers **to provide employability and entrepreneurship.**


UNIT V

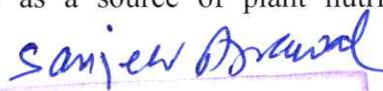
Nutrient cycles, N, P, K and S. Source, method and scheduling of nutrients for different soils and crops grown under rainfed and irrigated conditions **to provide employability and entrepreneurship.**

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Soil as a source of plant nutrients **for skill development.**


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CO2: Fertilizer and insecticides and their effect on soil water and air **to provide employability and entrepreneurship.**

CO3: Social Responsibility of Business. Social auditing. Project Preparation and Appraisal. CB ratio NPV and IRR **knowledge for better employability in industry.**

CO4: Understand Acquire knowledge about the Contract farming and joint ventures, public-private partnerships. Overview of agri inputs industry **for provide employability and entrepreneurship.**

CO5: Understand the Result Based Nutrient cycles, N, P, K and S. Source, method and scheduling **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

References:

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BAG706(H)

Cytology

L: T: P 2:0:0

Objective: To study about Cell cycle and architecture of chromosome in prokaryotes and improve the skill, employability and entrepreneurship.

UNIT I

Cell cycle and architecture of chromosome in prokaryotes and eukaryotes; Chromonemata, chromosome matrix, chromomeres, centromere, secondary constriction and telomere; artificial chromosome construction and its uses; Special types of chromosomes. Variation in chromosome structure: Evolutionary significance; Introduction to techniques for karyotyping; Chromosome banding and painting -In situ hybridization and various applications **to provide employability and entrepreneurship.**

UNIT II

Structural and numerical variations of chromosomes and their implications; Symbols and terminologies for chromosome numbers, euploidy, haploids, diploids and polyploids; Utilization of aneuploids in gene location; Variation in chromosome behaviour, somatic segregation and chimeras, endomitosis and somatic reduction; Evolutionary significance of chromosomal aberrations, balanced lethal and chromosome complexes; Inter-varietal chromosome substitutions **knowledge for better employability in industry.**

UNIT III

Fertilization barriers in crop plants at pre-and postfertilization levels; In-vitro techniques to overcome the fertilization barriers in crops; Polyploidy. Genetic consequences of polyploidization and role of polyploids in crop breeding; Evolutionary advantages of autopolyploid vs allopolyploids; Role of aneuploids in basic and applied aspects of crop breeding, their maintenance and utilization in gene mapping and gene blocks transfer; Alien addition and substitution lines, creation and utilization; Apomixis, evolutionary and genetic problems in crops with apomixes **to provide employability and entrepreneurship.**

UNIT IV

Reversion of autopolyploid to diploids; Genome mapping in polyploids; Interspecific hybridization and allopolyploids; Synthesis of new crops (wheat, Triticale, Brassica, and cotton); Hybrids between species with same chromosome number, alien translocations; Hybrids between species with different chromosome number; Gene transfer using amphidiploids, bridge species **knowledge for better employability in industry.**


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UNIT V

Chromosome manipulations in wide hybridization; case studies; Production and use of haploids, dihaploids and doubled haploids in genetics and breeding **to provide employability and entrepreneurship.**

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of field and crop management starting from field preparation, seed sowing, till harvesting and threshing of crop **for skill development.**

CO2: Define the importance of water in agriculture and ways to improve water use efficiency **to provide employability and entrepreneurship.**

CO3: Understand the nutritional requirements of crops and also about sources available to fulfill the nutritional requirement **knowledge for better employability in industry.**

CO4: Understand the importance of weed management in agriculture and also about advantages and disadvantages of herbicide usage **for provide employability and entrepreneurship.**

CO5: Understand the concept of plant growth and development **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|--|-------------------|---------------|------------------------------|
|--|-------------------|---------------|------------------------------|

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| | | | |
|-----|---|---|---|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

References:

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BAG706(I) Stored Grain Pest Management of Spices L: T: P 2:0:0

Objective: To study about stored grain pest management of spices **and improve the skill, employability and entrepreneurship.**

UNIT I

Distribution, biology, nature and symptoms of damage and management strategies of insect pests of rice, wheat, maize, sorghum, ragi, coconut, arecanut, oil palm, rubber, cashew **knowledge for better employability in industry.**

UNIT II

Distribution, biology, nature and symptoms of damage and management strategies of insect pests mango, banana, pomegranate, guava, sapota, citrus, grapevine, apple, sugarcane, cotton, pulses, groundnut, castor, gingelly, sunflower, brinjal, bhindi, tomato, moringa, amaranthus, chillies, curry leaf, cruciferous **knowledge for better employability in industry.**

UNIT III

Cucurbitaceous vegetables, tapioca, potato, sweet potato, colacasia, pepper, cardamom, ginger, turmeric, vanilla, onion, coffee, tea and ornamental and medicinal plants **to provide employability and entrepreneurship**

UNIT IV

Stored grain pests – Introduction. Causes of storage losses. Coleopteran and lepidopteran pests- biology and damage **to provide employability and entrepreneurship**

UNIT V

Preventive and curative methods of management **knowledge for better employability in industry.**

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts management strategies of insect pests of cereal crop **for skill development.**

CO2: Biology, nature and symptoms of damage and management strategies of insect pests **to provide employability and entrepreneurship.**

CO3: Understand the cucurbitaceous vegetables **knowledge for better employability in industry.**

CO4: Understand the importance stored grain pests – Introduction. Causes of storage losses **for provide employability and entrepreneurship.**

CO5: Understand the Preventive and curative methods of management **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

References:

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BAG706(J) Forest Ecology, Biodiversity and Conservation L: T: P 2:0:0

Objective: To acquaint the students with principles of economics and use of economic tools in appraisal of the agroforestry systems. Evaluation of ecosystem services from agroforestry-economic and ecological aspects of agroforestry **and improve the skill, employability and entrepreneurship.**

UNIT I

Basic principles of economics applied to agroforestry. Financial measures. Forestry–Silviculture and Agroforestry. Quantification and valuation of inputs and outputs- direct and indirect methods **knowledge for better employability in industry**

UNIT II

Optimization techniques-Planning, budgeting and functional analysis. Role of time, risk and uncertainty in decision making. Agroforestry budgeting. Risk analysis, reassessment **to provide employability and entrepreneurship**

UNIT III

Financial and socio-economic analysis of agroforestry projects. Principles of financial management and harvesting, post harvest handling, value addition, marketing of agroforestry products including benefit sharing. **knowledge for better employability in industry**

UNIT IV

Valuation of ecosystem services in agroforestry and payment for ecosystem systems. Bankable agroforestry projects, incentives, tree insurance, etc. **to provide employability and entrepreneurship**

UNIT V

Certification process in agroforestry based carbon projects, carbon finance, etc **knowledge for better employability in industry**

Course Outcomes:

Students completing this course will be able to:

CO6: Understand the basic concepts of field and crop management starting from field preparation, seed sowing, till harvesting and threshing of crop **for skill development.**

CO7: Define the importance of water in agriculture and ways to improve water use efficiency **to provide employability and entrepreneurship.**

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CO8: Understand the nutritional requirements of crops and also about sources available to fulfill the nutritional requirement **knowledge for better employability in industry.**

CO9: Understand the importance of weed management in agriculture and also about advantages and disadvantages of herbicide usage **for provide employability and entrepreneurship.**

CO10: Understand the concept of plant growth and development **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |


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11. Yellamanda Reddy, T. and Sankara Reddi, G.H. 2016. Principles of Agronomy, Kalyani
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BAG-706 (K)

Lac Cultivation

L: T: P 2:0:0

Objective To acquaint the students about recent advances in agricultural production for skill, employability and entrepreneurship development

Unit I

Definition and scope of insecticide toxicology; history of chemical control; pesticide use and pesticide industry in India **to provide employability and entrepreneurship**

Unit II

Classification of insecticides and acaricides based on mode of entry, mode of action and chemical nature; categorization of insecticides on the basis of toxicity – criteria for bees, beneficial insects and other insects in general; structure and mode of action of organochlorines, organophosphates, carbamates, pyrethroids, tertiary amines, neonicotinoids, oxadiazines, phenyl pyrozoles, insect growth regulators, microbials, botanicals, new promising compounds/ new insecticide molecules; nanopesticides; drawbacks of insecticide abuse **knowledge for better employability in industry**

Unit III

Principles of toxicology; evaluation of insecticide toxicity; joint action of insecticides-synergism, potentiation and antagonism; factors affecting toxicity of insecticides; insecticide compatibility, selectivity and phytotoxicity. bioassay definition, objectives, criteria, factors, problems and solutions **to provide employability and entrepreneurship**

Unit IV

Insecticide metabolism; insect-pest resistance to insecticides; mechanisms and types of resistance; insecticide resistance management and pest resurgence **knowledge for better employability in industry**

Unit V

Insecticide residues, their significance and environmental implications; procedures of insecticide residue analysis. Insecticide Act, registration procedures, label claim, and quality control of insecticides; safe use of insecticides; diagnosis and treatment of insecticide poisoning **to provide employability and entrepreneurship**

Course Outcomes:

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Students completing this course will be able to:

CO1: Understand the basic concepts of field and crop management starting from field preparation, seed sowing, till harvesting and threshing of crop **for skill development.**

CO2: Define the importance of water in agriculture and ways to improve water use efficiency **to provide employability and entrepreneurship.**

CO3: Understand the nutritional requirements of crops and also about sources available to fulfill the nutritional requirement **knowledge for better employability in industry.**

CO4: Understand the importance of weed management in agriculture and also about advantages and disadvantages of herbicide usage **for provide employability and entrepreneurship.**

CO5: Understand the concept of plant growth and development **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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1. Aldrich, R.J. and Kramer R.J. (1997), Principles in Weed Management.
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BAG-706 (L) Elementary Nematology and Mushroom Cultivation L: T: P 2:0:0

Objective To acquaint the students about recent advances in agricultural production for skill, employability and entrepreneurship development

UNIT I

Plant parasitic nematodes- morphology, anatomy , physiology and classification **to provide employability and entrepreneurship**

UNIT II

Nature and symptoms of damage in crops. Biology and management of important nematode pests of crops **to provide employability and entrepreneurship**

UNIT III

Mites- biology, nature and symptoms of damage on crops. Management of important mite pests of crops **to provide employability and entrepreneurship**

UNIT IV

Rodents - general characters of important species , biology, habits and management. Snails and slugs- biology, habits, economic importance and management **to provide employability and entrepreneurship**

UNIT V

Rodenticides, nematicides, acaricides and molluscicides- formulations and applications **to provide employability and entrepreneurship**

Course Outcomes:

Students completing this course will be able to:

CO6: Understand the basic concepts of field and crop management starting from field preparation, seed sowing, till harvesting and threshing of crop **for skill development.**

CO7: Define the importance of water in agriculture and ways to improve water use efficiency **to provide employability and entrepreneurship.**

CO8: Understand the nutritional requirements of crops and also about sources available to fulfill the nutritional requirement **knowledge for better employability in industry.**

CO9: Understand the importance of weed management in agriculture and also about advantages and disadvantages of herbicide usage **for provide employability and entrepreneurship.**

CO10: Understand the concept of plant growth and development **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

References:

8. Aldrich, R.J. and Kramer R.J. (1997), Principles in Weed Management.
9. Gupta O.P. (2007), Weed management Principles and Practices.
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BAG-706 (M) Mass Production of Bioagents & Biopesticides L :T:P 1:0:0

Objective: To study about mass production technology of bioagents and pesticide for commercial purpose.

Unit I

Biopesticides and bioagents: Introduction and types and importance of biofertilizers, Biopesticides and bioagents in agriculture and organic farming system,

Unit II

Equipment, machinery and tools used for Biopesticides and bioagents production. Preparation of media used for isolation and culturing of bioagents : media **to provide employability and entrepreneurship**

Unit III

Isolation of Rhizobium from root nodules Isolation Azotobacter from rhizosphere of cereal crops, Trichogramma, P.flurescence, Cryosoperla, Mass HaNPV, and EPN **for skill development.**

Unit IV

Quality control of Biopesticides and bioagents :. Storage of Biopesticides and bioagents packets, Testing of quality parameters and standardization of biopesticides **to provide employability and entrepreneurship**

Unit V

Mass production of Trichogramma, P.flurescence, Cryosoperla, Mass HaNPV, and EPN. Importance of Verticillium/Beauveria/ Trichoderma,/ Pseudomonas/Bacillus/ organic matter decomposers. Testing of quality parameters and standardization of biopesticides for entrepreneurship.

CO1: Students will gain knowledge on concepts and different media.

CO2: Students will gain knowledge about Equipments, machinery and tools used for Biopesticides and bioagents production.

CO3: Students will gain knowledge about Isolation of bioagents.

CO4: Students able to understand of Quality control of Biopesticides and bioagents

CO5: Student will be know about the mass production tech of Biopesticides and bioagents

BAG 706(N)

Tea Husbandry

L: T: P 1:0:0

Unit I

Origin and distribution, Different features of Assam tea and China tea **for development of skills.**

Unit II

Soil and climatic requirement for tea cultivation **for development of skill and employability.**

Unit III

Propagation and features of mother bush in tea maintenance of tea plantation-Training of young tea, Purpose and types of pruning in tea **for skill development and employability.**

Unit IV

Purpose of shade trees, Shade and its management in tea **for skill development and employability.**

Unit V

Permanent and temporary shade trees, Manuring, Blister blight disease in tea and its control, Plucking, processing and yield of tea **for skill development, entrepreneurship and employability.**

Course outcomes:

Students completing this course will be able to:

CO6: CO1: On successful completion of this course a student will be able to: Understand the origin and distribution **for development of skills.**

CO7: Understand all about Soil and climatic requirement for tea cultivation **for development of skill and employability.**

CO8: Understand all about Propagation and features of mother bush in tea maintenance of tea plantation **for skill development and employability.**

CO9: Understand about Purpose of shade trees **for skill development and employability.**

CO10: Understand permanent and temporary shade trees **for skill development, entrepreneurship and employability.**

PO-CO Mapping (Please ✓ wherever required)

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|--|-----|-----|-----|-----|-----|
|--|-----|-----|-----|-----|-----|

| | | | | | |
|------------|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | 1 | 1 |
| CO2 | 3 | 3 | 3 | 1 | 1 |
| CO3 | 3 | 3 | 3 | 3 | 1 |
| CO4 | 3 | 3 | 3 | 3 | 1 |

CO-Curriculum Enrichment Mapping (Please √ wherever required)

| | Skill Development | Employability | Entrepreneurship Development |
|------------|--------------------------|----------------------|-------------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 3 | 3 | 1 |
| CO3 | 3 | 3 | 1 |
| CO4 | 3 | 3 | 3 |

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BAG-706 (O) Germplasm characters ion and evaluation L: T: P 2:0:0

Objective To acquaint the students about recent advances in agricultural production for skill, enmployability and entrepreneurship development

UNIT I

Introduction – significance of conserving the germplasm – *in vitro* and field gene bank **for skill development.**

UNIT II

In vitro techniques for germplasm conservation – short and medium term conservation – manipulation of culture media and conditions for prolonging the culture period – long term storage/cryopreservation – freeze preservation **to provide employability and entrepreneurship.**

UNIT III

Significance of liquid nitrogen – pre freezing treatments - use of cryoprotectants – dry freezing – storage/incubation **knowledge for better employability in industry.**

UNIT IV

Alterations/modifications in cell components during cryopreservation - recalcitrant species - thawing and reculture - survival of freeze preserved cells/tissues **for provide employability and entrepreneurship.**

UNIT V

Conal fidelity and karyotype stability of cryopreserved cultures and regenerants – use of biochemical and molecular markers for testing and stability **for skill development.**

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of field and crop management starting from field preparation, seed sowing, till harvesting and threshing of crop **for skill development.**

CO2: Define the importance of water in agriculture and ways to improve water use efficiency **to provide employability and entrepreneurship.**


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CO3: Understand the nutritional requirements of crops and also about sources available to fulfill the nutritional requirement **knowledge for better employability in industry.**

CO4: Understand the importance of weed management in agriculture and also about advantages and disadvantages of herbicide usage **for provide employability and entrepreneurship.**

CO5: Understand the concept of plant growth and development **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

References:

1. Aldrich, R.J. and Kramer R.J. (1997), Principles in Weed Management.
2. Gupta O.P. (2007), Weed management Principles and Practices.
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BAG-706 (P)

Organic Crop Production System

L: T: P 2:0:0

Objective To acquaint the students about recent advances in agricultural production for skill, employability and entrepreneurship development

UNIT I

Farming System and Practices: Organic farming systems including biodynamic farming, natural farming, homa organic farming, rishi krishi, EM technology, cosmic farming; **for skill development.**

UNIT II

On-farm and off-farm production of organic inputs, role of bio-fertilizers, bio enhancers, legumes, inter cropping, cover crops, green manuring, zero tillage, mulching and their role in organic nutrition management **provide employability and entrepreneurship.**

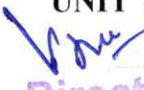
UNIT III

Organic seeds and planting materials, soil health management in organic production, weed management practices in organic farming, biological management of pests and diseases, trap crops, quality improvement in organic production of fruit crops **knowledge for better employability in industry.**

UNIT IV

Inspection, Control Measures and Certification: Inspection and certification of organic produce, participatory guarantee system (PGS), NPOP, documentation and control, development of internal control system (ICS), Concept of group certification, constitution of grower group as per NPOP, preparation of ICS manual, internal and external inspection, concept of third party verification, certification of small farmer groups (Group Certification), transaction certificate, group certificate, critical control points (CCP) and HACCP, IFOAM guidelines on certification scope and chain of custody, certification trademark – The Logo, accredited certification bodies under NPOP **for provide employability and entrepreneurship.**

UNIT V


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Constraints in certification, IFOAM and global scenario of organic movement, postharvest management of organic produce. Economics of organic fruit production **for skill development.**

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of field and crop management starting from field preparation, seed sowing, till harvesting and threshing of crop **for skill development.**

CO2: Define the importance of water in agriculture and ways to improve water use efficiency **to provide employability and entrepreneurship.**

CO3: Understand the nutritional requirements of crops and also about sources available to fulfill the nutritional requirement **knowledge for better employability in industry.**

CO4: Understand the importance of weed management in agriculture and also about advantages and disadvantages of herbicide usage **for provide employability and entrepreneurship.**

CO5: Understand the concept of plant growth and development **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |

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| | | | |
|-----|---|---|---|
| C02 | 1 | 3 | 3 |
| C03 | 1 | 3 | 1 |
| C04 | 2 | 3 | 3 |
| C05 | 3 | 1 | 2 |

References:

1. Aldrich, R.J. and Kramer R.J. (1997), Principles in Weed Management.
2. Gupta O.P. (2007), Weed management Principles and Practices.
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BAG-706 (Q) Farm System Suitable for Organic Management

L: T: P 2:0:0

Objective To acquaint the students about recent advances in agricultural production for skill, employability and entrepreneurship development

UNIT I

Farming System-scope, importance, and concept, Types and systems of farming system and factors affecting types of farming **for skill development.**

UNIT II

Farming system components and their maintenance, Cropping system and pattern, multiple cropping system, Efficient cropping system and their evaluation, Allied enterprises and their importance, Tools for determining production and efficiencies in cropping and farming system; **to provide employability and entrepreneurship.**

UNIT III

Sustainable agriculture- problems and its impact on agriculture, indicators of sustainability, adaptation and mitigation, conservation agriculture strategies in agriculture, HEIA, LEIA and LEISA and its techniques for sustainability, **knowledge for better employability in industry.**

UNIT IV

Integrated farming system-historical background, objectives and characteristics, components of IFS and its advantages, Site specific development of IFS model for different agro-climatic zones, resource use efficiency and optimization techniques **for provide employability and entrepreneurship.**

UNIT V

Resource cycling and flow of energy in different farming system, farming system and environment, **for skill development.**

Course Outcomes:

Students completing this course will be able to:


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CO1: Understand the basic concepts of field and crop management starting from field preparation, seed sowing, till harvesting and threshing of crop **for skill development.**

CO2: Define the importance of water in agriculture and ways to improve water use efficiency **to provide employability and entrepreneurship.**

CO3: Understand the nutritional requirements of crops and also about sources available to fulfill the nutritional requirement **knowledge for better employability in industry.**

CO4: Understand the importance of weed management in agriculture and also about advantages and disadvantages of herbicide usage **for provide employability and entrepreneurship.**

CO5: Understand the concept of plant growth and development **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

References:

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BAG-706 (R)

ICTs for Agriculture Extension

L :T:P 1:0:0

Objective: To acquaint the students with scope of ICT in agriculture, networking and communication media

UNIT I:

ICTs – concept, definition, Introduction, scope, tools and application in extension education. Reorganizing the extension efforts using ICTs, advantages, limitations and opportunities. of ICT in Agriculture, Need for ICT in Agricultural Extension. Methods of communication: meaning and function. Forms of communication. Role of Mass Media in dissemination of farm technology. Modern communication media: electronic video, tele text, tele conference, computer assisted instruction **for skill development.**

UNIT II:

ICTs projects, case studies in India and developing world. Different approaches (models) to ICTs. ICT use in field of extension – Expert systems on selected crops and enterprises, Self learning CDs on package of practices, diseases and pest management, Agricultural web sites and portals related crop production and marketing etc. Community Radio, Web, Tele, and Video conferencing. Computer Aided Extension Knowledge management, Information kiosks, multimedia, online, offline extension. Tools-mobile technologies, e-learning concepts **for skill development.**

UNIT III:

ICT Extension approaches-pre-requisites, information and science needs of farming community, Need integration. Human resource information. Intermediaries. Basic e-extension training issues. ICT enabled extension pluralism. Emerging issues in ICT **for skill development.**

UNIT-IV

Telephone/Mobile Technology: Farmer Call Centre, SMS Broadcast Service, m-krishi. ICT initiatives of NGOs and Private Companies. ICT initiatives by ICAR and SAUs, Value Added Services, Fisher Friend Project, SMS Services to farmers by Department of Agriculture. Practices of ICT for Agricultural Extension: aAQUA, Digital Green, e-Agrik (e-Agriculture), e- Sagu (e-cultivation), KISSAN (Karshaka Information Systems Service and Networking), Solutions through Information, VASAT-Virtual Academy for the Semi-Arid

Tropics, Touch Screen Kiosk, e-Extension (e-Soil Health Card Program) **for skill development.**

UNIT-V

Village Knowledge Centre (VRC/VRC/CIC): Introduction, concept, process for setting VRC. Warana Wired Village Project, Web Portals: AGRISNET, DACNET, InDG, DEAL, i-KISAN, e- Krishi, ASHA, IFFCO- Agri-Portal, Agriwatch Portal, i-Shakti. ICTs for market information and Agri-Business: AGMARKNET, e-KRISHI VIPNAN, ICT-e-CHOPAL, EID Garry-Indiagriline **for skill development.**

CO1: Students will gain knowledge on introduction, concepts and application in extension education **for skill development.**

CO2: Students will gain knowledge about ICTs projects, case studies in India and developing world **for skill development.**

CO3: Students will gain knowledge about ICT Extension approaches-pre-requisites and information **for skill development.**

CO4: Students able to understand about different communication tech **for skill development.**

CO5: Students will be understands about Introduction, concept, process for setting VRC **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|--------------------------|----------------------|-------------------------------------|
| C01 | 3 | 1 | 1 |
| C02 | 1 | 3 | 3 |
| C03 | 1 | 3 | 1 |
| C04 | 2 | 3 | 3 |
| C05 | 3 | 1 | 2 |

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BAG 706(S) Organizational Behavior and Development

L: T: P 1:0:0

Objective: To learn about the organizational behavior and development for overall development.

UNIT I:

Nature, scope and significance of management, evolution of management thoughts, Approaches to management, functions of a manager, planning – types, steps, course objective, process, strategies, policies, MBO, strategic planning process, SWOT analysis, organizing – structure & process, line staff, authority & responsibility **for development of skills.**

UNIT II:

Staffing – selection process, directing – training, communication & motivation, controlling – significance, process, techniques, standards & benchmarks, management audit **for development of skill and employability**

UNIT III:

Nature , scope and significance of organizational behaviour, evolution and historical background of organizational behaviour, models of organizational behaviour, foundations of individual behavior, diversity, micro organizational behaviour – personality, self-concept, self esteem and self-efficacy, attitudes, perception, power – types & structures **for skill development and employability.**

UNIT IV:

Motivation – Types of motivation. Theories of motivation, applications of motivation. Transactional analysis – Johari window-self fulfilling prophecy, Interpersonal relations understanding, determinants, and developing, leadership styles and influence process, leadership theories, types of leaders, and effective leader, group dynamics, types of groups, group formation, group decision making, team building **for skill development and employability.**

UNIT V:

Organizational culture or climate-concept, dimensions, ethos, determinants, organizational conflicts – concepts, sources, implications and management, organizational conflicts-concepts, sources, implications, and management, organizational changes-types, resistances


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to change, role of changing agents **for skill development, entrepreneurship and employability.**

Course outcomes:

Students completing this course will be able to:

CO11: CO1: On successful completion of this course a student will be able to: Understand the nature and scop of management **for development of skills.**

CO12: Understand all about Staffing – selection process, directing – training **for development of skill and employability.**

CO13: Understand all about the Nature , scope and significance of organizational behavior **for skill development and employability.**

CO14: Understand about the motivation and types of motivation **for skill development and employability.**

CO15: Understand the Organizational culture or climate-concept, dimensions, ethos, determinants, organizational conflicts **for skill development, entrepreneurship and employability.**

PO-CO Mapping (Please ✓ wherever required)

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 3 | 1 | 1 |
| CO2 | 3 | 3 | 3 | 1 | 1 |
| CO3 | 3 | 3 | 3 | 3 | 1 |
| CO4 | 3 | 3 | 3 | 3 | 1 |
| CO5 | 3 | 3 | 2 | 1 | 1 |

CO-Curriculum Enrichment Mapping (Please ✓ wherever required)

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 3 | 3 | 1 |
| CO3 | 3 | 3 | 1 |
| CO4 | 3 | 3 | 3 |
| CO5 | 33 | 3 | 3 |

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BAG-706 (T) Risk Management and Climate Change Adoption L: T: P 2:0:0

Objective To acquaint the students about recent advances in agricultural production for skill, employability and entrepreneurship development

UNIT I

Introduction, Global Warming and Climatic Variability: Introduction to climate change. Factors directly affecting climate change. **to provide Skill**

UNIT II

Global warming, effect of climate change on spatio-temporal patterns of temperature and rainfall, concentrations of greenhouse gasses in atmosphere. pollution levels such as tropospheric ozone, change in climatic variability and extreme events **to provide Skill**

UNIT III

Impact Assessment and Mitigation: Sensors for recording climatic parameters, plants response to the climate changes, premature bloom, marginally overwintering or inadequate winter chilling hours, longer growing seasons and shifts in plant hardiness for fruit crops. **to provide Skill**

UNIT IV

Climate mitigation measures through crop management- use of tolerant rootstocks and varieties, mulching – use of plastic- windbreak- spectral changes- protection from frost and heat waves. Climate management in greenhouse- heating – vents – CO₂ injection – screens – artificial light. **for better employability in industry**

UNIT V

Impact of climate changes on invasive insect, disease, weed, fruit yield, quality and sustainability. Climate management for control of pests, diseases, quality, elongation of growth and other plant processes- closed production systems. **for better employability in industry**

Course Outcomes:

Students completing this course will be able to:

CO11: Understand the basic concepts of Introduction, Global Warming and Climatic Variability **for skill development.**

CO12: Global warming, effect of climate change on spatio-temporal patterns of temperature and rainfall **to provide employability and entrepreneurship.**

CO13: Understand the Impact Assessment and Mitigation: Sensors for recording climatic parameters **knowledge for better employability in industry.**

CO14: Understand the importance of weed management in agriculture and also about advantages and disadvantages of herbicide usage **for provide employability and entrepreneurship.**

CO15: Understand the concept of Impact of climate changes on invasive insect, disease, weed, fruit yield **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |

| | | | |
|-----|---|---|---|
| CO5 | 3 | 1 | 2 |
|-----|---|---|---|

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BAG-804 A

Seed Production and Certification

L: T: P: 3:1:0

Unit I

Seed quality – concepts, importance and characteristics – Seed dormancy –types, methods to break seed dormancy

Unit II

Genetic and agronomic principles of seed production – Seed processing, post harvest processing, seed blending seed storage – Problems of storage

Unit III

Factors affecting seed quality during production; principles and methods of seed production in self and cross-pollinated field and vegetable crops

Unit IV

Hybrid seed production technology of field crops

Unit V

Seed certification: definition, phases and procedure for seed certification, field inspection; seed act and policies, WTO, IPR; seed village concept

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Seed quality – concepts, importance and characteristics **for skill development.**

CO2: Genetic and agronomic principles of seed production **to provide employability and entrepreneurship.**

CO3: Understand the Factors affecting seed quality during production **knowledge for better employability in industry.**

CO4: Understand the importance of Hybrid seed production technology of field crops **for provide employability and entrepreneurship.**

CO5: Understand the concept of Seed certification: definition, phases and procedure for seed certification **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|--|-----|-----|-----|-----|-----|
|--|-----|-----|-----|-----|-----|

| | | | | | |
|------------|---|---|---|---|---|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|--------------------------|----------------------|-------------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG-804 B

Mushroom Cultivation

L: T: P: 3:1:0

Unit I

Importance of mushroom cultivation – definition of mushroom - its importance – present scenario of mushroom cultivation

Unit II

General morphological features, taxonomy and identification of different mushrooms-poisonous, hallucinogenic and medicinal mushrooms. Pure culture of mushrooms and their nutritional requirements

Unit III

Definition of spawn, substrate for spawn, types of spawn, methods of spawn production, characteristic of a good spawn, storage of spawn

Unit IV

Cultivation of Agaricus species – composting – its formulation, casing, preparation of casing mixture, sterilization, cultivation of pleurotus, Volvariella, Lentinus, Calocybe and Auricularia. Different types of substrates, substrate preparation and sterilization, Spawning, methods of spawning, spawn run phase, cropping

Unit V

Identification and management of different pests and diseases of mushrooms. Methods of harvesting mushrooms, post harvest treatments and preservation of mushrooms. Packing and processing – Different methods of processing, canning and dehydration. Nutritive value of mushrooms and preparation of different recipes

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Importance of mushroom cultivation **for skill development.**

CO2: General morphological features, taxonomy and identification of different mushrooms **to provide employability and entrepreneurship.**

CO3: Understand the Definition of spawn, substrate for spawn, types of spawn, and methods of spawn production **knowledge for better employability in industry.**

CO4: Understand the importance of Cultivation of Agaricus species – composting – its formulation, casing, preparation of casing mixture, sterilization, cultivation of pleurotus **for provide employability and entrepreneurship.**

CO5: Understand the concept of Identification and management of different pests and diseases of mushrooms **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG-804 C

Soil Management

L: T: P: 3:1:0

(Conservation, Problematic soil, Soil quality)

Unit I

Soil loss- soil and water conservation – methods of soil conservation – Agronomic and Engineering. -
Soil wetness- anaerobiosis – desertification – management and alternative use

Unit II

Chemical degradation – Soil acidity- liming materials. Acid sulphate soils- genesis – classification-
problems associated with crop management in such soils

Unit III

Salt affected soils-classification , mine soils, causes , problems and management for agriculture and
alternate uses

Unit IV

Quality of irrigation water and its effect on soil. Diagnostic symptoms – deficiency and toxicity of
common crops

Unit V

Soils of the state- Kari, kayal, karappadom, kole, pokkali, kaipad and poonthalpadom- problems and
management Laterites and associated soils- problems and management

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Soil loss- soil and water conservation **for skill development.**


CO2: To understand the basics Chemical degradation – Soil acidity- liming materials **to provide employability and entrepreneurship.**

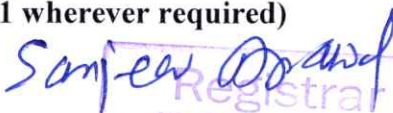
CO3: Understand the Salt affected soils-classification , mine soils, causes , problems and management for agriculture and alternate uses **knowledge for better employability in industry.**

CO4: Understand the importance of Quality of irrigation water and its effect on soil **for provide employability and entrepreneurship.**

CO5: Understand the concept of Soils of the state **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)


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Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|--------------------------|----------------------|-------------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG 804D

Adoption and Diffusion of innovations

L: T: P 3:0:0

Objective: The adoption of a new product, service, or idea is not an overnight phenomenon – it does not happen simultaneously across all people in a social system. According to research, consumers who adopt an innovation earlier demonstrate different characteristics than someone who adopts an innovation later. Therefore, for marketers, understanding the characteristics of each segment that will either help or hinder the adoption of an innovation is important.

UNIT- I

Diffusion – concept and meaning, elements; traditions of research on diffusion; the generation of innovations; innovation-development process; tracing the innovation-development process, converting research into practice for skill development.

UNIT- II

The adoption process- concept and stages, dynamic nature of stages, covert and overt processes at stages, the innovation-decision process – a critical appraisal of the new formulation for skill development.

UNIT- III

Adopter categories – Innovativeness and adopter categories, adopter categories as ideal types, characteristics of adopter categories; Perceived attributes of Innovation and their rate of adoption, factors influencing rate of adoption for skill development.

UNIT- IV

Diffusion effect and concept of over adoption, opinion leadership- measurement and characteristics of opinion leaders, monomorphic and polymorphic opinion leadership, multistep flow of innovation; concepts of homophily and heterophily and their influence on flow of innovations; Types of innovation-decisions –Optional, Collective and Authority and contingent innovation decisions; for skill development.

UNIT- V

Consequences of Innovation-Decisions – Desirable or Undesirable, direct or indirect, anticipated or unanticipated consequences; Decision making – meaning, theories, process, steps, factors for skill development.

Course Outcomes:

Students completing this course will be able to:



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CO1: Understand the basic concepts of Diffusion – concept and meaning, elements; traditions of research on diffusion **for skill development.**

CO2: The adoption process- concept and stages, dynamic nature of stages **to provide employability and entrepreneurship.**

CO3: Understand the Adopter categories – Innovativeness and adopter categories, adopter categories as ideal types, characteristics of adopter categories **knowledge for better employability in industry.**

CO4: Understand the Diffusion effect and concept of over adoption **for provide employability and entrepreneurship.**

CO5: Understand the concept of Consequences of Innovation-Decisions **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |

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| | | | |
|-----|---|---|---|
| CO5 | 3 | 1 | 2 |
|-----|---|---|---|

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BAG 804E

Group Dynamics and Leadership

L: T: P 3:0:0

Objective: Team Dynamics is the way your team members interact with one another. These interactions are shaped by things like individual personalities and behaviors, the nature of the work being done, and the relationships that exist within the team.

UNIT I

Group - Concepts, Importance, classification and description. Dynamics of the group - role, function and performance, group characteristics and their effects for skill development.

UNIT II

Group techniques. Group-based Extension- concept and cases. Self-Help Group – concept-organization-mobilization, Microfinance-functions for empowerment for skill development.

UNIT III

Leaders - types of leaders, roles and functions Leadership - importance in groups and theories.. Identification, selection, training and development of local leaders for skill development.

UNIT IV

Leadership index to identify effective leaders. Review of significant research findings.

Practical Practising group techniques like forum, panel, symposium dialogue, interview, brain storming and role playing for skill development.

UNIT V

Use of different methods of identifying village leaders – observation, sociometry, key informant technique. Indexing leaders by leadership index for skill development.

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Introduction, Global Warming and Climatic Variability **for skill development.**

CO2: Global warming, effect of climate change on spatio-temporal patterns of temperature and rainfall **to provide employability and entrepreneurship.**

CO3: Understand the Impact Assessment and Mitigation: Sensors for recording climatic parameters **knowledge for better employability in industry.**


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CO4: Understand the importance of weed management in agriculture and also about advantages and disadvantages of herbicide usage **for provide employability and entrepreneurship.**

CO5: Understand the concept of Impact of climate changes on invasive insect, disease, weed, fruit yield **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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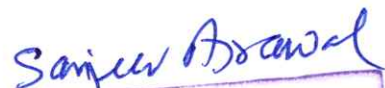
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BAG804F

Agricultural Price Analysis

L: T: P 3:0:0

Objectives: Agricultural marketing in a broader sense is concerned with the marketing of farm products produced by farmers and of farm inputs and services required by them in the production of these farm products. Thus, the learning Objectives of agricultural marketing is to study both product marketing as well as input marketing.

UNIT- I

Concepts and definition of Agricultural Marketing- its new role. Market and market structure. Problems in Agricultural Marketing. Characteristic of agricultural product and production factors affecting demand for and supply of farm products for skill development.

UNIT- II

Market intermediaries and their role - Need for regulation in the present context. Marketing Integration- efficiency, costs, margins and price spread for skill development.

UNIT- III

Marketing Co-operatives – APMC Regulated Markets - Direct marketing, Contract farming, contract marketing and retailing - Supply Chain Management. State trading, Warehousing and other Government agencies -Performance and Strategies - Market infrastructure needs, performance and Government role – Value Chain Finance. Market information for skill development.

UNIT- IV

Spatial and temporal price relationship – price forecasting – time series analysis – time series models – spectral analysis. Market segmentation, measurement and forecasting. for skill development.

UNIT-V

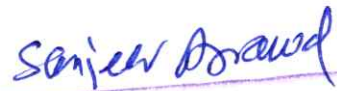
Introduction to commodities markets and future trading - Basics of commodity futures - Operation Mechanism of Commodity markets – Price discovery - Hedging and Basis - Fundamental analysis - Technical Analysis. Trade policy for agriculture-International trade agreements. Marketing research for skill development.

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Concepts and definition of Agricultural Marketing for skill development.


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CO2: Market intermediaries and their role to provide employability and entrepreneurship.

CO3: Understand the Marketing Co-operatives – APMC Regulated Markets - Direct marketing knowledge for better employability in industry.

CO4: Understand the importance of Spatial and temporal price relationship – price forecasting for provide employability and entrepreneurship.

CO5: Understand the concept of Introduction to commodities markets and future trading skill development.

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

References:

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1. Material covered in class will be based on: Tomek, W. G., and H. M. Kaiser. Agricultural Product Prices, 5th Edition, Cornell University Press.
2. Ithaca, New York, USA, 2014. The book is available in the campus bookstore (140 University Centre) and it will be on reserve in the William R. Newman Library—Agriculture (236 Agriculture Building).
3. Other readings will be provided during the term as needed.

Web Sources:

1. Class material will be posted on UM Learn (www.umanitoba.ca/umlearn).
2. The page provides announcements, information about the course, handouts, grades, and other pertinent information.
3. I strongly recommend you to check the course web site frequently during the semester, especially for announcements prior to class.
4. If you have trouble logging into UM Learn please contact the Information Services & Technology (IST) Service Desk located in 123 Fletcher Argue, by phone at (204) 474-8600, or by e-mail at servicedesk@umanitoba.ca.



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BAG804G Computer and its application in Agriculture

L: T: P 3:0:0

Objective: To provide information to students about various modern technology and ideas adopted in the agriculture sector.

UNIT I

Introduction to computer. A brief history of computing. Data Processing and information. Characteristics of the computer, function, capability and limitations, strength and weakness of computers for skill development.

UNIT II

Generation of computers, First, Second, Third, Fourth and Fifth generation computer with their features only. Types of computer, Digital, Analog and Hybrid computers for skill development.

UNIT III

Classification of computers on size and capabilities of Micro, Mini, Mainframe and Super computer. Anatomy and components of computer, computer organization CPU, ALU, Input and output devices, peripheral devices, storage units hard disk, compact disk, for skill development.

UNIT IV

Various types of memories, RAM, ROM, PROM and EPROM. Number systems, Decimal, Binary, Octal, Hexadecimal, Character codes, ASCH, EBCDIC, BCD. Types of software, System softwares and Application software for skill development.

UNIT V

Introduction to DOS, (disk Operating System), Fundamentals of DOS commands, internal commands, external command, files and directory, Editor. Elementary Idea of BASIC (Computer Language) for skill development.

Course Outcomes:


Students completing this course will be able to:

- CO1:** Understand the basic concepts of Introduction to computer. A brief history of computing **for skill development.**
- CO2:** Generation of computers, First, Second, Third, Fourth and Fifth generation computer **to provide employability and entrepreneurship.**
- CO3:** Understand the Impact Assessment and Mitigation: Sensors for recording climatic parameters **knowledge for better employability in industry.**



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CO4: Understand the importance of Classification of computers on size and capabilities of Micro, Mini, Mainframe and Super computer **for provide employability and entrepreneurship.**

CO5: Understand the concept of Introduction to DOS, (disk Operating System), Fundamentals of DOS commands, internal commands, external command, files and directory, Editor. Elementary Idea of BASIC **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|--------------------------|----------------------|-------------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

Suggested readings:

1. Gurvinder Singh, Rachhpal Singh & Saluja KK. 2003. Fundamentals of Computer Programming and Information Technology. Kalyani Publishers.

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2. Harshawardhan P. Bal. 2003. Perl Programming for Bioinformatics. Tata McGraw-Hill Education.
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BAG804H

Plant Cell Culture Technology

L: T: P 3:0:0

Objective: Define the basic concepts of Plant Tissue Culture "PTC" as a Biotechnology tool. Recognize the importance of Plant Tissue Culture technique. Practice the different techniques used in Plant Tissue Culture. Acquire all skills used in Plant Tissue Culture techniques. List of chemicals, media and equipment required for Plant Tissue Culture.

UNIT I

Plant tissue culture (PTC) is fundamental to most aspects of plant biotechnology. PTC has a great opportunity for the production of quality planting material which is virus free and true to type/ genetically uniform (compare to their stock source) produced through micro propagation techniques for skill development.

UNIT II

The products of plant tissue culture are being transferred rapidly from laboratories to the fields. Applications are invited for Biotech Job / Self-employment oriented course
ADMISSION One Year Post Graduate Diploma in Agriculture Biotechnology on "Plant Tissue Culture" Propagules derived from plant tissue culture exhibit several applications in horticulture, crops, and forestry for skill development.

UNIT III

"Plant Tissue Culture" in their syllabus in different weightage. It is a fact, such type of syllabus mainly based on 'Theory' and not 'Practical' based due to lots of reasons. One of the important unavoidable problem is 'Time factor' i.e., duration of practical classes for skill development.

UNIT IV

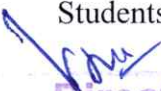
The result or response of PTC requires more time in comparison with microbial culture. So conventional University curriculum failed to generate professional, skilled plant tissue culturist particularly related to quality assessment of micropropagated plants for skill development.


UNIT V

The main purpose of the course for generation human resource of specialised skilled manpower for Plant Tissue culture industry. Such diploma course-program will provide to young people for high quality hands-on training by proper handling of different modern relevant instruments and specialised techniques for "Plant Tissue Culture" in the area of agriculture biotechnology for skill development.

Course Outcomes:

Students completing this course will be able to:


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CO1: Understand the basic concepts of Plant tissue culture (PTC) is fundamental to most aspects of plant biotechnology **for skill development.**

CO2: The products of plant tissue culture are being transferred rapidly from laboratories to the fields **to provide employability and entrepreneurship.**

CO3: Understand the Impact Assessment and Mitigation: Sensors for recording climatic parameters **knowledge for better employability in industry.**

CO4: Understand the importance Plant Tissue Culture **for provide employability and entrepreneurship.**

CO5: The main purpose of the course for generation human resource of specialised skilled manpower for Plant Tissue culture industry **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|--------------------------|----------------------|-------------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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1. Pullaiah. T. and M.V.Subba Rao. 2009. Plant Tissue culture. Scientific Publishers, New Delhi.
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3. Glick, B.R., Pasternak, J.J. (2003). Molecular Biotechnology- Principles and Applications of recombinant DNA. ASM Press, Washington.
4. Bhojwani, S.S. and Bhatnagar, S.P. (2011). The Embryology of Angiosperms. Vikas Publication House Pvt. Ltd., New Delhi. 5th edition.
5. Snustad, D.P. and Simmons, M.J. (2010). Principles of Genetics. John Wiley and Sons, U.K. 5th edition.
6. Stewart, C.N. Jr. (2008). Plant Biotechnology & Genetics: Principles, Techniques and Applications. John Wiley & Sons Inc. U.S.A.

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BAG804I

Stored Grain Pest Managements of Cereals

L: T: P 3:0:0

Objective: To effective management of storage insect pests integrated pest management approach should be followed which includes sanitation of storage facility, cleaning of grains before storage, monitoring of pest incidence, temperature and moisture control inside and outside the storage structure.

UNIT I

General account on nature and type of damage by different arthropods pests: Scientific name, order, family, host range, distribution, biology, nature of damage and management of insect pests of Cereals-Rice - Paddy stem borer, Green leaf hopper, Brown plant hopper, White backed plant hopper, Gall midge, Paddy grasshopper, Blue beetle, Caseworm, Armyworm, Gundhi bug, Hispa, Leaf folder. Sorghum – Shoot fly, Stem borer, Aphids, Delphacids, Grasshopper, Earhead midge, Earhead caterpillars. Maize – Shoot fly, Stem borer, Armyworm, Cob earworm. Bajra – Shoot fly, Blister beetle. Wheat – Stem borer, Aphids, Termites for skill development.

UNIT II

Minor millets. Pulses – Pigeon pea, chickpea, mungbean, urdbean, cowpea, pea. Pigeon pea – Pod borer, Plume moth, Pod fly, Spotted pod borer, Leaf webber, Mites. Chickpea – Gram pod borer, Aphids, Cutworm. Mung and Urdbean – Aphids, Leaf eating caterpillar, Semilooper, Pod borer. Cowpea and Pea – Aphids, Blue butterfly, Pod borer. Oilseeds - Groundnut – Leaf miner, Hairy caterpillar, Tobacco leaf eating caterpillar, Aphids, Thrips, White grub, Pod sucking bug. for skill development.

UNIT III

Castor – Semilooper, Capsule borer, Jassids, Tobacco leaf eating caterpillar. Sunflower – Capitulum borer, Hairy caterpillar, Jassids, Thrips, Whitefly, Stem borer. Safflower-aphids, Capitulum borer, Guziaweevil. Mustard – Aphids, Sawfly, Leaf webber. Linseed – Gall fly. Soybean – Stem fly, Girdle beetle, Leaf miner, Tobacco leaf eating caterpillar, Whitefly, Semilooper, Gram pod borer. Sesamum – Til hawk moth, Gall fly, leaf eating caterpillar. Niger – Semilooper, Gram pod borer. Fiber crops – Cotton – Aphids, Jassids, Thrips, Whitefly, Mealy bugs, Spotted bollworm, American bollworm, Pink bollworm, Tobacco leaf eating caterpillar, Leaf folder, Semilooper, Red cotton bug, Dusky cotton bug, Grey weevil for skill development.

UNIT IV

Sunhemp and Mesta – Sunhemp hairy caterpillar. Sugarcane crops - Early shoot borer, Internode borer, Top shoot borer, Whitefly, Pyrilla, Woolly aphids, Mealy bug, Scale insect, Termites, White grub. Noninsect pests of above crops – Crabs, Snails and Slugs.

millepedes, Mites, Rats and squirrels. Stored grain pests - Biology and damage of Primary and Secondary pests. Primary store grain pests- Internal feeders - Rice weevil, lesser grain borer, pulse beetle and Angoumois grain moth. External feeders - khapra beetle, Indian meal moth. Secondary store grain pests – Rust red flour beetle, Saw toothed grain beetle, Long headed beetle. Primary and Secondary store grain pests - Rice moth. Non insect pests, mites, rodents, birds and microorganisms associated with stored grain and their management. Preventive and curative methods of stored grain pests. Storage structure and methods of grain storage and fundamental principles of grain store management for skill development.

UNIT V

Practical Identification of different type of damage. Identification and study of life cycle and seasonal history of various insect pests attacking crops and their produce. Field crops: Cereals-Rice, Sorghum, Maize, Bajra, Wheat and Minor millets. Pulses- Pigeon pea, Chickpea, Mung bean, Urd bean, Cowpea and Pea. Oilseeds: Groundnut, Castor, Sunflower, 92 Safflower, Mustard, Linseed, Soybean, Sesamum and Niger. Fibre: Cotton, Sunhemp and Mesta. Sugar crop: sugarcane. Non insect pests of field crops. Store grain pests. Non insect pests, mites, rodents, birds and microorganisms associated with stored grain and their management. Preventive and curative methods of stored grain pests. Storage structure and methods of grain storage and fundamental principles of grain store management for skill development.

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of General account on nature and type of damage by different arthropods pests **for skill development.**

CO2: Minor millets. Pulses – Pigeon pea, chickpea, mungbean, urdbean, cowpea, pea **to provide employability and entrepreneurship.**

CO3: Understand the Impact Assessment and Mitigation: Sensors for recording climatic parameters **knowledge for better employability in industry.**

CO4: Understand the importance of Castor – Semilooper, Capsule borer, Jassids, Tobacco leaf eating caterpillar. Sunflower **for provide employability and entrepreneurship.**

CO5: Understand the concept of Practical Identification of different type of damage. Identification and study of life cycle **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)


Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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1. Atwal, A.S. 1976. *Agricultural Pests of India and South East Asia*. Kalyani Publishers, Ludhiana.
2. Butani, D.K. and Jotwani, M.G. 1984. *Insects in Vegetables*. Periodical Export Book Agency, New Delhi.
3. Butani, D. K. 1984. *Insects and Fruits*. Periodical Export Book Agency, New Delhi.
4. Dennis S Hill 1987 *Agricultural Insect Pests of tropics and their control*, Cambridge University Press , New York
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BAG804J

Rural Journalism

L: T: P 3:0:0

Objective: Rural journalism that can question the inadequacy of schemes and highlight the plight of rural citizens needs to find space on mainstream media. This should be made mandatory as part of development journalism by the Government.

UNIT I

Journalism: Meaning, definition, importance. Agricultural Journalism: Meaning, definition, agricultural journalism in rural areas, problem and prospectus of agricultural journalism .Agricultural Journalism: for skill development.

UNIT II

The nature and scope of agricultural journalism, characteristics and training of the agricultural journalist, how agricultural journalism is similar to and different from other types of journalism. Newspapers and magazines as communication media: Characteristics; kinds and functions of newspapers and magazines, characteristics of newspaper and magazine readers. Form and content of newspapers and magazines: Style and language of newspapers and magazines, parts of newspapers and magazines. for skill development.

UNIT III

The agricultural story: Types of agricultural stories, subject matter of the agricultural story, structure of the agricultural story for skill development.

UNIT IV

Gathering agricultural information: Sources of agricultural information, interviews, coverage of events, abstracting from research and scientific materials, wire services, other agricultural news sources. Writing the story: Organizing the material, treatment of the story, writing the news lead and the body, readability measures for skill development.

UNIT V

Illustrating agricultural stories: Use of photographs, use of artwork (graphs, charts, maps, etc.), writing the captions. Editorial mechanics: Copy reading, headline and title writing, proofreading, lay outting for skill development.

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Journalism: Meaning, definition, importance. Agricultural Journalism: Meaning, definition, agricultural journalism in rural areas, **for skill development.**

CO2: The nature and scope of agricultural journalism **to provide employability and entrepreneurship.**

CO3: Understand the The agricultural story: Types of agricultural stories **knowledge for better employability in industry.**

CO4: Understand the importance of Gathering agricultural information: Sources of agricultural information, interviews **for provide employability and entrepreneurship.**

CO5: Understand the concept of Illustrating agricultural stories: Use of photographs, use of artwork **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG804K

Tree Seed Technology

L: T: P 3:0:0

Objective: To introduce the basic principles of quality seed production

UNIT- I

Introduction : Seed as basic input in agriculture; seed development in cultivated plants; seed quality concept and importance of genetic purity in seed production; types of cultivars, their maintenance and factors responsible for deterioration; seed production in self and cross pollinated crops for skill development.

UNIT- II

Mode of pollination and reproduction in crop plants and their modification in relation to hybrid seed production. Principles of hybrid seed production, isolation distance, synchronization of flowering, rouging etc. male sterility and incompatibility system in hybrid seed production, role of pollinators and their management. for skill development.

UNIT- III

Seed multiplication ratios, seed replacement rate, demand and supply; suitable areas of seed production and storage, agronomy of seed production – agro climatic requirements and their influence on quality seed production; generation system of seed multiplication; maintenance of Nucleus seed, production of Breeder, Foundation and Certified seed– criteria involved; life span of a variety and causes for its deterioration; certification standards for self, cross pollinated and vegetative propagated crops for skill development.

UNIT- IV

Hybrid Seed - Methods of development of hybrids; use of male sterility and self incompatibility and CHA in hybrid seed production; one, two and three line system; maintenance of parental lines of hybrids; planning and management of hybrid seed production technology of major field crops and vegetables. for skill development.

UNIT- V

Planning of seed production for different classes of seeds for self and cross-pollinated crops, Seed quality control system and organization, seed village concept; Seed production agencies, seed industry and custom seed production in India. for skill development.

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Introduction : Seed as basic input in agriculture; seed development in cultivated plants; **for skill development.**

CO2: Global warming, effect of Mode of pollination and reproduction in crop plants and their modification in relation to hybrid seed production **to provide employability and entrepreneurship.**


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CO3: Understand the Impact Seed multiplication ratios, seed replacement rate, demand and supply; suitable areas of seed production and storage **knowledge for better employability in industry.**

CO4: Understand the importance of Hybrid Seed - Methods of development of hybrids; use of male sterility and self incompatibility **for provide employability and entrepreneurship.**

CO5: Understand the concept of Planning of seed production for different classes of seeds for self and cross-pollinated crops **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

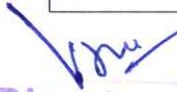
Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

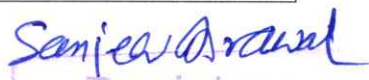
| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |


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BAG804L Health and Diseases Management of Livestock L: T: P 3:0:0

Objectives: At the conclusion of this course students will have the ability to: Understand management systems of food animal (dairy and beef cattle, poultry), equine, and aquatic animals. Understand the lifecycle of food and aquatic animals and biological rationale for different management strategies of food and aquatic animals and equine. Comprehend the most prevalent diseases, predisposing factors, and prevention strategies of food and aquatic animals and equine

UNIT- I

Domestic Animal Diversity in India, its origin, history and utilization. Present status and flow of Animal Genetic Resources and its contribution to livelihood security for skill development.

UNIT- II

Methodology for genotypic characterization of livestock and poultry breeds through systematic surveys. Fodder availability; management of breed; physical, biochemical and performance traits and uniqueness of animals of a breed; social, cultural and economic aspects of their owners/communities rearing the breed for skill development.

UNIT- III

Methodology for molecular genetic characterization, diversity analysis and relationship among the breeds for skill development.

UNIT- IV

Concept of conservation, In-situ and ex-situ (invivo and in-vitro); models of conservation; prioritization of breeds for conservation. National and international strategies for conservation of Animal Genetic Resources. for skill development.

UNIT -V


Status, opportunities and challenges in conservation of AnGR. IPR issues pertaining to animal genetic resources/animal products or by-products. Registration of livestock breeds and protection of livestock owner's rights in India for skill development.

Course Outcomes:

Students completing this course will be able to:

- CO1:** Understand the basic concepts of Domestic Animal Diversity in India, its origin, history and utilization **for skill development.**


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CO2: Global warming, effect of climate Methodology for genotypic characterization of livestock and poultry breeds through systematic surveys **to provide employability and entrepreneurship.**

CO3: Understand the Impact Assessment and Mitigation: Sensors for recording climatic parameters **knowledge for better employability in industry.**

CO4: Understand the importance of Concept of conservation, In-situ and ex-situ (invivo and in-vitro) **for provide employability and entrepreneurship.**

CO5: Understand the concept of Status, opportunities and challenges in conservation of AnGR. IPR **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG804M

Economic Botany

L: T: P 3:0:0

Objectives: To learn the diverse human uses of plants and plant products. To learn the taxonomic diversity of useful plants. To learn the biological reasons why certain plant resources are important.

UNIT-I

Origin of Cultivated Plants: Concept of Centres of Origin, their importance with reference to Vavilov's work. Examples of major plant introductions; Crop domestication and loss of genetic diversity; evolution of new crops/varieties, importance of germplasm diversity for skill development.

UNIT-II

Cereals: Brief account of Wheat, Rice and millets. Legumes: General account, importance to man and ecosystem. Sugars & Starches: Morphology and processing of sugarcane, products and byproducts of sugarcane industry. Potato – morphology, propagation & uses. for skill development.

UNIT-III

Spices: Listing of important spices, their family and part used, economic importance with special reference to fennel, saffron, clove and black pepper Beverages: Tea, Coffee (morphology, processing & uses). Drug-yielding plants: Therapeutic and habit-forming drugs with special reference to Cinchona, Digitalis, Papaver and Cannabis. Tobacco: Tobacco (Morphology, processing, uses and health hazards) for skill development.

UNIT-IV

Oils & Fats: General description, classification, extraction, their uses and health implications groundnut, coconut, linseed and Brassica (Botanical name, family & uses) .Essential Oils: General account, extraction methods, comparison with fatty oils & their uses. for skill development.

UNIT-V


Natural Rubber: Para-rubber: tapping, processing and uses. Timber plants: General account with special reference to teak and pine. Fibers: Classification based on the origin of fibers, Cotton and Jute (morphology, extraction and uses for skill development.

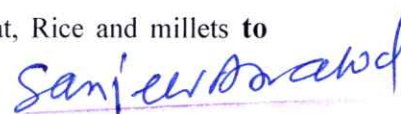
Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Origin of Cultivated Plants: Concept of Centres of Origin **for skill development.**

CO2: Global warming, effect of Cereals: Brief account of Wheat, Rice and millets **to provide employability and entrepreneurship.**


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CO3: Understand the Spices: Listing of important spices, their family and part used, economic importance **knowledge for better employability in industry.**

CO4: Understand the importance of Oils & Fats: General description, classification, extraction, their uses and health implications **for provide employability and entrepreneurship.**

CO5: Understand the concept of Natural Rubber: Para-rubber: tapping, processing and uses. Timber plants **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG804N

Livelihood Development

L: T: P 3:0:0

Objectives:

The livelihood development programmes approach, will aim at achieving societal emancipation for the targeted populations by working with the individuals to break out of the cycle of poverty, disenfranchisement, stigma, discrimination,

UNIT-I

Land and Soil Land and Soil - Types of Land holdings - Land utilization and cropping patterns. for skill development.

UNIT-II

Climate and water Climate and Water: Inland waters, Irrigation; Sustainable agriculture and regeneration of rural resources for skill development.

UNIT-III

Forest Forest Based Resources and social forestry - Joint forest management. for skill development.

UNIT-IV

Population Human Resources - Rural Population - Infrastructure for Health and Education - Connecting local resources to engage youth, family and community. for skill development.

UNIT-V

Livelihood system Rural Production Systems and Livelihoods: Agriculture, Horticulture, Sericulture, Animal Husbandry, Dairying and Fishery for skill development.

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Land and Soil Land and Soil - Types of Land holdings **for skill development.**

CO2: Global warming, Climate and water **to provide employability and entrepreneurship.**

CO3: Understand the Forest Based Resources and social forestry **knowledge for better employability in industry.**

CO4: Understand the importance of Population Human Resources - Rural Population **for provide employability and entrepreneurship.**


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CO5: Understand the concept of Livelihood system Rural Production Systems and Livelihoods **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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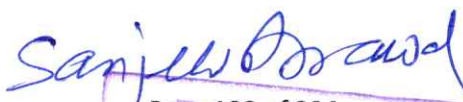
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BAG8040

Rural marketing

L: T: P 3:0:0

Objective: To Know the Demographics and Psychographics of Rural Customers – Rural marketing research tries to reveal the number of facts who buy why they buy, when they buy, the frequency to their buying and the sources of their buying.

UNIT I

Profile of rural marketing, definition, classification, strategies, characteristics, changing pattern of rural market, problems in rural marketing. Rural marketing in India – Difference between urban and rural market, study of rural resources for skill development.

UNIT II

Rural marketing and research – Sources for conducting marketing research, dos and don'ts for rural marketing and rural industries for skill development.

UNIT III

Rural segmentation - Targeting and positioning. Rural product and prices – Introduction, packing, pricing methods, rural branding. for skill development.

UNIT IV

Rural distribution / channels of distribution, functions of rural sales persons. Rural communication – Introduction, types, factors affecting rural communication, problems for skill development.

UNIT V

Market infrastructure – Meaning, facilities included and its importance. for skill development.

Course Outcomes:

Students completing this course will be able to:

- CO1:** Understand the basic concepts of Profile of rural marketing, definition, classification, strategies, and characteristics **for skill development.**
- CO2:** Rural marketing and research **to provide employability and entrepreneurship.**
- CO3:** Understand the Impact Rural segmentation - Targeting and positioning **knowledge for better employability in industry.**
- CO4:** Understand the importance of Rural distribution / channels of distribution, functions of rural sales persons. **for provide employability and entrepreneurship.**
- CO5:** Understand the concept of Market infrastructure – Meaning, facilities included and its importance **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG804P Management of Agribusiness Co-operatives

L: T: P 3:0:0

Objective: Agricultural cooperatives exist in countries all around the world, and they often face similar challenges: ineffective management, lack of market access, inadequate member commitment, and insufficient financial and other relevant services, among others. The information on available opportunities for cooperative members and for those working closely with agricultural cooperatives might be dispersed or unclear.

UNIT I

Co-operation: Meaning, Definition, principles of co-operation and its application in agriculture. Importance and role of co-operation in agriculture and rural development for skill development.

UNIT II

Co-operation compared with capitalism, socialism, communism and co-operative movement in India. for skill development.

UNIT III

Co-operative marketing and Processing Institutions: Institutional, non-institutional and multiagency approach, forms of co-operative, Co-operative education and training. for skill development.

UNIT IV

State co-operative Union and NCDC, co-operative administration and HRM. Co-operative Management: for skill development.

UNIT V


Nature and Functions, professional Management of Co-operatives, role of leadership in co-operative Management. for skill development.

Course Outcomes:

Students completing this course will be able to:

- CO1:** Understand the basic concepts of Co-operation: Meaning, Definition, principles of co-operation and its application in agriculture **for skill development.**
- CO2:** Co-operation compared with capitalism, socialism, communism and co-operative movement in India **to provide employability and entrepreneurship.**
- CO3:** Understand the Impact Co-operative marketing and Processing Institutions: Institutional **knowledge for better employability in industry.**


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CO4: Understand the importance of State co-operative Union and NCDC, co-operative administration and HRM **for provide employability and entrepreneurship.**

CO5: Understand the concept of Nature and Functions, professional Management of Co-operatives **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|--------------------------|----------------------|-------------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG-854A

Seed Production and Certification Lab


L: T: P:0:0:2

List of Experiments; Minimum 08 of the followings

1. Seedsampling
2. VisittowarehouseofStateWarehousingCorporationandfamiliarisationwithseedsampling procedures
3. Seedtesting–differenttestsfollowedinaSeedTestingLaboratory
4. Germinationtest-differenttestsfollowedindifferentcrops
5. SeedMoisturetestofdifferentcrops
6. VisittoSeedTestingLaboratory,familiarisationwithequipmentsandhandsonexperiencin seedtesting
7. Seed treatment against systemicdiseases
8. Seed treatment –scarification
9. Seed coating andpelleting
10. Seedtreatmentwithbeneficialorganisms
11. Seedtreatmentforconvenienceinsowing
12. Seedtreatmentforbreakingseeddormancy
13. VisittoNBPGRforstudyingseedstoragemethods
14. Seed production inrice
15. Seed production incoconut
16. Seedproductionintubercrops
17. Seedproductioninvegetablecrops
18. Seed production incocoa
19. Seedproductioninornamentalplants
20. Seed production inspices
21. Seedproductioninfruitplants
22. Seedproductioninmedicinalplants
23. Seedproductioninfoddercrops
24. Seedproductioningreenmanurecrops
25. Hybridseedproductioninrice


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BAG-854B

Mushroom Cultivation Lab

L: T: P: 0:0:2

List of Experiments; Minimum 08 of the followings

1. Identification of common edible and poisonous mushrooms
2. Equipments used in mushroom laboratory
3. Physical and chemical sterilization techniques
4. Preparation of spore print and spore culture
5. Preparation of culture media
6. Pure culture techniques
7. Isolation of different mushrooms in pure culture
8. Preparation of spawn-mother spawn and bed spawn
9. Visit to a commercial spawn production unit
10. Preparation of substrates for mushroom cultivation
11. Oyster mushroom cultivation
12. Milky mushroom cultivation
13. Casing soil preparation for milky mushrooms
14. Paddy straw mushroom cultivation
15. Button mushroom cultivation
16. Commonly used compost formulae, long and short method of composting
17. Cultivation of *Auricularia* sp
18. Substrate preparation and sterilization of *Auricularia* sp
19. Familiarization with other edible mushroom varieties
20. Visit to a commercial mushroom production unit
21. Identification and management of different pests and diseases of mushroom
22. Methods of harvesting mushrooms
23. Postharvest treatment and preservation of mushrooms
24. Packaging and processing of mushrooms
25. Different methods of processing, canning and dehydration
26. Mushroom recipes - preparation
27. Design and layout of mushroom farm
28. Cost analysis of mushroom farm
29. Preparation of projects
30. Market survey to assess the potentiality for various mushrooms
31. Organization set up at financial management, record keeping and store management
32. Use of mushrooms in bioremediation
33. Bio-waste management with mushroom fungi
34. Trainings to be conducted to farmers
35. Popularization through seminars and symposia etc
36. Evaluation of the local production unit to assess the targets achieved.



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BAG-854C

Soil Management Lab

L: T: P:0:0:2

List of Experiments; Minimum 08 of the followings

1. Estimation of soil loss by Multi slot device for soil conservation studies
2. Erection of vegetative barriers
3. Soil conservation methods
4. Agronomic measures for different slopes/crops construction of terraces and stone walls
5. Field visit to different areas in Uttar Pradesh requiring special management.
6. Identification of problem soils
7. Profile studies
8. Soil sample collection
9. Bulk soil sample collection and incubation study
10. Identification of the crops showing either toxicity or deficiency symptoms
11. Soil analysis–Estimation of pH, EC, redox potential, available N,P,K-Exchangeable Ca, Mg, S, micronutrients, detection of heavy metals if any
12. Rating of soil into fertility classes and recommendation of fertilizers for different crops
13. Laying out of observational trial and data recording based on the fertility classes
14. Soil health index and soil health cards



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BAG-854 D Adoption and Diffusion of Innovation Lab

L: T: P: 0:0:2

List of Experiments; Minimum 08 of the followings

1. To observe diffusion and innovation, tracing the innovation-development process.
2. To understand the adoption process and innovation-decision process.
3. To develop adopter categories, adopter categories as ideal types, characteristics of adopter categories.
4. To find out perceived attributes of Innovation and their rate of adoption, factors influencing rate of adoption.
5. Identification of diffusion effect over adoption and leadership- measurement.
6. To discuss the types of innovation-decisions –Optional, Collective and Authority and contingent innovation decisions.
7. To understand the consequences of Innovation-Decisions.
8. To know about decision making – meaning, theories, process, steps, factors.



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BAG-854 E Group Dynamics and Leadership Lab

L: T: P: 0:0:2

List of Experiments; Minimum 08 of the followings

1. Importance, classification and description of Groups.
2. To understand the dynamics of the group - role, function and performance.
3. Techniques of Grouping people and conducting group based extension activities.
4. To develop Self-Help Groups as organization for mobilization.
5. Role of microfinance-functions for empowerment.
6. To discuss the types of leaders, roles and functions of leadership in groups.
7. Identification, selection, training and development of local leaders.
8. Significance of leadership index to identify effective leaders.
9. Techniques of practical practicing group like forum, panel, symposium dialogue, interview, brain storming and role playing.
10. Identification and use of different methods of village leaders – observation, sociometry, key informant technique.



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BAG854F

Agricultural Price Analysis Lab

L: T: P 0:0:2

List of experiments; Minimum 08 of the followings

1. Marketing research processes. Sources of Data.
2. Conducting Interviews for market survey. Constructing Schedule/Questionnaire. Mechanics of Analysis and Interpretation of Data
3. Diagrammatic Representation of Research Results. Writing a Report on Market Survey Market information system and marketing research.
4. List of agencies and publications for market information. Appendices used for Market.
5. Information Importance of Prices in Agriculture Trends and fluctuation of prices in agriculture.
6. Price Policy in India. Price determination in Agricultural Product.
7. Different Prices in Agriculture. Procedure for determining MSP.
8. Trends in MSP over decade. Input factor prices in Agriculture.
9. Study of Arrivals and Prices of Major farm products. Trends in Production



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BAG854G Computer and its application in Agriculture Lab L: T: P: 0:0:2

List of Experiments; Minimum 08 of the followings

1. Introduction, data processing and information to computer.
2. To discuss the characteristics of the computer, function, capability and limitations.
3. To understand the generation of computer with their features.
4. Types of computer, Digital, Analog and Hybrid computers.
5. Classification of computers on size and capabilities of Micro-, Mini-, Mainframe and Super computer.
6. Anatomy and components of computer, computer organization CPU, ALU, Input and output devices, peripheral devices, storage units hard disk, compact disk,
7. To become aware about various types of memories, RAM, ROM, PROM and EPROM.
8. Understanding the types of software, system software and application software.
9. Introduction to DOS, (disk Operating System) and fundamentals of DOS commands.



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BAG854H Plant Cell Culture Technology Lab

L: T: P: 0:0:2

List of Experiments; Minimum 08 of the followings

1. Fundamentals of Plant tissue culture (PTC) to most aspects of plant biotechnology.
2. To develop and transfer the products of plant tissue culture from laboratories to the fields.
3. Applications and to exhibit "Plant Tissue Culture" Propagules derived from horticulture, crops, and forestry.
4. Results or responses of PTC with microbial culture.
5. Micro-propagation of plants the plant tissue culture to quality assessment.
6. A visit to Plant Tissue culture Laboratory or Industry for case study of PTC.
7. Handling of different modern relevant instruments practiced to develop Plant Tissue culture in Laboratories.
8. To understand and develop specialized techniques for "Plant Tissue Culture" in the area of agriculture biotechnology.



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BAG854I Stored Grain Pest Management of Cereals Lab L: T: P: 0:0:2

List of Experiments; Minimum 08 of the followings

1. To identify nature and type of damage by different arthropods pests.
2. Classification of storage grain pests of Cereals.
3. Management of various insect pests of Cereals.
4. Management of pests causes damage on minor millets.
5. To observe and manage pests of Pulses –Pod borer, Plume moth, Pod fly, spotted pod borer, Leaf webber, Cutworm and Mites.
6. To observe and manage pests of Oilseeds - Leaf miner, Hairy caterpillar, Leaf eating caterpillar, Aphids, Thrips and Pod sucking bug.
7. Study of life cycle and seasonal history of various insect pests attacking crops and their produce.
8. Study of stored grain pests - Biology and damage of Primary and Secondary pests.
9. Preventive and curative methods of stored grain pests.
10. Study of storage structure and methods of grain storage and fundamental principles of grain store management.



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BAG854J

Rural Journalism

L: T: P: 0:0:2

List of Experiments; Minimum 08 of the followings

1. Visit to newspaper Press, AIR station, TV and news agencies to study the mode of presentation and use of various modern electronic media.
2. Visit to advertisement agencies.
3. Writing news stories,
4. Writing features,
5. Practice in editing.
6. Script writing for radio, TV and Video story.
7. Photo feature writing.
8. Students will be attached to various media for individual learning experience.



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BAG-854K

Tree Seed Technology Lab

L: T: P: 0:0:2

List of Experiments; Minimum 08 of the followings

1. Identification of forest seeds;
2. Seed sampling, different storage methods, Seed quality testing-purity, viability and germination, collection and processing of seeds/ fruit;
3. Tests of viability, viz., cutting, hydrogen peroxide, excised embryo, tetrazolium, seed health testing primarily to the presence or absence of disease-causing organisms such as fungi, bacteria, virus and animal pests, recording, calculation and use of results of seed treatment.
4. Study of tree seed structure – internal and external structures;
5. Study on phenology of different tree species;
6. Assessment of seed set, physiological and harvestable maturity;
7. Assessing natural regeneration in different tree species;
8. Study on seed dispersal methods and dispersal distance in different species;
9. Seed collection techniques in important tree species – seed collection – orthodox and recalcitrant seeds – safety measures during collection;
10. Seed extraction methods – wet and dry extractions – fruits, pods, cones, etc.;
11. Study on different seed drying methods and precautions;
12. Practicing seed grading and upgrading techniques;
13. Practicing seed dormancy breaking methods;
14. Estimation of critical moisture content for safe storage;
15. Visit to seed production area and seed orchard;
16. Visit to tree seed processing unit.



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BAG854L Health and Diseases Management of Livestock Lab L: T: P 0:0:2

List of experiments; Minimum 08 of the followings

1. Signs of good and poor animal health,
2. Principal causes of diseases;
3. Methods of disease transmission and diagnosis;
4. Mechanisms of disease prevention and management including biosecurity,
5. Host immune responses and vaccination;
6. Common diseases of farm animals and management.
7. Cleaning, Disinfection, Sanitation, Animal Health Management
8. Animal housing requirements and animal welfare aspects.
9. Essential anatomy and Physiology of Cattle, Sheep, Goat, Swine and Poultry (Skeletal-muscular, cardiovascular, respiratory, digestive, nervous, urinary system).
10. Classification of animal diseases – Study of major diseases



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BAG-854M Economic Botany Lab

L: T: P: 0:0:2

List of Experiments; Minimum 08 of the followings

1. Botanical micro techniques for the study of structure, development and biochemical status of plant parts;
2. Identification of economically important plant parts in different groups of plants - oil yielding plants, cereals, millets, legumes, spices, condiments, woods, timber and industrial crops, medicinal and aromatic plants and fumitory, masticatory plants;
3. Structure of economic plant parts-root, stem, leaves, fruits, seeds, recognizing the grains;
4. Case studies on adaptations during domestication;
5. Histo chemical localization of chemical constituents in economically important plant parts e.g. starch-sugars, Proteins-lipids;
6. Genetic resource management and utilization of genetic diversity of important crops,
7. Studies on sugar, starch, cellulose, fibers, gums, rubber and resins;
8. Visit to Museum of economic products in other Institutes, visit to industrial units processing the economic products.



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BAG854N

Livelihood Development Lab

L: T: P: 0:0:2

List of Experiments; Minimum 08 of the followings

1. Village stays to understand the livelihood pattern of villagers and how the other socio-economic factors affect the livelihood of people
2. Visit to institutes/ universities adopted and/or nearby villages to experience the life and natural resources in rural communities
3. Understanding of village culture, evolution, social structure, livelihood pattern, trends, governance arrangements, and the natural context (landscape layout, land use, vegetation types etc)
4. Application of participatory rural appraisal skills for understanding village context
5. Engagement of working with rural communities and their grass-root institutions, understanding dynamics of working in a group
6. Visit to different agri-business models
7. Group assignments may be given to document the field experience in the form of case study of an enterprise/ entrepreneur/ members and other related stakeholders
8. Survey of village



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BAG8540

Rural Marketing Lab

L: T: P 0:0:2

List of experiments; Minimum 08 of the followings

1. Practice in interviewing.
2. Covering agricultural events.
3. Abstracting stories from research and scientific materials and from wire services.
4. Writing news story
5. Writing magazine story
6. Writing success story.
7. Preparation of leaflet
8. Preparation of folder
9. Script writing for radio and television



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BAG854P Management of Agribusiness Co-operatives Lab L: T: P 0:0:2

List of experiments; Minimum 08 of the followings

1. To study of primary Agricultural Co-operative Credit society.
2. District Central Co-operative bank, state Co-operative bank, M.S.
3. Co-operative Bank for Agricultural and Rural development. Forms of Cooperatives. Procedure for obtaining loans.
4. Formulation of loan proposal. Economic feasibility of a farm credit proposal. Study of co-operative Marketing.
5. Study of processing of cereals, pulses and oilseeds managed by co-operatives, study of NCDC.
6. Preparation of loan proposal for horticultural garden.
7. Visit to different cooperative credit institutions, Visit to agribusiness cooperatives.
8. Problems in cooperatives and remedies to overcome the same.



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BAG-804 B (I)

Commercial Floriculture

L:T:P::3:1:0

Unit I

Scope and importance of commercial floriculture in India. Present status and scenario and export potential of flower production in India. Major constraints in flower production in India.

Unit II

Introduction, botany and taxonomy, climate and soil requirements, Commercial varieties/hybrids, sowing/planting time and method, seed rate and seed treatment, nutritional and irrigation requirements, interculture operations, weed control, mulching, physiological disorders, harvesting, post harvest management, plant protection measures rose, marigold, chrysanthemum, jasmine, china aster.

Unit III

Production technology of cut flowers like rose, carnation, gerbera, orchids under protected environment polyhouse.

Unit IV

Post harvest technology of cut flowers in respect to commercial flower crops, dehydration technique for drying flowers.

Unit V

Production technology of bulbous flower crops.

Course Outcomes:

Students completing this course will be able to:

- CO1:** Understand the basic concepts of Scope and importance of commercial floriculture in India **for skill development.**
- CO2:** Introduction, botany and taxonomy, climate and soil requirements **to provide employability and entrepreneurship.**
- CO3:** Understand the Impact Co-operative marketing and Processing Institutions: Institutional **knowledge for better employability in industry.**
- CO4:** Understand the importance of Post harvest technology of cut flowers **for provide employability and entrepreneurship.**
- CO5:** Understand the concept of Production technology of bulbous flower crops **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

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Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|--------------------------|----------------------|-------------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG-804 B (II) Commercial Fruit and Vegetable Production L: T: P 3:1:0

Unit I

Prospects and constraints in commercial vegetable production in India

Unit II

Use of plant growth substances, use of mulches, off-season and organic vegetable production technology

Unit III

Hi-tech methods in commercial production of vegetable crops such as potato, tomato, brinjal, chilli, okra, sweet potato, onion, garlic, peas, beans, cauliflower, cabbage, radish, carrot, turnip, beet root, cucurbits, beet leaf and fenugreek

Unit IV

Scope and strategies for growth of fruit cultivation in state and country

Unit V

Planning and lay out of orchards; high density planting; commercial varieties of fruit crops; propagation techniques, crop regulation, fruit set and drop, harvest indices, ripening and export standards for various fruits

Course Outcomes:

Students completing this course will be able to:

- CO1:** Understand the basic concepts of Co-operation: Meaning, Definition, principles of co-operation and its application in agriculture **for skill development.**
- CO2:** Hi-tech methods in commercial production of vegetable crops **to provide employability and entrepreneurship.**
- CO3:** Understand the Hi-tech methods in commercial production of vegetable crops **knowledge for better employability in industry.**
- CO4:** Understand the importance of Scope and strategies for growth of fruit cultivation in state and country **for provide employability and entrepreneurship.**
- CO5:** Understand the concept Planning and lay out of orchards; high density planting **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|--|-----|-----|-----|-----|-----|
|--|-----|-----|-----|-----|-----|

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|------------|---|---|---|---|---|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|--------------------------|----------------------|-------------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG-804 B (III) Protected Cultivation of Horticultural Crops L: T: P: 3:1:0

Unit I

Introduction – scope and importance – problems and prospects of protected culture in India

Unit II

Growing structures – green house– polyhouse – net house – basic considerations in establishment and operation of green houses – maintenance

Unit III

Advantages of growing plants in a green house – functioning and maintenance

Unit IV

Manipulation of environmental factors – environmental control systems in green house – containers – substrate culture – soil decontamination – water management – nutrient management

Unit V

Crop regulation – special horticultural practices –harvesting methods – postharvest handling – standards – grading – packing and marketing

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts Introduction – scope and importance – problems and prospects of protected culture in India **for skill development.**

CO2: Growing structures – green house– polyhouse – net house – basic considerations in establishment **to provide employability and entrepreneurship.**

CO3: Understand the Advantages of growing plants in a green house – functioning and maintenance **knowledge for better employability in industry.**

CO4: Understand the importance of Manipulation of environmental factors – environmental control systems in green house **for provide employability and entrepreneurship.**

CO5: Understand the concept of Crop regulation – special horticultural practices **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated


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| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|--------------------------|----------------------|-------------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG804B (IV) Principles of Animal Nutrition and Feed Technology L: T: P 3:0:0

Objective

To acquaint with inherent nutritional quality of feed ingredients and feeds. Evaluation of feeds and fodders and feed preservation techniques. Procurement and storage of feed ingredients. Losses during storage and its control.

UNIT-I

Importance of nutrients in animal production and health. Composition of animal body. Composition of plants. Nutritional terms. Importance of minerals in animal health and production, Classification of minerals. for skill development.

UNIT-II

Major and trace minerals, their importance in animal health and production, their requirement and supplementation in feed. Importance of vitamins in animal health and production, Classification of vitamins for skill development.

UNIT-III

Water soluble and fat soluble vitamins, their importance in animal health and production, their requirement and supplementation in feed. Common feeds and fodders, their classification. Various types of concentrates and roughages, its importance for livestock health and production and availability. for skill development.

UNIT-IV

Measures of food energy and their applications, gross energy, digestible energy, metabolizable energy and net energy Total digestible nutrients, Starch equivalent, food units and physiological fuel value. Direct calorimetry. Indirect calorimetry, Carbon nitrogen balance. Protein evaluation of feeds- Measures of protein quality in ruminants and non-ruminants, By pass protein. Biological value of protein, protein efficiency ratio, protein equivalent. Digestible crude protein, Calorie protein ration and nutritive ratio. for skill development.

UNIT-V

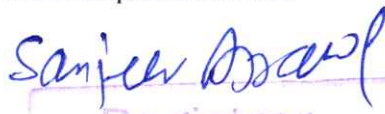
Various physical, chemical and biological methods of feed processing for improving the nutritive value of inferior quality roughages. Preparation, Storage and conservation of livestock feed trough silage and hay, its use in livestock feeding. Harmful natural constituents and common adulterants of concentrates and fodders. Feed additives in the rations of livestock and poultry, Antibiotics and Hormonal compounds and other growth stimulants, their uses for skill development.

Course Outcomes:

Students completing this course will be able to:

- CO1:** Understand the basic concepts of Importance of nutrients in animal production and health for skill development.


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CO2: Importance of nutrients in animal production and health. Composition of animal body **to provide employability and entrepreneurship.**

CO3: Understand the Major and trace minerals, their importance in animal health and production, their requirement and supplementation in feed **knowledge for better employability in industry.**

CO4: Understand the importance of Measures of food energy and their applications, gross energy, digestible energy, metabolizable energy and net energy **for provide employability and entrepreneurship.**

CO5: Understand the concept Various physical, chemical and biological methods of feed processing for improving the nutritive value of inferior quality roughages **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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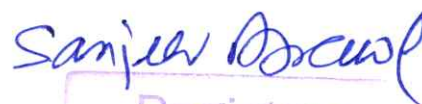
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Web Sources:

- <https://agrimoon.com>
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BAG804B (V)

Programme Planning

L: T: P 3:0:0

Objectives- To the end of the course students are expected to be able to: Describe the basic elements of program planning in public health: needs assessment, goals, objectives, activities, timeline, budget, and evaluation. Identify barriers to successful implementation of program plans. Identify methods for overcoming barriers to program implementation.

UNIT-I

Ancient and Medieval Cities in India Urbanization in the Medieval period including a study of cities like Varanasi, Mohenjo-Daro, Harappa, Dholavira and Lothal; Chola dynasty sponsored famous towns like Thanjavur, Nagapattinam, Kanchipuram and Madurai; Why India could not become urbanized during the medieval period? for skill development.

UNIT-II

Mughal and Colonial Built Environment Mughals and Vijayanagara Kingdoms built grand cities like Shahjahanabad in the north and Hampi – the capital of Vijayanagara Kingdom in the south; Mughal towns and cities; City and regional planning during the British Raj involving cantonments, model towns, capital towns like New Delhi; Regional planning efforts involving development of port cities such as Bombay, Madras, Calcutta, etc.; for skill development.

UNIT-III

Construction of railways, and road networks; The Portuguese port towns of Cochin, Cannanore, Goa, Daman and Diu. Contributions of scholars like Sir Patrick Geddes to Indian planning; Governance and planning legislation during the British period include a study of improvement trusts, municipalities, etc for skill development.

UNIT-IV

Urban Theories Concentric Zone Theory, Sector Theory, and Multiple Nuclei Theory with a focus on the contributions of Robert E. Park, Louis Wirth, etc.; Land Use and Land Value Theory of William Alonso; From the world city to the global city for skill development.

UNIT-V

Theories of Planning Rational Planning Model; Advocacy Planning Model; Political Economy Model; Equity Planning Model; Radical Planning model; Collaborative Planning Theory for skill development.

Course Outcomes:

Students completing this course will be able to:



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CO1: Understand the basic concepts of Ancient and Medieval Cities in India **for skill development.**

CO2: Co-operation compared with capitalism, socialism, communism and co-operative movement in India **to provide employability and entrepreneurship.**

CO3: Understand the Impact Co-operative marketing and Processing Institutions: Institutional **knowledge for better employability in industry.**

CO4: Understand the importance of State co-operative Union and NCDC, co-operative administration and HRM **for provide employability and entrepreneurship.**

CO5: Understand the concept of Nature and Functions, professional Management of Co-operatives **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|--------------------------|----------------------|-------------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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- <https://tnau.ac.in>
- <https://iasri.icar.gov.in>
- <https://ecourseonline.iasri.res.in>



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BAG804B(VI)

Agricultural Input Marketing

L: T: P 3:0:0

Objective: The objective of this course is to give the students an understanding of different marketing concept and marketing system in context of agricultural inputs.

UNIT I

Scope and importance of agricultural input marketing management. Study of demand and supply scenario of major agro-inputs: seeds, fertilizers, agro-chemicals, farm machineries and electricity for skill development.

UNIT II

Production organizations in seeds, fertilizes, agro-chemicals. for skill development.

UNIT III

Various types of Credit for procurement of inputs for skill development.

UNIT IV

Study of Marketing of various inputs, various Marketing channels, problems in marketing and suggestion to overcome the problems for skill development.

UNIT V

Branding and packaging for major agroinputs for skill development.

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Scope and importance of agricultural input marketing management **for skill development.**

CO2: Production organizations in seeds **to provide employability and entrepreneurship.**

CO3: Understand the Various types of Credit for procurement of inputs for skill development **knowledge for better employability in industry.**

CO4: Understand the importance Study of Marketing of various inputs, various Marketing channels, problems in marketing and suggestion to overcome the problems **for provide employability and entrepreneurship.**

CO5: Understand the concept of Branding and packaging for major agroinputs **or skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|--|-----|-----|-----|-----|-----|
|--|-----|-----|-----|-----|-----|

| | | | | | |
|------------|---|---|---|---|---|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|--------------------------|----------------------|-------------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG804B (VII)

Morphology and Systemics of Crop Plants

L: T: P 3:0:0

Objective-

Rational thinking: To check assumptions for their accuracy and validity. Biodiversity awareness: Understand the local and global issues of environment and its sustainable development. Continuous learning: ability to engage independently on context of human society and technological changes. Solving problems related to food scarcity.

UNIT- I

Cytology: Chromatin organization, Chromosome structure and packaging of DNA, Molecular organization of centromere and telomere, Nucleolus and ribosomal RNA genes, Euchromatin and heterochromatin, Karyotype analysis and evolution, Banding patterns. Chromosome tracking/introgression using FISH and GISH, localization and mapping of genes or genomic segments for skill development.

UNIT- II

Genetics of Prokaryotes and Eukaryotes: Mapping of prokaryotic and eukaryotic genome, Mobile genetic elements and their significance, Gene families. for skill development.

UNIT- III

Process of crop evolution and stabilization of polyploids (cytogenetic and genetic stabilization) Crop Genetic Resources: Centres of origin of cultivated plants, Importance of genetic conservation, Global network for genetic conservation and utilization in major crops of world, Institutes engaged in conservation and improvement of crop genetic resources, Wild relatives of crop plants, Gene banks, Gene sanctuaries for skill development.

UNIT- IV

Population and Evolutionary Genetics: Evolutionary theory and population genetics, Theory of allele frequencies, Changes in genetic structure of population: Natural selection, Migration, Mutation, Genetic drift. Genetic variation in natural populations. Gene flow and population structure for skill development.

UNIT- V

Classical and modern methods of crop breeding and improvement: Genetic variability in crop plants, Methods of breeding in self and cross pollinated crops, Heterosis and hybrid development Use of cytoplasmic male sterility in hybrid breeding, Breeding methods in asexual and clonally propagated crops, clonal selection, Marker assisted breeding. for skill development.

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Cytology: Chromatin organization, Chromosome structure and packaging of DNA **for skill development.**

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CO2: Genetics of Prokaryotes and Eukaryotes: to provide employability and entrepreneurship.

CO3: Understand the Impact Process of crop evolution and stabilization of polyploids (cytogenetic and genetic stabilization) **knowledge for better employability in industry.**

CO4: Understand the importance of Population and Evolutionary Genetics: Evolutionary theory and population genetics **for provide employability and entrepreneurship.**

CO5: Understand the concept of Classical and modern methods of crop breeding and improvement **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG804B (VIII) Plant Parasitic Nematods, other Non-insect Pest and their Management
L: T: P 3:0:0

Objective: To teach the students about various microbes that are pathogenic to insects, factors that affect their virulence; provide hands-on training in identification, isolation, culturing various pathogens and assessing pathogenicity.

UNIT I

Definition of IPM, Scope of IPM, Importance of IPM, Principles of IPM, Components/Tools of IPM- (Cultural method, Physical method, Mechanical Method, Biological method, Legal method-Insecticide Act-1968, HPR, Chemical method, Resent trends (NCIPM for skill development.

UNIT II

IPM strategies for-(Cash crops- Sugarcane, cotton. Cereals- Paddy, Wheat, Jawar, Bajra for skill development.

UNIT III

Pulses- Pigeon pea. Oilseed crops- Ground nut, Fruits- Mango, Grapes, Pomegranate, for skill development.

UNIT V

Citrus, Banana, Vegetable crops- Brinjal, Okra, Tomato, Chilly, Onion, Cabbage and cauliflower for skill development.

UNIT V

Food safety standards & Pesticide residue and their management for skill development.

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Definition of IPM, Scope of IPM, Importance of IPM, Principles of IPM **for skill development.**

CO2: IPM strategies for-(Cash crops-to **provide employability and entrepreneurship.**

CO3: Understand Pulses- Pigeon pea. Oilseed crops- Ground nut, Fruits- Mango, Grapes, Pomegranat **knowledge for better employability in industry.**

CO4: Understand the importance of Citrus, Banana, Vegetable crops- Brinjal, Okra, Tomato, Chilly, Onion, Cabbage and cauliflower **for provide employability and entrepreneurship.**

CO5: Understand the concept of Food safety standards & Pesticide residue and their management **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG804B (IX)

Plant Tissue Culture

L: T: P 3:0:0

Objectives: of tissue culture studies is to obtain high-frequency shoot regeneration, which is also a prerequisite for an efficient transformation system and a clonal propagation of plants with attractive flowers and fruits in large scale for ornamental purposes.

UNIT I

Concepts of Plant Biotechnology: History of Plant Tissue Culture and Plant Genetic Engineering; Scope and importance in Crop Improvement: Totipotency and Morphogenesis, Nutritional requirements of in-vitro cultures; Techniques of In-vitro cultures, Micropropagation, for skill development.

UNIT II

Anther culture, Pollen culture, Ovule culture, Embryo culture, Test tube fertilization, Endosperm culture, Factors affecting above in-vitro culture; Applications and Achievements; Somaclonal variation, Types, Reasons: Somatic embryogenesis and synthetic seed production technology; Protoplast isolation, Culture, Manipulation and Fusion; Products of somatic hybrids and cybrids, for skill development.

UNIT III

Applications in crop improvement. Genetic engineering; Restriction enzymes; Vectors for gene transfer – Gene cloning – Direct and indirect method of gene transfer – Transgenic plants and their applications for skill development.

UNIT IV

Blotting techniques – DNA finger printing – DNA based markers – RFLP, AFLP, RAPD, SSR and DNA Probes – Mapping QTL – Future prospects. MAS, and its application in crop improvement for skill development.

UNIT V

Nanotechnology: Definition and scope, types of nano material and their synthesis, green synthesis. Tools and techniques to characterize the nanoparticles. Nanobiotechnological applications with examples, Nano toxicology and safety for skill development.

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Concepts of Plant Biotechnology **for skill development.**

CO2: Anther culture, Pollen culture, Ovule culture, Embryo culture, Test tube fertilization, Endosperm culture, Factors affecting above in-vitro culture **to provide employability and entrepreneurship.**

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CO3: Understand the Applications in crop improvement. Genetic engineering; Restriction enzymes; Vectors for gene transfer – Gene cloning **for better employability in industry.**

CO4: Understand the importance of Blotting techniques – DNA finger printing – DNA based markers – RFLP, AFLP, RAPD, SSR and DNA Probes – Mapping QTL – Future prospects **for provide employability and entrepreneurship.**

CO5: Understand the concept of Nanotechnology: Definition and scope, types of nano material and their synthesis **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG804B(X)

Transgenic Plants

L: T: P 3:0:0

Objective: the production of transgenic plants is to produce crops, which have ideal traits, quality, and high yield. Besides being beneficial to the agriculture sector, the plants are found to be able to act as the factory for pharmaceutical protein production.

UNIT-II

Basic concept of genetic engineering Genetic transformation of plants, Transgenic techniques, Steps for developing new crop varieties for skill development.

UNIT-II

Gene transfer methods Bacteria and gene transfer in plants, Vector mediated gene transfer Creating recombinant DNA for skill development.

UNIT-III

Agrobacterium mediated gene transfer Tumor inducing principle and the Ti plasmid, Agrobacterium mediated virus infection- agro infection for skill development.

UNIT-IV

Vectorless or direct DNA transfer Physical gene transfer methods, Electroporation Particle bombardment/ micro projectile/ biolistic, Macroinjection, Microinjection for skill development.

UNIT-V

Chemical gene transfer methods .Transgenic in crop improvement Resistance to biotic stresses, Insect resistance, Virus resistance, Disease resistance, Resistance to abiotic stresses, Transgenic for quality for skill development.

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Basic concept of genetic engineering Genetic transformation of plants **for skill development.**

CO2: Gene transfer methods Bacteria and gene transfer in plants **to provide employability and entrepreneurship.**

CO3: Understand the Agrobacterium mediated gene transfer Tumor inducing principle and the Ti plasmid **for better employability in industry.**

CO4: Understand the importance of Vectorless or direct DNA transfer Physical gene transfer methods **for provide employability and entrepreneurship.**

CO5: Understand the concept of Chemical gene transfer methods **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)



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Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| C01 | 3 | 3 | 1 | 1 | 3 |
| C02 | 3 | 3 | 1 | 1 | 1 |
| C03 | 1 | 1 | 3 | 1 | 1 |
| C04 | 2 | 2 | 3 | 2 | 1 |
| C05 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| C01 | 3 | 1 | 1 |
| C02 | 1 | 3 | 3 |
| C03 | 1 | 3 | 1 |
| C04 | 2 | 3 | 3 |
| C05 | 3 | 1 | 2 |

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BAG804B (XI)

Plant Biotechnology

L: T: P 3:0:0

UNIT-I

Plant Tissue Culture Techniques Historical aspects and significance: Plant cell and tissue culture Introduction, history, and scope. Development of organ, tissue and cell culture, exploitation of totipotency. for skill development.

UNIT-II

Laboratory requirements for plant tissue culture: Designing of plant tissue culture laboratory. Lab maintenance and fumigation for skill development.

UNIT-III

Basic aspects of plant tissue culture: Sterilization techniques, different culture media components, growth regulators, undefined supplements, surface sterilization of explants, inoculation, subculturing etc for skill development.

UNIT-IV

Types of Cultures: Cyto differentiation, organogenic differentiation, callus culture, callus mediated organogenesis, cell suspension culture- different types, measurements of growth pattern of cells in suspension, culture methods of single cells, testing viability of cells. Application of cell suspension and callus culture with special reference to medicinal and aromatic plants. for skill development.

UNIT-V

In vitro Techniques for Micropropagation: Axillary bud proliferation approach, meristem and shoot tip culture. Production of virus free plants, phases of micropropagation, Micropropagation of tree species, medicinal and aromatic plants. Organogenesis via callus formation. for skill development.

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Plant Tissue Culture Techniques Historical aspects and significance **for skill development.**

CO2: Laboratory requirements for plant tissue culture: **to provide employability and entrepreneurship.**

CO3: Understand the Basic aspects of plant tissue culture: **knowledge for better employability in industry.**

CO4: Understand the importance of Types of Cultures: Cyto differentiation, organogenic differentiation, callus culture, callus mediated organogenesis **for provide employability and entrepreneurship.**

CO5: Understand the concept of In vitro Techniques for Micropropagation **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

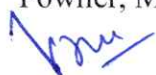
CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG804B (XII)

Biophysics

L: T: P 3:0:0

Objective: The main aim of biophysics is to understand biological systems, while the aim of bioengineering is to make practical devices.

UNIT-I

Bioenergetics, Tools and Technique in Biology: Bioenergetics: Concepts of Entropy, free energy, enthalpy, redox potential. Tools and Technique in Biology: Microscopy: Principles and applications of light, phase contrast fluorescence, Polarizing, Scanning and transmission electron microscopy: cytophotometry and flow cytometry, video-micrometry, camera lucida and photomicrography for skill development.

UNIT-II

Centrifuges: Basic principles of sedimentation – Types of centrifuges and their uses – Preparative and Analytical centrifuge – Sedimentation equilibrium method, Sedimentation velocity method – Density Gradient Centrifugation – Isokinetic and isopycnic centrifugation – Differential centrifugation. (iii) Chromatography: General principles – Adsorption and Partition Chromatography – Thin layer chromatography, paper chromatography, Gasliquid chromatography (GLC), High performance liquid chromatography (HPLC), Ion-Exchange Chromatography and Affinity Chromatography for skill development.

UNIT-III

Electrophoresis: General principles – apparatus, methods and applications – Moving boundary, electrophoresis and zone electrophoresis – Paper electrophoresis thin layer column chromatography – starch gel, agarose gel and polyacrylamide gel electrophoresis – SDS, Non-SDS, DIS for skill development.

UNIT-IV

Spectroscopic techniques, X-ray diffraction Autoradiography: (i) Spectroscopic techniques: General principles, Types of spectra and their biochemical usefulness, visible and UV spectrophotometry, Infra-red (IR) Circular Dichroism (CD), NMR, ESR and mass spectroscopy, Spectrofluorimetry, Luminometry, Atomic/Flame spectrophotometry, Atomic absorption and plasma emission spectroscopy. for skill development.

UNIT-V

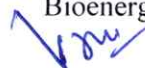
X-ray diffraction – Principles and Application: Radiation Biophysics: Types of radiation, interaction between radiation and matter – dosimetry,- radiation detectors. (iii). Autoradiography – Light microscope auto radiography – fibre auto radiography, High resolution auto radiography for skill development.

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Bioenergetics, Tools and Technique in Biology:

Bioenergetics for skill development.



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CO2: Centrifuges: Basic principles of sedimentation – Types of centrifuges and their uses **to provide employability and entrepreneurship.**

CO3: Understand Electrophoresis: General principles – apparatus, methods and applications **knowledge for better employability in industry.**

CO4: Understand the importance of Spectroscopic techniques, X-ray diffraction Autoradiography **for provide employability and entrepreneurship.**

CO5: Understand the concept of X-ray diffraction – Principles and Application: Radiation Biophysics **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG804B (XIII) Non-insect Pests, Pests of Farm Animals and Plant Disease Vectors

L: T: P 3:0:0

Objectives: To familiarize the students with principles of insect pest management, including concept and philosophy of IPM. Train students in computation of ETL, implementing IPM programmes.

UNIT-I

History of developments in the area of insects as vectors of plant pathogens. Important insect vectors and their characteristics; mouth parts and feeding processes of important insect vectors. Efficiency of transmission for skill development.

UNIT-II

Transmission of plant viruses and fungal pathogens. Relation between viruses and their vectors. Transmission of plant viruses by aphids, whiteflies, mealy bugs and thrips. for skill development.

UNIT-III

Transmission of mycoplasma and bacteria by leaf hoppers and plant hoppers. for skill development.

UNIT-IV

Transmission of plant viruses by psyllids, beetles and mites. for skill development.

UNIT-V

Epidemiology and management of insect transmitted diseases through vector for skill development.

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts History of developments in the area of insects as vectors of plant pathogens **for skill development.**

CO2: Transmission of plant viruses and fungal pathogens. **to provide employability and entrepreneurship.**

CO3: Understand the Transmission of mycoplasma and bacteria by leaf hoppers and plant hoppers **for better employability in industry.**

CO4: Understand the importance of Transmission of plant viruses by psyllids, beetles and mites **for provide employability and entrepreneurship.**

CO5: Understand the concept of Epidemiology and management of insect transmitted diseases through vector **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

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| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|--------------------------|----------------------|-------------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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4. 1983. Pest and Vector Management in the Tropics. English Language Books Series, Longman, London.

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BAG804B(XIV)

Commercial Bee Keeping

L: T: P 3:0:0

Objective-The main aim of NBB is the complete development of Beekeeping by promoting Scientific Beekeeping in India to increase the productivity of crops through pollination and increase the honey production to increase the income of Beekeepers or honey farmers.

UNIT I

Systematic and Taxonomy – Classification and characteristics of Phylum Arthropoda & Characteristics of Hexapoda, Morphology of insects. for skill development.

UNIT II

Major pests in following crops: a. Scientific name, b. Symptoms of insect damages, c. Lifecycle of insect/pests, d. Management of insects, Cash crops- Sugarcane, cotton, Cereals- Paddy, Jawar, Bajra, Wheat, Maize, Pulses Pigeonpea, Oilseed crops- Ground nut for skill development.

UNIT III

Soya bean, Fruits- Mango, Grapes, Pomegranate, Citrus, Banana, Vegetable crops- Brinjal, Okra, Tomato, Chilly, Onion, Cabbage & cauliflower for skill development.

UNIT IV

Honey Bees and Bee-keeping, Silkworms for skill development.

UNIT IV

Sericulture & Pests of stored products and their management for skill development.

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Systematic and Taxonomy – Classification and characteristics of Phylum **for skill development.**

CO2: Major pests in following crops: a. Scientific name **to provide employability and entrepreneurship.**

CO3: Understand the Soya bean, Fruits- Mango, Grapes, Pomegranate, Citrus, Banana, Vegetable crops- Brinjal, Okra, Tomato, Chilly, Onion, Cabbage & cauliflower **for better employability in industry.**

CO4: Understand the importance Honey Bees and Bee-keeping, Silkworms **for provide employability and entrepreneurship.**

CO5: Understand the concept of Sericulture & Pests of stored products and their management **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

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Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|--------------------------|----------------------|-------------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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2. The World of the Honey Bee. Kalyani Publ., New Delhi. Ganga G. 2003. Comprehensive Sericulture. Vol. II.
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BAG804B (XV)

Soil Physics

L: T: P 3:0:0

Objective: To impart basic knowledge about soil physical properties and processes in relation to plant growth.

UNIT I

Soil as a disperse poly-phase system; mass-volume relationships of soil constituents; sample problems for skill development.

UNIT II

Soil texture; nature and behaviour of soil particles; textural classes; particle-size analysis for skill development.

UNIT III

Soil structure- genesis, classification and evaluation; soil aggregation and dispersion; soil conditioners; soil tilth for skill development.

UNIT IV

Consistency; consistency limits; soil strength and its measurement; swelling and shrinkage; soil compaction; soil crusting; phenomenon and implications. for skill development.

UNIT V

Soil water retention; soil water constants; energy concept of soil water; different components of soil water potential; measurement of soil water content and potential; soil-moisture characteristics; hysteresis for skill development.

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Soil as a disperse poly-phase system; mass-volume relationships of soil constituents **for skill development.**

CO2: Soil texture; nature and behaviour of soil particles; textural classes **to provide employability and entrepreneurship.**

CO3: Understand the Soil structure- genesis, classification and evaluation; soil aggregation and dispersion; soil conditioners; soil tilth **for better employability in industry.**

CO4: Understand the importance of Consistency; consistency limits; soil strength and its measurement; swelling and shrinkage; soil compaction; soil **for provide employability and entrepreneurship.**

CO5: Understand the concept of Soil water retention; soil water constants; energy concept of soil water; different components of soil water potential **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

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Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG804B(XVI)

Nano Science and Technology for Agriculture

L: T: P 3:0:0

Objective: The rapid growth of the integrated circuit (IC) industry has led to the emergence of nano microelectronics process engineering as a new advanced discipline. Thus, there is a need to impart quality education at a sufficiently advanced level in the current state of art Nano electronics and design discipline.

UNIT I

Precision agriculture: concepts and techniques; their issues and concerns for Indian agriculture; Geo-informatics- definition, concepts, tool and techniques; their use in Precision Agriculture for skill development.

UNIT II

Crop discrimination and Yield monitoring, soil mapping; fertilizer recommendation using geospatial technologies; Spatial data and their management in GIS; Remote sensing concepts and application in agriculture; Image processing and interpretation; Global positioning system (GPS). for skill development.

UNIT III

Components and its functions; Introduction to crop Simulation Models and their uses for optimization of Agricultural Inputs; STCR approach for precision agriculture; Nanotechnology, definition, concepts and techniques, brief introduction about nanoscale effects, nano-particles, nano-pesticides, nano-fertilizers, nano-sensors, Use of nanotechnology in seed, water, fertilizer, plant protection for scalingup farm productivity for skill development.

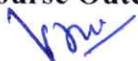
UNIT IV

Practical Introduction to GIS software, spatial data creation and editing. Introduction to image processing software. Visual and digital interpretation of remote sensing images. Generation of spectral profiles of different objects. Supervised and unsupervised classification and acreage estimation. Multispectral remote sensing for soil mapping for skill development.

UNIT V

Creation of thematic layers of soil fertility based on GIS. Creation of productivity and management zones. Fertilizers recommendations based of VRT and STCR techniques. Crop stress (biotic/abiotic) 13 monitoring using geospatial technology. Use of GPS for agricultural survey. Formulation, characterization and applications of nanoparticles in agriculture. Projects formulation and execution related to precision farming.

Course Outcomes:



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Students completing this course will be able to:

CO1: Understand the basic concepts of Precision agriculture: concepts and techniques; their issues and concerns for Indian agriculture **for skill development.**

CO2: Crop discrimination and Yield monitoring, soil mapping **to provide employability and entrepreneurship.**

CO3: Understand the Introduction to crop Simulation Models and their uses for optimization of Agricultural Inputs; STCR approach **for better employability in industry.**

CO4: Understand the importance of Practical Introduction to GIS software, spatial data creation and editing. Introduction to image processing software **for provide employability and entrepreneurship.**

CO5: Understand the concept of Nature and Functions, professional Management of Co-operatives **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |

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| | | | |
|------------|---|---|---|
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG-854B(I)

Commercial Floriculture Lab

L: T: P:0:0:2

List of Experiments; Minimum 08 of the followings

1. Selection of varieties, cultural practices and propagation of orchids
2. Selection of varieties, cultural practices and propagation of anthurium
3. Post harvest handling techniques in orchids and anthurium
4. Selection of varieties, cultural practices and propagation and post harvest handling techniques in rose
5. Selection of varieties, cultural practices and propagation and post harvest handling techniques in chrysanthemum and carnation
6. Selection of varieties, cultural practices and propagation and post harvest handling techniques in tuberose.
7. Selection of varieties, cultural practices and propagation and post harvest handling techniques in gladiolus
8. Selection of varieties, cultural practices and propagation and post harvest handling techniques in heliconia and alpinia
9. Selection of varieties, cultural practices and propagation and post harvest handling techniques in gerbera
10. Selection of varieties, cultural practices and propagation and post harvest handling techniques in jasmine
11. Selection of varieties, cultural practices and propagation and post harvest handling techniques in crossandra
12. Selection of varieties, cultural practices and propagation and post harvest handling techniques in marigold
13. Seed production in annual flower crops
14. Seed production in annual flower crops
15. Selection of varieties, cultural practices and propagation of important cut foliage
16. Harvesting and post harvest handling techniques in important cut foliage
17. Integrated pest and disease management practices in cut flowers and foliage
18. Production techniques of dry flowers
19. Production of pot plants
20. Hi-tech cultivation of commercial flowers
21. Visit to commercial production units of orchids, anthurium and other cut flowers
22. Visit to production units of field grown commercial flowers
23. Visit to flower markets and auction centers
24. Preparation of projects for starting a commercial unit of cut flowers and foliage

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BAG-854B(II) Commercial Fruit and Vegetable Production Lab L: T: P:

0:0:2

List of Experiments; Minimum 08 of the followings

1. Study of morphology of different parts of vegetable crops
2. Cultural operations in raising vegetables
3. Practices in use of plant growth regulators, weedicides, mulching, manures and fertilizers, irrigation and fertigation
4. Training, pruning, staking and techniques of commercial vegetable production
5. Visit to commercial vegetable farms
6. Commercial propagation methods in mango, citrus, sapota and guava; fertilizer application
7. Field observation of deficiency symptoms of micronutrients in major fruit crops
8. Irrigation and fertigation practices in fruit crops
9. Canopy management in mango (pruning, training, application of paclobutazol, etc.)
10. Training and pruning in grape, ber and pomegranate
11. Flower and fruit drop and their control in mango and citrus
12. Hormonal application to improve fruit set, fruit thinning, fruit size and quality in major fruit crops
13. Harvesting indices in mango, banana, papaya and grape
14. Harvesting methods in fruit crops
15. Harvesting, desaping, pre-cooling, grading and palletisation and storage in mango
16. Ripening methods in mango and banana
17. Working out benefit cost ratios for mango, citrus, banana and grape
18. Visit to commercial orchards of important fruit crops, local cold storage and export units of various fruits



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BAG-854B (III) Protected Cultivation of Horticultural Crops Lab L: T: P:0:0:2

List of Experiments; Minimum 08 of the followings

1. Study of structures utilized for protected culture
2. Cost estimation of different growing structures
3. Design and orientation of poly/greenhouses
4. Study of various inputs utilized for protected culture
5. Type of containers used in protected culture
6. Use of substrate and preparation of substrate for protected floriculture
7. Fertigation system in greenhouse
8. Maintenance of cooling and heating system in greenhouses
9. Special horticultural practices in protected floriculture
10. Special lecture on-Protected cultivation of rose
11. Protected cultivation of chrysanthemum
12. Protected cultivation of carnation and gerbera
13. Protected cultivation of orchids and anthurium
14. Protected cultivation of lily
15. Protected cultivation of cut foliage
16. Visit to cut flower industry
17. Practical Examination

V. M.

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BAG854B (IV) Principles of Animal Nutrition and feed Technology Lab L: T: P 0:0:2

List of experiments; Minimum 08 of the followings

1. Familiarization of various feed stuff, fodders and their selection.
2. Preparation and processing of samples for chemical analysis – herbage, faeces, urine and silages.
3. Weende's System of analysis – Estimation of dry matter, total ash, acid insoluble ash, crude protein, ether extract, crude fibre, nitrogen free extract.
4. Calcium and phosphorus in feed samples.
5. Demonstration of detergent methods of forage analysis.
6. Qualitative detection of undesirable constituents and common adulterants of feed.
7. Demonstration of laboratory ensiling of green fodders.
8. Silage pit preparation.

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List of Experiments; Minimum 08 of the followings

1. Visit Directorate of Extension in your university and enquire about extension programmes being implemented / coordinated by Directorate. Develop an evaluation proposal of any one programme using 'Ten Steps in Programme Evaluation' discussed in the theory class.
2. Review any comprehensive programme evaluation report from published sources. Evaluate the report and write your observations following the 'Evaluating the Evaluation' approach.
3. Identify at least four agriculture development programmes and their objectives being implemented in your state. Write two attributes each on Strengths, Weaknesses, Opportunities and Threats related to the identified programme objectives in the SWOT grid.
4. Identify an on-going development programme and make-out 6 activities from the programme.
5. Draw a Gantt chart for 12 months programme activities.
6. Write a report on evaluation hierarchy levels and indicators as per Bennett's hierarchy of evaluation for any development programme or project.
7. Develop LFA four-by-four grid for any development programme or project with activities, outputs, purpose and goal and objectively verifiable indicators, means of verification & assumptions.
8. Visit a nearby KVKs / ATIC. Select any agriculture technology with package of practices and extension advisory services promoted by KVK / ATIC. Identify impact assessment indicators for social and behavioral indicators, socio-cultural indicators, technology level indicators, environmental impact assessment indicators and institutional impact assessment indicators.



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BAG854 B (VI)

Agricultural Input Marketing Lab

L: T: P 0:0:2

List of experiments; Minimum 08 of the followings

1. Visit to seed organizations (MSSC, Mahabeej, NSC etc.)
2. Study of production, pricing, transportation and promotion of seeds.
3. Study of Chemical fertilizer production Units. Public sector, Co-operative Sector, Private Sector Companies and their products range.
4. Study of Demand and Supply of chemical fertilizers and gap therein. Types of agro-chemicals used as agricultural inputs
5. Visit to Agricultural Exhibition.
6. Role of Agricultural exhibitions in marketing of Agro-inputs.
7. Market survey of local market to know potentiality of different crop seeds.
8. Fertilizers, various plant protection chemicals and farm machineries



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BAG854B (VII) Morphology and Systematics of Crop Plants Lab L: T: P 0:0:2

List of experiments; Minimum 08 of the followings

1. Classification of plants and species
2. Systems of classification
3. Artificial system by Hutchinson and Engler,
4. Use of flora in identifying plants by utilizing key to plant kingdom
5. Division, sub-division, class, sub-class, series, order
6. Family, genus and species.
7. Introduction to field crops
8. Agricultural classification of field crops.
9. Observing general morphology of roots, stem and leaves
10. Observing general morphology of inflorescence
11. Dlowers stems and pistils
12. Family characters and Botany and economic parts of the crop plants



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BAG854B (VIII) Plant Parasitic Nematods, other non insect pest and their management

Lab

L: T: P 0:0:2

List of experiments; Minimum 08 of the followings.

1. Formulation of insecticides.
2. Classification of Insecticides and hazards.
3. Status of chemical and bio pesticides.
4. India according to CIB Central Insecticide Board, Insecticide act.
5. Plant protection appliances, Production of Bio-pesticides.
6. To Study of the HaNPV, SINPV & Bio-agents- Chrysoperla.
7. To Study of the Cryptolaemus and Trichogramma.
8. Visit to pesticide manufactures / Agro service centre and make visit report.


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BAG-854B (IX)

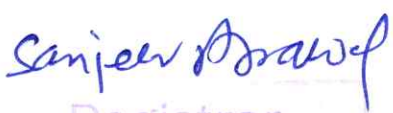
Plant Tissue Culture Lab

L: T: P: 0:0:2

List of Experiments; Minimum 08 of the followings

1. Requirements for plant tissue culture laboratory;
2. Techniques in plant tissue culture;
3. Media components and media preparation;
4. Aseptic manipulation of various explants, observations on the contaminants occurring in media, interpretations;
5. Inoculation of explants, callus induction and plant regeneration; Standardizing the protocols for regeneration;
6. Hardening of regenerated plants; Establishing a greenhouse and hardening procedures;
7. Visit to commercial micropropagation unit;
8. Transformation using Agrobacterium strains;
9. GUS assay in transformed cells/ tissues;
10. DNA isolation, DNA purity and quantification tests;


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BAG854B (X)

Transgenic Plants Lab

L: T: P: 0:0:2

List of Experiments; Minimum 08 of the followings

1. Isolation of DNA/ RNA;
2. Purity determinations, purification of total DNA from animal tissues;
3. Base pair estimation;
4. Agarose gel electrophoresis;
5. Quantitative enzyme profile of alimentary canal;
6. DNA and Protein profiling – molecular markers, PCR Handling
7. DNA fingerprinting of flower crop varieties;
8. Restriction mapping of DNA;
9. Demonstration of PCR, RFLP and RAPD techniques.


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BAG854B (XI)

Plant Biotechnology Lab

L: T: P 0:0:2

List of experiments; Minimum 08 of the followings

1. Media components and preparations
2. Sterilization techniques and Inoculation of various explants
3. Callus induction and Plant Regeneration
4. Micro propagation of important crops and hardening / acclimatization of regenerated plants
5. Anther, Embryo and Endosperm culture
6. Somatic embryogenesis and synthetic seed production
7. Isolation of protoplast
8. Demonstration of Isolation of DNA
9. Demonstration of Gene transfer techniques, direct methods
10. Demonstration of Gene transfer techniques, indirect methods



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BAG854B (XII)


Biophysics Lab

L: T: P 0:0:2

List of experiments; Minimum 08 of the followings

1. Measurement and error
2. Osmosis
3. Specific heat
4. Radioactive decay
5. Lenses and lens systems
6. Microscopy system
7. Salt bridge
8. Propagation of electrical impulses in neural tissue
9. Electrical impedance dispersion
10. Action potential


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BAG854B (XIII) Non-Insect Pests, Pests of Farm Animals and Plant Disease Vectors

Lab L: T: P 0:0:2

List of experiments; Minimum 08 of the followings

1. Methods of preventing and controlling rodents;
2. Harmful birds and ways to controlling them
3. Land snails and ways to controlling it
4. Study about the pests of farm animals like ticks,
5. Identification of common vectors of plant pathogens- aphids, leafhoppers, whiteflies, thrips, beetles, culturing and handling of vectors;
6. Demonstration of virus transmission through vectors- aphids, leafhoppers and whiteflies
7. Study of Orders of insects and their identification using taxonomic keys.
8. Keying out families of insects of different major Orders: Odonata, Orthoptera, Blattodea, Mantodea, Isoptera, Hemiptera, Thysanoptera, Phthiraptera, Neuroptera, Coleoptera, Diptera, Lepidoptera and Hymenoptera.
9. Field visits to collect insects of different orders



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BAG854B (XIV)

Commercial Bee Keeping Lab

L: T: P 0:0:2

List of experiments; Minimum 08 of the followings

1. Collection and preservation of insects,
2. Identification of insects and their damages,
3. Morphology of insects- Types of legs,
4. Types of mouthparts,
5. Types of antenna & Dissection of cockroach (Digestive system)
6. Management of insects, Cash crops- Sugarcane
7. Lifecycle of insect/pests
8. Characteristics of Hexapoda


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BAG854B (XV)

Soil Physics Lab

L: T: P 0:0:2

List of experiments; Minimum 08 of the followings

1. Particle-size analysis by hydrometer method and international pipette method
2. Determination of particle density and bulk density of soils
3. Soil water content determinations
4. Measurement of soil water potential by using tensiometer
5. Soil-moisture characteristics • Aggregate analysis by wet and dry sieving methods
6. Measurement of Atterberg limits
7. Measurement of soil strength
8. Determination of saturated and unsaturated hydraulic conductivity


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BAG854B (XVI) Nano Science and Technology for Agriculture Lab L: T: P 0:0:2

List of experiments; Minimum 08 of the followings

1. To study about the geo-informatics techniques and their use in Precision Agriculture.
2. To study about the soil mapping;
3. To study about the fertilizer recommendation using geospatial technologies;
4. To study about the global positioning system (GPS).
5. To study about the nano-particles, nano-pesticides, nano-fertilizers, nano-sensors,
6. Practical Introduction to GIS software, Introduction to image processing software.
7. To study about the fertilizers recommendations based of VRT and STCR techniques;
8. Use of GPS for agricultural survey.
9. Formulation, characterization and applications of nanoparticles in agriculture.



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BAG-804 C (I)
3:1:0

Post Harvest Technology of Horticultural Crops

L: T: P

Unit I

Importance of post harvest technology of horticultural crops – meaning and importance of post harvest technology – causes of post harvest losses.

Unit II

Maturity – definition – physiological maturity and horticultural maturity / harvest maturity – determination of harvest maturity – chemical methods and physiological methods – determination of maturity – methods – skin colour, optical methods, shape, size, aroma, leaf changes, abscission, firmness, juice content, oil content, moisture content, sugars, starch content, acidity and specific gravity.

Unit III

Harvesting and post harvesting of fruits and vegetables – methods of harvesting (hand and mechanical) – their advantages and disadvantages – curing – degreening – precooling – washing and drying – sorting and grading – disinfestation – post harvest treatments and waxing.

Unit IV

Pre harvest factors affecting the quality and post harvest shelf life of fruits and vegetables – environmental factors (temperature, light, rain, wind and humidity) – mineral nutrients (Ca, Mg, Zn, B and Cu) – growth regulators (auxins, gibberellins, cytokinins, ethylene and growth retardants) – rootstock, irrigation, pruning, thinning, girdling, varieties, pests and diseases, pesticides, maturity and mechanical injury.

Unit V

Marketing and transportation of important fruit and vegetable crops.

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Precision agriculture: concepts and techniques; their issues and concerns for Indian agriculture **for skill development.**

CO2: Crop discrimination and Yield monitoring, soil mapping **to provide employability and entrepreneurship.**



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CO3: Understand the Introduction to crop Simulation Models and their uses for optimization of Agricultural Inputs; STCR approach **for better employability in industry.**

CO4: Understand the importance of Practical Introduction to GIS software, spatial data creation and editing. Introduction to image processing software **for provide employability and entrepreneurship.**

CO5: Understand the concept of Nature and Functions, professional Management of Co-operatives **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG-804 C (II) Unit Operation for Quality, Value Addition, L: T: P 3:1:0
Processing and Development of New Products

Unit I

Unit operations involved in the post harvest management of quality fruits and vegetables- harvesting operations, equipments used for washing, sorting grading and packaging

Unit II

Exposure to unit operations involved in pasteurization, canning, aseptic packaging of fruit and vegetable products, familiarization with various pasteurizers, plate heat exchanger, tabular pasteurizers and their operation in food processing

Unit III

Unit operations involved in evaporation, exposure to various harvesting devices and their functions, introduction to cannery equipment and layout. Unit operations involved in the manufacture of instant coffee powder, instant tea powder, instant fruit milk shake milk powders

Unit IV

Unit operations in freeze drying and preparation of freeze dried products. Role of osmotic dehydration, preparation of osmotically dehydrated pineapple slices, sapota, aonla, exposure to various equipments involved in food processing through visit to processing factories

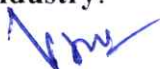
Unit V

Exposure to packaging machine and their operations related to horticultural products, layout of processing unit, laws and regulations in establishing processing units

Course Outcomes:

Students completing this course will be able to:

- CO1:** Understand the basic concepts of Precision agriculture: concepts and techniques; their issues and concerns for Indian agriculture **for skill development.**
- CO2:** Crop discrimination and Yield monitoring, soil mapping **to provide employability and entrepreneurship.**
- CO3:** Understand the Introduction to crop Simulation Models and their uses for optimization of Agricultural Inputs; STCR approach **for better employability in industry.**


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CO4: Understand the importance of Practical Introduction to GIS software, spatial data creation and editing. Introduction to image processing software **for provide employability and entrepreneurship.**

CO5: Understand the concept of Nature and Functions, professional Management of Co-operatives **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

References

1. Pantastico, Er. B. (Ed.), 1975. Postharvest Physiology, Handling and Utilization of Tropical and Subtropical Fruits and Vegetables. Westport, AVI Publ. Co., 560 pp.
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3. Ryall, A.L. and W.T. Pentzer, 1982. Handling, Transportation and Storage of Fruits and Vegetables. Vol. 2, Fruits and Tree Nuts. Westport, AVI Publ Co. 610pp.
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BAG-804 C (III) Processing of Cereals, Pulses and Oil Seeds Crops L: T: P: 3:1:0

Unit I

Structure, composition and nutritional significance of cereals – Rice and Wheat. Major processed rice products –puffed, flaked, popped rice – Instant rice, breakfast cereals. By-products of rice – rice bran, rice polishing, rice bran oil. Wheat products – Types of flour – pasta products – Instant food mixes from cereals.

Unit II

Nature, composition and nutritional significance of pulses – processing of pulses – decortications, germination, and fermentation – processed products of pulses. Significance of pulses – Malted products from cereals and pulses.

Unit III

Presence of antinutritional factors in pulses – ill effects –methods of removal of antinutritional factors – soy products – milk substitutes.

Unit IV

Primary and secondary processing of cereals, pulses, nuts and oilseeds – need and significance

Unit V

Preparation and processing of value added products and by-products from rice, wheat, millets, common pulses, nuts and oilseeds. Their use and economic significance – cost benefit analysis

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Precision agriculture: concepts and techniques; their issues and concerns for Indian agriculture **for skill development.**

CO2: Crop discrimination and Yield monitoring, soil mapping **to provide employability and entrepreneurship.**

CO3: Understand the Introduction to crop Simulation Models and their uses for optimization of Agricultural Inputs; STCR approach **for better employability in industry.**

CO4: Understand the importance of Practical Introduction to GIS software, spatial data creation and editing. Introduction to image processing software **for provide employability and entrepreneurship.**

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CO5: Understand the concept of Nature and Functions, professional Management of Co-operatives **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG804C(IV)

Bio-waste Management

L: T: P 3:0:0

Objective: To ensure proper storage of the wastes as per their classification, characterization, and mode of treatment and disposal. To analyze and decide the treatment and disposal scheme of wastes as per the guidelines of MOEF, CPCB & DPCC.

UNIT I

Composting. Definition- Solid waste suitable for composting – Methods of composting – vermicomposting -Mineralization process in composting – Biochemistry of composting – Factors involved -Infrastructure required – maturity parameters – value addition – application methods for skill development.

UNIT II

Definition – potential agro residues and their characteristics for briquetting – fundamental aspects and technologies involved in briquetting – economic analysis of briquetting – setting up of briquetting plant-appliances for biomass briquettes for skill development.

UNIT III

For complete syllabus and results, class timetable and more pls. It's a light weight, easy to use, no images, no pdfs platform to make students life easier. for skill development.

UNIT-IV

Biogas and Bio Ethanol Production. Screening of suitable lingo cellulosic substrate for biogas production -determination of bio-energy potential of agro-waste by estimating total solids – volatile solids for skill development.

UNIT V

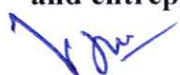
Calorific value- per cent total carbohydrates, moisture, lignin and cellulosic contents – preparation of feed stocks for anaerobic bio- digestion – types of digesters – factors affecting – nutrient value and utilization of biogas slurry. Ethanol production from lingo cellulosic wastes – Processing of Biomass to Ethanol -pretreatment-fermentation-distillation for skill development.

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Precision agriculture: concepts and techniques; their issues and concerns for Indian agriculture **for skill development.**

CO2: Crop discrimination and Yield monitoring, soil mapping **to provide employability and entrepreneurship.**



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CO3: Understand the Introduction to crop Simulation Models and their uses for optimization of Agricultural Inputs; STCR approach **for better employability in industry.**

CO4: Understand the importance of Practical Introduction to GIS software, spatial data creation and editing. Introduction to image processing software **for provide employability and entrepreneurship.**

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| | PO1 | PO2 | PO3 | PO4 | PO5 |
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| CO1 | 3 | 3 | 1 | 1 | 3 |
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| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG804C (V)

Process and Media of Communication

L: T: P 3:0:0

Objective: Communication is fundamental to the health and operation of an organization. A clear communication process creates a space and platform for people to share ideas, information, facts and feelings. It improves the reliability and coordination of information. As a result, key stakeholders can make informed decisions quickly and efficiently.

UNIT-I

Important Concepts: Understanding Society in Indian Context, Characteristics of Indian Society, Nation State and Nationalism, Modernism, Post Modernism, Feminism for skill development.

UNIT-II

Indian Social Movements: Social Reformers in India, Role of Media in Social Movements for skill development.

UNIT-III

Globalization: Global Issues, Technology and social divide, Digital divide, Information Rich and Information Poor. E-waste, Environmental issues and Global warming. for skill development.

UNIT-IV

National Issues: Poverty, Economic disparities, Urban issues, Rural Issues, Communal issues, Geo politics, and Political issues, Migration, Malnutrition, Women and Children's Issues, Unemployment for skill development.

UNIT-V

Conflict Areas: Naxalism, Terrorism, Religious Conflicts, And Caste Conflicts, Law and order for skill development.

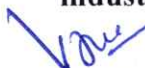
Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Precision agriculture: concepts and techniques; their issues and concerns for Indian agriculture **for skill development.**

CO2: Crop discrimination and Yield monitoring, soil mapping **to provide employability and entrepreneurship.**

CO3: Understand the Introduction to crop Simulation Models and their uses for optimization of Agricultural Inputs; STCR approach **for better employability in industry.**


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CO4: Understand the importance of Practical Introduction to GIS software, spatial data creation and editing. Introduction to image processing software **for provide employability and entrepreneurship.**

CO5: Understand the concept of Nature and Functions, professional Management of Co-operatives **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG804C (VI)

Modern Methods in Crop Breeding

L: T: P 3:0:0

Objective: Hybridization: The most frequently employed plant breeding technique is hybridization. The aim of hybridization is to bring together desired traits found in different plant lines into one plant line via cross pollination.

UNIT-I

Heterosis and Inbreeding: Definitions. Inbreeding depression – effect of inbreeding – degree of inbreeding depression – homozygous and heterozygous balance. Heterosis and luxuriance – manifestation of heterosis for skill development.

UNIT-II

Hybrids and synthetic varieties: Procedure – development of inbreds – evaluation of inbreds – phenotypic and top cross test, single cross evaluation, production of hybrid seeds- double cross and polycross hybrids for skill development.

UNIT-III

Mutation Breeding: Introduction – spontaneous and induced mutation- mutation effects- molecular basis- base substitution addition and deletion. Mutagens- physical – chemical and radiation dose effects of non ionizing radiation on biological targets for skill development.

UNIT-IV


Polyploidy breeding: Definitions, types of changes in chromosome number – euploids and aneuploids – auto and allopolyploids. Aneuploids- nullisomics, monosomics, double monosomics and trisomics. Autopolyploids, autotriploids, autotetraploids, autohexaploids and autooctoploids for skill development.


UNIT-V

Distant hybridization: History, barriers in production of distant hybrids-failure of zygote formation-failure of zygote development-lethal genes-phenotypic disharmony between two parental genomes- chromosome elimination- incompatible cytoplasm-mendelism abortion-failure of hybrid seedling development for skill development.

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BAG804C (VII) Agriculture Finance and Business Management L: T: P 3:0:0

Objective: Define Agricultural business, finance, credit, marketing, planning, farm records and accounts. Explain the components and various sectors of Agricultural management and management decisions

UNIT-I

Agricultural Finance: Meaning, scope and significance, credit needs and its role in Indian agriculture; Agricultural credit: Meaning, definition, need, classification. Credit analysis: 3 R's, 5 C's and 7 P's of credits, loan repayment plans; Banking: Role in modern economy, types of banks, functions of commercial banks, credit creation policy for skill development.

UNIT-II

Sources of agricultural finance: Institutional and non-institutional sources, commercial banks, social control and nationalization of commercial banks, Micro financing including SHGs, KCC. Lead bank scheme, RRBs, Scale of finance and unit cost for skill development.

UNIT-III

An introduction to higher financing institutions (RBI, NABARD, ADB, IMF, World Bank, Deposit Insurance and Credit Guarantee Corporation of India): Genesis, objectives, and functions, Recent development in agricultural credit for skill development.

UNIT-IV

Concept of financial statements – Balance Sheet and Income and expenditure statement, profit and loss account. Basic guidelines for preparation of project reports, bank norms; Time value of money; Project appraisal techniques-PBP, BCR, NPV, IRR, Break even analysis, SWOT analysis; Agricultural Cooperation – Meaning, brief history of cooperative development in India, objectives, principles of cooperation, significance of cooperatives in Indian agriculture for skill development.

UNIT-V

Agricultural Cooperation in India- credit, marketing, consumer and multi-purpose cooperatives, farmers' service cooperative societies, processing cooperatives, farming cooperatives, cooperative warehousing; role of ICA, NCUI, NCDC, NAFED for skill development.

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Precision agriculture: concepts and techniques; their issues and concerns for Indian agriculture **for skill development.**

CO2: Crop discrimination and Yield monitoring, soil mapping **to provide employability and entrepreneurship.**


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CO3: Understand the Introduction to crop Simulation Models and their uses for optimization of Agricultural Inputs; STCR approach **for better employability in industry.**

CO4: Understand the importance of Practical Introduction to GIS software, spatial data creation and editing. Introduction to image processing software **for provide employability and entrepreneurship.**

CO5: Understand the concept of Nature and Functions, professional Management of Co-operatives **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

References:

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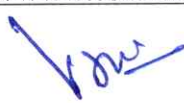
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BAG804C (VIII) Stored Grain Pest Managements of Pulses

L: T: P 3:0:0

Objective: Scientific name, order, family, distribution, identification, host range and nature of damage, biology and bionomics, and management of important arthropod pests.

UNIT-I

Polyphagous insect pests: Locust, grasshopper, white grub, termite and red hairy caterpillar
Rice: Brown plant hopper, yellow stem borer, rice hispa for skill development.

UNIT-II

Sorghum: Shootfly; Maize: Stem borer; Sugarcane: Pyrilla, whitefly, shoot borer
Pulses: Gram pod borer, cutworm. Tobacco: Tobacco caterpillar for skill development.

UNIT-III

Oilseeds: Mustard aphid, sawfly, painted bug, groundnut aphid, soybean girdle beetle, castor semilooper, castor capsule borer, sesame leaf and capsule borer for skill development.

UNIT-IV

Pests of vegetables crops: Brinjal- brinjal shoot and fruit borer; Tomato Fruit borer (Covered in gram);
Okra- Shoot and fruit borer (Covered in cotton). Potato: Tuber moth. Pea: Stem fly for skill development.

UNIT-V

Cruciferous vegetables: Cabbage caterpillar, diamondback moth, semilooper, tobacco caterpillar
(Covered in tobacco for skill development).

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Precision agriculture: concepts and techniques; their issues and concerns for Indian agriculture **for skill development.**

CO2: Crop discrimination and Yield monitoring, soil mapping **to provide employability and entrepreneurship.**

CO3: Understand the Introduction to crop Simulation Models and their uses for optimization of Agricultural Inputs; STCR approach **for better employability in industry.**

CO4: Understand the importance of Practical Introduction to GIS software, spatial data creation and editing. Introduction to image processing software **for provide employability and entrepreneurship.**

CO5: Understand the concept of Nature and Functions, professional Management of Co-operatives **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG804C (IX) Post Harvest Management of Mushroom L: T: P 3:0:0

UNIT-I

Importance of postharvest technology in horticultural crops. Maturity, types of maturity and factors affecting maturity of horticultural crops, maturity indices, harvesting, handling, grading of fruits, vegetables, cut flowers for skill development.

UNIT-II

Plantation crops, medicinal and aromatic plants. Pre-harvest factors affecting quality, factors responsible for deterioration of horticultural produce, physiological and biochemical changes, for skill development.

UNIT-III

Hardening and delaying ripening process. Postharvest treatments of horticultural crops. Quality parameters and specification. Structure of fruits, vegetables and cut flowers related to physiological changes after harvest. for skill development.

UNIT-IV

Methods of storage for local market and export. Pre-harvest treatment and pre-cooling, pre-storage treatments. Different systems of storage, packaging methods and types of packages, recent advances in packaging for skill development.

UNIT-V

Types of containers and cushioning materials, vacuum packaging, cold storage, poly shrink packaging, grape guard packing treatments. Modes of transport for skill development.

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Precision agriculture: concepts and techniques; their issues and concerns for Indian agriculture **for skill development.**

CO2: Crop discrimination and Yield monitoring, soil mapping **to provide employability and entrepreneurship.**

CO3: Understand the Introduction to crop Simulation Models and their uses for optimization of Agricultural Inputs; STCR approach **for better employability in industry.**

CO4: Understand the importance of Practical Introduction to GIS software, spatial data creation and editing. Introduction to image processing software **for provide employability and entrepreneurship.**

CO5: Understand the concept of Nature and Functions, professional Management of Co-operatives **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)


Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG804C(X)

Dimensions of Agriculture Extension

L: T: P 2:0:0

Objective- Extension is fundamentally a system of out-of-school education for adults and youths alike. It is a system where people are motivated through a proper approach to help them by applying science in their daily lives, in farming, home making and community living.

UNIT I

Education- Formal, non-formal and informal education. Extension education- meaning, definition, concepts, characteristics, Terminology in extension .Extension education- objectives, principles, scope and importance for skill development.

UNIT II

Rural development- meaning, definition, concepts, objectives, importance and problems in rural development. Extension programme planning- meaning of planning, programme, importance. Principles and steps in programme development process for skill development.

UNIT III

Monitoring-meaning and types. Evaluation - meaning, definition, Objectives, types and importance . Developmental programmes - Pre independence era- Sriniketan, Sevagram, Marthandam and Gurgaon Post independence era- Firka development, Etawah pilot project and Nilokheri experiment for skill development.

UNIT IV

Community development programme- meaning, definition, concepts, philosophy 10. Community development programme- principles, objectives, similarities and differences between community development and extension education, NES. Panchayat Raj system/ democratic for skill development.

UNIT V

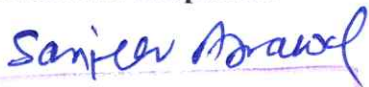
Social justice and poverty alleviation programmes- ITDA, IRDP, SGSY, MGNREGP . Women development programmes- DWCRA, IKP, ICDS, MSY, ANTWA . New approaches in extension- PRA, NATP, ATMA, SREP, ATIC . Privatization of extension, market led extension, RCY, PURA. decentralization and Panchayat Raj –need, three tiers of Panchayat Raj system- powers, functions and organizational setup. Mandal system in A.P . Agricultural developmental programmes- IADP, T&V system-features, WSDP for skill development.

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Precision agriculture: concepts and techniques; their issues and concerns for Indian agriculture **for skill development.**


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CO2: Crop discrimination and Yield monitoring, soil mapping **to provide employability and entrepreneurship.**

CO3: Understand the Introduction to crop Simulation Models and their uses for optimization of Agricultural Inputs; STCR approach **for better employability in industry.**

CO4: Understand the importance of Practical Introduction to GIS software, spatial data creation and editing. Introduction to image processing software **for provide employability and entrepreneurship.**

CO5: Understand the concept of Nature and Functions, professional Management of Co-operatives **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG804C (XI)

Mass Communication

L: T: P 3:0:0

Objective:

The fundamental objective of this course is to educate the students about how develop the rural people economically, socially and culturally. To learn about effective activities about personality development and different Communication skills.

UNIT I

Communication: meaning and definition; Principles and Functions of Communication, models and barriers to communication, process of communication, basic purpose of communication, communication network, types of communication, difference between oral and written communication, 7C's and 4S's of effective communication for skill development.

UNIT II

Media in Development Communication: Understanding the role of traditional and modern media in development communication, Use of folk media, puppetry, exhibition, theatre, posters, Print media (newspapers, books, leaflets, IEC material), radio, television and cinema for skill development.

UNIT III

Government policies and regulations on mass media in India, Planning, organisation, administration and evaluation of Development communication programmes. Understanding and analysis of the ongoing Government and Non-governmental efforts in development communication for skill development.

UNIT IV

Sustainable development needs and strategies. Participatory approaches in development communication. New avenues for development communication - literacy, women and development, human rights, environment. National projects of development communication - SITE, Jhabna etc, case studies on development communication for skill development.

UNIT V

Social advertising and commercial advertising; definitions, need, scope, understanding marketing and social marketing: 3P, 4P and 5P models, terminology of social marketing and social advertising, Similarities and differences between commercial marketing of products, services and social marketing, Approaches of social advertising and marketing, Social advertising as developmental communication model for skill development.

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Precision agriculture: concepts and techniques; their issues and concerns for Indian agriculture **for skill development.**

CO2: Crop discrimination and Yield monitoring, soil mapping **to provide employability and entrepreneurship.**

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CO3: Understand the Introduction to crop Simulation Models and their uses for optimization of Agricultural Inputs; STCR approach **for better employability in industry.**

CO4: Understand the importance of Practical Introduction to GIS software, spatial data creation and editing. Introduction to image processing software **for provide employability and entrepreneurship.**

CO5: Understand the concept of Nature and Functions, professional Management of Co-operatives **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG804C(XII)

Research Methodology

L: T: P 3:0:0

Objective: The purpose of research methodology is to discover answers to questions through the application of scientific procedures. The main aim of research is to find out the truth which is hidden and which has not been discovered as yet. Though each research study has its own specific purpose.

UNIT I

Foundations of Research: Meaning, Objectives, Motivation, Utility. Concept of theory, empiricism, deductive and inductive theory. Characteristics of scientific method - Understanding the language of Research - Concept, Construct, Definition, Variable. Research Process. Problem Identification & Formulation - Research Question - Investigation Question - Measurement Issues - Hypothesis - Qualities of a good Hypothesis- Null Hypothesis & Alternative Hypothesis. Hypothesis Testing - Logic & Importance for skill development.

UNIT II

Research Design: Concept and Importance in Research - Features of a good research design - Exploratory Research Design - concept, types and uses, Descriptive Research Designs - concept, types and uses. Experimental Design: Concept of Independent & Dependent variables for skill development.

UNIT III

Qualitative and Quantitative Research: Qualitative research - Quantitative research - Concept of measurement, causality, generalization, replication. Merging the two approaches. Measurement: Concept of measurement- what is measured? Problems in measurement in research- Validity and Reliability. Levels of measurement- Nominal, Ordinal, Interval, Ratio for skill development.

UNIT IV

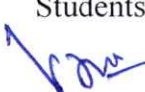
Sampling: Concepts of Statistical Population, Sample, Sampling Frame, Sampling Error, Sample Size, Non Response. Characteristics of a good sample. Probability Sample- Simple Random Sample, Systematic Sample, Stratified Random Sample & Multi-stage sampling. Determining size of the sample- Practical considerations in sampling and sample size. Data Analysis: Data Preparation - Univariate analysis (frequency tables, bar charts, pie charts, percentages), Bivariate analysis- Cross tabulations and Chi-square test including testing hypothesis of association for skill development.

UNIT V

Interpretation of Data and Paper Writing- Layout of a Research Paper, Journals in Computer Science, Impact factor of Journals, When and where to publish? Ethical issues related to publishing, Plagiarism and Self-Plagiarism. Use of Encyclopedias, Research Guides, Handbook etc., Academic Databases for Computer Science Discipline for skill development.

Course Outcomes:

Students completing this course will be able to:


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CO1: Understand the basic concepts of Precision agriculture: concepts and techniques; their issues and concerns for Indian agriculture **for skill development.**

CO2: Crop discrimination and Yield monitoring, soil mapping **to provide employability and entrepreneurship.**

CO3: Understand the Introduction to crop Simulation Models and their uses for optimization of Agricultural Inputs; STCR approach **for better employability in industry.**

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CO5: Understand the concept of Nature and Functions, professional Management of Co-operatives **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |

| | | | |
|-----|---|---|---|
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG804C (XIII)

Plant Health Management

L: T: P 3:0:0

Objectives: To understand the methods of assessing plant diseases and the factors that affect them, to understand the importance of forecasting in plant disease management and to gain knowledge and skill in seed health testing methods

UNIT I

Important Diseases of Orchids and their Management, Recent Advances in the Management of Spike Diseases of Wheat. Diseases of Pearl Millet and their Management, Diseases of Leguminous Trees and their Management, Mulberry Diseases of India and its Management for skill development.

UNIT II

Banded Leaf and Sheath Blight of Maize: A Disease of National Importance. Biology and Management of Dry Root Rot of Pulses Incited by *Macrophomina phaseolina* (Tassi.) Goid, Biology and Management of *Cercospora* Leaf Spot Diseases of Crops *Alternaria* Blight in Rapeseed-Mustard: A Chronic Problem for skill development.

UNIT III

Recent Advances in the Management of Diseases of Pulse Crops, Tillage and Plant Diseases. Apple Diseases and their Management, Cercosporin: A Photoactivated Toxin in Fungal Pathogenesis of Plants, Gummosis of Citrus- Main Cause of Decline in Mandarin, Eco-Friendly Management of Bacterial Wilt of Tomato Caused by *Ralstonia solanacearum* for skill development.

UNIT IV

Phytoplasma Diseases Associated with Ornamental Plants in India, Viral Diseases of Solanaceous Crops, Virus Diseases of Cucurbits, Some Plant Pathogenic *Ditylenchus* species: Their Present Status and Future Strategies for skill development.

UNIT V


Durable Resistance in Plant Disease Management, Using Fungi and Yeasts to Manage Post Harvest Diseases of Perishables, Nanotechnology: An Emerging Approach in Plant Disease Management for skill development.

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Precision agriculture: concepts and techniques; their issues and concerns for Indian agriculture **for skill development.**

CO2: Crop discrimination and Yield monitoring, soil mapping **to provide employability and entrepreneurship.**


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CO3: Understand the Introduction to crop Simulation Models and their uses for optimization of Agricultural Inputs; STCR approach **for better employability in industry.**

CO4: Understand the importance of Practical Introduction to GIS software, spatial data creation and editing. Introduction to image processing software **for provide employability and entrepreneurship.**

CO5: Understand the concept of Nature and Functions, professional Management of Co-operatives **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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3. Plant Health Management: Plant Health Management, 1 August 2012 by Neeta Sharma (Author), H. Singh (Author)

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BAG804C (XIV) Value Chain Management for Organic Product L: T: P 3:0:0

Objectives: Value chain management focuses on understanding what different customers value, measuring inputs and outputs to assess value, and generating higher value for customers and surpluses.

UNIT I

Organic farming, principles and its scope in India; Initiatives taken by Government (central/state), NGOs and other organizations for promotion of organic agriculture for skill development.

UNIT II

Organic ecosystem and their concepts; Organic nutrient resources and its fortification; Restrictions to nutrient use in organic farming; Choice of crops and varieties in organic farming for skill development.

UNIT III

Fundamentals of insect, pest, disease and weed management under organic mode of production for skill development.

UNIT V

Operational structure of NPOP; Certification process and standards of organic farming for skill development.

UNIT V

Processing, leveling, economic considerations and viability, marketing and export potential of organic products for skill development..

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Precision agriculture: concepts and techniques; their issues and concerns for Indian agriculture **for skill development.**

CO2: Crop discrimination and Yield monitoring, soil mapping **to provide employability and entrepreneurship.**

CO3: Understand the Introduction to crop Simulation Models and their uses for optimization of Agricultural Inputs; STCR approach **for better employability in industry.**

CO4: Understand the importance of Practical Introduction to GIS software, spatial data creation and editing. Introduction to image processing software **for provide employability and entrepreneurship.**

CO5: Understand the concept of Nature and Functions, professional Management of Co-operatives **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG804C(XV) Nursery Raising Techniques for Vegetable Crops L: T: P 3:0:0

Objectives: 1. Students will learn about the orientation and planting system.
2. Students know about cultivation of fruit crops and to learn about preparation needed to become posologist.

UNIT I

Importance of vegetables & spices in human nutrition and national economy, brief about origin, area, production, improved varieties for skill development.

UNIT II

Cultivation practices such as time of sowing, sowing for skill development.

UNIT III

Transplanting techniques, planting distance, fertilizer requirements, irrigation, weed management. for skill development.

UNIT IV

Harvesting, storage, physiological disorders, disease and pest control

UNIT V

Seed production of important vegetable and spices. for skill development.

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Precision agriculture: concepts and techniques; their issues and concerns for Indian agriculture **for skill development.**

CO2: Crop discrimination and Yield monitoring, soil mapping **to provide employability and entrepreneurship.**

CO3: Understand the Introduction to crop Simulation Models and their uses for optimization of Agricultural Inputs; STCR approach **for better employability in industry.**

CO4: Understand the importance of Practical Introduction to GIS software, spatial data creation and editing. Introduction to image processing software **for provide employability and entrepreneurship.**

CO5: Understand the concept of Nature and Functions, professional Management of Co-operatives **for skill development.**


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PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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2. JitenderSingh,2016, BasicHorticulture,KalyaniPublishers.RajinderNagar, Ludhiana.
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BAG804C (XVI) Agricultural Development and Policy Analysis L: T: P 3:0:0

Objectives: To achieve self-sufficiency in food production.

2. To increase Agricultural production and income of farmers / farm labours.
3. To promote sustainable use of Natural Resources such as Land and Water.
4. To promote Soil Health Management and Integrated Nutrient Management.

UNIT I

Concept of Entrepreneur, Entrepreneurship Development, Characteristics of entrepreneurs; SWOT Analysis & achievement motivation, Government policy and programs for skill development.

UNIT II

Institutions for entrepreneurship development, Impact of economic reforms on Agribusiness/ Agrienterprises for skill development.

UNIT III

Entrepreneurial Development Process; Business Leadership Skills; developing organizational skill (controlling, supervising, problem solving, monitoring & evaluation) for skill development.

UNIT IV

Developing Managerial skills, Business Leadership Skills (Communication, direction and motivation Skills), Problem solving skill, Supply chain management for skill development.

UNIT V

Total quality management, Project Planning Formulation and report preparation; Financing of enterprise, Opportunities for agri-entrepreneurship and rural enterprise for skill development.

Course Outcomes:

Students completing this course will be able to:

- CO1:** Understand the basic concepts of Precision agriculture: concepts and techniques; their issues and concerns for Indian agriculture **for skill development.**
- CO2:** Crop discrimination and Yield monitoring, soil mapping **to provide employability and entrepreneurship.**
- CO3:** Understand the Introduction to crop Simulation Models and their uses for optimization of Agricultural Inputs; STCR approach **for better employability in industry.**
- CO4:** Understand the importance of Practical Introduction to GIS software, spatial data creation and editing. Introduction to image processing software **for provide employability and entrepreneurship.**
- CO5:** Understand the concept of Nature and Functions, professional Management of Co-operatives **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG-854C(I) Post Harvest Technology of Horticultural Crops Lab

L: T: P: 0:0:2

List of Experiments:

1. Identification of equipment of post-harvest management and processing
2. Handling of equipment of post-harvest management and processing
3. Practices in harvesting, grading, packaging and storage
4. Visit to processing units


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**BAG-854C(II) Unit Operation for Quality, Value Addition, L: T:
P: 0:0:2 Processing and Development Lab**

List of Experiments; Minimum 08 of the followings

1. Familiarization with various postharvest operations
2. Pasteurization of fruit juices and shelf life study
3. Familiarization with various pasteurizers viz plate heat exchangers, tubular pasteurizers, surface scrape pasteurizers
4. Familiarization with various evaporators and their functions and trial runs for various products
5. Visit to canning industries and familiarization with cannery equipments and trial runs for canning various horticultural products
6. Familiarization with spray driers and trials for spray drying instant coffee, tea and cocoa powders
7. Spray drying equipments for instant fruit milk shake powders
8. Familiarization with freeze driers and trial runs freeze drying fruit and vegetable products and their package studies
9. Osmotic dehydration trials using, sugar, syrup and honey for sapota, gooseberry, pineapple and other fruits.
10. Packaging and storage studies in dried products
11. Development of sorption isotherm curves of various dried products and their significance in packaging
12. Exposure to various packaging machines and their functions
13. Familiarization with quality testing equipments in food products including packaging testing instruments
14. Visit to various factories and learning various unit operations


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BAG-854C(III) Processing of Cereals, Pulses and Oil seedsCropsLab L:

T: P: 0:0:2

List of Experiments; Minimum 08 of the followings

1. Processingofcereals–milling,dehulling,parboiling,puffing,roasting,pulverization
2. Processingofpulses–
maltingofpulses,preparationoffermentedproductsfrompulses– preparation of
milksubstitutes
3. Preparation of soyproducts
4. Preparation of bakedproducts
5. Preparationofpastriesandcakes
6. Preparationofsupplementaryfoods–weaningmixes
7. Preparationofextrudedproducts/pastaproducts
8. Preparationofprocessedotherproductsfromcoconutandoilseeds
9. PreparationofBeverages/healthmixes
10. Visittovariousfoodprocessingindustries.


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BAG854C (IV)

Bio-waste Management Lab

L: T: P 0:0:2

List of experiments; Minimum 08 of the followings

1. Methods of composting – vermicomposting;
2. Mineralization process in composting;
3. Biochemistry of composting;
4. Biogas and Bio Ethanol Production;
5. Determination of bio-energy potential of agro-waste by estimating total solids – volatile solids;
6. Calorific value- per cent total carbohydrates, moisture, lignin and cellulosic contents;
7. Preparation of feed stocks for anaerobic bio- digestion – types of digesters – factors affecting – nutrient value and utilization of biogas slurry;
8. Ethanol production from lingo cellulosic wastes;
9. Processing of Biomass to Ethanol -pretreatment-fermentation-distillation.


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BAG854C (V) Process and Media of Communication Lab L: T: P 0:0:2

List of experiments; Minimum 08 of the followings

1. Handling of different communication media,
2. Developing communication skill,
3. Collection of data regarding number of sources used;
4. Channels used and credibility of channels;
5. Visit to AIR and TV center and press.
6. Models of communication,
7. Theories of communication process; directions of communication process;
8. Communication strategy for Agricultural development.
9. Social, psychological and mathematical communication behavior, Communication skill empathy.


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BAG-854 C (VI) Modern Methods in Crop Breeding Lab L: T: P:

0:0:2

List of Experiments; Minimum 08 of the followings

1. Floral biology, emasculation, pollination techniques in rice, maize, pigeon pea, soybean, sesame, cotton; in wheat, oats, barley, chickpea, rajma, rapeseed mustard, sunflower;
2. Study of range of variation for yield and yield components;
3. Study of segregating populations in cereal, pulses and oilseed crops;
4. Learning on the crosses between different species; attempting crosses between black gram and green gram;
5. Evaluating the germplasm of cotton for yield, quality and resistance parameters, learning the procedures on development of Bt cotton;
6. Use of descriptors for cataloguing; Learning on the crosses between different species;
7. Trait based screening for stress resistance;
8. Learning on the Standard Evaluation System (SES) and des


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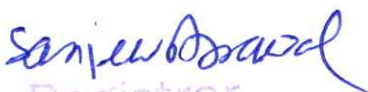

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BAG854C (VII) Agriculture Finance and Business Management Lab L: T: P 0:0:2

List of experiments; Minimum 08 of the followings

1. Factors governing use of Capital and identification of credit needs;
2. Estimations of credit needs and comparison with scale of finance and unit costs;
3. Preparations and analysis of loan proposals;
4. Types of repayment plans;
5. Study of PACS,
6. Study of DCCB,
7. Study of Apex Banks,
8. Study of RRBs,
9. Study of CBs,
10. Study of NABARD.


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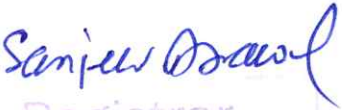

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BAG854C (VIII) Stored Grain Pest Management of Pulses Lab L: T: P 0:0:2

List of experiments; Minimum 08 of the followings

1. Identification of pests,
2. Damage symptoms and management of pulses,
3. Coleopteran pests of stored products
4. Biology of coleopteran pests
5. Damage of coleopteran pests
6. Lepidopteran pests of stored products
7. Biology of lepidopteran pests
8. Damage of lepidopteran pests


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BAG854C (IX) Post Harvest Management of Mushroom Lab L: T: P 0:0:2

List of experiments; Minimum 08 of the followings

1. Methods of harvesting mushrooms
2. Post harvest treatment and preservation of mushrooms
3. Packaging and processing of mushrooms
4. Different methods of processing, canning and dehydration
5. Mushroom recipes - preparation
6. Design and layout of mushroom farm
7. Cost analysis of mushroom farm
8. Preparation of projects
9. Market survey to assess the potentiality for various mushrooms
10. Organization setup at financial management, record keeping and store management
11. Use of mushrooms in bioremediation
12. Bio-waste management with mushroom fungi
13. Trainings to be conducted to farmers
14. Popularization through seminars and symposia etc.
15. Evaluation of the local production units to assess the targets achieved.


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BAG854C(X) Dimensions of Agriculture Extension Lab. L: T: P 0:0:2

List of experiments; Minimum 08 of the followings

1. Visit to a village to study ongoing developmental programmes
2. Visit to a village to study ongoing developmental programmes
3. Visit to Panchayat Raj institutions to study the functioning of Gram Panchayat (GP)
4. Visit to Panchayat Raj institutions to study the functioning of Mandal Praja Parishad (MPP)
5. Visit to Panchayat Raj institutions to study the functioning of Zilla Praja Parishad (ZPP)
6. Visit to study the DRDA
7. Visit to Water shed development project area
8. Visit to a village to study the self help groups of DWCRA


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BAG854C (XI)

Mass Communication Lab

L: T: P: 0:0:2

List of Experiments; Minimum 08 of the followings

1. Identify and suggest the suitable keywords for a product
2. Identifying best practices for Social Media Marketing, including platform level best practices
3. Creating Fan Pages in Social media platforms
4. Creating channel on YouTube
5. Updating the profile on YouTube Channel
6. Types of videos and different platforms of video creation
7. Uploading videos on YouTube
8. Promotion of videos
9. Promotion of product on YouTube
10. Review of analytics of product promotion
11. Presentation of multimedia practice experience



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BAG-854 C (XII) Research Methodology Lab

L: T: P: 0:0:2

List of Experiments; Minimum 08 of the followings

1. Analysis of data obtained from CRD, RBD, LSD;
2. Analysis of factorial experiments with confounding;
3. Analysis of factorial experiments without confounding;
4. Analysis with missing data;
5. Split plot design;
6. Strip plot designs;
7. Transformation of data;
8. Fitting of response surfaces.
9. Balanced incomplete block design;
10. Groups of experiments.
11. Simple random sampling,
12. Stratified random sampling,
13. Systematic random sampling.



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BAG854C (XIII)

Plant Health Management Lab

L: T: P 0:0:2

List of experiments; Minimum 08 of the followings

1. Introduction to Plant Diseases
2. Diagnosis of diseased Plants
3. Integrated Plant Health Management
4. Viral Diseases of Plants
5. Bacterial Diseases of Plants
6. Fungal and Fungal-like Diseases of Plants
7. Nematode Diseases of Plants
8. Parasitic Higher Plants
9. Sanitation and Phytosanitation (SPS)
10. Importance of SPS in Global Movement of Plant Materials


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BAG854C (XIV) Value Chain Management for Organic Product Lab L: T: P 0:0:2

List of experiments; Minimum 08 of the followings

1. Organic Farming: Concepts and principles of organic farming;
2. Key indicators of sustainable agriculture;
3. Transition to organic agriculture.
4. Production Management: Rotation design for organic system;
5. Input management; Plant protection measures;
6. Organic crop management: field crops, horticulture and plantation crops.
7. Livestocks Management: Input management; Feed and fodder; Animal health.
8. Organic Standards and Marketing:
9. Standards of organic agriculture;
10. Organic certification,
11. Processing and marketing.


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BAG-854 C (XV) Nursery Raising Techniques for Vegetable Crops Lab

L: T: P: 0:0:2

List of Experiments; Minimum 08 of the followings

1. Preparation of nursery beds for raising vegetable seedlings.
2. Seed treatment of vegetable crops.
3. Sterilization of soil for seed sowing.
4. Seedling raising in different containers and media.
5. Hardening of seedlings.
6. Transplanting of vegetable seedlings.
7. Calculation of seed germination percentage and other related germination parameters.
8. Methods of planting of asexually propagated vegetable crops like pointed gourd, sweet potato, Elephant foot yam, potato, onion, garlic, etc.
9. Cost of seedling production in different vegetable crops.
10. Cost of establishing a commercial vegetable seedling nursery, grafting techniques in vegetable crops.



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BAG-854 C (XVI) Agricultural Development and Policy Analysis Lab

L: T: P: 0:0:2

List of Experiments; Minimum 08 of the followings

1. To study about the National water policy in India
2. To study about the National seed policy in India
3. To study about the National fertilizer policy in India
4. To study about the National credit policy in India
5. To study about the National crop insurance policy in India
6. To study about the Development Issues – Population, Food Security, Rural Poverty, Inequality and Environmental Concerns.
7. Estimation of Trade Gains- Estimation of competitive and comparative measures like NPC, EPC, ERP and DRC.
8. Estimation of Effect of Tariff, Export Subsidy, Producer Subsidy, Import Quota and Export Voluntary Restraints on National Welfare.
9. Estimation of Ricardian Model, Terms of Trade and Exchange rate.
10. Gini-coefficient and Lorenz Curve.



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BAG805A

Agrochemicals

L:T:P 3:0:0

Objective: To impart comprehensive knowledge about the chemicals used for agricultural purposes.

Unit-I

An introduction to agrochemicals, their type and role in agriculture, effect on environment, soil, human and animal health, merits and demerits of their uses in agriculture, management of agrochemicals for sustainable agriculture.

Unit-II

Herbicides-Major classes, properties and important herbicide. Fate of herbicides.

Unit-III

Fungicides - Classification – Inorganic fungicides - characteristics, preparation and use of sulfur and copper, Mode of action-Bordeaux mixture and copper oxychloride.

Organic fungicides- Mode of action- Dithiocarbamates-characteristics, preparation and use of Zineb and maneb. Systemic fungicides- Benomyl, carboxin, oxycarboxin, Metalaxyl, Carbendazim, characteristics and use.

Unit-IV

Fertilizers and their importance. Nitrogenous fertilizers: Feedstocks and Manufacturing of ammonium sulphate, ammonium nitrate, ammonium chloride, urea. Slow release N-fertilizers. Phosphatic fertilizers: feedstock and manufacturing of single superphosphate. Preparation of bone meal and basic slag. Potassic fertilizers: Natural sources of potash, manufacturing of potassium chloride, potassium sulphate and potassium nitrate.

Mixed and complex fertilizers: Sources and compatibility-preparation of major, secondary and micronutrient mixtures. Complex fertilizers: Manufacturing of ammonium phosphates, nitrophosphates and NPK complexes. Fertilizer control order. Fertilizer logistics and marketing.

Unit-V

Plant bio-pesticides for ecological agriculture, Bio-insect repellent.

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of an introduction to agrochemicals for skill development.

CO2: Herbicides-Major classes, properties and important herbicides to provide employability and entrepreneurship.

CO3: Understand the Fungicides - Classification and Inorganic fungicides for better employability in industry.

CO4: Understand Fertilizers and their importance **for provide employability and entrepreneurship.**

CO5: Understand the concept Plant bio-pesticides for ecological agriculture **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG805B

Biopesticides and Biofertilizers

L:T:P 3:0:0

Objective: To educate about the principles and application of biopesticides and biofertilizers in order to protect environment, soil fertility and human health.

Unit-I

History and concept of biopesticides. Importance, scope and potential of biopesticide.

Definitions, concepts and classification of biopesticides viz. pathogen, botanical pesticides, and biorationales.

Unit-II

Botanicals and their uses. Mass production technology of bio-pesticides. Methods of application of biopesticides. Methods of quality control and Techniques of biopesticides.

Impediments and limitation in production and use of biopesticide.

Unit-III

Biofertilizers - Introduction, status and scope. Structure and characteristic features of bacterial biofertilizers- *Azospirillum*, *Azotobacter*, *Bacillus*, *Pseudomonas*, *Rhizobium* and *Frankia*; Cyanobacterial biofertilizers- *Anabaena*, *Nostoc*, *Hapalosiphon* and fungal biofertilizers- AMmycorrhiza and ectomycorrhiza. Nitrogen fixation -Free living and symbiotic nitrogen fixation.

Unit-IV

Mechanism of phosphate solubilization and phosphate mobilization, K solubilization. Production technology: Strain selection, sterilization, growth and fermentation, mass production of carrier based and liquid biofertilizers.

Unit-V

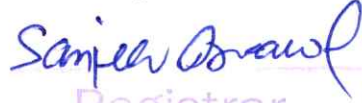
FCO specifications and quality control of biofertilizers. Application technology for seeds, seedlings, tubers, sets etc. Biofertilizers -Storage, shelf life, quality control and marketing. Factors influencing the efficacy of biofertilizers.

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Precision agriculture: concepts and techniques; their issues and concerns for Indian agriculture **for skill development.**


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CO2: Crop discrimination and Yield monitoring, soil mapping **to provide employability and entrepreneurship.**

CO3: Understand the Introduction to crop Simulation Models and their uses for optimization of Agricultural Inputs; STCR approach **for better employability in industry.**

CO4: Understand the importance of Practical Introduction to GIS software, spatial data creation and editing. Introduction to image processing software **for provide employability and entrepreneurship.**

CO5: Understand the concept of Nature and Functions, professional Management of Co-operatives **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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1. Hand book of Organic Farming and Biofertilizers - A.C.Gaur
2. Anwar. A. 2017. Biopesticides and Bioagents: Novel Tools for Pest Management. CRC Press.
3. Singh. 2014. Advances and Plant-pesticides. Springer India
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BAG805C

Agro Waste Management

L:T:P 3:0:0

Objective: To provide an understanding of the technology for waste and bi-product utilization of agriculture waste.

UNIT-I

Characterization and utilization of by-products from cereals, pulses, oilseeds, fruits, vegetables, plantation, dairy, eggs, meat, fish and poultry processing industries. Elements of importance in efficient management of wastes from aforesaid food industries.

UNIT-II

Waste utilization in various industries, furnaces and boilers run on agricultural wastes and byproducts, briquetting of biomass as fuel, production of charcoal briquette, generation of electricity using surplus biomass, producer gas generation and utilization.

UNIT-III

Concept, scope and maintenance of waste management and effluent treatment, Temperature, pH, Oxygen demands (BOD, COD), fat, oil and grease content, metal content, forms of phosphorous and sulphur in waste waters, microbiology of waste, other ingredients like insecticide, pesticides and fungicides residues.

UNIT-IV

Waste treatment and disposal, design, construction, operation and management of institutional community and family size biogas plants, concept of vermin-composting, Pretreatment of waste: sedimentation, coagulation, flocculation and floatation,

UNIT-V

Secondary treatments: Biological and chemical oxygen demand for different food plant waste– trickling filters, oxidation ditches, activated sludge process, rotating biological contractors, lagoons. Tertiary treatments: Advanced waste water treatment process, Effluent treatment plants.

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Characterization and utilization of by-products from cereals for skill development.


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CO2: Waste utilization in various industries, furnaces and boilers run on agricultural wastes and byproducts **to provide employability and entrepreneurship.**

CO3: Understand the Introduction to Concept, scope and maintenance of waste management and effluent treatment, Temperature, pH, Oxygen demands **for better employability in industry.**

CO4: Understand the importance of Waste treatment and disposal, design, construction, operation and management of institutional community and family size biogas plants **for provide employability and entrepreneurship.**

CO5: Understand the concept of Secondary treatments: Biological and chemical oxygen demand for different food plant waste– trickling filters **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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3. Industrial microbiology by L.E.Casida Jr
4. Environmental pollution control engineering by C.S.Rao.
5. Food processing waste management by green and Kramer (AVI)

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BAG-805 (D)

Vermicompost Production Technology

L: T: P 2:0:0

Objectives: To impart knowledge on vermicompost production technology for skill Employability and entrepreneurship development

UNIT I

Definition of Vermicompost. Importance of Vermicompost in organic farming **for skill development**

UNIT II

Importance of earthworms for vermicomposting. Classification of earth worms **for better employability in industry**

UNIT III

Digestion system of earthworm. Behavior of earth worm. Reproduction in earthworm

UNIT IV

Commercial management of earthworm and Vermiculture. Preparation of Vermicompost **for better employability in industry**

UNIT V

Factors affecting the quality of Vermicompost. Economics of vermicomposting. Problems and remedies of vermicomposting **for better employability in industry**

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of vermicomposting **for skill development.**

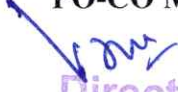
CO2: Understand the Importance of earthworms for vermicomposting **to provide employability and entrepreneurship.**

CO3: Understand the Science of earthworm **for better employability in industry.**

CO4: Understand the commercial production of earthworms and compost **for provide employability and entrepreneurship.**

CO5: Understand the problem solution and economics **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)


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Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping(Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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12. Mishra, R. C. 1998. *Perspectives in Indian Apiculture*. Agro botanica, Bikaner, Rajasthan. Sardar Singh. 1962. *Bee Keeping in India*. ICAR, New Delhi.

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BAG-805 (E)

Hatchery Management

L: T: P 2:0:0

Objectives: To impart knowledge on housing, flooring and management of poultry. They also learn incubation and hatching of eggs for skill Employability and entrepreneurship development

Unit I

Poultry housing systems - cage vs floor system, litter management and lighting for poultry, rearing turkey, duck and quails, backyard poultry **to provide employability and entrepreneurship**

Unit II

Management of chicks, growing, laying and breeding flocks, broiler production, selection and culling of laying flocks. Health management. Management of birds during disease outbreaks **to provide employability and entrepreneurship**

Unit III

Procuring, care and pre-incubation storage of hatching eggs - Method of incubation, sanitation disinfection and management of hatchery. Bio-security in poultry farms **to provide employability and entrepreneurship**

Unit IV

Embryonic development and factors affecting fertility and hatchability of eggs. **to provide skill**

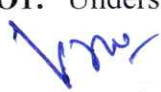
Unit V

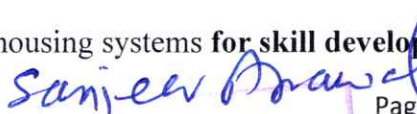
Chick sexing, packing and hatchery business - Transporting management of farm and hatchery waste **to provide employability and entrepreneurship**

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Poultry housing systems **for skill development.**


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CO2: Management of chicks, growing, laying and breeding flocks **o provide employability and entrepreneurship.**

CO3: Understand the Procuring, care and pre-incubation storage of hatching eggs - **knowledge for better employability in industry.**

CO4: Understand the importance of weed management in agriculture and also about advantages and disadvantages of herbicide usage **for provide employability and entrepreneurship.**

CO5: Understand the concept of embryonic development and factors affecting fertility **for skill development.**

PO-CO Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG805 F Methods of Extension Research & Evaluation L:T:P 3(2-0-1)

Objective: To understand the methods of extension research and evaluation in practical manners.

Unit I

Evaluation- meaning, types, principles, importance criteria, evidence & objectives. Research – the scientific methods, meaning, characteristics, types, objectives **for development of skills and employability.**

Unit II

Characteristics and problems of extension research, selection of research problems guidelines, sources, motivating factors, problematic situations **for development of skills.**

Unit III

Hypothesis: meaning, importance, characteristics of hypothesis. Variable – meaning and types of variables. Measurement – meaning and level of measurement. Validity & reliability of measuring devices objectives **for development of skills and employability.**

Unit IV

Research Design –meaning, design of Social research including experimental design. Tools of data Collection- schedules, questionnaires, observation, case study, content analysis objectives **for skills development and employability.**

Unit V

Sampling-types, procedure, merits and demerits, interviewing techniques, Tabulation and classification of data. Steps involved in thesis writing, writing bibliography, references and footnote **for skills development and employability.**

Course outcomes:

Students completing this course will be able to:

CO1: On successful completion of this course a student will be able to: Understand the advances in extension research and evaluation for **development of skills.**

CO2: Understand all about the identification of research problems in extension **for development of skill and employability.**


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CO3: Understand the hypothesis and variables in extension research and evaluation **for skill development and employability.**

CO4: Understand about the research design for extension research and evaluation **for skill development and employability.**

CO5: Understand the sampling techniques in extension research **for skill development, entrepreneurship and employability.**

PO-CO Mapping (Please √ wherever required)

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 3 | 1 | 1 |
| CO2 | 3 | 3 | 3 | 1 | 1 |
| CO3 | 3 | 3 | 3 | 3 | 1 |
| CO4 | 3 | 3 | 3 | 3 | 1 |
| CO4 | 1 | 3 | 1 | 1 | 3 |

CO-Curriculum Enrichment Mapping (Please √ wherever required)

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 3 | 3 | 1 |
| CO3 | 3 | 3 | 1 |
| CO4 | 3 | 3 | 1 |
| CO5 | 3 | 3 | 3 |


Reference Books

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2. Scientific Survey and Social Research by Pauline V. Young
3. Research Method in Extension Education by Suwnati Mulay

- <https://www.g-fras.org/en/knowledge/gfras-publications.html?download=669:manual-on-good-practices-in-extension-research-and-evaluation>
- <http://aims.fao.org/news/good-practices-extension-research-and-evaluation>
- <https://archives.joe.org/joe/2002december/a1.php>

- <https://www.crispindia.org/manual-on-good-practices-in-extension-research-evaluation/>
- https://dae.portal.gov.bd/sites/default/files/files/dae.portal.gov.bd/publications/295f75c5_f491_4f9c_bd63_86f3268e231d/Extension_Mannual_Chapt10.pdf


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BAG-805 G Introduction of Sericulture

L: T: P 2:0:0

Objectives: To learn the Sericulture for skill Employability and entrepreneurship development

UNIT-I

Sericulture – history and development to **provide skill**

UNIT-II

Types of silkworms in India – morphology, biology. Rearing of silkworms to **provide employability and entrepreneurship**

UNIT-III

Host plants and their cultivation. Diseases and enemies of silkworm and their control to **provide employability and entrepreneurship**

UNIT-IV

Use of biotechnology in sericulture. Scope of sericulture in India to **provide employability and entrepreneurship**

UNIT-V

Recent advances in sericulture research to **provide employability and entrepreneurship**

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of sericulture for skill development.

CO2: Understand the Types of silkworms in India to **provide employability and entrepreneurship**.

CO3: Understand the Host plants and their cultivation knowledge for better employability in industry.



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CO4: Understand the importance and Use of biotechnology in sericulture **for provide employability and entrepreneurship.**

CO5: Understand the Recent advances in sericulture research **for skill development.**

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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13. David, B. V. and Kumarawami, T. 1978. *Elements of Economic Entomology* Popular Book Depot, Madras.
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1. Groul, R.A. 1963. *The Hive and the Honeybee*. Dadani and Sons. Inc. Illinois.
2. Jolly, M. S. 1986. *Economics of Sericulture Under Irrigated Conditions*, CSTRI, Mysore.

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5. Mishra, R. C. 1998. *Perspectives in Indian Apiculture*. Agro botanica, Bikaner, Rajasthan. Sardar Singh. 1962. *Bee Keeping in India*. ICAR, New Delhi.

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BAG-805H

Genetic Engineering

L: T: P 2:0:0

Objectives: To learn the Genetic engineering advanced improvement methods through biotechnological approaches for skill Employability and entrepreneurship development

UNIT-I

Genetic engineering-principles and methods to provide employability and entrepreneurship

UNIT-II

Identification and isolation of genes. DNA cloning strategies. Characteristics of vectors - plasmids, phages and cosmids as cloning vehicles, PCR techniques for cloning to provide employability and entrepreneurship

UNIT-III

Separation and isolation of nucleic acids and proteins, sequencing to provide employability and entrepreneurship

UNIT-IV

Enzymes of molecular cloning - exo and endo nucleases, restriction enzymes, classes of restriction enzymes, mode of action. Methylation ligases to provide employability and entrepreneurship

UNIT-V

DNA polymerases. preparation and screening of genomic and cDNA libraries. cDNA cloning. Structural and regulatory genes. Antisense RNA-ribozymes to provide employability and entrepreneurship

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts of Genetic engineering-principles and methods for skill development.


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CO2: Understand the Identification and isolation of genes **to provide employability and entrepreneurship.**

CO3: Understand the Separation and isolation of nucleic acids and proteins, sequencing **knowledge for better employability in industry.**

CO4: Understand the importance of Enzymes of molecular cloning - exo and endo nucleases, restriction enzymes, classes of restriction enzymes, mode of action. **for provide employability and entrepreneurship.**

CO5: Understand the concept of DNA polymerases **for skill development.**

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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BAG-805 I

Bio floc Farming

L: T: P 2:0:0

Objectives: To learn the Bio floc Farming and advanced aquaculture production system research for different species globally for skill Employability and entrepreneurship development

Unit I

Introduction: An overview of global aquaculture production, demand- consumption scenario and emerging trends, Present status, Constraints and future prospects in India and the world, Aquaculture practices indifferent parts of the world, Enhancing carrying capacity in culture systems.

Unit II

Biofloc technology: Principles of biofloc, Different carbon sources, Design of aeration system and biofloc reactor, Carrying capacity, C: N ratio, harvesting of biofloc, Biofloc quality and quantity, Biofloc as feed ingredient, Stocking of fish and shellfish species. Bioremediation in wastewater aquaculture.

Unit III

Minimal water exchange aquaculture systems: Principles of closed system farming, RAS, Components, design of mechanical and biological filters for the water reuse system, Sludge removal, disposal of wastes and control of pollution to the environment, Design of RAS, biofiltration and nitrifiers, Suitable cultivable species for indoor culture systems, polyhouses.

Unit IV

Aquaponics: Principles, Components and design of different aquaponics systems, Components in aquaponics, ratio of fish and plants, Water quality and system maintenance, Resource utilization, Nutrient recycling and zero discharge of nutrients.

Unit V

Running water systems: Flow-through system, Raceways (IPR), IMTA, Partitioned Aquaculture Systems (PAS), Aquamimicry systems.

Course Outcomes:

Students completing this course will be able to:

CO1: Understand the basic concepts and an overview of global aquaculture production **for skill development.**

CO2: Define the Biofloc technology: Principles of biofloc **to provide employability and entrepreneurship.**

CO3: Understand the Minimal water exchange aquaculture systems: Principles of closed system farming, **knowledge for better employability in industry.**

CO4: Understand the aquaponics: Principles, Components and design of different aquaponics systems, Components in aquaponics, **for provide employability and entrepreneurship.**

CO5: Understand the concept of running water systems: Flow-through system, Raceways (IPR), IMTA, **for skill development.**

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|-------------------|---------------|------------------------------|
| CO1 | 3 | 1 | 1 |
| CO2 | 1 | 3 | 3 |

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| | | | |
|-----|---|---|---|
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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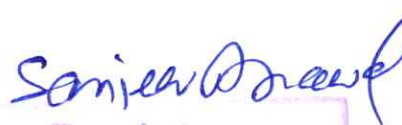
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BAG-805 J Pesticides and plant protection equipment

L: T: P 2:0:0

Objective: Enhance skill Employability and entrepreneurship through the knowledge of Pesticides and plant protection equipment

UNIT-I

History, principles and scope of insect toxicology – Classification and chemistry of pesticides. For skill development

UNIT-II

Mode of action and metabolism of major insecticides and new molecules. Factors affecting toxicity of insecticides. Insecticidal pollution – pathways of environmental contamination. Pesticide resistance. For skill development

UNIT-III

Bio-accumulation and susceptibility of biological materials to insecticides. Insecticidal poisoning – symptoms and treatment. Residue problems caused by insecticides – methods of estimation of residues – management of residue. Plant protection equipments- classification and working principles. Parts of plant protection equipment. For skill Employability and entrepreneurship development

UNIT-IV

Importance of fungicides in plant disease management – familiarization with common terminologies – groups and classification of fungicides – fungicides formulation – spray adjuvants/ auxiliary spray materials – methods of preparation of Bordeaux mixture – Bordeaux paste, Cheshnut compound etc. Methods of application of fungicides – foliar spray, dust – pouring, soil drenching, fumigation – seed dressing etc. Dosage calculation of fungicides – application equipment- For skill Employability and entrepreneurship development

UNIT-V

Rules and registration of fungicides. Phytotoxicity and compatibility of fungicides – safe use

of fungicides , hazards. Bioassay of fungicides- assay of fungicide resistance. For skill Employability and entrepreneurship development

Course Outcomes:

Students completing this course will be able to:

CO6: Understand the History, principles and scope of insect toxicology **for skill development.**

CO7: Define the importance of water in agriculture and ways to improve water use efficiency **to provide employability and entrepreneurship.**

CO8: Bio-accumulation and susceptibility of biological materials to insecticides. Insecticidal poisoning – symptoms and treatment.

CO9: Understand the Importance of fungicides in plant disease management **for provide employability and entrepreneurship.**

CO10: Understand the concept of plant growth and development **for skill development.**

PO-CO Mapping (Please write 3, 2, 1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping (Please write 3,2,1 wherever required)

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|--------------------------|----------------------|-------------------------------------|
| CO1 | 3 | 1 | 1 |

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| | | | |
|------------|---|---|---|
| CO2 | 1 | 3 | 3 |
| CO3 | 1 | 3 | 1 |
| CO4 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 |

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AG805 (K)

ECONOMIC ENTOMOLOGY

L: T: P 2:0:0

Objective: To introduce students to insects of medical importance and the diseases they transmit (such as malaria, and arbovirus), as well as insects of agricultural pests and the economic damage they cause. To describe biology, physiology ecology and genomics of insects, as well as present means used for their control and the diseases they transmit, including recent biotechnology-based applications.

UNIT I

Insect pests of cereals and millets and their management. Polyphagous pests: grasshoppers, locusts, termites, white grubs, hairy caterpillars, and non-insect pests (mites, birds, rodents, snails, slugs etc.).

UNIT II

Insect pests of pulses, tobacco, oilseeds and their management.

UNIT III

Insect pests of fibre crops, forages, sugarcane and their management.

UNIT IV

Fruit Crops- mango, guava, banana, jack, papaya, pomegranate, litchi, grapes, ber, fig, citrus, aonla, pineapple, apple, peach and other temperate fruits.

UNIT V

Vegetable crops- tomato, potato, radish, carrot, beetroot, cole crops, French beans, chow-chow, brinjal, okra, all gourds, gherkin, drumstick, leafy vegetables etc.

Course Outcomes:

Students completing this course will be able to:

CO 1: Attain a solid foundation in insect biology, including general entomology, basic systematic, morphology, physiology, and biodiversity for skill development.

CO 2: Understand evolution and biodiversity generation through macro- and micro-evolutionary processes, including how these processes have formed and diversified insects for skill development and employability.

CO 3: Develop the ability to read and interpret scientific papers in entomology, and critically assess content for development of skill.

CO 4: Attain skills in written and verbal scientific communication for skill development.


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CO 5: Develop the ability to design and perform a scientific study on insects, and to analyze results **for skill development and employability.**

PO-CO Mapping

Note: 3= highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|--------------------------|----------------------|-------------------------------------|
| CO1 | 3 | 1 | 2 |
| CO2 | 3 | 3 | 2 |
| CO3 | 3 | 2 | 2 |
| CO4 | 3 | 2 | 2 |
| CO5 | 3 | 3 | 2 |

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BAG 805 (L) SILKWORM COCOON PRODUCTION TECHNOLOGY L: T: P 2:0:0

Objective: Motivating the farmers to plant high yielding mulberry varieties to increase income and productivity. Imparting training in mulberry cultivation, silkworm rearing and silk reeling. Assist in procurement of improved rearing equipment and construction of separate rearing house. Ensure supply of disease free silkworm seeds.

UNIT I

Developmental biology: Morphology and structure of silkworm egg, fertilization, cleavage, blastoderm, germ band formation, blastokinesis, eye spot and blue egg; diapause development. A general account of silkworm seed, grainages, production and demand trends.

UNIT II

Silkworm seed organisation, significance of seed organization; Basic seed multiplication centres-P4, P3, P2 and P1; Seed areas- identification; concept. Concept of selected seed rearers/villages- Seed Legislation Act- maintenance of seed crops.

UNIT III

Seed cocoon markets- pupal examination, certification of seed cocoon lots- price fixation for seed cocoons. Seed production centres (grainages)- types of grainages- organisation and functions of grainages.


UNIT IV


Plan for model grainage- grainage equipments and their use - Seed production plan. Procurement and transportation of seed cocoons- processing and preservation of seed cocoons- sex separation in seed cocoons. Moth emergence and synchronisation; sex separation in moth; effect of improper synchronisation on egg hatching and quality-safe duration.

UNIT V

Coupling and decoupling; oviposition; method of egg production; refrigeration of male moths; mother moth examinations- individual and mass methods- dry moth examination; environmental conditions for grainage activity.

Course Outcomes:


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Students completing this course will be able to:

CO 1: Learn about parasitological for development of skill.

CO 1: Learn detail the classification and general characteristics of pathogenic/ medically important parasites for skill development and entrepreneurship.

CO 3: Establish the relationship between a parasite and the host and their effects for development of skill. .

CO 4: Students can differentiate the parasitic Protozoan, Trematodes Cestodes, and Nematodes for development of skill.

CO 5: Learn the various types of parasites and hosts for development of skill.

PO-CO Mapping

Note: 3= highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|--------------------------|----------------------|-------------------------------------|
| CO1 | 3 | 2 | 2 |
| CO2 | 3 | 2 | 3 |
| CO3 | 3 | 2 | 2 |
| CO4 | 3 | 1 | 2 |
| CO5 | 3 | 2 | 1 |

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BAG 805 (M)

Agriculture Chemistry

L: T: P 2:0:0

Objective: The goals of agricultural chemistry are to expand understanding of the causes and effects of biochemical reactions related to plant and animal growth, to reveal opportunities for controlling those reactions, and to develop chemical products that will provide the desired assistance or control.

UNIT-I

Biochemistry-introduction, scope and Importance in agriculture. Carbohydrate: Importance and classification of Monosaccharides, Disaccharides and Polysaccharides.

UNIT-II

Lipid: Importance and classification; Structures and properties of fatty acids; lipids. Proteins: Importance of proteins and classification; Structures.

UNIT-III

Amino acid-definition, classification and important function. Structural organization of proteins. Enzymes: General properties; Classification; Mechanism of action;

UNIT-IV

Classification of vitamin structure role and its deficiency symptoms. Introduction to allosteric enzymes. Nucleic acids: Importance and classification;

UNIT-V

Structure of Nucleotides. Metabolism of carbohydrates: Glycolysis.

Course Outcomes:

Students completing this course will be able to:

CO 1: At the end of the course the student will have the basic knowledge and operational capacity for development of skill.

CO 2: the understanding of the major functional and molecular processes in plants (at cellular and organism level), with particular attention for development of skill.

CO 3: the aspects of the soil-plant-atmosphere system, as well as the tools to assess.

CO 4: in terms of physical-chemical and biological soil fertility for development of skill and entrepreneurship.

CO 5: implement strategies to maintain or improve it in relation to the objectives of production and / or environmental goals for development of skill and employability

PO-CO Mapping

Note: 3= highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

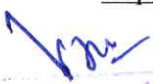
| | Skill Development | Employability | Entrepreneurship Development |
|------------|--------------------------|----------------------|-------------------------------------|
| CO1 | 3 | 2 | 2 |
| CO2 | 3 | 2 | 3 |
| CO3 | 3 | 1 | 1 |
| CO4 | 3 | 2 | 2 |
| CO5 | 3 | 2 | 1 |

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BAG 805 (N)

General Climatology

L: T: P 2:0:0

Objective: To the course is to provide the issues of general climatology - climate formation processes, factors and elements of the climate and their diversity of time and space. Students gain knowledge about the causes of climate change

UNIT-I

Earth atmosphere- its composition, extent and structure; Atmospheric weather variables; Atmospheric pressure, its variation with height; Wind, types of wind, daily and seasonal variation of wind speed, cyclone, anticyclone, land breeze and sea breeze.

UNIT-II

Nature and properties of solar radiation, solar constant, depletion of solar radiation, short wave, long wave and thermal radiation, net radiation, albedo.

UNIT-III

Atmospheric temperature, temperature inversion, lapse rate, daily and seasonal variations of temperature, vertical profile of temperature, Energy balance of earth; Atmospheric humidity. concept of saturation, vapor pressure, process of condensation, formation of dew, fog, mist, frost, cloud; Precipitation, process of precipitation, types of precipitation such as rain, snow, sleet, and hail, cloud formation and classification; Artificial rainmaking.

UNIT-IV

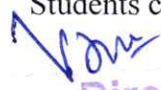
Monsoon- mechanism and importance in Indian agriculture, Weather hazards - drought, floods, frost, tropical cyclones and extreme weather conditions such as heat-wave and cold-wave. Agriculture and weather relations; Modifications of crop microclimate, climatic normals for crop and livestock production.

UNIT-V

Weather forecasting- types of weather forecast and their uses. Climate change, climatic variability, global warming, causes of climate change and its impact on regional and national Agriculture.

Course Outcomes:

Students completing this course will be able to:


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CO 1: Understands complex atmospheric phenomena and climate formation processes for skill development.

CO 2: Possess knowledge about actual problems of climatology discussed in the world literature on the subject for skill development.

CO 3: The area of education in the natural sciences. General academic profile for skill development.

CO 4: Understands of needs for continuous education for all life for skill development.

CO 5: Get skills of statistical and climatologically analysis of meteorological measurements and presents results in the form of a report or a research article for skill development.

PO-CO Mapping

Note: 3= highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|--------------------------|----------------------|-------------------------------------|
| CO1 | 3 | 2 | 2 |
| CO2 | 3 | 2 | 2 |
| CO3 | 3 | 1 | 1 |
| CO4 | 3 | 2 | 2 |
| CO5 | 3 | 2 | 1 |

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BAG 805 O Organic Certification, Standards and Regulation

L: T: P 2:0:0

Objective: Organic certification addresses a growing worldwide demand for organic food. It is intended to assure quality and prevent fraud. For organic producers, certification identifies suppliers of products approved for use in certified operations.

UNIT-I

Organic farming, principles and its scope in India; Initiatives taken by Government (central/state), NGOs and other organizations for promotion of organic agriculture; Organic ecosystem and their concepts;

UNIT-II

Organic nutrient resources and its fortification; Restrictions to nutrient use in organic farming; Choice of crops and varieties in organic farming;

UNIT-III

Fundamentals of insect, pest, disease and weed management under organic mode of production;

UNIT-IV

Operational structure of NPOP; Certification process and standards of organic farming;

UNIT-V

Processing, leveling, economic considerations and viability, marketing and export potential of organic products.

Course Outcomes:

Students completing this course will be able to:

CO 1: To prepare cropping schemes and design and evaluate cropping system and workout in put requirements for crops for skill development.

CO 2: To understand interaction between different farm enterprises for skill development.

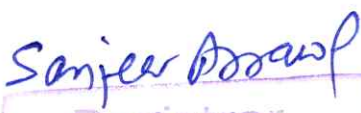
CO 3: To prepare integrated farming system models for different eco system for skill development.

CO 4: To gain knowledge about drought mitigation strategie for skill development.

CO 5: To evaluate different resource management techniques in conservation agriculture for skill development.

PO-CO Mapping


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Note: 3= highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|--------------------------|----------------------|-------------------------------------|
| CO1 | 3 | 2 | 2 |
| CO2 | 3 | 2 | 2 |
| CO3 | 3 | 1 | 1 |
| CO4 | 3 | 2 | 2 |
| CO5 | 3 | 2 | 1 |

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BAG 805 P Fundamentals of Plant Propagations

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Objective: Various techniques of propagation have been developed with the objective to have uniformity in crops, early bearing, increased production, resistance against pests and diseases, and introduce certain characters in new generation. These objectives have made plant propagation interesting and challenging.

UNIT-I

Horticulture - Its definition and branches, importance and scope; horticultural and botanical classification; climate and soil for horticultural crops;

UNIT-II

Plant propagation-methods and propagating structures; Seed dormancy, Seed germination, principles of orchard establishment;

UNIT-III

Principles and methods of training and pruning, juvenility and flower bud differentiation; unfruitfulness; pollination, pollinizers and pollinators;

UNIT-IV

Fertilization and parthenocarpy; medicinal and aromatic plants; importance of plant bio-regulators in horticulture.

UNIT-V

Irrigation – methods, Fertilizer application in horticultural crops.

Course Outcomes:


Students completing this course will be able to:

CO 1: Identify plant structures and how they are involved in propagation for skill development

CO 2: Apply the best treatments and storage conditions for successful seed germination for skill development

CO 3: Demonstrate the procedures for a successful graft for skill development

CO 4: Select the correct propagation method for plants based on their characteristics for skill development


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CO 5: Apply the principles and techniques of plant propagation to the commercial horticulture industry for skill development

PO-CO Mapping

Note: 3= highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|--------------------------|----------------------|-------------------------------------|
| CO1 | 3 | 2 | 2 |
| CO2 | 3 | 2 | 2 |
| CO3 | 3 | 1 | 1 |
| CO4 | 3 | 2 | 2 |
| CO5 | 3 | 2 | 1 |

Reference:

Web Sources:

- <https://agrimoon.com>
- <https://tnau.ac.in>
- <https://iasri.icar.gov.in>
- <https://ecourseonline.iasri.res.in>

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BAG 805 Q

Seed Quality Testing

L: T: P 2:0:0

Objective: To determine the quality i.e. suitability for planting. To identify seed quality problems and their probable cause. To determine the need for drying and processing and specific procedures to be used. To determine, if seed meets established quality standards or labelling specifications.

UNIT I

Seed and seed technology: introduction, definition and importance. Deterioration causes of crop varieties and their control; Maintenance of genetic purity during seed production, seed quality; Definition, Characters of good quality seed, different classes of seed. Foundation and certified seed production of important cereals, pulses, oilseeds, fodder and vegetables.

UNIT II

Seed certification, phases of certification, procedure for seed certification, field inspection. Seed Act and Seed Act enforcement. Duty and powers of seed inspector, offences and penalties. Seeds Control Order 1983, Varietal Identification through Grow Out Test and Electrophoresis, Molecular and Biochemical test.

UNIT III

Detection of genetically modified crops, Transgene contamination in non-GM crops, GM crops and organic seed production. Seed drying, processing and their steps, seed testing for quality assessment, seed treatment, its importance, method of application and seed packing.

UNIT IV

Seed storage; general principles, stages and factors affecting seed longevity during storage. Measures for pest and disease control during storage.

UNIT V

Seed marketing: structure and organization, sales generation activities, promotional media. Factors affecting seed marketing, Role of WTO and OECD in seed marketing. Private and public sectors and their production and marketing strategies.

Outcomes

CO 1: Students are able to know the basic principles involved in seed planting value, germination percentage and seed testing for skill development.

CO 2: Learned the methods of seed production, seed certification, seed legislation, seed act and seed processing for skill development

CO 3: Know the agencies and their functions in the seed production and management at national and state level for skill development

CO 4: Learned the basics of maintenance breeding, seed priming and seed cost-benefit ratio for skill development

CO 5: Students know and can practice the production of hybrid seeds in the important crops of India for skill development

PO-CO Mapping

Note: 3= highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|--------------------------|----------------------|-------------------------------------|
| CO1 | 3 | 2 | 2 |
| CO2 | 3 | 2 | 2 |
| CO3 | 3 | 1 | 1 |
| CO4 | 3 | 2 | 2 |
| CO5 | 3 | 2 | 1 |

Reference:

1. Akhodri. N.M.P. etl (1989). Trainers Manual on Developing entrepreneurial motivation. NIES Bud. New Delhi.
2. ED. Institute of India. (1987). Developing New entrepreneurs. EDII. Ahmedabad. NISIET. libraries. 338.93/EDI.

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3. Rao. T.V. (11974). Development of an entrepreneur: A behavioural model IIM (A)

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BAG805 R Indian Economy, History and Contemporary: Issues L: T: P 2:0:0

Objectives: To study a brief idea about the different sources and the changing interpretations, agricultural planning, marketing structure, and role of Indian economy in agriculture.

UNIT I

Economics: Meaning, scope and subject matter, definitions, activities, approaches to economic analysis; micro and macroeconomics, positive and normative analysis. Nature of economic theory; rationality assumption, concept of equilibrium, economic laws as generalization of human behavior. Basic concepts: Goods and services, desire, want, demand, utility, cost and price, wealth, capital, income and welfare. Agricultural economics: meaning, definition, characteristics of agriculture, importance and its role in economic development.

Unit II

Agricultural planning and development in the country. Demand: meaning, law of demand, demand schedule and demand curve, determinants, utility theory; law of diminishing marginal utility, equi-marginal utility principle. Consumer's equilibrium and derivation of demand curve, concept of consumer surplus. Elasticity of demand: concept and measurement of price elasticity, income elasticity and cross elasticity. Production: process, creation of utility, factors of production, input output relationship.

Unit III

Market structure: meaning and types of market, basic features of perfectly competitive and imperfect markets. Price determination under perfect competition; short run and long run equilibrium of firm and industry, shut down and break even points. Distribution theory: meaning, factor market. Concepts of rent, wage, interest and profit. Laws of returns: Law of variable proportions and law of returns to scale. Cost: Cost concepts, short run and long run cost curves. Supply: Stock v/s supply, law of supply, supply schedule, supply curve, determinants of supply, elasticity of supply.

UNIT IV

Population: Importance, Malthusian and Optimum population theories, natural and socio-economic determinants, current policies and programmes on population control. Money: Barter system of exchange and its problems, evolution, meaning and functions of money, classification of money, money supply, general price index, inflation and deflation. National

income: Meaning and importance, circular flow, concepts of national income accounting and approaches to measurement, difficulties in measurement.

UNIT V

Banking: Role in modern economy, types of banks, functions of commercial and central bank, credit creation policy. Agricultural and public finance: meaning, micro v/s macro finance, need for agricultural finance, public revenue and public expenditure. Tax: meaning, direct and indirect taxes, agricultural taxation, VAT. Economic systems: Concepts of economy and its functions, important features of capitalistic, socialistic and mixed economies, elements of economic planning.

Course Outcomes:

Students completing this course will be able to:

CO1: Understand agriculture as the foundation of economic growth and development.

CO2: Gain knowledge of the causes of regional variations in productivity and production, social and economic inequality, size of land holdings and lack of quality inputs etc.

CO3: To Gain knowledge about market structure, law of variable proportions and cost concept.

CO 4: Students will aware about recent economic affairs such as demonetization, universal basic income, cashless economy, skill and training development schemes, make in India etc

CO5: Study role of modern economy its function, types of bank, agricultural and public finance.

PO-CO Mapping


Note: 3= highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|-----|-------------------|---------------|------------------------------|
| CO1 | 3 | 2 | 2 |
| CO2 | 3 | 2 | 2 |
| CO3 | 3 | 1 | 1 |
| CO4 | 3 | 2 | 2 |
| CO5 | 3 | 2 | 1 |


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BAG805 S Computer Application in Agribusiness and Economics L: T: P: 2:0:0

Objective: To provide information to students about various modern technology and ideas adopted in the agriculture sector.

UNIT-I

Theory Introduction to Computers, Operating Systems, definition and types, Applications of MS-Office for document creation & Editing, Data presentation, interpretation and graph creation.

UNIT-II

Statistical analysis, mathematical expressions, Database, concepts and types, uses of DBMS in Agriculture, World Wide Web (WWW): Concepts and components.

UNIT-III

Introduction to computer programming languages, concepts and standard input/output operations. E-Agriculture, concepts and applications, Use of ICT in Agriculture. Computer Models for understanding plant processes.

UNIT-IV

IT application for computation of water and nutrient requirement of crops, Computer-controlled devices (automated systems) for Agri-input management, Smartphone Apps in Agriculture for farm advises.

UNIT-V

Market price, postharvest management etc; Geospatial technology for generating valuable agri-information. Decision support systems, concepts, components and applications in Agriculture, Agriculture Expert System, Soil Information Systems etc for supporting Farm decisions. Preparation of contingent crop-planning using IT tools.

Course Outcomes:

On successful completion of this course students will:

CO1: Demonstrate a basic understanding of computer hardware and software, how to assess hardware, solve problems using computer software, doing business online, and the inner workings of the Internet.


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CO2: Describe the features and functions of the major categories of applications software (word processing, database, spreadsheet, presentation)

CO3: Create and format text in various communication forms, to create presentation, application of excel in business and how to work with databases.

CO4: Students will get knowledge of market activities and behavior: production, distribution, selling, purchasing etc.

CO5: Understand the technology in agriculture production, yield gap analysis for skill development.

PO-CO Mapping

Note: 3= highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping

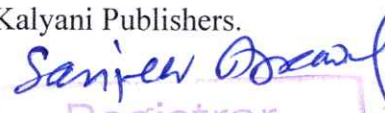
Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|--------------------------|----------------------|-------------------------------------|
| CO1 | 3 | 2 | 2 |
| CO2 | 3 | 2 | 2 |
| CO3 | 3 | 1 | 1 |
| CO4 | 3 | 2 | 2 |
| CO5 | 3 | 2 | 1 |

Suggested readings:

1. Gurvinder Singh, Rachhpal Singh & Saluja KK. 2003. Fundamentals of Computer Programming and Information Technology. Kalyani Publishers.


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3. Kumar A 2015. Computer Basics with Office Automation. IK International Publishing House Pvt Ltd.
4. Rajaraman V & Adabala N. 2015. Fundamentals of Computers. PHI Recommended Latest Online Tutorials (over Internet).

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BAG805 T

ENVIRONMENTAL ECONOMICS

L: T: P: 2:0:0

Objectives: To study the economic approaches to analyse policy options to better manage the environment at both the local and global levels.

UNIT-I

Economic Development and Environment- Inter-relationship between Economic Development and Environment

UNIT-II

Concept of Externalities, Types and Measures to control Negative Environmental Externalities- Pigovian tax, Property Rights and Coase theorem, Carbon tax.

UNIT-III

Environmental Management- Concept, Types and Methods of Environmental Management; Environmental management and people's participation (PPP).

UNIT-IV

Problems of Pollution- Air Pollution and Water Pollution; National Environmental Policy. Social Forestry- Rationale and Benefits.

UNIT-V

Concept of Environmental Values- Use Value, Non-use Value and Option Value. Basics of the valuation of environment- Contingent Valuation Method, Travel Cost Method, Hedonic Price Method.

Course Outcomes:

On successful completion of this course students will:

CO1: To study about, the economics of pollution control, market-based instruments, environmental cost-benefit analysis for skill development

CO2: Understand the environment and the economy, global environmental problems for skill development

CO3: Gain knowledge about environmental management and public private partnership for skill development

CO4: Be able to use economic techniques to analyse environmental problems and to assess environmental policies for skill development

CO5: Have a detailed understanding of the discipline of environmental economics, including its key principles and methods for skill development.

PO-CO Mapping

Note: 3= highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

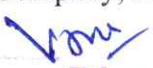
CO-Curriculum Enrichment Mapping

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|--------------------------|----------------------|-------------------------------------|
| CO1 | 3 | 2 | 2 |
| CO2 | 3 | 2 | 2 |
| CO3 | 3 | 1 | 1 |
| CO4 | 3 | 2 | 2 |
| CO5 | 3 | 2 | 1 |

READING BOOK:

1. Chenery H. and TN. Srinivasan(Eds.) (1989), Hand Book of Development Economics, Vol. 1 & 2 Elsevier, Amsterdam.
2. Baumol, W.J. and W.E. Oates (1988), the Theory of Environmental Policy, (2nd Edition), Cambridge University Press, Cambridge.
3. Bromely, D.W. (Ed.) (1995), Handbook of Environmental Economics, Blackwell, London.
4. Hanley, N., J.F. Shogern and B. White (1997), Environmental Economics in Theory and Practice, Macmillan.
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BAG806

Dairy Technology

L:T:P 3:0:0

Objective: To provide in-depth knowledge in various unit operations and basic concepts in dairy processing.

Unit- I

Introduction: Status of Dairy Industry in India. Cooperative Dairying. Operation Floods. Chemical composition, microbiological quality, and nutritional importance of milk and milk product in PFA Act, Rules, 1955 as amended to date.

Unit- II

Receiving and quality assessing of liquid milk in dairy industry for detection of adulteration, decision for acceptance/rejection, and determination of price of the milk.

Unit- III

Standardization and/or processing (pasteurization, homogenisation, sterilization and UHT processing), storage, packaging and distribution of liquid milks: whole, standardized, toned, double-toned, and skim milk. Bactofugation: Theory and microbiology. Recombined, reconstituted, and flavoured milks. Cleaning and sanitization of dairy equipments and plant as a whole.

Unit- IV

Thermal processing of milk: Principles of thermal processing: kinetics of microbial destruction, thermal death curve, Arrhenius equation, D value, Z value, F value, Q10 value. Factors affecting thermal destruction of microorganisms.

Unit- V

Milk Products: Definition, composition, methods of preparation/production, quality and/or grading parameters, packaging, storage characteristics, uses and shelf-life of cream, butter and ghee; evaporated and condensed milks, skimmed, whole and instant milk powders.

Course Outcomes:

On successful completion of this course students will:

CO1: To study about, Introduction: Status of Dairy Industry in India for skill development

CO2: Understand the Receiving and quality assessing of liquid milk in dairy industry for detection of adulteration for skill development

CO3: Gain knowledge about Standardization and/or processing (pasteurization, homogenisation for skill development

CO4: Be able to use economic techniques to analyse environmental problems and to assess environmental policies for skill developmet.

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated


| | Skill Development | Employability | Entrepreneurship Development |
|------------|--------------------------|----------------------|-------------------------------------|
| CO1 | 3 | 2 | 2 |
| CO2 | 3 | 2 | 2 |
| CO3 | 3 | 1 | 1 |
| CO4 | 3 | 2 | 2 |
| CO5 | 3 | 2 | 1 |


References

1. Warner, James N.,(1953), Dairying in India, Calcutta: Mac Millanand Company Limited.
2. Sukumar De,(2006), Outlines of Dairy Technology, 23rd ed., NewDelhi: Oxford University Press.
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BAG856

Dairy Technology Lab

L:T: P 0:0:1

List of Experiments: Minimum 08 of the followings-

1. Sampling of milk and milk products for different tests.
2. Determination of the composition of milk and its properties (fat content, total solids, specific gravity, acidity, pH, viscosity etc)
3. Study of milk plant.
4. To determine the stability of milk for heat processing.
5. Standardization of Milk
6. Detection of Adulteration of Milk, Khoa, Butter and Ice-cream
7. Study of plate heat exchanger and tubular heat exchanger.
8. HTST pasteurization of milk.
9. Centrifugal separation of milk.
10. Spray drying of milk
11. Study of soya milk process and related equipments
12. Visit to milk and milk products processing plant.


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BAG807

Farm Machinery and Power

L:T:P 3:0:0

Objective: To develop skills in the students required developing and modification of indigenous farm machines as per the need of the area and farmers.

Unit- I

Status of Farm Power in India, Sources of Farm Power, I.C. engines, working principles of IC engines, comparison of two stroke and four stroke cycle engines.

Unit-II

Study of different components of I.C.engine, I.C.engine terminology and solved problems, Familiarization with different systems of I.C. engines: Air cleaning, cooling, lubrication, fuel supply and hydraulic control system of a tractor.

Unit-III

Familiarization with Power transmission system: clutch, gear box, differential and final drive of a tractor, Tractor types, Cost analysis of tractor power and attached implement. PTO system in tractor.

Unit-IV

Familiarization with Primary and Secondary Tillage implement, implement for hill agriculture, implement for intercultural operations.

Unit-V

Familiarization with sowing and planting equipment, calibration of seed drill and solved examples, Familiarization with Plant Protection equipment, Familiarization with harvesting and threshing equipment.

Course Outcomes:

On successful completion of this course students will:

CO1: To study about, Status of Farm Power in India, Sources of Farm Power for skill development

CO2: Understand Study of different components of I.C.engine, I.C.engine for skill development

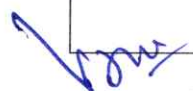
CO3: Gain knowledge about familiarization with Power transmission system: clutch, gear box for skill development

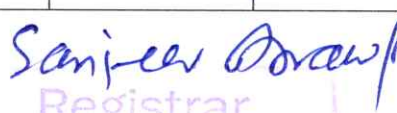
CO4: Be able to use Familiarization with Primary and Secondary for skill development.

CO5: Familiarization with sowing and planting equipment for skill development.

Note: 3= highly correlated, 2= moderately correlated, 1= Less correlated

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|--|-----|-----|-----|-----|-----|
|--|-----|-----|-----|-----|-----|


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| | | | | | |
|------------|---|---|---|---|---|
| CO1 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 3 | 1 | 1 |
| CO4 | 2 | 2 | 3 | 2 | 1 |
| CO5 | 1 | 3 | 3 | 2 | 1 |

CO-Curriculum Enrichment Mapping

Note: 3= Highly correlated, 2= Moderately correlated, 1= Less correlated

| | Skill Development | Employability | Entrepreneurship Development |
|------------|--------------------------|----------------------|-------------------------------------|
| CO1 | 3 | 2 | 2 |
| CO2 | 3 | 2 | 2 |
| CO3 | 3 | 1 | 1 |
| CO4 | 3 | 2 | 2 |
| CO5 | 3 | 2 | 1 |

References

1. Ojha, T.P. and A.M.Michael. *Principles of Agricultural Engineering*, Vol.I. Jain Brothers New Delhi.3rd edition 2001.
2. Sahay, Jagdiswar. *Elements of Agricultural Engineering*. Agro book Agencies1977
3. Singhal, O.P. *Agricultural Engineering*, 19

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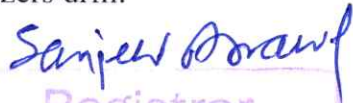
BAG857 Farm Machinery and Power Lab

L:T:P 0:0:1

List of Experiments: Minimum 08 of the followings-

1. Study of different components of I.C. engine.
2. To study air cleaning and cooling system of engine.
3. Familiarization with clutch, transmission, differential and final drive of a tractor or.
4. Familiarization with lubrication and fuel supply system of engine.
5. Familiarization with brake, steering, hydraulic control system of engine.
6. Learning of tractor driving.
7. Familiarization with operation of power tiller.
8. Familiarization with different types of primary and secondary tillage implements: mould plough, disc plough and disc harrow.
9. Familiarization with seed-cum-fertilizer drills, their seed metering mechanism.
10. Familiarization with different types of sprayers and dusters.
11. Familiarization with different inter-cultivation equipment.
12. Familiarization with harvesting and threshing machinery.
13. Calibration of seed drill and seed-cum-fertilizers drill.


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BAG858 Rural Agricultural Work Experience (RAWE) L:T:P 0:0:20

Under this programme, students' performance will be assessed based on model in Semester-VIII.

RAWE Model

| Sr. | RAWE Model | Duration (Week) | Credits |
|-----|--|-----------------|---------|
| 1 | Orientation | 1 | 0+1 |
| 2 | Training / Attachment Agro-industries, Agri-clinics, KVK | 4 | 0+4 |
| 3 | Village attachment | 12 | 0+12 |
| 4 | Project report preparation and examination | 3 | 0+3 |
| | Total | 20 | 20 |

Schedule of RAWE conduct:

Group formation: Maximum 15 students

Allocation of Group's mentor: Individual faculty will be assigned to guide each group

Working activity: Student in group will be allowed to visit rural (village) environment under supervision of their mentor for strengthening practical exposure.

Village attachment time and duration: Working day on Friday and Saturday for 6 weeks.

RAWE Training / Attachment-Agro-industries, Agri-clinics, KVK: During RAWE Programme the students will undergo internship in any one of the following industries / companies / institutes for a period of four weeks during summer months after sixth semester.

Evaluation criteria:

| Course Code | Course Name | Evaluation (Marks) | | |
|-------------|------------------------------------|-------------------------|--------------------------|---------------|
| | | Parameters | Mid Term (Internal exam) | External exam |
| BAG-858 | Rural Agricultural Work Experience | Regularity (Attendance) | 50 | - |
| | | Performance | 50 | - |
| | | Seminar | 50 | - |
| | | Summer Training | 100 | |
| | | Report | 50 | - |
| | | Viva-voce | - | 200 |
| | | Sub Total | 300 | 200 |
| | | Total | | 500 |


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CERTIFICATE

This is to certify that Mr./Ms. **[Name of the student]** has carried out his/her Rural Agricultural Work Experience (RAWE) project in village-**[Name of the village]** of the district-**[Name of the district]** under guidance of **[Name of the mentor]**. The student's performance has been assessed to be (Good/Very Good/Excellent).

Mentor

[Name]

Course Coordinator

[Name]

Dean/Director

[Name]

Date:


Director
School of Agril. Sci. & Engg.
IFTMU, Moradabad.


Registrar
IFTM University
Moradabad

BAG 757 & BAG 758 Experiential Learning Programme L:T:P 0:0:4

Experiential learning programme provides the students an excellent opportunity to develop practical and entrepreneurial skills, and knowledge through meaningful hands on experience, confidence in their ability to design and execute project work.

The students have to register for any two modules, which are as follows-

1. Production Technology for Bio-agents and Bio-fertilizer
2. Seed Production Technology
3. Mushroom Cultivation Technology
4. Soil, Plant, Water and Seed Testing
5. Commercial Beekeeping
6. Poultry Production Technology
7. Commercial Horticulture
8. Floriculture and Landscaping
9. Food Processing
10. Agriculture Waste Management
11. Organic Production Technology
12. Commercial Sericulture
13. Milk and Milk Product

Evaluation of Experiential Learning Programme

| Sl. No. | Aspects of Evaluation | Max. Marks |
|--------------|---|------------|
| 1. | Project Planning and Writing | 20 |
| 2. | Presentation | 10 |
| 3. | Regularity | 10 |
| 4. | Monthly Assessment | 10 |
| 6. | Technical Skill Development | 10 |
| 7. | Entrepreneurship and Business networking skills | 20 |
| 9. | Report Writing Skills | 10 |
| 10. | Final Presentation | 10 |
| Total | | 100 |


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