

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

IFTM University Moradabad

Course Structure & Evaluation Scheme

Bachelor of Computer Application

(Effective from Session 2022-23)



Director
School of Computer Science & Applications
IFTM University, Moradabad


Registrar
IFTM University
Moradabad.

BCA Programme Structure

I/II/III/IV Semesters

	Courses	No. of Courses L/P	Instruction Hrs/week	Duration of Exam(hrs)	Marks			Credits
					IA	Exam	Total	
Group 1	5 Computer Application Courses	3T	3 x 4	3 x 4	3 x 30	3 x 70	3 x 100	3 x 4 = 12
		2P	2 x 4	2 x 3	2 x 30	2 x 70	2 x 100	2 x 2 = 4
Group 2	One course from 2 Electives	1T	1 x 4	1 x 3	1 x 30	1 x 70	1 x 100	1*4 = 4
Group 3	1 Languages	1T	1 x 4	1 x 3	1 x 30	1 x 70	1 x 100	1 x 4 = 4
	Elective Foundation	1L	1 x 2	1 x 3	1 x 30	1 x 70	1 x 100	1*1 = 1
Group 4	EC & CC	1T	1 x 2	1 x 2	1 x 50	--	1 x 50	1*1 = 1
Semester Credit Total								26

V Semester

	Courses	No. of Courses L/P	Instruction hrs/week	Duration of Exam(hrs)	Marks			Credits
					IA	Exam	Total	
Group 1	9 Computer Application Courses	6T	6 x 4	6 x 3	6 x 30	6 x 70	6 x 100	6 x 4=24
		2P	2 x 2	2 x 3	2 x 30	2 x 70	2 x 100	2 x 2 = 4
		1P	1 x 2	1 X 3	1 x 30	1 x 70	1 x 100	1 X 1 = 1
					Semester Credit Total			29

VI Semester

	Courses	No. of Courses L/P	Instruction on hrs/ week	Duration of Exam(hrs)	Marks			Credits
					IA	Exam	Total	
Group 1	4 Computer Application courses	4 (T/P)	4x4	4x3	4x30	4x70	4x100	4x4 = 16
	Project work	Dissertation	20		100	Project Report : 300 Presentation & VIVA : 100	500	10
							Semester Credit Total	26
Grand Total Credit for three year Degree Programme								: 159

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BCA I SEMESTER

Group	Course Code	Course	Course Type	Periods (L-T-P)	Marks & Credits			
					IA	Exam	Total	Credits
I	BCACC-111	Fundamentals of Computer Science	CC	3-1-0	30	70	100	4
	BCACC-112	Problem Solving using C	CC	3-1-0	30	70	100	4
	BCACC-113	Computer Organization	CC	3-1-0	30	70	100	4
	BCAPL-114	Computer Organization Lab	Lab	0-0-4	30	70	100	2
	BCAPL-115	C Programming Lab	Lab	0-0-4	30	70	100	2
II	BCADS-116	E1 : Internet Basics & HTML	DSE (Choose any One)	3-1-0	30	70	100	4
	BCADS-117	E2: Algorithm & Logic Development						
III	EHU-101	HVPE (Human Values & Professional Ethics)	GE	3-1-0	30	70	100	4
	BCAGE-102	Mathematics-I						
	TPSD-101	Professional skill Development-I						
	BCAPL-101	Elective Foundation Office Automation Lab	Lab	0-0-2	30	70	100	1
IV		EC & CC			50	-	50	1
		Total		15-5-10	290	560	850	26


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BCA II SEMESTER

Group	Course Code	Course	Course Type	Periods (L-T-P)	Marks & Credits			
					IA	Exam	Total	Credits
I	BCACC-211	Mathematics-II	CC	3-1-0	30	70	100	4
	BCACC-212	Object Oriented Programming using C++	CC	3-1-0	30	70	100	4
	BCACC-213	Data Structure using C/C++	CC	3-1-0	30	70	100	4
	BCAPL-214	C++ Lab	Lab	0-0-4	30	70	100	2
	BCAPL-215	Data Structure Lab	Lab	0-0-4	30	70	100	2
II	BCADS-216 BCADS-217 BCADS-218	E1 : Internet of Things E2: Big Data Analytics E3: Artificial Intelligence	DSE (Choose any One)	3-1-0	30	70	100	4
III	BCAGE-201	Environmental Science	GE	3-1-0	30	70	100	4
	BCAGE-202	OR Organizational Behavior						
	BCAGE-203	OR Business Data Processing						
	BCAPL-201	Elective Foundation Business Data Processing Lab	Lab	0-0-2	30	70	100	1
IV		EC & CC			50	-	50	1
		Total		15-5-10	290	560	850	26



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BCA III SEMESTER

Group	Course Code	Course	Course Type	Periods (L-T-P)	Marks & Credits			
					IA	Exam	Total	Credits
I	BCACC-311	Operating Systems	CC	3-1-0	30	70	100	4
	BCACC-312	Database Management System	CC	3-1-0	30	70	100	4
	BCACC-313	.NET Programming Using C#	CC	3-1-0	30	70	100	4
	BCAPL314	DBMS Lab	Lab	0-0-4	30	70	100	2
	BCAPL315	.Net Programming Lab	Lab	0-0-4	30	70	100	2
II	BCADS-316	E1 : Hardware & PC Maintenance	DSE (Choose any One)	3-1-0	30	70	100	4
	BCADS-317	E2 : Desktop Publishing						
III	BCAGE-301	Entrepreneurship	GE	3-1-0	30	70	100	4
		OR						
	BCAGE-302	Disaster Management						
		OR						
	BCAGE-303	Discrete Mathematics						
	BCAPL-301	Elective Foundation Desktop Publishing Lab	Lab	0-0-2	30	70	100	1
IV		EC &CC			50	-	50	1
		Total		15-5-10	290	560	850	26







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BCA IV SEMESTER

Group	CourseCode	Course	Course Type	Periods (L-T-P)	Marks & Credits			
					IA	Exam	Total	Credits
I	BCACC-411	Computer Graphics and Animation	CC	3-1-0	30	70	100	4
	BCACC-412	Java Programming	CC	3-1-0	30	70	100	4
	BCACC-413 BCACC-414 BCACC-415	E1: Data Mining E2: Computer Oriented Numerical Analysis E3: Business Statistics & Mathematics	CC	3-1-0	30	70	100	4
	BCAPL-416	Computer Graphics and Animation Lab	Lab	0-0-4	30	70	100	2
	BCAPL-417	Java Programming Lab	Lab	0-0-4	30	70	100	2
II	BCADS-418	E1 : Fundamentals of ICT	DSE (Choose any One)	3-1-0	30	70	100	4
	BCADS-419	E2: E-Commerce						
III	BCAGE-401	Analytical Skills OR	GE	3-1-0	30	70	100	4
	BCAGE-402	Information Security & Cyber Law OR						
	BCAGE-403	System Analysis & Design						
	BCAPL-401	Elective Foundation ICT based Lab	Lab	0-0-2	30	70	100	1
IV		EC & CC			50	-	50	1
		Total		15-5-10	290	560	850	26

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BCA V SEMESTER

Group	Course Code	Course Particulars	Course Type	Periods (L-T-P)	Marks & Credits			
					IA	Exam	Total	Credits
I	BCACC-511	Software Engineering	CC	3-1-0	30	70	100	4
	BCACC-512	Data Communication & Networks	CC	3-1-0	30	70	100	4
	BCACC-513	Management Information system	CC	3-1-0	30	70	100	4
	BCACC-514	Web Technology	CC	3-1-0	30	70	100	4
	BCACC-515	Python Programming	CC	3-1-0	30	70	100	4
	BCADS-516	E2: Android Application Development	DSE (Choose any One)	3-1-0				4
	BCADS-517	E3: Machine Learning			30	70	100	
	BCAPL-518	Mini Project based on 514	Project	0-0-4	30	70	100	2
	BCAPL-519	Python Programming Lab	Lab	0-0-4	30	70	100	2
	BCAPL-501	E2: AAD Lab	Lab	0-0-2				1
	BCAPL-502	E3: ML Lab			30	70	100	
		Total		18-6-10	270	630	900	29





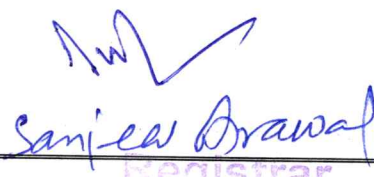






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BCA VI SEMESTER

Group	Course Code	Course Particulars	Course Type	Periods (L-T-P)	Marks & Credits			
					IA	Exam	Total	Credits
I	BCACC-611	E-Commerce	CC	3-1-0	30	70	100	4
	BCACC-612	Client Server Computing	CC	3-1-0	30	70	100	4
	BCACC-613	Programming in PHP	CC	3-1-0	30	70	100	4
	BCACC-614	E1: Cloud Computing	CC (Choose any One)	3-1-0	30	70	100	4
	BCACC-615	E2: Enterprise Resource Planning						
	BCACC-616	E3: Digital Image Processing						
	BCACC-617	E4: Information Retrieval System						
	BCACC-618	E5: Probability, Statistics & Queuing Theory						
	BCAPL-601	Project Work	Project	0-0-20	100	Reports -300 Presentation and Viva - 100 Total: 400	500	10
		Total		12-4-20	220	680	900	26

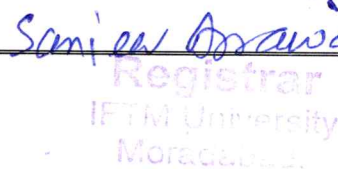
Total Marks: 5600

Grand Total Credit for three years BCA Degree Programme: 138


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Co-and Extra – Curricular Activities (CC& EC*)

A student shall opt for any one of the following activities in the first four semesters offered in the college

- N.S.S / N.C.C./Rotary Activities / Rovers and Rangers
- Sports and Games / Activities related to Yoga
- A Small project work concerning the achievements of Indian in different fields
- Evolution of study groups/seminar circles on Indian thoughts and ideas
- Interaction with local communities in their neighborhood and learn about and from them
- Exploring different aspects of Indian civilizations
- Other activities such as Cultural Activities as prescribed by the University.

Evaluation of Co-and Extra Curricular Activities is as per the procedure evolved by the University from time to time.



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Bachelor of Computer Applications, Program
BCA I Year (I Semester)
(Effective from 2022-23)

BCACC-111 FUNDAMENTALS OF COMPUTER SCIENCE

L-T-P

3-1-0

Objective(s): The objectives of this course:

The subject aims to provide the student with:

1. An understanding of basic concepts of computer science and applications.
2. An introduction to the fundamentals of hardware, software and programming.
3. An introduction to mathematical software.
4. An understanding of cyber laws and computer security *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Knowing computer: What is Computer, Basic Applications of Computer; History of Computers, Components of Computer System, Central Processing Unit (CPU), VDU, Input/output Devices, Computer Memory, Concepts of Hardware and Software; Concept of Computing, Data and Information; Connecting keyboard, mouse, monitor and printer to CPU and checking power supply *for skill development and employability.*

UNIT II:

(8 Sessions)

Understanding Word Processing: Word Processing Basics; Opening and Closing of documents; Text creation and Manipulation; Formatting of text; Table handling; Spell check, language setting and thesaurus; Printing of word document Mail merge. Using Spread Sheet: Basics of Spreadsheet; Manipulation of cells; Formulas and Functions; Editing of Spread Sheet, printing of Spread Sheet for skill and Employability *for skill development and employability.*

UNIT III:

(8 Sessions)

Basic of Computer networks; LAN, WAN; Introduction to Internet, WWW and Web Browsers, Applications of Internet; Connecting to internet; What is ISP; Knowing the Internet; World Wide Web; Web Browsing software, Search Engines; Understanding URL; Domain name; IP Address; Using website *for skill development and employability.*

UNIT IV:

(8 Sessions)

Programming Fundamentals: Algorithm Development, Techniques of problem solving. Flowcharting, Stepwise refinement, Structured programming concepts; Top-down Design, Development of efficient programs, Program Correctness, Debugging and testing of Programs *for skill development and employability.*

UNIT V:

(7 Sessions)

Data Type, Storage Classes, Variable, Constant, Keyword, Identifier, Operator & expression, Type Conversion *for skill development and employability.*

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Course Outcomes (COs):

On completion of the course students will be able to

CO1	Understand the concept of input and output devices of Computers and how it works and recognize the basic terminology used in computer system for skill development and employability.
CO2	Understand Word Processing and use different Text creation and Manipulation using Spread Sheet, Word for global use system for skill development and employability.
CO3	Understand Basic Concepts of Computer networks system for skill development and employability.
CO4	Understand Basic Concepts of Programming and Design programs connecting decision structures, loops and functions system for skill development and employability.
CO5	Use different data structures and create / manipulate basic data files and developing applications for real world problems system for skill development and employability.

PO-CO Mapping (Please ✓ wherever required)

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	1	1	2	1	1	1	2	1	1	2
CO2	2	3	1	1	2	3	1	1	2	1	2	2
CO3	2	1	2		3	2	1	1	1	3	2	3
CO4	3	2	1	2	3	1	1	1	1	1	3	2
CO5	3	1	2	1	2	2	1	1	2	1	3	2

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:

1. "Computer Fundamentals" by P K Sinha.
2. Computer Fundamental and Concepts by V. Raja Raman
3. Let Us C by Yaswant P. Kanetkar

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4. Programming in C by Dennis and Ritchie
5. "Computer Fundamentals" by Goel.
6. "Fundamentals of Natural Computing: Basic Concepts, Algorithms, and Applications (Chapman & Hall/CRC Computer and Information Science Series)" by de Castro and Leandro Nunes.

Websites Sources:

1. <https://www.livescience.com/20718-computer-history.html>
2. <http://people.bu.edu/baws/brief%20computer%20history.html>
3. https://web.cs.wpi.edu/~emmanuel/courses/cs513/S10/pdf_slides/intro1.pdf
4. https://en.wikipedia.org/wiki/Local_area_network
5. <https://sites.google.com/site/vandangedth10/introduction>
6. <https://www.w3schools.com>

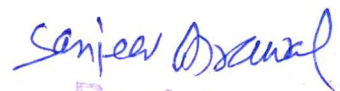
MOOC/ Certification Courses:

1. <https://nptel.ac.in/courses/106/105/106105182/>
2. <https://nptel.ac.in/courses/106/101/106101163/>
3. <https://nptel.ac.in/courses/106/101/106101061/>



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BCACC-112

PROBLEM SOLVING USING C

L-T-P

3-1-0

Objective(s): The objectives of this course are:

1. To Make the Student Learn C Programming Language.
2. To Learn Problem Solving Techniques using C.
3. To Teach the Student to Write Programs in C and to Solve the Problems.
4. To Teach the Concepts of C Programming Like Control Structures Functions
5. Learn About Arrays Structures and Union etc. *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Introduction to Computer based Problem Solving; Algorithms and flowcharts; Programming Languages; Classification of Programming Languages; Characteristics of a program; Rules/conventions of coding, documentation, naming convention; Structured Programming; Modular Programming; Programming Environment: Assembler, Interpreter, Compiler, Linker and Loader for *Skill Development*.

UNIT II:

(8 Sessions)

Fundamentals of C programming; History of C; Structure of C Program; Character set, Identifiers and Keywords; Data types; Constants and Variables; Operators and Expressions, Type Conversion, Operator Precedence and Associativity; Basic Input/output operations; Decision control structures: if-else, switch-case; Loop control structure: while, do-while, for; Jump statement: Break, continue; goto statement *for skill development and employability*.

UNIT III:

(8 Sessions)

Array: One dimensional array -Declaration, initialization of one-dimensional arrays; two-dimensional array -Declaration, initialization of two-dimensional arrays; multi-dimensional array. Strings: Declaring and initializing string, reading and writing strings, string manipulation functions, array of strings. Function: Need of user-defined function, Arguments, return value, return statement; passing parameters call by value, call by reference; Scope, visibility and lifetime of variables; Nesting of functions; passing arrays to function; passing strings to function. Recursion: basics, comparison with iteration, types of recursions. Storage Classes *for skill and employability*.

UNIT IV:

(7 Sessions)

Pointer: Declaring and initializing pointer variables, chain of pointers, Pointer expression, Pointer arithmetic, Array of pointer and its limitations; Pointers as Function arguments; Function returning pointer, Dynamic Memory management functions. Structure: Defining a Structure, Declaring & initializing Structure Variables, Membership Operator, and Array in structure, Array of Structure, Structure within structure, Pointer to structure. Union: Defining union, Declaring & initializing union Variables; Bit Fields; Enumerated data type; typedef; Bitwise operators *for skill development and employability*.


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UNIT V:**(7 Sessions)**

Command line arguments; File handling: Defining, opening and closing a file, input/output operations on file, merging files; C pre-processors: Macro substitution, file inclusion, compiler control directive *for skill development and employability*.

Course Outcomes (COs):

On completion of the course students will be able to

CO1	Understanding the concept of algorithm and flowchart and how it works for Skill Development system for skill development and employability.
CO2	Recognize of the basic terminology used in C programming system for skill development and employability.
CO3	To understand the basic concept of Array and Function and how it is useful to create programs system for skill development and employability.
CO4	To understand the dynamic behaviour of memory by the use of pointers and to be familiar with the concept of structure and union system for skill development and employability.
CO5	To be familiar with the basic concepts of file handling and implement this concept for creating projects in C language for global use system for skill development and employability.

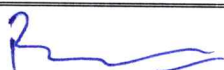
PO-CO Mapping (Please ✓ wherever required)

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	2	1	2	1	1	1	1	1	2	2
CO2	3	2	2	2	2	1	1	1	2	1	3	1
CO3	2	2	3	1	1	1	1	1	1	1	2	2
CO4	1	1	3	1	1	1	1	1	2	1	3	1
CO5	3	2	3	1	1	1	1	1	3	1	3	2

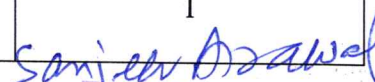
CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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


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Suggested Readings:

1. "Concept of 'C'" by Robert laffore, TMH Publication.
2. "Programming in 'C'" by E. Balaguruswami, TMH Publication
3. "Let Us C" by Yaswant P. Kanetkar, Narosa Publication
4. "Magic in C" AB Publication.
5. Programming in C by Dennis and Ritchie.
6. Silberschatz A., Korth F. H. and Sudarshan S., Database System Concepts, Tata McGraw Hill (2010) 6th ed.
7. Elmasri R. and Navathe B. S., Fundamentals of Database Systems, Pearson (2016) 7th ed
8. Hoffer J., Venkataraman, R. and Topi, H., Modern Database Management, Pearson (2016) 12th ed.

Websites Sources:

1. <https://www.bmu.edu.in/social/best-books-for-c-programming/>
2. <http://ce.sharif.edu/courses/9596/1/ce15312/resources/root/Books/Advanced%20C%201992.pdf>
3. <https://www.w3schools.com/>

MOOC/ Certification Courses:

1. <https://nptel.ac.in/courses/106/106/106106210/>
2. <https://www.udemy.com/course/c-programming-for-beginners-/>
3. <https://edube.org/study/ce1>



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BCACC-113

COMPUTER ORGANIZATION

L-T-P

3-1-0

Objective(s): The objectives of this course are:

1. To Make the Student Learn the basics involved in data representation and digital logic circuits used in the computer system age.
2. To Learn general concepts in digital logic design, including logic elements, and their use in combinational and sequential logic circuit design.
3. To Teach the Student the basic architecture of processing, memory and I/O organization in a computer system *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Fundamental of Digital Electronics: Number systems, Logic gates and their truth tables, Combining logic circuits for expressions using NAND and NOR gates. Boolean Algebra Basics Laws of Boolean Algebra, Simplifications of Boolean equations using K-maps, Circuit Designing techniques (SOP, POS, K-Map). Combinational and sequential circuits: (Simple block diagrams, truth tables and IC packages only required). Adders, decoders, multiplexers, encoder circuits, Flip-flops: RS, clocked RS, JK, D and T flip flops, Master slave flip flops *for skill development.*

UNIT II:

(8 Sessions)

Register Transfer and Micro-operations: Register Transfer Language, Register Transfer, Bus and Memory Transfers, Arithmetic Micro-operations, Logic Micro-operations, Shift Micro operations, Arithmetic logic shift unit Computer Arithmetic: Introduction, Multiplication Algorithms, Division Algorithms, for fixed point-members *for skill development and employability.*

UNIT III:

(8 Sessions)

Central Processing Unit: Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Difference between RISC and CISC *for skill development.*

UNIT IV:

(7 Sessions)

Input-Output Organization: Peripheral Devices, Input-Output Interfaces, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access (DMA) *for skill development and employability.*

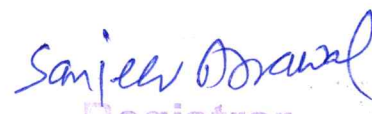
UNIT V:

(7 Sessions)

Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory *for skill development and employability.*


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Course Outcomes (COs):

On completion of the course students will be able to

CO1	Understand the general concepts in digital logic design, including logic elements, and their use in combinational and sequential logic circuit design for skill development, employability and entrepreneurship development.
CO2	Understand the Register Transfer and Micro-operations, digital representation of data in a computer system for skill development, employability and entrepreneurship development.
CO3	Understand the general concepts of Central Processing and its operations for Skill Development at National Level for skill development, employability and entrepreneurship development.
CO4	Understand computer arithmetic formulate and solve problems, understand the performance requirements of Input-Output Organization systems for skill development, employability and entrepreneurship development.
CO5	Understand the basic architecture of processing, memory and I/O organization in a computer system for skill development, employability and entrepreneurship development.

PO-CO Mapping (Please ✓ wherever required)

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	2	1	1	1	1	1	1	1	1	1
CO2	2	1	1	1	1	1	1	1	1	1	2	1
CO3	3	2	2	1	3	1	1	1	1	1	1	1
CO4	2	1	2	2	1	1	1	1	1	1	1	1
CO5	3	2	1	2	2	1	2	1	1	1	2	1

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:

1. M.M. Mano, "Computer Architecture", PHI 1998.
2. Malvino and Leach, "Digital Electronics", TMH, 1998.
3. Computer System Architecture, NaushJotwani- 7MM.
4. Digital Electronics, James W Bignel, Robert Donovan, 5th Edition, Cengage Learning

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Publications.

5. Digital Design – Morris Mano, PHI, 3rd Edition, 2006.
6. Taub & Schilling: Digital integrated electronics , McGraw-Hill
7. R P Jain : Digital Electronics, 4th Edition TMH.

Websites Sources:

1. <https://www.geeksforgeeks.org/digital-electronics-and-computer-organisation/>
2. <https://bcastudyguide.wordpress.com/digital-electronics-and-computerorganisation/>
3. <http://www.birzeit.edu/en/content/encs211-digital-electronics-and-computerorganization-lab-0>
4. <https://www.javatpoint.com/digital-computers>
5. <https://www.w3schools.com/>


MOOC/ Certification Courses:

1. <https://nptel.ac.in/courses/106/104/106104073/>
2. <https://www.coursera.org/learn/comparch>
3. <https://nptel.ac.in/courses/106/103/106103068/>



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BCAPL-114

COMPUTER ORGANIZATION LAB

L-T-P

0-0-4

Objective(s): The objectives of this course are:

1. To acquire the basic knowledge of digital logic levels and application of knowledge to understand digital electronics circuits.
2. To prepare students to perform the analysis and design of various digital electronic circuits *to inculcate skill, provide employability & entrepreneurship skill.*

List of Experiments:

1. Realization of basic gates using Universal logic gates.
2. Code conversion circuits- BCD to Excess-3 and vice-versa.
3. Four-bit parity generator and comparator circuits.
4. Construction of simple Decoder and Multiplexer circuits using logic gates.
5. Design of combinational circuit for BCD to decimal conversion to drive 7-segment display using multiplexer.
6. Construction of simple arithmetic circuits-Adder, Subtractor.
7. Realization of RS-JK and D flip-flops using Universal logic gates.
8. Realization of Universal Register using JK flip-flops and logic gates.
9. Realization of Universal Register using multiplexer and flip-flops.
10. Realization of Asynchronous Up/Down counter.
11. Realization of Synchronous Up/Down counter.
12. Realization of Ring counter and Johnson's counter.
13. Construction of adder circuit using Shift Register and full Adder.
14. Code conversion circuits – Binary to Gray & Vice-Versa.(Innovative)
15. Design of Sequential Counter with irregular sequences. (Innovative)

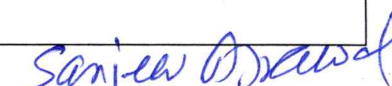
Course Outcomes (COs):

After studying this lab course, the students will be able to

CO1	Have a thorough understanding of the fundamental concepts and techniques used in digital electronics high-level constructs that are more easily understood by humans for skill development, employability and entrepreneurship development.
CO2	Understand and examine the structure of various number systems and its application in digital design for skill development, employability and entrepreneurship development.


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CO3	The ability to understand, analyze and design various combinational and sequential circuits for Skill Development for global level for skill development, employability and entrepreneurship development.
CO4	Ability to identify basic requirements for a design application and propose a cost effective solution for skill development, employability and entrepreneurship development.
CO5	The ability to identify and prevent various hazards and timing problems in a digital design & to Develop skill to build, and troubleshoot digital circuits for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	2	1	1	1	1	1	1	1	1
CO2	2	1	1	1	1	1	1	1	1	1	2	1
CO3	3	2	2	1	3	1	1	1	1	1	1	1
CO4	2	1	2	2	1	1	1	1	1	1	1	1
CO5	3	2	1	2	2	1	2	1	1	1	2	2

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
 (Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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



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BCAPL-115

C PROGRAMMING LAB

L-T-P

0-0-4

Objective(s): The objectives of this course are:

1. To introduce students to the basic knowledge of programming fundamentals of C language.
2. To impart writing skill of C programming to the students and solving problems.
3. To impart the concepts like looping, array, functions, pointers, file, structure *to inculcate skill, provide employability & entrepreneurship skill.*

List of Experiments:

1. Find the area of a Triangle.
2. Find greatest among 3 numbers.
3. Perform the arithmetic expression using switch statement.
4. Find the factorial of a given number.
5. Generate all prime numbers up to nth number
6. Print Fibonacci series
7. Find total of even integers
8. Print product of two matrices
9. Concatenate two strings without using library functions
10. Print the elements of array using pointers
11. Find factorial of a given number using function.
12. Find total mark of n students

Course Outcomes (COs):

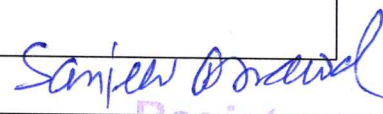
After completing this lab course, students will be able to:

CO1	Understand the logic for a given problem. Write the algorithm of a given problem & Draw a flow chart of a given problem for global level. Also recognize and understand the syntax and construction of C programming code global level for skill development, employability and entrepreneurship development.
CO2	Gain experience of procedural language programming for skill development, employability and entrepreneurship development.
CO3	Know the steps involved in compiling, linking and debugging C code for skill development, employability and entrepreneurship development.
CO4	Understand using header files. Learn the methods of iteration or looping and branching for skill development, employability and entrepreneurship development.



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CO5	Make use of different data-structures like arrays, pointers, structures and files for skill development, employability and entrepreneurship development.
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Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	1	2	1	1	1	1	1	1	3
CO2	2	1	2	2	2	1	1	1	2	1	3	1
CO3	2	2	3	1	1	1	1	1	1	1	2	2
CO4	1	1	3	1	1	1	1	1	2	1	3	2
CO5	3	2	3	1	1	1	1	1	3	1	2	2

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

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BCADS-116

E1: INTERNET BASICS & HTML

L-T-P

3-1-0

Objective(s): The objectives of this course are to:

1. Understand the basics of Internet and its working.
2. Give knowledge about protocols for Internet.
3. Understand the principles of creating an effective web page.
4. Make students familiar with graphic design.
5. Know principles that relate to web design and learn how to implement theories into practice.
6. Develop skills in analyzing the usability of a web site. Develop basic programming skills using Java script *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I: (8 Sessions)

Introduction to Internet: Brief History of Internet, its working, World Wide Web, Growth of the Web, Protocols- HTTP, FTP, SMTP, POP3, MIME, IMAP, Introduction to Internet Services (ISP), Choosing an ISP, E-mail concepts, URL, Firewall, Domain Name System *for skill development.*

UNIT II: (8 Sessions)

Web Designing: Basic principles involved in developing a web site, planning process, Designing navigation bar, Design Concept, Web Browser *for skill development & Employability.*

UNIT III: (8 Sessions)

HTML: What is HTML, History of HTML, HTML Documents, Structure of HTML document, Mark up Tags, HTML Tags, and elements of HTML, Lists, Hyperlinks, Images, Tables, Forms and Frames?
CSS: Concept of CSS, CSS Properties, Generating Internal and External Style Sheets, CSS Id and Class, Background images, colors and properties, manipulating texts *for skill development and employability.*

UNIT IV: (7 Sessions)

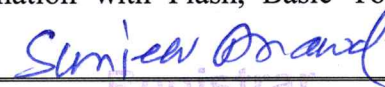
Scripting Programming: The principal of scripting language, Difference between scripting languages and non- scripting languages, Types of Scripting Languages.
JavaScript Programming: Introduction to JavaScript: Utility and Evolution of the JavaScript Language, Data Types, Statements and Operators, Variable Declarations, Conditional Statement, Function, Objects *for skill development and employability.*

UNIT V: (7 Sessions)

Photoshop: Objective of graphic design, differentiate between raster and vector graphics, Basic of Photoshop, Navigation and All tools, working with basic selections, Color theory, working with layer, Importing and Exporting images. **Flash:** Fundamental concepts of Animation with Flash, Basic Tools,


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Different Tween Techniques, Frame Animation, Various Flash Effect, Adding Action Script *knowledge for better employability in industry.*

Dreamweaver: Fundamental of Dreamweaver, creating a Page Layout, working with forms and Navigation *for skill development and employability.*

Course Outcomes (COs):

On completion of the course students will be able to

CO1	Students are able to understand the basics of Internet and basic services provided by Internet for skill development, employability and entrepreneurship development.
CO2	Students will be able to understand basic principles involved in developing a web site at global level for skill development, employability and entrepreneurship development.
CO3	Students will be able to write and understands HTML and CSS Tags for skill development, employability and entrepreneurship development .
CO4	Students will be able to write a server-side/Client Side java application called Java Scripts to catch form data sent from client, process it and store it on database for skill development, employability and entrepreneurship development.
CO5	Students will be able to design GUI web pages using Photoshop and Dreamweaver for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)								3 strong, 2 medium, 1 weak				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	3	1	3	1	1	1	1	3	2	2
CO2	2	2	3	1	3	2	2	1	1	1	3	2
CO3	3	1	3	1	2	2	1	1	1	1	2	2
CO4	3	1	2	2	1	1	1	1	1	1	3	1
CO5	2	1	3	1	3	1	1	1	1	1	2	2

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	1	1
CO2	3	3	1
CO3	3	3	1

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CO4	3	3	1
CO5	3	3	2

Suggested Readings:

1. Internet & Word Wide Web, 4e by Deitel, Pearson
2. Magic with HTML, DHTML and Javascript", Laxmi Publication
3. Web Designing and Development Training Guide, by Satish Jain, Ambrish K Rai and M. Geeta, BPB Publication
1. Java script programming by Deitel, pearson
2. Sams Tech Yourself Adobe creative suit 3 all in one by Golding, pearson
3. Adobe Fireworks CS4 by Babbage, pearson Adobe flash CS4 Professional by Schaeffer,
4. pearson
5. The Dreamwaver CS 4 by David Sawyear McFarland, Oreilly

Websites Sources:

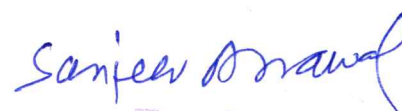
1. www.journaldev.com
2. www.itdesk.info
3. nielit.gov.in/chuchuyimlang/sites/default/files.
4. www.tutorialspoint.com

MOOC/ Certification Courses:

1. <https://nptel.ac.in/courses/106/105/106105084/>
2. <https://nptel.ac.in/courses/106/105/106105166/>


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BCADS-117

E2: ALGORITHM & LOGIC DEVELOPMENT

L-T-P

3-1-0

Objective(s): The objective of this course is to:

1. To learn mathematical background for analysis of algorithm
2. To learn various advanced data structures.
3. To understand the concept of designing an algorithm.
4. To learn dynamic programming and greedy method.
5. To understand the concept of pattern matching
6. To learn advanced tree and graph applications *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

An introduction to the program development and design process, including computer-based concepts of problem-solving, structured programming logic and techniques, algorithm development and program design. Topics include program flowcharting, algorithms, input/output techniques, looping, modules, selection structures, file handling, control breaks, pseudo coding, and user documentation *for skill development and employability..*

UNIT II:

(8 Sessions)

Introduction to Algorithm Design and Data Structure: Introduction to Data Structure, Classification data Structure, Characteristics of an Algorithm; Building Blocks of Algorithms, Complexity of Algorithms: Notations for the Growth Rates of Functions. Procedure and Recursion, Array: Single and Multidimensional *for skill development and employability..*

UNIT III:

(8 Sessions)

List, Stacks and Queues: List ADT: Implementation using arrays, linked list, cursor based linked lists, applications of lists, Stack ADT: Concept and Applications, Queue ADT: Concept and Applications *for skill development and employability..*

UNIT IV:

(7 Sessions)

Trees and Graphs: Definitions and Concepts, Operations on Binary Trees, Representation of binary tree, Conversion of General Trees to Binary Trees, Sequential and Other Representations of Trees, Tree Traversal. Graphs: Matrix Representation of Graphs, List Structures, Other Representations of Graphs, Spanning Trees, Traversal in graph: Breadth First Search, Depth First Search *for skill development and employability..*

UNIT V:

(7 Sessions)

Sorting and Searching: Sorting: Insertion Sort, Shell Sort, Heap Sort, Merge Sort, Quick Sort, Linear search and Binary Search, Balanced Search Trees: AVL trees, B-Tree. Indexing & hashing: Hash Function –


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Separate Chaining – Open Addressing. Divide and Conquer Strategy: Binary Search, Merge sort, Quick sort. Greedy Strategy: Knapsack Problem *for skill development and employability..*

Course Outcomes (COs):

On completion of the course students will be able to

CO1	Implement the basic data structures and solve problems using fundamental algorithms and Offers Students an opportunity to apply skills in a laboratory environment for skill development, employability and entrepreneurship development.
CO2	To understand the concept of designing an algorithm Design and Data Structure for skill development, employability and entrepreneurship development.
CO3	Implementation of List, Stacks and Queues in various fields in real world (global level) for skill development, employability and entrepreneurship development.
CO4	Implement and Understand the Trees and Graphs: Definitions and Concepts, and its Operations for skill development, employability and entrepreneurship development.
CO5	Implement various search and sorting techniques. Also Analyze, evaluate and choose appropriate data Structure and algorithmic technique to solve real-world problems for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	3	2	1	1	1	1	1	1	2	1
CO2	2	1	3	2	2	1	1	1	1	1	2	1
CO3	2	2	3	2	1	1	1	1	1	1	2	1
CO4	1	2	3	1	1	1	1	1	1	1	2	2
CO5	1	1	3	2	2	1	1	1	1	1	3	2

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	3	1
CO2	3	2	1

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CO3	3	2	1
CO4	3	2	1
CO5	3	2	1

Suggested Readings:

1. AV Aho, J Hopcroft, JD Ullman, Data Structures and Algorithms, Addison- Wesley, 1983.
2. TH Cormen, CF Leiserson, RL Rivest, C Stein, Introduction to Algorithms, 3rd Ed., MIT Press, 2009.
3. AV Aho, J Hopcroft, JD Ullman, The Design and Analysis of Algorithms, Addison-Wesley, 1974.
4. MT Goodrich, R Tamassia, DM Mount, Data Structures and Algorithms in Java, 5th Ed., Wiley, 2010. (Equivalent book in C also exists.)
5. Corman, Leiserson&Rivest, Introduction to Algorithms, MIT Press (2009)
6. Narasimha Karumanchi, Data Structures and Algorithms Made Easy (2014).

Websites Sources:

1. <https://www.cs.bham.ac.uk/~jxb/DSA/dsa.pdf>
2. <https://www.cs.bham.ac.uk/~jxb/DSA/dsa.pdf>
3. <https://www.w3schools.com/>

MOOC/ Certification Courses:

1. <https://nptel.ac.in/courses/106/105/106105230/>
<https://nptel.ac.in/courses/106/106/106106130>



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EHU – 101: HUMAN VALUES AND PROFESSIONAL ETHICS

L T P
3 1 0

Objective(s): The objectives of this course:

1. To create an awareness on Engineering Ethics and Human Values.
2. To understand social responsibility of an engineer.
3. To appreciate ethical dilemma while discharging duties in professional life *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I: (8 Sessions)

HUMAN VALUES: Morals, Values and Ethics – Integrity – Work Ethic – Service – Learning – Civic Virtue – Respect for others – Living Peacefully – Caring – Sharing – Honesty – Courage – Valuing Time – Co-operation – Commitment – Empathy – Self-Confidence – Character – Spirituality *for employability.*

UNIT II: (8 Sessions)

ENGINEERING ETHICS: Senses of 'Engineering Ethics' - variety of moral issues - types of inquiry - Moral dilemmas - Moral autonomy - Kohlberg's theory - Gilligan's theory - consensus and controversy – Models of Professional Roles - theories about right action - Self-interest - custom and religion - uses of ethical theories. Valuing Time – Co-operation – Commitment *for skill development and employability.*

UNIT III: (8 Sessions)

ENGINEERING AS SOCIAL EXPERIMENTATION: Engineering as experimentation - engineers as responsible experimenters - codes of ethics - a balanced outlook on law - the challenger case study *for skill development, employability and entrepreneurship development.*

UNIT IV: (7 Sessions)

SAFETY, RESPONSIBILITIES AND RIGHTS: Safety and risk - assessment of safety and risk - risk benefit analysis and reducing risk - the three mile is land and Chernobyl case studies.

Collegiality and loyalty – Respect for authority – Collective bargaining – Confidentiality – Conflicts of interest – Occupational crime – Professional rights – Employee rights – Intellectual Property rights (IPR) – Discrimination for skill development, employability and entrepreneurship development *for skill development, employability and entrepreneurship development.*

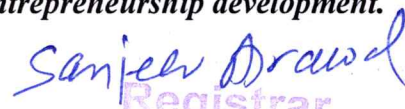
UNIT V: (7 Sessions)

GLOBAL ISSUES: Multinational corporations - Environmental ethics - computer ethics - weapons development - engineers as managers-consulting engineers and engineers as expert witness and advisors - moral leadership – Sample code of Ethics like ASME, ASCE, IEEE, IETE etc for skill development, employability and entrepreneurship development for skill development, employability and entrepreneurship development *for skill development, employability and entrepreneurship development.*



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Course Outcomes (COs):

On completion of the course students will be able to

Course Code	EHU – 101
Course Name	E2: ALGORITHM & LOGIC DEVELOPMENT
COs	Description
CO1	Understood the core values that shape the ethical behaviour of an engineer for employability global level for skill development, employability and entrepreneurship development.
CO2	Exposed awareness on professional ethics and human values. These issues will help to sensitize students to be broader towards the social, cultural, economic and human issues, involved in social changes for skill development, employability and entrepreneurship development.
CO3	Known their role in technological development & making engineering
CO4	Understood the technology students aware of the various issues concerning man and society for skill development, employability and entrepreneurship development.
CO5	Understood to understand the nature of the individual and the relationship between the self and the community for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)								3 strong, 2 medium, 1 weak				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1	1	1	1	1	2	1	2	1	1
CO2	1	2	3	1	3	1	1	1	2	1	1	2
CO3	3	1	1	2	3	2	1	1	2	3	1	1
CO4	2	2	1	1	1	1	3	1	1	1	1	2
CO5	2	1	1	1	1	1	2	1	1	1	1	2

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	1	2	1
CO2	2	2	1

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C03	2	2	3
C04	2	2	2
C05	2	2	3

Suggested Readings:

1. Mike Martin and Roland Schinzinger, "Ethics in Engineering", McGraw-Hill, New York 1996.
2. Govindarajan M, Natarajan S, Senthil Kumar V. S, "Engineering Ethics", Prentice Hall of India, New Delhi, 2004.
3. Jayshree Suresh and B.S.Raghavan, "Human values and Professional Ethics", S.Chand & Company Ltd., New Delhi.

Websites Sources:

1. <https://www.ugc.ac.in/e-book/HUMAN%20VALUE%20English.pdf>
2. https://onlinecourses.swayam2.ac.in/ntr21_ed54/preview
3. <https://coer.ac.in/naac20/naac131.pdf>
4. onlinecourses.nptel.ac.in

MOOC/ Certification Courses:

1. <https://www.coursera.org/courses?query=ethics>


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BCAGE-102

MATHEMATICS-I

L-T-P

3-1-0

Objective(s):

The main aims of this course are to encourage and enable students to: recognize that mathematics permeates the world around us. Appreciate the usefulness, power and beauty of mathematics. Enjoy mathematics and develop patience and persistence when solving problems, study of fundamental and basic applications and logics of **Mathematics to inculcate skill, provide employability & entrepreneurship skill.**

UNIT 1

(10 Sessions)

Matrix: Definition, Type of Matrices, Algebra of matrices, Transpose of a matrix, Adjoint of a square matrix and Solution of linear equations, Cramer's rule, Determinants **for skill development.**

UNIT 2

(08 Sessions)

Differential Calculus: Successive differentiation, Leibnitz theorem, Partial differentiation, Euler's theorem, Change of variable, Jacobian and theorems **for skill development and employability.**

UNIT 3

(12 Sessions)

Integral Calculus: Integration of rational and irrational functions, Reduction formulae, Definite integral, Simple problems of double and triple integrals knowledge **for better employability in industry.**

Differential Equation: Differential equations of first order, Differential equations of second order and Differential of second order with constant coefficients **for skill development and employability.**

UNIT 4


(10 Sessions)

Vector Calculus and Algebra: Vectors, Differentiation and Partial differentiation of vector functions, Derivative of sum, Dot product and Cross product of two vectors, Gradient, Divergence and curl **for employability.**

UNIT 5

(10 Sessions)

Coordinate Geometry: Straight Line, Circles and the system of circles, Standard equations and Properties of Parabola, Ellipse and Hyperbolas, General equation of second degree in two variables **for skill development and employability.**



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Course Outcomes (COs):

CO1	Familiar with the matrix and its types and perform the matrix operations of addition, multiplication, transposition, inverse, system of simultaneous linear equations in matrix form for skill development, employability and entrepreneurship development.
CO2	Develop the ability to understand the Leibnitz's theorem, Euler's theorem and Jacobian for skill development, employability and entrepreneurship development.
CO3	Develop the ability to perform the basic definite integral problem and understand the order, degree and various standard forms of differential equations and also determine solutions to first and higher order linear differential equations for skill development, employability and entrepreneurship development.
CO4	Familiar with the basic knowledge of vector and their products and develop the ability to understand the divergence, curl of the vector for skill development, employability and entrepreneurship development.
CO5	Explain the basic concepts of coordinate geometry for high level for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	1	1	1	1	1	2	1	2	1	1
CO2	1	2	3	1	3	2	1	1	2	1	1	2
CO3	3	2	1	2	1	1	1	1	1	3	1	1
CO4	1	2	1	1	1	1	3	1	1	1	1	2
CO5	2	1	1	1	1	1	2	1	1	1	1	3

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

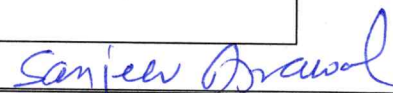
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	1	1
CO2	3	2	1
CO3	3	2	1
CO4	1	2	1



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CO5	3	2	1
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Suggested Readings:

1. E..Kreyszig: "Engineering Mathematics", wiley Editorial Ltd.
2. B.S.Grewal: "Higher Engineering Mathematics", Khanna Publications.
3. H.K.Das: "Engineering Mathematics", S. Chand Publication.
4. Gorakh Prasad: "Differential Calculus", Pothishala Private Ltd.
5. A. R. Vasishtha: "Vector Calculus", Krishna Prakashan Media (P) Ltd, Meerut.
6. Ajay Kumar, Usa Gupta: "Coordinate Geometry", Mcgraw hill Publication.

Websites Sources:

1. www.pdfdrive.com
2. www.dmi.gov.in
3. www.yourarticlelibrary.com
4. onlinecourses.nptel.ac.in
5. en.wikipedia.org

MOOC/ Certification Courses:

1. <https://nptel.ac.in/courses/111/108/111108157/>
2. <https://nptel.ac.in/courses/111/105/111105123/>



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IFTM University, Moradabad
Bachelor of Computer Applications, Program
(TPSD101/TPSD201)
Followed in B. Tech., I Year
B. Sc. (BT, FT,) I Year
BCA, I Year
(Effective from 2022-23)
PROFESSIONAL SKILL DEVELOPMENT-I

(TPSD101/TPSD201)

L-T-P
3-1-0

Objective(s): The objectives of this course:

1. To develop knowledge and understanding of grammar.
2. To develop abilities to make use of the grammar in own writing English.
3. To increase understanding and recall of what is read and listen including facts and main idea.
4. To enhance competencies in writing paragraph, gist or abstract/précis of the passage in own words/ language and in writing resumes, bio-data, letters and applications of different kinds.
5. To develop all the four skills of English language *to inculcate skill, provide employability & entrepreneurship skill.*

Unit I

(08 Session)

Basic Applied Grammar and Usage

The Sentences: Parts – Subject and Predicate; Kinds of Sentences and their Transformation. Parts of Speech. **Noun:** Kinds; Gender; Case; Number; Usage. **Pronouns:** Definition; Kinds; Usage. **Adjectives:** Kinds, Degrees of Comparison, Transformation of Degrees. **Determiners:** Kinds: many, many a, a great many; less and fewer; each and every; elder, eldest and older, oldest; much, many; little, a little, the little. **Articles:** Kinds, Articles and Number system, Articles and Gender system, Omission of Articles, Repetition of Articles. **Verbs:** Kinds; Auxiliaries: Principal Auxiliaries; Modal Auxiliaries; Semi-Modals; Usage *for skill development and employability.*

Unit II

(08 Session)

Basic Applied Grammar Continued

Non-Finite Verbs: Kinds; Infinitives; Gerund; Participle. **Adverbs:** Kinds and Usage. **Prepositions:** Kinds and Usage. **Conjunctions:** Kinds; Usage. **Interjections:** Definition; Usage *for skill development and employability.*

Unit III

(08 Session)

Clauses and Phrases, Tenses, Active and Passive Voice, Direct and Indirect Speech *for skill development and employability.*

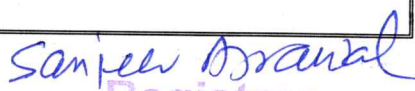
Unit IV

(08 Session)

Précis Writing: Techniques of Précis Writing; examples. **Paragraph Writing:** Structure of Paragraph, Construction of Paragraphs; Techniques of Paragraph Writing: Unity, Coherence, Emphasis. **Reading Comprehension. Listening Comprehension** *for skill development and employability.*


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Unit V**(08 Sessions)**

Writing of Resume, Bio-Data. Writing of Letters and Applications: Formats; Elements; Kinds: Leave Applications, Job Applications, Order Letters, Letters of Claims and Complaints, Letters of Adjustment *for skill development*.

Course Outcomes (COs):

The students completing this course will be able to:

CO1	Use grammar in their own writing in English correctly for skill development, employability and entrepreneurship development.
CO2	Increase understanding and recall of what read and listen is including facts and main idea for skill development, employability and entrepreneurship development.
CO3	Enhance competencies in writing paragraph, gist or abstract/précis of the passage in own words/ language for skill development, employability and entrepreneurship development.
CO4	And in writing resumes, bio-data, letters and applications of different kinds at global level/National level for skill development, employability and entrepreneurship development.
CO5	Have all the four skills of English language for skill development for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	1	1	2	1	1	2	1	3	2	2
CO2	2	1	2	1	1	2	1	1	1	1	1	1
CO3	1	2	1	1	1	1	2	1	3	2	1	
CO4	3	1	1	2	1	1	1	1	1	2	1	2
CO5	2	3	1	1	1	1	1	1	1	3	1	

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


(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	3	1
CO2	3	3	1
CO3	3	2	1



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CO4	3	3	1
CO5	3	1	1

Suggested Readings:

- (1) Remedial English Language by Malti Agarwal, Krishna Publications, Meerut.
- (2) Professional Communication by Malti Agarwal, Krishna Publications, Meerut.
- (3) High School English Grammar & Composition by Wren & Martin, S. Chand & Company LTD., New Delhi.

Website Sources:

- www.wikipedia.org
- www.english grammar.org
- www.perfect-english-grammar.com
- www.sucesscds.net
- www.grammarly.com



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(Effective from 2022-23)

BCAPL-101

OFFICE AUTOMATION LAB

L-T-P

0-0-2

Objective(s): The objectives of this course are:

1. To provide an in-Depth Training in use of office Automation Packages.
2. To Understand the Basics of Windows Operating Systems
3. To Understand How to use Software Packages in Day-to-Day Activities
4. To Provide the Knowledge of Microsoft Office Package.
5. To Prepare Students to make use of MS-Office Package Professionally.
6. To Learn About Word Processing, MS Excel, Power Point Presentation etc *to inculcate skill, provide employability & entrepreneurship skill.*

List of Experiments:

1. Experiment on Windows

- 1 Starting the Windows, Starting a Program, Running a Program Running Multiple Programs and Switching Between Windows, Customizing the Task Bar Recycle Bin, Restoring the Deleted Files
- 2 Creating and Removing Folders, Making the Taskbar Wider, Arranging Icons on the Desktop Displaying and Hiding the Taskbar Clock, Controlling the Size of Start Menu Options, Creating Shortcuts.
- 3 Installing a Screen Saver, Assigning a Wallpaper to Desktop, Adding a Program to the Start Menu, Adding a Program Shortcut in the Desktop, Customizing the Mouse Settings. Expanding and Collapsing a Folder, Recognizing File Types Using Icons, Running a Program from Explorer, Renaming a File or Folder, Sorting a Folder
- 4 Displaying the Properties for a File or Folder, Using Cut and Paste Operations to Move a File Using Copy and Paste Operations to Copy a File, Moving and Copying Files with Mouse, Searching a File or Folder by Using Search Command, Finding a File or Folder, by Name Defragmenting the Disk, Using Disk Defragmenter, Controlling the Speaker Volume Recording and Saving an Audio File, Connecting a Printer to the Pc

Experiment on Word Processing:

1. Type the Following Paragraph as Given. "My Dream Career"
My Ambition of Life is to Become a doctor. I Have Taken Up Science and Hygiene as Optional Subjects. When I Joint College, I Shall Take UP Medical Group. I Shall Appear in the P.M.T. Examination to Qualify for Joining a Medical College. After Passing the P.M.T., I Shall Join the Medical College to Become a Doctor.
I Would Like to Be a doctor. My Country Has Become Free from Diseases, Government Has Decided to Uproot the Diseases from the Country and Improve the Health of the People. Hospitals are Being Opened for This Purpose. There is Great Demand for Doctor. Taking All These Things into Consideration I Have Made Up Mind to Become a doctor. I Do Not Want to Be Clerk. This Line Does Not Suit Me. I Do Not Want to Be a teacher. Law is Not a Paying Profession These Days So Becoming Lawyer is Not My Goal.
2. Correct any Spelling Errors Displayed in the Given Text.

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3. Save the Document as <My Dream >_W01.
4. Change the Layout of the Page as Given Below.
>Page Size: A4 (8.27" X 11.69") >Page Orientation: Landscape.
5. Change the Page Margins as Follows:
>Top: 1.25">Bottom: 1.25">Right: 1.25">Left: 1.25"
6. Format the Entire Document as Given Below.
>Line Spacing: 1.15">Font: Times New Roman >Font Size: 14
>Align: Justify
7. Select the Heading "Academy Award" and Format It as Given Below.
>Font Color: Blue >Style: Bold and Underline >Align: Center
>Change All the Letters to Uppercase
8. Make the First Letter of the Paragraph Larger and Fall into Three Lines (Drop Cap).
9. Format the Heading "My Dream Career" with Style: Heading 2.
10. Create a Bulleted List for the Last Paragraph Lines of Document.
11. Enter "My Document Tutorial" Text as the Heading of the Table and Format It to Get the Following Output Using a Word Art. (Font: Arial Black, Font Size: 16, Align: Center)
12. Insert Footer with the Following Formatting Options.
>Caption: <My First Document>>Font: Times New Roman >Font Size: 12
13. Insert the W01 Image Given in the "Resources" Directory, to the Right Hand Side of the Bulleted List of the Document.
14. Prepare Your Class Time Table Using and Format the Entire Table as Given Below.
Change the Cell Size of the Table to Auto Fit to Contents. >Align: Center
15. Select the Heading Row and Format It as Given Below.
Convert All Text in to Capital Letters >Style: Bold >Align: Center
16. Insert a New Row Just Below the Last Row of the Table and Enter the Following Information into the New Row:
>Saturday: Special Lecture on Cloud Computing > Merging All the Column.
17. Send a Call Letter for All Applicants to Inform Interview Details Using Mail Merge Base
18. Preparing a Govt. Order / official Letter / Business Letter / Circular Letter
Covering Formatting Commands - Font Size and Styles - Bold, Underline, Upper Case, Lower Case, Superscript, Subscript, Indenting Paragraphs, Spacing Between Lines and Characters, Tab Settings etc.
19. Preparing a News Letter:
To Prepare a Newsletter with Borders, Two Columns Text, Header and Footer and Inserting a Graphic Image and Page Layout.
20. Creating and Using Styles and Templates
21. To Create a Style and Apply That Style in a Document
22. To Create a Template for the Styles Created and Assemble the Styles for the Template.

Spreadsheet Experiment:

1. Create a Blank Spreadsheet in and Save It as "<Your Index No>_E01".
2. Create a Table with 7 Rows and 8 Columns in the Cell Range A3:H9.
3. Insert a Title "Vivekananda College " and a Sub Title "Mark Sheet for a/L Biology- Class a", by Centering It with the Table, Making the Text Bold, and Changing the Font Size 16 for Main Title and 14 for Subtitle.
4. Enter Data of 6 Students Under the Columns, "Roll No", "Name", "Physics", "Chemistry", "Biology", and "English".

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5. Use the Relevant Formula to Calculate the Total Marks and Average and Copy the Formula to the Relevant Cells.
6. Format the "Average" Column with Two Decimal Places.
7. Use Conditional Formatting to Change the Color of the Cells of Which the Average Mark is More Than 60, into Green.
8. Select the Columns, "Roll No", "Physics", "Chemistry", "Biology", and "English" Column and Draw a Column Chart.
9. Insert the Title, "Vivekananda College ", and the Sub Title, "Mark Sheet for a/L Biology - Class a" to the Top of the Chart.
10. Set the X Axis Labels with the Index Numbers.
11. Label the X Axis Title as, "Roll No" and Y Axis Title as, "Marks".
12. Label the Legends for 4 Subjects, "Physics", "Chemistry", "Biology" and "English".
13. Make Sure to Get a Graph Similar to the One Given Below.
14. Sorting Data, Filtering Data and Creation of Pivot Tables.
15. Operating on the Sheets: Finding, Deleting and Adding Records, Formatting Columns, Row Height, Merging, Splitting Columns etc. Connecting the Worksheets and Enter the Data.

Presentation Experiments

- Create a Presentation with Four Blank Slides.
- Modify the Presentation as Follows.
- Insert a Suitable Design Template.
- Insert a Footer to Show Your Name and Your Student Id.
- Insert Today's Date as a Fixed Date in the Date Area.
- Make Necessary Changes to Appear Slide Numbers in the Slide Number Area.
- Make Necessary Changes So That the Footer, Date and the Slide Number Do Not Appear on the Title Slide (First Slide).
- Add Content to the Title Slide (First Slide) by Following the Instruction Given Below.
- Type "River" as the Slide Title and It's Format Should Be Font Type: Arial, Style: Bold, Size:96, Color: Black
- Type "Our Life Support" as the Sub Title and Insert an Image from the Resources Directory to a Suitable Location.



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Course Outcomes (COs):

After completing this lab course, students will be able to:

CO1	Use Microsoft Office Programs to Create Personal, Academic for skill development, employability and entrepreneurship development.
CO2	Business Documents Using Current Professional and/or Industry Standards for skill development, employability and entrepreneurship development.
CO3	Perform Calculations in Microsoft Excel Using Formulas and Built-in Functions for skill development, employability and entrepreneurship development.
CO4	Prepare Datasheet and Graphs to Describe and analyze the Data in Microsoft Excel for global level data management for skill development, employability and entrepreneurship development.
CO5	Create Effective Presentation Using Various Features of MS Power Point for skill development, employability and entrepreneurship development.


Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	3	2	3	1	1	1	1	2	2	2
CO2	1	1	2	1	2	1	1	1	1	1	2	2
CO3	2	2	2	3	3	1	1	1	3	2	3	2
CO4	3	2	2	3	2	2	1	1	2	1	2	3
CO5	2	2	2	2	3	1	1	1	1	2	3	2

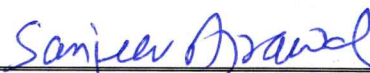
CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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


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BCACC-211

MATHEMATICS-II

L T P
3 1 0

Objective(s): -The main aims of this course are to provide students with the special knowledge which necessary for basic concepts in Real Analysis. More precisely, it strives to enable students to learn basic concepts about functions of bounded variation grasp basic concepts about the uniform convergence of sequences, Understand continuity and differentiability in terms of **limits to inculcate skill, provide employability & entrepreneurship skill.**

UNIT 1 (12 Sessions)

Real numbers: The sets of natural numbers, Integers, Rational and irrational numbers, Real numbers, Intervals, Absolute value of a real number, Bounded set, Complete ordered field, Neighborhood, Open and Closed sets for skill development **for skill development.**

UNIT 2 (08 Sessions)

Limits and Continuity: Definition, Algebra of limits, Right hand and Left hand limits, Definition of Continuity, Discontinuity and Types of Discontinuity **for skill development.**

UNIT 3 (10 Sessions)

Indeterminate Forms: Definition and Types of Indeterminate forms.

Maxima and Minima: Definition, Conditions for maxima and minima and its simple problems **for skill development, employability and entrepreneurship development.**

UNIT 4 (10 Sessions)

Mean Value Theorems: Rolle's theorem, Lagrange's Mean Value theorem, Cauchy's Mean Value theorem, Taylor's series and Maclaurin series **for skill development.**

UNIT 5 (10 Sessions)

Infinite Series: Introduction, Convergent series, Divergent series, Oscillatory series, Positive term series test, Alternating Series test, p -series test, Comparison test, D'Alembert's ratio test, Cauchy's n^{th} root test and Rabbe's test **for skill development, employability and entrepreneurship development.**

Course Outcomes (COs):

CO1	Describe the basic differences between the rational and the real numbers for skill development for skill development, employability and entrepreneurship development.
CO2	Familiar with the basic concepts of limit and continuity for skill

	development, employability and entrepreneurship development.
CO3	Develop the ability to understand the indeterminate forms of limit evaluate the limits for skill development, employability and entrepreneurship development.
CO4	Evaluate the maxima and minima problems defined the Problem at global level maths.
CO5	Familiar with different type of mean value theorems and able to apply these theorems for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1	1	1	1	1	2	1	2	1	1
CO2	1	2	3	1	3	1	1	1	2	1	1	2
CO3	3	1	1	2	2	2	1	1	2	3	1	1
CO4	1	1	1	1	1	1	3	1	1	1	1	2
CO5	2	1	1	1	1	1	2	1	1	1	1	3

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:

1. E..Kreyszig: "Engineering Mathematics", wiley Editorial Ltd.
2. B.S.Grewal: "Higher Engineering Mathematics", Khanna Publications.
3. H.K.Das: "Engineering Mathematics", S. Chand Publication.
4. GorakhPrasad: "Differential Calculus", Pothishala Private Ltd.
5. A. R. Vasishta: "Vector Calculus", Krishna Prakashan Media (P) Ltd, Meerut.

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6. Ajay Kumar, Usa Gupta: "Coordinate Geometry", McGraw hill Publication.

Website Sources:


- www.pdfdrive.com
- www.dmi.gov.in
- www.yourarticlelibrary.com
- onlinecourses.nptel.ac.in
- en.wikipedia.org

MOOC/ Certification Courses:

1. <https://study.com/academy/lesson/using-differentiation-to-find-maximum-and-minimum-values.html>
2. <https://www.udemy.com/course/calculus-1-limits-and-continuity/>


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(Effective from 2022-23)

BCACC-212 OBJECT ORIENTED PROGRAMMING USING C++

L T P
3 1 0

Objective(s): The objectives of this course are to enable students to:

1. To develop programming skills of students, using object-oriented programming concepts
2. Learn the concept of class and object using C++
3. Develop classes for simple applications *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Introduction to OOP: Advantages of OOP, Need of object-oriented programming, Procedure Oriented Vs Object Oriented Programming.

Introduction to C++: C++ Programming Basics, Basic Program Construction of C++, Key words in C++, Input/ Output in C++, Variables, Constants, Data Types and Operators in C++, Precedence of Operators, Characteristics of object-oriented languages, C++ and C *for skill development and employability.*

UNIT II:

(8 Sessions)

Decision Making and Loops in C++: Conditional statement, Switch Statement, Break Statement, Continue Statement, Go to Statement Loops in C++, While, Do-While, For loop *for skill development and employability.*

UNIT III:

(8 Sessions)

Functions: User Defined Functions, library functions, General form of a function, scope rules of Functions, function arguments (Call by value, Call by Reference), Recursion Calling Functions with arrays, returning by reference, Friend Functions, Inline Functions *for skill development and employability.*

UNIT IV:

(7 Sessions)

Objects and classes: Structure and Classes, friend classes, Scope resolution operator, specifying and using class and object, Constructors, objects and function arguments. Inheritance: Base Class, Derived Class, access specifies Single Inheritance, Multiple Inheritance, Multilevel Inheritance *for skill development and employability.*

UNIT V:

(7 Sessions)

Polymorphism: Compile time, Run time, Operator Overloading, Function Overloading, Virtual functions, Dynamic Binding, Static Binding. File Processing, Templates *for skill development and employability.*


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Course Outcomes (COs):

On completion of the course students will be able to

CO1	Identify importance of object-oriented programming and difference between structured for skill development, employability and entrepreneurship development.
CO2	Oriented and object-oriented programming features for skill development, employability and entrepreneurship development.
CO3	Understand the relative merits of C++ as an object-oriented programming language for skill for skill development, employability and entrepreneurship development.
CO4	Development and Employability at National and global level.
CO5	Understand how to apply the major object-oriented concepts to implement object oriented for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	1	2	1	1	1	1	1	1	1	1
CO2	2	2	2	2	1	1	2	1	1	1	1	1
CO3	2	3	2	2	1	1	1	1	1	1	1	1
CO4	1	2	2	2	1	1	1	1	1	1	1	1
CO5	1	2	3	2	1	1	2	1	1	1	1	1

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:

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1. Herbort Schildt "The Complete Reference C++" TMH Publication.
2. E. Balaguruswami "Object Oriented Programming with C++" TMH Publication.
3. James Rumbaugh "Object Oriented Modeling and Design" Pearson Publication.

Websites Sources:

1. www.codementor.io/@michaelsafyan/object-oriented...
2. www.w3schools.com/cpp/cpp_oop.asp
3. stackoverflow.com/questions/351733
4. www.tutorialspoint.com
5. www.sathyabama.ac.in

MOOC/ Certification Courses:

1. <https://nptel.ac.in/courses/106/101/106101208/>
2. <https://nptel.ac.in/courses/106/105/106105151/>



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BCACC-213

DATA STRUCTURE USING C/C++

L T P
3 1 0

Objective(s): The objectives of this course are to enable students to:

1. To become familiar with different types of data structures.
2. Their applications and learn different types of algorithmic techniques and strategies.
3. Linear Data Structures: Arrays, Records, Strings and string processing, References and aliasing,
4. Linked lists, Strategies for choosing the appropriate data structure, Abstract data types and their implementation: Stacks, Queues, Priority queues, Sets, Maps *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Arrays: Abstract Data Types and the C/C++ Class, An Introduction to C++ Class- Data Abstraction and Encapsulation in C/C++- Declaring Class Objects and Invoking Member Functions- Special Class Operations- Miscellaneous Topics- ADTs and C++Classes, The Array as an Abstract Data Type, The Polynomial Abstract Data type- Polynomial Representation- Polynomial Addition. Sparse Matrices, Introduction- Sparse Matrix Representation *for skill development and employability.*

UNIT II:

(8 Sessions)

STACKS AND QUEUES: Templates in C/C++, Template Functions- Using Templates to Represent Container Classes, The Stack Abstract Data Type, The Queue Abstract Data Type, Sub typing and Inheritance in C++,Evaluation of Expressions, Expression- Postfix Notation- Infix to Postfix *for skill development and employability.*

UNIT III:

(8 Sessions)

LINKED LISTS: Single Linked List and Chains, Representing Chains in C/C++, Defining a Node in C++- Designing a Chain Class in C/C++- Pointer manipulation in C/C++- Chain Manipulation Operations, The Template Class Chain, Implementing Chains with Templates- Chain Iterators- Chain Operations- Reusing a Class, Circular Lists, Available Space Lists, Linked Stacks and Queues, Polynomials, Polynomial Representation- Adding Polynomials- Circular List Representation of Polynomials, Equivalence Classes, Sparse Matrices, Sparse Matrix Representation- Sparse Matrix Input Deleting a Sparse Matrix, Doubly Linked Lists, Generalized Lists, Representation of Generalized Lists- Recursive Algorithms for Lists- Reference Counts, Shared and Recursive Lists *for skill development and employability.*

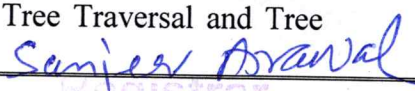
UNIT IV:

(7 Sessions)

Trees: Introduction, Terminology, Representation of Trees, Binary Trees, The Abstract Data Type, Properties of Binary Tress, Binary Tree Representations, Binary Tree Traversal and Tree


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Iterators, Introduction, In order Traversal Preorder Traversal, Post order Traversal, Thread Binary Trees, Threads, In order Traversal of a Threaded Binary Tree, Inserting a Node into a Threaded Binary Tree, Heaps, Priority Queues, Definition of a Max Heap, Insertion into a Max Heap, Deletion from a Max Heap, Binary Search Trees, Definition, Searching a Binary Search Tree, Insertion into a Binary Search Tree, Deletion from a Binary Search Tree, Height of Binary *for skill development and employability.*

UNIT V:

(7 Sessions)

Graph: The Graph Abstract Data Type, Introduction, Definition, Graph Representation, Elementary Graph Operation, Depth First Search, Breadth First Search, Connected Components, Spanning Trees, Biconnected Components, Minimum Cost Spanning Trees, Kruskal S Algorithm, Prim s Algorithm Sollin' s Algorithm, Shortest Paths and Transitive Closure, Single Source/All Destination: Nonnegative Edge Cost, Single Source/All Destination: General Weights, All-Pairs Shortest Path, Transitive Closure *for skill development and employability.*

Course Outcomes (COs):

On completion of the course students will be able to

CO1	Distinguish between procedures and object-oriented programming for skill development, employability and entrepreneurship development.
CO2	Use and implement appropriate data structure for the required problems using a programming language such as C/C++ for skill development, employability and entrepreneurship development.
CO3	Analyze step by step and develop algorithms to solve real world problems at high(global level) level Programming for skill development, employability and entrepreneurship development.
CO4	Implementing various data structures viz. Stacks, Queues, Linked Lists, Trees and Graphs for skill development, employability and entrepreneurship development.
CO5	Understand various searching & sorting techniques for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	1	2	1	1	1	1	2	1	1
CO2	1	3	2	1	2	1	1	1	1	1	1	1
CO3	1	1	3	1	1	1	1	1	2	1	1	1
CO4	1	2	2	3	2	1	1	1	1	1	1	2
CO5	1	1	2	1	1	1	1	1	1	1	1	1

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:

1. AV Aho, J Hopcroft, JD Ullman, Data Structures and Algorithms, Addison- Wesley, 1983.
2. TH Cormen, CF Leiserson, RL Rivest, C Stein, Introduction to Algorithms, 3rd Ed., MIT Press, 2009.
3. AV Aho, J Hopcroft, JD Ullman, The Design and Analysis of Algorithms, Addison- Wesley, 1974.
4. MT Goodrich, R Tamassia, DM Mount, Data Structures and Algorithms in Java, 5th Ed., Wiley, 2010. (Equivalent book in C also exists.)
5. Cormen, Leiserson & Rivest, Introduction to Algorithms, MIT Press (2009)
6. Narasimha Karumanchi, Data Structures and Algorithms Made Easy (2014).
- 7.

Websites Sources:

1. <https://www.cs.bham.ac.uk/~jxb/DSA/dsa.pdf>
2. <https://www.cs.bham.ac.uk/~jxb/DSA/dsa.pdf>
3. <https://www.w3schools.com/>

MOOC/ Certification Courses:

1. <https://nptel.ac.in/courses/106/101/106101208/>
2. <https://nptel.ac.in/courses/106/105/106105151/>

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BCAPL-214

C++ Lab

L T P
0 0 4

Objective(s): The objectives of this course are:

1. To develop programming skills of students, using object-oriented programming concepts.
2. To learn the concept of class and object using C++ and develop classes for simple. Applications *to inculcate skill, provide employability & entrepreneurship skill.*

List of Experiments:

1. WAP to print a single statement.
2. WAP to print more than one statement.
3. WAP to calculate the arithmetic multiplication
4. WAP which demonstrate the use of if else statement.
5. WAP which demonstrate the use of while loop.
6. WAP which demonstrate the use of do_ while loop.
7. WAP which demonstrate the use of for loop.
8. WAP to get the area of square, circle & rectangle according the choice of user by using a case.
9. WAP to demonstrate the break statement.
10. WAP to demonstrate the continue.
11. WAP to get Sum of two integer type value by call by value method of function call.
12. WAP to swap the values by using call by value method of function call.
13. WAP to get the address of all type of variable & gets the value by pointer type.
14. WAP to swap two values by using the call by reference method.
15. WAP to find the factorial of a number using recursion.
16. WAP to demonstrate the inline function.
17. WAP to expose the use of simple class with an object.
18. WAP to expose the use of simple one class with two object.
19. WAP to expose the use of simple friend class.
20. WAP to expose the use of constructor.

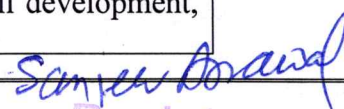
Course Outcomes (COs):

After completing this lab course, students will be able to:

CO1	Creating simple programs using classes and objects in C++for skill development, employability and entrepreneurship development.
CO2	Implement Object Oriented Programming Concepts in C++ for skill development, employability and entrepreneurship development.
CO3	Develop applications using stream I/O and file I/O for skill development,


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	employability and entrepreneurship development.
CO4	Implement simple graphical user interfaces for skill development, employability and entrepreneurship development.
CO5	Implement Object Oriented Programs using templates and exceptional handling concepts at global level for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	1	2	1	1	1	1	1	1	1
CO2	1	3	3	1	3	1	1	1	1	1	1	1
CO3	2	1	3	1	1	1	1	1	1	1	1	1
CO4	1	2	2	3	2	1	1	1	1	1	1	1
CO5	1	1	2	1	1	1	1	1	1	1	1	1

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	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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BCAPL-215

DATA STRUCTURE LAB

L T P
0 0 4

Objective(s): The objectives of this course are:

1. Designed to develop skills to design and analyze simple linear and nonlinear data structures.
2. It strengthens the ability to the students to identify and apply the suitable data structure for the given real-world problem.
3. It enables them to gain knowledge in practical applications of data structures *to inculcate skill, provide employability & entrepreneurship skill.*

List of Experiments:

1. Design and Implement List data structure using i) array ii) singly linked list.
2. Design and Implement basic operations on doubly linked list.
3. Design and Implement stack using i) array ii) singly linked list
4. Design and Implement Queue using i) array ii) singly linked list
5. Design and Implement basic operations on Circular Queue
6. Design and Implement basic operations (insertion, deletion, search, find min and findmax) on Binary Search trees.
7. Implementation of Breadth First Search Techniques.
8. Implementation of Depth First Search Techniques.
9. Implementation of Dijkstra's Algorithm.
10. Implementation of Kruskal's Algorithm.
11. Implementation of MergeSort.
12. Implementation of Binary Search using arrays.

Course Outcomes (COs):

After completing this lab course, students will be able to:

CO1	Design and analyze the time and space efficiency of the data structure for skill development, employability and entrepreneurship development.
CO2	Capable to identify the appropriate data structure for given problem for skill development, employability and entrepreneurship development.
CO3	Have practical knowledge on the applications of data structures for skill development, employability and entrepreneurship development.
CO4	Be able to design and analyze the time and space efficiency of the data structure for skill development, employability and entrepreneurship development.


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CO5	Be capable to identity the appropriate data structure for given problem and practical for effective high level Programming for skill development, employability and entrepreneurship development.
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Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	1	2	1	1	1	1	1	1	1
CO2	1	3	2	2	2	1	1	1	1	1	1	1
CO3	2	1	3	1	1	1	2	1	1	1	1	1
CO4	1	2	2	3	2	1	1	1	1	1	1	1
CO5	2	1	2	1	1	1	1	1	1	1	1	1

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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


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BCADS-216

E1: INTERNET OF THINGS

L T P
3 1 0

Objective(s): The objectives of this course are to enable students to:

1. Focuses on hands-on IoT concepts such as sensing, actuation and communication.
2. Develop the Internet of Things (IoT) prototypes—including devices for sensing, actuation, processing, and communication—to help you develop skills and experiences *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I: (8 Sessions)

Introduction to Internet of Things –Definition and Characteristics of IoT, Physical Design of IoT – IoT Protocols, IoT communication models, IoT Communication APIs IoT enabled Technologies – Wireless Sensor Networks, Cloud Computing, Big data analytics, Communication protocols, Embedded Systems, IoT Levels and Templates Domain Specific IoTs – Home, City, Environment, Energy, Retail, Logistics, Agriculture, Industry, health and Lifestyle *for skill development, employability and entrepreneurship development.*

UNIT II: (8 Sessions)

IoT and M2M – Software defined networks, network function virtualization, difference between SDN and NFV for IoT Basics of IoT System Management with NETCOZF, YANG- NETCONF, YANG, SNMP NETOPEER *for skill development, employability and entrepreneurship development.*

UNIT III: (8 Sessions)

Introduction to Python - Language features of Python, Data types, data structures, Control flow, functions, modules, packaging, file handling, data/time operations, classes, Exception handling *for skill development, employability and entrepreneurship development.*

UNIT IV: (7 Sessions)

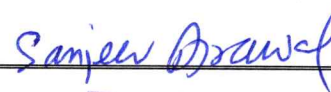
Python packages - JSON, XML, HTTPLib, URLLib, SMTPLib. IoT Physical Devices and Endpoints - Introduction to Raspberry PI-Interfaces (serial, SPI, I2C) Programming – Python program with Raspberry PI with focus of interfacing external gadgets, controlling output, and reading input from pins *for skill development, employability and entrepreneurship development.*

UNIT V: (7 Sessions)

IoT Physical Servers and Cloud Offerings – Introduction to Cloud Storage models and communication APIs Webserver – Web server for IoT, Cloud for IoT, Python web application framework Designing a RESTful web API for *skill development, employability and entrepreneurship development.*


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Course Outcomes (COs):

On completion of the course students will be able to

CO1	To identify the vision of IoT and its future roadmap for skill development, employability and entrepreneurship development.
CO2	To Understand IoT Market perspective for skill development, employability and entrepreneurship development.
CO3	To help implementing Data and Knowledge Management and use of Devices in IoT Technology for skill development, employability and entrepreneurship development.
CO4	To classify Real World IoT Design Constraints, Industrial Automation in IoT for skill development, employability and entrepreneurship development.
CO5	To Understand State of the Art - IoT Architecture at global level for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)								3 strong, 2 medium, 1 weak				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	1	2	1	1	1	1	1	1	1	1
CO2	1	2	1	2	1	1	1	1	1	1	1	1
CO3	2	1	1	2	1	1	1	1	1	1	1	1
CO4	1	2	1	1	1	2	1	1	1	1	1	1
CO5	2	1	1	2	1	2	1	1	1	1	1	1

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	3	2
CO2	3	3	2
CO3	3	2	2
CO4	3	3	2
CO5	3	3	2

Suggested Readings:

1. Arshdeep Bahga and Vijay Madisetti, Internet of Things - A Hands-on Approach, Universities Press, 2015, ISBN: 9788173719547
2. Matt Richardson & Shawn Wallace, Getting Started with Raspberry Pi, O'Reilly (SPD), 2014, ISBN: 9789350239759.
3. Vijay Madisetti, Arshdeep Bahga, "Internet of Things A Hands-On- Approach", 2014, ISBN: 978 0996025515
4. Adrian McEwen, "Designing the Internet of Things", Wiley Publishers, 2013, ISBN: 978-1-118-43062-0
5. Daniel Kellmerit, "The Silent Intelligence: The Internet of Things". 2013, ISBN 0989973700

Websites Sources:

1. <https://www.docsity.com/en/internet-of-things-bca-bsc/5223551/>
2. https://www.tutorialspoint.com/internet_of_things/internet_of_things_tutorial.pdf
3. <https://www.geeksforgeeks.org/introduction-to-internet-of-things-iot-set-1/>

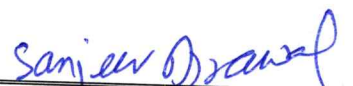
MOOC/ Certification Courses:

1. https://www.greatlearning.in/iit-madras-acse?&utm_source=google&utm_medium=search&utm_campaign=acse_iot_purchase_inte%20nt-course-RoI&adgroup_id=121976910874&campaign_id=12503856709&keyword=iot%20online%20certification%20course&placement=&gclid=Cj0KCQjws4aKBhDPArisAIWH0JUJBjWVgZLCr0JGTFtwAzTT-Z2lkbo5aNHXGGOkhFYFirn6HL8usMaAvznEALw_wcB
2. https://www.perpetual-solutions.com/iot-training?utm_source=IndianSub-iot&gclid=Cj0KCQjws4aKBhDPArisAIWH0JWp0-6-LI-r3cyN-pupn9ci46NoLHd26hqMQMC7BmN_Pf2K7MsUjd4aAv8PEALw_wcB
3. <https://www.udemy.com/topic/internet-of-things/>



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BCADS-217

E2: BIG DATA ANALYTICS

L T P
3 1 0

Objective(s): The objectives of this course are to enable students to:

1. To study the basic technologies that forms the foundations of Big Data.
2. To study the programming aspects of cloud computing with a view to rapid prototyping of complex applications.
3. To understand the specialized aspects of big data including big data application, and big data analytics *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

INTRODUCTION TO BIG DATA: Introduction – distributed file system – Big Data and its importance, Four Vs, Drivers for Big data, Big data analytics, Big data applications. Algorithms using map reduce, Matrix-Vector Multiplication by Map Reduce *for skill development, employability and entrepreneurship development.*

UNIT II:

(8 Sessions)

INTRODUCTION HADOOP: Big Data – Apache Hadoop & Hadoop EcoSystem – Moving Data in and out of Hadoop – Understanding inputs and outputs of Map Reduce - Data Serialization *for skill development, employability and entrepreneurship development.*

UNIT III:

(8 Sessions)

HADOOP ARCHITECTURE:Hadoop Architecture, Hadoop Storage: HDFS, Common Hadoop Shell commands, Anatomy of File Write and Read., Name Node, Secondary NameNode, and DataNode, Hadoop Map Reduce paradigm, Map and Reduce tasks, Job, Task trackers - Cluster Setup – SSH & Hadoop Configuration – HDFS Administering –Monitoring & Maintenance *for skill development, employability and entrepreneurship development.*

UNIT IV:

(7 Sessions)

HADOOP ECOSYSTEM AND YARN: Hadoop ecosystem components - Schedulers - Fair and Capacity, Hadoop 2.0 New Features Name Node High Availability, HDFS Federation, MRv2, YARN, Running MRv1 in YARN *for skill development, employability and entrepreneurship development.*

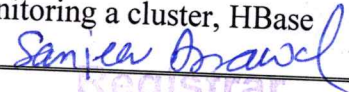
UNIT V:

(7 Sessions)

HIVE AND HIVEQL, HBASE: Introduction to No Query Language, Hive Architecture and Installation, Comparison with Traditional Database, HiveQL - Querying Data - Sorting And Aggregating, Map Reduce Scripts, Joins & Sub queries, HBase concepts Advanced Usage, Schema Design, Advance Indexing - PIG, Zookeeper - how it helps in monitoring a cluster, HBase


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uses Zookeeper and how to Build Applications with Zookeeper *for skill development, employability and entrepreneurship development.*

Course Outcomes (COs):

On completion of the course students will be able to

CO1	Apply Identify Big Data and its Business Implications for skill development, employability and entrepreneurship development .
CO2	Able to list the components of Hadoop and Hadoop Eco-System for skill development, employability and entrepreneurship development.
CO3	Apply Access and Process Data on Distributed File System for skill development, employability and entrepreneurship development .
CO4	Able to manage Job Execution in Hadoop Environment for skill development, employability and entrepreneurship development.
CO5	Develop Big Data Solutions at global level using Hadoop and the practical enhancement of visualization for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	1	1	1	1	1	1	1	1	1	1
CO2	2	3	1	2	1	1	1	1	1	1	1	2
CO3	2	1	3	1	1	1	1	1	1	1	1	1
CO4	1	2	1	3	3	1	1	1	1	1	1	2
CO5	1	1	1	2	1	1	1	1	1	1	1	1

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

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Suggested Readings:

1. Boris lublinsky, Kevin t. Smith, Alexey Yakubovich, "Professional Hadoop Solutions", Wiley, ISBN: 9788126551071, 2015.
2. Chris Eaton, Dirk derooset al. , "Understanding Big data ", McGraw Hill, 2012.
3. Tom White, "HADOOP: The definitive Guide" , O Reilly, 2012.
4. Vignesh Prajapati, "Big Data Analytics with R and Haoop", Packet Publishing 2013.
5. Tom Plunkett, Brian Macdonald et al, "Oracle Big Data Handbook", Oracle Press,2014.
6. <http://www.bigdatauniversity.com/>
7. Jy Liebowitz, "Big Data and Business analytics",CRC press, 2013.

Websites Sources:


1. https://www.oracle.com/in/cloud/solutions/the-top-use-cases-for-big-data-analytics/?source=:ad:pas:go:dg:a_apac:71700000084253321-58700007130459629-p64167882033:RC_WWMK210119P00066C0003:&SC=:ad:pas:go:dg:a_apac::RC_WWMK210119P00066C0003:&gclid=Cj0KCQjws4aKBhDPAIsAIWH0JU2AzKtA8XNx DzR0h9mb8-Oej7xg7xvifvhNKRTOD2_pCVYsJ92pE8aAvgjEALw_wcB&gclsrc=aw.ds
2. <https://lecturenotes.in/subject/884/big-data-analysis-bda/note>
3. <https://www.qubole.com/big-data-analytics/>

MOOC/ Certification Courses:

1. <https://nptel.ac.in/courses/106/104/106104189/>
2. <https://nptel.ac.in/courses/106/106/106106142/>


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BCADS-218

E3: ARTIFICIAL INTELLIGENCE

L T P
3 1 0

Objective(s): The objectives of this course are to enable students to:

1. The frontiers of AI-intensive computing and information systems, while providing a sufficiently strong foundation to encourage further research.
2. Make computers and information systems more "intelligent" to solve complex problems and provide more natural and effective services to human beings *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Introduction to AI, Importance of AI, AI and its related field, AI techniques, Criteria for success. Problems, problem space and search: Defining the problem as a state space search, Production system and its characteristics, Issues in the design of the search problem. Heuristic search techniques: Generate and test, hill climbing, best first search technique, problem reduction, constraint satisfaction *for skill development and employability.*

UNIT II:

(8 Sessions)

Knowledge representation: Definition and importance of knowledge, Knowledge representation, various approaches used in knowledge representation, Issues in knowledge representation. Using Predicate Logic: Representing Simple Facts in logic, representing instances and is-a relationship, Computable function and predicate *for skill development and employability.*

UNIT III:

(8 Sessions)

Natural language processing: Introduction syntactic processing, Semantic processing, Discourse and pragmatic processing *for skill development and employability.*

UNIT IV:

(7 Sessions)

Learning: Introduction learning, Rote learning, learning by taking advice, learning in problem solving, learning from example-induction, Explanation based learning *for skill development and employability.*

UNIT V:

(7 Sessions)

Expert System: Introduction, Representing using domain specific knowledge, Expert system shells. LISP and other AI Programming Language *for skill development and employability.*


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Course Outcomes (COs):

On completion of the course students will be able to

CO1	Compare AI with human intelligence and traditional information processing and discuss its Strengths and limitations as well as its application to complex and human-centered problems for skill development, employability and entrepreneurship development.
CO2	Discuss the core concepts and algorithms of advanced AI, including informed searching, CSP, logic, uncertain knowledge and reasoning, dynamic Bayesian networks, graphical models, decision making, multiagent, inductive learning, statistical learning, reinforcement learning, deep learning, natural language processing, robotics, and so on for skill development, employability and entrepreneurship development.
CO3	Apply the basic principles, models, and algorithms of AI to recognize, model, and solve for skill development, employability and entrepreneurship development.
CO4	Analyze the structures and algorithms of a selection of techniques related to searching, reasoning, machine learning, and language processing for skill development, employability and entrepreneurship development.
CO5	Design AI functions and components involved in intelligent systems such as computer games, expert systems, semantic web, information retrieval, machine translation, mobile robots, decision support systems, and intelligent tutoring systems at global level for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)								3 strong, 2 medium, 1 weak				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	3	2	2	1	1	1	1	1	1	1
CO2	1	2	3	1	2	1	1	1	1	2	1	2
CO3	1	1		1	1	1	3	1	1	1	1	1
CO4	2	1	2	3	1	1	1	1	1	1	1	1
CO5	1	2	3	3	2	1	1	1	1	2	1	1

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	3	2

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CO2	3	2	1
CO3	3	2	1
CO4	3	2	1
CO5	3	1	1

Suggested Readings:

1. E. Rich and K. Knight, "Artificial intelligence", TMH, 2nd ed., 1999.
2. D. W. Patterson, "Introduction to AI and Expert Systems", PHI, 1999
3. Nils J Nilsson, "Artificial Intelligence - A new Synthesis" 2nd Edition (2000), Harcourt Asia Ltd.

Websites Sources:

1. https://www.vssut.ac.in/lecture_notes/lecture1428643004.pdf
2. <https://cse.iitk.ac.in/users/cs365/2013/materials.html>
3. https://en.wikipedia.org/wiki/Artificial_intelligence
4. <https://builtin.com/artificial-intelligence>

MOOC/ Certification Courses:

5. <https://nptel.ac.in/courses/112/103/112103280/>
6. <https://nptel.ac.in/courses/106/102/106102220/>
7. <https://nptel.ac.in/courses/106/106/106106226/>



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BCAGE-201

ENVIRONMENTAL SCIENCE

L T P
3 1 0

Objective(s): The objectives of this course are to:

1. Provide every student with opportunities to acquire the knowledge, values, attitudes, commitment, and skills needed to protect and improve the environment.
2. To develop and reinforce new patterns of environmentally sensitive behavior among individuals, groups and society as a whole for a sustainable environment.
3. Understand the trans-national character of environmental problems such as global warming, climate change, ozone layer depletion etc.
4. Ways of addressing them, including interactions across local to global scales *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(12 Sessions)

Environment: Definition of environment. Environmental education. Need for the public awareness.
: Concept of Ecology: Ecosystem, energy and nutrients flow in ecosystem food chain.
Environmental segment: Atmospheric structure. Classification of air pollutants, sources of air pollution and their effect on human health and property *for skill development and employability..*

UNIT II:

(10 Sessions)

Air quality and standard: Meteorological phenomenon and their influence on air quality, lapse rates, dispersion of pollutants. Air pollution control: Introduction to particulates and gaseous pollutants such as SO_x, NO_x & CO, and their effects *for skill development and employability..*

UNIT III:

(10 Sessions)

Water quality: Physical. Chemical & biological parameters. Water quality standard, BOD. COD and BOD COD calculations. : Environmental Analysis: pH, alkalinity, conductivity, ammonia, fluoride, sulphate, chloride. Analysis and measurement of gaseous pollutants *for skill development and employability..*

UNIT IV:

(8 Sessions)

Pollution: Pollution from industry and agriculture. Polymers and plastic, food additives, fertilizers, insecticides, fungicides and herbicides. Heavy metal and energy their environmental implications. Solid waste and its managements. Pollution and public health aspect Environmental Protection- Role of government, initiatives by non-governmental organizations (NGO) *for skill development and employability..*


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Course Outcomes (COs):

On completion of the course students will be able to

CO1	Understand the issues and challenges related to environmental and ecosystem due to some human activities for skill development, employability and entrepreneurship development.
CO2	Understand key concepts from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies for skill development, employability and entrepreneurship development.
CO3	Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world for skill development, employability and entrepreneurship development.
CO4	Appreciate concepts and methods from ecological and physical sciences and their application in environmental problem solving for skill development, employability and entrepreneurship development.
CO5	Appreciate the ethical, cross-cultural, and historical context of environmental issues at global level for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)								3 strong, 2 medium, 1 weak				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	2	3	2	1	1	1	1	1
CO2	2	2	2	3	1	3	3	1	1	1	1	2
CO3	2	2	2	2	1	3	3	1	1	1	1	2
CO4	3	2	2	2	2	3	3	1	1	1	1	2
CO5	2	2	2	2	2	3	3	1	1	1	1	1

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:

1. "Environmental studies" Benny Joseph, Tata McgrawHill-2005
2. "Environmental studies"-Dr D.L. Manjunath, Pearson Education-2006
3. "Environmental studies" R. Rajagopalan, Oxford Publication-2005
4. "Text book of environment science & Technology", M.Anji Reddy, BS Publication.

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Websites Sources:

1. <https://www.india.gov.in/official-website-ministry-environment-and-forests-0>
2. <https://www.earthshare.org/environews/>

MOOC/ Certification Courses:

- <https://nptel.ac.in/courses/127/105/127105018/>
- <https://nptel.ac.in/courses/120/108/120108004/>
-



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BCAGE-202

ORGANIZATIONAL BEHAVIOR

L T P
3 1 0

Objective(s): The objectives of this course are to enable students to:

1. To help the students to develop cognizance of the importance of human behavior.
2. To enable students to describe how people behave under different conditions and understand why people behave as they do.
3. To provide the students to analyses specific strategic human resources demands for future action.
4. To enable students to synthesize related information and evaluate options for the most logical and optimal solution such that they would be able to predict and control human behavior and improve results.
5. To enable the students to understand the impact that individual, group & Structures have on behavior within the organizations and such knowledge towards improving organizational effectiveness *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Organizational Behavior: Concept, Nature, Characteristics, Conceptual Foundations, Models of Organizational Behavior, Management Challenge, A Paradigm Shift, Relationship with Other Fields, Organizational Behavior: Cognitive Framework, Behavioristic Framework and Social Cognitive Framework *for skill development, employability and entrepreneurship development.*

UNIT II:

(8 Sessions)

Perception and Attribution: Concept, Nature, Process, Importance of Perception. Attitude: Concept, Process and Importance, Attitude Measurement. Personality: Concept, Nature, Types and Theories of Personality Shaping *for skill development & employability.*

UNIT III:

(8 Sessions)

Learning: Concept and Theories of Learning. Motivation: Concepts and Their Application, Principles, Motivation Theories. Leadership: Concept, Function, Leadership Theories, Leadership Style *for skill development, employability and entrepreneurship development..*

UNIT IV:

(7 Sessions)

Organizational Culture: Concept, Characteristics, Elements of Culture. Organizational Power and Politics: Concept, Sources of Power, Distinction Between Power, Authority *for skill development, employability and entrepreneurship development..*

UNIT V:

(7 Sessions)


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Organization Change: Concept, Nature, Resistance to change, Managing resistance to change, Kurt Lewin Theory of Change. Meaning and Types of Grievance and Process of Grievance Handling. Stress: Understanding Stress and Its Consequences, Causes of Stress, Managing Stress *for skill development, employability and entrepreneurship development.*

Course Outcomes (COs):

On completion of the course students will be able to

CO1	Demonstrate the applicability of the concept of organizational behavior to understand the behavior of people in the organization for skill development, employability and entrepreneurship development.
CO2	Demonstrate the applicability of analyzing the complexities associated with management of individual behavior in the organization for skill development, employability and entrepreneurship development.
CO3	Analyze the complexities associated with management of the group behavior in the Organization for skill development, employability and entrepreneurship development.
CO4	Demonstrate how the organizational behavior can integrate in understanding the motivation (why) behind behavior of people in the organization at global level for skill development, employability and entrepreneurship development.
CO5	Demonstrate the applicability of the concept Organizational Culture: Concept, Characteristics, Elements of Culture for skill development, employability and entrepreneurship development.


Mapping COs with POs:

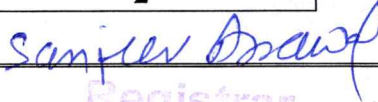
(3,2,1- indicates the strength of correlation)								3 strong, 2 medium, 1 weak				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	2	2	1	2	1	3	3	3	2	1
CO2	3	2	2	1	2	3	1	1	1	3	1	3
CO3	2	2	1	1	2	2	1	2	2	1	2	2
CO4	1	2	2	1	2	2	1	2	1	3	3	1
CO5	2	1	2	2	1	1	1	3	2	1	1	1

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	3	3
CO2	3	3	1
CO3	3	3	2
CO4	2	3	2


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CO5	3	2	2
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Suggested Readings:


1. Davis, Keith - Human Behavior at Works – Tata Mc Graw Hill, New Delhi.
2. Luthans Fred - Organizational Behavior (Tata Mc Graw Hill)
3. Newstrom John W. - Organizational Behavior: Human Behavior at Work (Tata Mc Graw Hill, 12th Edition)
4. Robbins Stephen P. - Organizational Behavior (Pearson Education, 12th Edition)
5. Greenberg Jerald and Baron Robert A. - Behavior In Organizations: Understanding and Managing the Human Side of Work (Prentice Hall of India)

Websites Sources:

1. <https://2012books.lardbucket.org/pdfs/an-introduction-to-organizational-behaviorv1.1.pdf>
2. http://www.tmv.edu.in/pdf/Distance_education/BCA%20Books/BCA%20VI%20SEM/BCA-629%20OB.pdf
3. <https://ebs.online.hw.ac.uk/EBS/media/EBS/PDFs/Organisational-Behaviour-CourseTaster.pdf>
4. https://www.macmillanihe.com/resources/sample-chapters/9781137429445_sample.pdf
5. <https://www.w3schools.com/>

MOOC/ Certification Courses:

1. <https://nptel.ac.in/courses/110/105/110105154/>
2. <https://nptel.ac.in/courses/110/106/110106145/>
3. <https://nptel.ac.in/courses/106/103/106103180/>



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BCAGE-203

BUSINESS DATA PROCESSING

L T P
3 1 0

Objective(s): The objectives of this course are to:

1. Provide insight into methods and tools for analysis and processing of the data generated by modern information systems.
2. Expose students to the data analytics practices executed in the business world.
3. Explore such key areas as the analytical process, how data is created, stored, accessed, and how the organization works with data and creates the environment in which analytics can flourish *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Data Processing: Concepts, Data processing Cycle, Methods of Data Processing, Major functional areas, Need of Data and Information, Online Processing, Batch Processing, Real-time Processing, Time-Sharing, Multiprogramming Systems, Multiprocessing Systems, Distributed Data Processing *for skill development and employability.*

UNIT II:

(8 Sessions)

Data storage Devices and Hierarchy: Tape Cartridge, Circular Disk (Floppy), Hard Disk, And CD-ROM Disk. Fields, Records, Fixed & Variable length records, Primary & Secondary Key, Disk Structure *for skill development and employability.*

UNIT III:

(8 Sessions)

File Organization and Operations: Sorting, Searching and Merging, Sequential, Direct or relative Access, Index Sequential File, Heap File Organization, Hash File Organization, B+ Tree File Organization, Clustered File Organization *for skill development and entrepreneurship development.*

UNIT IV:

(7 Sessions)

Programming Methodologies: Structured and Object-oriented programming concepts. Programming principles, Coding Style, DBMS Concepts, Relational Database Management Applications *for skill development and employability.*

UNIT V:

(7 Sessions)

Types of Database Models - Network Model, Hierarchical Model, RDBMS -ORDBMS, Creating Databases, Tables, Views, Queries, Forms, Reports, Fields & Its Properties, Data Types, Normalization overview *for skill development and employability.*


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Course Outcomes (COs):

On completion of the course students will be able to

CO1	Describe the fundamentals of information technology concepts – hardware, software, security, and privacy for skill development, employability and entrepreneurship development.
CO2	Demonstrate proper file management techniques to manipulate electronic files and folders in local, network, and online environments for skill development, employability and entrepreneurship development.
CO3	Create business documents with word processing software using spelling and grammar Check, format and layout, tables, citations, graphics, and mail merge for skill development at global level for skill development, employability and entrepreneurship development.
CO4	Create business documents and analyze data with spreadsheet software using (1) tables, Sorting, filtering, charts and graphics, pivot tables, macros; (2) statistical, financial, Logical and look-up functions and formulas; and (3) add-ins for skill development, employability and entrepreneurship development.
CO5	Create business multimedia presentations with presentation software using templates, Lists, groups, themes, colors, clip art, pictures, tables, transitions, animation, video, charts, and views for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	3	2	3	1	1	1	2	2	1	2
CO2	2	2	1	2	2	1	1	1	1	2	3	2
CO3	1	2	3	2	1	1	1	1	3	2	2	2
CO4	2	2	1	2	1	1	1	1	2	2	2	1
CO5	1	2	3	2	1	1	1	1	3	2	2	2

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	3	1
CO2	3	3	1
CO3	3	2	3

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CO4	3	3	1
CO5	3	3	1

Suggested Readings:

1. Arnold, Robert R., Hill, Harold C., and Nichols, Aylmer V. Introduction to DataProcessing. Wiley.
2. V. K. Kapoor, Introduction to Computer Data Processing & System Analysis, SultanChand & Sons.
3. Theory and Problem of Data Processing - Schaum Series Martin M. Lipschutz.
4. Computer And Data Processing with Basic - Sharma, A. K. & Emdad H. Khan, Oford and IBH Publications.
5. John Shelly and Roger Hunt, Computer Studies : A first course, PHI.

Websites Sources:

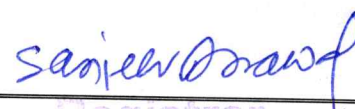
1. <http://www.ddegjust.ac.in/studymaterial/pgdca/ms-09.pdf>
2. <https://static1.squarespace.com/static/5a707ed890bcce204deb229f/t/5b3d20b4758d46435998ba93/1530732729195/Management+Information+Systems.pdf>
3. http://bitsavers.trailing-edge.com/pdf/ibm/generalInfo/C20-1638-1_Data_File_Handbook_Mar66.pdf
4. <https://www.w3schools.com/>

MOOC/ Certification Courses:

1. <https://www.upgrad.com/data-science-ms-uo>
2. <https://www.upgrad.com/data-science-pgd-iiiitb>
3. <https://www.upgrad.com/data-science-pgc-iiiitb>


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BCAPL-201

BUSINESS DATA PROCESSING LAB

L T P
0 0 2

Objective(s): The objectives of this lab course are to;

1. Develop Business applications.
2. Identify all peripheral devices.
3. Prepare of all documents developed during system development.
4. Expose students to the data analytics practices executed in the business world *to inculcate skill, provide employability & entrepreneurship skill.*

List of Experiments:

1. Demonstration of MS word processing skills?
2. Program for SORT, MERGE and INPUT-OUTPUT procedure.
3. To create a formula in cell C2 that multiplies a value entered in cell A2 by a value in cell B2.
4. To create a two data series chart in Excel.
5. How to use mail merge using an Excel spreadsheet.
6. How to make Inventory Models using Excel?
7. Risk Analysis and Sensitivity Analysis:

Ajay is a financial consultant in ABC Ltd. Ayay has been given the task of deciding whether they have to take up project A. The initial cash out lay for project A is Rs. 50,000. The cost of capital is 7%. The cash inflows are shown below.

Year	Cash Inflows
1	10000
2	12000
3	15000
4	15000
5	20000

Help Ajay in deciding whether the project should be accepted using NPV. Also perform sensitivity analysis varying the cost of capital.

8. Hypothesis - Non-Parametric Test:

A car manufacturing company like to find the sales of three types of cars produced by them in three regions and is given below

	Region 1	Region 2	Region 3	Total
Maruti 800	28	15	47	90
Maruti Zen	5	6	50	60
Maruti Alto	50	41	9	100
Total	82	60	106	250

Test if there is any association between the regions and types of cars purchased.

9. Perform following operations in DBMS.

- Creation

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- Insertion
- Deletion
- Modification

10. Perform following operations on INDEX file

- Creation
- Insertion
- Deletion
- Modification

Course Outcomes:

After studying this lab course, the students will be able to:

CO1	Work with word, spreadsheets and data analysis software for business modeling & Demonstrate proper file management techniques to manipulate electronic files and folders in local, network, and online environments at global level for skill development, employability and entrepreneurship development.
CO2	Create business documents with word processing software using spelling and grammar check, format and layout, tables, citations, graphics, and mail merge for skill development, employability and entrepreneurship development.
CO3	Create business documents and analyze data with spreadsheet software using tables, sorting, filtering, charts and graphics, pivot tables, macros; for skill development, employability and entrepreneurship development.
CO4	Create business documents and analyze data with spreadsheet software using statistical, financial, logical for skill development, employability and entrepreneurship development.
CO5	Create business documents and analyze data with spreadsheet software using add-ins for skill development, employability and entrepreneurship development.

Mapping COs with POs:

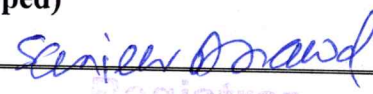
(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3	2	3	2	1	1	2	2	1	2
CO2	2	2	1	1	2	1	1	1	1	1	3	2
CO3	1	2	3	2	1	1	1	1	3	2	2	2
CO4	2	2	1	1	2	1	1	1	2	1	2	1
CO5	1	2	3	2	1	1	1	1	3	2	2	2

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


(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)


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


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BCACC-311

OPERATING SYSTEM

L T P
3 1 0

Objective(s): The objectives of this course:

1. Students will learn how Operating System is Important for Computer System.
2. To make aware of different types of Operating System and their services.
3. To act as an intermediary between the hardware and its users, making it easier for the users to access and use other resources.
4. To manage the resources of a computer system.
5. To keep track of who is using which resource, granting resource requests, and mediating conflicting requests from different programs and users.
6. To provide efficient and fair sharing of resources among users and programs.
7. To learn different process scheduling algorithms and synchronization techniques to achieve better performance of a computer system.
8. To know virtual memory, Deadlock, Storage management and disk management concepts *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Introduction: Definition and types of operating systems and function, the evolution of OS, Operating System services, OS Components. Operating Systems Types: Batch, Time Sharing, Multiprogramming, Multitasking, Multiprocessor, Distributed, Real Time, Network system *for skil development and employability.*

UNIT II:

(8 Sessions)

CPU Scheduling: Process concept, Process state transitions, schedulers (long term, short term, mid-term), Scheduling concept, Performance criteria, Scheduling algorithms, multiple processor scheduling *for skil development and employability.*

UNIT III:

(8 Sessions)

Deadlocks: System model, Deadlock characterization, prevention, avoidance detection and recovery from deadlock *for skil development and employability.*

UNIT IV:

(8 Sessions)

Memory Management: Resident monitor, multiprogramming with fixed Partition, multiprogramming with variable partition, paging, segmentation, paged segmentation, virtual memory, demand paging, thrashing *for skil development and employability.*

UNIT V:

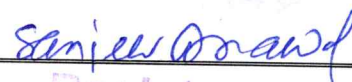
(8 Sessions)

File System: File support, access methods, allocation methods (Contiguous, linked and index allocation), Directory system (Single level, tree structured, acyclic graph and general graph



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directory), file protection. Disk Scheduling: FCFS, C-Scan etc *for skill development and employability.*

Course Outcomes (COs):

Students will be able to understand

CO1	Able to explain basic concept, functions and types of operating system skill development, employability and entrepreneurship development.
CO2	Understand CPU scheduling and able to solve process synchronization problems at local machine skill development, employability and entrepreneurship development.
CO3	Analyze the concepts of deadlock in operating systems and apply the deadlock handling techniques in multiprogramming system for skill development, employability and entrepreneurship development.
CO4	Be able to manage files and directory, recovery and manage disk spaces,also correlate basic concepts file system of operating system with an existing operating system for skill development, employability and entrepreneurship development.
CO5	Able to describe paging and segmentation methods suitable for virtual memory for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	2	3	1	1	1	2	2	1	2
CO2	2	2	1	2	3	1	1	1	1	2	3	2
CO3	2	2	3	2	1	1	1	1	3	2	2	2
CO4	2	2	1	2	1	1	1	1	2	2	2	1
CO5	1	2	3	2	1	1	1	1	3	2	2	2

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:

1. Peterson & Silberschatz, "Operating System Concepts", Addison-Wesley company

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2. Tenenbaum, A.S., "Modern Operating System", PHI Publication

Websites Sources:

1. www.smartzworld.com/notes/operating-system-notes
2. www.tutorialspoint.com/operating_system/os
3. lecturenotes.in/subject/56/operating-systems-OS
4. crectirupati.com/sites/default/files/lecture_notes
5. www.cse.iitb.ac.in/~mythili/os

MOOCS Certification Courses:-

1. <https://nptel.ac.in/courses/106/105/106105214/>
2. <https://nptel.ac.in/courses/106/105/106105172/>
3. <https://nptel.ac.in/courses/106/106/106106144/>
4. <https://nptel.ac.in/courses/106/102/106102132/>



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BCACC-312

DATABASE MANAGEMENT SYSTEM

L	T	P
3	1	0

Objective(s): The objectives of this course:

1. An introduction to database management systems, with an emphasis on how to organize, maintain and retrieve - efficiently, and effectively - information from a DBMS.
2. To develop an understanding of essential DBMS concepts such as: database security, integrity, concurrency and to design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Introduction: An overview of database management system, Database System Vs File System, Database system concepts and architecture, Data definitions language, DML, Overall Database Structure *for skill development and employability.*

UNIT II:

(8 Sessions)

Data Modeling using the Entity Relationship Model: ER model concepts, notation for ER diagram, mapping constraints, keys *for skill development and employability.*

UNIT III:

(8 Sessions)

Relational data Model, integrity constraints, entity integrity, referential integrity, Keys constraints. Introduction to SQL: Characteristics of SQL, Advantages of SQL, SQL data types and literals, Types of SQL commands, SQL operators and their procedure, Tables, views and indexes, Queries and sub queries, Aggregate functions, Insert, update and delete operations *for skill development and employability.*

UNIT IV:

(8 Sessions)

Data Base Design & Normalization: Functional dependencies, normal forms, first, second, third normal forms, inclusion dependence, loss less join decompositions. Transaction Processing Concepts: Transaction system, Testing of Serializability, Serializability of schedules, conflict & view serializable schedule. Recovery from transaction failures *for skill development and employability.*

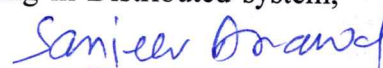
UNIT V:

(8 Sessions)

Concurrency Control Techniques: Concurrency control, locking Techniques for concurrency control, Time stamping protocols for concurrency control, validation based protocol, multiple granularity, Recovery with concurrent transaction. Transaction Processing in Distributed system,


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data fragmentation. Replication and allocation techniques for distributed system, overview of concurrency control *for skill development and employability*.

Course Outcomes (COs):

Students will be able to understand

CO1	Describe the fundamental elements of relational database management systems for skill development, employability and entrepreneurship development.
CO2	Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL for skill development, employability and entrepreneurship development.
CO3	Improve the database design by normalization for skill development, employability and entrepreneurship development.
CO4	Design ER-models to represent simple database application scenarios, Convert the ER- model to relational tables, populate relational database and formulate SQL queries on data for effective global level problem for skill development, employability and entrepreneurship development.
CO5	Familiar with basic database storage structures and access techniques: file and page organizations, indexing methods, and hashing for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	2	1	1	1	1	1	1	1	1	1
CO2	2	1	2	1	1	1	1	1	1	1	1	1
CO3	2	1	2	1	2	1	1	1	1	1	1	1
CO4	2	1	2	1	1	1	1	1	1	1	1	1
CO5	1	2	1	2	1	1	1	1	1	1	1	1

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:

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1. Date C J, "An Introduction To Database System", Addison Wesley
2. Korth, Silbertz, Sudarshan, "Database Concepts", McGraw Hill
3. Elmasri, Navathe, "Fundamentals Of Database Systems", Addison Wesley
4. Paul Beynon Davies, "Database Systems", Palgrave Macmillan
5. Bipin C. Desai, "An introduction to Database Systems", Galgotia Publication

Websites Sources:

1. beginnersbook.com
2. www.smartzworld.com
3. lecturenotes.in/.../database-management-system-dbms
4. lecturenotes.in/notes/5536-notes-for-database.

MOOCS Certification Courses:-

1. <https://nptel.ac.in/courses/106/104/106104135/>
2. <https://nptel.ac.in/courses/106/105/106105175/>
3. <https://nptel.ac.in/courses/106/106/106106220/>
4. <https://nptel.ac.in/courses/106/106/106106093/>



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BCACC-313

.NET PROGRAMMING USING C#

L T P
3 1 0

Objective(s): The objectives of this course:

1. Introduce to .Net IDE Component Framework.
2. Programming concepts in .Net Framework.
3. Creating website using ASP.Net Controls.
4. To gain programming knowledge in .Net Framework *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

The Framework of .Net: Building blocks of .Net Platform (the CLR, CTS and CLS), Features of .Net, deploying the .Net Runtime, Architecture of .Net platform, Introduction to namespaces & type distinction. Types & Object in .Net *for skill development and employability.*

UNIT II:

(8 Sessions)

Introduction to C#: Characteristics of C#, Data types: Value types, reference types, default value, constants, variables, scope of variables, boxing and unboxing. Operators and expressions: Arithmetic, relational, logical, bitwise, special operators, evolution of expressions, operator precedence & associativity, Control constructs in C#: Decision making, loops, Classes & methods: Class, methods, constructors, destructors, overloading of operators & functions *for skill development and employability.*

UNIT III:

(8 Sessions)

Inheritance & polymorphism: visibility control, overriding, abstract class & methods, sealed classes & methods, interfaces. Advanced features of C#: Exception handling & error handling, automatic memory management, Input and output (Directories, Files, and streams), Delegate and events *for skill development and employability.*

UNIT IV:


(8 Sessions)

The evolution of Web development, Web Application using ASP.NET, ASP.NET Architecture, Control- based Programming, User Interface Elements, ASP.NET Server Controls *for skill development and employability.*

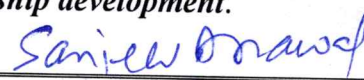
UNIT V:

(8 Sessions)

Validation Controls, Introduction to ADO.NET: Comparison between ADO & ADO.NET—The difference between Connection Model & Disconnected Model – difference between the DataSet and RecordSet- The Dataset Model. Accessing Data using ADO.NET: dataset-DataAdapter DataRelation *for skill development, employability and entrepreneurship development.*


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Course Outcomes (COs):

After completing this course, the student will be able to:

CO1	Understand the list the major elements of the .NET frame work and explain how C# fits into the .NET platform for skill development, employability and entrepreneurship development.
CO2	Analyze the basic structure of a C# application for skill development, employability and entrepreneurship development.
CO3	Debug, compile, and run a simple application such Inheritance & polymorphism for skill development, employability and entrepreneurship development.
CO4	Develop programs using C# on .NET for web applications (global level web sites) for skill development, employability and entrepreneurship development.
CO5	Design and develop Web based applications on .NET at global level web pages for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	3	1	3	1	1	1	1	1	1	1
CO2	1	1	3	1	2	1	1	1	1	1	1	1
CO3	1	1	3	1	3	1	1	1	1	1	1	1
CO4	2	1	3	1	3	1	1	1	1	1	1	1
CO5	1	1	3	1	1	1	1	1	1	1	1	1

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

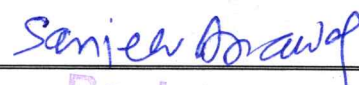
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:

1. Herbert Schildt, "The Complete Reference: C# 4.0", Tata McGraw Hill, 2012.
2. Christian Nagel et al. "Professional C# 2012 with .NET 4.5", Wiley India, 2012.
3. Andrew Troelsen, "Pro C# 2010 and the .NET 4 Platform, Fifth edition, A Press, 2010.


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4. Ian Griffiths, Matthew Adams, Jesse Liberty, "Programming C# 4.0", Sixth Edition, O'Reilly, 2010.

Websites Sources:

1. <https://docs.microsoft.com/en-us/dotnet/csharp/getting-started/introduction-to-the-csharp-language-and-the-net-framework>.
2. <https://www.geeksforgeeks.org/c-sharp-net-framework-basic-architecture-component-stack/>

MOOCS Certification Courses:-

1. <https://dotnet.microsoft.com/learn/csharp>
2. <https://dotnet.microsoft.com/learn>
3. <https://www.udemy.com/topic/c-sharp/>
4. <https://www.udemy.com/topic/net/>
5. <https://www.bestdotnettraining.com/csharp-online-training>



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BCAPL-314

DBMS Lab

L T P
0 0 4

Objective(s): The objectives of this course:

1. The objective of the course is to present an introduction to database management systems, with an emphasis on how to organize, maintain and retrieve - efficiently, and effectively - information from a DBMS.
2. To develop an understanding of essential DBMS concepts such as: database security, integrity, concurrency and to design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS *to inculcate skill, provide employability & entrepreneurship skill.*

List of programs:

1. Create a table in SQL
2. Insert a new row in table
3. Insert a new value in table
4. Update a value in table
5. Delete a value from a table
6. Search a value from table
7. Select the given item from table
8. Modify the data item from table
9. Alter the table structure
10. Create a stored procedure
11. Create a trigger
12. Create index

Course Outcomes (COs):

Students will be able to understand

CO1	Describe the fundamental elements of relational database management systems for skill development, employability and entrepreneurship development.
CO2	Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL for skill development, employability and entrepreneurship development.
CO3	Design ER-models to represent simple database application scenarios for skill development, employability and entrepreneurship development.


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CO4	Convert the ER-model to relational tables, populate relational database and formulate SQL queries on data local/central level sql problems for skill development, employability and entrepreneurship development.
CO5	Improve the database design by normalization for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation) 3 strong, 2 medium, 1 weak												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	2	1	1	1	1	1	1	1	1	1
CO2	2	1	2	2	2	1	1	1	1	1	1	1
CO3	2	1	2	1	2	1	1	1	1	1	1	1
CO4	2	1	2	1	1	1	1	1	1	1	1	1
CO5	1	2	1	1	1	1	1	1	1	1	1	1

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:

1. Date C J, "An Introduction To Database System", Addison Wesley
2. Korth, Silbertz, Sudarshan, "Database Concepts", McGraw Hill
3. Elmasri, Navathe, "Fundamentals Of Database Systems", Addison Wesley
4. Paul Beynon Davies, "Database Systems", Palgrave Macmillan
5. Bipin C. Desai, "An introduction to Database Systems", Galgotia Publication

Websites Sources:

1. beginnersbook.com
2. www.smartzworld.com
3. lecturenotes.in/.../database-management-system-dbms
4. lecturenotes.in/notes/5536-notes-for-database.

MOOCS Certification Courses:-

1. <https://nptel.ac.in/courses/106/104/106104135/>
2. <https://nptel.ac.in/courses/106/105/106105175/>
3. <https://nptel.ac.in/courses/106/106/106106220/>
4. <https://nptel.ac.in/courses/106/106/106106093/>

Ram

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Sanjeev Bora

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BCAPL-315

.NET PROGRAMMING LAB

L	T	P
0	0	4

Objective(s): The objectives of this course:

1. Introduce to .Net IDE Component Framework.
2. Programming concepts in .Net Framework.
3. Creating website using ASP.Net Controls.
4. To gain programming knowledge in .Net Framework *to inculcate skill, provide employability & entrepreneurship skill.*

List of programs:

1. Write a program to display the following feedback form.
2. Write a program containing the following controls:
3. Write a program that displays a button in green color and it should change into yellow when the mouse moves over it.
4. Write a program to display "Welcome To Radiant" in the form when the "click" button is clicked. The form title must be ASP.NET.
5. Write a program to get a user input such as the boiling point of water and test it to the appropriate value using CompareValidator.
6. Write a program that uses a textbox for a user input name and validate it for Required Field Validation.
7. Write a program that gets user input such as the user name, mode of payment, appropriate credit card. After the user enters the appropriate values the Validation button validates the values entered.
8. Write a program to connect to the master database in SQL Server, in the Page_Load event. When the connection is established, the message "Connection has been established" should be displayed in a label in the form.
9. Create a RadioButtonList that displays the names of some flowers in two columns. Bind a label to the RadioButtonList so that when the user selects an option from the list and clicks on a button, the label displays the flower selected by the user.

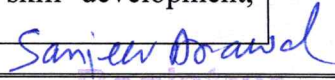
Course Outcomes:

After completing this course, the student will be able to:

CO1	List the major elements of the .NET frame work for skill development, employability and entrepreneurship development.
CO2	Explain how C# fits into the .NET platform for skill development, employability and entrepreneurship development.
CO3	Analyze the basic structure of a C# application for skill development, employability and entrepreneurship development.
CO4	Debug, compile, and run a simple application for skill development,


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	employability and entrepreneurship development.
CO5	Develop programs using C# on .NET and Design and develop Web based applications on global level web pages for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	2	1	1	1	1	1	1	1	1	1
CO2	2	1	2	2	2	1	1	2	1	1	1	1
CO3	2	1	2	1	2	1	2	1	1	1	1	1
CO4	2	1	2	1	1	1	1	2	1	1	1	1
CO5	1	2	1	1	1	1	1	1	1	1	1	1

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:


1. Herbert Schildt, "The Complete Reference: C# 4.0", Tata McGraw Hill, 2012.
2. Christian Nagel et al. "Professional C# 2012 with .NET 4.5", Wiley India, 2012.
3. Andrew Troelsen, "Pro C# 2010 and the .NET 4 Platform, Fifth edition, A Press, 2010.
4. Ian Griffiths, Matthew Adams, Jesse Liberty, "Programming C# 4.0", Sixth Edition, O'Reilly, 2010.

Websites Sources:

1. <https://docs.microsoft.com/en-us/dotnet/csharp/getting-started/introduction-to-the-csharp-language-and-the-net-framework>.
2. <https://www.geeksforgeeks.org/c-sharp-net-framework-basic-architecture-component-stack/>


MOOCS Certification Courses:-

1. <https://dotnet.microsoft.com/learn/csharp>
2. <https://dotnet.microsoft.com/learn>
3. <https://www.udemy.com/topic/c-sharp/>
4. <https://www.udemy.com/topic/net/>
5. <https://www.bestdotnettraining.com/csharp-online-training>



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BCADS-316

E1: Hardware & PC Maintenance

L	T	P
3	1	0

Objective(s): The objectives of this course:

1. Indicate the names and functions of hardware ports and the parts of the motherboard.
2. Identify the names and distinguishing features of different kinds of input and output devices.
3. Describe how the CPU processes data and instructions and controls the operation of all other devices.
4. Identify the names, distinguishing features, and units for measuring different kinds of memory and storage devices.
5. Search your personal computer for the various hardware components it contains *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Introduction to Portable Mobile Computers, Laptops, Tablets

Types and classes of portable computers: - Laptops, Notebooks, Tablets, Smart Phones, Palmtops. Portable System models and configurations from different manufacturers: - IBM, DELL, Apple, Samsung, HP, Toshiba, Fujitsu, Acer, Compact Version Operating Systems and applications for portable Computers: - WINDOWS 8, Android and various various releases, various flavors of Linux that being loaded on handheld devices, Apple Macintosh and iOS. Low powered Portable system Processors and Graphics Processors GPU:- Intel Mobile Pentium, Mobile Celeron Processors, ARM Cortex processors, AMD Mobile Athlon-4 and Mobile Duron. Mobile processor packaging and compact Motherboards *for skill development and employability.*

UNIT II:

(8 Sessions)

Compact devices used in Portable Mobile Computers

Compact Hard Drives, CD/DVD R/W used in Mobile computers. Various type of secondary memory deployed in compact devices like Compact FLASH, MicroSD Cards, Wireless bluetooth based Keyboards and mouse: - Inbuilt and External keyboards, Compact multimedia keyboards, TrackPoint, Touchpad's, Wireless mouse *for skill development and employability.*

UNIT III:

(8 Sessions)

Specialized output devices used in Portable Mobile Computers

Display used in portable computers:- Dual Scan(passive Matrix) Displays. Active Matrix, Flat-Panel LCD/LED/AMOLED/IPS Displays, Active TFT Displays, touch panel, etc.

UNIT IV:

(8 Sessions)

Interfacing used with Portable Mobile Computers

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PCMCIA Cards:- PCMCIA Ethernet LAN card, PCMCIA Wireless Card. Type –I, Type –II Type –III types of cards, and their slots. Infrared ports, Docking Stations, USB port, OTG USB, Mini USB, HDMI, micro HDMI port, etc *for skill development and employability.*

UNIT V:

(8 Sessions)

Preventive maintenance for Portable Mobile Computers

Power Supply constraints, Battery charging, Handling and Storage, Cleaning of Displays, Running diagnostic software tools, Antivirus Software, Handling Plug-in /Plug out Hardware *for skill development and employability.*

Course Outcomes (COs):

After completing this course, the student will be able to:

CO1	Perform all the functions with Electrical and Electronic Components related to Computer and Networking system drawing following safety precautions for skill development, employability and entrepreneurship development .
CO2	Assemble and repair Desktop Computer with all its hardware components, and Install different Operating System and all other application software for skill development, employability and entrepreneurship development.
CO3	Customize Operating System and maintenance of system application software. Assemble and repair Laptop and its hardware components for skill development, employability and entrepreneurship development.
CO4	Perform the operations of office package (word, excel, power point).
CO5	Install Printer, Scanner and troubleshoot their faults. Also set up and configure Networking System using various network devices for local level networking system for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1	1	2	1	2	1	1	2	3	2
CO2	2	2	2	1	3	1	1	1	1	3	2	2
CO3	2	1	2	1	2	2	1	1	1	1	3	1
CO4	2	2	1	1	3	1	1	1	1	2	2	2
CO5	2	1	1	1	2	1	1	1	1	1	1	2

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	3	1

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CO2	2	3	1
CO3	3	3	1
CO4	3	3	1
CO5	3	3	1

Suggested Readings:

1. How Computers Work and What to Do When They Don't By: Matthew R Baker
2. Vintage Commodore 128 Personal Computer Handbook 2019 Survival EditiMargaret Gorts Morabito

Websites Sources:

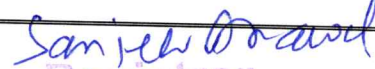
1. <https://www.techwalla.com/articles/what-is-computer-hardware-maintenance>
2. <https://worldclassictcenter.wordpress.com/2016/12/06/what-is-computer-hardware-maintenance/>
3. http://www.cstaricalcutta.gov.in/images/CTS%20CHNM_CTS_NSQF-4.pdf

MOOCS Certification Courses:-

1. <https://nptel.ac.in/courses/106/105/106105194/>
2. <https://nptel.ac.in/courses/106/105/106105165/>


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BCADS-317

E2: DESKTOP PUBLISHING

L	T	P
3	1	0

Objective(s): The objectives of this course:

1. understanding of the techniques essential to build their career in desktop publishing using suitable hardware and software tools.
2. This course offers a range of topics of immediate relevance to industry and makes the participants exactly suitable for DTP Industry.
3. expertise in the use of the DTP page layout program
4. In Design, from basic page setup through use of specialized techniques such as type manipulation and graphic effects ways to find, adapt and create art even if you are NOT an artist understanding graphic formats and conventions that give publications a quality look writing and editing copy to enhance your message *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

MS Paint

Introduction About the limits of MS Paint Presentation and setup of user interface and help Open and save an image Knowledge of available file types (JPG, TIFF, ICO, PNG, GIF...) Set opened image as desktop wallpaper Display options (zoom, miniature, grid, etc.) Define or resize the size of an image (nonfunctional transparency) Drawing tools overview Colors selection with right click/left click in the palette Copy/Paste from selection with or without transparency Insert an external image in a composition Colors number selection and color inversion *for skill development and employability.*

UNIT II:

(8 Sessions)


Photoshop

Getting Acquainted with Photoshop Basic Image Manipulation Color Basics Painting Tools Brush Settings, Making Selections, Filling and stroking, Layers, Advanced Layers, Text, Drawing, Using Channels and Masking Manipulating images Getting to know the work area Using Adobe Bridge Basic Photo Corrections Retouching and Repairing Working with selections Layer Basics Masks and channels Correcting and enhancing digital photographs Topographic design Vector drawing techniques Advanced Layer techniques Vector Compositing Creating Links within an image Creating rollover web visuals Animating GIF images for the web Producing and printing consistent color *for skill development and employability.*

UNIT III:

(8 Sessions)

PageMaker



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Getting Started with PageMaker, PageMaker Interface, Creating a New Document, Managing Document Layer, Creating & Editing Text, Working with Edit Story, Managing Text as an Object Working with Text and Graphics, Using Graphics, Applying Colors to Graphics, Framing Graphics, Cropping and masking Graphics, Working with Layers, Working with Master pages, Working with Plugins, Using Text Wrap Using Advanced Features, Creating a PDF Document in PageMaker, Working with Data Merger, Using Scripts, Using Object Linking and Embedding, Color Separation Capabilities, Printing *for skill development and employability*.

UNIT IV:

(8 Sessions)

Coral Draw

Getting started with Corel Draw, Introduction to Corel Draw, Features of Corel Draw, Corel Draw Interface, Tool Box, Moving from Adobe Illustrator to Corel Draw, Common Tasks Drawing and Coloring, Selecting Objects, Creating Basic Shapes, Reshaping Objects, Organizing objects, Applying color fills and Outlines Mastering with Text, Text Tool Artistic and paragraph text, Formatting Text, Embedding Objects into text, Wrapping Text around Object, Linking Text to Objects Applying Effects, Power of Blends Distortion, Contour Effects, Envelopes, Lens effects, Transparency, Creating Depth Effects, Power Clips Working with Bitmap Commands, Working with Bitmaps, Editing Bitmaps, Applying effects on Bitmaps, Printing Corel Draw- Web resources, Internet Tool bar, Setting your webpage, Exporting files, Creating buttons with rollover effects *for skill development and employability*.

UNIT V:

(8 Sessions)

Project work

Design Process Designing Aids Printing and presentation *for skill development and employability*.

Course Outcomes (COs):

After completing this course, the student will be able to:

CO1	Install and setup operating system and related software in a computer following safety precautions for skill development, employability and entrepreneurship development.
CO2	Create, format and edit different publication using publication software Adobe PageMaker. Create, edit, format and develop publication using Quark Xpress application software. & Install and setup scanner and scan the documents and images. Also Create, format, edit and develop images using Adobe Photoshop software for skill development, employability and entrepreneurship development.
CO3	Create, format, edit text file, document file and BMP file by using different Accessories of Windows for skill development, employability and entrepreneurship development.
CO4	Introduce the Networking concept including sharing of different resources, use of Internet, accessing/ browsing, downloading and e-mailing for any local Organization for skill development, employability and entrepreneurship development.

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CO5	Create, edit, format and enhance document using word processing application Software for skill development, employability and entrepreneurship development.
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Mapping COs with POs:

(3,2,1- indicates the strength of correlation)						3 strong, 2 medium, 1 weak						
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	2	1	2	2	1	1	1	1	1	1
CO2	2	2	1	2	2	2	1	1	1	2	1	1
CO3	2	2	2	2	2	2	1	1	1	1	2	1
CO4	2	3	2	1	3	3	1	1	2	2	1	1
CO5	2	2	1	1	1	2	1	1	1	1	1	1

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:

1. The Ultimate DTP Book – Bill Rosoman
2. Computer Fundamentals - P.K. Shinha
3. Adobe PageMaker 7.0 develop by Staff of Adobe
4. Adobe Photoshop develop by Staff of Adobe
5. The Essential book for MS-Office by – Bill Bruck

Websites Sources:

1. [https://en.wikipedia.org/wiki/Desktop_publishing#:~:text=Desktop%20publishing%20\(DTP\)%20is%20the,\(%22desktop%22\)%20computer.&text=This%20technology%20allows%20individuals%2C%20businesses,the%20expense%20of%20commercial%20printing.](https://en.wikipedia.org/wiki/Desktop_publishing#:~:text=Desktop%20publishing%20(DTP)%20is%20the,(%22desktop%22)%20computer.&text=This%20technology%20allows%20individuals%2C%20businesses,the%20expense%20of%20commercial%20printing.)
2. <https://ehlion.com/magazine/what-is-desktop-publishing/>
3. <https://www.lifewire.com/what-is-desktop-publishing-1073862>
4. <https://www.britannica.com/topic/desktop-publishing>

MOOCS Certification Courses:-

1. <https://www.classcentral.com/course/udemy-desktop-publishing-for-you-38583>
2. <https://www.udemy.com/course/desktop-publishing-for-you/>
3. <https://collegedunia.com/courses/desktop-publishing>
4. <https://iisd.in/product/certificate-in-desk-top-publishing-dtp/>

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IFTM University, Moradabad
Bachelor of Computer Applications Program
BCA II Year (III Semester)
(Effective from 2022-23)

BCAGE-301

ENTREPRENEURSHIP

L	T	P
3	1	0

Objective(s): The objectives of this course:

1. The students develop and can systematically apply an entrepreneurial way of thinking that will allow them to identify and create business opportunities that may be commercialized successfully.
2. Explore and experience the joy of creating unique solutions to market opportunities
3. Create and exploit innovative business ideas and market opportunities
4. Turn market opportunities into a business plan
5. Build a mindset focusing on developing novel and unique approaches to market opportunities
6. Demonstrate and present successful work, collaboration and division of tasks in a multidisciplinary and multicultural team
7. Demonstrate understanding and application of the tools necessary to create sustainable and viable businesses *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Introduction to Entrepreneurship Role of the entrepreneur in India and around the globe; forces that are driving the growth of entrepreneurship; benefits and drawbacks of entrepreneurship; mistakes of entrepreneurship and how to avoid them; entrepreneurial failure traits *for skill development, employability and entrepreneurship development.*

UNIT II:

(8 Sessions)

Overview of business and its functioning Business and industry; Components of macro and micro business environment *for employability and entrepreneurship development.*

UNIT III:

(8 Sessions)

Business Idea and Feasibility Creativity, innovation and entrepreneurship; mental locks" that limit individual creativity; steps in the creative process; techniques for improving the creative process; protection of intellectual property involving patents, trademarks, and copyrights *for employability and entrepreneurship development.*

UNIT IV:

(8 Sessions)

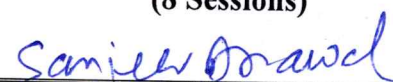
Strategic Management and Entrepreneur Importance of strategic management to a (small) business; understanding competitive advantages; steps in the strategic planning process; basic strategies: low-cost, differentiation, and focus; balanced scorecard in the planning process *for employability and entrepreneurship development.*

UNIT V:

(8 Sessions)


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Forms of Business Ownership Advantages and the disadvantages of the three major forms of ownership: the sole proprietorship, the partnership, and the corporation. Types of franchising: trade name, product distribution, and pure. Major trends shaping franchising *for skill development, employability and entrepreneurship development.*

Course Outcomes (COs):

After completing this course, the student will be able to:

CO1	Have the ability to discern distinct entrepreneurial traits for skill development, employability and entrepreneurship development.
CO2	Know the parameters to assess opportunities and constraints for new business ideas for skill development, employability and entrepreneurship development.
CO3	Understand the systematic process to select and screen a business idea for skill development, employability and entrepreneurship development.
CO4	Design strategies for successful implementation of ideas for skill development, employability and entrepreneurship development.
CO5	Write a business plan Local/ global level for skill development, employability and entrepreneurship development.

Mapping COs with POs:

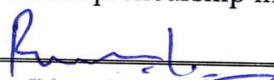
(3,2,1- indicates the strength of correlation)												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	3	2	2	1	1	1	3	2	3	1
CO2	1	2	3	1	2	2	1	1	2	2	3	2
CO3	1	3	2	3	1	1	1	1	3	3	2	2
CO4	1	2	3	2	2	2	1	1	2	1	3	3
CO5	3	3	3	1	2	1	1	1	1	1	3	3

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

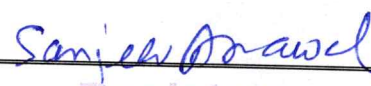
	Skill Development	Employability	Entrepreneurship Development
CO1	3	3	3
CO2	1	3	2
CO3	1	3	3
CO4	1	3	3
CO5	3	3	3

Suggested Readings:

1. Entrepreneurship: Strategies and Resources, 3/E -: Marc Dollinger; Prentice Hall
2. Bringing New Technology to Market- Kathleen R. Allen, Prentice Hall
3. Entrepreneurship in Action, 2/E - Mary Coulter; Prentice Hall


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Websites Sources:

1. <http://ediindia.ac.in/e-policy/> [Entrepreneurial Policy India]
2. http://en.wikipedia.org/wiki/List_of_venture_capital_companies_in_India[Venture Capital]
3. indiavca.org/venture-capital-in-india.html [Venture Capital]
4. www.indianangelnetwork.com/ [Angel Investing]
5. www.startbizindia.in/angel_investors_india.php [ANGEL INVESTING]

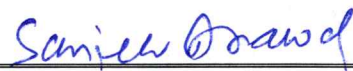
MOOCS Certification Courses:-

1. <https://www.coursera.org/browse/business/entrepreneurship>
2. https://in.pearson.com/ppp/programs/lbs-entrepreneurship-development-course.html?utm_source=google&utm_medium=google%20search&utm_campaign=google%20search%20ind%20lbs%20entrepreneurship%20program&gclid=Cj0KCQjws4aKBhDPArisAIWH0JWeDB9Y6q58L3j7LbjJCQhZhVUf71XBTR1kyGDEWeTOBNBjEgpkFMoaAnxrEALw_wcB
3. https://www.kluonline.edu.in/online-degree-learning-courses/?source=KLOnline&media=GAW&campaign=SRCH&cn=s_bba_d&gclid=Cj0KCQjws4aKBhDPArisAIWH0JXozxghqw7DntHsfd37zzhxdZAwsFqXaedU8DYQi3r4wUQUQpgggaAtbREALw_wcB



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(Effective from 2022-23)

BCAGE-302

DISASTER MANAGEMENT

	L	T	P
	3	1	0

Objective(s): The objectives of this course:

1. To minimize the risk of disasters with the effective use of Remote sensing and GIS
2. To train students on various aspects of Disaster Management
3. To create safe and sustainable environment by community strengthening capacity building
4. To assist local administration by providing expertise in the field of Disaster Management *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Hazard, Risk, Vulnerability, Disaster, Disaster Management, Meaning, Nature Importance, Dimensions & Scope of Disaster Management, Disaster Management Cycle *for skill development, employability and entrepreneurship development.*

UNIT II:

(8 Sessions)

National disaster management framework; financial arrangements for Disaster management, International Strategy for Disaster reduction *for skill development, employability and entrepreneurship development.*

UNIT III:

(8 Sessions)

Geological Disasters- Earthquakes, Landslides, Avalanches, Volcanic eruptions, Mudflow Wind related- Cyclone, Storm, Storm surge, tidal waves *for skill development, employability and entrepreneurship development.*

UNIT IV:

(8 Sessions)

Heat and cold Waves, Climatic Change, Global warming, Sea Level rise, Ozone Depletion. Factors affecting damage – types, scale population, social status, habitation pattern, physiology and climate *for skill development, employability and entrepreneurship development.*

UNIT V:

(8 Sessions)

Factors affecting mitigation measures, prediction, preparation, communication, area and accessibility, population, physiology and climate *for skill development, employability and entrepreneurship development.*

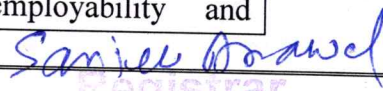
Course Outcomes (COs):

After completing this course, the student will be able to:

CO1	Students will learn different disasters and measures to reduce the risk due to these Disasters for skill development, employability and
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	entrepreneurship development.
CO2	Students will learn about Geological Disasters- Earthquakes, Landslides, Avalanches, Volcanic eruptions for skill development, employability and entrepreneurship development.
CO3	Students will learn institutional frame work for disaster management at national as well as global level for skill development, employability and entrepreneurship development.
CO4	Students will learn different factors affecting mitigation measures, prediction for skill development, employability and entrepreneurship development.
CO5	Students will learn about Geological Disasters- Earthquakes, Landslides, and Avalanches, Volcanic eruptions for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	2	3	2	1	1	1	2	2	1
CO2	3	1	2	1	3	3	2	1	2	1	1	2
CO3	2	2	1	2	2	2	3	2	2	2	2	1
CO4	1	3	2	2	2	2	3	1	1	1	1	1
CO5	2	1	2	2	1	1	2	1	2	2	2	2

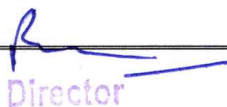
CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)


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

Suggested Readings:

1. Disaster Administration and Management, Text & Case studies- SL Goel-Deep and Deep Publications
2. Disaster Management- G.K Ghosh-A.P.H. Publishing Corporation
3. Disaster management – S.K.Singh, S.C. Kundu, Shobha Singh A – 119, William Publications, New Delhi. Disaster Management – Vinod K Sharma- IIPA, New Delhi,1995
4. Encyclopedia of Disaster Management- Goel S.L. - Deep and Deep Publications, New Delhi, 2006.


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Websites Sources:

1. http://sdmassam.nic.in/pdf/publication/undp/disaster_management_in_india.pdf
2. <https://elaw.org/system/files/Chapter%208%20Disaster%20Management.pdf>
3. https://www.undp.org/content/dam/india/docs/disaster_management_in_india.pdf

MOOCS Certification Courses:-

1. <https://nidm.gov.in/online.asp>
2. <https://www.shiksha.com/business-management-studies/disaster-management-chp>
3. <http://www.onlinenidm.gov.in/>



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BCAGE-303

DISCRETE MATHEMATICS

L T P

3 1 0

Objective(s): The objectives of this course:

1. Prepare the students to develop and understand the mathematical foundations.
2. Create mathematical arguments require in learning many mathematics and computer sciences courses.
3. To motivate students how to solve practical problems using discrete mathematics.
4. Also, in this course basic concepts of Graph theory such as Trees, Eulerian Graphs, Vertex colourings and learn about the basic knowledge of prepositions *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I

(8 Sessions)

Mathematical Logic: Statement, Simple and Compound Statements, Logical connectives, Truth Tables, Duality, Conditional and Bi- Conditional Statements, Tautologies, Contradiction, Algebra of propositions, Logical equivalence, Normal forms, Arguments and Validity of arguments *for skill development and employability.*

UNIT II

(8 Sessions)

Boolean Algebra: Definition, Laws of Boolean algebra, Duality, The AND, OR and NOT gates and others, Boolean Expressions, Logic diagrams, Normal forms and K-maps for two, three and four variables *for skill development and employability.*

UNIT III

(8 Sessions)

Functions: Introduction, Functions, Identity function, One to one, Onto and Invertible functions, Composition of functions, Mathematical functions, Exponential and Logarithmic functions, Recursively defined function *for skill development and employability.*

UNIT IV

(8 Sessions)

Relations: Introduction, Ordered pair, Cartesian product, Relations, Domain and Range, Pictorial representation of relations, Inverse relation, Identity relation, Universal relation, Composition of relations, Types of relations, Equivalence relations and Partial order relations *for skill development and employability.*

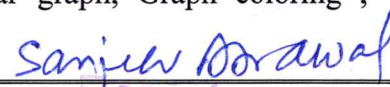
UNIT V

(8 Sessions)

Graph Theory: Definitions, Finite and Infinite graphs, Incidence and degree, Null graph, Sub graph, Connected and Disconnected graphs, Planar graph, Regular graph, Graph coloring ,


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Chromatic number, Adjacency matrix and Incidence Matrix *for skill development and employability*.

Trees: Definition, Properties of Trees, Rooted tree, Binary tree and Path length of tree *for skill development and employability*.

Course Outcomes (COs):

After completing this course, the student will be able to:

CO1	Write an argument using logical notation and determine if the argument is or is not valid for skill development, employability and entrepreneurship development.
CO2	Demonstrate the ability to write and evaluate a proof or outline the basic structure and give examples of each proof technique described for skill development, employability and entrepreneurship development.
CO3	Understand the basic principles of sets and operations in sets for skill development, employability and entrepreneurship development.
CO4	Apply counting principles to determine probabilities for skill development, employability and entrepreneurship development.
CO5	Demonstrate an understanding of relations and functions and be able to determine their relationship with Programming for skill development, employability and entrepreneurship development.


Mapping COs with POs:

(3,2,1- indicates the strength of correlation)						3 strong, 2 medium, 1 weak						
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1	1	1	1	1	1	1	1	1	1
CO2	1	2	2	1	2	1	1	1	2	1	1	2
CO3	3	1	2	2	2	2	1	1	1	1	1	1
CO4	1	1	1	2	1	1	1	1	1	1	1	2
CO5	2	1	1	1	1	1	1	1	1	1	1	1

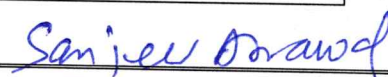
CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:


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1. Schaum's (Seymour Lipschutz, Marc Lipson): "Discrete Mathematics" TMH Publication.
2. N. Deo, "Graph Theory with application to Engineering and Computer Science," PHI Publication.
3. B.Colman and Robert C. Busby, "Discrete Mathematical structure for Computer Science," PHI.
4. Olympia Nicodemi, "Discrete Mathematics" CBS Publication, Delhi.
5. C.L.Liu, "Element of Discrete Mathematics" Mc Graw Hill Book Co., 1985.

Websites Sources:


1. www.pdfdrive.com
2. www.dmi.gov.in
3. www.yourarticlelibrary.com
4. onlinecourses.nptel.ac.in
5. en.wikipedia.org

MOOCS Certification Courses:-

1. https://www.udemy.com/topic/discrete-math/?utm_source=adwords&utm_medium=udemyads&utm_campaign=DSA_Catchall_la.EN_cc.INDIA&utm_content=deal4584&utm_term=.ag_82569850245_.ad_533220805577_.kw_.de_c_.dm_.pl_.ti_dsa-404285868850_.li_9303984_.pd_.&matchtype=b&gclid=Cj0KCQjws4aKBhDPAIIsAIWH0JW1zGYsjSsOqSZSphQRj1HNA_ZmwogDDOzaUAVuxCezVI27vjeICg8aAIW-EALw_wcB
2. <https://digitaldefynd.com/best-discrete-mathematics-courses/>
3. <https://www.coursera.org/courses?query=discrete%20mathematics>


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BCAPL-301

DESKTOP PUBLISHING LAB

L	T	P
0	0	2

Objective(s): The objectives of this course:

1. Understanding of the techniques essential to build their career in desktop publishing using suitable hardware and software tools.
2. This course offers a range of topics of immediate relevance to industry and makes the participants exactly suitable for DTP Industry.
3. expertise in the use of the DTP page layout program
5. In Design, from basic page setup through use of specialized techniques such as type manipulation and graphic effects ways to find, adapt and create art even if you are NOT an artist understanding graphic formats and conventions that give publications a quality look writing and editing copy to enhance your message *to inculcate skill, provide employability & entrepreneurship skill.*

List of Programs

1. Install and set up operating system and related software in a computer.
2. Create, format, edit text file, document file and BMP file by using different Accessories of Windows.
3. Create, edit, format and enhance document using word processing application software.
4. Introduce the Networking concept including sharing of different resources, use of
5. Internet, accessing/ browsing, downloading and e-mailing.
6. Create, format, edit and different publication using publication software Adobe PageMaker.
7. Create, edit, format and develop publication using Quark Xpress application software.
8. Install and setup scanner and scanning the documents and images.
9. Create, format, edit and develop images using Adobe Photoshop software.
10. Draw, edit, format and develop graphics design using Corel draw application software.
11. Create, edit, format and develop page combining text and graphics using page makeup Adobe in Design application software.
12. Create, edit and format, different types of publication using bilingual software.
13. Printing, binding and publishing to form a full-fledged book format.

Course Outcomes (COs):

After completing this course, the student will be able to:

CO1	Install and setup operating system and related software in a computer following safety Precautions for skill development, employability and entrepreneurship development.
CO2	Understand the basic principles of sets and operations in sets for skill development, employability and entrepreneurship development.

CO3	Create, format, edit text file, document file and BMP file by using different Accessories of Windows for skill development, employability and entrepreneurship development.
CO4	Demonstrate an understanding of relations and functions and be able to determine their properties & demonstrate different traversal methods for trees and graphs for skill development, employability and entrepreneurship development.
CO5	Create, edit, format and enhance document using word processing application software for local / global level for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)						3 strong, 2 medium, 1 weak						
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	1	1	2	1	1	1	1	1	2	1
CO2	3	2	2	2	3	1	1	1	2	1	2	2
CO3	2	1	2	3	2	1	2	1	1	1	1	1
CO4	1	2	1	2	3	1	1	1	2	1	2	2
CO5	2	2	1	1	1	1	1	1	1	2	3	1

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:

1. The Ultimate DTP Book – Bill Rosoman
2. Computer Fundamentals - P.K. Shinha
3. Adobe PageMaker 7.0 develop by Staff of Adobe
4. Adobe Photoshop develop by Staff of Adobe
5. The Essential book for MS-Office by – Bill Bruck

Websites Sources:

1. [https://en.wikipedia.org/wiki/Desktop_publishing#:~:text=Desktop%20publishing%20\(DTP\)%20is%20the,\(%22desktop%22\)%20computer.&text=This%20technology%20allows%20individuals%2C%20businesses,the%20expense%20of%20commercial%20printing.](https://en.wikipedia.org/wiki/Desktop_publishing#:~:text=Desktop%20publishing%20(DTP)%20is%20the,(%22desktop%22)%20computer.&text=This%20technology%20allows%20individuals%2C%20businesses,the%20expense%20of%20commercial%20printing.)
2. <https://ehlion.com/magazine/what-is-desktop-publishing/>
3. <https://www.lifewire.com/what-is-desktop-publishing-1073862>
4. <https://www.britannica.com/topic/desktop-publishing>

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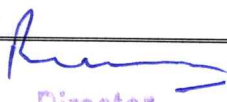
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MOOCS Certification Courses:-

1. <https://www.classcentral.com/course/udemy-desktop-publishing-for-you-38583>
2. <https://www.udemy.com/course/desktop-publishing-for-you/>
3. <https://collegedunia.com/courses/desktop-publishing>
4. <https://iisdt.in/product/certificate-in-desk-top-publishing-dtp/>



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BCACC-411

COMPUTER GRAPHICS AND ANIMATION

L T P

3 1 0

Objective(s): The objectives of this course:

1. The main objective of this module is to introduce to the students the concepts of computer graphics and animation.
2. It starts with an overview of interactive computer graphics, two dimensional system and mapping, then it presents the most important drawing algorithm, two-dimensional transformation; Clipping, filling and an introduction to 3-D graphics *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Introduction: Introduction to Computer Graphics, Basic Graphics and Standards. Raster Scan and Random Scan Graphics, continual refresh and storages displays Devices, display processors and character generations *for skill development and employability.*

UNIT II:

(8 Sessions)

Color display techniques, frame buffer and Bit Operations concepts in raster graphics *for skill development and employability.*

UNIT III:

(8 Sessions)

Drawing Techniques: Point, lines and curves, scan conversion, line drawing algorithms, circle and ellipse generation, polygon filling, Ant-Aliasing *for skill development and employability.*

UNIT IV:

(8 Sessions)

Two- dimensional: Two- dimensional viewing, Basic Transformations Methods, coordinate system, windowing and clipping, segments, interactive picture construction techniques, interactive input and output devices *for skill development and employability.*

UNIT V:

(8 Sessions)

Three-dimensional: Three- Dimensional concepts, 3-D Representation and Transformation, 3-D Viewing, Spline Curves, Bezier Curves *for skill development and employability.*

Course Outcomes (COs):

Students will be able to understand

CO1	Be able to create interactive graphics applications for skill development, employability at global level for skill development, employability and entrepreneurship development.
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CO2	Have a knowledge and understanding of geometrical transformations and 2D/ 3D Viewing for skill development, employability and entrepreneurship development.
CO3	Have a knowledge and understanding of the Three-dimensional Representation and Transformation concepts for skill development, employability and entrepreneurship development.
CO4	Have a knowledge and understanding of techniques for representing 3D geometrical Objects for skill development, employability and entrepreneurship development.
CO5	Have a knowledge and understanding of the structure of an interactive computer graphics System for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	1	1	1	1	1	1	2	1	3	1
CO2	1	3	1	2	1	1	1	1	3	2	1	1
CO3	2	3	1	2	1	1	1	1	2	3	3	1
CO4	1	2	2	1	1	2	1	1	3	3	2	1
CO5	1	3	1	2	1	2	1	1	2	3	2	1

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:

1. Newman W.M. & Spraul R.F. "Principles of Interactive Computer Graphics", McGraw Hill.
2. Harington, "Introduction to Computer Graphics," McGraw Hill.
3. Hannen & Backer, Computer Graphics, PHI.
4. "Computer Graphics" D. Hearn & M. Baker, Publisher: Prentice Hall, 2000

Websites Sources:

1. <http://www.svecw.edu.in/Docs%5CCSECGLNotes2013.pdf>
2. <https://www.dgp.toronto.edu/~hertzman/418notes.pdf>
3. https://www.tutorialspoint.com/computer_graphics/index.htm

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4. <https://www.ncertbooks.guru/computer-graphics-notes/>
5. https://en.wikipedia.org/wiki/Computer_graphics

MOOCS Certification Courses:-

1. <https://nptel.ac.in/courses/106/103/106103224/>
2. <https://nptel.ac.in/courses/112/105/112105294/>
3. <https://nptel.ac.in/courses/106/102/106102063/>
4. <https://nptel.ac.in/courses/106/102/106102065/>



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BCACC-412

JAVA PROGRAMMING

L T P
3 1 0

Objective(s): The objectives of this course:

1. The objective of this course is to gain knowledge about basic Java language.
2. Syntax and semantics to write Java programs and use concepts with the fundamentals of object-oriented programming in Java, including defining classes, objects, invoking methods etc and exception handling mechanisms *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Object oriented programming, Overview of java, java programming design, importance and limitations of java. Java Developer Kit *for skill development and employability.*

UNIT II:

(8 Sessions)

Data Types: constant and variables, arrays, strings, expression and operators, Reference variables, Conditional and loop statements *for skill development and employability.*

UNIT III:

(8 Sessions)

Classes, packages and interfaces, Encapsulation, Polymorphism, Dynamic Binding, Overloading, Overriding, inheritance, interfaces and Packages, initializing and class loading *for skill development and employability.*

UNIT IV:

(8 Sessions)

I/O package, Language package and utilities packages, Introduction to Applet Programming. Programming a Graphical User Interface, Building a Simple User Interface, Laying out a User Interface *for skill development and employability.*

UNIT V:

(8 Sessions)

Exception handling in java, Event handling, multiple threading and thread control, thread life cycle, Synchronization, daemon threads. I/O handling in java, stream classes, Input stream, Output Stream, Byte Stream, Character Stream, reading a file, writing to a file, I/O exceptions *for skill development and employability.*

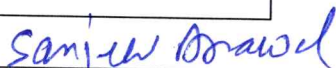
Course Outcomes (COs):

Students will be able to understand

CO1	Identify classes, objects, members of a class and relationships among them needed for a specific problem for skill development, employability and entrepreneurship development.
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CO2	Write Java programs to implement error handling techniques using exception handling for skill development, employability and entrepreneurship development.
CO3	Use of Java in a variety of technologies and on different platforms for skill development, employability and entrepreneurship development.
CO4	Write Java application programs using OOP principles and proper program structuring at Effective level Programming for skill development, employability and entrepreneurship development.
CO5	Demonstrate the concepts of polymorphism and inheritance for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	2	1	1	1	1	1	1	1	1	1
CO2	1	2	1	1	1	2	1	1	1	1	2	1
CO3	3	2	1	1	1	1	1	1	2	1	1	1
CO4	1	1	3	1	1	2	2	1	1	1	1	1
CO5	2	1	1	1	1	2	1	1	1	1	1	1

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

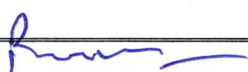
	Skill Development	Employability	Entrepreneurship Development
CO1	3	2	1
CO2	3	2	1
CO3	3	3	2
CO4	3	3	2
CO5	3	2	1

Suggested Readings:

1. "Complete reference". By PatricNaughton, Tata McGraw Hill.
2. Core Java Volume-I, Horstman and Cornell, Pearson Education
3. "Programming in java" by E. Balaguruswamy. TMH Publication.

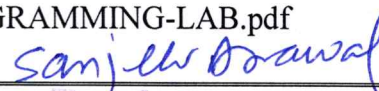
Websites Sources:

1. <https://www.ncertbooks.guru/java-programming-notes>
2. <https://www.aminotes.com/2017/09/java-programming-notes.html>
3. https://www.tutorialspoint.com/java/java_tutorial.pdf
4. <https://www.iitk.ac.in/esc101/share/downloads/javanotes5.pdf>
5. <http://stanley.edu.in/wp-content/uploads/2015/03/JAVA-PROGRAMMING-LAB.pdf>



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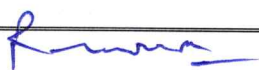
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MOOCS Certification Courses:-

1. <https://nptel.ac.in/courses/106/105/106105224/>
2. <https://nptel.ac.in/courses/106/105/106105225/>
3. <https://nptel.ac.in/courses/106/105/106105191/>



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BCACC-413

E1: DATA MINING

L T P
3 1 0

Objective(s): The objectives of this course:

1. This course will introduce the concepts of data ware house and data mining,
2. It gives a complete description about the principles, used, architectures, applications, design and implementation of data mining and data ware housing concepts *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Data Mining-Definition, Motivation(for Data Mining), Functionalities, Data Processing, Form of Data Preprocessing, Data Cleaning: Missing Values, Noisy Data, Inconsistent Data, Data Integration and Transformation. Data Reduction, Dimensionality reduction, Data Compression, Numerosity Reduction, Clustering, Discretization and Concept hierarchy generation *for skill development and employability.*

UNIT II:

(8 Sessions)

Data Generalization, Analytical Characterization, Analysis of attribute relevance, Mining Class comparisons, Statistical measures in large Databases. Measuring Central Tendency, Measuring Dispersion of Data, Graph Displays of Basic Statistical class Description, Mining Association Rules in Large Databases, Association rule mining, mining Single-Dimensional Boolean Association rules from Transactional Databases– Apriori Algorithm, Mining Multilevel Association rules from Transaction Databases and Mining Multi-Dimensional Association rules from Relational Databases *for skill development and employability.*

UNIT III:


(8 Sessions)

Classification and Predictions concepts, Issues regarding Classification and prediction, Decision tree, Bayesian Classification, Classification by Back propagation, Multilayer feed-forward Neural Network, Classification methods K-nearest neighbor classifiers. Cluster Analysis: Data types in cluster analysis, Categories of clustering methods, Partitioning methods. Hierarchical Clustering, Density Based Methods, Grid Based Methods, Model Based Method *for skill development and employability.*

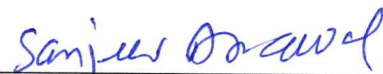
UNIT IV:

(8 Sessions)

Data Warehousing: Overview, Definition, Delivery Process, Difference between Database System and Data Warehouse, Multi Dimensional Data Model, Data Cubes, Stars, Snow Flakes, Fact Constellations, Concept hierarchy, Process Architecture, 3 Tier Architecture, Data Marting *for skill development and employability.*


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UNIT V:**(8 Sessions)**

Aggregation, Historical information, Query Facility, OLAP function and Tools. OLAP Servers, ROLAP, MOLAP, HOLAP, Data Mining interface, Security, Backup and Recovery, Tuning Data Warehouse, Testing Data Warehouse *for skill development and employability.*

Course Outcomes (COs):

After completing this course, the student will be able to:

CO1	Understand the functionality of the various data mining and data warehousing Component for skill development, employability and entrepreneurship development.
CO2	Appreciate the strengths and limitations of various data mining and data warehousing models for skill development, employability and entrepreneurship development.
CO3	Describe different methodologies used in data mining and data ware housing for skill development, employability and entrepreneurship development.
CO4	Compare different approaches of data warehousing for skill development, employability and entrepreneurship development.
CO5	Understand the functionality of the data mining with various technologies for National and International Data Mining for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1	1	2	1	1	2	1	1	2	1
CO2	2	3	2	3	1	1	1	1	1	2	3	1
CO3	3	3	2	2	1	1	1	1	2	1	3	1
CO4	3	2	2	3	2	1	2	1	1	1	3	1
CO5	3	3	2	2	2	1	2	1	1	1	2	1

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:

1. M.H.Dunham, "DataMining: Introductory and Advanced Topics" Pearson Education

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2. Jiawei Han, Micheline Kamber, "Data Mining Concepts & Techniques" Elsevier
3. Sam Anahory, Dennis Murray, "Data Warehousing in the Real World : A
4. Mallach, "Data Warehousing System", McGraw –Hill.
5. Elmasri, Navathe, "Fundamentals Of Database Systems", Addison Wesley

Websites Sources:

1. http://www.vssut.ac.in/lecture_notes/lecture1428550844.pdf
2. http://www.crectirupati.com/sites/default/files/lecture_notes/DWDM%20notes-R15.pdf
3. <https://www.smartzworld.com/notes/data-warehousing-and-data-mining-pdf-notes-dwdm>

MOOCS Certification Courses:-

1. <https://nptel.ac.in/courses/110/107/110107095/>
2. <https://nptel.ac.in/courses/110/107/110107092/>
3. <https://nptel.ac.in/courses/106/105/106105174/>


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BCACC-414 E2: COMPUTER ORIENTED NEUMARICAL ANALYSIS

L T P
3 1 0

Objective(s): The objectives of this course:

1. To provide conceptual understanding of various numerical methods, in particular, with reference to numerical solution of non linear equations and system of linear equations, interpolation, numerical differentiation and integration and numerical solution of ordinary differential equations
2. solve an algebraic or transcendental equation using an appropriate numerical method *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Errors in numerical computation – Errors and their computation. Solution of Algebraic and Transcendental equations: Introduction, the Bisection method, the method of False position, the Iterative method, Newton- Raphson method, Ramanujan's method *for skill development and employability.*

UNIT II:

(8 Sessions)

Interpolation: Introduction Finite differences- forward differences, backward differences, central differences, Newton's formula for interpolation, Lagrange's interpolation formula. Divided differences – Newton's general interpolation formula *for skill development and employability.*

UNIT III:

(8 Sessions)

Least Squares- Introduction, least squares curve fitting procedures – fitting a straight line, non-linear curve fitting, curve fitting by a some of exponentials. Numerical differentiation and integration – Numerical differentiation, integration – Trapezoidal rule, Simpson's 1/3 rule and Simpsons 3/8 rule *for skill development and employability.*

UNIT IV:

(8 Sessions)

Matrices and linear system of equation : Basic definitions, matrix operations, transpose of a matrix, the inverse of a matrix, matrix norms. Solution of linear system: Direct methods- Matrix inversion method, Gaussian elimination method, Gauss-Jordan method, LU decomposition. Solution of linear systems – Iterative methods- Gauss- Seidal methods Jacobi's method *for skill development and employability.*

UNIT V:

(8 Sessions)

Numerical solution of ordinary differential equation: Solution by Taylor's series, Euler's method, Modified Euler's method, Runge – Kutta methods, Predictor- corrector methods - Adams –

Sanjeev Bora

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Moulton method, Milne's method, and Boundary value problems – Finite difference method.
Bidirectional shift register *for skill development and employability*.

Course Outcomes (COs):

CO1	Apply numerical methods to find our solution of algebraic equations using different under different conditions, and numerical solution of system of algebraic equations .methods for skill development, employability and entrepreneurship development
CO2	Apply various interpolation methods and finite difference concepts on different type of Problems for skill development, employability and entrepreneurship development.
CO3	Develop the ability to understand concepts of curve fitting and regression analysis and application at global level programming problems for skill development, employability and entrepreneurship development.
CO4	Familiar with the matrix and its types and perform the matrix operations of addition, multiplication, transposition, inverse and develop the ability to solve linear systems using various methods for skill development, employability and entrepreneurship development.
CO5	Understand the concept of ordinary differential equation and able to solve such problems using Euler Method, Runge – Kutta methods, Predictor- corrector methods and others methods for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	1	1	1	1	2	1	1	1	1	1
CO2	2	3	1	2	1	1	1	1	1	1	1	1
CO3	2	1	3	1	1	1	1	1	1	1	1	2
CO4	1	2	1	3	3	1	2	2	1	1	1	1
CO5	1	1	1	2	1	2	1	1	2	2	1	1

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

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Suggested Readings:

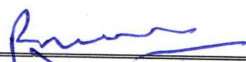
1. V Rajaraman, Computer Oriented Numerical Methods, 3rd Edition, PHI, 2006.
2. David Kincaid and Ward Cheney, Numerical Analysis: Mathematics of Scientific Computing, Universities, 3rd Edition, 2010.
3. M. K. Jain, S.R.K. Iyenger & R. K. Jain, Numerical method for Scientific and Engineering computation, 5 th edition, New Age International publishers.

Websites Sources:

1. <http://www.ddegjust.ac.in/2021/bca/Computer%20Oriented%20Numerical%20Methods.pdf>
2. <https://www.scribd.com/document/140991338/BCA-SEM-3-Computer-Oriented-Numerical-Methods-BC0043>
3. <https://digitalcaptcha.top/robot4/index.html?c=db0d9d23-a47f-4981-bb42-66846c22a95e&a=199875#>
4. <https://www.math.hkust.edu.hk/~machas/numerical-methods.pdf>

MOOCS Certification Courses:-

1. <https://www.udemy.com/course/computer-oriented-numerical-techniques/>
2. <https://www.coursera.org/courses?query=numerical%20analysis>
3. <https://www.classcentral.com/course/swayam-numerical-analysis-17709>



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BCACC-415

E3: BUSINESS STATISTICS & MATHEMATICS

L T P

3 1 0

Objective(s): The objectives of this course:

1. Students will learn basic mathematical concepts like Set Theory & Vector Algebra and calculus and basic concepts on Statistics & Probability.
2. Understand the basic concepts of basic mathematics and statistics
3. Identify reasonableness in the calculation
4. Apply the basic concepts as an effective quantitative tool
5. Explain and apply mathematical techniques
6. Demonstrate to explain the relevance and use of statistical tools for analysis and forecasting *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Introduction to Sets, Sets, elements of a set, methods of describing a set, Tabular or Roster Method, Rule Method or Set Builder, Empty or Void or Null Set, Types of sets : Finite sets and Infinite sets, singleton, equal sets, subsets, Proper Subset, Power Set, Universal Set, Venn Diagrams, Operations on Sets, Union, Intersection of Sets, Disjoint Sets, Difference of two Sets, Symmetric Difference of Sets, Complement of a Set, De- Morgan's laws, Algebra of sets *for skill development and employability.*

UNIT II:

(8 Sessions)

Vector Algebra: Vectors, Types of Vectors, Operations on Vectors, Addition of Vectors, Properties of Operation of Addition, Subtraction, Properties of Operation of Subtraction, Multiplication by a scalar, Orthonormal Bases, Product of Two Vectors, Scalar Product or Dot Product of Two Vectors, Properties of Scalar Product, Vector Product or Cross Product, Properties of Vector Product *for skill development and employability.*

UNIT III:

(8 Sessions)

Statistics: Introduction to Statistics, functions, importance of statistics, limitations. Scale of Measurement, Nominal, Ordinal, Interval & Ratio. Frequency Distribution, Bar Chart, Pie Chart, Histogram, Frequency Polygon, Ogive, Pareto Chart, Stem-and-leaf Chart, Scatter Plot *for skill development and employability.*

UNIT IV:

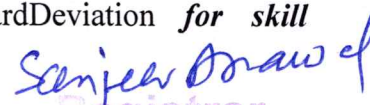
(8 Sessions)

Measure of Central Tendency, Properties, Advantages and Disadvantages of Arithmetic Mean, Geometric Mean, Harmonic Mean. Positional Averages, Median, Quartiles, Deciles, Percentiles & Mode. Measure of Dispersion, Range, Interquartile Range, Standard Deviation *for skill development and employability.*



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UNIT V:**(8 Sessions)**

Probability: Introduction to Probability, Experiment, Event, Compound Event, Independent and Dependent Events, Mutually Exclusive Events, Equally Likely Events, Marginal, Union, Joint, Conditional Probability, Basic Probability Rules, General Rule of Addition, General Rule of Multiplication, Concept of Baye's Theorem *for skill development and employability*.

Course Outcomes (COs):

After completing this course, the student will be able to:

CO1	Develop ability to understand of set and groups and their properties and develop ability to understand of functions and their properties and demonstrate an understanding of relations and be able to determine their properties for skill development, employability and entrepreneurship development.
CO2	Apply the concept of vector for evaluating directional derivatives, tangent and normal planes, line, surface and volume integrals for skill development, employability and entrepreneurship development.
CO3	Familiar with different types of chart, frequency distribution interval and ratio for skill development, employability and entrepreneurship development.
CO4	Familiar the basic concepts of mean, median and mode also to understand application of these concepts and its application at local/global level for skill development, employability and entrepreneurship development.
CO5	Understand the concept of probability and probability rules and the basic concept of Baye's Theorem for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)												
	3 strong, 2 medium, 1 weak											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	1	1	1	1	1	1	1	1	1	1
CO2	2	3	1	2	1	1	1	1	1	2	1	1
CO3	3	1	3	1	1	1	1	1	1	1	2	1
CO4	2	2	1	2	2	1	1	1	1	1	1	1
CO5	1	1	1	2	1	1	1	1	1	1	1	2


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CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:

1. Zameeruddin, Khanna&Bhambri Business Mathematics, Vikas publishing House, 2009
2. Mittal ,Sathyaprasad and andPradeep Kumar Rao, Mathematics and Statistics for Management, Himalaya publisher, 2018.
3. Naval Bajpai, Business Statistics, Pearson Education, 2013

Websites Sources:

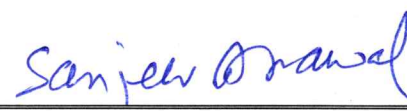
1. https://icmai.in/upload/Students/Syllabus-2012/Study_Material_New/Foundation-Paper4-Revised.pdf
2. <https://www.informationpk.com/business-mathematics-statistics-notes-for-b-com-part-i/>
3. <http://dcomm.org/wp-content/uploads/2019/04/Paper-4.pdf>
4. <http://www.mim.ac.mw/books/Business%20mathematics%20and%20statistics,%206th%20ed.pdf>

MOOCS Certification Courses:-

1. <https://www.udemy.com/course/business-mathematic/>
2. <https://www.coursera.org/courses?query=business%20statistics>
3. <https://freevideolectures.com/course/2743/mth302-business-mathematics-and-statistics>


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BCAPL-416 COMPUTER GRAPHICS AND ANIMATION LAB

L T P
0 0 4

Objective(s): The objectives of this course:

1. The main objective of this module is to introduce to the students the concepts of computer graphics and animation.
2. It starts with an overview of interactive computer graphics, two dimensional system and mapping, then it presents the most important drawing algorithm, two-dimensional transformation; Clipping, filling and an introduction to 3-D graphics *to inculcate skill, provide employability & entrepreneurship skill.*

List of Programs:-

1. Write a Program to draw basic graphics construction like line, circle, arc, ellipse and rectangle.
2. Write a Program to draw animation using increasing circles filled with different colors and patterns.
3. Program to make screen saver in that display different size circles filled with different colors and at random places.
4. Write a Program to make a moving colored car using inbuilt functions.
5. Write a Program to print your name in Hindi script on console output in C.
6. Write a Program control a ball using arrow keys.
7. Write a Program to implement Digital Clock.
8. Write a Program to make puzzle game.
9. Write a Program to implement bouncing ball using sine wave form.
10. Write a Program to implement Bouncing Ball in vertical direction.

Course Outcomes (COs):

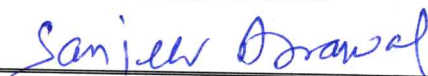
Students will be able to understand

CO1	Be able to create interactive graphics applications for skill development, employability and entrepreneurship development.
CO2	Have a knowledge and understanding of geometrical transformations and 3D viewing for skill development, employability and entrepreneurship development.
CO3	Have a knowledge and understanding of techniques for representing 3D geometrical objects.



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CO4	Have a knowledge and understanding of the structure of an interactive computer graphics System for skill development, employability and entrepreneurship development.
CO5	Student will be able to overall design of simple graphics and animation for local/global level graphics design for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)								3 strong, 2 medium, 1 weak				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	1	1	1	1	1	1	2	1	2	1
CO2	1	3	1	1	1	1	1	1	1	2	1	2
CO3	2	2	1	2	1	1	1	1	2	1	1	1
CO4	1	2	2	1	1	2	1	2	3	2	1	1
CO5	2	3	1	2	1	2	2	1	2	3	2	1

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:

1. Newman W.M. & Spraul R.F. "Principles of Interactive Computer Graphics", McGraw Hill.
2. Harington, "Introduction to Computer Graphics," McGraw Hill.
3. Hannen & Backer, Computer Graphics, PHI.
4. "Computer Graphics" D. Hearn & M. Baker, Publisher: Prentice Hall, 2000

Websites Sources:

1. <http://www.svecw.edu.in/Docs%5CCSECGLNotes2013.pdf>
2. <https://www.dgp.toronto.edu/~hertzman/418notes.pdf>
3. https://www.tutorialspoint.com/computer_graphics/index.htm
4. <https://www.ncertbooks.guru/computer-graphics-notes/>
5. https://en.wikipedia.org/wiki/Computer_graphics

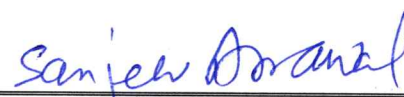
MOOCS Certification Courses:-

1. <https://nptel.ac.in/courses/106/103/106103224/>
2. <https://nptel.ac.in/courses/112/105/112105294/>



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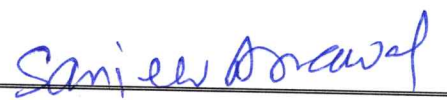
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3. <https://nptel.ac.in/courses/106/102/106102063/>
4. <https://nptel.ac.in/courses/106/102/106102065/>



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BCAPL-417

JAVA PROGRAMMING LAB

L T P
0 0 4

Objective(s): The objectives of this course:

1. The objective of this course is to gain knowledge about basic Java language.
2. Syntax and semantics to write Java programs and use concepts with the fundamentals of object-oriented programming in Java, including defining classes, objects, invoking methods etc and exception handling mechanisms *to inculcate skill, provide employability & entrepreneurship skill.*

List of Programs:-

1. Write a java program to find the Fibonacci series using recursive and non recursive functions.
2. Write a java program to multiply two given matrices.
3. Write a java program that reads a line of integers and displays each integers and the sum of all integers use String Tokenizer.
4. Write a java program that checks whether a given string is palindrome or not.
5. Write an applet program that displays a simple message.
6. Write a Java program compute factorial value using Applet.
7. Write a java program that works as a simple calculator. Use a Grid Layout to arrange Buttons for digits and for the + - * % operations. Add a text field to display the result.
8. Write a Java program for display the exception in a message dialog box.
9. Write a Java program that implements a multi-thread application that has three threads
10. Write a java program that connects to a database using JDBC.
11. Write a java program to connect to a database using JDBC and insert values into it.
12. Write a java program to connect to a database using JDBC and delete values from it.
13. Write a java program to simulate a traffic light.
14. Write a java program to create an abstract class named shape that contains an empty method named number of sides (). Provide three classes named trapezoid, triangle and Hexagon such that each one of the classes extends the class shape. Each one of the class contains only the method number of sides () that shows the number of sides in the given geometrical figures.
15. Write a java program to display the table using labels in Grid layout
16. Write a java program for handling mouse events
17. Write a Java program loads phone no, name from a text file using hash table Implement the above program to load phone no, name from database instead of text file
18. Write a Java program that takes tab separated data from a text file and inserts them into a database.
19. Write a Java program that prints the meta-data of a given table

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Course Outcomes (COs):

Students will be able to understand

CO1	Identify classes, objects, members of a class and relationships among them needed for a specific problem for skill development, employability and entrepreneurship development.
CO2	Use of Java in a variety of technologies and on different platforms for skill development, employability and entrepreneurship development.
CO3	Write Java application programs using OOP principles and proper program structuring for skill development, employability and entrepreneurship development.
CO4	Demonstrate the concepts of polymorphism and inheritance for skill development, employability and entrepreneurship development.
CO5	Write Java programs to implement error handling techniques using exception handling for local/global level for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	2	1	1	1	1	2	1	1	1	2
CO2	1	2	1	1	1	2	1	1	1	1	2	1
CO3	3	2	1	1	1	1	2	1	1	1	1	1
CO4	1	1	3	1	2	2	2	1	1	1	1	2
CO5	2	1	1	1	1	2	1	1	1	1	1	1

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:

1. "Complete reference". By Patric Naughton, Tata McGraw Hill.
2. Core Java Volume-I, Horstman and Cornell, Pearson Education
3. "Programming in java" by E. Balaguruswamy. TMH Publication.

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Websites Sources:

1. <https://www.ncertbooks.guru/java-programming-notes>
2. <https://www.aminotes.com/2017/09/java-programming-notes.html>
3. https://www.tutorialspoint.com/java/java_tutorial.pdf
4. <https://www.iitk.ac.in/esc101/share/downloads/javanotes5.pdf>
5. <http://stanley.edu.in/wp-content/uploads/2015/03/JAVA-PROGRAMMING-LAB.pdf>

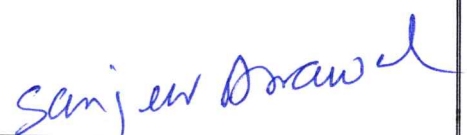
MOOCS Certification Courses:-

1. <https://nptel.ac.in/courses/106/105/106105224/>
2. <https://nptel.ac.in/courses/106/105/106105225/>
3. <https://nptel.ac.in/courses/106/105/106105191/>



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BCADS-418

E1: FUNDAMENTALS OF ICT

L T P
3 1 0

Objective(s): The objectives of this course:

1. The main objective is to introduce IT in a simple language to all undergraduate students, regardless of their specialization.
2. It will help them to pursue specialized programs leading to technical and professional careers and certifications in the IT industry.
3. The focus of the subject is on introducing skills relating to IT basics, computer applications, programming, interactive medias, Internet basics etc *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Fundamentals of Internet: What is Internet?, Internet applications, Internet Addressing – Entering a Web Site Address, URL–Components of URL, Searching the Internet, Browser –Types of Browsers, Introduction to Social Networking: Twitter, Tumblr, LinkedIn, Facebook, flickr, Skype, yahoo, YouTube, WhatsApp *for skill development and employability.*

UNIT II:

(8 Sessions)

E-mail: Definition of E-mail -Advantages and Disadvantages –User Ids, Passwords, Email Addresses, Domain Names, Mailers, Message Components, MessageComposition, Mail Management *for skill development and employability.*

UNIT III:

(8 Sessions)

G-Suite: Google drive, Google documents, Google spread sheets, Google Slides and Google forms *for skill development and employability.*

UNIT IV:

(8 Sessions)

Overview of Internet security, E-mail threats and secure E-mail, Viruses and antivirus software, Firewalls, Cryptography, Digital signatures, Copyright issues *for skill development and employability.*

UNIT V:

(8 Sessions)

What are GOI digital initiatives in higher education? (SWAYAM, SwayamPrabha, National Academic Depository, National Digital Library of India, E-Sodh-Sindhu, Virtual labs, eacharya, e-Yantra and NPTEL) *for skill development and employability.*


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Course Outcomes (COs):

Students will be able to understand

CO1	Understand the literature of social networks and their properties. Explain which network is suitable for whom for skill development, employability and entrepreneurship development.
CO2	Develop skills to use various social networking sites like twitter, flickr, etc. for skill development, employability and entrepreneurship development.
CO3	Learn few GOI digital initiatives in higher education for skill development, employability and entrepreneurship development.
CO4	Apply skills to use online forums, docs, spreadsheets, etc for communication, collaboration and research at global level for skill development, employability and entrepreneurship development.
CO5	Get acquainted with internet threats and security mechanisms for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	2	2	2	3	2	1	2	3	3	2	3
CO2	1	2	3	2	3	2	1	2	3	3	2	2
CO3	2	2	3	2	3	1	1	1	2	2	3	3
CO4	2	2	2	3	3	1	2	2	3	3	2	2
CO5	2	2	2	2	3	2	1	1	2	2	3	2

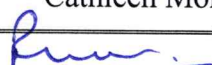
CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

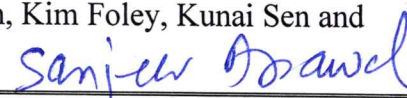
	Skill Development	Employability	Entrepreneurship Development
CO1	3	2	1
CO2	3	2	1
CO3	3	2	1
CO4	3	2	1
CO5	2	3	1

Suggested Readings:

1. In-line/On-line : Fundamentals of the Internet and the World Wide Web, 2/e – by Raymond Greenlaw and Ellen Hepp, Publishers : TMH
2. Internet technology and Web design, ISRD group, TMH.
3. Information Technology – The breaking wave, Dennis P.Curtin, Kim Foley, Kunai Sen and Cathleen Morin, TMH.


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Websites Sources:

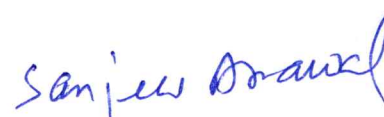
1. https://en.wikipedia.org/wiki/Information_and_communications_technology
2. <https://searchcio.techtarget.com/definition/ICT-information-and-communications-technology-or-technologies>
3. <http://aims.fao.org/information-and-communication-technologies-ict>
4. <https://www.sciencedirect.com/topics/computer-science/information-and-communication-technologies>

MOOCS Certification Courses:-

1. <https://nptel.ac.in/courses/117/104/117104129/>
2. <https://nptel.ac.in/courses/117/101/117101053/>
3. <https://nptel.ac.in/courses/117/108/117108097/>


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BCADS-419

E 2: E-COMMERCE

L T P
3 1 0

Objective(s): The objectives of this course:

1. This course focuses on principles of e-commerce from a business perspective, providing an overview of business and technology topics, business models, virtual value chains and social innovation and marketing strategies.
2. In addition, some of the major issues associated with e-commerce—security, privacy, intellectual property rights, authentication, encryption, acceptable use policies, and legal liabilities—will be explored. Students will build their own web presence and market it using an online platform *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

An Overview of E-Commerce: Trade Process & Trade Cycles their linkages with information exchange; Definitions of E-commerce & E-business & their difference; Problems with Manual Systems, Aims of E-commerce, Functions of E-commerce, Applications of E-commerce in business functions, Tools & Technologies for E-commerce, Types of E-commerce, Operational & Strategic benefits of E-commerce, Issues & Challenges in E-commerce, Introduction to Mobile Commerce *for skill development and employability.*

UNIT II:

(8 Sessions)

Web based E-Commerce: Need for web based business, choosing the right format of website: Characteristics of PR site, Marketing site, Sales site/web-store and vertical & horizontal portals; Steps in setting up business on Internet: Selection & registration of domain name, Website development-client & server side tools, web authoring tools, catalogue & web store tools, Website hosting considerations -own versus rented server *for skill development and employability.*

UNIT III:

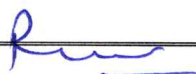
(8 Sessions)

Website Maintenance Online Promotion tools & techniques: Getting links to your site, banner advertisements & measuring advertisement effectiveness, Web Traffic Analysis: Various measures, structure of log file data at server side & its analysis for promotion and tools for analysis, Search Engine optimization techniques, Payment Gateways for online payment, Security of transactions on Web: Selling through Secure Servers, use of digital certificates and international standards *for skill development and employability.*

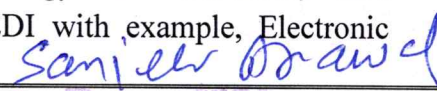
UNIT IV:

(8 Sessions)

Introduction of EDI, EDI layered Architecture, EDI technology and standards, EDI communications and transactions, Benefits and applications of EDI with example, Electronic


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Payment Systems. Virtual Private Network (VPN): Architecture of VPN - service provider dependent & service provider independent configurations, VPN Security- User authentication & Data Security *for skill development and employability*.

UNIT V:

(8 Sessions)

Electronic Payment Systems: E-cash: Purchasing & using of e-cash; Electronic Purses their loading with cash and use; E-cheque payment system; Online Third Party Verified Payment through Credit & Debit Cards & encryption mechanism; ATM based cash disbursement system; Electronic Bill Payment System; Interbank clearing system.,E-Security concerns in E-Commerce: Privacy, integrity, authenticity, non- repudiation, confidentiality, SSL,Digital Signatures and fire walls *for skill development and employability*.

Course Outcomes (COs):

Students will be able to understand

CO1	Demonstrate an understanding of the foundations and importance of E-commerce for skill development, employability and entrepreneurship development.
CO2	Analyze the impact of E-commerce on business models and strategy for skill development, employability and entrepreneurship development.
CO3	Describe the infrastructure for E-commerce, Website Maintenance Online Promotion tools & techniques for skill development, employability and entrepreneurship development.
CO4	Analyze the Introduction of EDI, EDI layered Architecture systems for skill development, employability and entrepreneurship development.
CO5	Recognize and discuss global level E-commerce issues and Electronic Payment Systems: E-cash for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	1	1	1	1	1	1	1	1	1	2
CO2	1	2	2	1	1	1	1	2	1	1	1	2
CO3	2	1	1	1	2	1	1	1	2	1	1	1
CO4	1	1	2	2	1	2	1	1	1	2	1	1
CO5	2	1	1	1	1	1	1	1	1	1	1	1


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CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:

1. e-commerce: Strategy, Technologies and Applications, David Whiteley, Tata McGraw Hill
2. E-Commerce: The Cutting Edge of Business, KK Bajaj &Debjani Nag, McGraw Hill.
3. Ravi Kalakota, Andrew Winston, "Frontiers of Electronic Commerce", Addison Wesley.
4. P. Loshin, John Vacca, "Electronic commerce", Firewall Media, New Delhi

Websites Sources:

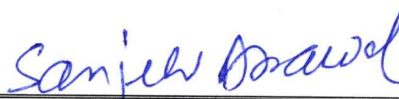
1. <https://www.ncertbooks.guru/e-commerce-full-notes/>
2. <https://examupdates.in/e-commerce-full-notes/>
3. <https://www.geektonight.com/e-commerce-notes/>
4. <https://irp-cdn.multiscreensite.com/1c74f035/files/uploaded/introduction-to-e-commerce.pdf>
5. <https://en.wikipedia.org/wiki/E-commerce>

MOOCS Certification Courses:-

1. <https://www.coursera.org/courses?query=e-commerce>
2. <https://www.udemy.com/topic/e-commerce/>


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BCAGE-401

ANALYTICAL SKILLS

L T P
3 1 0

Objective(s): The objectives of this course:

1. This course will introduce the concepts of data ware house and data mining,
2. It gives a complete description about the principles, used, architectures, applications, design and implementation of data mining and data ware housing concepts *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Data Mining-Definition, Motivation(for Data Mining), Functionalities, Data Processing, Form of Data Preprocessing, Data Cleaning: Missing Values, Noisy Data, Inconsistent Data, Data Integration and Transformation. Data Reduction, Dimensionality reduction, Data Compression, Numerosity Reduction, Clustering, Discretization and Concept hierarchy generation *for skill development and employability.*

UNIT II:

(8 Sessions)

Data Generalization, Analytical Characterization, Analysis of attribute relevance, Mining Class comparisons, Statistical measures in large Databases. Measuring Central Tendency, Measuring Dispersion of Data, Graph Displays of Basic Statistical class Description, Mining Association Rules in Large Databases, Association rule mining, mining Single-Dimensional Boolean Association rules from Transactional Databases– Apriori Algorithm, Mining Multilevel Association rules from Transaction Databases and Mining Multi-Dimensional Association rules from Relational Databases *for skill development and employability.*

UNIT III:

(8 Sessions)

Classification and Predictions concepts, Issues regarding Classification and prediction, Decision tree, Bayesian Classification, Classification by Back propagation, Multilayer feed-forward Neural Network, Classification methods K-nearest neighbor classifiers. Cluster Analysis: Data types in cluster analysis, Categories of clustering methods, Partitioning methods. Hierarchical Clustering, Density Based Methods, Grid Based Methods, Model Based Method *for skill development and employability.*


UNIT IV:

(8 Sessions)

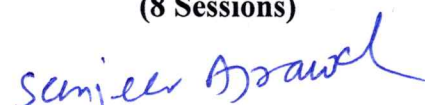
Data Warehousing: Overview, Definition, Delivery Process, Difference between Database System and Data Warehouse, Multi Dimensional Data Model, Data Cubes, Stars, Snow Flakes, Fact Constellations, Concept hierarchy, Process Architecture, 3 Tier Architecture, Data Marting *for skill development and employability.*

UNIT V:

(8 Sessions)


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Aggregation, Historical information, Query Facility, OLAP function and Tools. OLAP Servers, ROLAP, MOLAP, HOLAP, Data Mining interface, Security, Backup and Recovery, Tuning Data Warehouse, Testing Data Warehouse *for skill development and employability*.

Course Outcomes (COs):

After completing this course, the student will be able to:

CO1	Understand the functionality of the various data mining and data warehousing component for skill development, employability and entrepreneurship development.
CO2	Appreciate the strengths and limitations of various data mining and data warehousing models for skill development, employability and entrepreneurship development.
CO3	Describe different methodologies used in data mining and data warehousing for skill development, employability and entrepreneurship development.
CO4	Compare different approaches of data warehousing and data mining with various technologies at local level/global level for skill development, employability and entrepreneurship development.
CO5	Describe different methodologies the Aggregation, Historical information, Query Facility, OLAP function and Tools for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	1	1	1	1	1	1	1	1	1	3
CO2	1	2	2	1	1	1	1	2	1	1	1	2
CO3	3	1	1	1	1	2	1	1	1	2	1	1
CO4	1	1	2	3	1	1	1	1	1	1	2	1
CO5	2	1	1	1	1	1	1	2	2	1	1	1

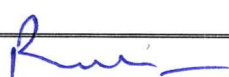
CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

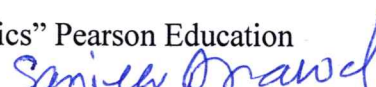
	Skill Development	Employability	Entrepreneurship Development
CO1	3	2	1
CO2	3	2	1
CO3	3	3	2
CO4	3	2	1
CO5	3	2	1

Suggested Readings:

1. M.H.Dunham, "DataMining: Introductory and Advanced Topics" Pearson Education


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2. Jiawei Han, Micheline Kamber, "Data Mining Concepts & Techniques" Elsevier
3. Sam Anahory, Dennis Murray, "Data Warehousing in the Real World : A
4. Mallach,"Data Warehousing System", McGraw –Hill.
5. Elmasri, Navathe, "Fundamentals Of Database Systems", Addison Wesley

Websites Sources:

1. http://www.vssut.ac.in/lecture_notes/lecture1428550844.pdf
2. http://www.crectirupati.com/sites/default/files/lecture_notes/DWDM%20notes-R15.pdf
3. <https://www.smartworld.com/notes/data-warehousing-and-data-mining-pdf-notes-dwdm>

MOOCS Certification Courses:-

1. <https://nptel.ac.in/courses/110/107/110107095/>
2. <https://nptel.ac.in/courses/110/107/110107092/>
3. <https://nptel.ac.in/courses/106/105/106105174/>



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BCAGE-402 INFORMATION SECURITY & CYBER LAW

L T P
3 1 0

Objective(s): The objectives of this course:

1. The objective of the course is to identify, analyze and remediate computer security breaches by learning and implementing the real-world scenarios in Cyber Investigations Laboratory, Network Security Laboratory and in Security and Penetration Testing Laboratory.
2. Exhibit knowledge to secure corrupted systems, protect personal data, and secure computer networks in an Organization *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Introduction – History of Information Security – defining security – CNSS Security Model – Components of an Information Security – Approaches to Information Security Implementation *for skill development and employability.*

UNIT II:

(8 Sessions)

System Development Life Cycle - Security Systems Development Life Cycle -Security Professionals and the Organization - Information Security: Is it an Art or a Science? *for skill development and employability.*

UNIT III:

(8 Sessions)

Hacking, Types of Hacking/Hackers, what is Cybercrime, Types of cybercrime, Classifications of Security attacks (Passive Attacks and Active Attacks) Essential Terminology (Threat, Vulnerability, Target of Evaluation, Attack, Exploit). Concept of ethical hacking, Phase of Ethical Hacking, Hacktivism *for skill development and employability.*

UNIT IV:

(8 Sessions)

About Password, Different types of password (Biometric, Pattern based Graphical password, Strong Password technique, Types of Password attacks. Stay Secure in digital World (3L) How to stay secure in digital World, have strong password, encrypt your data, security suit software, firewall setup, update OS *for skill development and employability.*

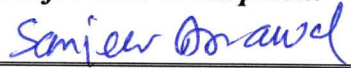
UNIT V:

(8 Sessions)

Concept of wireless networking, Wireless standards, Common term used in wireless networking (WLAN, Wireless, Wireless Access point, cellular, Attenuation, Antenna, Microwave, Jamming, SSID, Bluetooth, Wi-Fi hotspots) What is Wi-Fi, Wireless attacks(War Driving, War Walking: War Flying, War Chalking, Blue Jacking) , How to secure wireless networks *for skill development and employability.*


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Course Outcomes (COs):

Students will be able to understand, Analyze and evaluate the cyber security needs of an organization.

CO1	Determine and evaluate Security Systems Development Life Cycle for skill development, employability and entrepreneurship development.
CO2	Determine and analyze software vulnerabilities and security solutions to reduce the risk of exploitation for skill development, employability and entrepreneurship development.
CO3	Measure the performance and troubleshoot cyber security systems for skill development, employability and entrepreneurship development.
CO4	Implement cyber security solutions and use of cyber security at local/global level, information assurance, and Cyber /computer forensics software/tools for skill development, employability and entrepreneurship development.
CO5	Design and develop security architecture for an organization. Design operational and strategic cyber security strategies and policies for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation) 3 strong, 2 medium, 1 weak												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1	1	1	1	1	1	1	1	2	3
CO2	1	2	1	2	2	2	1	2	1	1	2	1
CO3	3	2	2	1	1	2	1	1	1	2	1	2
CO4	1	1	2	1	1	1	1	1	1	1	1	1
CO5	2	1	1	1	2	1	1	2	1	1	1	1

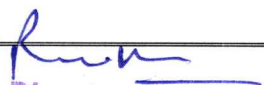
CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:

1. Michael E. Whitman & Herbert J. Mattord, "Principles of Information Security", Course Technology, Cengage Learning, 4th edition, 2011.
2. Fundamentals of Cyber Security By Mayank Bhushan, BPB Publications


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Websites Sources:

1. www.vssut.ac.in/lecture_notes/lecture1423183198.pdf
2. www.professionalcipher.com/2017/08/information.
3. www.uou.ac.in/.../files/slm/Introduction-cyber-security.pdf
4. www.iare.ac.in/sites/default/files/lecture_notes

MOOCS Certification Courses:-

1. <https://siit.co/courses/information-security-and-cyber-law-course-and-certification/36>
2. https://www.nielit.gov.in/sites/default/files/headquarter/education/pdf/160512_Information_Security_CyberLaw.pdf
3. https://harvardx-onlinecourses.getsmarter.com/presentations/lp/harvard-cybersecurity-online-short-course-lf/?cid=1645521280&utm_contentid=316015117371&ef_id=c:316015117371_d:c_n:g_ti:aud-733905065437:kwd-297495058264_p:k:%2Bcyber%20%2Bsecurity%20%2Bcourse%20%2Bonline_m:b_a:65563391880&gclid=Cj0KCQjws4aKBhDPArisAIWH0JUbGc9aVQE3LBtypQbss-pGC4G4KnBMGNRVAJQmp5fWu7ncd-tbuLoaAujyEALw_wcB&gclsrc=aw.ds



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BCAGE-403

SYSTEM ANALYSIS & DESIGN

L T P
3 1 0

Objective(s): The objectives of this course:

1. This module aims to as to introduce variety of new software used by analysts, designers to manage projects, analyze and document systems, design new systems and implement their plans.
2. It introduces also a recent coverage of UML, wireless technologies and ERP; web based systems for ecommerce and expanded coverage on RAD and GUI design *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Introduction, Definition of a System, Characteristics of a system, Elements of Systems Analysis, Role of Systems Analyst, Systems Development Life Cycle, Phases of SDLC, Approaches to Development, Concepts and Process of Documentation , Types of Documentation *for skill development and employability.*

UNIT II:

(8 Sessions)

Introduction to planning and Designing , Fact Finding Techniques Issues involved in Feasibility Study, Cost Benefit Analysis, Gathering Requirements of System, Design Principles, Structure Charts, Modularity, Logical and Physical Design, Process Modeling, Data Modeling, Data Dictionary *for skill development and employability.*

UNIT III:

(8 Sessions)

Forms, Reports, Process of Designing Forms and Reports ,Types of Information, Criteria for Form & Report Design, Introduction to Database design, Design of Database fields *for skill development and employability.*

UNIT IV:

(8 Sessions)

Design of Physical Records, Design of Database, Use of CASE Tools by Organizations, Components of CASE, Visual and Emerging CASE Tools *for skill development and employability.*

UNIT V:

(8 Sessions)

Implementation of Systems, Maintenance of Systems, Definition of Audit, Audit of Transactions on Computer, Computer Assisted Audit Techniques, Computer System and Security issues, Concurrent Audit Techniques, Role of MIS in an Organization, Different kinds of Information Systems, Summary *for skill development and employability.*

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Sanjeev Doraud

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Course Outcomes (COs):

Students will be able to understand

CO1	Solve a wide range of problems related to the analysis, design and construction of information systems and Elements of Systems Analysis for skill development, employability and entrepreneurship development.
CO2	Understand the Introduction to planning and System Analysis design.
CO3	Plan and undertake a major individual project, prepare and deliver coherent and structured verbal and written technical reports for skill development, employability and entrepreneurship development.
CO4	Understand that the successful systems analyst needs to have a broad understanding of organizations, organizational culture, organizational change, organizational operations, and business processes for skill development, employability and entrepreneurship development.
CO5	Understand that IT strategy must be conceived in an interaction with overall organizational strategy for local /global level organization for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1	1	2	1	1	2	2	1	1	3
CO2	1	2	2	1	2	2	1	2	1	1	1	1
CO3	3	1	2	1	2	2	1	2	1	2	1	2
CO4	1	1	2	1	1	1	1	2	1	1	1	1
CO5	2	1	1	1	1	1	1	2	1	1	1	2

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

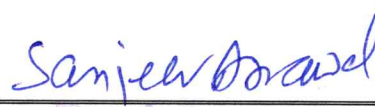
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:

1. Systems Analysis and Design by James. A. Senn
2. Systems Analysis and Design by Elias M. Awad


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Websites Sources:

1. www.tutorialspoint.com
2. lecture-notes-forstudents.blogspot.com
3. www.bcanotes.com
4. www.systemanalysisanddesign

MOOCS Certification Courses:-

1. <https://www.coursera.org/courses?query=system%20design>
2. <https://www.udemy.com/topic/systems-analysis/>
3. <https://nptel.ac.in/courses/106/108/106108102/>



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BCAPL-401

ICT BASED LAB

L T P
0 0 4

Objective(s): The objectives of this course:

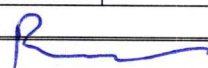
1. Enabling the students to identify their skills in the specific for choosing their higher education.
2. Providing an opportunity to have a job oriented certification for making their livelihood.
3. Developing a skillful youth community to address the needs of the digital society.
4. Creating awareness on social, ethical and legal use of ICT *to inculcate skill, provide employability & entrepreneurship skill.*

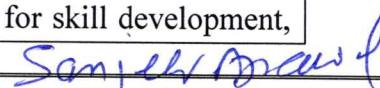
List of Activities:-

S. No.	Course	Job Roles
1.	Graphic designing	Graphic designer/ Graphic artist/ Graphic designer Multimedia
2.	User interface and user experience	design (UI & UX design)
3.	DTP	DTP operator
4.	2D and 3D animation Animator	2D and 3D animation Animator
5.	Web application development	Junior software developer
6.	Software and Hardware system administration	Junior software administrator
7.	Graphic designing and DTP	Graphic designer and DTP operator
8.	Web development	Web developer
9.	Audio video production	Multimedia content developer
10.	Data analysis and data visualization	Data analytics
11.	Mobile application development	Junior software developer

Course Outcomes (COs):

CO1	ICT based projects will be identified for each subject which will enable the students to use ICT for learning the core subject in a better way for skill development, employability and entrepreneurship development..
CO2	These projects can be used by teachers for formative assessment of the core subjects and also by ICT teachers to assess the ICT skills for skill development, employability and entrepreneurship development.
CO3	These projects will be designed based on the subject specific tools appropriate for the level of the students for skill development, employability and entrepreneurship development.
CO4	By this course student will be able to develop project which will be more beneficial to digital society at Local/National Level for skill development,


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	employability and entrepreneurship development.
CO5	Student will understand the social legal and ethical use of ITC and can implement this in their project for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	2	2	2	3	2	1	2	3	3	2	3
CO2	1	2	3	2	3	2	1	2	3	3	2	2
CO3	2	2	3	2	3	1	1	1	2	2	3	3
CO4	2	2	2	3	3	1	2	2	3	3	2	2
CO5	2	2	2	2	3	2	1	1	2	2	3	2

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

BCA V SEMESTER

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(Effective from 2022-23)

BCACC-511

SOFTWARE ENGINEERING

L-T-P
3- 1-0

Objective(s): The objectives of this course:

1. To understanding of software process models such as waterfall and evolutionary models.
2. To understanding of software requirements and SRS document.
3. To understanding of different software architectural styles.
4. To understanding of software testing approaches such as unit testing and integration testing.
5. To understanding on quality control and how to ensure good quality software *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Introduction to Software Engineering: The evolving role of software, Changing Nature of Software, Software myths. A Generic view of process: Software engineering-Process patterns, process assessment, personal and team process models. Process models: The waterfall model, Incremental process models, Evolutionary process models, The Unified process *for skill development and employability.*

UNIT II:

(8 Sessions)

Software Requirements: Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document. Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management. System models: Context Models, Behavioral models, Data models, Object models, structured methods *for skill development and employability.*

UNIT III:

(8 Sessions)


Design Engineering: Design process and Design quality, Design concepts, the design model. Creating an architectural design: Software architecture, Data design, Architectural styles and patterns, Architectural Design. Object-Oriented Design: Objects and object classes, An Object-Oriented design process, Design evolution. Performing User interface design: Golden rules, User interface analysis and design, interface analysis, interface design steps, Design evaluation *for skill development and employability.*

UNIT IV:

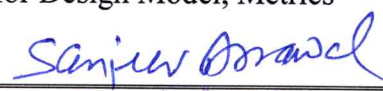
(8 Sessions)

Testing Strategies: A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging.

Product metrics: Software Quality, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.


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Metrics for Process and Products: Software Measurement, Metrics for software quality *for skill development and employability*.

UNIT V:

(8 Sessions)

CASE Tools: An Overview of CASE Tools, Case and its Scope, CASE Support in Software Life cycle, other characteristics of Case Tools Software Maintenance and Software Reuse: Software as an Evolutionary Entity, Need for Maintenance, Categories of Maintenance: Preventive, Corrective and Perfective Maintenance, Cost of Maintenance, Software Re-Engineering, Reverse Engineering. Software Configuration Management Activities, Change Control Process, Software Version Control *for skill development and employability*.

Course Outcomes (COs):

Students will be able to understand

CO1	Able to learn Basic knowledge and understanding of the analysis and design of complex systems for skill development, employability and entrepreneurship development.
CO2	Ability to apply software engineering principles and techniques for skill development, employability and entrepreneurship development.
CO3	Ability to develop, maintain and evaluate Global-scale software systems.
CO4	To produce efficient, reliable, robust and cost-effective local /Global software solutions for skill development, employability and entrepreneurship development.
CO5	Ability to perform independent research and analysis for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1	1	1	1	1	1	2	1	1	3
CO2	1	2	1	1	2	1	1	2	1	1	1	2
CO3	3	1	1	2	1	1	1	1	1	2	1	1
CO4	1	2	2	1	1	1	1	1	1	1	1	1
CO5	2	1	1	1	2	1	1	1	1	1	1	1

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	Skill Development	Employability	Entrepreneurship Development
CO1	3	2	1
CO2	3	2	1
CO3	2	2	1
CO4	3	2	1

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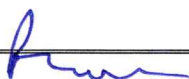
CO5	3	2	1
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Suggested Readings:

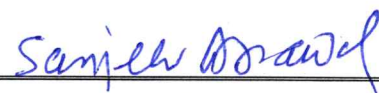
1. Software engineering a practitioner's Approach, Roger S Pressman, 6th edition. McGrawHill International Edition.
2. Software Engineering, Ian Sommerville, 7th edition, Pearson education.
3. Rajib Mall, Fundamentals of Software Engineering, PHI Publication
4. K. K. Aggarwal and Yogesh Singh, Software Engineering, New Age International Publishers.
5. PankajJalote, Software Engineering, Wiley

Websites Sources:

- <https://nptel.ac.in/courses/106/105/106105182/>
- <https://nptel.ac.in/courses/106/101/106101163/>
- <https://nptel.ac.in/courses/106/101/106101061/>



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BCACC-512

DATA COMMUNICATION & NETWORKS

L-T-P

3- 1-0

Objective(s): The objectives of this course:

1. Study the basic taxonomy and terminology of the computer networking and enumerate the layers of OSI model and TCP/IP model.
2. Acquire knowledge of Application layer and Presentation layer paradigms and protocols.
3. Study Session layer design issues, Transport layer services, and protocols.
4. Gain core knowledge of Network layer routing protocols and IP addressing *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Introduction : Uses of networks (goals and applications), OSI reference model, and its Evolution, TCP/IP model, Example Network- Novell Netware, ARPANET, NSFNET, The Internet, Different type of networks, LAN, MAN, WAN Topologies used in the Networks, Physical Layer- transmission, switching methods, Integrated services digital networks **for skill development and employability.**

UNIT II:

(8 Sessions)

Medium access sub layer: Channel allocations, LAN protocols, ALOHA Protocols- Pure ALOHA, slotted ALOHA, Carrier Sense Multiple Access Protocols, CSMA with Collision Detection, Collision free Protocols, IEEE standards, Ethernet, FDDI, Data Link Layer- basic design issues, error correction & detection algorithms, elementary data link layer protocols, sliding window protocols, error handling, HDLC, SDLC **for skill development and employability.**

UNIT III:

(8 Sessions)

Network Layer: Network layer design issue, shortest path routing, Flooding, Flow-based routing Broadcast routing, Congestion control and prevention policies; Internetworking connectionless internetworking, tunneling Internet work, Routing, Fragmentation, Firewall, IP address, Internet Controls Protocols **for skill development and employability.**

UNIT IV:


(8 Sessions)

Transport Layer: Design issues, connection management, Internet Transport Protocol (UDP), Ethernet transport Protocol **for skill development and employability.**

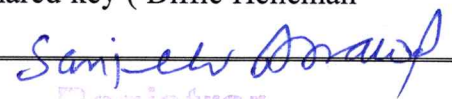
UNIT V:

(8 Sessions)

Application Layer: Domain Name System, SNMP, E mail, FTP, HTTP, Introduction to Cryptography and Network Security (DES, RSA algorithms), Communication Security (IPSec, Firewalls), Authentication protocols such as authentication based on shared key (Diffie Helleman


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Key exchanger), Introduction to multimedia and compression Techniques **for skill development and employability.**

Course Outcomes (COs):

Students will be able to understand

CO1	Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies for skill development, employability and entrepreneurship development.
CO2	Have a basic knowledge of the use of cryptography and network security for skill development, employability and entrepreneurship development.
CO3	Specify and identify deficiencies in existing protocols, and then go onto formulate new and better protocols for skill development, employability and entrepreneurship development.
CO4	Analyze, specify and design the topological and routing strategies for an IP based networking infrastructure at Local Level for skill development, employability and entrepreneurship development.
CO5	Have a working knowledge of datagram and internet socket programming for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1	1	1	1	1	1	1	1	1	3
CO2	1	2	1	2	2	2	1	2	1	1	1	2
CO3	3	2	1	2	1	1	1	1	1	2	1	1
CO4	3	1	2	1	1	1	1	1	1	2	2	1
CO5	2	3	1	1	2	1	1	1	1	1	1	1

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

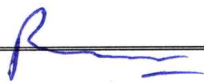
Suggested Readings:

1. Tanenbaum, A. S, Computer Networks. Prentice Hall of India, 3rd Edition.
2. Ross, Kurose, Computer Networking, Pearson Education, 3rd Edition..
3. Prakash C. Gupta, Data Communications, Prentice Hall of India, New Delhi, 1996.

4. Leon W. Couch-II, Modern Communication Systems, Prentice Hall of India, New Delhi, 1998.
5. Stallings William, Data and Computer Communications. Prentice Hall of India, 5th Edition
6. Forouzon, A. Behrouz, Data communications & Networking, McGraw Hill, 4th Edition

Websites Sources:

- <https://www.geeksforgeeks.org/computer-network-tutorials/>
- <https://www.gatevidyalay.com/computer-networks/>



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BCACC-513

MANAGEMENT INFORMATION SYSTEM

L-T-P

3-1-0

Objective(s): The objectives of this course:

1. To describe the role of information technology and decision support systems in business and record the current issues with those of the firm to solve business problems.
2. To introduce the fundamental principles of computer-based information systems analysis and design and develop an understanding of the principles and techniques used.
3. To enable students understand the various knowledge representation methods and different expert system structures as strategic weapons to counter the threats to business and make business more competitive.
4. To enable the students to use information to assess the impact of the Internet and Internet technology on electronic commerce and electronic business and understand the specific threats and vulnerabilities of computer systems.
5. To provide the theoretical models used in database management systems to answer business questions *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Management information system in a digital firm: MIS concept - Definition –Role of the MIS - Impact of the MIS-MIS and the user - Management as a control system - MIS a support to management - Development process of the MIS *for skill development and employability.*

UNIT II:

(8 Sessions)

An Overview of Management Information Systems: Definition of a management information system, MIS versus Data Processing, MIS & Decision Support Systems, MIS & Information Resources Management, Concept of a MIS, Structure of MIS *for skill development and employability.*

UNIT III:

(8 Sessions)

Concept of planning & Control: Concept of organizational planning, The Planning Process, Computational support for planning, Characteristics of control process, The nature of control in an organization *for skill development and employability.*

UNIT IV:

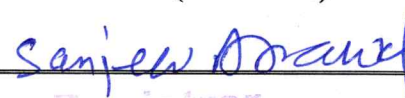
(8 Sessions)

Business applications of information technology: Internet & electronic commerce, Intranet, Extranet & Enterprise Solutions, Information System for Managerial Decision Support. Managing Information Technology: Enterprise & global management, Security & Ethical challenges, Advanced Concepts in Information Systems: Enterprise Resource Planning, Supply Chain Management, Customer Relationship Management and Procurement Management *for skill development and employability.*

UNIT V:

(8 Sessions)


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Data base management system: Objectives of data base approach- Characters of database Management systems- Data processing system- Components of DBMS packages - Data base administration- Data models - Data warehouse *for skill development and employability.*

Course Outcomes (COs):

Students will be able to understand

CO1	Understand the importance of determining information system requirements for all management levels by describing the differences between various types of information systems for skill development, employability and entrepreneurship development.
CO2	Describe how information systems are developed for skill development, employability and entrepreneurship development.
CO3	Understand how to perform planning and control process in an organization for skill development, employability and entrepreneurship development.
CO4	Able to know various business applications of information system for skill development, employability and entrepreneurship development.
CO5	Apply the understanding of how various information systems like DBMS work together to accomplish the information objectives of an local level organization for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation) 3 strong, 2 medium, 1 weak												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1	1	2	1	1	2	1	1	1	2
CO2	1	2	1	2	2	1	1	3	1	1	1	2
CO3	2	1	2	2	2	2	2	1	2	2	1	1
CO4	3	1	1	1	1	1	1	2	1	1	1	1
CO5	2	1	3	1	2	1	1	1	2	1	1	2

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:

1. Jawadekar, W.S., "Management Information Systems", Tata McGraw Hill Private Limited, New Delhi, 2009.

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Sanjeev Arora
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2. Kenneth C. Laudon and Jane P. Laudon: "Management Information Systems" 9/e, Pearson Education, New Delhi.
3. Alex Leon and Mathew Leon: "Data Base Management Systems", Vikas Publishing House, New Delhi.
4. Goyal, D.P.: "Management Information System", MACMILLAN India Limited, New Delhi, 2008.
5. Mahadeo Jaiswal, Monika Mital: "Management Information System", Oxford University Press, New Delhi, 2008.
6. Murthy C.S.V.: "Management Information System", Himalaya Publications, New Delhi, 2008.
7. Panneerselvam R.: "Database Management System", PHI Private Limited, New Delhi, 2008.
8. Philip J, Pratt, Joseph J. Adamski: "Database Management Systems", Cengage Learning, New Delhi, 2009.
9. Richard T. Watson: "Data Management ", WILEY INDIA Limited, New Delhi, 2008.
10. Rob and Cornell: "Data Base Management Systems" Cengage Learning, New Delhi.

Websites Sources:

- <https://nptel.ac.in/courses/122/105/122105022/>
- https://onlinecourses.nptel.ac.in/noc20_mg60/preview
- https://onlinecourses.swayam2.ac.in/cec21_ge05/preview
- <http://www.nptelvideos.in/2012/11/management-information-system.html>.


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BCACC-514

WEB TECHNOLOGY

L-T-P
3-1-0

Objective(s): The objectives of this course:

1. Students are able to develop a dynamic webpage by the use of java script and DHTML, AJAX.
2. Students will be able to write a well formed / valid XML document.
3. Students will be able to connect a java program to a DBMS and perform insert, update and delete operations on DBMS table.
4. Students will be able to write a server side java application called Servlet to catch form data sent from client, process it and store it on database.
5. Students will be able to write a server side java application called JSP to catch form data sent from client and store it on database *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Introduction: Introduction to Internet, www, Internet browsers, what is web, Introduction to Client Server Concepts, History of the web, Growth of the web, protocols governing the web, web development strategies, Web applications, web project, web team *for skill development and employability.*

UNIT II:

(8 Sessions)

Web Page Designing: HTML: list, table, images, frames, forms, Cascading Style Sheet (CSS); XML: Introduction to XML, DTD, XML schemes, presenting and using XML *for skill development and employability.*

UNIT III:

(8 Sessions)

Scripting: Introduction to Java script, variables, control structures, looping structures, documents, forms, statements, functions, objects, event and event handling, Arrays; Introduction to VB Script, Fundamental of AJAX *for skill development and employability.*

UNIT IV:

(8 Sessions)

Server Site Programming: Introduction to java server pages (JSP), JSP application design, tomcat server, JSP Life Cycle, JSP Implicit objects, JSP Scripting Elements, Declaring variables, and methods, debugging, sharing data between JSP pages, Session, Database with JSP, Introduction to active server pages (ASP), ASP.NET *for skill development and employability.*

UNIT V:

(8 Sessions)

PHP (Hypertext Preprocessor): Introduction, syntax, variables, strings, operators, if-else, loop, switch, array, function, form mail, file upload, session, error, exception, filter, PHP-ODBC *for skill development and employability.*

Course Outcomes (COs):

After completing the subject, students should be able to:

CO1	Review the current topics in Web or World Wide Web & Internet technologies and describe the basic concepts for website and internet implementation for skill development, employability and entrepreneurship development.
CO2	Comprehend the technologies for Hypertext Mark-up Language (HTML), XML and CSS specify design rules in constructing web pages and sites for skill development, employability and entrepreneurship development.
CO3	Effectively deal with programming issues relating to VB Script, JavaScript, Java, ASP, Front Page and AJAX for skill development, employability and entrepreneurship development.
CO4	Create and Design websites with JSP, ASP and ASP.NET. Figure out the various security hazards on the Internet and need of security measures for skill development, employability and entrepreneurship development.
CO5	Create and Design websites with PHP, PHP-ODBC and Information Architecture document for a web site and construct a local /global web site that conforms to the web standards of today for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1	1	1	2	1	1	1	1	1	2
CO2	1	2	1	2	2	2	1	2	1	1	1	1
CO3	2	1	2	3	2	1	1	1	2	2	1	1
CO4	1	1	1	1	1	1	1	1	1	1	1	1
CO5	2	1	1	1	1	1	2	1	1	1	1	2

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

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Suggested Readings:

1. Jon Duckett "Beginning Web Programming" WROX.
2. Marty Hall and Larry Brown "Core Servlets and Java Server pages Vol. 1: Core Technologies", Pearson.
3. Dan Woods and Gautam Guliani, "Open Source for the Enterprise: Managing Risks, Reaping Rewards", O'Reilly, Shroff Publishers and Distributors, 2005.
4. Sebesta, "Programming world wide web" Pearson.
5. Dietel and Nieto, "Internet and World Wide Web – How to program", PHI/Pearson Education Asia.
6. Murach, "Murach's beginning JAVA JDK 5", SPD
7. Wang, "An Introduction to web Design and Programming", Thomson.

Websites Sources:

- <https://www.tutorialspoint.com>
- <https://www.javatpoint.com>
- onlinecourses.nptel.ac.in
- <https://www.programiz.com>



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BCACC-515

PYTHON PROGRAMMING

L-T-P

3- 1-0

Objective(s): The objectives of this course:

1. To learn and understand Python programming basics and paradigm.
2. To learn and understand python looping, control statements and string manipulations.
3. Students should be made familiar with the concepts of GUI controls and designing GUI applications.
4. To learn and know the concepts of file handling, exception handling and database connectivity *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Introduction to Python, use IDLE to develop programs, Basic coding skills, working with data types and variables, working with numeric data, working with string data, Python functions, Boolean expressions, selection structure, iteration structure, Illustrative Programs, Exercises *for skill development and employability.*

UNIT II:

(8 Sessions)

Define and use functions and modules, working with recursion, Basic skills for working with lists, work with a list of lists, work with tuples, work with dates and times, get started with dictionaries, Illustrative programs, Exercises *for skill development and employability.*

UNIT III:

(8 Sessions)

An introduction to file I/O, use text files, use CSV files, use binary files, Handle a single exception, handle multiple exceptions, Illustrative programs, Exercises *for skill development and employability.*

UNIT IV:


(8 Sessions)

Object Oriented Programming, An introduction to classes and objects, define a class, work with object composition, work with encapsulation, and work with inheritance, override object methods, Illustrative programs, Exercises *for skill development and employability.*

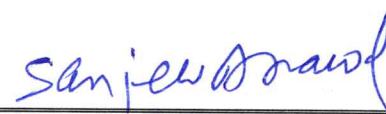
UNIT V:

(8 Sessions)

An introduction to relational databases, SQL statements for data manipulation, Using SQLite Manager to work with a database, Using Python to work with a database, Creating a GUI that handles an event, working with components, Illustrative programs, Exercises *for skill development and employability.*


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Course Outcomes (COs):

After completing the subject, students should be able to:

CO1	This course is a foundation for the development of more advanced mathematical concepts for skill development, employability and entrepreneurship development.
CO2	To use appropriate set, function, or relation models for analysis of practical examples and interpretation of the associated operations and terminology in context for skill development, employability and entrepreneurship development.
CO3	To formulate problems precisely, solve the problems, apply formal proof techniques, and explain their reasoning clearly for skill development, employability and entrepreneurship development.
CO4	This course is a foundation for the development of Object Oriented Programming using python for skill development, employability and entrepreneurship development.
CO5	To develop the ability to write local /global database applications in Python for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	2	1	1	1	1	1	2	1	1	2
CO2	1	1	2	1	2	2	1	2	2	1	1	3
CO3	3	1	2	2	1	1	2	1	1	2	1	2
CO4	1	1	1	1	1	1	1	1	1	1	1	1
CO5	2	1	1	1	1	1	1	1	1	1	1	2

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

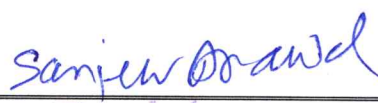
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:

1. Programming and Problem Solving with PYTHON, by Ashok Namdev Kamthane and Amit Ashok Kamthane, Mc Graw Hill Education.

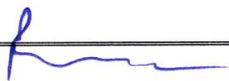

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2. Practical Programming: An introduction to Computer Science Using Python, second edition, Paul Gries, Jennifer Campbell, Jason Montojo, The Pragmatic Bookshelf.
3. Learning with Python: How to Think Like a Computer Scientist Paperback – Allen Downey, Jeffrey Elkner, 2015.
4. Core Python Programming, Second Edition, by Wesley J. Chun, Prentice Hall.

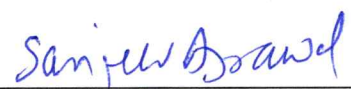
Websites Sources:

- <https://nptel.ac.in/courses/106/106/106106182/>
- <https://nptel.ac.in/courses/106/106/106106145/>
- <https://nptel.ac.in/courses/106/106/106106212/>
- <https://www.python.org/about/gettingstarted/>



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BCADS-516

ANDROID APPLICATION DEVELOPMENT

L-T-P

3-1-0

Objective(s): The objectives of this course:

1. Covers the fundamentals of Android programming using the Android SDK.
2. Covers the fundamental concepts in Android programming - activities and intents, designing user interface using views, data persistence, content providers, messaging and networking, location-based services,
3. Covers the developing android services *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Android programming environment, Linking activities using intents, Calling built in applications using intents *for skill development and employability.*

UNIT II:

(8 Sessions)

Creating the user interface programmatically, Listening for UI notifications, Build basic views, Build picker views, Build list views, Using image views, Using menus with views, Saving and loading user preferences *for skill development and employability.*

UNIT III:

(8 Sessions)

Persisting data to files, Creating and using databases, Study Session, Sharing data in android, Using a content provider, Creating a content provider *for skill development and employability.*

UNIT IV:

(8 Sessions)

SMS messaging, sending emails, Networking, Displaying maps, Getting location data *for skill development and employability.*

UNIT V:

(8 Sessions)

Creating your own services, communicating between a service and an Activity, Binding Activities to Services, A complete lab work for Android service development, Deploy APK files *for skill development and employability.*

Course Outcomes (COs):

Students will be able to understand

CO1	Demonstrate their understanding of the fundamentals of Android operating systems for skill development, employability and entrepreneurship development.
CO2	Demonstrate their skills of using Android software development tools for skill development, employability and entrepreneurship development.

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CO3	Demonstrate their ability to develop software with reasonable complexity on mobile platform for skill development, employability and entrepreneurship development.
CO4	Demonstrate their ability to deploy local /global software to mobile devices for skill development, employability and entrepreneurship development.
CO5	Demonstrate their ability to debug programs running on mobile devices for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1	1	1	1	2	1	2	1	1	2
CO2	3	1	1	1	2	1	1	2	1	1	1	2
CO3	2	1	2	2	1	2	1	1	1	2	1	2
CO4	1	1	2	1	1	1	1	1	1	1	1	1
CO5	2	1	1	1	2	1	1	1	2	1	1	2

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)


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

Suggested Readings:

1. Paul Deitel "Android for Programmers: An App-Driven Approach" 1st Edition, Pearson India.
2. Wei-Meng Lee, "Beginning Android 4 Application Development", Wiley India Pvt Ltd.
3. Reto Meier, "Professional Android 2 Application Development", Wiley India Pvt Ltd
4. Mark L Murphy, "Beginning Android", Wiley India Pvt Ltd
5. Android Application Development All in one for Dummies by Barry Burd, Edition: I

Websites Sources:

- <https://nptel.ac.in/courses/106/106/106106156/>
- https://onlinecourses.swayam2.ac.in/aic20_sp02/preview
- <https://web.stanford.edu/class/cs231m/lectures/lecture-2-android-dev.pdf>
- <https://www.tutorialspoint.com/android/index.htm>


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BCADS-517

MACHINE LEARNING

L-T-P
3-1-0

Objective(s): After completing the subject, students should be able to:

1. To know about basic concepts of NLP and Machine Learning
2. To obtain a thorough knowledge of various knowledge representation schemes
3. To study about various heuristic and game search algorithms
4. To know about various Expert System tools and applications *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Introduction: Learning theory, Hypothesis and target class, Inductive bias and bias-variance trade off, Occam's razor, Limitations of inference machines, Approximation and estimation errors *for skill development and employability.*

UNIT II:

(8 Sessions)

Supervised learning: Linear separability and decision regions, Linear discriminants, Bayes optimal classifier, Linear regression, Standard and stochastic gradient descent, Lasso and Ridge Regression, Logistic regression, Support Vector Machines, Perceptron, Back propogation, Artificial Neural Networks, Decision Tree Induction, Over fitting, Pruning of decision trees, Bagging and Boosting, Dimensionality reduction and Feature selection *for skill development and employability.*

UNIT III:

(8 Sessions)

Support Vector Machines: Structural and empirical risk, Margin of a classifier, Support Vector Machines, Learning nonlinear hypothesis using kernel functions *for skill development and employability.*

UNIT IV:

(8 Sessions)

Evaluation: Performance evaluation metrics, ROC Curves, Validation methods, Bias variance decomposition, Model complexity *for skill development and employability.*

UNIT V:

(8 Sessions)

Unsupervised learning: Clustering, Mixture models, Expectation Maximization, Spectral Clustering, Non-parametric density estimation *for skill development and employability.*

Course Outcomes (COs):

After completing the subject, students should be able to:

CO1	Basics on what is a learning machine for skill development, employability and entrepreneurship development.
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CO2	Basic mathematics behind learning algorithms for skill development, employability and entrepreneurship development.
CO3	Different types of learning using Support Vector Machines for skill development, employability and entrepreneurship development.
CO4	Understand how to evaluate models generated from data for skill development, employability and entrepreneurship development.
CO5	Apply the algorithms to a global real-world problem, optimize the models learned and report on the expected accuracy that can be achieved by applying the local /global level models for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)						3 strong, 2 medium, 1 weak						
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1	1	1	2	1	1	1	1	1	1
CO2	3	3	1	3	2	1	1	2	1	1	1	2
CO3	3	1	2	2	2	2	1	1	2	2	1	3
CO4	1	1	1	1	1	1	1	1	1	1	1	1
CO5	2	1	1	1	1	1	1	1	1	1	1	2

CO-Curriculum Enrichment Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

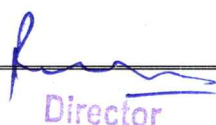
	Skill Development	Employability	Entrepreneurship Development
CO1	3	2	1
CO2	3	2	1
CO3	3	2	1
CO4	3	3	2
CO5	3	2	1

Suggested Readings:


1. Introduction to Statistical Learning, Gareth James, Daniela Witten, Trevor Hastie, Robert Tibshirani, Springer, 2013.
2. Pattern Classification, 2nd Ed., Richard Duda, Peter Hart, David Stork, John Wiley & Sons, 2001.
3. E. Alpaydin, Introduction to Machine Learning, Prentice Hall of India, 2006.
4. T. M. Mitchell, Machine Learning, McGraw-Hill, 1997.

Websites Sources:

- <https://nptel.ac.in/courses/106/106/106106156/>
- https://onlinecourses.swayam2.ac.in/aic20_sp02/preview
- <https://web.stanford.edu/class/cs231m/lectures/lecture-2-android-dev.pdf>
- <https://www.tutorialspoint.com/android/index.htm>


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BCAPL-518

MINI PROJECT WORK BASED ON 514

L-T-P
0-0-2

Objective(s):

Course Objective:

The BCA students are encouraged to involve themselves completely on the project work in their final semester. It is advised to students to develop their project for solving problems of software industry or any research organization. Doing this will give more exposure to handle real life problems of project development.

The courses studied by you during your BCA programme provide you the basic background to work on diverse application domains. The theoretical background of various courses provides you the necessary foundation, principles, and practices to develop effective ways to solve computing problems. The hands on experience gained from the practical courses provide you the knowledge to work with various operating systems, programming languages, and software tools.

This project work is kept in BCA program to give you opportunity to develop quality software solution. During the development of the project you should involve in all the stages of the software development life cycle (SDLC) like requirements analysis, systems design, software development/coding, testing and documentation, with an overall emphasis on the development of reliable software systems. The primary emphasis of the project work is to understand and gain the knowledge of the principles of software engineering practices, and develops good understanding of SDLC.

Students should take this project work very seriously. BCA project should be taken as an opportunity to develop software, which gives exposure to SDLC. Topics selected, should be complex and large enough to justify as a BCA project. The project should be genuine and original in nature and should not be copied from anywhere else. If found copied, the project report will be forwarded to the Exam Discipline Committee of the University as an Unfair means case for necessary action. Students should strictly follow and adhere to the BCA project guidelines *to inculcate skill, provide employability & entrepreneurship skill.*

List of Projects:

1. University Management System Project In Php
2. College Management System Project In Vb
3. Online Examination System In Php
4. Student Information System Project In Java
5. Online Job Portal Project In Php
6. Airline Reservation System Project In Asp Net
7. Online Doctor Appointment System Project
8. Vehicle Management System Project In Java


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9. Online Examination System Project In Php
10. Hospital Management System Project In Php
11. Online Recruitment System Project In Java With Source Code
12. Mobile Shopping Project
13. Blood Bank Management System Project
14. Social Networking Scripts
15. Online Voting System Project
16. College Admission System Project
17. Institute Management System Project
18. Attendance Management System Project

Course Outcomes (COs):

After completing the subject, students should be able to:

CO1	Develop an appreciation for what is involved in learning models from DATA for skill development, employability and entrepreneurship development.
CO2	To make the student confident in designing a system based on System Analysis & Software Engineering course, using PHP and My SQL for skill development, employability and entrepreneurship development.
CO3	Understand a wide variety of PROJECTS for skill development, employability and entrepreneurship development.
CO4	These projects will be designed based on the subject specific tools appropriate for the level of the students for skill development, employability and entrepreneurship development.
CO5	To make the student confident in designing a local /global level system based on Machine learning, IoT and all new emerging technologies for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	2	1	2	1	1	1	1	1	1	3
CO2	3	3	3	3	2	1	1	2	1	1	1	2
CO3	3	3	2	2	2	2	1	1	1	2	1	3
CO4	3	3	2	2	2	1	1	1	1	1	1	3
CO5	3	3	3	1	2	1	1	1	1	1	1	2

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

[Signature]
Director

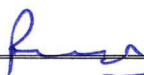
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Websites Sources:

- <https://mini-projects.in/cse-project-topics-ideas>
- <https://nevonprojects.com/year-projects-for-computer-engineering/>
- <https://cse.final-year-projects.in/>
- <https://1000projects.org/projects/cse-mini-projects>
- <https://projectworlds.in/computer-science-and-engineeringcse-mini-projects-3/>



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(Effective from 2022-23)

BCAPL-519

PYTHON PROGRAMMING LAB

L-T-P
0- 0- 2

Objective(s): After completing the subject, students should be able to:

1. To learn and understand Python programming basics and paradigm.
2. To learn and understand python looping, control statements and string manipulations.
3. Students should be made familiar with the concepts of GUI controls and designing GUI applications.
4. To learn and know the concepts of file handling, exception handling and database connectivity *to inculcate skill, provide employability & entrepreneurship skill.*

Practical Exercises

1. Write a Python class to convert an integer to a roman numeral.
2. Write a Python class to convert a roman numeral to an integer.
3. Write a Python class to find validity of a string of parentheses, '(', ')', '{', '}', '[' and ']'. These brackets must be close in the correct order.
4. Write a Python class to get all possible unique subsets from a set of distinct integers.
5. Write a Python class to find a pair of elements (indices of the two numbers) from a given array whose sum equals a specific target number.
6. Write a Python class to find the three elements that sum to zero from a set of n real numbers.
7. Write a Python class to implement pow(x, n).
8. Write a Python class to reverse a string word by word.
9. Write a Python class which has two methods get_String and print_String. get_String accept a string from the user and print_String print the string in upper case.
10. Write a Python class named Rectangle constructed by a length and width and a method which will compute the area of a rectangle.
11. Write a Python class named Circle constructed by a radius and two methods which will compute the area and the perimeter of a circle.
12. Write a Python program to get the class name of an instance in Python.

Course Outcomes (COs):

After completing the subject, students should be able to:

CO1	Install and run the python language software for skill development, employability and entrepreneurship development.
CO2	To develop proficiency in creating applications using python Programming Language for skill development, employability and entrepreneurship development.


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CO3	Understand the concepts of file I/O, Array, Function for skill development, employability and entrepreneurship development.
CO4	To be able to understand different library function available in Python Language for skill development, employability and entrepreneurship development.
CO5	Student will be able to design simple local /global level application by the use of Python Programming Language for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)						3 strong, 2 medium, 1 weak						
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1	1	1	1	1	1	1	1	2	1
CO2	2	3	1	3	2	1	1	3	2	1	1	2
CO3	3	1	2	2	1	2	1	1	1	2	1	2
CO4	1	1	1	1	1	2	1	2	1	1	1	3
CO5	2	1	1	1	1	1	2	1	1	1	1	2

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:

1. Programming and Problem Solving with PYTHON, by Ashok NamdevKamthane and Amit Ashok Kamthane, Mc Graw Hill Education.
2. Practical Programming: An introduction to Computer Science Using Python, second edition, Paul Gries, Jennifer Campbell, Jason Montojo, The Pragmatic Bookshelf.
3. Learning with Python: How to Think Like a Computer Scientist Paperback – Allen Downey, Jeffrey Elkner, 2015.
4. Core Python Programming, Second Edition, by Wesley J. Chun, Prentice Hall.

Websites Sources:

- <https://nptel.ac.in/courses/106/106/106106182/>
- <https://nptel.ac.in/courses/106/106/106106145/>
- <https://nptel.ac.in/courses/106/106/106106212/>
- <https://www.python.org/about/gettingstarted/>

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BCAPL-501 ANDRIOD APPLICATION DEVELOPMENT LAB (AAD LAB)

L-T-P
0-0-2

Objective(s): The objectives of this course:

1. Covers the fundamentals of Android programming using the Android SDK.
2. Covers the fundamental concepts in Android programming - activities and intents, designing user interface using views, data persistence, content providers, messaging and networking, location-based services.
3. Covers the developing android services *to inculcate skill, provide employability & entrepreneurship skill.*

Practical Exercises

Development of Android Applications Based on BCADS-516.

Course Outcomes (COs):

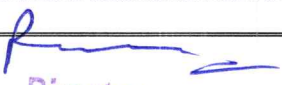
Students will be able to understand

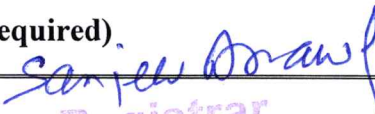
CO1	Demonstrate their understanding of the fundamentals of Android operating systems for skill development and employability.
CO2	Demonstrate their skills of using Android software development tools for skill development and employability.
CO3	Demonstrate their ability to develop software with reasonable complexity on mobile platform for skill development and employability.
CO4	Demonstrate their ability to deploy software to mobile devices for skill development and employability.
CO5	Demonstrate their ability to debug programs running on mobile devices <i>for</i> local /global level for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)								3 strong, 2 medium, 1 weak				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1	1	1	1	1	1	1	2	2	1
CO2	3	3	1	1	2	1	1	2	1	1	2	2
CO3	1	1	2	2	1	2	1	1	1	2	1	1
CO4	1	1	1	1	1	3	1	1	1	2	1	1
CO5	2	1	1	1	1	1	1	1	1	1	1	2

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


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(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:

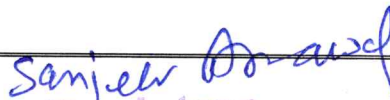
1. Paul Deitel "Android for Programmers: An App-Driven Approach" 1st Edition, Pearson India.
2. Wei-Meng Lee, "Beginning Android 4 Application Development", Wiley India Pvt Ltd.
3. Reto Meier, "Professional Android 2 Application Development", Wiley India Pvt Ltd
4. Mark L Murphy, "Beginning Android", Wiley India Pvt Ltd
5. Android Application Development All in one for Dummies by Barry Burd, Edition: I

Websites Sources:

- <https://nptel.ac.in/courses/106/106/106106156/>
- https://onlinecourses.swayam2.ac.in/aic20_sp02/preview
- <https://web.stanford.edu/class/cs231m/lectures/lecture-2-android-dev.pdf>
- <https://www.tutorialspoint.com/android/index.htm>


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BCAPL-502

MACHINE LEARNING LAB (ML LAB)

L-T-P
0-0-2

Objective(s): After completing the subject, students should be able to:

1. To know about basic concepts of NLP and Machine Learning
2. To obtain a thorough knowledge of various knowledge representation schemes
3. To study about various heuristic and game search algorithms
4. To know about various Expert System tools and applications *to inculcate skill, provide employability & entrepreneurship skill.*

Practical Exercises

Development of Machine Learning Applications Based on BCADS-517.

Course Outcomes (COs):

After completing the subject, students should be able to:

CO1	Develop an appreciation for what is involved in learning models from data for skill development and employability.
CO2	Understand a wide variety of learning algorithms for skill development and employability.
CO3	Understand how to evaluate models generated from data for skill development and employability.
CO4	Apply the algorithms to a real-world problem, optimize the models learned for skill development and employability.
CO5	Develop report on the expected accuracy that can be achieved by applying the models for skill development and employability

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1	1	1	1	1	2	1	1	1	1
CO2	3	3	1	1	2	1	1	2	1	1	1	2
CO3	2	1	2	2	1	2	1	1	1	2	1	3
CO4	1	1	1	1	1	3	1	1	1	1	1	1
CO5	2	1	1	1	1	1	1	1	1	1	1	2

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:

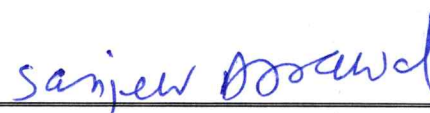
1. Introduction to Statistical Learning, Gareth James, Daniela Witten, Trevor Hastie, Robert Tibshirani, Springer, 2013.
2. Pattern Classification, 2nd Ed., Richard Duda, Peter Hart, David Stork, John Wiley & Sons, 2001.
3. E. Alpaydin, Introduction to Machine Learning, Prentice Hall of India, 2006.
4. T. M. Mitchell, Machine Learning, McGraw-Hill, 1997.

Websites Sources:

- <https://nptel.ac.in/courses/106/106/106106156/>
- https://onlinecourses.swayam2.ac.in/aic20_sp02/preview
- <https://web.stanford.edu/class/cs231m/lectures/lecture-2-android-dev.pdf>


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BCA VI SEMESTER

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(Effective from 2022-23)

BCACC-611

E-COMMERCE

L-T-P
3-1-0

Objective(s): After completing the subject, students should be able to:

1. On successful completion of this module students should be able to understand concepts of E-Commerce and E-business Understand the E-Commerce and E- business infrastructure and trends.
2. Analyze different types of portal technologies and deployment methodologies commonly used in the industry.
3. Analyze the effectiveness of network computing and cloud computing policies in a multi-location Organization.
4. Analyze real business cases regarding their e-business strategies and transformation processes and choices.
5. Integrate theoretical frameworks with business strategies *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

E-commerce: The revolution is just beginning, E-commerce : A Brief History, Understanding E-commerce: organizing Themes *for skill development and employability.*

UNIT II:

(8 Sessions)

E-commerce Business Models, Major Business to Consumer (B2C) business models, Major Business to Business (B2B) business models, Business models in emerging E-commerce areas, How the Internet and the web change business: strategy, structure and process, The Internet: Technology Background, The Internet Today, Internet II- The Future Infrastructure, The World Wide Web, The Internet and the Web: Features *for skill development and employability.*

UNIT III:

(8 Sessions)

Building an E-commerce Web Site: A systematic Approach, The e-commerce security environment, Security threats in the e-commerce environment, Technology solution, Management policies, Business procedures, and public laws, Payment system, E-commerce payment system, Electronic billing presentment and payment *for skill development and employability.*

UNIT IV:

(8 Sessions)

Consumer online: The Internet Audience and Consumer Behaviour, Basic Marketing Concepts, Internet Marketing Technologies, B2C and B2B E-commerce marketing and business strategies, The Retail sector, Analyzing the viability of online firms, E-commerce in action: E-tailing Business Models, Common Themes in online retailing, The service sector: offline and online,

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Online financial services, Online Travel Services, Online career services *for skill development and employability*.

UNIT V:

(8 Sessions)

Social networks and online communities, online auctions, E-commerce portals *for skill development and employability*.

Course Outcomes (COs):

After Completion of the subject student should able to

CO1	Design and implement an e-commerce application with a shopping cart for skill development, employability and entrepreneurship development.
CO2	Integrate user-cantered design guidelines in developing user-friendly websites for skill development, employability and entrepreneurship development.
CO3	Analyze real business cases regarding their e-business strategies and transformation processes and choices for skill development, employability and entrepreneurship development.
CO4	To understand the basic concept of online consumer for skill development, employability and entrepreneurship development.
CO5	To be able to understand and develop online portal, inline auction system at local /global level for skill development, employability and entrepreneurship development.

Mapping COs with POs:

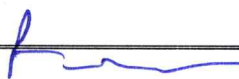
(3,2,1- indicates the strength of correlation)						3 strong, 2 medium, 1 weak						
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	1	1	1	1	1	2	1	1	1	1
CO2	3	3	1	1	3	1	1	3	1	1	1	2
CO3	2	1	2	2	1	2	1	1	1	2	1	3
CO4	1	1	1	1	1	3	1	1	1	1	1	2
CO5	2	1	1	1	1	1	1	1	1	1	1	3

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

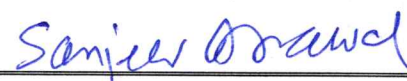
	Skill Development	Employability	Entrepreneurship Development
CO1	3	2	1
CO2	3	2	1
CO3	3	2	2
CO4	3	3	2
CO5	3	2	1

Suggested Readings:



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1. E-commerce: Strategy, Technologies and Applications, David Whiteley, Tata McGraw Hill
- 2 E-Commerce: The Cutting Edge of Business, KK Bajaj &Debjani Nag, McGraw Hill.
2. Ravi Kalakota, Andrew Winston, "Frontiers of Electronic Commerce", Addison Wesley.
3. P. Loshin, John Vacca, "Electronic commerce", Firewall Media, New Delhi

Websites Sources:

1. <https://www.ncertbooks.guru/e-commerce-full-notes/>
2. <https://examupdates.in/e-commerce-full-notes/>
3. <https://www.geektonight.com/e-commerce-notes/>
4. <https://irp-cdn.multiscreensite.com/1c74f035/files/uploaded/introduction-to-e-commerce.pdf>
5. <https://en.wikipedia.org/wiki/E-commerce>

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BCACC-612

CLIENT SERVER COMPUTING

L-T-P
3-1-0

Objective(s): After completing the subject, students should be able to:

1. This Subject deals with the C/S Computing, GUI.
2. To apply the techniques and features of a client/server development language to construct a moderately complex client/server application.
3. To learn the advantages of client-server systems over monolithic systems *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Client/Server Computing: DBMS concept and architecture, Single system image, Client Server architecture, mainframe-centric client server computing, downsizing and client server computing, preserving mainframe applications investment through porting, client server development tools, advantages of client server computing *for skill development and employability.*

UNIT II:

(8 Sessions)

Components of Client/Server application: The client: services, request for services, RPC, windows services, fax, print services, remote boot services, other remote services, Utility Services & Other Services, Dynamic Data Exchange (DDE), Object Linking and Embedding (OLE), Common Object Request Broker Architecture (CORBA). The server: Detailed server functionality, the network operating system, available platforms, the network operating system, available platform, the server operating system *for skill development and employability.*

UNIT III:

(8 Sessions)

Client/Server Network: connectivity, communication interface technology, Interposes communication, wide area network technologies, network topologies (Token Ring, Ethernet, FDDI, CDDI) network management, Client-server system development: Software, Client-Server System Hardware: Network Acquisition, PC-level processing UNIT, Macintosh, notebooks, pen, UNIX workstation, x-terminals, server hardware *for skill development and employability.*

UNIT IV:

(8 Sessions)

Data Storage: magnetic disk, magnetic tape, CD-ROM, WORM, Optical disk, mirrored disk, fault tolerance, RAID, RAID-Disk network interface cards. Network protection devices, Power Protection Devices, UPS, Surge protectors. Client Server Systems Development: Services and Support, system administration, Availability, Reliability, Serviceability, Software Distribution, Performance, Network management, Help Disk, Remote Systems Management Security, LAN and Network Management issues *for skill development and employability.*

UNIT V:

(8 Sessions)


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Client/Server System Development: Training, Training advantages of GUI Application, System Administrator is training, Database Administrator training, End-user training. The future of client server Computing Enabling Technologies, The transformational system *for skill development and employability*.

Course Outcomes (COs):

After Completion of the subject student should able to

CO1	Comprehend the basic concepts of the client-server model for skill development, employability and entrepreneurship development.
CO2	Understand how Client-Server systems work for skill development, employability and entrepreneurship development.
CO3	Differentiate between two-tier and three-tier architectures for skill development, employability and entrepreneurship development.
CO4	Improve the performance and reliability of Client Server based systems for skill development, employability and entrepreneurship development.
CO5	Identify security and local /global level ethical issues in Client Server Computing for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	1	1	1	1	1	2	1	1	1	1
CO2	3	3	1	1	3	1	1	3	1	1	1	2
CO3	2	1	2	2	1	2	1	1	2	2	1	3
CO4	1	1	3	1	1	1	1	1	1	1	1	1
CO5	2	1	1	1	1	1	1	1	1	1	1	3

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:

1. Patrick Smith & Steave Guengerich, "Client / Server Computing", PHI
2. Dawna Travis Dewire, "Client/Server Computing", TMH
3. Majumdar & Bhattacharya, "Database management System", TMH

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4. Korth, Silberchatz, Sudarshan, "Database Concepts", McGraw Hill
5. Elmasri, Navathe, S.B, "Fundamentals of Data Base System", Addison Wesley

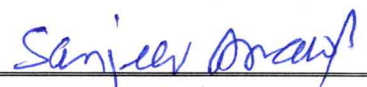
Websites Sources:

- <https://www.tutorialspoint.com/Client-Server-Computing>
- <https://pdfs.semanticscholar.org/fe8c/ca2f103875e09a3f7ca72e1542c4022f0729.pdf>
- <https://lecturenotes.in/subject/1293/client-server-computing>
- https://www.technicalsymposium.com/CLIENT_SERVER_COMPUTING.html



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BCACC-613

PROGRAMMING IN PHP

L-T-P
3 -1 -0

Objective(s): After completing the subject, students should be able to:

1. Understand how server-side programming works on the web.
2. PHP Basic syntax for variable types and calculations.
3. Creating conditional structures
4. Storing data in arrays
5. Using PHP built-in functions and creating custom functions *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Introduction to PHP: Evaluation of PHP, Basic Syntax, Defining variable and constant, PHP Data type, Operator and Expression.

Decisions and loop: Making Decisions, Doing Repetitive task with looping, Mixing Decisions and looping with HTML *for skill development and employability.*

UNIT II:

(8 Sessions)

Function: What is a function, Define a function, Call by value and Call by reference, Recursive function, String Creating and accessing, String Searching & Replacing String, Formatting String, String Related Library function?

Array Anatomy of an Array, Creating index based and Associative array Accessing array, Element Looping with Index based array, Looping with associative array using each () and foreach(), Some useful Library function *for skill development and employability.*

UNIT III:

(8 Sessions)

Handling Html Form with PHP Capturing Form, Data Dealing with Multi-value filed, and Generating File uploaded form, redirecting a form after submission *for skill development and employability.*

Working with file and Directories Understanding file& directory, Opening and closing, a file, Coping, renaming and deleting a file, working with directories, Creating and deleting folder, File Uploading & Downloading *for skill development and employability.*

UNIT IV:

(8 Sessions)

Session and Cookie Introduction to Session Control, Session Functionality What is a Cookie, Setting Cookies with PHP. Using Cookies with Sessions, Deleting Cookies, Registering Session variables, Destroying the variables and Session *for skill development and employability.*

UNIT V:

(8 Sessions)

Database Connectivity with MySQL Introduction to RDBMS, Connection with MySQL Database, Performing basic database operation(DML) (Insert, Delete, Update, Select), Setting query parameter, Executing queryJoin (Cross joins, Inner joins, Outer Joins, Self joins.)

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Exception Handling Understanding Exception and error, Try, catch, throw. Error tracking and debugging *for skill development and employability.*

Course Outcomes (COs):

After successful completion of this course, students will be able to:

CO1	Write PHP scripts to handle HTML forms for skill development, employability and entrepreneurship development.
CO2	Write regular expressions including modifiers, operators, and met characters for skill development, employability and entrepreneurship development.
CO3	Create PHP programs that use various PHP library functions, and that manipulate files and directories for skill development, employability and entrepreneurship development.
CO4	Analyze and solve various database tasks using the PHP language for skill development, employability and entrepreneurship development.
CO5	Analyze and solve common local /global level Web application tasks by writing PHP programs for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)						3 strong, 2 medium, 1 weak						
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	1	1	1	1	1	2	1	1	1	1
CO2	2	3	1	1	3	1	1	1	1	1	1	2
CO3	2	1	2	2	1	2	1	1	2	2	1	1
CO4	1	1	3	1	1	1	1	1	1	1	1	3
CO5	2	1	1	1	1	1	2	1	1	1	1	3

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:

1. Learning PHP, MySQL, books by 'O' riley Press
2. Internet & World Wide Web – Dietel and Dietel Pearson education Asia.
3. Principles of Web Design Sklar TMH THH.
- 4.. Basics of Web Site Design NIIT – PHI
- 5.. Straight to the point PHP Laxmi Publications
6. The Web Warrior Guide to Web Design Gosselin, Thomson

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7. Web Technology & Design C Xavier, New Age Inter.

Websites Sources:

- i. <http://www.codecademy.com/tracks/web> ,
- ii. <http://www.codecademy.com/tracks/php>
- iii. <http://www.w3schools.com/PHP>
- iv. <http://www.tutorialpoint.com>
- v. <http://www.homeandlearn.co.uk>



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BCACC-614

E1: CLOUD COMPUTING

L-T-P
3- 1- 0

Objective(s): After completing the subject, students should be able to:

1. Identify the technical foundations of cloud systems architectures.
2. Analyze the problems and solutions to cloud application problems.
3. Apply principles of best practice in cloud application design and management.
4. Identify and define technical challenges for cloud applications and assess their importance *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I: (8 Sessions)

Introduction: Cloud-definition, benefits, usage scenarios, History of Cloud Computing - Cloud Architecture - Types of Clouds - Business models around Clouds – Major Players in Cloud Computing issues in Clouds - Eucalyptus - Nimbus - Open Nebula, Cloud Sim *for skill development and employability.*

UNIT II: (8 Sessions)

Cloud Services: Types of Cloud services: Software as a Service-Platform as a Service – Infrastructure as a Service - Database as a Service - Monitoring as a Service –Communication as services. Service providers- Google, Amazon, Microsoft Azure, IBM, Sales force *for skill development and employability.*

UNIT III: (8 Sessions)

Collaborating Using Cloud Services: Email Communication over the Cloud - CRM anagement - Project Management-Event Management - Task Management – Calendar - Schedules - Word Processing – Presentation – Spreadsheet - Databases – Desktop - Social Networks and Groupware *for skill development and employability.*

UNIT IV: (8 Sessions)

Virtualization for Cloud: Need for Virtualization – Pros and cons of Virtualization – Types of Virtualization –System Vim, Process VM, Virtual Machine monitor – Virtual machine properties - Interpretation and binary translation, HLL VM - supervisors – Xen, KVM, VMware, Virtual Box, Hyper-V *for skill development and employability.*

UNIT V: (8 Sessions)

Security, Standards and Applications: Security in Clouds: Cloud security challenges – Software as a Service Security, Common Standards: The Open Cloud Consortium – The Distributed management Task Force – Standards for application Developers – Standards for Messaging – Standards for Security, End user access to cloud computing, Mobile Internet devices and the cloud *for skill development and employability.*

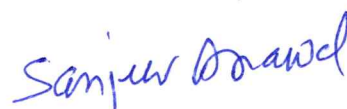
Course Outcomes (COs):

After Completion of the subject student should able to



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CO1	Understand the fundamental principles of distributed computing for skill development, employability and entrepreneurship development.
CO2	Understand how the distributed computing environments known as Grids can be built from lower level services for skill development, employability and entrepreneurship development.
CO3	Understand the importance of virtualization in distributed computing and how this has enabled the development of Cloud Computing for skill development, employability and entrepreneurship development.
CO4	Analyze the performance of Cloud Computing for skill development, employability and entrepreneurship development.
CO5	Understand the concept of local /global level Cloud Security; learn the Concept of Cloud Infrastructure Model for skill development, employability and entrepreneurship development.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	1	1	1	1	1	2	1	2	1	1
CO2	3	3	1	1	3	1	1	1	1	1	1	3
CO3	2	1	3	2	1	2	1	1	2	3	1	1
CO4	1	1	1	1	1	1	2	1	1	1	1	2
CO5	2	1	1	1	1	1	2	1	1	1	1	3

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:

1. David E.Y. Sarna Implementing and Developing Cloud Application, CRC press 2011.
2. Lee Badger, Tim Grance, Robert Patt-Corner, Jeff Voas, NIST, Draft cloud computing Synopsis And recommendation, May 2011.
4. Anthony T Velte, Toby J Velte, Robert Elsenpeter, Cloud Computing : A Practical Approach, Tata McGraw-Hill 2010.
5. Haley Beard, Best Practices for Managing and Measuring Processes for On-demand Computing, Applications and Data Centers in the Cloud with SLAs, Emereo Pty Limited, July 2008.
6. G.J.Popek, R.P. Goldberg, Formal requirements for virtualizable third generation

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Architectures, Communications of the ACM, No.7 Vol.17, July 1974.

7. John Rittinghouse & James Ransome, Cloud Computing, Implementation, Management and Strategy, CRC Press, 2010.
8. Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Que Publishing, August 2008.
8. James E Smith, Ravi Nair, Virtual Machines, Morgan Kaufmann Publishers, 2006.

Websites Sources:

- <https://www.tutorialspoint.com>
- <https://www.javatpoint.com>
- onlinecourses.nptel.ac.in
- <https://www.programiz.com>



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BCACC-615

E2: ENTERPRISE RESOURCE PLANNING

L-T-P
3- 1- 0

Objective(s): After completing the subject, students should be able to:

1. To learn the fundamental concepts of ERP systems, architecture and their services.
2. To develop the skill for planning, implementation and managing ERP projects.
3. To provide a contemporary and forward-looking on the theory and practice of Enterprise Resource Planning Technology.
4. To focus on a strong emphasis upon practice of theory in Applications and Practical oriented approach.
5. To train the students to develop the basic understanding of how ERP enriches the business organizations in achieving a multidimensional growth.
6. To aim at preparing the students technological competitive and make them ready to self-upgrade with the higher technical skills *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

ERP Introduction, Benefits, Origin, Evolution and Structure: Conceptual Model of ERP, The Evolution of ERP, the Structure of ERP *for skill development and employability.*

UNIT II:

(8 Sessions)

Business Process Reengineering, Data ware Housing, Data Mining, Online Analytic Processing(OLAP), Product Life Cycle Management(PLM),LAP, Supply chain Management *for skill development and employability.*

UNIT III:

(8 Sessions)

ERP Marketplace and Marketplace Dynamics: Market Overview, Marketplace Dynamics, The Changing ERP Market. ERP- Functional Modules: Introduction, Functional Modules of ERP Software, Integration of ERP, Supply chain and Customer Relationship Applications *for skill development and employability.*

UNIT IV:

(8 Sessions)

ERP Implementation Basics, ERP Implementation Life Cycle, Role of SDLC/SSAD, Object Oriented Architecture, Consultants, Vendors and Employees *for skill development and employability.*

UNIT V:

(8 Sessions)

ERP & E-Commerce, Future Directives- in ERP, ERP and Internet, Critical success and failure factors, Integrating ERP into organizational culture. Using ERP tool: either SAP or ORACLE format to case Study *for skill development and employability.*

Course Outcomes (COs):

After Completion of the subject student should able to

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On completion of the course students will be able to

CO1	Understand basics of ERP applications by using features of ERP tools for skill development and employability.
CO2	Understand the Importance of ERP in future, Business Process Reengineering for skill development and employability.
CO3	Understand the process of local /global level ERP Marketplace and Marketplace Dynamics for skill development and employability.
CO4	Understand the Implementation process of ERP Implementation Basics for skill development and employability.
CO5	Know important software that can be learn ERP & E-Commerce, Future Directives for skill development and employability.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	1	1	1	1	1	2	1	2	1	1
CO2	1	3	3	1	3	1	1	1	1	1	1	2
CO3	2	1	1	2	1	2	1	1	2	3	1	1
CO4	1	1	1	1	1	1	3	1	1	1	1	2
CO5	2	1	1	1	1	1	2	1	1	1	1	3

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:

1. Alexis Leon, "ERP Demystified", Tata McGraw Hill
2. Rahul V. Altekhar "Enterprisewide Resource Planning", Tata McGraw Hill,
3. Vinod Kumar Garg and Venkitakrishnan N K, "Enterprise Resource Planning – Concepts and Practice", PHI
4. Joseph A Brady, Ellen F Monk, Bret Wagner, "Concepts in Enterprise Resource Planning", Thompson Course Technology
5. Mary Summer, "Enterprise Resource Planning"- Pearson Education

Websites Sources:

- <https://www.tutorialspoint.com>
- <https://www.javatpoint.com>
- onlinecourses.nptel.ac.in
- <https://www.programiz.com>

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BCACC-616

E3: DIGITAL IMAGE PROCESSING

L-T-P
3- 1- 0

Objective(s): The objectives of this course:

1. To study the image fundamentals and mathematical transforms necessary for image processing.
2. To study the image enhancement techniques
3. To study image restoration procedures.
4. To study the image compression procedures *to inculcate skill, provide employability & entrepreneurship skill.*

UNIT I:

(8 Sessions)

Introduction to Digital Image Processing, Applications, Components of Image, Processing System, Element of Visual Perception, A Simple Image Model, Sampling and Quantization. Image Enhancement in Frequency Domain Fourier Transform and the Frequency Domain, Basis of Filtering in Frequency Domain *for skill development and employability.*

UNIT II:

(8 Sessions)

Image Enhancement in Spatial Domain Introduction, Basic Gray Level Functions, Piecewise-Linear Transformation Functions, Contrast Stretching, Histogram Specification, Local Enhancement, Enhancement using Arithmetic/Logic Operations–Image Subtraction, Image Averaging, Basics of Spatial Filtering *for skill development and employability.*

UNIT III:

(8 Sessions)

Image Restoration, Noise Models, Restoration in the presence of Noise only-Spatial Filtering, Mean Filters, Arithmetic Mean filter, Geometric Mean Filter, Order Statistic Filters, Median Filter, Max and Min filters, Periodic Noise Reduction by Frequency Domain Filtering, Bandpass Filters, Minimum Mean-square Error Restoration *for skill development and employability.*

UNIT IV:

(8 Sessions)

Introduction to Image Compression, Image compression model, Error-free compression, Lossy compression, Lossless predictive coding, Lossy predictive coding, transform coding, wavelet coding *for skill development and employability.*

UNIT V:

(8 Sessions)

Introduction to Image Segmentation, Detection of discontinuities, Edge linking and boundary detection, thresholding, region based segmentation *for skill development and employability.*

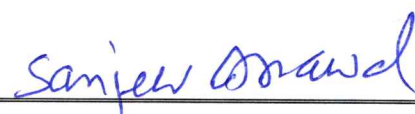
Course Outcomes (COs):

Students will able to:



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CO1	Analyze general terminology of digital image processing for skill development and employability.
CO2	Examine various types of images, intensity transformations and spatial filtering for skill development and employability.
CO3	Develop Fourier transform for image processing in frequency domain for skill development and employability.
CO4	Evaluate the methodologies for image segmentation, restoration etc for skill development and employability.
CO5	Implement image process and analysis algorithms and image processing algorithms in local /global level practical applications for skill development and employability.

Mapping COs with POs:

(3,2,1- indicates the strength of correlation)							3 strong, 2 medium, 1 weak					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1	1	1	1	1	2	1	2	1	1
CO2	1	2	3	1	3	1	1	1	2	1	1	2
CO3	3	1	1	2	2	2	1	1	2	3	1	1
CO4	1	1	1	1	1	1	3	1	1	1	1	2
CO5	2	1	1	1	1	1	2	1	1	1	1	3

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

Suggested Readings:

1. Digital Image Processing 2nd Edition, Rafael C. Gonzalvez and Richard E. Woods. Published by: Pearson Education.
2. Digital Image Processing and Computer Vision, R.J. Schalkoff. Published by: John Wiley and Sons, NY.
3. Fundamentals of Digital Image Processing, A.K. Jain. Published by PrenticeHall, Upper Saddle River, NJ.
4. Digital Image Processing, by W.K. Pratt, Addison Wesley.

Websites Sources:

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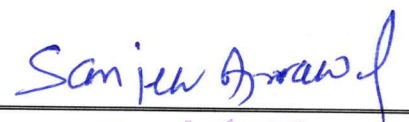
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- http://www.vssut.ac.in/lecture_notes/lecture1423722885.pdf
- https://www.iare.ac.in/sites/default/files/lecture_notes/DIP-LECTURE_NOTES.pdf
- <https://www.cs.nmt.edu/~ip/lectures.html>
- https://mrcet.com/downloads/digital_notes/ECE/IV%20Year/6.Digital%20Image%20Processing.



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BCAPL-601

PROJECT WORK

L-T-P
3- 1- 0

The objective of the BCA project work is to develop a quality software solution by following the software engineering principles and practices. During the development of the project the students should involve in all the stages of the software development life cycle (SDLC). The main objective of this project course is to provide learners a platform to demonstrate their practical and theoretical skills gained during five semesters of study in BCA Programme. During project development students are expected to define a project problem, do requirements analysis, systems design, software development, apply testing strategies and do documentation with an overall emphasis on the development of a robust, efficient and reliable software systems. The project development process has to be consistent and should follow standard. For example database tables designed in the system should match with the E-R Diagram. SRS documents to be created as per IEEE standards.

Students are encouraged to spend maximum time of the sixth semester working on a project preferably in a software industry or any organization. Topics selected should be complex and large enough to justify as a BCA final semester project. The courses studied by the students during the BCA Programme provide them the comprehensive background knowledge on diverse subject areas in Computer Applications such as computer programming, data structure, DBMS, Computer Organization, SAD, Software Engineering, Computer Networks, PHP, Python, Machine Learning, Cloud Computing , Deep Learning etc., which will be helping students in doing project work *to inculcate skill, provide employability & entrepreneurship skill.*


Course Outcomes (COs):

After completing the subject, students should be able to:

CO1	Develop an appreciation for what is involved in learning models from DATA for skill development and employability.
CO2	To make the student confident in designing a system based on System Analysis & Software Engineering course, using PHP and My SQL and Python Programming for skill development and employability.
CO3	Understand a wide variety of PROJECTS for skill development and employability.
CO4	These projects will be designed based on the subject specific tools appropriate for the level of the students for skill development and employability.
CO5	To make the student confident in designing local /global level a system based on Machine learning, IoT ,Deep learning and all new emerging technologies for skill development and employability.


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Mapping COs with POs:

(3,2,1- indicates the strength of correlation)						3 strong, 2 medium, 1 weak						
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	2	1	2	1	1	1	1	1	1	3
CO2	3	3	3	3	2	1	1	2	1	1	1	2
CO3	3	3	2	2	2	2	1	2	1	2	1	3
CO4	3	3	2	2	2	1	1	1	1	1	1	3
CO5	3	3	3	1	2	1	1	1	1	1	1	2

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

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

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

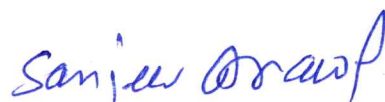
Websites Sources:

- <https://mini-projects.in/cse-project-topics-ideas>
- <https://nevonprojects.com/year-projects-for-computer-engineering/>
- <https://cse.final-year-projects.in/>
- <https://1000projects.org/projects/cse-mini-projects>
- <https://projectworlds.in/computer-science-and-engineeringcse-mini-projects-3/>



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