आईएफटीएम विश्वविद्यालय, मुरादाबाद, उत्तर प्रदेश
IFTM University, Moradabad, Uttar Pradesh
NAAC ACCREDITED

SCHOOL OF SCIENCES

DEPARTMENT OF HOME SCIENCE

MASTER OF SCIENCE (HOME SCIENCE)

TWO YEAR PROGRAMME

[W. E. F. ACADEMIC SESSION: 2020 - 21]

IFTM UNIVERSITY
N.H.-24, Lodhipur Rajput, Delhi Road, Moradabad, Uttar Pradesh-244001
www.iftmuniversity.ac.in

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SCHOOL OF SCIENCES
DEPARTMENT OF HOME SCIENCE

Study & Evaluation Scheme of
Master of Science (Home Science)
[Session 2020-21]

Programme	**:**	**Master of Science (Home Science)**
Course Level	**:**	**PG Course**
Duration	**:**	**Two Year (Four Semester) Full Time**
Medium of Instruction	**:**	**English**
Minimum Required Attendance	**:**	**75%**
Maximum Credits	**:**	**80**

Programme Outcomes (POs):

Students completing this course will be able to:

- To impart the understanding of the concepts of biochemistry, food chemistry and food Microbiology
- To enable the students to learn the methods of assessing human nutritional requirements, nutritional assessment and diet planning
- To apply theoretical concepts in laboratory setting as per standard methods in the above mentioned areas
- To understand the applications of nutritional sciences in clinical interventions, communication for health promotion, food service management, food science and processing
- To acquire skills to undertake systematic research in the area of food science and Nutrition
- To prepare a cadre of professionals to work with governmental and nongovernmental organizations, hospitals,food service institutes and industry in various capacities.
- Ensuring Food safety and quality for consumers
- To enhance self-employment potential through entrepreneurial skill training.

COURSE STRUCTURE
M.Sc.(Home Science)
(Food Science and Nutrition)
YEAR I, SEMESTER- I (2020-2021)

S.N.	Course Code	Course Titles	Periods			EVALUATION SCHEME				Total	Credits
						Internal Exam			External Exam		
			L	T	P	CT	AS +AT	Total			
1.	MHSCFN-101	Statistics and Computer Application	3	1	0	20	10	30	70	100	4
2.	MHSCFN-102	Research Methodology	3	1	0	20	10	30	70	100	4
3.	MHSCFN-103	Food Analysis	3	1	0	20	10	30	70	100	4
4.	MHSCFN-104	Food Science-I	3	1	0	20	10	30	70	100	4
PRACTICALS											
5	MHSCFN-151	Computer Fundamentals	0	0	2	0	30	30	70	100	2
6	MHSCFN-152	Food Analysis	0	0	2	0	30	30	70	100	2
		TOTAL				-	-	-	-	**600**	**20**

YEAR I, SEMESTER- II (2020-2021)

S.N.	Course Code	Course Titles	Periods			EVALUATION SCHEME				Total	Credits
						Internal Exam			External Exam		
			L	T	P	CT	AS +AT	Total			
1.	MHSCFN-201	Advanced Food Science	3	1	0	20	10	30	70	100	4
2.	MHSCFN-202	Food Microbiology	3	1	0	20	10	30	70	100	4
3.	MHSCFN-203	Public Health Nutrition	3	1	0	20	10	30	70	100	4
4.	MHSCFN-204	Therapeutic Nutrition	3	1	0	20	10	30	70	100	4
PRACTICALS											
5	MHSCFN-251	Food Microbiology	0	0	2	0	30	30	70	100	2
6	MHSCFN-252	Food Science	0	0	2	0	30	30	70	100	2
		TOTAL				**-**	**-**	**-**	**-**	**600**	**20**

YEAR II, SEMESTER- III (2020-2021)

S.N.	Course Code	Course Titles	Periods			EVALUATION SCHEME				Total	Credits
						Internal Exam			External Exam		
			L	T	P	CT	AS +AT	Total			
1.	MHSCFN-301	Advanced Human Nutrition	3	1	0	20	10	30	70	100	4
2.	MHSCFN-302	Improving Health and Nutrition	3	1	0	20	10	30	70	100	4
3.	MHSCFN-303	Food Product Development Safety and Quality control	3	1	0	20	10	30	70	100	4
4.	MHSCFN-304	Nutritional Biochemistry	3	1	0	20	10	30	70	100	4
PRACTICALS											
5	MHSCFN-351	Food Product - Development Safety and Quality Control	0	0	2	0	30	30	70	100	2
6	MHSCFN-352	Internship	0	0	0	0	30	30	70	100	2
		TOTAL				-	-	-	-	**600**	**20**

YEAR II, SEMESTER- IV (2020-2021)

S.N.	Course Code	Course Titles	Periods			EVALUATION SCHEME				Total	Credits
						Internal Exam			External Exam		
			L	T	P	CT	AS +AT	Total			
1.	MHSCFN-401	Food Processing and Preservation	3	1	0	20	10	30	70	100	4
2.	MHSCFN-402	Institutional Food Management	3	1	0	20	10	30	70	100	4
3.	MHSCFN-403	Human Physiology	3	1	0	20	10	30	70	100	4
4	MHSCFN-404	Maternal and Child Nutrition	3	1	0	20	10	30	70	100	4
PRACTICALS											
5	MHSCFN-451	Dissertation	0	0	4	0	50	50	150	200	4
		TOTAL				-	-	-	-	**600**	**20**

IFTM University, Moradabad
Course Code: MHSCFN-101
STATISTICS & COMPUTER APPLICATIONS

Course Objectives:

- To understand the significance of statistics and research methodology in Home science Research.
- To understand the types, tools and method of research and develop the ability to construct data gathering instruments appropriate to the research design.
- To understand the application of appropriate technique for the measurement scale and design.
- To understand the basic concepts, theories and methods in statistics,learn basic statistical procedures for research and understand applications of statistical techniques for analysis and interpretation
- An understanding of basic concepts of computer science.
- An introduction to the fundamentals of hardware, software and programming.

UNIT I **(8Sessions)**

Classification & tabulation of Data: Meaning, objective and types of classification, formation of discrete and continuous frequency distribution, tabulation of data, parts of a table, General Rule of tabulation, Types of tables, Diagrammatical and graphical presentation of data: significance, types and limitation of different types of diagrams and graphs used for presentation of data.

UNIT II **(8 Sessions)**

Measure of Central tendency: Mean, Median, Mode and their uses with examples.

UNIT III **(6 Sessions)**

Interpretation & Report writing; meaning, technique of interpretation, significance, and steps followed, layout of report writing, the computer system, important characteristics and application in Research.

UNIT IV **(8Sessions)**

MS-office: basics of MS-word, MS-excel MS-PowerPoint and application of this software for documentation and report generation.

Course outcomes:

After undertaking the course students will be able to:

- Differentiate between the qualitative and quantitative methods of analysis of data.
- Suitably apply data reduction strategies and illustrate data using various graphical methods.
- Explain the needs of hardware and software required for a computation task.
- Student will develop a vocabulary of key terms related to the computer and to software program menus
- Student will be able to identify the components of a personal computer system

- Student will be able to demonstrate mouse and keyboard functions
- Student will be able to demonstrate window and menu commands and how they are used
- Student will be able to demonstrate how to organize files and documents on a USB/hard drive
- Student will be able to compose, format and edit a word document
- Student will be able to send email messages (with or without attachments)
- Student will be able to navigate and search through the internet

Suggested Readings:

1. Cyganski, Information Technology: Inside and outside, Pearson Education.
2. Basandra S.K., Computers Today, Galgotia Publishers.
3. Leon A & Leon M, Introduction to Computers, Vikas Publication.
4. Leon, Fundamentals of Information Technology, Vikas Publication.
5. Kakkar D.N., Goyal R, Computer Applications in Management, New Ag
6. Agresti, A. & Franklin C.A. (2009) Statistics: The Art and Science of Learning from Data (Second Edition) Boston,MA: Pearson Prentice Hall, ISBN 978-0-13-513199-2
7. Bernard, H.R. (2000). Social Research Methods: Qualitative and Quantitative Approaches. Thousand Oaks, CA: Sage.
8. Blaxter, L., Hughes, C, and Tight, K. (1999). How to Research. New Delhi: Viva books.
9. Diez, D. M., Barr, C. D., Cetinkaya-Rundel M. (2015). OpenIntroStatistics:((Third Edition). CreateSpace Independent Publishing Platform. ISBN-10: 194345003X, ISBN-13: 978-1943450039 http://www.openintro.org/stat/ textbook.php.
10. Elmes, D.G., Kanowitz, B.H. and Roediger, H.L. (1989). Research Methods in Psychology (Third Edition). New York: West Publishing Company.
11. Fowler, F.J. (1988). Survey Research Methods. Applied Social Research Methods Series, Vol. 1. Newbury Park, CA: Sage.
12. Greene, S. and Hogan, D. (Eds.). (2005). Researching Children's Experiences: Methods and Approaches. London: Sage.
13. Gordis L. (2013) Epidemiology. (Fifth Edition). Philadelphia, PA: Saunders Elsevier,
14. Minium, E. W., King, B. M., & Bear, G. (1995/2004). Statistical Reasoning for Psychology and Education. New York: Wiley and Sons.

Website Sources:

- http://www.dspmuranchi.ac.in/pdf/Blog/Classification_and_Tabulation_of_Data_1..pdf
- https://statistics.laerd.com/statistical-guides/measures-central-tendency-mean-mode-median.php
- https://www.bartleby.com/essay/Interpretation-and-Report-Writing-PKGFZK4KRYZA

IFTM University, Moradabad

Course Code: MHSCFN-102

RESEARCH METHODOLOGY

Course objective

To provide students understandings about the basic concepts, approaches and methods in conducting research thereby enabling them to appreciate and critique the nuances of designing a research study as well the ethical dimensions of conducting researches.

UNIT I **(8 Sessions)**

Research Methodology: Meaning, aim & objective of research, significance of research, role of research, types of research, research process, and criteria of a good research. Research problem, defining a research problem, selecting the problem, technique involved in defining a problem Thrust areas in research in Human development & family studies.

UNIT II **(6 Sessions)**

Research Design: Meaning need & feature of a good design. Different types of research design, experimental research design. Sampling design, Census and sample survey, Steps in sampling design, characteristics of a good sampling design, Types of sampling design, sampling error, criteria for selecting a sampling design.

UNIT III **(6 Sessions)**

Data collection: Collection of primary data through different methods (Questionnaire, observation, Interview, case study, Sociometry, Anthropometry, Projective tests and other methods), Collection of Secondary data, Selection of appropriate method for data collection.

UNIT IV **(8 Sessions)**

Measurement & Scaling techniques: Measurement scales. Tests of Sound measurement, Techniques of developing measurement tools, Scaling, Meaning, scale classification bases, important scaling techniques, Scale construction techniques.

Course outcomes:

After undertaking the course students will be able to:

- Demonstrate knowledge of the scientific method, purpose and approaches to research
- Compare and contrast quantitative and qualitative research
- Explain research design and the research cycle
- Prepare key elements of a research proposal
- Explain ethical principles, issues and procedures

Suggested Readings:

1. Scientific Social Survey – P.V.Young.
2. Statistical Methods – S.P.Gupta, Sultan Chand & Sons Publisher- New Delhi

3. Research Methodology, Methods and Techniques – C.R. Kothari Wiley Eastern Limited New.
4. Elements of Statistics, Theory & Practice – M.Singhal. Lakshmi NarainAgarwal, Educational Publisher – Agra.
5. Bell, J. (1999). Doing your research project: Guide for first time researchers in social sciences. New Delhi: Viva Books.
6. Bernard, H. R. (2000). Social research methods: Qualitative and quantitative approaches.Thousand Oaks, CA.: Sage.
7. Blaxter, L. Hughes, C., & Tight, K. (1999). How to research. New Delhi: Viva Books.
8. Bryman, A. (2008). Social research method. Oxford: Oxford University Press.
9. Creswell, J. W. (2009). Research design: Qualitative, quantitative, and mixed methods approaches. Thousand Oaks, CA: Sage Publications.
10. Denscombe, M. (1999). The good research guide for small-scale social research projects. New Delhi: Viva Publications.
11. Denzin, N. and Lincoln, Y. (Eds.) 2005. The Sage handbook of qualitative research. London: Sage.
12. Kerlinger, F. N, & Lee, H. B. (2000). Foundations of behavioral research. Belmont, Calif.: Wadsworth.

Website Sources:

- https://www.questionpro.com/blog/what-is-research/
- https://www.modares.ac.ir/uploads/Agr.Oth.Lib.17.pdf
- https://www.scribbr.com/dissertation/methodology/
- https://www.questionpro.com/blog/data-collection/
- https://hal.archives-ouvertes.fr/hal-02546801/document
- http://www.fao.org/3/w3241e/w3241e04.htm

IFTM University, Moradabad
Course Code: MHSCFN-103
FOOD ANALYSIS

Course objective

To provide knowledge and skills in the applications, principles and practices of the analysis of foods for purposes of trade, compliance, quality assurance, authentication, complaint investigation, nutritional attributes and scientific research.

UNIT I (6Sessions)

Familiarization to terms and calculations used in preparation of various standard solutions; sample and sampling techniques.

UNIT II (8Sessions)

Physico- chemical principles involved in visible and UV spectrophotometry. Construction and working of colourimeter and UV spectrophotometer.flourimeter, flame photometer, atomic absorption spectrophotometer.

UNIT III (8Sessions)

Chromatography (paper chromatography, TLC, GLC, HPLC).And a brief overview of its application.Principle and application of paper electrophoresis and gel electrophoresis.

UNIT IV (8Sessions)

Proximate analysis (moisture, ash, crude fat, crude fibre, crude protein, carbohydrate by difference and energy value).

UNIT V (10 Sessions)

Principles and methods of estimation of vitamins (beta- carotene and Vitamin C) and minerals (Iron, Phosphorus, Calcium).

Courses outcomes:

After undertaking the course students will be able to:

- Apply statistically valid sampling techniques to food materials having widely diverse properties and volumes.
- Demonstrate competency in the use of standard techniques of food analysis and the treatment of experimental data.
- Apply modern instrumental methods to analyze chemical and physical properties of foods.
- Compare the purposes and methods of food analysis employed in government, research and industry.

Suggested Readings:

1. Raghuramulu et al (1983). A Manual of Laboratory Techniques. National Institute of Nutrition, Hyderabad (India)
2. Sharma BK (1999) 8 th ed. Instumental Methods of Chemical Analysis, Get Publishing House.

3. Khosla BD, Gaeg VC and Khosla A (1987). 5 th ed. Sr. Practical Physical Chemistry. S. Chand & co. New Delhi.
4. AOAC 1995. Association of Official Analytical Chemists. Washington, DC.
5. Gruenwedels DW &Whitakor JR 1984. Food Analysis: Principles and Techniques. Vols. I-VIII. Marcel Dekker.
6. Joslyn MA. 1970. Methods in Food Analysis: Physical, Chemical and Instrumental Methods of Analysis. Academic Press.
7. Pomeranz Y &Molean CE. 1977. Food Analysis Theory and Practice. AVI Publ. Sawhney SK & Singh R. 2000. Introductory Practical Biochemistry. Narosa.

Website Sources:

- https://fssai.gov.in/cms/manuals-of-methods-of-analysis-for-various-food-products.php
- https://old.fssai.gov.in/Portals/0/Pdf/Draft_Manuals/BEVERAGES_AND_CONFECTIONARY.pdf
- https://old.fssai.gov.in/Portals/0/Pdf/Manual_Cereal_25_05_2016.pdf
- https://www.fssai.gov.in/upload/advisories/2018/02/5a93ea66376f2Manual_Milk_25_05_2016.pdf
- https://old.fssai.gov.in/Portals/0/Pdf/Draft_Manuals/MEAT_AND_FISH.pdf

IFTM University, Moradabad
Course Code: MHSCFN-104
FOOD SCIENCE-I

Course objective

This course aims to give you the scientific skills and knowledge base needed to understand food processes and meet society's demands for safe and sustainable food products.

UNIT- I **(8Sessions)**

• Beverages: Synthetic and natural, alcoholic and non-alcoholic, carbonated and non-carbonated, coffee, tea, cocoa, Malted drinks.

• Nuts and Oilseeds: Composition, Oil extraction and by-products.

• Fats and Oils: Sources of edible fats and oils. Characteristics of fats and oils: Physical and chemical properties, changes in fats during storage and cooking uses of fats.

UNIT-II **(8Sessions)**

• Spices and Condiments: Composition, flavouring extracts – natural and synthetic.

• Fermentation technology, enrichment and fortification technology.

• Sugar Cookery: Sources, uses and properties of crystallization of sugar, stages of sugar cookery fondant, fudge, caramel and brittles.

• Starch Cookery:

a) Sources and uses of starch, gelatinization.

c) Cooking and parboiling of rice.

UNIT-III **(7 Sessions)**

- Leavened Products: Leavening agents. Biologically leavened and chemically leavened products. Batters and dough.
- Flours- Composition and baking qualities.Batters and doughs (chappaties and puries), Leavening agents.

Unit-IV **(7 Sessions)**

• Food colorants: Pigments in animal and plant tissues, Food colours – Types, properties, safety issues

• Sweetener Chemistry related to usage in food products: solubility & crystallization, hygroscopic, fermentation & non-enzymatic browning.

Course outcomes:

After undertaking the course students will be able to:

- Apply and incorporate the principles of food science in practical, real world situations and problems.
- Impart awareness on the concept of new food product development and current topics of importance to the industry.

- Apply the various techniques in the quality evaluation of foods and demonstrate practical proficiency in a food analysis laboratory.

Suggested Readings:

1. Experimental Cookery: Low Bells.
2. Food Selection and Preparation: Sweetman, M.D.
3. Handbook of Food Preparation: A.N. Hime Ec. Asso.
4. Our Food: Swaminathan, M, and Bhagiam, R.K.
5. Experimental Foods: Swaminathan
6. Food Science and Application: L Paul, C. Pauling.
7. Food Science: Mudami, S.R. &Rao, S.M. 1994, Wiley Eastern Ltd. New Delhi
8. Swaminathan, M : Essentials of food and Nutrition
9. Food Science: Fifth Edition (Food Science Text Series) 5th Edition.by Norman N. Potter and Joseph H. Hotchkiss
10. . Introduction to Food Engineering, Fifth Edition (Food Science and Technology) Aug 16, 2013. R Paul Singh and Dennis R. Heldman
11. Essentials of Food Science (Food Science Text Series) 4th ed. 2014 Edition. Vickie A. Vaclavik and Elizabeth W. Christian
12. Lawrie's Meat Science, Eighth Edition; Woodhead Publishing Series in Food Science, Technology and Nutrition; Fidel Toldra.
13. Flavor, Satiety and Food Intake Beverly Tepper and Martin Yeomans. ISBN: 978-1-119-04489-5

Website Sources:

- https://hmhub.me/cocoa-and-malted-beverages-non-alcoholic-beverages/
- https://setupmyhotel.com/train-my-hotel-staff/f-and-b/369-classification-beverage.html
- http://hotelstudies.in/beverages-its-classification/
- https://www.vegplate.info/nuts.html
- https://www.betterhealth.vic.gov.au/health/healthyliving/Nuts-and-seeds
- https://en.wikipedia.org/wiki/Condiment
- https://onlinelibrary.wiley.com/doi/full/10.1002/fsn3.846
- https://www.exploratorium.edu/cooking/candy/sugar-stages.html

IFTM University, Moradabad
MHSCFN-151
COMPUTER FUNDAMENTALS (LAB)

Course Objectives:

1. An understanding of basic concepts of computer science.
2. An introduction to the fundamentals of hardware, software and programming.

Practical

• Working with windows

• Working with MS-office package (MS-Word, Excel, Power-point)

• Using internet devices

Course outcomes:

After undertaking the course students will be able to:

1. Explain the needs of hardware and software required for a computation task.
2. Explain the working of important application software and hardware.
3. Student will develop a vocabulary of key terms related to the computer and to software program menus
4. Student will be able to identify the components of a personal computer system
5. Student will be able to demonstrate mouse and keyboard functions
6. Student will be able to demonstrate window and menu commands and how they are used
7. Student will be able to demonstrate how to organize files and documents on a USB/hard drive
8. Student will be able to compose, format and edit a word document
9. Student will be able to send email messages (with or without attachments)
10. Student will be able to navigate and search through the internet
11. Demonstrate the use of Operating system commands and shell script.

Suggested Readings:

1. Computer fundamentals by P. K. Sinha.
2. Condex Computer Kit by Vikas Gupta, Dream tech press, New-Delhi.
3. Microsoft office XP complete, RonnJost, Kylic Johnson, SYBEX Company.
4. Gill, Nasib S.: Essentials of Computer and Network Technology, Khanna Book Publishing Co., New Delhi.
5. Gill Nasib Singh: Computing Fundamentals and Programming in C, Khanna Books Publishing Co., New Delhi.
6. Chhillar, Rajender S.: Application of IT in Business, Ramesh Publishers, Jaipur.
7. Donald Sanders: Computers Today, McGraw-Hill Publishers.
8. Davis: Introduction to Computers, McGraw-Hill Publishers.
9. V. Rajaraman : Fundamental of Computers, Prentice-Hall India Ltd., New Delhi.
10. Learning MS-Office, 2000 by R Bangia (Khanna Book Pub)
11. Teach yourself MS-Office by Sandlers (BPB Pub).

Website Sources:

- http://en.copian.ca/library/learning/nlllc/essential_skills/skill_book_2010/skill_book_2010.pdf
- https://www.polygwalior.ac.in/file/20181204071417842813.pdf
- http://www.sitttrkerala.ac.in/misc/LabManual/1008.pdf

IFTM University, Moradabad

MHSCFN-152

FOOD ANALYSIS

Course Objective

To provide knowledge and skills in the applications, principles and practices of the analysis of foods for purposes of trade, compliance, quality assurance, authentication, complaint investigation, nutritional attributes and scientific research.

Proximate analysis

- Moisture
- Ash
- Crude fibre
- Protein by MicroKjeldhal Method
- Fat by soxhelete Method
- Vitamin C
- Iron by Wong's Method
- Calcium
- Phosphorous

Course outcomes:

After undertaking the course students will be able to:

1. Apply statistically valid sampling techniques to food materials having widely diverse properties and volumes;
2. Demonstrate competency in the use of standard techniques of food analysis and the treatment of experimental data;
3. Apply modern instrumental methods to analyze chemical and physical properties of foods;
4. Compare the purposes andmethods of food analysis employed in government, research and industry.

Suggested Readings:

1. Food Analysis, 3 rd edition. 2003. S. Suzanne Nielsen (ed). Springer.
2. Food Analysis, 4th edition. 2010. S. Suzanne Nielsen (ed). Springer
3. AOAC International: www.aoac.org
4. American Chemical Society: www.acs.org
5. The Institute of Food Technologists: www. Ift.org

Website Sources:

- https://fssai.gov.in/cms/manuals-of-methods-of-analysis-for-various-food-products.php
- https://old.fssai.gov.in/Portals/0/Pdf/Draft_Manuals/BEVERAGES_AND_CONFECTIONARY.pdf
- https://old.fssai.gov.in/Portals/0/Pdf/Manual_Cereal_25_05_2016.pdf
- https://www.fssai.gov.in/upload/advisories/2018/02/5a93ea66376f2Manual_Milk_25_05_2016.pdf
- https://old.fssai.gov.in/Portals/0/Pdf/Draft_Manuals/MEAT_AND_FISH.pdf

IFTM University, Moradabad
Course Code: MHSCFN-201
ADVANCED FOOD SCIENCE

Course Objectives:

- To make the students aware about common food processing techniques and understand the physico-chemical properties of foods.
- To provide systematic knowledge and understanding of chemistry of food components like water, sugar and lipids, various aspects of food product development and systematic interpretation of sensory evaluation and get an insight in to the additives that are relevant to processed food industry for shelf life extension, processing aids and sensory appeal.

UNIT 1 **(6Sessions)**

• Water: Definition of water in foods, structure, colloidal properties of foods.

• pH: Hydrogen ion concentration in food, oxidation reduction potential of foods and their applications in food systems.

UNIT 1II **(8 lectures)**

• Sugars: Composition and properties of different types of sugars, their application in food systems, crystallization, caramalization, Maillard reaction and its industrial application.

• Lipids: Properties of fats, functional properties of fats and oils, fat stabilizers, fat deterioration and antioxidants, inter esterification of fats.

UNIT III **(6Sessions)**

- Basic concepts of new product development
- Market research, consumer dynamics, process of product development and standardization, sensory evaluation, packaging, labelling and marketing of new food products.

UNIT IV **(10Sessions)**

Food safety laws and standards

• Hazard Analysis and Critical Control Points (HACCP), Good Manufacturing Practices (GMP), Good Hygienic Practices (GHP), International Organisation for Standardization (ISO), Essential Commodities Act, Codex Alimentarius, World Trade Organisation (WTO), Technical Barrier to Trades (TBT), Sanitary Phyto-Sanitary (SPS) rules, Bureau of Indian Standards (BIS), AGMARK, Food Safety and Standards Act, 2006 (FSSA): Prevention of Food Adulteration Act (PFA), Milk and Milk Products Order (MMPO), Meat Food Products Order (MFPO), Fruits Products Order (FPO).

Course outcomes:

After undertaking the course students will be able to:

- Understand the chemistry of food components like water, sugar and lipids.
- Understand basic concepts of new food product development.

- Enable to learn about the food additives that are relevant to processed food industry for shelf life extension, processing aids and sensory appeal.
- Familiarize about some Food safety laws and standards.

Suggested Readings:

1. Bureau of Indian standards: Specifications and standard methods. Volume I to XII.
2. Fellows P J (2002), Food Processing Technology- Principles and Practices, 2nd Edition. Woodhead Publishing Ltd.
3. Food and Agriculture Organization. (1980) Manual of Food Quality Control. Additive Contaminants Techniques. Rome.
4. Fuller, G.W. (1999) New Food Product Development. From concept to market place. CRC press, New York.
5. Graf E and Saguy I S, (1991) Principles and practices for the safe processing of foods. Butterw Heinemann Ltd., Oxford.
6. Mahindru, S N (2000) Food Additives- Characteristics Detection and Estimation. Tata McGraw Hill Publishing Co. Ltd.
7. The Technology of Food Preservation. AVI Publ. Griswold RM. 1962.
8. The Experimental Study of Foods. Houghton Miffin. Khader V. 1999
9. Text Book on Food Storage and Preservation. Kalyani. Krishna Swami K. 2000
10. Nutrition Research – Current Scenario. Oxford & IBH. Lowe B. 1955
11. Experimental Cookery. John Wiley & Sons. Manay NS &Shadaksharaswamy M. 1997.
12. Foods, Facts and Principles. New Age International. McWilliams M. 1993.
13. Foods, Experimental Perspectives. Macmillan. Meyer LH. 1976
14. Food Chemistry. AVI Publ. Potter NN & Hotchkiss HJ. 1996.
15. Food Science. CBS. Subbulakshmi G &Udipi SA. 2006. Food Processing and Preservation. New Age International.

Website Sources:

- https://www.tandfonline.com/doi/full/10.1080/10942912.2011.650339
- https://www.everydayhealth.com/water-health/water-body-health.aspx
- https://www.jbc.org/article/S0021-9258(18)87341-0/pdf
- https://en.wikipedia.org/wiki/Sugar
- https://en.wikipedia.org/wiki/Food_Safety_and_Standards_Authority_of_India
- https://www.destechpub.com/wp-content/uploads/2015/01/Methods-for-Developing-New-Food-Products-preview.pdf
- file:///C:/Users/Avinash/Downloads/Nutrition_Vol8_No3_p_690-702.pdf

IFTM University, Moradabad
Course Code: MHSCFN-202
FOOD MICROBIOLOGY

Course Objective

The course aims to provide theoretical and practical knowledge about the micro-organisms involved in the food spoilage, infections and intoxications. The course also enables to understand the concept of preservation and microbiological safety in various food operations.

UNIT I **(6Sessions)**

1. Overview of Basic Microbiology

• Definition, Scope of Food Microbiology

• An introduction to microbial world: Bacteria, Fungi, Yeast, Viruses

2. **Bacterial groups based on their morphology:** Gram +ve/Gram –ve bacteria, Motile/Non-motile bacteria, Sporulating/Non-sporulating bacteria

3. Bacterial groups based on their physiological growth factors: Temperature, pH, water activity, availability of oxygen.

UNIT II **(6 Sessions)**

• **Food spoilage**: Definition, sources of contamination and microorganisms involved in spoilages of various foods: Milk, Bread, Canned food, Vegetables and fruits, Fruit juices, Meat, Eggs and Fish.

• **Physical and chemical means used in destruction of microbes:** Definition of sterilization and disinfection, role of heat, filtration and radiation in sterilization, use of chemical agents-alcohol, halogens and detergents

UNIT III **(6Sessions)**

Microorganisms in Human Welfare

• **Importance of microbes in food biotechnology:** genetically engineered organisms, probiotics and single cell proteins.

• **Dairy products** (cheese and yoghurt) and traditional Indian fermented foods and their health benefits.

UNIT IV **(8Sessions)**

Food safety and Quality Control

• **Public health hazards due to microbial contamination of foods:** Important food borne infections and intoxications due to bacteria, moulds, viruses (*Salmonella typhi, Helicobacter pylori, Campylobacter jejuni, Yersinia enterocolitica, Bacillus cereus, Staphylococcus aureus, Clostridium botulinum, Escherichia coli, Mycotoxins, Hepatitis A virus & Rota virus*)- Symptoms, mode of transmission and methods of prevention.

UNIT V **(8Sessions)**

• **Assessing the microbiological quality of food:** indicator organisms, microbiological standards, principles of GMP & HACCP in food processing. Safety management at household and industrial level.

Course outcomes:

After undertaking the course students will be able to:

- Understand the nature of microorganisms involved in food spoilage, food infections and intoxications.
- Comprehend principles of various preservation and control techniques.
- Understand microbial safety in various foods operations.

Suggested Readings:

1. Garbutt John (1997) *Essentials of Food Microbiology*. Arnold London. Jay JM, Loessner DA, Martin J.(2005) *Modern Food Microbiology. 7th ed*.Springe.
2. Pelczar MJ, Chan ECS, Krieg N. (1993) *Microbiology. 5th ed*. Tata McGraw-Hill Publishing Co. Ltd. Prescott LM, Harley JP, Klein DA.(2008) *Microbiology. 6th ed*. WMC Brown Publishers.
3. Frazier, W.C. &Westoff, D.C. (2013). Food Microbiology. 5th Edition. Tata McGraw-Hill Publishing Co. Ltd.
4. Jay, J.M., Loessner, D.A. & Martin, J. (2006). Modern Food Microbiology. 7th Edition.Springer
5. Banwart, G.J. (2004). Basic Food Microbiology. 2nd Edition. CBS Publishers and Distributors, India.
6. Prescott, L.M., Harley, J.P. & Klein, D.A. (2017). Microbiology. 10th Edition. Tata McGraw-Hill Publishing Co. Ltd.
7. Mathur, P. (2018). Food Safety and Quality Control. 1st Edition. Orient Blackswan Private Ltd. India.
8. Forsythe, J.S. (2011). The Microbiology of Safe Food. 2nd Edition. Wiley-Blackwell Publishing.
9. Ravishashankar, R. &Jamuna, B. (2015). Microbial Food Safety and Food Preservation. CRC Press, Boca Raton.
10. Manual of Methods of Analysis of Foods- Microbiological Testing. (2012). Lab Manual FSSAI, GoI, New Delhi.

Website Sources:

- https://microdok.com/scope-of-food-microbiology/
- https://en.wikipedia.org/wiki/Nonmotile_bacteria#:~:text=Motile%20and%20non%2Dmotile%20bacteria,only%20along%20the%20stab%20line.
- https://www.lamission.edu/lifesciences/lecturenote/mic20/Chap06Growth.pdf
- https://www.toppr.com/guides/evs/mangoes-round-the-year/food-spoilage/
- http://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/S000015FT/P000043/M000086/ET/1500291844Pp03_Mdl06_PPT.pdf
- https://lab-training.com/2015/03/11/beneficial-role-of-microorganisms-in-food industry/#:~:text=Bacteria%2C%20molds%20and%20yeast%20are,variety%20of%20cultured%20milk%20products.
- https://www.frontiersin.org/articles/10.3389/fmicb.2016.02154/full

IFTM University, Moradabad
Course Code: MHSCFN-203
PUBLIC HEALTH NUTRITION

Course Objectives:
To enable the students to

- Gain insight into the public health problems and their implications
- Develop skills in organizing and evaluating nutrition, projects in the community.
- Appreciate the national and international contribution towards nutrition improvement in India

UNIT-I **(6Sessions)**

Community nutrition: Definition, aims, basic measurements and applications. Factors influencing community nutrition: Environmental, social and economic factors, food habits, food faddism, ignorance and food losses.

UNIT-II **(10Sessions)**

Community Health Centre: Organization and functions of community health centers and primary health centers, Primary health care and concept. Types of services- services in primary, secondary and tertiary health care setup, patients in different critical care centers, post-natal, pediatric and geriatric patients.Role of nutrition support team- dietetic interns, dietitians (therapeutic, administrative and consultant dietitian).Team approach in patient care.

UNIT-III **(8Sessions)**

Food security in the community: Assessment of nutritional status of individual and community. Role of New food, Food fortification and enrichment, Food labeling in the community. Food Service: Style of Service & Types of Service.

UNIT-IV **(8Sessions)**

Nutrition Education and individual behavior change: Meaning, nature and importance of nutrition education to the community, training of workers in nutrition education programme. Principles of planning, executing and evaluation nutrition education programme. Methods and Techniques of organizing nutrition programs using audio, video aids and exhibition, Problems of nutrition

.

Course outcomes:
After undertaking the course students will be able to:

- Become familiar with the concept of public health nutrition and health care of thecommunity.
- Understand the causes, consequences and preventive strategies for nutritional problems inthe community.
- Comprehend the strategies for improving nutrition and health status of communities.
- Acquire knowledge about the concept of food and nutrition security and the variousprogrammes for improving food and nutrition security.

Suggested Readings:

1. Normal and Therapeutic nutrition - C.H.Robinson, Oxford &IBH Publishing Co.Calcutta.
2. Public Health and Hygiene- Y.P.Bedi, Atma ram & sons, Kashmere gate, Delhi.
3. Text Book of Public Health and Social Medicine- A.N.Ghei, Lakshmi Book Store, New Delhi.
4. Gulani, K.K. 2005. Community Health Nursing. 1st Edition. Kumar Publishing House. New Delhi. Pp – 662 to 664.
5. Gibney M J, Margetts B M, Kearney J M Arab (IstEds) (2004) Public Health Nutrition, NS Blackwell Publishing
6. Gopalan C (Ed) (1987) Combating Under nutrition- Basic Issues and Practical Approaches,Nutrition Foundation of India
7. Kaufman M (2007) Nutrition in promoting the public health strategies, principles andpractices. Jones and Barlett Publishers
8. Park K (24th ed) (2017) Park's Textbook of Preventive and Social Medicine, Jabalpur M/s.BanarsidasBhanot
9. Dietary Guidelines for Indians (2nd ed) (2011) Dietary Guidelines for Indians: A manual.,NIN
10. IFCT (2017) Indian food composition table, NIN
11. Ross A C (Eds) (2012) Nutrition in health and disease, Lippincott Williams & Wilkins
12. Shils M E (Eds) (1998) Nutrition in health and disease, Lippincott Williams & Wilkins

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1. Indian pediatrics 2001.38.721-731.
2. www.springerlink.com/index/pdf
3. http://wcd.nic.in/sites/default/files/nnp_0.pdf
4. "Nutrition and Anaemia" (PDF). Retrieved 2009-11-26.
5. "A campaign to end malnutrition in Bihar". www.ideasforindia.in.
6. National nutrition problems in India- a power point presentation - https://www.slideshare.net/harshahirdyani/national-nutritionalprogrammes-in-india-43239816
7. "Child Development Website". Source: Child Development programmes site (2009).

IFTM University, Moradabad
Course Code: MHSCFN-204
THERAPEUTIC NUTRITION

Course Objective
To understand the etiology, physiological and metabolic anomalies and provide appropriate nutrition care for prevention and treatment of various disorders / diseases

UNIT-I **(8Sessions)**

Therapeutic Nutrition: Therapeutic adoption of normal diets (normal, soft & fluid diets) factors to be considered in planning therapeutic diets, drugs & diet inter-action, special feeding methods, pre& post-operative diets, role of dietician, dietary calculation using food exchange lists, high & low calorie diet, high protein, high fat,& low carbohydrate diets.

UNIT-II **(8Sessions)**

Therapeutic Diets: Etiology, physiological disturbances, biochemical & clinical manifestations & dietary management of: Fever & infection, Allergy & skin disturbances (bland & fiber restricted diet), Surgical conditions – Pre-Operative and Post-Operative conditions. Burns and Trauma – complications and dietary treatment.Peptic ulcer, gastritis, colitis (very low residue diet), Cancer, HIV and AIDS.

UNIT-III **(8Sessions)**

Therapeutic Diets: Etiology, Physiological disturbances, biochemical & clinical manifestations & dietary management of Hepatitis & cirrhosis (High protein, high carbohydrate moderate fat or fat restricted diet) Diabetes mellitus (metabolic disorder) Diseases of kidney (Nephrosis, nephrosclerosis, glomerulonephiritis, uremia) (controlled protein, potassium & sodium diet).

UNIT-IV **(8Sessions)**

Therapeutic Diets: Etiology, physiological disturbances, clinical & biochemical manifestation and dietary management of cardio vascular disorder. Hyper-lipidemia&Antherosclorosis (fat controlled diet) Heart disease (sodium restricted diet) Hypertension, Coma, Trauma, Stroke. Intestinal Tract disorder & Neurological disorder.

Course outcomes*:*
After undertaking the course students will be able to:

- To acquire basic knowledge of nutrient requirements, recommended dietary allowances, and dietary modification under different physiological conditions.
- To acquire basic knowledge of food groups, food exchange system and their nutritional significance, and application of knowledge acquired for healthy eating.
- To develop practical skills in planning and management of diets for the different age groups under normal/ physiological conditions keeping in mind the dietary guidelines.
- To gain knowledge on the nature and scope of therapeutic nutrition; and understand the principles of dietary modification and apply in planning.
- To understand nutrition-related diseases of the: gut, liver, gallbladder, pancreas, and heart.

- To know the etiology, incidence, nature, clinical symptoms, diagnosis, and medical and dietary management of disease.
- To modify the diet plans to suit the disease condition

Suggested Readings:

1. Nutrition and Dietetics – Subhangini A.Joshi – Tata McGraw-Hill Publishing Company Limited, New Delhi
2. Dietetics – B.Srilakshmi – New age international (P) limited New Delhi.
3. Clinical Dietetics and Nutrition – F.A. Antia, Oxford University Press, London.
4. Normal and Therapeutic Nutrition- C.H.Robinson, Oxford & IBH publishing Co. Calcutta.
5. Text Book of Human Nutrition- Mahtab S. Bamji, N.Rao& V. Reddy, Oxford & IBH Publishing Co. Pvt Ltd.
6. Essentials of Food and nutrition – M.Swaminathan, Vol I & II, The Bangalore Printing & Publishing Co. Ltd (BAPPCO)
7. Normal and Therapeutic nutrition- C.H. Robinson & M.R Lawler – Macmillen Publishing Co. New York.
8. Food, Nutrition & Diet Therapy-L.K.Mahan&Escott.Stump- W.B. Saunders Ltd
9. Applied Nutrition & Diet Therapy for Nurses- J Davis, K.Sherer- W.B.Saunders.Co
10. Nutrition& Diet Therapy- S.R.Williams-Times mirror Mosby college Publishing. Co. Suggested Readings:
11. Mahan, L. K. and Escott Stump. S. (2016) Krause's Food & Nutrition Therapy 14th ed.Saunders-Elsevier
12. Joshi Y K.(2008) Basics of Clinical Nutrition 2nd ed. Jaypee Brothers Medical PublishersShils, M.E., Shike, M, Ross, A.C., Caballero B and Cousins RJ (2005) Modern Nutrition in Health and Disease. 10th ed. Lipincott, William and Wilkins.
13. Gibney MJ, Elia M, Ljungqvist&Dowsett J. (2005) Clinical Nutrition. The Nutrition Society Textbook Series. Blackwell Publishing Company
14. Garrow, J.S., James, W.P.T. and Ralph, A. (2000) Human Nutrition and Dietetics. 10thed. Churchill Livingstone.

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- https://alraziuni.edu.ye/uploads/pdf/fundamentals-of-foodnutrition-and-diet-therapy.pdf
- http://docshare03.docshare.tips/files/14163/141630991.pdf

IFTM University, Moradabad
Course Code: MHSCFN -251
FOOD MICROBIOLOGY

Course Objective

To familiarize with the techniques and methods used for cultivation, purification and identification of microbes.

Practical

1. Assess the microbial safety of personal hygiene, water, milk and other food products.
2. To study morphology and structural features of Bacteria, Fungi, Yeast, Viruses commonly associated with Foods.
3. Microbiological analysis of Water, Milk, Canned product, Fruit juices and Street foods.
4. HACCP plan for a food process
5. Various Techniques and Instruments Used in Microbiology
6. Sterilization, Disinfection and Filtration,

Learning outcomes:

After undertaking the course students will be able to:

1. Understand the morphology and structural features of various micro-organisms.
2. Familiarize with the procedure of microscope.

Suggested Readings:

1. Bell C, Neaves P, Williams AP.(2006) *Food Microbiology and Lab Practice*.
2. Yousef AL (2003). *Food Microbiology. A Laboratory Manual*. Wiley Interscience New Jersey.
3. Co. Benson HJ (1990). *Microbiological Application.5th ed*. WMC Brown Dubugue.
4. Benson, H.J. (2002). Microbiological Application.8th Edition. Tata McGraw Hill.
5. Mortimore& Wallace. (2013). HACCP: A Practical Approach. 3rd Edition. Springer Publication.
6. Cappuccino & Sherman. (2007). Microbiology: A laboratory Manual. 7th Edition.Pearson Education Inc.
7. Hoorfar, J. (2011). Rapid Detection, Characterization and Enumeration of Food Borne Pathogens. American Society for Microbiology, Washington, USA.
8. Drinking Water Specification- Indian Standard. (2012). 2nd Revision. IS 10500:2012.
9. Bureau of Indian Standard, ManakBhawan, New Delhi, India.

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- http://eta.health.usf.edu/publichealth/PHC6562/Midterm_Final_ExtraCredit_pools/HO1_Microbiology_Basics_APIC_Chapter16.pdf
- https://www.fsis.usda.gov/shared/PDF/SPN_Guidebook_Microbiology.pdf
- https://microbenotes.com/instruments-used-in-microbiology-lab/
- https://old.fssai.gov.in/Portals/0/Pdf/15Manuals/MICROBIOLOGY%20MANUAL.pdf

IFTM University, Moradabad

Course Code: MHSCFN-252

FOOD SCIENCE

Objective

To familiarize with the heating effects on cereals, jam and jellies formation techniques, fermentation, stages of sugar cookery, Methods of sensory evaluation.

Practical

• **Starches, Vegetable Gums and Cereals**: Dextrinization, gelatinization, retro gradation, thickening power. Factors affecting gels.Gluten formation and factors affecting gluten formation.

• **James and Jellies:** Pectin content of fruits, role of acid, pectin and sugar in jam and jelly formation. Use of gums as emulsifiers / stabilizers.

• **Leavened Products:** Fermentation – Use of Microorganisms (lactic acid, yeast), Steam as an agent, egg as an agent, chemical agents.

• **Sensory Evaluation -** detection of primary flavour and sensitivity, threshold teststriangle test, paired comparison, scoring test, ranking test. Effect of solutes on boiling point and freezing point of water.

• Effect of types of water on characteristics of cooked vegetables, pulses and cereals.

• **Sugar ad Jaggery Cookery:** Relative sweetness, solubility and sizes of sugars, stages of sugar cookery, caramelization, crystallization, factors affecting crystal formation.

Course outcomes:

After undertaking the course students will be able to:

1. Conduct appropriate sensory evaluation tests to answer specific questions regarding food attributes or consumer preferences.
2. Apply food science knowledge to describe functions of ingredients in food.
3. To enable the students to understand food composition and its physicochemical, nutritional, microbiological and sensory aspects,
4. To familiarize the students about the processing and preservation techniques of fruits and vegetables
5. To understand about the different types of browning reactions.
6. To familiarizeabout the gelatinization behavior of various starches
7. To understand about the concept of gluten formation of various flours.
8. To familiarize with thedextrinization in foods.

Suggested Readings:

1. Charley, H.(1982): Food Science(2nd edition), John Willey & Sons, New York. 16. Potter, N. and Hotchkiss, J.H. (1996): Food Science, Fifth edition, CBS publishers and Distributors, New Delhi.
2. Belitz, H.D. and Gropsch, W. (1999): Food Chemistry (2nd edition), Springer, New York.
3. Abers, R.J. (Ed.) (1976): Foam, Academic Press, New York.
4. Cherry, J.P. (Ed.) (1981): Protein Functionality in Foods, American Chemical Society, Washington,D.C.

5. Pomeranz, Y. (Ed.) (1991): Functional Properties of Food Components, (2nd edition), Academic Press, New York. 21. Duckworth, R.B. (Ed.) (1978): Water Relation to Foods, Academic Press, London.
6. Bawa. A.S, O.P Chauhanetal. Food Science. New India Publishing agency, 2013
7. Roday,S. Food Science, Oxford publication, 2011.
8. B. Srilakshmi, Food science, New Age Publishers,2002
9. Meyer, Food Chemistry, New Age,2004
10. De Sukumar., Outlines of Dairy Technology, Oxford University Press, 2007

Website Source:

- https://extension.msstate.edu/sites/default/files/publications/publications/p2772.pdf
- http://health.jbpub.com/foodscience/docs/03441_edelstein_lab_manual.pdf
- http://extension.msstate.edu/publications/experiments-food-science-laboratory-manual

IFTM University, Moradabad
Course Code: MHSCFN-301
ADVANCED HUMAN NUTRITION

Course objectives:

- To understand how Dietary Reference Intakes are derived for the population.
- To appreciate the role of nutrition in cellular and physical growth and assess nutritional status.

UNIT I **(8 Sessions)**

Human Nutrient Requirements - Micronutrients

Critical evaluation of sensitive methods and derivations of requirements and recommended dietary allowances of micronutrients for all age groups:

• Water soluble vitamins

• Fat soluble vitamins

• Minerals and trace elements

Critical evaluation of national and international nutrient allowances; factors affecting the requirements, dietary guidelines for Indians.

UNIT II **(6Sessions)**

Nutrition in Special Conditions

Extreme temperatures - low and high, High altitude, Space nutrition and food systems, Sports nutrition

UNIT III **(8Sessions)**

Assessment of Nutritional Status

• Critical overview of various methods of nutritional assessment.

• Detailed methodology of the various techniques and interpretation of results.

• National and International Growth Standards/References

• National Nutrition Surveys – NNMB, NFHS, DLHS

UNIT IV **(8Sessions)**

Growth and Development through the Life Cycle

• Different aspects of growth – cellular to physical

• Malnutrition and cognitive development

• Determinants of growth and development

• Impact of altered nutrition on growth and development

• Maternal malnutrition and pregnancy outcome Changes in body composition throughout the life cycle.

• Alterations in body composition and their consequences.

Course outcomes:

After undertaking the course students will be able to:

- Critically evaluate and derive requirements for specific macronutrients.
- Understand critical periods in growth and development and impact of malnutrition.
- Assess the nutritional status of children and adults.
- Appreciate implications of poor dietary and lifestyle practices.

Suggested Readings:

1. Bamji M.S., Rao N.P., Reddy V. Eds. (2009). Textbook of Human Nutrition. 3rd Edition. Oxford and IBH Publishing Co. Pvt. Ltd.
2. ICMR (1990) Nutrient Requirements and Recommended Dietary Allowances for Indians.
3. FAO/WHO. (2004) Vitamin and Mineral Requirements in Human Nutrition. Report of a Joint Expert Consultation.
4. Gibson R S. (2005) Principles of Nutritional Assessment. 2nd ed. Oxford University Press.
5. WHO (1995). Physical Status: The Use and Interpretation of Anthropometry. Report of a WHO Expert Committee. WHO Tech Rep Series 854.
6. WHO (2006). WHO Child Growth Standards. Suggested Readings:
7. Bamji, M.S., Krishnaswamy K. Brahmam G.N.V. (Eds). (2017). Textbook of HumanNutrition. 4th Edition. New Delhi : Oxford and IBH Publishing Co. Pvt. Ltd.
8. Cameron N. (2002). Human Growth and Development. USA: Academic Press, ElsevierScience.
9. FAO/WHO/UNU (2004). Human Energy Requirements. Report of a Joint ExperConsultation. Rome.
10. Gibson R S. (2005). Principles of Nutritional Assessment. 2nd ed. Oxford UniversityPress.
11. ICMR (2010). Nutrient Requirements and SUGGESTED Dietary Allowances for Indiansand its revised documents. New Delhi. ICMR.
12. Proceedings of NFI-WHO (SEARO) Symposium. (2006). Nutrition in DevelopmentalTransition. New Delhi: NFI.
13. Report of a WHO Expert Committee. (1995). Physical Status: The Use and Interpretationof Anthropometry. Tech Rep Series 854, Geneva: WHO.
14. WHO (2006). WHO Child Growth Standards. Geneva : WHO.

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- http://ssu.ac.ir/cms/fileadmin/user_upload/Mtahghighat/taghzie_imani/book/Essentials%20of%20Human%20Nutrition.pdf
- https://www.anme.com.mx/libros/Principles%20of%20Human%20Nutrition.pdf
- http://egyankosh.ac.in/bitstream/123456789/33312/1/Unit-18.pdf
- pdfdrive.com

IFTM University, Moradabad
Course Code: MHSCFN-302
IMPROVING HEALTH AND NUTRITION

Course Objectives:

- To identify factors influencing the dynamics of intra-household food and other resource distribution for improving nutrition security of the vulnerable;
- To stimulate and build national capacity for operational research on determinants of health, nutrition and behavioral change, and approaches to enhancing the health, nurturing, caring and development functions within households and communities;
- To facilitate household and community-based interventions to ensure and enhance family well-being with specific focus on caring for the vulnerable;
- To collect and disseminate scientific and technical information, and facilitate and encourage an international exchange of ideas and experience in the area of household food and nutrition security.

UNIT-I **(8 Sessions)**

• Concept of Communication, Concept of Communication and Mass Communication, Scope of Communication , Elements of Communication, Models of Communication, Communication Process, Approaches to Communication, Barriers to Communication, Communication for Extension Education and Development

• Introduction to IEC (Information, Education and Communication).

• Aims and Objectives: Importance of IEC, relevance to programmes.

• IEC for Behavioral Changes: Behavior and determinants of behavior need for IEC

UNIT-II **(6Sessions)**

Deferent Media, their characteristics and use

a) Audio visual aids (Graphics aids, puppets and other three dimensional aids, display boards and projected and non-projected aids).

b) Mass Media: Print, Radio/Recordings, Films, Television/video, Advertising, Journalism Methods, Techniques and Tools.

UNIT-III **(8Sessions)**

• Planning effective IEC Programmes- Broad-based strategy and for specific objectives. Identification of key messages for re-enforcement, preparation of IEC material.Refining of IEC messages.Socialmobilisation, social marketing and role of community.Training to use IEC.

• Implementation - Use of IEC, training supportive supervision and monitoring.

• IEC for different target groups: Policy makers, Managerial level and middle level officials from Government donor agencies and NGOs, Grassroots functionaries, Community.

UNIT-IV **(6Sessions)**

• Impact Assessment and Case studies of various IEC programmes

• Specific National Programmes and IEC - Influence at mass level

Course outcomes:
After undertaking the course students will be able to:

- Develop understanding about the concept of communication systems.
- Develop understanding about the theories of communication.
- Understand the concept of the media involved in communication.
- Develop understanding regarding diffusion and its core elements.
- Develop understanding of history of diffusion research and the status of diffusion research in the present age.
- Understand the generation of innovations and the innovation decision process.
- Study the different adopter categories.

Suggested Readings:

1. Matarazzo J.D.; Weiss S.M.; Herd J.A.; Muller N.E.; Weiss S. (Eds) (1984): Behavioural Health: A handbook of health enhancement and disease prevention, John Wiley, New York.
2. Wallach L.; Dorfman L., Jemigan D., Themba M. (1993): Media Advocacy and Public Health: Power for Prevention, Newbury Park, CA: Sage.
3. Mass Communication- Kewal, j.Kumar,Jaico Publishers.
4. News Reporting and Edition – K.M. Srivastava, Sterling Publishers.
5. Mass Communication and Journalism in India –D.S.Mehta,Allied Publishers.
6. Principles of journalism –PrathakarPadhya, Popular Publications.
7. Public Relation – Principles, Cases, & Problems – H.Frazier Moore & Frank. B.Kalupa. Surjeet Publications Delhi.
8. Public relation in action –Prof. K.R. Balan& Dr. C.S. Rayadu, Castle Books Pvt. Ltd., New Delhi.,
9. Media of Mass Communication – Vivian, J. (1991).
10. The dynamics of mass communication –Joseph D.(1993).

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- http://v2020eresource.org/content/files/IEC.htm
- https://www.praccreditation.org/resources/documents/APRSG-Comm-Models.pdf
- http://ioc.edu.my/images/demo/printedMaterial/OUMH1203.pdf
- http://www.egyankosh.ac.in/bitstream/123456789/34467/1/prac%2020.pdf
- http://vbch.dnh.nic.in/pdf/PIP%202016%2017.pdf

IFTM University, Moradabad
Course Code: MHSCFN-303
FOOD PRODUCT - DEVELOPMENT SAFETY AND QUALITY CONTROL

Course Objectives:
To provide theoretical and practical knowledge about the micro-organisms involved in the food spoilage, infections and intoxications. The course also enables to understand the concept of preservation and microbiological safety in various food operations.

UNIT-I **(6Sessions)**
Introduction to food safety: Definition, food safety issues, factors affecting food safety, importance of safe foods. Shelf life of Food Products: factors affecting shelf life and methods to check the shelf life

UNIT-II **(8Sessions)**
Food additives and contaminants: Meaning, various kinds of additives- food colour. Preservatives, antioxidants, antimicrobial substances, artificial sweeteners, flavouring, emulsifying, stabilizing agents, Food contaminants of natural origin- seafood toxins, toxic aminoacids and lathyrism, goitrogens, Haemagglutinins, phytates, cyanogenic glycosides, indirect additives, pesticides, contaminants and adulterants, pesticide residues, metallic contaminants, radionuclides, adulterants. Recent concerns on food safety: genetically modified foods.

UNIT-III **(6Sessions)**
Food processing: types of processing methods, effect of processing treatments – processing of application of heat, processing by removal of heat, ambient temperature processing. Minimal processing.

UNIT-IV **(8Sessions)**
Food laws and regulations: national food legislation, other food legislations/ authorities and their role-essential commodities act, 1955, standard of weight and measures act, 1976, export(quality control and inspection) act, 1963, voluntary based product certifications (ISI mark of BIS and agmark), international organization and agreements-food and agricultural organization (FAO), world health organization(WHO), codex alimentarius, codex India, joint FAO/WHO expert committee on food additives(JECFA), world trade organization(WTO), sanitary and phytosanitary measures(SPS) and technical barriers to trade(TBT), international organization for standardization(ISO).

UNIT-V **(8Sessions)**
Food safety and quality management systems: general principle of food safety risk management, hazard analysis critical control point system (HACCP), quality management system.
Food Packaging: Need, material used and labeling.

Course outcomes:

After undertaking the course students will be able to:

- Understand the nature of microorganisms involved in food spoilage, food infections and intoxications.
- Comprehend principles of various preservation and control techniques.
- Understand microbial safety in various foods operations
- Familiarize about the food laws and regulations

Suggested Readings

1. WHO, 1998 world health report life in the 21 st centuries. Report of the director generol who Geneva.
2. FAO food and nutrition paper manual of food quality control – part 14/1 (1979), to 14/8 (1986) FAO of the United Nations.
3. Curricula on food safety. Directorate general of health services. Ministry of health and family welfare. Government of India. NirmanBhavan, New Delhi.
4. Graham, H.D. 1980: the safety of foods, AVI publishing company Inc. Westport.
5. Early, R. (2006) Guide to Quality Management Systems for the Food Industry, Blackie, Academic and professional, London.
6. Gould, W.A and Gould, R.W. (2005) Total Quality Assurance for the Food Industries, CTI Publications Inc. Baltimore.
7. Pomeraz, Y. and MeLoari, C.E. (2008) Food Analysis: Theory and Practice, CBS publishers and Distributor, New Delhi.
8. Bryan, F.L. (2007) Hazard Analysis Critical Control Point Evaluations A Guide to Identifying Hazards and Assessing Risks Associated with Food Preparation and Storage. World Health Organization, Geneva.
9. Kirk, R.S and Sawyer, R. (2005) Pearson's Composition and Analysis of Foods, Longman Scientific and Technical. 9th Edition, England.

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1. www.fssai.gov.in
2. www.thanut-swu.com/images/BOT331/food%20quality%20assurance.pdf
3. www.sciencedirect.com/science/book/9781845690106
4. onlinelibrary.wiley.com/doi/10.1002/9781118846315.ch10/summary
5. www.value-chains.org/.../GTZ-Food_Quality_And_Safety_ReferencebookEd_2007

IFTM University, Moradabad
Course Code: MHSCFN -304
NUTRITIONAL BIOCHEMISTRY

Course Objective

The aim of the course is toobtain depth in the study of Biochemistry of major nutrients and metabolic pathways. Understand the application of Biochemistry in the field of Foods and Nutrition.

UNIT-I ` (8Sessions)

- Carbohydrates: classification and chemical structure of carbohydrate; chemical properties, nutritive roles of carbohydrate, important carbohydrates in food.
- Carbohydrates: digestion, absorption, metabolism (glycolysis, citric acid cycle, glycogenesis, Glycogenolysis, Gluconeogenesis, hexose monophosphate pathway), Blood sugar level and equilibrium.& effect of deficiency.

UNIT-II (6Sessions)

Amino acids and its classification, essential amino acids; Proteins: properties, classification, protein denaturation, Protein: Digestion, absorption, transportation and metabolism of Protein (Nitrogen balance, transamination & deamination of protein, urea cycle and biosynthesis of protein), Functional properties of protein & effect of deficiency.

UNIT-III (8Sessions)

Lipid: role of lipid in body, structure, classification and physiochemical properties of Lipids, Chemical aspects of lipolysis-rancidity, Lipids: Digestion, absorption, transport and Metabolism of lipids, importance of lipo -protein, oxidation of fatty acids, fatty acid synthesis, metabolism of cholesterol.

UNIT-IV (8Sessions)

- Water: physical properties, structure of water molecule, Role and types of water in Food, water activity and sorption isotherm, Importance of dietary fiber in body.
- Terpenoids and alkaloids: Definition, Classification, Structure, Biosynthesis, Properties, Extraction, Biological Role.
- Naturally occurring phenolic compounds: Definition, Classification, Structure, Biosynthesis, Properties and Biological Role.

Course outcomes:

After undertaking the course students will be able to:

- Explain themetabolism carbohydrates, amino acid and lipid: the macronutrient present in the food along with the role played by vitamins and minerals: micronutrients and relationship between human nutrition and metabolism.
- Develop insight into structure and functioning of carbohydrates, amino acid and lipids
- Learn basics of metabolic pathways in the body.

- Understand about the physical properties of water, structure of water molecule and role and types of water in Food.

Suggested Readings

1. Aurand, L.W. and Woods, A.E. 1973. Food Chemistry. AVI, Westport.
2. Birch, G.G., Cameron, A.G. and Spencer, M. 1986. Food Science, 3rd Ed. PergamonPress, New York.
3. Fennema, O.R. Ed. 1976. Principles of Food Science: Part-I Food Chemistry. Marcel Dekker, New York.
4. Harold. A. Harper, Review of Physiological Chemistry, 16th Ed. The Kothari book Depot, Bombay
5. White, A., Andler, P. and Smith, E.L. Principle of Biochemistry, 5th ed. McGraw Hill,Kogakusha.Ltd.1975
6. Henry, R, Mahler and Eugene H. Cordes, Basic Biological Chemistry, 2nd ed., Harper International Ed., Harper and Row Publications, New York,1968
7. West, E.S. Todd, W.R. Mason, H.S and Van Burggen, J.T. Text Book of Biochemistry, IV Ed . Mac million Co., New York,1968
8. Nikola, Experimental Methods, Biophysical Methods, John Wiley & Sons, Inc.
9. Sepal, Biochemical calculation, Holland Publishing Co,1970
10. Viewing Instrumental methods, chemical analysis, McGraw Hill Co. 134
11. Zweig and Whitaker, Paper chromatography and Electrophoresis, Arnold Pvt ltd,1975
12. Harold Varley, Practical Clinical Biochemistry, Arnold Pvt Ltd,1975
13. 1Paul, D. Soyer, The Enzyme ,3rd Ed, Academic Press SUGGESTED READINGS::
14. Berg J M, Stryer. L, Tymoczko JL and Gatto, GJ. (2015) Biochemistry 8th ed. W.H.Freeman.
15. Devlin TM. (2010) Text Book of biochemistry with Clinical Correlations 7th ed. JohnmWiley and Sons.
16. Rodwell VW, Bender DA, Botham KM, Kennelly PJ and Weil PA. (2015) Harper'sIllustrated Biochemistry. 30th ed. McGraw-Hill. Asia.
17. Nelson DL and Cox MM. (2017) Principles of Biochemistry. 7th ed. W.H. Freeman.
18. Wilson K and Walker J. (2000) Practical Biochemistry 5th ed. Cambridge UniversityPress

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- http://med-mu.com/wp-content/uploads/2018/06/DM-Vasudevan-Textbook-of-Biochemistry-For-Medical-Students-6th-Edition.pdf
- https://labalbaha.files.wordpress.com/2014/04/fundamentals-of-biochemistry.pdf

IFTM University, Moradabad
Course Code: MHSCFN-351
FOOD PRODUCT - DEVELOPMENT SAFETY AND QUALITY CONTROL

Objective
To familiarize with an analytical tool uses in sensory evaluation and aware about statistical analysis of the data.

Practicals
1. Establishing sensory panels selecting and recreating panels, orienting, screening for trained panels, training panelist, monitoring the performance.
2. Analytical Tools: - (i) Difference, (ii) Ranking, (iii) Descriptive, (iv) Scoring, (v) Rating.
3. Planning a sensory experiment – • Designing the questionnaire and score card. • Identifying descriptors. • Designing sensory testing facilities.
4. Conducting the test – • Preparing the samples. • Using reference samples. • Reducing panel response error. • Product marketing. • Shelf life studies.
5. Collecting and analyzing sensory data, statistical analysis, inter prevention.
6. Report writing

Course outcomes:
After undertaking the course students will be able to:

- Apply the knowledge of quality assurance in food industry,
- Explore the sensory and nutritional attributes of new products.
- Describe the various aspects of food products development.
- Plan sensory experiment by designing questionnaire and score card.
- Explain and apply different analytical tools in food industry.

Suggested Readings:

1. WHO, 1998 world health report life in the 21st centuries. Report of the director general who Geneva.
2. FAO food and nutrition paper manual of food quality control – part 14/1 (1979), to 14/8 (1986) FAO of the United Nations.
3. Curricula on food safety. Directorate general of health services. Ministry of health and family welfare. Government of India. NirmanBhavan, New Delhi.
4. Early, R. (2006) Guide to Quality Management Systems for the Food Industry, Blackie, Academic and professional, London.
5. Gould, W.A and Gould, R.W. (2005) Total Quality Assurance for the Food Industries, CTI Publications Inc. Baltimore.
6. Pomeraz, Y. and MeLoari, C.E. (2008) Food Analysis: Theory and Practice, CBS publishers and Distributor, New Delhi.
7. Kirk, R.S and Sawyer, R. (2005) Pearson's Composition and Analysis of Foods, Longman Scientific and Technical. 9th Edition, England.

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- https://old.fssai.gov.in/Portals/0/Pdf/manual%20of%20food%20safety%20management%20system,%20fss%20act%202006.pdf
- http://eprints.icrisat.ac.in/12148/1/RP-04749.pdf
- http://www.fao.org/3/a-t0451e.pdf

IFTM University, Moradabad
Course Code: MHSCF-352
INTERNSHIP

Objective:

To enable the students to acquire an in depth understanding of the practical aspects of knowledge and skills acquired during the internship in food industry/ hospital/ diet clinic etc. in the relevant subject/ subjects. It further intends to develop their analytical abilities for situation analysis and to devise means and ways for improvement in the existing system.

IFTM University, Moradabad
Course Code: MHSCFN-401
FOOD PROCESSING AND PRESERVATION

Course Objective

The course aims to provide knowledge of principles and technical aspects of food processing and preservation.

UNIT-I **(8 Sessions)**

Basic concept of food processing and preservation: Reason of food Spoilage and Scope of food processing preservation; principles of food processing and preservation. Principle and preservation by low temperature: (refrigeration, freezing, and dehydro freezing; cold storage, frozen food), changes during freezing-physical and chemical changes. Processing and preservation by drying: factors affecting drying rate.

UNIT-II **(8Sessions)**

Processing and preservation by heat: (blanching, pasteurization, sterilization, UHT processing, heating, dehydration, canning, Microwave cooking-(principle, changes during microwave cooking, advantages), difference between microwave and conventional heating, Concentration and evaporation-(flash evaporator, falling film evaporator and multiple effect evaporators).

UNIT-III **(8 Sessions)**

Processing and preservation by non-thermal method: irradiation, high pressure, pulsed electric field, high hydrostatic pressure, Hurdle technology: concept of hurdle technology and its application, Ultrasonic processing: Properties of ultrasonic, application of ultrasonic as processing techniques, IR heating;

UNIT-IV **(6Sessions)**

Food processing equipment's: material handling, cleaning and grading, conveyors, size reduction, food grain storage and milling, Separation Technique: filtration, agitation and mixing. Baking, Roasting, Frying. Extrusion Technology-(principle, types of extruders)

Course outcomes:

After undertaking the course students will be able to:

- Understand various aspects of processing and quality of food products.
- Ingrain the understanding of post-harvest management of fruits and vegetables.
- Gain in depth knowledge about processing and preservation techniques and quality aspects of fruits and vegetable.
- To familiarize with food processing equipment's.

Suggested Readings:

1. Arsdel WB, Copley MJ & Morgan AI. 1973. Food Dehydration.

2. 2nd Ed. Vols. I, II.AVI Publ. 2. Desrosier NW & James N.1977. Technology of Food Preservation. 4th Ed. AVI. Publ.
3. Fellows PJ. 2005. Food Processing Technology: Principle and Practice. 2nd Ed. CRC.
4. Jelen P. 1985. Introduction to Food Processing. Prentice Hall.
5. Fellows P J (2002), Food Processing Technology- Principles and Practices, 2nd Edition.Woodhead Publishing Ltd
6. Earle RL. 1985. Unit Operations in Food Processing. Pergamon Press.
7. Fellows P. 1988. Food Processing Technology. VCH Ellis Horwood.
8. Heldman DR & Singh RP.1995. Food Process Engineering. AVI Publ.
9. McCabe WL & and Smith JC. 1971. Fundamental of Food Engineering. AVI Publ.
10. Sahay KM & Singh KK. 1994. Unit Operation of Agricultural Processing Vikas Publ.House.
11. Singh RP &Heldman DR. 1993. Introduction to Food Engineering. Academic Press.

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- http://www.cold.org.gr/library/downloads/Docs/Handbook%20of%20Food%20Preservation.PDF
- http://www.uop.edu.pk/ocontents/Lecture%20no%202.pdf
- https://cetiquimica2.files.wordpress.com/2014/03/pr1nc1pl35_f00d_pr353rv4t10n.pdf
- https://www.webpal.org/SAFE/aaarecovery/2_food_storage/Food%20Processing%20Technology.pdf

IFTM University, Moradabad
Course Code: MHSCFN-402
INSTITUTIONAL FOOD MANAGEMENT

Course Objective

To develop a knowledge base about the facilities required for different types of food service units and to equip individuals in understanding and managing resources in a food service institution

UNIT-I **(8Sessions)**

Introduction to Food Service Systems: Evolution of the food service industry. Broad categories of catering services; commercial and Institutional. Characteristics of the various types of food service units – Canteens, Hostels, Hospitals and Restaurants. Scope for food and nutrition services in hospitals- importance of nutritional care and foods service in hospitals.

UNIT-II **(6 Sessions)**

Principles of Institutional food Management: Management functions. Management tools: Tangible, Intangible tools. Management Process: Tools of Management**,** Management of resources, (money, space, materials' equipment, staff, time and procedures).

UNIT-III **(6Sessions)**

Personnel Management: Manpower planning. Space Planning & Organizing, Recruitment, selection and orientation- Training and motivation, employee facilities & benefits, Types of employee welfare Schemes, training and development of employees. LabourLaws.Welfare policies and schemes for employees.

UNIT-IV **(8Sessions)**

Energy and Finance Management: Importance of time and energy management, Types of energy – Human and fuel energy, Measures for utilization and conservation. Management of Finance: Sources of finance and Budgets, Cost accounting/analysis: Food cost analysis, Labour cost analysis and Cost Control Techniques.

Course outcomes:

After undertaking the course students will be able to:

- Gain expertise to function as a food service manager.
- Develop knowledge in managing various food service systems.
- Understand and manage resources in a food service institution.
- Provide practical experience in managing food material for food service management Steer expertise to function as a food service manager.
- Develop knowledge in managing food service in a healthcare set up.
- Understand and manage resources in a food service institution.
- To provide practical experience in managing food material for food service management.

Suggested Readings:

1. Catering Management – an integrated approach- M. Sethi& S. Malhon, Wiley Eastern Limited, 2. Institutional food Management- MohiniSethi, New Age International Publishers, New delhi
2. Catering Management in the Technological age-Fuller Barrievd- Rock hiff Publications.
3. Personal Management in the Hotel& Catering Industries- Boella- Hutchinson Publications.
4. Hotel House Keeping Training Manual- Andrews Snoher-Tata McGraw Hill Publication-New Delhi.
5. The Practice of Hospitality Management,vol I and II –R.Lewis, T.Begg'sM.Shaw&S.Croffot-AVI Publishing Co.DC.West Port Connecticut. Hospitality & Catering- Ursula Jones &Newtons.
6. Handbook of Food Preparations – A.M. Home Economics Association.
7. Food Selection and Preparations – Sweetman, M.D., 4, Mackeller.
8. Food service Planning: layout Equipment – Lender H. Ketshevar and Marget E. Terrel.
9. West B Bessie & Wood Levelle (1988) Food Service in Institutions 6th Edition RevisedBy Hargar FV, Shuggart SG, &Palgne Palacio June, Macmillian Publishing Company NewYork.
10. SethiMohini (2005) Institution Food Management. New Age International Publishers
11. Kazarian E A (1977) Food Service facilities Planning 3rd Edition Von Nostrand ReinholdNew York.
12. Kotas Richard &Jayawardardene. C (1994) Profitable Food and Beverage ManagementHodder& Stoughton Publications
13. Kotler Philip. (2001) Marketing management Millennium Edition Prentice Hall of India
14. Taneja S and Gupta SL (2001) Entrepreneurship development, Galgotia Publishing
15. Dessler Gary (2007) Human Resource Management 11th edition Prentice Hall New Jersey
16. Luthans Fred (2004) OrganisationalBehaviour 10th Edition McGraw Hill International

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- http://www.egyankosh.ac.in/bitstream/123456789/33522/1/Unit-12.pdf
- https://ncert.nic.in/textbook/pdf/lehe104.pdf

IFTM University, Moradabad
Course Code: MHSCFN-403
HUMAN PHYSIOLOGY

Objective

To understand the normal functioning of various organ systems of the body and their interactions and to be able to comprehend the pathophysiology of commonly occurring diseases

Unit I **(6Sessions)**

Definition and importance of physiology, cell structure and functions, various sub cellular organelles and their functions, transport across cell membrane- active transport, diffusion and osmosis.

Unit II **(8Sessions)**

Physiology of digestive system, secretory and digestive functions of gastro-intestinal tract.Role of liver, pancreas, gall bladder and their functions, mechanism of digestion and absorption of carbohydrates, protein and fats.

Unit III **(6Sessions)**

Composition of blood, coagulation of blood and blood groups, Rh factor, brief overview of anemia and its type. Structure and functions of the heart, cardiac output, blood pressure, hypertension,

Unit IV **(6Sessions)**

Excretory system- structure and function of kidney, mechanism of urine formation and role of kidney in maintaining blood pH and acid base, water and electrolyte balance.

Unit V **(8 Sessions)**

Endocrine system- main structural features and functions of endocrine glands, hypothalamus, pituitary, thyroid, parathyroid, adrenals, ovary, testis, α and β endocrine cells of pancreas, functions of different syndromes resulting from cortex, medulla, hypo or hyper activity of the glands.

Course outcomes:

After undertaking the course students will be able to:

- Understand the current state of knowledge about the functional organization of the human body.
- Develop insight of normal functioning of all the organ systems of the body and their interactions.
- Comprehend the pathophysiology of commonly occurring diseases.
- Correlate physiology with various disorders and their pathogenesis.

Suggested Readings:

1. Gonong, W.F. (1985) review
2. Wilson, K.J.W. and Waugh, A. (1986) 3. Jain, A.K. Textbook of Physiology
3. Best CH & Taylor NB. 1989. The Human Body. ASI Publ. House. (Source: National Book Depot, Bombay).
4. Chatterjee CC. 1992. Human Physiology. Vols. I , II. Medical Allied Agency. 21

5. Guyton AC. 1991. Text Book of Medical Physiology. WB Saunders.
6. Mukherjee KL. 1994. Medical Laboratory Technology. Vol I. Tata McGraw Hill. Wilson KJW & Ross JS.1987.
7. Ross and Wilson Anatomy and Physiology in Health and Illness. 6th Ed. Churchill Livingstone.
8. Ganong W.F.(2003)-Review of Medical Physiology.21st ed. McGraw Hill.
9. Guyton A.C. and Hall J.E.(2000)Textbook of Medical Physiology.10th ed. India: Harcourt Asia..
10. Tortora G.J and Grabowski S.R.(2000) Principles of Anatomy and Physiology.9th ed. John Wiley and Sons.Inc.
11. West J.B.(1996): Physiological Basis of Medical Practice.12th Edition. B. I. Waverly Pvt. Ltd.
12. MariebE.N(2001) Human Anatomy and Physiology(5th ed)Pearson Education ,Inc, publishing as Benjamin Cummings.
13. Jain A. K (2014) Human Physiology for BDS(5th Edition), Publisher: Avichal Publishing Company; ISBN: 9788177394337 .
14. Pal G.K and Pal Pravati (2016) Comprehensive Textbook Of Medical Physiology (2Vols) Publisher: Jaypee Brothers Medical Pub (P) Ltd.) ISBN: 5551234080758;

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- https://mymedicallibrary.files.wordpress.com/2016/08/jaypee-essentials-of-medical-physiology-6th-edition.pdf
- https://textbookequity.org/Textbooks/anatomy+phys+vol2a.pdf

IFTM University, Moradabad
Course Code: MHSCFN-404
MATERNAL AND CHILD NUTRITION

Objective

The course will provide adequate information for learners to promote their learning and intellectual development in the area of Maternal and Child Nutrition, and to eventually prepare them for providing nutritional recommendations/consultations to mothers and children and health care professionals, when necessary.

Unit-1 **(6 Sessions)**

• Current Nutrition and Health Status of Women and Children in India.

• Changing concepts and controversies in Maternal and Child Nutrition.

Unit-II **(8Sessions)**

• Importance of Maternal Nutrition: Importance of Nutrition prior to and during pregnancy.

• Pre-requisites for successful outcome. Effect of under nutrition on mother-child diad including pregnancy outcome and Maternal and Child Health-Short term and Long term.

• Physiology and endocrinology of pregnancy and embryonic and fetal growth and development. Nutritional requirements during pregnancy.

• Adolescent Pregnancy

• Pregnancy and AIDS

• Pregnancy and TB

• Intra-uterine growth retardation

• Complications of pregnancy and management and importance of antenatal care.

• Congenital malformation, foetal alcohol syndrome and gestational diabetes mellitus.

Unit-III **(8Sessions)**

• Lactation: Development of mammary tissue and role of hormones. Physiology and endocrinology of lactation-synthesis of milk components. Let down reflex, role of hormones, lactation amenorrhea, effect of breast feeding on maternal health. Human milk composition and factors affecting breastfeeding and fertility. Management of lactation-Prenatal breastfeeding skill education, rooming in, problems, sore nipples, engorged breast, inverted nipples etc.

• Exclusive breastfeeding

• Baby friendly hospitals initiative.

• Breast feeding in the age of AIDS

Unit-IV **(8Sessions)**

• Growth and development during infancy, childhood and adolescence.

• Malnutrition in mother and children: etiology and management (in brief)

• Policies and programmes for promoting maternal and child nutrition and health.

Course outcomes:

After undertaking the course students will be able to:

- Physiological changes during pregnancy and lactation periods
- Nutritional needs during pregnancy and lactation periods
- Nutritional managements of common pregnancy complications
- Basic concepts of growth and development
- Nutritional needs during various stages of growth and development
- Nutritional interventions of common medical problems during growth and development
- Interpretation of basic concepts of nutritional clinical trials during pregnancy and childhood

Suggested Readings:

1. UNICEF (1997). The Care initiative: Assessment, Analysis and Action to improve care for Nutrition, New York, UNICEF
2. WHO (1999) Management of severe malnutrition, A manual for physicians and other senior health workers. Geneva, WHO.
3. Bamji MS, Rao NP & Reddy V.1999. Text Book of Human Nutrition. Oxford & IBH.
4. Falkner F & Tanner JM. 1978. Human Growth - Postnatal Growth and Neurobiology. Vol. II. Plenum Press.
5. Falkner F & Tanner JM. 1986. Human Growth - A Comprehensive Treatise. Development Biology Press.
6. Falkner F & Tanner JM. 1986. Human Growth – Methodology, Ecological, Genetic and Nutritional Effects on Growth. Vol. III. Plenum Press.
7. Francis DEM. 1986. Nutrition in the Life Span. John Wiley & Sons. NNMB Reports
8. Sachdeva HPS &Choudhary P. 1994. Nutrition in Children. Cambridge Press.
9. Williams SR,Worthington RS, Sneholinka ED, Pipes P, Ress JM &Mahal KL. 1988. Nuritionthroughout the Life Cycle. Times Mirror/Mosby College Publ.
10. Ziegler EE & Filer LJ. 1996. Present Knowledge in Nutrition. International Life Science Institute, Washington, D.C.

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- https://www.cartercenter.org/resources/pdfs/health/ephti/library/lecture_notes/health_science_students/LN_maternal_care_final.pdf

IFTM University, Moradabad
Course Code: MHSCFN-451
DISSERTATION

Course Objective

The aim of dissertation is to develop skills in conducting a research study/ working in a project and learn the process of writing a dissertation/ project report

Dissertation

Each student has to carry out the dissertation work immediately after registration in the Third Semester and submit the final dissertation containing Introduction, Literature review, objectives, Hypothesis, Methodology, Result & discussion, summary, conclusion, recommendation references etc. for evaluation by one internal & one external examiner in the end of Fourth Semester.The candidate has to submit two copies and a soft copy of the final dissertation to the head of the department. The H.O.D will forward the dissertation to the examiner for evaluation.

Course outcomes:

After undertaking the course students will be able to:

- Know the practical aspects of, collecting data/ project work
- Evaluate, select and use appropriate strategies for reduction, analysis and presentation of data collected during research process/ project work
- Suitably illustrate data/ insights using various graphical and other methods.
- Prepare a dissertation document/ project report based on research process/ project work done.
- Students will be given an option of doing either Dissertation or Project work in a chosen area congruent to their discipline/ field of study.
- The research will be an original work with plagiarism check and ethical clearance.