School of Basic and Applied Sciences

Program: Bachelor of Computer Application (Three Years Course)

2017-20

Programme Educational Objective (PEO)
Programme Outcomes (POs)
Programme Specific Outcomes (PSOs)
Course Outcomes (COs)
and
Lesson Plans

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RNB GLOBAL UNIVERSITY
Educating stars for tomorrow

RNB GLOBAL UNIVERSITY

RNB Global City, Ganganagar Road,

Bikaner, Rajasthan 334601

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RNB Global University
Programme: BCA (Three Years Course)

1. Vision

To create an environment where a holistic education is given in order to ignite an inquisitive mind, inculcate the qualities of excellence, perceive the intricacies of research, seek out obstacles, overcome them, and carve out a niche for oneself.

2. Mission

- Enabling students to maximize their potential and use their professional standards through ethics and education to raise their level of competence and become change agents.
- Fostering a scholarly culture that fosters the phenomenon of giving back to society via research and creative endeavours.
- To integrate partnerships that enhance knowledge in order to create a dynamic intellectual capital.
- To employ emerging technology to create an inclusive learning environment that is integrated with an improved educational process.
- To create a teaching-learning atmosphere that fosters resilience, sensitivity, and critical thinking, ultimately leading to the development of a strong personality.

3. Programme Educational Objectives (PEOs)

PEO1: To facilitate in development of basic fundamentals of Computer Applications that fit as a perfect foundation towards a beginning a professional career in industry.

PEO2: To develop programming skills of students by using fundamental knowledge of computer science

PEO3: To apply new designs and solutions to complex real life problems using technologies.

PEO4: To play a creative role during professional life through turning problems to opportunities.

4. PROGRAM OUTCOME (POs)

PO1: Technical understanding: Solve complicated problems using mathematics, physics, technical foundations, and a specialization in technology.

PO2: **Problem analysis:** Identify, formulate, analyze research materials, and analyse complex engineering problems using foundational principles of mathematics, natural sciences, and sciences to reach justifiable conclusions.

PO3: **Application of modern technologies:** Create, select, and apply appropriate approaches, tools, and advanced engineering and IT tools, such as predictions and modelling, to technically challenging processes while taking into account the constraints.

PO4: **Expert Principles and Cyber Systems:** The ability to use and provide expert principles and cyber systems in a global monetary environment.

PO5: **Ultimate Education:** Determine the demand for and expand the capacity to work as a Computing certified in permanent education.

PO6: **The expert and society:** Apply reasoning informed by contextual information to evaluate societal, health, safety, legal, and cultural issues, as well as the obligations that come with them, in the context of professional engineering activity.

PO7: **Environmental and sustainable development:** Display knowledge of the need for sustainable development by identifying the implications of professional technological solutions in society and the environment contexts.

PO8: **Personality and Cooperative Learning:** Ability to work as a member or manager in a variety of diverse teams.

PO9: **Ethics:** Adhere to professional ethics, duties, and automotive technology norms by adopting ethical ideas.

PO10: **Communication:** Interact well with the technical community and society at large on associated technical activities, such as being able to understand and write effective reports and design documentation, give and receive clear directions.

PO11: **Finance and project management:** Demonstrate knowledge and understanding of technical and professional principles and apply those to one's own work, as a member of the team and leader, to manage projects and in multidisciplinary domains.

PO12: **Life-long learning:** With socio-technological advancements, students will be able to engage in independent and life-long learning.

1. PROGRAM SPECIFIC OUTCOME (PSOs)

PSO1: Prepare for a potentially lucrative and employable profession of computer applications.

PSO2: Continue your education in Computer Science/Applications.

PSO3: Work for yourself in the Indian and worldwide software markets.

PSO4: Comply with all applicable industrial standards.

COURSE OUTCOMES (COs)

6.1 Semester I	
Course	**Course outcomes: - After completion of these courses students should be able to**
13004200 Mathematics- I	**CO1:** Demonstrate proficiency in the subjects that make up the mathematics major's core. **CO2:** Demonstrate an understanding of and ability to construct mathematical proofs. **CO3:** Solve mathematical issues using appropriate technology. **CO4:** Build relevant mathematical models to handle a number of actual situations. **CO5:** Explain common matrix operations such as addition, scalar multiplication, multiplication, and transposition
13004100 Introduction to Computers and IT	**CO1:** How to recognize computer hardware and peripherals **CO2:** Illustrate about software applications. **CO3:** Plan how to organise files **CO4:** Classify basic documents, workbooks, and presentations and understand their properties. **CO5:** Explain Email experience and understanding of email etiquette
13004300 Fundamentals of Programming with C	**CO1:** List the fundamentals of computer programming vocabulary. **CO2:** Explain computer programme and use many data kinds. **CO3:** Develop software with decision structures, loops, and functions. **CO4:** Distinguish the terms "call by value" and "call by reference. **CO5:** Choose pointers to better understand memory dynamics.
13004500 System Analysis and Design	**CO1:** Recall the major components of a computer, such as the processor, memory, I/O, and storage. **CO2:** Show Students the significance of cache memory. **CO3:** Choose familiar with both internal and external memory technology. **CO4:** Analyse the operating system's role in interacting with computer hardware. **CO5:** Discuss about the CPU's basic components, such as the ALU and control unit
99002200 Business Communication	**CO1:** Explain historical background and the development of communication; Importance and role of communication in everyday life. **CO2:** Understand Mechanics behind the communication process, difficulties experienced in communication. Different types of communication, impedance due to extraneous factors called “barriers”

	CO3: Apply different types of communication, impedance due to extraneous factors called "barriers". **CO4:** Analyse the Important non-verbal parameters in communication. So to make communication effective and attractive. **CO5:** Apply the appropriate body language for making presentation more effective
13004600 Lab for Office Automation and PC hardware	**CO1:** Recall the properties of fundamental documents created and formatted in word processor software. **CO2:** Explain how to create and use worksheet formulae and charts. **CO3:** Build presentations and incorporate numerous animations. **CO4:** Simplify Memory, file management **CO5:** Elaborate use of DOS Commands
13004400 Programming with C Lab	**CO1:** Define advanced C-language ideas to write programmes. **CO2:** Interpret and use pointers, memory allocation strategies, and file usage to a range of issues. **CO3:** Choose C to create graphical programmes. **CO4:** Classify different functions, unions and pointers **CO5:** Determine structure units
13002700 Ability & Skill Enhancement – I	**CO1:** Understand the relevance and method of writing impactful and structured resume. **CO2:** Explain the need for right etiquettes to be followed in the professional world. **CO3:** Develop confidence in public speaking and expressing their opinions and ideas clearly and effectively. **CO4:** Build employability skills like critical thinking, team work, conflict management and leadership skills. **CO5:** Communicate effectively in English
99002700 Human Values & Social Service/NCC/NSS	**CO1:** Find about the working and mechanism of human nature. **CO2:** Classify and explain group behavior at organizational level and individual level. **CO3:** Organize and plan organizational change and stress management practices. **CO4:** Discover various human values and their importance in real world. **CO5:** Evaluate the hierarchy of human values.

6.2 Mapping: Semester – I

13004200	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	3	2	1		3		3	2	2
CO2	2		3	1	2	3	2		2	2	1	3
CO3	3	3	3	2		3	2		3	1	2	2
CO4		3		3	3	2	1	2	3		2	3
CO5	2		2		3	3	3	3				

13004100	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	3	1		3	3	2	1		2	2
CO2	3	3	3		3	2	1	3			3	3
CO3		3	3	3	2	2	1		3		2	3
CO4	3	2	2		2	1		3	2		2	1
CO5	3		3	3	3		3		3			3

13004300	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2		2	1		3	2		2	1
CO2	2		3	1	2	3	2		2	2	1	3
CO3	3	3	3		3	2	1	3			3	3
CO4	3	2	1	3	2	1		3		3	2	2
CO5		3		3		3	3		3	3		

13004500	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	3	2	1		3		3	2	2
CO2	3	3	3	3	1			2	2	3	1	2
CO3	2		2	3	3	1	2	2		3		1
CO4	3	2	3	2	1		3	2	3	1		2
CO5		3			3	3	2		3		3	

99002200	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2		2			3	2		2	
CO2	2		3		2	3	2		2	2		3
CO3	3	3	3		3	2	1	3			3	3
CO4	3	2		3	2			3		3	2	2
CO5	3		3		3			3			3	3

13004600	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		3	3	3		2	1	1		3	2	2
CO2	2	2	3	2	3		3	2	3	3		3
CO3	3	3	3	3		2	2	3	2		2	3
CO4	2	3	3	3	3	1			2	1	3	3
CO5		3	3	3	3		3	3	3		3	

13004400	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	1		3	3	3		3	3	3
CO2	3	2	2	1	1		3	3	3	3	3	2
CO3	3	2	3	2	3	3			3	2	2	3
CO4	2	3	3		2		3	1	2			2
CO5		3	3	3		3		3	2	3	3	

13002700	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	3	3	3	2	2	3	1	2	-	3
CO2	-	2	3	3	2	1	-	-	2	2	-	3
CO3	2	-	1	3	3	2	-	3	2	-	2	3
CO4	2	1	2	2	1	-	-	-	-	2	2	1
CO5	3	2	3	2	3	-	-	2	-	2	2	2

99002700	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	2	3	2	3	2	3	2	-	3	3
CO2	2	3	2	3	2	3	2	3	2	3	2	3
CO3	3	2	3	2	-	3	2	3	3	3	3	3
CO4	2	3	2	2	3	2	2	-	2	3	2	3
CO5	2	3	2	2	3	2	3	3	2	2	2	3

6.3 Lesson Plans: Semester - I

13004200 – Mathematics-I

Unit	Particulars	Class No.	Pedagogy of Class
UNIT-I	DETERMINANT -DEFINITION WITH EXAMPLE	C1	Lecture
UNIT-I	MINORS AND COFACTORS WITH EXAMPLE AND PROPERTIES OF DETERMINANT	C2,C3	Lecture
UNIT-I	MATRICE AND TYPES OF MATRICES WITH EXAMPLE	C4,C5,C6	Lecture
UNIT-I	ADDITION, SUBTRACTION AND MULTIPLICATION OF MATRICES WITH EXAMPLE	C7,C8	Lecture
UNIT-I	ADJOINT AND INVERSE OF MATRIX WITH EXAMPLE	C9, C10	Lecture
UNIT-I	CRAMER'S RULE DEPENDENCE AND INDEPENDENCE OF MATRIX WITH EXAMPLE	C11 C12	Lecture
UNIT-I	RANK OF MATRIX AND EIGEN VALUE AND EIGEN VECTORS WITH EXAMPLE	C13 C14 C15	Lecture
UNIT-I	CAYLEY-HAMILTION THEOREM WITH EXAMPLE	C16	Lecture
UNIT-II	LIMIT AT A POINT AND PROPERTIES OF LIMIT	C17 C18 C19	Lecture
UNIT-II	COMPUTATION OF LIMITS OF VARIOUS TYPES OF FUNCTION	C20,C21	Lecture
UNIT-II	CONTINUITY AT A POINT AND CONTINUITY OVER AN INTERVAL	C22,C23 C24	Lecture
UNIT-II	INTERMEDIATE VALUE THEOREM	C25 C26	Lecture
UNIT-II	TYPES OF DISCONTINUITIES	C27 C28 C29	Lecture
UNIT-III	DERIVATIVE, DERIVATIVE OF SUM,DIFFERENCE, PRODUCT AND QUOTIENT, CHAIN RULE.	C30 C31 C32 C33	Lecture
UNIT-III	DERIVATIVE OF COMPOSITE FUNCTION, LOGARITHMIC DIFFERENTIATION.	C34 C35	Lecture
UNIT-III	ROLLE'S THEOREM	C36 C37	Lecture
UNIT-III	MEAN VALUE THEOREM	C38 C39	Lecture
UNIT-III	EXPANSION OF FUNCTION-MACLAURIN'S THEOREM AND TAYLOR'S THEOREM. INDETERMINATE FORMS	C40 C41	Lecture
UNIT-III	L' HOSPITAL RULE, MAXIMA AND MINIMA	C42,C43,C44	Lecture
UNIT-III	CURVE TRACING, SUCCESSIVE DIFFERENTIATION AND LEIBNITZ THEOREM.	C45,C46,C47	Lecture
UNIT-IV	INTEGRAL AS LIMIT OF SUM	C48 C49	Lecture

UNIT-IV	FUNDAMENTAL THEOREM OF CALCULUS (WITHOUT PROOF)	C50	Lecture
UNIT-IV	INDEFINITE INTEGRALS AND METHOD OF INTEGRATION SUBSTITUTION BY PARTS AND SUBSTITUTION RULE	C51,C52	Lecture
UNIT-IV	REDUCTION FORMULAE FOR TRIGNOMETRIC FUNCTION, BETA AND GAMMA FUNCTION(DEFINITION)	C53,C54	Lecture
UNIT-V	DEFINITION OF VECTOR IN TWO AND THREE DIMENSIONS	C55,C56	Lecture
UNIT-V	DOUBLE AND TRIPLE SCALAR AND VECTOR PRODUCT	C57,C58	Lecture
UNIT-V	PHYSICAL INTERPRETATION OF AREA AND VOLUME	C59,C60	Lecture

13004100 – Introduction to Computers and IT

Unit	Particulars	Class No.	Pedagogy of Class
1	Syllabus & Objectives of the Course Introduction to Computers	C1	Lecture
1	The evolution of computers: Computer Generation from First Generation to Fifth Generation.	C2	Lecture
1	Classifications of Computers: Micro, Mini, Mainframe and super computers.	C3,4&5	Lecture
1	Computer Hardware: Major Components of a digital computer,	C6	Lecture
1	Block Diagram of Computers	C7	Lecture
	Control Module, ALU, Input/output functions		
1	Description of Computer Input-output devices	C8	Lecture
1	Computer Memory: Memory Cell, Memory Organization, Read Only Memory, Serial Access	C9	Lecture
1	Physical Devices Used to construct Memories, Drives Floppy Disks	C10	Lecture
1	Magnetic Hard disks	C11	Lecture
1	Compact Disk Read Only Memory, Magnetic Tape Drives.	C12	Lecture
1	Distributed Computer System, Parallel Computers.	C13	Lecture
1	Group Presentation by Students On assigned Topics	C14	Presentations
2	Computer Software: System software & Application Software,	C15	Lecture
2	System Software: assemblers, compilers, interpreters, linkers, BIOS	C16	Lecture
2	Elementary Operating System concepts, different types of operating systems	C17	Lecture
2	Functions of operating System	C18	Lecture
2	Booting process of a Computer	C19	Lecture
2	Application Software: Introduction to MS Office	C20	Lecture
2	Page & Paragraph Formatting; Indentations	C21	Lecture
2	Character Formatting in Word Processor	C22	Lecture
2	Formula & Basic, Cell Reference, Use of Excel	C23	Lecture
2	Computer Programming and Languages: Algorithms	C24	Lecture
2	Flow charts, pseudo code, Low level languages	C25	Lecture
2	Introduction to high level languages.	C26	Lecture
2	Group Presentation by Students On assigned Topics	C27	Presentations
2	Group Presentation by Students On assigned Topics	C28	Presentations
3	Computer Number System: Decimal & Binary	C29	Lecture
3	Octal, Hexa-decimal	C30	Lecture
3	Conversion: Decimal to all Binary number systems,	C31	Lecture
3	Conversion: Decimal to all Binary number systems	C32	Practice Session
3	Conversion: Decimal to all Octal & Hexa-Decimal number systems	C33	Lecture
3	Conversion: Decimal to all Octal & Hexa-Decimal number systems	C34	Practice Session
3	Conversion: Binary to octal and Hexa-decimal	C35	Lecture
3	Addition of binary numbers, Binary subtraction	C36	Lecture
3	Use of complements to represent negative numbers,	C37	Lecture
3	Use of complements to represent negative numbers	C38	Practice Session

3	Conversion of a binary fraction to a decimal fraction and decimal to binary fraction	C39	Lecture
3	Conversion of a binary fraction to a decimal fraction and decimal to binary fraction	C40	Practice Session
3	Binary Coded Decimal(BCD), ASCII Codes, EBCDIC codes, Gray codes, Unicode's	C41	Lecture
4	Introduction of Computer Network Basic elements of a communication system	C42	Lecture
4	Data transmission modes	C43	Lecture
4	Data Transmission speed,	C44	Lecture
4	Data transmission media,	C45	Lecture
4	Digital and Analog Transmission	C46	Lecture
4	Network topologies	C47-48	Lecture
4	Network Types (LAN, WAN and MAN)	C49	Lecture
4	Client and Servers	C50	Lecture
4	Origin & Overview of Internet	C51	Lecture
4	Intranet, Extranet	C52	Lecture
4	Protocol, Domain name	C53	Lecture
4	IP address	C54	Lecture
4	URL, Worldwide Web	C55	Lecture
4	E-mail	C56	Lecture
4	FTP, Telnet, Chat, Instant Messaging.	C57	Lecture
4	Individual Presentation by Students	C58	Presentations
4	Individual Presentation by Students	C59	Presentations
4	Individual Presentation by Students	C60	Presentations

13004300 – Fundamentals of Programming with C

Unit	Particulars	Class No.	Pedagogy of Class
1	C basics, C character set	C1	Presentation/Demo
1	Identifiers and keywords, Data types	C2	Presentation/Demo
1	constants, variables and arrays	C3	Presentation/Demo
1	declarations, expressions statements, symbolic constants, compound statements	C4	Presentation/Demo
1	arithmetic, operators, unary operators, relational and logical operators,	C5	Presentation/Demo
1	assignment operators, conditional, operators, bit operators.	C6	Presentation/Demo
1	C constructs: If statement, if….else statement, if…..else if….else statement	C7	Presentation/Demo
1	C constructs: If statement, if….else statement, if…..else if….else statement	C8	Presentation/Demo
1	while statement, do….while statement,	C9	Presentation/Demo
1	while statement, do….while statement,	C10	Presentation/Demo
1	for statement, switch statement	C11	Presentation/Demo
1	for statement, switch statement	C12 -C13	Presentation/Demo
1	nested control statement, break operator, continue operator, comma operator, go to statement.	C14-C15	Presentation/Demo
1	Tutorial	C16	
1	Lab based Mini Project	C17-18	LAB WORK
1	Lab based Mini Project	C19-20	LAB WORK
1	Lab based Mini Project	C20	LAB WORK
2	C Functions: Functions: declaration	C21-C22	Presentation/Demo
2	definition & scope, recursion	C23	Presentation/Demo
2	call by value, call by reference.	C24	Presentation/Demo
2	Storage Classes: automatic, external (global),	C25	Presentation/Demo
2	static & registers; Recursion	C26	Presentation/Demo
2	Presentations	C27	Presentation/Demo
2	Presentations	C28	Presentation/Demo
3	Arrays: Arrays	C29	Presentation/Demo
3	pointers	C30-31	Presentation/Demo
3	array & pointer relationship	C32	Presentation/Demo
3	pointer arithmetic, dynamic memory allocation,	C33	Presentation/Demo
3	pointer to arrays	C34	Presentation/Demo
3	array of pointers	C35	Presentation/Demo
3	pointers to functions	C36-C37	Presentation/Demo
3	array of pointers to functions,	C38-C39	Presentation/Demo
3	Pre-processor directives: #include, #define	C40	Presentation/Demo
3	macro’s with arguments	C41	Presentation/Demo
3	the operators #and ##, conditional compilations	C42	Presentation/Demo

3	Tutorial	C43	
3	Presentations	C44	Presentation/Demo
4	Structures: Structures	C45-C46	Presentation/Demo
4	unions	C47	Presentation/Demo
4	passing structure to functions	C48	Presentation/Demo
4	bit fields	C49	Presentation/Demo
4	file handling [text(ASEII), binary]	C50-C51	Presentation/Demo
4	Tutorial	C52	
5	String manipulation functions and other standard library functions from stdio.h	C53-C54	Presentation/Demo
5	stdlib.h, conio.h, ctype.h, math.h, string.h, process.h	C55-C56	Presentation/Demo
5	Usage of command line arguments	C57-C58	Presentation/Demo
5	QUIZ	C59-C60	QUIZ

13004500 – System Analysis and Design

Unit	Particulars	Class No.	Pedagogy of Class
1	System Concepts: Definition	C1	Lecture
1	System characteristics	C2	Lecture
1	System characteristics	C3	Lecture
1	elements of system types of system	C4	Lecture
1	elements of system types of system	C5	Lecture
1	types of system	C6	Lecture
1	types of system	C7	Lecture
1	System development life cycle	C8	Lecture
1	System development life cycle	C9	Lecture
1	System development life cycle: Recognition of need	C10	Lecture
1	Feasibility study	C11	Lecture
	Assignment No. 1 (Home)		Home Assignment
1	System Analysis- Introduction	C12	Lecture
1	System Analysis- Introduction	C13	Lecture
1	information collection	C14	Lecture
1	information collection	C15	Lecture
1	interviews, questionnaires	C16	Lecture
1	observation, record searching and document analysis	C17	Lecture
1	observation, record searching and document analysis	C18	Lecture
1	Clarification Class	C19	Lecture
	Assignment No. 2 (Home)	C20	Assignment
	Video Lecture or Guest Lecture	C21	Activity
2	Analysis tools	C22	Lecture
2	Analysis tools	C23	Lecture
2	data flow diagram	C24	Lecture
2	data flow diagram	C25	Lecture
2	data dictionary	C26	Lecture
2	decision tree	C27	Lecture
2	decision tree	C28	Lecture
2	structured English	C29	Lecture
	Assignment No. 3 (Home)		Assignment
2	decision table	C30	Lecture
2	decision table	C31	Lecture
2	System Design: The process	C32	Lecture
2	stages of systems design	C33	Lecture
2	input/output and file design	C34	Lecture
2	input/output and file design	C35	Lecture
2	input/output and file design	C36	Lecture
2	Clarification Class	C37	Clarification Class
2	Assignment No. 4 (Class)	C38	Assignment
	Presentation (Individual)	C39	Presentation
3	system testing	C40	Lecture
3	Black box, White Box,	C41	Lecture
3	Alpha, Beta Testing	C42	Lecture
3	Unit Testing and System Testing	C43	Lecture
3	implementation process	C44	Lecture
3	implementation process	C45	Lecture

	Assignment No. 5 (Home)		Home Assignment
3	implementation methods: Parallel Run	C46	Lecture
3	implementation methods: Parallel Run	C47	Lecture
3	Phased Adoption;	C48	Lecture
3	Phased Adoption;	C49	Lecture
3	Clarification Class	C50	Clarification Class
	Assignment No. 6 (Class)	C51	Assignment
4	system maintenance: Corrective maintenance	C52	Lecture
4	system maintenance: Corrective maintenance	C53	Lecture
4	Adaptive maintenance	C54	Lecture
4	Adaptive maintenance	C55	Lecture
	Assignment No. 7 (Home)		Home Assignment
4	Perfective maintenance	C56	Lecture
4	Perfective maintenance	C57	Lecture
4	Clarification Class	C58	Clarification Class
	Video Lecture or Guest Lecture	C59	Activity
	Assignment No. 8 (Class)	C60	Assignment

99002200 – Business Communication (AECC)

Unit	Particulars	Class No.	Pedagogy of Class
I	BUSINESS COMMUNICATION and its nature	1	LECTURE
I	Communication definition	2	LECTURE
I	Types of Communication	3	LECTURE
I	Types of communication verbal and nonverbal	4	lecture
I	Types of communication Non Verbal and verbal	5	discussion
I	Types of communication verbal and nonverbal	6	no class
I	Different forms of communications	7	lecture
I	Forms of communications	8	LECTURE
I	Forms of communications	9	clarification class
I	communication Barriers	10	lecture
I	Linguistic barriers, cultural Barriers	11	LECTURE
I	Physical barriers	12	activity
I	Organisational barriers	13	quiz
II	organisational barriers	14	quiz
II	Business letter writing its importance	15	assignment in the class
II	Presentation of Business letter writing	16	Lecture
II	format of sales letters	17	Lecture
II	how to write sales letters	18	Lecture
II	Assignments on sales letters	19	Lecture
II	Notices	20	Lecture
II	Job Application letter	21	Lecture
II	job Application letter	22	Lecture
II	job Application letter assignment	23	Lecture
II	how to prepare Resume	24	Lecture
II	Resume preparation	25	Lecture
III	format of Report writing	26	Lecture
III	Business report writing	27	Lecture
III	Types and characteristic of report writing	28	Lecture
III	Assignment on Report writing	29	Lecture
IV	Vocabulary words often confused	30	Lecture
IV	Vocabulary words often confused assignment	31	Lecture
IV	words often misspelt	32	Lecture
IV	common errors in English	33	Lecture
IV	common errors in English activity	34	Lecture
IV	oral presentation importance	35	Lecture
IV	characteristics of oral presentation	36	Lecture
IV	presentation plan	37	Lecture
IV	power point presentation	38	Lecture
IV	assignment	39	Lecture
IV	visual aids	40	Lecture

13004600 – Lab for Office Automation and PC hardware

S. No.	Particulars	Class No.	Pedagogy of Class
1	introduction of windows, introduction of LAN	P1-2	Practical
2	Introduction of MS-office, Making resume	P3-4	Practical
3	Working with Headers and Footers, making time table	P5	Practical
4	Creating Form, Tarck Changes in MS-Word	P6	Practical
5	write a program to count the number	P7	Practical
6	ADDING DIGITAL SIGNATURE	P8	Practical
7	Mail Merge	P9-10	Practical
8	Calculate a Salary	P11	Practical
9	PIVOT TABLES IN EXCEL	P12	Practical
10	HLOOKUP AND VLOOKUP IN EXCEL	P13	Practical
11	GOAL SEEK FUNCTION, Scenario Manager	P14-15	Practical
12	MS-Power Point, animation on slide	P16	Practical
13	Master Slide	P17	Practical
14	Bookmark and Hyperlink in word	P18	Practical
15	Business based spreadsheets	P19	Practical
16	Corelation and Regression	P20-22	Practical
17	Loan Calculation	P23	Practical
18	Macros in Excel	P24-25	Practical

13004400 – Programming with C Lab

S. No.	Particulars	Class No.	Pedagogy of Class
1	Write a program sum of two numbers	P1-P2	Practical/Demo
2	Write a program to check either the number is even or odd	P3-P4	Practical/Demo
3	Write a program calculate simple interest.	P5-P6	Practical/Demo
4	Write a program to calculate the marks of four subject and percentage	P7-P8	Practical/Demo
5	Write a program to check either the year is leap year or not.	P9-P10	Practical/Demo
6	Write a program to find out the grade using if/else if statement.	P11-P12	Practical/Demo
7	Write a program to find out the greater number between two number.	P13-P14	Practical/Demo
8	WAP to read base and height of a triangle, calculate the area using formula : i. Area =1/2*base*height; CIRCLE Area=PI*(R*R); SQUARE = SIDE*SIDE;	P15-P16	Practical/Demo
9	WAP to read marks obtained and maximum marks of a student and calculate its percentage and display it.	P17-P18	Practical/Demo
10	Write a program to print even number up to n.	P19-P20	Practical/Demo
11	Write a program to print odd number up to n.	P21-P22	Practical/Demo
12	Write a program to print table.	P23-P24	Workshop
13	WORKSHOP	P25-P26	Practical

13002700 – Ability & Skill Enhancement Module – I

S. No.	Particulars	Class No.	Pedagogy of Class
1	INTERACTION -ICE BREAKING ACTIVITY	C1	LECTURE
2	ORIENTATION & INTRODUCTION TO ASE	C2	LECTURE
3	PARTS OF SPEECH	C3	ACTIVITY
4	PARTS OF SPEECH	C4	LECTURE
5	PARTS OF SPEECH-WORKSHEET ACTIVITY	C5	ACTIVITY
6	PARTS OF SPEECH-WORKSHEET ACTIVITY	C6	ACTIVITY
7	RNBGU- STUDENT GROOMING WEEK: DRESSING/HYGIENE	C7	LECTURE
8	RNBGU- STUDENT GROOMING WEEK: CODE OF CONDUCT	C8	ACTIVITY
9	TENSES	C9	ACTIVITY
10	TENSES	C10	LECTURE
11	TENSES	C11	ACTIVITY
12	TENSES	C12	ACTIVITY
13	TENSES-WRITTEN & SPOKEN EXERCISE	C13	ACTIVITY
14	TENSES-WRITTEN & SPOKEN EXERCISE	C14	ACTIVITY
15	EMAIL WRITING (ERP)	C15	ACTIVITY
16	EMAIL WRITING (ERP)	C16	LECTURE
17	EXTEMPORE	C17	ACTIVITY
18	EXTEMPORE	C18	ACTIVITY
19	READING COMPREHENSION	C19	LECTURE
20	READING COMPREHENSION	C20	ACTIVITY
21	READING COMPREHENSION-ACTIVITY	C21	ACTIVITY
22	READING COMPREHENSION-ACTIVITY	C22	LECTURE
23	MODELS: LECTURE	C23	ACTIVITY
24	MODELS: LECTURE	C24	ACTIVITY
25	ARTICLES	C25	LECTURE
26	ARTICLES	C26	ACTIVITY
27	ACTIVITY ON ARTICLES	C27	ACTIVITY
28	ACTIVITY ON ARTICLES	C28	LECTURE
29	SHORT MOVIE/SOCIETAL ISSUES	C29	ACTIVITY
30	SHORT MOVIE/SOCIETAL ISSUES	C30	ACTIVITY

7.1 Semester II	
Course Code	**Course outcomes: - After completion of these courses students should be able to**
13006100 Mathematics-II	**CO1:** Define the tabular technique for simplifying logical expressions. **CO2:** Classify the various forms and equivalences of mathematical induction. **CO3:** Develop whether a given set and binary operation form a group by checking group axioms. **CO4:** Compare different filling algorithm of basic objects and their comparative analysis. **CO5:** Interpret common matrix operations such as addition, scalar multiplication and transposition.
13004900 Digital Electronics	**CO1:** Define different type of codes and number systems which are used in digital transmission and computer systems. **CO2:** Demonstrate the codes and number systems converting circuits and Compare different types of logic families which are the basic unit of different types of logic gates in the domain of economy, performance and efficiency. **CO3:** Apply different types of digital electronic circuit using various mapping and logical tools and know the techniques to prepare the most simplified circuit using various mapping and mathematical methods. **CO4:** Categorize different types of with and without memory element digital electronic circuits for particular operation, within the real time of economic, performance, efficiency, user friendly and environmental constraints. **CO5:** Justify the nomenclature and technology in the area of various memory devices used and apply the memory devices in different types of digital circuits for real world application.
13005000 Digital Electronics Lab	**CO1:** Define the basics of gates. **CO2:** Contrast basic combinational circuits and verify their functionalities **CO3:** Apply the design procedures to design basic sequential circuits **CO4:** Examine about counters **CO5:** Explain about Shift registers
11011100 Principles of Management	**CO1:** Understand the Nature of Management **CO2:** Understand the Planning and Decision Making **CO3:** Apply the concept of management in Organizing. **CO4:** Apply Directing, Leadership, Co-ordination and Controlling **CO5:** Compile isolate issues and formulate best control methods.
13005100 Operating System	**CO1:** Label about operating systems, functions of operating systems, system calls.

	CO2: Explain about process coordination and process scheduling algorithms **CO3:** Construct memory management, critical section and deadlock handling algorithms. **CO4:** Classify about file management **CO5:** Determine disk scheduling algorithms
13005200 Operating System Lab	**CO1:** Define the advantages of Unix OS. **CO2:** Explain and debug, C programs created on UNIX platforms. **CO3:** Develop and if necessary, install standard libraries. **CO4:** Distinguish between different platforms **CO5:** Evaluate knowledge of file system and Android OS
13004700 Data Structure using C	**CO1:** What is able to walk through insert and delete for different data structures. **CO2:** Compare to calculate and measure efficiency of code **CO3:** Apply some interesting algorithms like Huffman, Quick Sort, and Shortest Path etc. **CO4:** Analyse to walkthrough algorithm. **CO5:** Build programming skills.
13004800 Data Structure using C Lab	**CO1:** Define how to design and analyse the time and space efficiency of the data structure **CO2:** Explain capable to identity the appropriate data structure for given problem **CO3:** Make use of practical knowledge on the applications of data structures **CO4:** Analyse programming skills **CO5:** Evaluate various Design Techniques of Algorithms and understand the real implementation of Sorting, Greedy Method and Dynamic Programming.
99001900 Environmental Studies	**CO1:** Understand theoretical & Practical aspect of environment studies. About various conservation strategies and problems with environment. **CO2:** Define the importance of Environmental education and ecosystem & acquire the knowledge about environmental pollution sources, effects and control measures of environmental pollution. **CO3:** Apply basic Environmental Concepts **CO4:** Analyze causes of Environment degradation & apply innovations in business- an environmental Perspective **CO5:** Explain different Environmental laws and policies.
13002800 Ability & Skill Enhancement – II	**CO1:** Select the correct phonetic symbols for improving language **CO2:** Operate reading and writing skills in English

	CO3: Prepare listening and speaking skills in English **CO4:** Focus in understanding the ethics, virtues and values **CO5:** Aware about etiquettes and personal branding

7.2 Mapping: Semester – II

13006100	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	3	2		3	3	1	3	2	2	3
CO2	1		2	3		2	3	3	1		2	3
CO3	3	3	3	2		1	1	2	2		2	3
CO4	3	3	2		1	2	3	3		3	3	2
CO5	3	3		3		3		3		3	3	3

13004900	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2		3	2	2	3	3	1	3	2	2	3
CO2	1	2	2	2		2	2	3	1		2	3
CO3	3	3	3	2	3	1	1	2	2	2	2	1
CO4	3	3	2		1	2	3	3		3	3	2
CO5		3	3	3			3		3	3		3

13005000	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		3	3	3		2	1	1		3	2	2
CO2	2	2	3	2	3		3	2	3	3		3
CO3	3	3	3	3		2	2	3	2		2	3
CO4	2	3	3	3	3	1			2	1	3	3
CO5		3	3	3	3		3		3		3	3

11011100	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	3	2	1		3		3	2	2
CO2	3	3	3	3	1			2	2	3	1	2
CO3	2		2	3	3	1	2	2		3		1
CO4	3	2	3	2	1		3	2	3	1		2
CO5	1		2	3		3	3	3	3		3	3

13005100	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	3	2	1		3		3	2	2
CO2	3	3	3	3	1			2	2	3	1	2
CO3	2		2	3	3	1	2	2		3		1
CO4	3	2	3	2	1		3	2	3	1		2
CO5	3	3		3		3			3		3	

13005200	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	3	2	1		3		3	2	2
CO2	3	3	3	3	1			2	2	3	1	2
CO3	2		2	3	3	1	2	2		3		1
CO4	3	2	3	2	1		3	2	3	1		2
CO5		3		3		3	3		3		3	

13004700	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	3	2	1		3		3	2	2
CO2	3	3	3	3	1			2	2	3	1	2
CO3	2		2	3	3	1	2	2		3		1
CO4	3	2	3	2	1		3	2	3	1		2
CO5		3		3		3			3		3	3

13004800	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2		2	1		3	2		2	1
CO2	2		3	1	2	3	2		2	2	1	3
CO3	3	3	3		3	2	1	3			3	3
CO4	3	2	1	3	2	1		3		3	2	2
CO5		3		3		2	3		3			2

99001900	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		2	3	3	2		3	3	3	2	3	3
CO2	2	2	2	2	2			3	2	3		3
CO3		3	3	2		3	3		3	2		3
CO4	3	2		2	2		3	3	2	2	2	2
CO5	2	3	2	3	2	3	2	3	2		2	2

13002800	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3		3	3		3		3	3	2
CO2	3	2	2	3	2	2		2	2	3	2	2
CO3	3	3			2			3	3	3		2
CO4	3	3	3	2	2	2		2	3	3	2	2
CO5	3	3	2	3	2	3	3	3	2		2	2

7.3 Lesson Plans: Semester - II

13006100 – Mathematics-II

Unit	Particulars	Class No.	Pedagogy of Class
1	Sets, subsets	C-1	Lecture
1	Equal sets, equivalent sets	C-2	Lecture
1	Finite and infinite sets, Union and intersection of sets	C-3	Lecture
1	Complements of sets, cardinality of sets	C-4	Lecture
1	Cartesian product	C-5	Lecture
1	Power sets	C-6	Lecture
1	Some applications	C-7	Lecture
1	Some more examples on set theory	C-8	Lecture
1	Class room assignment	C-9	Class Room Assignment
2	Relations and it's properties	C-10	Lecture
2	Presentation	C-11	Presentation
2	Partial order relation function	C-12	Lecture
2	Domain and range	C-13	Lecture
2	Onto, Into and one one functions	C-14	Lecture
2	Composite and inverse functions	C-15	Lecture
2	Trignometric functions	C-16	Lecture
2	Logarithmic and exponential functions	C-17	Lecture
2	Clarification class/ Classroom assignment	C-18	Clarification Class
3	Partial ordered sets	C-19	Lecture
3	Hasse diagram and representation of POSETS	C-20	Lecture
3	Chains	C-21	Lecture
3	Maximal and minimal point	C-22	Lecture
3	Greatest lower bound and least upper bound	C-23	Lecture
3	Lattices and algebraic systems	C-24	Lecture
3	Principles of duality	C-25	Lecture
3	Presentation	C-26	Presentation
3	Sublattices	C-27	Lecture
3	Distributed and complemented lattices	C-28	Lecture
3	Clarification class	C-29	Clarification Class
3	Class room assignment	C-30	Class Room Assignment
4	3D coordinate geometry	C-31	Lecture
4	Coordinates in space	C-32	Lecture
4	Direction cosines and angle between two lines	C-33	Lecture
4	Presentation	C-34	Presentation
4	Projection of join of two points on a plane	C-35	Lecture
4	Equations of plane	C-36	Lecture
4	Straight lines	C-37	Lecture
4	Conditions for a line to be lie in a plane	C-38	Lecture
4	Conditions for two lines to be coplanar	C-39	Lecture
4	Shortest distance between two lines	C-40	Lecture
4	Equations of sphere	C-41	Lecture
4	Tangent plane at a point on the sphere	C-42	Lecture
4	Clarification class	C-43	Clarification Class

4	Class room assignment	C-44	Class Room Assignment
4	Quiz	C-45	Quiz
4	Seminar	C-46	Seminar
5	Double integrals	C-47	Lecture
5	Cartesian coordinates and area	C-48	Lecture
5	Polar coordinates and area of shapes	C-49	Lecture
5	Change of order of integration	C-50	Lecture
5	Change of order of integration	C-51	Lecture
5	Theory of triple integral	C-52	Lecture
5	Finding volumes using triple integral	C-53	Lecture
5	Presentation	C-54	Presentation
5	Volume in cartesian coordinates	C-55	Lecture
5	Some more examples on integral calculus	C-56	Lecture
5	Clarification class	C-57	Clarification Class
5	Class room assignment	C-58	Class Room Assignment
5	Webinar	C-59	Webinar
5	Guest lecture	C-60	Guest lecture

13004900 – Digital Electronics

Unit	Particulars	Class No.	Pedagogy of Class
1	Introduction of Digital Electronics, Application of Digital Electronics, Advantages of digital electronics, Number System, Decimal Number	C1	Lecture
1	Number System, Decimal Number System	C2	Lecture
1	Binary Number System and its conversion	C3	Lecture
1	Hexadecimal Number System and its Conversion	C4	Lecture
1	Octal Number System and its Conversion	C5	Lecture
1	Home Assignment No. 1		Take Home Assignments
1	Presentation	C6	Presentation
1	1's Compliment and 2's Compliment, Addition, Binary Addition	C7	Lecture
1	Signed Number, Floating Point number	C8	Lecture
1	Clarification Class	C9	Clarification Class
1	Home Assignment 2		Take Home Assignments
1	Digital Codes	C10	Lecture
1	BCD Codes, Gray Codes	C11	Lecture
1	Excess 3 Codes, Format For ASCII Codes	C12	Lecture
1	Detection and correction codes, detecting and correcting an error	C13	Lecture
2	Positive and Negative Logic, Introduction of logic gates, AND Gate, OR gate and NOT Gate	C14	Lecture
2	Home Assignment 3		Take Home Assignments
2	Activity	C15	Activity
2	NAND Gate, NOR Gate, EX-OR gate, EX-NOR gate	C16	Lecture
2	Universal Properties of NAND and NOR gates and its realization	C17	Lecture
2	Webinar 1	C18	Lecture
2	Symbol of Gate, Truth Table of gates, Circuit diagram of gates using diode	C19	Lecture
2	Circuit diagram of gates using transistor	C20	Activity
2	Circuit diagram of gates using transistor	C21	Lecture
2	Circuit diagram of gates using transistor	C22	Lecture
2	Clarification Class	C23	Clarification Class
3	Introduction of boolean algebra, boolean operators, logic expressions	C24	Lecture
3	Rules and law of boolean algebra	C25	Lecture
3	Presentation 2	C26	Presentation
3	Clarification Class	C35	Clarification Class
3	Standard Forms of Boolean Expression	C36	Lecture
3	Introduction of Karnaugh Map	C37	Lecture
3	Karnaugh Map - Grouping	C38	Lecture
3	Karnaugh Map - Examples	C39	Lecture
3	Home Assignment 3		Take Home Assignments
4	Introduction of Register, Types of Register	C40	Lecture
4	Universal Shift Register and Its working	C41	Lecture

4	Half Adder and Subtractor & Flip Flops	C42	Lecture
4	Design of asynchronous counter	C43	Lecture
4	Presentation 4	C44	Lecture
4	Programmable Counter	C45	Clarification Class
4	Mode Counter and Ripple Counter	C46	Lecture
4	Guest Lecture 2	C47	Lecture
4	Register, Shift Registers	C48	Seminar
4	Serial Registers and Their application	C49	Lecture
4	Clarification Class	C50	Lecture
4	Up Counter	C51	Lecture
4	Down Counter	C52	Lecture
	Seminar 1	C53	Lecture
	Revision Unit 1	C54	Lecture
	Revision Unit 1	C55	Lecture
	Revision-U2	C55	Lecture
	Revision-U2	C56	Lecture
	Revision - U3	C57	Lecture
	Revision-U3	C58	Lecture
	Revision - U4	C59	Lecture
	Revision - U4	C60	Lecture
	Quiz 1	C62	Quiz
	Unit 1 & Unit 2	C63	Lecture
	Unit 3 & Unit 4	C64	Lecture

13005000 – Digital Electronics Lab

Unit	Particulars	Class No.	Pedagogy of Class
1	To get familiar with following instruments CRO, Multimeter, Function Generator and Power Supply, Breadboard, Gates	P1-P2	Practical
2	Study of Logic Gates, Truth-Table Verification OR, AND and NOT Gate	P3-P4	Practical
3	Study of XOR, NAND and NOR Gates and verification of truth-table	P5-P6	Practical
4	Half Adder using basic gates, Half Adder Using XOR Gate	P7-P8	Practical
5	Presentation	P9-P10	Presentation
6	Realization of Basic Gates using NAND and NOR	P11-P12	Clarification Class
7	Full adder using XOR gates	P13-P14	Practical
8	Half subtractor using basic gates	P15-P16	Practical
9	Half subtractor using NAND gates	P17-P18	Practical
10	Quiz	P19-P20	Quiz
11	4-bit binary to Grey Converters	P21-P22	Practical
12	Grey to binary Converters	P23-P24	Practical
13	Classroom Assignment	P25-P26	Practical
14	1-Bit Comparator, 2 - Bit Comparator	P27-P28	Practical
15	Activity	P29-P30	Activity

11011100 – Principles of Management

Unit	Particulars	Class No.	Pedagogy of Class
UNIT-1	Syllabus, Pedagogy and Reference Books Will be Discussed., Management: concept, Management: Art/ Science/profession; Mgmt Vs. Adm	1	Lecture
UNIT-1	Evolution of Management: early contributions, Taylor and Scientific Management,	2	Lecture
UNIT-1	Fayol's Administrative Management, Bureaucracy,	3	Lecture
UNIT-1	Modern System of Management	4	Lecture
UNIT-1	Process of Management, Levels of Management	5	Lecture
UNIT-1	Ethics and CSR, Roles of Manager	6	Lecture
UNIT-1	Clarification Class	7	Clarification Class
UNIT-1	Classroom Presentation	8,9	Presentation
UNIT-1	Take Home Assignment		Take Home Assignment
UNIT-2	Introduction to functions of Management, Planning: nature, scope, objectives and significance	10	Lecture
UNIT-2	Planning Premises	11	Lecture
UNIT-2	Decision Making	12	Lecture
UNIT-2	Management by Objective (MBO- Peter Drucker), Decision Making	13	Lecture
UNIT-2	Organizing: concept, Organization Theories,	14,15	Lecture
UNIT-2	Delegation of Authority, Authority & Responsibility, Principle of One Boss, Organizational Design.	16	Lecture
UNIT-2	Departmentation	17,18	Lecture
UNIT-2	Clarification Class	19	Clarification Class
UNIT-2	Classroom Presentation	20	Presentation
UNIT-2	Take Home Assignment-II		Take Home Assignment
UNIT-3	Staffing: concept, System Approach,	21	Lecture
UNIT-3	HRP and Job Analysis	22	Role Play
UNIT-3	Recruitment & Selection,	23	Lecture
UNIT-3	Selection	24	Presentation
UNIT-3	Training & Development	25	Presentation
UNIT-3	Directing: concept, Direction and Supervision. Principle and need of Unity of Direction	26	Lecture
UNIT-3	Motivation: concept; Motivation and Performance;	27	Lecture
UNIT-3	Leadership: concept and functions, process and models of Leadership Development.	28	Lecture
UNIT-3	Controlling: concept; methods: Pre-control, Concurrent Control, Post-control;	29	Lecture
UNIT-3	Integrated Control System, The Quality Concept: factors affecting Quality, developing a Quality Control System, Total Quality Control.	30	Lecture
UNIT-3	Clarification Class	31	Clarification Class
UNIT-3	Classroom Presentation/CRA	32,33	Presentation
UNIT-3	Take Home Assignment		Take Home Assignment
UNIT-3	Quiz	34	Quiz

UNIT-4	Managing People - Meaning, Need of understanding human behaviour in organization	35,36	Lecture
UNIT-4	Models of OB, Major concepts in OB (elementary)- Personality, Learning,	37,38	Lecture
UNIT-4	Perception & Attitude Building.	39	Lecture
UNIT-4	Clarification Class	40	Clarification Class
UNIT-4	Take Home Assignment		Take Home Assignment
	Guest Lecture	43,44	Guest Lecture
	Seminar	45	Seminar

13005100 – Operating System

Unit	Particulars	Class No.	Pedagogy of Class
Unit I	Introduction to operating system	C1	Lecture
Unit I	need and operating system services	C2	Lecture
Unit I	operating system classification	C3	Lecture
Unit I	batch processing, Multiprogramming, Multitasking, parallel Systems,	C4	Lecture
Unit I	Distributed system, Real time system, System Call	C5	Lecture
Unit I	Process concept, Process scheduling,	C6	Lecture
Unit I	threads, overview of Inter process communication,	C7	Lecture
Unit I	CPU scheduling	C8	Lecture
Unit I	CPU scheduling	C9	
	Clarification Class	C10	Clarification Class
	Presentation 1	C11	
	Home Assignment 1		
Unit II	Memory management		
Unit II	Memory management	C12	Lecture
Unit II	Logical versus Physical address space	C13	Lecture
Unit II	Swapping, Partition, Paging and segmentation	C14	Lecture
Unit II	Virtual memory: Demand paging	C15	Lecture
Unit II	Virtual memory: Demand paging	C16	Lecture
Unit II	Page replacement algorithms, Allocation algorithms	C17	Lecture
Unit II	Thrashing	C18	Lecture
Unit III	File Management		
Unit III	File Management	C21	Lecture
Unit III	File concept, access methods, and Directory structure	C22	Lecture
Unit III	single level, two lever, tree structures	C23	Lecture
	Webinar	C24	Webinar
	Home Assignment 2		Home Assignment 2
Unit III	acrylic graph and general graph directory	C25	Lecture
Unit III	acrylic graph and general graph directory	C26	Lecture
Unit III	file protection	C27	Lecture
Unit III	free space management	C28	Lecture
	Webinar	C29	Webinar
Unit IV	Device Management: Semaphore		
Unit IV	Device Management: Semaphore	C30	Lecture
	Seminar	C31	Seminar
Unit IV	Disk Structure, Disk Scheduling	C32	Lecture
Unit IV	FCFS Scheduling, SSTF Scheduling,	C33	Lecture
Unit IV	SCAN Scheduling, C-SCAN Scheduling	C34	Lecture
	Clarification Class	C35	Clarification Class
	Presentation 2	C36	Presentation
	Home Assignment 3	C37	
Unit IV	Disk Scheduling algorithm , Dead Lock	C38	Lecture
Unit IV	Deadlock characteristic, Prevention, Avoidance, Detection and Recovery, Critical Section	C39	Lecture

Unit IV	Synchronization, Hardware, Semaphore, Combined Approach to dead lock Handling	C40	Lecture
Unit IV	Synchronization, Hardware, Semaphore, Combined Approach to dead lock Handling	C41	Lecture
	Guest Lecture	C42	Guest Lecture
	Clarification Class	C43	Clarification Class
	Presentation 3	C44	Presentation
	Quiz	C45	Quiz

13005200 – Operating System Lab

S. No.	Particulars	Class No.	Pedagogy of Class
1	Basic Commands in unix	P1-P2	Practical
2	VI editor	P3-P4	Practical
3	Shell Programming	P5-P6	Practical
4	File Permission	P7-P8	Practical
5	Clarification Class	P9-P10	Clarification Class
6	Factorial of any number, Binary arithmetic	P11-P12	Practical
7	Write a program to check whether a given string is palindrome or not.	P13-P14	Practical
8	Bitwise operators , Size of data Types , Switch Statement	P15-P16	Practical
9	Area of Circle	P17-18	Practical
10	Clarification Class	P19-20	Tutorial
11	Nested If-else, Do while	P21-P22	Practical
12	For Loop, other scrpitng Programs	P23-24	Practical
13	Nano and emacs editor in linux	P25-26	Practical
14	C-Programming in C	P27-28	Practical
15	Clarification Class	P29-30	Tutorial

13004700 – Data Structure using C

Unit	Particulars	Class No.	Pedagogy of Class
UNIT I	Introduction to Data Structures		
UNIT I	Basic Terminology, Elementary Data Organization	C1	Lecture
UNIT I	Classification of data structures and its operations	C2	Lecture
UNIT I	Representation of single and multi dimensional array	C3	Lecture
UNIT I	Sparse Arrays (Lower and Upper triangular matrices), Addition and Subtraction of two sparse arrays	C4	Lecture
UNIT I	Stack and its operations	C5	Lecture
UNIT I	Polish notaions & reverse polish notations, Evaluation of postfix expression	C6	Lecture
UNIT I	Conversion from infix to postfix	C7	Lecture
UNIT I	Queue and its operations	C8	Lecture
UNIT I	Queue and its operations	C9	Lecture
UNIT I	D-Queue	C10	Lecture
UNIT I	D-Queue	C11	Lecture
UNIT I	Priority queues	C12	Lecture
	Clarification Class	C13	Clarification Class
	Home Assignment 1		Take Home Assignments
UNIT II	Lists & Trees		
UNIT II	Introduction to linked lists, Linked list operations- Insertion	C14	Lecture
UNIT II	Linked list operations-Deletion	C15	Lecture
UNIT II	Linked list operations- Traversal, Searching	C16	Lecture
UNIT II	Two way linked list and use of headers	C17	Lecture
UNIT II	Trees- Introduction and terminology	C18	Lecture
UNIT II	Traversal of binary trees	C19	Lecture
UNIT II	Traversal of binary trees	C20	Lecture
UNIT II	Tree Insertion using recursion	C21	Lecture
UNIT II	Tree Deletion using recursion	C22	Lecture
	Clarification Class	C23	Clarification Class
	Presentation 1	C24	Presentation
	Presentation 1	C25	Presentation
UNIT III	AVL Trees & Multi Way Search Trees		
UNIT III	AVL Trees- Introduction	C26	Lecture
UNIT III	AVL Trees- Introduction	C27	Lecture
	Presentation 2	C28	Presentation
	Presentation 2	C29	Presentation
UNIT III	M-way search trees, Multilevel Indexing	C30	Lecture
UNIT III	B-Trees- Introduction	C31	Lecture
UNIT III	Indexing with binary search trees	C32	Lecture
UNIT III	Creating a B-Tree	C33	Lecture
	Clarification Class	C34	Clarification Class
	Home Assignment 2		Take Home Assignments
UNIT IV	Sorting Technique		

UNIT IV	Insertion Sort, Selection Sort	C35	Lecture
UNIT IV	Merge Sort	C36	Lecture
UNIT IV	Linear Search, Binary Search	C37	Lecture
UNIT IV	Hashing	C38	Lecture
UNIT IV	Hashing	C39	Lecture
	Quiz	C40	Quiz
	Clarification Class	C41	Clarification Class
	Class Room Assignment	C42	Class Room Assignment
	Home Assignment 3		Take Home Assignments
	Clarification Class	C43	Clarification Class
	Clarification Class	C44	Clarification Class
	Clarification Class	C45	Clarification Class

13004800 – Data Structure using C Lab

S. No.	Particulars	Class No.	Pedagogy of Class
1	Linear Search or Binary Search	P1-P2	Practical
2	Insertion Sort	P3-P4	Practical
3	Linked List	P5-P6	Practical
4	Circular Linked List	P7-P8	Practical
5	Doubly Linked List	P9-P10	Practical
6	Stack	P11-P12	Practical
7	Queue	P13-P14	Practical
8	Binary Search Tree	P15-P16	Practical
9	Pre order, Post order, In order Traversal	P17-P18	Practical
10	Clarification Class	P19-P20	Clarification Class
11	Breadth First Search, Depth First Search	P21-P22	Practical
12	Merge Sort	P23-P24	Practical
13	Bubble Sort Using Recursion, Insertion Sort Using Recursion	P25-P26	Practical
14	Selection Sort Using Recursion, Heap Sort	P27-P28	Practical
15	Linear Search Using Recursion, Binary Search Using Recursion	P29-P30	Practical

99001900 – Environmental Studies

Unit	Particulars	Class No.	Pedagogy of Class
I	Introduction to Environment	C1	Lecture
I	Multidisciplinary nature of environment studies. Scope and importance	C2	Lecture
I	Applications and need for public awareness	C3	Lecture
I	Ecosystem: Introduction	C4	Lecture
I	Structure of ecosystem	C5	Lecture
I	Functioning of ecosystem	C6	Lecture
I	Energy flow in an ecosystem	C7	Lecture
	HOME ASSIGNMENT 1		
I	Food chain and Food web	C8	Lecture
I	Ecological Pyramid	C9	Lecture
I	Ecological succession	C10	Lecture
	CLASS ASSIGNMENT 1	C11	Class Room Assignment
I	Forest and Grassland ecosystem	C12	Lecture
I	Aquatic ecosystem and Desert ecosystem	C13	Lecture
II	Natural Resources, Introduction and Renewable resources	C14	Lecture
II	Non renewable resources	C15	Lecture
	Clarification of Doubts	C16	Clarification Class
	CLASS ASSIGNMENT 2	C17	Class Room Assignment
II	Land resources and Land use	C18	Lecture
II	Land degradation and Soil erosion, Desertification	C19	Lecture
II	Deforestation: Causes and Impacts	C20	Lecture
II	Deforestation: Causes and Impacts cont..	C21	Lecture
	HOME ASSIGNMENT 2		Take Home Assignments
II	Water: Use and overexploitation	C22	Lecture
II	Floods, Droughts, conflicts over water	C23	Lecture
II	Energy resources: Renewable Energy	C24	Lecture
II	Non renewable energy resources, alternate energy sources	C25	Lecture
II	Case studies	C26	Lecture
	QUIZ	C27	Quiz
III	Biodiversity and Conservation: Levels of biodiversity - genetic, species and ecosystem	C28	Lecture
III	Biogeographic zones of India, Biodiversity patterns and global biodiversity hotspots	C29	Lecture
III	India as mega biodiversity nation, Endangered and endemic species of India	C30	Lecture
III	Threats to biodiversity	C31	Lecture
III	Conservation of biodiversity	C32	Lecture
	HOME ASSIGNMENT 3		HOME ASSIGNMENT
	Clarification of Doubts	C33	Clarification of Doubts
	PRESENTATION	C34	PRESENTATION
	PRESENTATION	C35	PRESENTATION
	PRESENTATION	C36	PRESENTATION
	PRESENTATION	C37	PRESENTATION

	GUEST LECTURE	C38	GUEST LECTURE
IV	Environmental pollution: types, causes, effects and control	C39	Lecture
IV	Air pollution	C40	Lecture
IV	Water pollution	C41	Lecture
IV	Soil pollution	C42	Lecture
IV	Noise Pollution	C43	Lecture
	CLASS ASSIGNMENT 3	C44	
V	Nuclear hazards and human health risk	C45	Lecture
V	Solid waste management	C46	Lecture
V	Environmental policies and Practices : Sustainable development	C47	Lecture
V	Climate change, global warming, ozone layer depletion, rain impacts on human and agriculture	C48	Lecture
V	Environment laws	C49	Lecture
	Clarification class	C50	Clarification class
	HOME ASSIGNMENT 4		HOME ASSIGNMENT
V	Human communities and Environment	C51	Lecture
V	Human population growth: Impacts on Environment and human health & Welfare	C52	Lecture
V	Resettlement and Rehabilitation,	C53	Lecture
	SEMINAR	C54	SEMINAR
	CLASS ASSIGNMENT 4	C55	CLASS ASSIGNMENT
V	Disaster management	C56	Lecture
V	Environmental movements	C57	Lecture
V	Environmental ethics, Environmental communication and public awareness	C58	Lecture
	WEBINAR	C59	WEBINAR
	Clarification class	C60	Clarification class

13002800 – Ability & Skill Enhancement Module – II

Unit	Particulars	Class No.	Pedagogy of Class
Unit I	Phonetic symbols and the International Phonetic Alphabets (IPA)	C1	Lecture
Unit I	The Description and Classification of Vowels (Monophthongs & Diphthong)	C2	Lecture
Unit I	Consonants	C3	Lecture
Unit I	Phonetic Transcription & Phonology	C4	Lecture
Unit I	Syllable	C5	Lecture
Unit I	Stress & Intonations	C6	Lecture
	Reading aloud, recording audio clips	C7	Class Room Assignment
Unit II	Idioms and Phrases	C8	Lecture
Unit II	Words Often Confused	C9	Lecture
Unit II	One word Substitution	C10	Lecture
Unit II	Word Formation: Prefix & Suffix	C11	Lecture
	Home Assignment		Take Home Assignments
Unit III	What are ethics, what are values, difference between ethics and morals	C12	Lecture
Unit III	Business ethics, workplace ethics,	C13	Lecture
Unit III	what are virtues for e.g. civic virtues, etc. Human ethics and values- 5 core human values are: right conduct, living in peace, speaking the truth, loving and care, and helping others.	C14	Lecture
Unit III	Etiquette awareness	C15	Lecture
Unit III	Importance of First Impression, Personal Appearance & Professional presence, Personal Branding	C16	Lecture
Unit III	Dressing Etiquette	C17	Lecture
Unit III	Dining Etiquette	C18	Lecture
Unit III	Presentation	C19	Presentation
Unit III	Clarification Class	C20	
Unit IV	Reading Comprehension	C21	Activity
Unit IV	News Reading	C22	Activity
Unit IV	Picture Description	C23	Activity
Unit IV	Paragraph Writing	C24	Lecture
Unit IV	Paragraph Writing	C25	Activity
Unit IV	News Writing	C26	Lecture
Unit IV	Clarification Class	C27	Lecture
Unit V	Public Speaking/Debate	C28	Lecture
Unit V	Debate	C29	Class Room Assignment
Unit V	Inspirational Movie Screening	C30	Activity
Unit V	Skit Performance	C31	Activity
	Workshop	C32	Workshop

8.1 Semester III	
Course	**Course outcomes: - After completion of these courses students should be able to**
13008100 Mathematics-III	**CO1:** How to reason at multiple levels of detail and abstraction, being aware, in particular, of the applicability and limitations of tools from mathematics and theoretical computer science **CO2:** Explain the context in which a computer system may function, including its interactions with people and the physical world. **CO3:** Plan to communicate with, and learn from, experts from different domains throughout their careers **CO4:** Examine a solid foundation that allows and encourages them to maintain relevant skills as the field evolves **CO5:** Determine the problem using graphs and represent the trees traversal, and also basics of recurrence relations.
13008200 Database Management System	**CO1:** Define, appreciate and effectively explain the underlying concepts of database Technologies. **CO2:** Demonstrate and implement a database schema for a given problem-domain **CO3:** Construct a database and Populate and query a database using SQL DML/DDL commands. **CO4:** Examine and enforce integrity constraints on a database **CO5:** Determine an understanding of Procedures and Functions
13008300 Database Management System Lab	**CO1:** Relate an understanding of the relational data model. **CO2:** Demonstrate an information model into a relational database schema and to use a data definition language and/or utility to implement the schema using a DBMS. **CO3:** Organize using relational algebra, solutions to a broad range of query problems. **CO4:** Compare using SQL, solutions to a broad range of query and data update problems. **CO5:** Decide the concept of Indexing, Views, Rollback, Commit, Grant and Revoke Permission
13008400 Computer Architecture	**CO1:** List the fundamentals of different instruction set architectures and their relationship to the CPU design. **CO2:** Classify the principles and the implementation of computer arithmetic. **CO3:** Identify about Primary and Secondary storage System. **CO4:** Distinguish about parallel computer structure and Pipelining **CO5:** Evalute the concepts of parallel processing, pipelining and inter processor communication.
13008500 Object Oriented	**CO1:** How object-oriented programming features in C++. **CO2:** Compare these features to program design and implementation.

Programming with C/C++	**CO3:** Choose object-oriented concepts and how they are supported by C++. **CO4:** Examine some practical experience of C++. **CO5:** Choose the facilities offered by C++ for Object-Oriented Programming.
13008600 Object Oriented Programming with C/C++ Lab	**CO1:** Label key features of the object-oriented programming language such as encapsulation (abstraction), inheritance, and polymorphism. **CO2:** Explain and implement object-oriented applications. **CO3:** Apply the facilities offered by C++ for Object-Oriented Programming. **CO4:** Analyse problems and implement simple C++ applications using an object-oriented software engineering approach **CO5:** Design and develop Object Oriented systems
11014900 Principles of Accounting	**CO1:** Define the basic concepts of accounting and financial statements. **CO2:** Remember the execution of the accounting process- Recording-Classifying and Summarizing. **CO3:** Apply the principles and concepts of accounting in preparing the financial statements. **CO4:** Apply the use of accounting software. **CO5:** Determine software in preparation of Financial Statements
13002900 Ability & Skill Enhancement – III	**CO1:** Classify the different types of reviews i.e. book review, movie review etc. **CO2:** Express his/ her feeling at pressor situation or emotional situation **CO3:** Explain his/her thoughts in group discussion and also build leadership quality **CO4:** Enhance creativity in making documentary etc. **CO5:** Manage negative emotions keeping balance of mental stability, stress and distress.
99002700 Human Values & Social Service/NCC/NSS	**CO1:** Find about the working and mechanism of human nature. **CO2:** Classify and explain group behaviour at organizational level and individual level. **CO3:** Organize and plan organizational change and stress management practices. **CO4:** Discover various human values and their importance in real world. **CO5:** Evaluate the hierarchy of human values.
99002800 Workshops & Seminars	**CO1:** Relate to the concept of cognitive development and Big Five personality characteristics. **CO2:** Explain the basic fundamentals of Emotional Intelligence.

	CO3: Develop ability to practice new problem-solving skills in a group and use these skills in personal life. **CO4:** Build coping strategies and adapt balanced self- determined behaviour. **CO5:** Create leadership skills to be effective as a manager.

8.2 Mapping: Semester – III

13008100	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2		2	1		3	2		2	1
CO2	2		3	1	2	3	2		2	2	1	3
CO3	3	3	3		3	2	1	3			3	3
CO4	3	2	1	3	2	1		3		3	2	2
CO5	3			3			3		3	3		

13008200	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2		2	1		3	2		2	1
CO2	2		3	1	2	3	2		2	2	1	3
CO3	3	3	3		3	2	1	3			3	3
CO4	3	2	1	3	2	1		3		3	2	2
CO5		2		3			3		3	3		1

13008300	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2		2	1		3	2		2	1
CO2	2		3	1	2	3	2		2	2	1	3
CO3	3	3	3		3	2	1	3			3	3
CO4	3	2	1	3	2	1		3		3	2	2
CO5		3	3		3		3	2		3	1	2

13008400	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2		2	1		3	2		2	1
CO2	2		3	1	2	3	2		2	2	1	3
CO3	3	3	3		3	2	1	3			3	3
CO4	3	2	1	3	2	1		3		3	2	2
CO5		3		3		2	3	1	3	3		

13008500	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2		2	1		3	2		2	1
CO2	2		3	1	2	3	2		2	2	1	3
CO3	3	3	3		3	2	1	3			3	3
CO4	3	2	1	3	2	1		3		3	2	2
CO5		3		3			3		3	3		2

13008600	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2		2	1		3	2		2	1
CO2	2		3	1	2	3	2		2	2	1	3
CO3	3	3	3		3	2	1	3			3	3
CO4	3	2	1	3	2	1		3		3	2	2
CO5		3		3			3		3	3		1

11014900	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	1			3	3		3	3	3
CO2	3	2	2	1	1		3	3	3	3	3	2
CO3	3	2	3	2	3	3			3	2	2	3
CO4	2	3	3		2		3	1	2			2
CO5	2			2		3		2		2	3	

13002900	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	3	3		3		2	2	3	3	2
CO2	2	2	3	3		2		2		3	2	2
CO3	2				3	2		3	2	3	2	2
CO4	2		2		2			2		3		2
CO5	3	3	2	2	2	2	3	3	2	2	3	2

99002700	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	2	3	-	3	2	3	2	-	3	3
CO2	2	3	-	3	2	3	-	3	2	3	2	3
CO3	3	2	3	2	-	3	2	3	3	3	3	3
CO4	2	3	2	2	3	2	2	-	2	3	2	3
CO5	2	3	2	2	3	2	3	3	-	-	2	3

99002800	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	-	3	-	2	3	2	-	3	3
CO2	2	3	3	3	-	2	2	2	3	2	-	3
CO3	2	3	2	3	1	-	-	-	2	3	2	1
CO4	2	1	3	2	3	-	-	2	3	-	3	2
CO5	3	3	3	3	3	3	3	3	3	3	3	3

8.3 Lesson Plans: Semester - III

13008100 – Mathematics-III

Unit	Particulars	Class No.	Pedagogy of Class
UNIT-II	CORRELATION COEFFICIENT, ASSUMPTION OF CORRELATION ANALYSIS	C1	Lecture
UNIT-II	COEFFICIENT OF DETERMINATION AND CORRELATION	C2	Lecture
UNIT-II	MEASUREMENT OF CORRELATION-KARL PEARSON'S COEFFICIENT, SPEARMEN'S RANK CORRELATION	C3 C4	Lecture
UNIT-II	CONCURRENT DEVIATION THE CORRELATION COEFFICIENT-	C5	Lecture
UNIT-II	PITFALLS AND LIMITATIONS ASSOCIATED WITH REGRESION AND CORRELATIONS ANALYSIS APPLICATION USING IT TOOLS	C6 C7	Lecture
UNIT-III	CONCEPT A ASSUMPTION USAGE IN BUSINESS DECISION MAKING LINEAR PROGRAMMING PROBLEM - MODEL FORMULATION	C8 C9 C10	Lecture
UNIT-III	METHODS OF SOLVING : GRAPHICAL AND SIMPLEX AND QUESTION OF CORRELATION AND REGRESSION	C11 C12 C13 C14 C15	Lecture
UNIT-III	PROBLEM WITH MIXED CONSTRAINTS- DUALITY ; CONCEPT , SIGNIFICANCE, USAGE AND APPLICATION IN BUSINESS DECISION MAKING	C16 C17 C18 C19 C20	Lecture
UNIT-III	QUEUING MODELS : BASIC STRUCTURE OF QUEUING MODELS.	C21 C22 C23	Lecture
UNIT-III	BIRTH DEATH QUEUING MODELS.	C24 C25 C26 C27	Lecture
UNIT-III	BIRTH DEATH QUEUING MODELS OF ITS STEADYSTATE SOLUTION.	C28 C29 C30	Lecture
UNIT-IV	GENERAL STRUCTURE OF TRANSPORTATION PROBLEMS	C31 C32	Lecture
UNIT-IV	SOLUTION PROCEDURE FOR TRANSPORTATION PROBLEM, METHODS FOR FINDING INITIAL SOLUTIONS AND ALSO TEST FOR OPTIMALITY	C33 C34 C35 C36 C37	Lecture
UNIT-IV	MAXIMIZATION OF TRANSPORTATION PROBLEMS	C38 C39 C40 C41	Lecture

UNIT-IV	ASSISGNMENT PROBLEM APPROACH OF THE ASSIGMENT MODEL	C42 C43 C44	Lecture
UNIT-IV	SOLUTION METHODS OF ASSIGNMENT PROBLEM	C45 C46 C47	Lecture
UNIT-IV	MAXIMIZATION IN AN ASSIGNMENT	C48 C49 C50 C51 C52	Lecture
UNIT-IV	UNBALANCED ASSIGMENT PROBLEM	C52 C53 C54 C55 C56	Lecture
UNIT-IV	RESTRICTION ON ASSIGNMENT	C57 C58	Lecture
UNIT-IV	EXTRA EXAMPLES OF ALL TOPICS	C59 C60	Lecture

13008200 – Database Management System

Unit	Particulars	Class No.	Pedagogy of Class
1	Introduction of Database, Purpose of database, application of database, Data view and data schema	C1	Lecture
1	Data Model in Database, Hierarchical model, network model, E-R model and Object Oriented Model	C2	Lecture
1	Relational Data Model, How it works, application of relational data model	C3	Lecture
1	Presentation	C4	Presentation
1	Data base key and importance of key, Super Key, Primary Key	C5	Lecture
1	Candidate Key, Composite Key, Compound Key, Alternate key	C6	Lecture
1	Example of each type key, database instance, database design schema	C7	Tutorial
1	Presentation	C8	Presentation
2	Introduction of SQL, Application of SQL, Advantages and disadvantage of SQL, Create database	C9	Lecture
2	Implementation of Primary Key, Creation of Table, Dropping of table, modifying of table, alternation of table	C10	Lecture
2	Introduction of Insert Query, Select Query, Select Query with Example and condition	C11	Lecture
2	Example of each type of SQL Query	C12	Tutorial
2	Conductive Operator with Example	C13	Lecture
2	Update query, Delete Query,	C14	Tutorial
2	Like Clause, Order By, Having, Group by, In between	C15	Lecture
2	Presentation	C16	Presentation
	Declared Holiday		Declared Holiday
2	Clarification Class	C17	Clarification Class
2	Logical Operators, Between, IN, AND or NOT Null	C18	Lecture
2	Presentation	C19	Presentation
2	Using Null Values, Constraints, Integrity Constraints	C20	Lecture
2	Introduction of Nested Queries, Correlated Nested Comparison operators,	C21	Lecture
2	All Problems related to SQL Queries	C22	Tutorial
2	Group By, Having Clause, Join, Inner join, left join, right join, fuller join, Overview of Index	C23	Lecture
2	Relational Data Model, Relational model terminology, domains, attributes, characteristics of relation	C24	Lecture
2	Clarification Classes	C25	Clarification Class
2	Presentation	C26	Presentation
2	Introduction of Nested Queries, Correlated Nested Comparison operators,	C27	Lecture
2	Overview of Indexes and Views	C28	Lecture
3	Relational Data Model, Relational model terminology, domains, attributes, characteristics of relation, database schema	C29	Lecture

3	Basic Operation selection and projection, Set Theoretic operation, Database designing using ER Model, Data Normalization	C30	Lecture
3	Clarification Classes	C31	Clarification Class
4	Transaction Processing and concurrency, definition of transaction, Desirable ACID properties, Types of transaction	C32	Lecture
4	Definition of concurrency, lost, update, dirty read, problem due to concurrency control	C33	Lecture
4	Clarification Classes	C34	Clarification Class
4	Discussion of all problems related to course	C35	Tutorial
4	Overview of Locking, Validation	C36	Lecture
4	Concepts of Database Security	C37	Lecture
4	Presentation	C38	Presentation
4	System Failure, Backup and Recovery Techniques	C39	Lecture
4	Authorization and Authentication	C40	Lecture
4	Problem Solving Classes	C41	Tutorial
All	Revision of Unit Wise Problem	C42	Clarification Class
All	Multiple choices question quiz for job oriented	C43	Quiz
All	Discuss about various topic decided my faculty	C44	Group discussions
All	Doubt clearance classes for all unit	C45	Clarification Class

13008300 – Database Management System Lab

S. No.	Particulars	Class No.	Pedagogy of Class
1	Installation of database, Introduction of SQL server Management studio	P1-P2	Practical
1	Create Database, Drop Database, Create Table, Insertion of data	P3-P4	Practical
2	Updation of data, deletion of data, Review of all query	P5-P6	Practical
2	Order By, Group By, Having Clause, Like	P7-P8	Practical
3	Min, Max, AVG, Count, SUM, IN, BETWEEN	P9-P10	Practical
4	Combining Table Using Joins, Aggregate Functions	P11-P12	Practical
4	Working with Sub Queries	P13-P14	Practical
4	Workshop based on previous operation	P15-P16	Workshop
5	Creating Views, Creating Column Aliases	P17-P18	Practical
5	Creating Database users	P19-P20	Practical
5	Using Grant and Revoke	P21-P22	Practical
All	Extra Practical	P23-P24	Practical
All	Revision of all practical	P25-P26	Practical

13008400 – Computer Architecture

Unit	Particulars	Class No.	Pedagogy of Class
1	Basic of Digital Electronics, Why we need digital Electronics, Application of Digital Electronics, Number System	1	Lecture
1	Introduction of Logic Gates	2	Lecture
1	Introduction of Combinational circuits, Adder, Half adder, full adder	3	Lecture
1	Multiplexer and De-Multiplexer	4	Lecture
1	Presentation	5	Presentation
1	Presentation	6	Presentation
1	introduction of CA	7	Lecture
1	Register transfer Language, Register transfer,	8	Lecture
1	Bus & memory transfer	9	Lecture
1	Logic micro operations, Shift micro operation.	10	Lecture
1	Instruction codes, Computer instructions, Timing & control,	11	Lecture
1	Instruction Cycles, Memory reference instruction, Input/Output & Interrupts,	12	Lecture
1	Complete computer description & design of basic computer.	13	Lecture
2	question paper solutions and discussion	14	Lecture
2	Workshop by NSE - 12 Sept. 2017	15	
2	Functional units, Basic operational concepts and Bus structures	16	Lecture
2	instruction and instruction Sequencing	17	Lecture
2	Addressing modes	18	Lecture
2	viva, application	19	Activity
2	Basic instruction cycle, Single Bus Organisation of processor	20	Lecture
2	multi Bus Organisation of processor	21	Lecture
2	execution of the instruction and Hardwird Control	22	Lecture
2	Micro programmed control	23	Lecture
3	general register and stack organization	24	Lecture
3	computer arithmetic	25	Lecture
3	computer arithmetic	26	Lecture
3	computer arithmetic	27	Tutorial
3	Input-Output Organization	28	Lecture
3	Input-Output Organization	29	Lecture
3	Memory hierarchy	30	Lecture
3	cache memory - mapping, I/O organization	31	Lecture
3	numerical of cache mapping	32	Tutorial
3	Interrupt, DMA	33	Lecture
4	Data transfer schemes, Program control,	34	Lecture
4	Pipelining, Characteristics	35	Lecture
4	Interconnection structures, Inter processor arbitration,	36	Lecture
4	Inter processor communication & synchronization.	37	Lecture

13008500 – Object Oriented Programming with C/C++

Unit	Particulars	Class No.	Pedagogy of Class
1	Programming Concepts: Algorithm and its characteristics	C1	Lecture
1	pseudo code / flow chart, program	C2	Lecture
1	identifiers, variables, constants	C3	Lecture
1	primitive data types, expressions	C4	Lecture
1	structured data types	C5	Lecture
1	arrays	C6	Lecture
1	compilers and interpreters	C7	Lecture
	Assignment No. 1(Home)		Home Assignment
	Clarification Class	C8	Clarification Class
2	Statements: Assignment statement, if then else statements	C9	Lecture
2	switch statement	C10	Lecture
2	looping statements- while, do while, for	C11	Lecture
2	break, continue, input/output statements	C12	Lecture
2	functions/ procedures	C13	Lecture
	Assignment No. 2(Class)	C14	Assignment
	Clarification Class	C15	Clarification Class
3	Object Oriented Concepts: Abstraction, encapsulation	C16	Lecture
3	objects, classes	C17	Lecture
3	methods, constructors,	C18	Lecture
3	inheritance	C19	Lecture
3	polymorphism	C20	Lecture
3	static and dynamic binding	C21	Lecture
3	overloading	C22	Lecture
3	Program Development: Object oriented analysis design	C23	Lecture
3	unit testing & debugging	C24	Lecture
3	system testing & integration, maintenance	C25	Lecture
	Assignment No. 3 (Class)	C26	Assignment
	Clarification Class	C27	Clarification Class
	Assignment No. 4 (Home)		Home Assignment
4	data types- simple data types, floating data types, character data types, string data types,	C28	Lecture
4	Arithmetic operators and operator precedence, variables and constant declarations	C29	Lecture
4	expressions, input using the extraction operator >> and cin, output using the insertion operator << and cout	C30	Lecture
4	preprocessor directives, increment (++) and decrement operations (--)	C31	Lecture
4	creating a C++ program	C32	Lecture
4	input/output, relational operators, logical operators and logical expressions	C33	Lecture
4	if and if … else statement	C34	Lecture
4	if and if … else statement	C35	Lecture
4	switch and break statements	C36	Lecture
	Clarification Class	C37	Clarification Class
	Assignment No. 5 (Home)	C38	Assignment

	Presentation No. 1	C39	Presentation
	Video Lecture/ Guest Lecture	C40	Activity
5	“for”, “while” and “do – while” loops	C41	Lecture
5	break and continue statement	C42	Lecture
5	nested control statement, value returning functions	C43	Lecture
5	void functions, value versus reference Parameters	C44	Lecture
5	void functions, value versus reference Parameters	C45	Lecture
5	local and global variables	C46	Lecture
5	static and automatic variables	C47	Lecture
5	static and automatic variables	C48	Lecture
5	enumeration type	C49	Lecture
5	one dimensional array	C50	Lecture
5	one dimensional array	C51	Lecture
5	two dimensional array	C52	Lecture
5	two dimensional array	C53	Lecture
5	character array	C54	Lecture
5	pointer data	C55	Lecture
5	pointer variables	C56	Lecture
	Clarification Class	C57	Clarification Class
	Video Lecture/ Guest Lecture	C58	Activity
	Assignment No. 6 (Class)	C59	Assignment
	Presentation No. 2	C60	Presentation
	Assignment No. 7 (Home)		Home Assignment
	Assignment No. 8 (Class)		Assignment

13008600 – Object Oriented Programming with C/C++ Lab

S. No.	Particulars	Class No.	Pedagogy of Class
1	sum and product of digits of an integer, reverse a number	P1-P2	Practical
2	sum of the first n terms, Prime No.	P3-P4	Practical
3	Factors, Swapping	P5-P6	Practical
4	Triangle of stars, Array: Print even-valued elements, odd-valued elements	P7-P8	Practical
5	sum and average of the elements of array, maximum and minimum element of array	P9-P10	Practical
6	array in reverse order, Swapping using pointers	P11-P12	Practical
7	Swapping using pointers, Finding out the area and circumference of circle, radius given as input and use function for calculating area.	P13-P14	Practical
8	Finding out the area and circumference of circle, radius given as input and use function for calculating area, Show address of each character in string	P15-P16	Practical
9	Calculate number of vowels, WAP to display Fibonacci series using recursion	P17-P18	Practical
10	WAP to display Fibonacci series using iteration, WAP to calculate Factorial of a number using iteration, WAP to calculate Factorial of a number using recursion, Create Matrix class using templates	P19-P20	Practical
11	Assignment	P21-P22	Assignment
12	Create Matrix class using templates	P23-P24	Practical
13	Create a class Box containing length, breath and height and calculate surface area and volume.	P25-P26	Practical
14	Assignment	P27-P28	Assignment
15	Minor Project	P29-P30	Minor Project

11014900 – Principle of Accounting

Unit	Particulars	Class No.	Pedagogy of Class
I	Introduction to accounting and process	C1	Lecture
I	Scope of financial accounting, Interrelationship of Accounting	C2-C4	Lecture
I	Branches of Accounting, Accounting concepts	C5-C6	Lecture
II	Journal, Entries, Rule of Entries	C7-C8	Lecture
II	Sub Division of Journal- Cash book	C9-C12	Lecture
III	Preparation of Final Accounts, Profit & Loss Account, Balance Sheet	C13-C23	Case Study/Lecturer
I	Unit-I	C24	Presentation
IV	Meaning of Inventory, Objectives of Inventory Valuation	C25-C28	Lecture
	Unit-I, II	C29	Clarification Class
IV	Methods of Valuation of Inventories-FIFO, LIFO and Weighted Average Method	C30-C34	Lecture
IV	International Financial Reporting Standard	C35	Presentation
IV	Causes of Depreciation,	C36-C40	Lecture
IV	Methods of Providing Depreciation	C40-C43	Lecture
	Unit-IV	C44	Presentation
	Unit-IV	C45	Presentation

13002900 – Ability & Skill Enhancement Module – III

S. No.	Particulars	Class No.	Pedagogy of Class
1	Recap LAST SEMESTER(POEM)	C1	Lecture
2	CURRICULUM DISCUSSION	C2	Lecture
3	CURRICULUM DISCUSSION	C3	Lecture
4	Event Report Writing	C4	Lecture
5	Event Report Writing	C5	Lecture
6	Event Report Writing	C6	Activity
7	Activity stage presentation/skills/compering /Introduction/vote of thanks	C7	Lecture
8	Activity stage presentation/skills/compering /Introduction/vote of thanks	C8	Activity
9	Activity stage presentation/skills/compering /Introduction/vote of thanks	C9	Lecture
10	Telephone etiquette; grooming week	C10	Lecture
11	Telephone etiquette	C11	Lecture
12	Telephone etiquette	C12	Lecture
13	Event organisation and presentation	C13	Lecture
14	event organisation and presentation	C14	Lecture
15	event organisation and presentation	C15	Lecture
16	movie review	C16	Lecture
17	movie review assignment	C17	Activity
18	movie review assignment	C18	Activity
19	group discussion	C19	Activity
20	group discussion	C20	Activity
21	group discussion	C21	Activity
22	Time and stress Management	C22	Lecture
23	Time and stress Management	C23	Lecture
24	Time and stress Management: activity	C24	Lecture
25	Documentary making	C25	Lecture
26	Documentary making	C26	Lecture
27	Documentary making	C27	Activity
28	Documentary making	C28	Activity
29	Documentary making	C29	Activity
30	Documentary making	C30	Activity
31	lecture personal branding /health and well being	C31	Lecture
32	activity market yourself	C32	Lecture
33	activity; market yourself	C33	Lecture
34	Train the trainer	C34	Lecture
35	Train the trainer	C35	Lecture
36	Train the trainer	C36	Lecture
37	script writing	C37	Lecture
38	script writing	C38	Lecture
39	script writing	C39	Lecture
40	presentation level	C40	Activity
41	presentation level	C41	Activity
42	presentation level	C42	Activity
43	presentation level	C43	Activity
44	presentation level	C44	Activity
45	presentation level	C45	Activity

9.1 Semester IV	
Course	**Course outcomes: - After completion of these courses students should be able to**
13010200 Java Programming Language	**CO1:** Define the features of Java Programming Language with Syntax and structure of Java Programs and how to use various operators in Java. **CO2:** Explain how to implement the Object-oriented features by writing Java programs. **CO3:** Solve Arrays, Strings, Vectors, Packages etc. in Java and implementing the Exception handling Mechanism in Java. **CO4:** Analyse different concepts to create and use Threads and Packages in Java. **CO5:** Determine the different concepts of applets and adding them to a HTML File.
13010300 Java Programming Language Lab	**CO1:** How to write programs for solving real world problems using java collection frame work. **CO2:** Demonstrate programs using abstract classes. **CO3:** Develop multithreaded programs. **CO4:** Examine GUI programs using swing controls in Java **CO5:** Create Java programs to implement error handling techniques using exception handling
13010600 Computer Networks	**CO1:** How communication works in computer networks and to understand the basic terminology of computer networks **CO2:** Explain the role of protocols in networking and to analyze the services and features of the various layers in the protocol stack. **CO3:** Develop design issues in Network Security and to understand security threats, security services and mechanisms to counter. **CO4:** Classify basic devices like repeaters, bridges, gateways and quality of service **CO5:** Interpret the network security, common threats, firewalls, and cryptography
13010700 Computer Networks Lab	**CO1:** Name the structure and organization of computer networks; including the division into network layers, role of each layer, and relationships between the layers. **CO2:** Explain the basic concepts of application layer protocol design; including client/server models, peer to peer models, and network naming. **CO3:** Identify understanding of transport layer concepts and protocol design; including connection oriented and connection-less models, techniques to provide reliable data delivery and algorithms for congestion control and flow control. **CO4:** Examine the network security, common threats, firewalls, and cryptography

	CO5: Create algorithms for congestion control and flow control
13010400 Computer Graphics	**CO1:** Show comprehensive introduction about computer graphics system **CO2:** Interpret algorithms to generate the basic primitives **CO3:** Identify 2d transformations. **CO4:** Compare with techniques of clipping, three-dimensional graphics and three-dimensional transformations. **CO5:** Familiar with animations
13010500 Computer Graphics Lab	**CO1:** Define Geometric primitives using OpenGL **CO2:** Explain scan line polygon filling using OpenGL **CO3:** Identify basic transformations on objects using OpenGL **CO4:** Classify clipping algorithm on lines using OpenGL **CO5:** Design algorithm
13011000 Optimization Technique	**CO1:** Define the fundamental knowledge of Linear Programming and Dynamic Programming problems. **CO2:** Show classical optimization techniques and numerical methods of optimization. **CO3:** Identify the basics of different evolutionary algorithms. **CO4:** Analyse fundamentals of Integer programming technique and apply different techniques to solve various optimization problems **CO5:** Determine decision making process about Information System, Industry-Engineering and Manufacturing Systems, Multicriteria Decision Making and Operations and Supply Chain Management.
13011100 Software Engineering	**CO1:** Relate the importance of the stages in the software life cycle. **CO2:** Infer the various process models. **CO3:** Develop the design software by applying the software engineering principles. **CO4:** Analyse new software models, techniques and technologies to bring out innovative and novelistic solutions for the growth of the society in all aspects and evolving into their continuous professional development. **CO5:** Enhances value and is valued by their professional teammates
13010800 Web Technology	**CO1:** Define, analyze and create web pages using HTML, DHTML and Cascading Styles Sheets. **CO2:** Illustrate, analyze and build dynamic web pages using JavaScript and VB Script (client side programming). **CO3:** Identify, analyze and build interactive web applications. **CO4:** Discover, analyze and build web applications using PHP. **CO5:** Assess, analyze and create XML documents and XML Schema

13010900 Web Technology Lab	**CO1:** Select, understand, and analyze any suitable real time web application. **CO2:** Interpret java and server-side scripting languages to develop web applications. **CO3:** Develop and deploy real time web applications in web servers and in the cloud. **CO4:** Analyse this knowledge to .Net platforms. **CO5:** Determine real life examples
13003000 Ability & Skill Enhancement - IV	**CO1:** Design the resume and know about different format **CO2:** Know and classify the different types of interviews i.e. Mock Interview, HR Expert Mock Interview, Telephonic Interviews. **CO3:** Examine the Company Specific Research and Presentation. **CO4:** Build conversation skill **CO5:** Find out Industry suitable for internship or job.

9.2 Mapping: Semester – IV

13010200	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	1	-	3	-	2	-	2	2	-	3
CO2	3	-	2	3	-	2	-	3	3	-	2	3
CO3	2	1	2	2	2	3	3	1	3	3	3	3
CO4	2	3	1	-	3	-	2	2	1	1	-	3
CO5		4	2		3		2		3		3	

13010300	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	-	3	-	3	-	2	2	1	3
CO2	2	-	2	3	-	2	2	3	-	-	2	3
CO3	2	2	2	2	3	3	3	1	3	3	3	3
CO4	3	3	1	-	3	-	2	2	3	1	-	3
CO5		3		3		2		2		3	2	

13010600	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	-	3	-	3	-	2	2	1	3
CO2	2	-	2	3	-	2	2	3	-	-	2	3
CO3	2	2	2	2	3	3	3	1	3	3	3	3
CO4	3	3	1	-	3	-	2	2	3	1	-	3
CO5		3		3	3	3	3		3		3	

13010700	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	-	2	-	3	-	2	2	1	3
CO2	2	-	2	3	2	2	2	3	-	-	2	3
CO3	2	2	2	2	2	3	3	1	3	3	3	3
CO4	3	3	1	-	-	-	2	2	3	1	-	3
CO5		3	3	3		3		3		3	3	3

13010400	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	3	-	2	-	3	-	2	2	1	3
CO2	2	-	2	3	2	2	2	3	-	-	2	3
CO3	2	2	2	2	2	3	3	1	3	3	3	3
CO4	1	3	1	-	-	-	2	2	2	1	-	3
CO5	2		2		3	3	2	3		2	3	

13010500	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	3	-	3	-	3	-	3	2	2	3
CO2	2	-	2	3	2	2	2	3	-	-	2	3
CO3	2	2	2	2	2	3	3	1	3	3	3	3
CO4	1	3	1	-	-	-	2	2	2	1	-	3
CO5		3	3	3	3		3		3	3	3	

13011000	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	3	-	3	-	3	-	3	2	2	3
CO2	2	-	2	3	2	2	2	3	-	-	2	3
CO3	2	2	2	2	2	3	3	1	3	3	3	3
CO4	1	3	1	-	-	-	2	2	2	1	-	3
CO5		3		3	3	3		3	3	3		

13011100	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	3	-	3	-	3	-	3	2	2	3
CO2	2	-	2	3	2	2	2	3	-	-	2	3
CO3	2	2	2	2	2	3	3	1	3	3	3	3
CO4	1	3	1	-	-	-	2	2	2	1	-	3
CO5		3	3	3		3	3	3		3	3	

13010800	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	2	-	3	-	3	-	3	2	2	3
CO2	3	-	3	3	2	2	2	3	-	-	2	3
CO3	2	2	2	2	2	3	3	1	3	3	3	3
CO4	-	3	2	-	-	-	2	3	2	3	-	3
CO5		3	3	3			3	3		3		3

13010900	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	1	-	3	-	3	-	3	3	2	3
CO2	3	-	3	3	3	2	2	3	-	-	2	3
CO3	2	2	2	2	3	3	3	1	3	3	3	3
CO4	-	3	2	-	-	-	2	3	2	3	-	3
CO5		3	3	3		3		3		3	3	3

13003000	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3		3	2	2		3	3	3		2
CO2	3	3	3	3	3	2		2	2	3	3	2
CO3					3	2			2	3	2	2
CO4	3	3	2	3	2	2				3	3	2
CO5	3	3		3	3		3	3	2		2	2

9.3 Lesson Plans: Semester – VI

13010200 – Java Programming Language

Unit	Particulars	Class No.	Pedagogy of Class
1	Brief History of Java, Object oriented programming, characteristics of object orientated programming	C1	Lecture
1	JDK Environment Variables, classes, Java Programming: classes, object, etc.	C2	Lecture
1	JVM, Java Programming: Introduction, Data types, access specifiers,	C3	Lecture
1	Fundamental Data types, operators, control statements, arrays.	C4	Lecture
1	operators, control statements, arrays.	C5	Lecture
1	Classes: Fundamentals, objects, methods.	C6	Lecture
1	constructors.	C7	Lecture
1	Inheritance: Super class, sub class, this and super operator, method	C8	Lecture
1	this and super operator, method overriding,	C9	Lecture
1	use of final, packages, abstract class, interface.	C10	Lecture
1	Polymorphism: Method	C11	Lecture
1	overloading, constructor overloading.	C12	Lecture
1	Home Assignment 1		Assignments
	Clarification Class 1	C13	Clarification Class
2	Exception Handling	C14	Lecture
2	Exception Handling	C15	Lecture
2	Multi threaded programming	C16	Lecture
2	Multi threaded programming	C17	Lecture
2	Multi threaded programming	C18	Lecture
2	Presentation	C19	Presentation
2	Java Library	C20	Lecture
2	Java Library	C21	Lecture
2	Guest lecture 1	C22	Lecture
2	Home Assignment 2		Lecture
	Clarification Class 2	C23	Lecture
3	Applets	C24	Lecture
3	Applets	C25	Lecture
3	AWT controls:	C26	Lecture
3	AWT controls:	C27	Lecture
3	Event Handling	C28	Lecture
3	Event Handling	C29	Lecture
3	Swings	C30	Lecture
3	Swings	C31	Lecture
3	Home Assignment 3		Home Assignment 3
3	Clarification Class 3	C32	Clarification Class 3
4	Networking Basics:	C33	Lecture
4	Networking Basics:	C34	Lecture
4	Guest lecture 2	C35	Lecture
4	JDBC	C36	Lecture
4	JDBC	C37	Lecture
	Webinar	C38	Webinar
4	Introduction to Java Servlets	C39	Lecture

4	Introduction to Java Servlets	C40	Lecture
	Home Assignment 4		Home Assignment 4
	Clarification Class 4	C41	Clarification Class 4
	Presentation	C42	Presentation
	Quiz	C43	Quiz
	Webinar	C44	Webinar
	Seminar	C45	Seminar

13010300 – Java Programming Language Lab

S. No.	Particulars	Class No.	Pedagogy of Class
1	Write a program to display "Hello World" in 'JAVA' language.	P1-P2	Practical
2	Implementation of input and output statements	P3-P4	Practical
3	Implementation of control statements.	P5-P6	Practical
4	Implementation of functions.	P7-P8	Practical
5	Implementation of single dimension, two dimension and three dimension array	P9-P10	Practical
6	Write a JAVA program that uses a recursive function for solving Towers of Hanoi problem.	P11-P12	Practical
7	Write a JAVA program to implement the matrix ADT using a class. The operations supported by this ADT are: a) Reading a matrix.	P13-P14	Practical
8	b) Addition of matrices.	P15-P16	Practical
9	c) Printing a matrix.	P17-P18	Practical
10	d) Subtraction of matrices.	P19-P20	Practical

13010600 – Computer Networks

Unit	Particulars	Class No.	Pedagogy of Class
UNIT I	Introduction of Computer Network		Lecture
UNIT I	Introduction+B17, Type of Network, Transmission Mode	C1	Lecture
UNIT I	Topologies	C2	Lecture
UNIT I	OSI MODEL	C3	Lecture
UNIT I	OSI MODEL	C4	Lecture
UNIT I	OSI MODEL	C5	Lecture
UNIT I	TCP/IP MODEL	C6	Lecture
UNIT I	TCP/IP MODEL	C7	Lecture
UNIT I	TCP/IP MODEL	C8	Lecture
UNIT I	Bits over signals, Synchronous communication	C9	Lecture
UNIT I	Modulation	C10	Lecture
UNIT I	Home Assignment 1		Home Assignment 1
UNIT I	Throughput and Noise	C11	Lecture
UNIT I	Multiplexing-Time and Frequency	C12	Lecture
	Clarification Class	C13	Clarification Class
	Class Room Assignment 1	C14	Class Room Assignment 1
UNIT II	Packet Transmission, Frames and Multiplexing	C15	Lecture
UNIT II	Error Correction techniques	C16	Lecture
UNIT II	LAN/WAN Topologies	C17	Lecture
UNIT II	Home Assignment 2		Home Assignment 2
UNIT II	Shared Media and Media Access	C18	Lecture
UNIT II	Bus Topology	C19	Lecture
UNIT II	CSMA/CD	C20	Lecture
UNIT II	Wireless and CSMA/CA	C21	Lecture
	Guest Lecture	C22	Guest Lecture
UNIT II	Ethernet addressing	C23	Lecture
UNIT II	Wiring hubs	C24	Lecture
	Clarification Class	C25	Clarification Class
	Presentation 1	C26	Presentation
	Webinar	C27	Webinar
UNIT III	Other Lan Technologies		
UNIT III	Ring Topology	C28	Lecture
UNIT III	Home Assignment 3		Home Assignment 3
UNIT III	Token Pass Ring	C29	Lecture
UNIT III	Shortest path computation, Dijkstra's Algorithm, WAN technologies	C30	Lecture
	Seminar	C31	
UNIT III	Star Topology, Asynchronous transfer mode	C32	Lecture
UNIT III	IEEE 802.3, 802.5, Distance-Vector, Link-State	C33	Lecture
	Clarification Class	C34	Clarification Class
	Webinar	C35	Webinar
	Class Room Assignment 2	C36	Class Assignment
	Presentation 2	C37	Presentation
UNIT IV	INTERNET WORKING	C38	
UNIT IV	Concept, Goals, Ip addressing, Addressing Binding with ARP, Validation and testing	C39	Lecture
	Guest Lecture		Guest Lecture

	Class Room Assignment 3	C40	Class Assignment
UNIT IV	IP Datagram, Electronic mail, Remote login, IP fragmentation, ICMP, TCP and UDP	C41	Lecture
UNIT IV	Quiz	C42	Activity
UNIT IV	Clarification Class	C43	Clarification Class
	Presentation 3	C44	Presentation
	Class Room Assignment 3	C45	Class Assignment

13010700 – Computer Networks Lab

S. No.	Particulars	Class No.	Pedagogy of Class
1	Study of Different Cables& Use of Crimping Tool	P1-P2	Practical
2	Study of Network Tools	P3-P4	Practical
3	Study of Network Devices	P5-P6	Practical
4	Study of Network IP Addressing	P7-P8	Practical
5	Study of Network IP Addressing	P9-P10	Practical
6	Study of Network IP Addressing	P11-P12	Practical
7	Study about different physical equipment's used for networking.	P13-P14	Practical
8	Study different internetworking devices in a computer network	P15-P16	Practical
9	Study the working of Basic Networking Commands	P17-P18	Practical
10	To assign IP address to the PC connected to the internet	P19-P20	Practical
11	To connect the computers in Local Area Network	P21-P22	Practical
12	Workshop	P23-P24	Workshop
13	Clarification Class	P25-P26	Clarification Class
14	Activity	P27-P28	Activity
15	Revision	P29-P30	Clarification Class

13010400 – Computer Graphics

Unit	Particulars	Class No.	Pedagogy of Class
1	Introduction of Computer graphics, Concept	C1	Lecture
1	The Advantages of Interactive Graphics, Representative Uses of Computer Graphics,	C2	Lecture
1	The Advantages of Interactive Graphics, Representative Uses of Computer Graphics,	C3	Lecture
1	Classification of Application Development of Hardware for computer Graphics	C4	Lecture
1	software for computer Graphics, Conceptual Framework for Interactive Graph	C5	Lecture
1	software for computer Graphics, Conceptual Framework for Interactive Graph	C6	Lecture
1	software for computer Graphics, Conceptual Framework for Interactive Graph	C7	Lecture
1	Overview, Scan: Converting Lines, Algorithms	C8	Lecture
1	Scan: Converting Lines, Algorithms	C9	Lecture
1	Scan Converting Circles, Algorithm	C10	Lecture
1	Scan Converting Ellipses Algorithm	C11	Lecture
	Home Assignment 1		Take Home Assignments
1	Clarification Class 1	C12	Clarification Class
2	Technologies, Display Technologies, Raster-Scan Display System,	C13	Lecture
2	Technologies, Display Technologies, Raster-Scan Display System,	C14	Lecture
2	Webinar	C15	Lecture
2	Video Controller, Random-Scan Display processor,	C16	Lecture
2	Video Controller, Random-Scan Display processor,	C17	Lecture
2	Guest lecture	C18	Lecture
2	Input Devices for Operator Interaction, Image Scanners	C19	Lecture
2	Working exposure on graphics tools like Dream Weaver, 3D Effects etc	C20	Lecture
2	Clipping Southland- Cohen Algorithm,	C21	Lecture
2	Cyrus-Beck Algorithm, Midpoint Subdivision Algorithm	C22	Lecture
2	Midpoint Subdivision Algorithm	C23	Lecture
2	Presentation	C24	Presentation
2	Home Assignment 2		
2	Clarification Class 2	C25	Lecture
3	2D Transformation	C26	Lecture
3	Homogeneous Coordinates and Matrix Representation of 2D Transformations	C27	Lecture
3	composition of 2D Transformations	C28	Lecture
3	the Window-to-Viewport Transformations	C29	Lecture
3	Introduction to 3D Transformations Matrix	C30	Lecture
3	3D Transformations Matrix	C31	Lecture
3	Home Assignment 3		
3	Clarification Class 3	C32	class Assignment
4	Introductory Concepts: Multimedia Definition	C33	Lecture

4	CD-ROM and the multimedia highway	C34	Lecture
4	Computer Animation (Design, types of animation, using different functions)	C35	Lecture
4	Computer Animation (Design, types of animation, using different functions)	C36	Lecture
4	Uses of Multimedia, Introduction to making multimedia	C37	Lecture
4	Guest lecture	C38	Lecture
4	Uses of Multimedia, Introduction to making multimedia	C39	Lecture
4	Home Assignment 4	C40	Lecture
4	Clarification Class 4		
4	Presentation	C41	Lecture
	class Assignment 2	C42	Presentation
	Webinar	C43	class Assignment
	Quiz	C44	Lecture
	Seminar	C45	Lecture

13010500 – Computer Graphics Lab

S. No.	Particulars	Class No.	Pedagogy of Class
1	introduction of graphics library of C	P1-P2	Practical
2	project in c	P3-P4	Practical
3	Students are required to understand the graphics library available in Compiler and other graphical software	P5-P6	Practical
4	Students are required to understand the graphics library available in Compiler and other graphical software	P7-P8	Practical
5	Students are required to understand the graphics library available in Compiler and other graphical software	P9-P10	Practical
6	Students are required to understand the graphics library available in Compiler and other graphical software	P11-P12	Practical
7	Preliminary study of Open GL, Open CV	P13-P14	Practical
8	Preliminary study of Open GL, Open CV	P15-P16	Practical
9	Preliminary study of Open GL, Open CV	P17-P18	Practical
10	Preliminary study of Open GL, Open CV	P19-P20	Practical
11	To make small program of graphics using C, JAVA	P21-P22	Practical
12	To make small program of graphics using C, JAVA	P23-P24	Practical
13	Presentation	P25-P26	Presentation
14	Clarification Class	P27-P28	Clarification Class
15	Quiz	P29-P30	Quiz

13011000 – Optimization Technique

Unit	Particulars	Class No.	Pedagogy of Class
UNIT - I	Linear Programming Problem: Introduction and Definition of different related terms	C1	Lecture
UNIT - I	Formulation of LPP: Steps and method	C2	Lecture
UNIT - I	Questions based on formulation of LPP	C3	Lecture
UNIT - I	Solution of LPP using Graphical Method	C4	Lecture
UNIT - I	Assignment		Take Home Assignments
UNIT - I	Simplex Method: Steps for solution of LPP	C5	Lecture
UNIT - I	Solution of LPP using Simplex Method	C6	Lecture
UNIT - I	Questions based on Simplex Method; Problem of Degeneracy	C7	Lecture
UNIT - I	Primal, Dual and Dual Simplex method	C8	Lecture
UNIT - I	Assignment		Class Room Assignment
UNIT - I	Revised Simplex Method: Steps for solution	C9	Lecture
UNIT - I	Sensitivity Analysis: Introduction and explanation with examples	C10	Lecture
UNIT - I	Clarification Class	C11	Clarification Class
UNIT - II	Transportation Problems	C12	Lecture
UNIT - II	Transportation Problem with Trans-shipment	C13	Lecture
UNIT - II	Assignment Problems	C14	Lecture
UNIT - II	Classroom Assignment	C15	Class Room Assignment
UNIT - II	Vogel's method to solve the transportation problem	C16	Lecture
UNIT - II	Shortest route problem	C17	Lecture
UNIT - II	Minimal spanning tree and Graph theory	C18	Lecture
UNIT - II	Quiz	C19	Quiz
UNIT - II	Maximal flow problem	C20	Lecture
UNIT - II	Branch and Bound algorithm	C21	Lecture
UNIT - II	Travelling salesman problem	C22	Lecture
UNIT - II	Clarification Class	C23	Clarification Class
UNIT - II	Presentation	C24	Presentation
UNIT - III	Dynamic programming with forward recursions	C25	Lecture
UNIT - III	General problem on recursions	C26	Lecture
UNIT - III	Reliability problem	C27	Lecture
UNIT - III	Classroom Assignment	C28	Class Room Assignment
UNIT - III	Capital Budgeting problem	C29	Lecture
UNIT - III	Cargo loading problem	C30	Lecture
UNIT - III	Drawing of networks	C31	Lecture
UNIT - III	Presentation	C32	Presentation
UNIT - III	Removal of redundancy	C33	Lecture
UNIT - III	Network computations	C34	Lecture
UNIT - III	Free slack in computations	C35	Lecture
UNIT - III	Clarification Class	C36	Clarification Class
UNIT - III	Total slack in computations	C37	Lecture
UNIT - III	Crashing in computations	C38	Lecture
UNIT - III	Resource allocation	C39	Lecture

UNIT - III	Webinar	C40	Webinar
UNIT - III	Guest Lecture	C41	Guest lecture
UNIT - IV	Characteristics of non linear programming	C42	Lecture
UNIT - IV	Concept of convexity	C43	Lecture
UNIT - IV	Maxima of functions of n-variables using Langrange multiplier	C44	Lecture
UNIT - IV	Presentation	C45	Presentation
UNIT - IV	Minima of functions of n-variables using Langrange multiplier	C46	Lecture
UNIT - IV	Maxima of functions of n-variables using Kuhn-Tucker conditions	C47	Lecture
UNIT - IV	Minima of functions of n-variables using Kuhn-Tucker conditions	C48	Lecture
UNIT - IV	Classroom Assignment	C49	Class Room Assignment
UNIT - IV	Webinar	C50	Webinar
UNIT - IV	One dimensional search methods	C51	Lecture
UNIT - IV	Fibonacci numbers and their use	C52	Lecture
UNIT - IV	Golden section method for unconstrained problems	C53	Lecture
UNIT - IV	Presentation	C54	Presentation
UNIT - IV	Golden section method for unconstrained problems	C55	Lecture
UNIT - IV	Gradient method for unconstrained problems	C56	Lecture
UNIT - IV	Gradient method for unconstrained problems	C57	Lecture
UNIT - IV	Clarification Class	C58	Clarification Class
UNIT - IV	Guest Lecture	C59	Guest lecture
UNIT - IV	Seminar	C60	Seminar

13011100 – Software Engineering

Unit	Particulars	Class No.	Pedagogy of Class
UNIT I	Introduction		
UNIT I	Introduction to Software Engineering, importance of Software	C1	Lecture
UNIT I	The Software Evolution, Software Characteristics	C2	Lecture
UNIT I	Software Applications, Software Crisis: Problem and Causes	C3	Lecture
UNIT I	Software Development Life Cycle: Waterfall model,	C4	Lecture
UNIT I	Incremental	C5	Lecture
UNIT I	Evolutionary process models	C6	Lecture
UNIT I	Evolutionary process models	C7	Lecture
UNIT I	Personal Software process (PSP)	C8	Lecture
UNIT I	Team Software process(TSP)	C9	Lecture
UNIT I	Overview of agile process	C10	Lecture
UNIT I	Aspect oriented programming	C11	Lecture
	Clarification Class	C12	Clarification Class
	Class Assignment		Class Assignment
	Presentation	C13	Presentation
UNIT II	Software Requirement Specification & System Design		
UNIT II	Problem Analysis	C14	Lecture
UNIT II	Requirement elicitation and Validation	C15	Lecture
UNIT II	Requirements modelling: Scenarios, Information and analysis classes	C16	Lecture
	Guest Lecture	C17	Guest lecture
UNIT II	Flow and behavioural modelling	C18	Lecture
UNIT II	Documenting Software Requirement Specification (SRS)	C19	Lecture
UNIT II	System Design: Design Concepts, design models for architecture	C20	Lecture
UNIT II	Component, Data and user interfaces, Problem Partitioning	C21	Lecture
UNIT II	Abstraction, Cohesiveness	C22	Lecture
UNIT II	Coupling, Top Down	C23	Lecture
UNIT II	Bottom Up design approaches	C24	Lecture
UNIT II	Functional Versus Object Oriented Approach	C25	Lecture
UNIT II	Design Specification, 4GL	C26	Lecture
	Clarification Class	C27	Clarification Class
	Class Room Assignment	C28	Class Assignment
	Home Assignment		Home Assignments
UNIT III	Coding, Software Testing & Quality Assurance		
UNIT III	TOP-DOWN and BOTTOM-UP structure programming	C29	Lecture
UNIT III	Information Hiding, Programming Style	C30	Lecture
UNIT III	Internal Documentation, Verification	C31	Lecture
UNIT III	Software Testing: Levels of Testing	C32	Lecture
UNIT III	Functional Testing, Structural Testing	C33	Lecture
UNIT III	Test Plan, Test Case Specification	C34	Lecture
	Webinar	C35	Webinar
UNIT III	Software Testing Strategies, Verification & Validation	C36	Lecture

UNIT III	Unit, Integration Testing, Top Down and Bottom Up Integration Testing	C37	Lecture
	Class Room Assignment	C38	Class Assignment
	Guest Lecture	C39	Guest lecture
UNIT III	Alpha & Beta Testing, White box and black box testing techniques	C40	Lecture
UNIT III	System Testing and Debugging	C41	Lecture
UNIT III	Software Quality Assurance: Software Configuration Management	C42	Lecture
UNIT III	Overview of Software Quality Control and Quality Assurance	C43	Lecture
UNIT III	ISO 9000 Certification for Software Industry	C44	Lecture
UNIT III	Capability Maturity Model (CMM) and Comparison between ISO & SEI CMM	C45	Lecture
	Clarification Class	C46	Clarification Class
	Presentation	C47	Presentation
	Activity	C48	Activity
	Seminar	C49	Seminar
	Home Assignment		Home Assignments
UNIT IV	Technical Metrices for Software & CASE Tools		
UNIT IV	A Framework for Technical Software Metrics	C50	Lecture
UNIT IV	Metrics for the Analysis Model, Metrics for Design Model	C51	Lecture
UNIT IV	Metrics for Source Code, Metrics for Testing, Metrics for Maintenance.	C52	Lecture
UNIT IV	CASE (Computer Aided Software Engineering): CASE and its Scope	C53	Lecture
	Webinar	C54	Webinar
UNIT IV	CASE support in Software Life Cycle, Documentation Support	C55	Lecture
UNIT IV	Architecture of CASE Environment	C56	Lecture
UNIT IV	Exposure to CASE tools like Rational Software suit	C57	Lecture
UNIT IV	Turbo Analyst, Silk Suite	C58	Lecture
	Clarification Class	C59	Clarification Class
	Home Assignment	C60	Take Home Assignments
	Home Assignment		Take Home Assignments

13010800 – Web Technology

Unit	Particulars	Class No.	Pedagogy of Class
Unit I	What is Web Technology, Area of HTML, Why we study HTML, JS and CSS		
Unit I	History on Internet and World wide Web	C1	Lecture
Unit I	Search Engines, ISP, Domain Name,	C2	Lecture
Unit I	URL, E-mail and All technology related to E-Mail	C3	Lecture
Unit I	What is Difference Between Static and Dynamic Web page	C4	Lecture
Unit I	Introduction of HTML, Tags Related to Text Formatting Tools	C5	Lecture
Unit I	anchor tags, adding images and sounds, Lists in HTML	C6	Lecture
Unit I	Frames in HTML	C7	Lecture
Unit I	Tables in HTML	C8	Lecture
Unit I	Forms in HTML-1	C9	Lecture
Unit I	Forms in HTML-2	C10	Lecture
Unit I	global and Local Tags	C11	Lecture
Unit I	ID and Class Attributes in html, Mao tag in HTML	C12	Lecture
	clarification Class	C13	Clarification Class
	Class Room Assignment-1	C14	
	Home Assignment-1		Home Assignments
Unit II	Introduction of Java Script		
Unit II	Introduction to Java Script, Data Types and Controls	C15	Lecture
Unit II	Types of Operators, Functions, Types of Functions, Objects in Java Scrip	C16	Lecture
Unit II	Handling Events	C17	Lecture
Unit II	Introduction of CSS, Internal and External CSS	C18	Lecture
Unit II	Introduction of JS, Uses of CSS	C19	Lecture
Unit II	Designing of WebPage-1 Uses of HTML and CSS	C20	Lecture
Unit II	CSS Colours, CSS Borders, CSS Margins	C21	Lecture
	Class Room Assignment-2	C22	Lecture
	Guest Lecture	C23	Guest lecture
Unit II	CSS Outline, CSS text, CSS Tables, CSS Tips	C24	Lecture
	Clarification Class	C25	Clarification Class
	Presentation 1	C26	Presentation
	Webinar	C27	Webinar
Unit III	DHTML		
Unit III	What is DHTML, What is Role in HTML	C28	Lecture
Unit III	Java Script and DHTML, Document Object model	C29	Lecture
Unit III	Filter and Transitions	C30	Lecture
Unit III	DHTML Events-I	C31	Lecture
Unit III	DHTML Events-II	C32	Lecture
Unit III	Dynamic Changes in HTML Document-1	C33	Lecture
Unit III	Dynamic Changes in HTML Document-2	C34	Lecture
Unit III	Clarification Class	C35	Clarification Class
	Webinar-2	C36	Lecture
	Home Assignment 2		Home Assignment
	Presentation 2	C37	Lecture
UNIT IV	Website Creation		
UNIT IV	Introduction of tools like dreamviewer, Code Editor	C38	Lecture

UNIT IV	Web Hosting, Publishing, Introduction of XML	C39	Lecture
UNIT IV	XML Features, ML Naming rules, Difference between HTML and XML	C40	Lecture
UNIT IV	Class Room Assignment-3	C41	Lecture
UNIT IV	XML Parser DTD using XML,XML with CSS	C42	Lecture
UNIT IV	Quiz	C43	Lecture
	Clarification Class	C44	Lecture
	Presentation 3	C45	Lecture
	Home Assignment 3		Lecture

13010900 – Web Technology Lab

S. No.	Particulars	Class No.	Pedagogy of Class
1	Introduction of HTML, Browser, Online and Offline editor	P1-P2	Practical
2	Basic tags, text formatting tags	P3-P4	Practical
3	List and Type Definition Tags, Image and Anchor tags	P5-P6	Practical
4	Use of tables in HTML	P7-P8	Practical
5	Use of Frames in HTML	P9-P10	Practical
6	Introduction of JavaScript, Variables and Type Casting in HTML	P11-P12	Practical
7	Form in HTML	P13-P14	Practical
8	Use of DHTML and Use in HTML	P15-P16	Practical
9	Introduction of CSS, Tags related CSS	P17-P18	Practical
10	Use of XML and How use in WEB Designing	P19-P20	Practical
11	XML Syntax and Use in HTML Coding	P21-P22	Practical
12	Clarification Class	P23-P24	Clarification Class
13	Clarification Class	P25-P26	Clarification Class
14	Revision	P27-P28	Clarification Class
15	Revision	P29-P30	Clarification Class

13003000 – Ability & Skill Enhancement – IV

Unit	Particulars	Class No.	Pedagogy of Class
Unit I	Receiving Calls, Placing a call, Ending Calls	C1	Lecture
Unit I	Transferring calls, Taking Message/ Voice Mails, Placing call on hold	C2	Lecture
Unit I	Handling Complaints	C3	Lecture
	Telephonic Conversation	C4	Class Room Assignment
Unit II	How to build confidence by positive thinking,	C5	Lecture
Unit II	identifying negative thoughts, how to control negative thoughts entering our mind, identifying personal talents, and its ways to improve	C6	Lecture
Unit II	how to develop good habits and having principles and follow them at all times	C7	Lecture
Unit II	Need to learn new things, ideas and skills	C8	Lecture
Unit II	what is brain storming, why do we need it,	C9	Lecture
Unit II	what are the different ways of brain storming through logics and reasoning	C10	Lecture
Unit II	Brain Storming Session - Assignment	C11	Activity
	Presentation	C12	Presentation
Unit III	What is resume	C13	Lecture
Unit III	Format of Resume, Formatting	C14	Lecture
	Resume Preparation		Take Home Assignments
Unit III	Covering Letter, PI Kit	C15	Lecture
Unit IV	Mastering the art of giving interviews in	C16	Lecture
Unit IV	selection or placement interviews	C17	Lecture
Unit IV	web /video conferencing	C18	Activity
Unit IV	Mock Interview (Questions)	C19	Lecture
Unit IV	Mock Interview (Questions)	C20	Lecture
	HR Expert Mock Interview	C21	Class Room Assignment
Unit IV	Telephonic Interviews	C22	Activity
	Class Room Assignment	C23	Class Room Assignment
Unit V	Identifying domain specific industries	C24	Lecture
Unit V	Identifying domain specific industries - Assignment	C25	Activity
	researching the industry		Take Home Assignments
Unit V	Industry analysis	C26	Lecture
	Presentation on specific industry/company	C27	Presentation
	Webinar	C28	Webinar
	Guest Lecture	C29	Guest lecture
	Home Assignment		Take Home Assignments
	Clarification Class	C30	Clarification Class

10.1 Semester V	
Course	**Course outcomes: - After completion of these courses students should be able to**
13012400 Analysis and Design of Algorithm	**CO1:** Match the principles and tools of systems analysis and design **CO2:** Classify the application of computing in different context **CO3:** Identify the professional and ethical responsibilities of practicing the computer professional including understanding the need for quality **CO4:** Analysis and Design of systems of small sizes **CO5:** Assess a wide range of problems related to the analysis, design and construction of information systems
13012500 Analysis and Design of Algorithm Lab	**CO1:** Recall the various process models **CO2:** Relate to build software using software development concepts. **CO3:** Apply current techniques, skills, and tools necessary for computing practice **CO4:** Distinguish various design and development principles in the construction of software systems of varying complexity. **CO5:** Develop importance of the stages in the software life cycle.
13012600 Data Warehousing and Data Mining	**CO1:** Relate a deeper understanding of database systems and their underlying theory to be able to improve the decision-making process. **CO2:** Interpret the technology of data warehousing. **CO3:** Organize data mining concepts and techniques. **CO4:** Examine different methodologies used in data mining and data ware housing. **CO5:** Estimate the decision-making process
13012700 Mobile Computing	**CO1:** How the understanding of different generations, terminologies, systems, operations and design of wireless and mobile communications. **CO2:** Classify sufficient knowledge about IEEE 802.11 **CO3:** Identify the contribution of Mobile and Wireless Communication networks to overall technological growth **CO4:** Examine mobile computing nomenclature to describe and analyze existing mobile computing frameworks and architectures. **CO5:** Estimate Bluetooth standards.
13012800 Web Security Services	**CO1:** Define and evaluate the cyber security needs of an organization. **CO2:** Extend and analyze software vulnerabilities and security solutions to reduce the risk of exploitation. **CO3:** Identify the performance of cyber security systems. **CO4:** Analyse cyber security solutions and use of cyber security, information assurance, and cyber/computer forensics software/tools. **CO5:** Determine troubleshoot cyber security systems

13012900 Elective-I PHP & My SQL	**CO1:** Explain the differences between typical scripting languages and typical system . **CO2:** Apply your knowledge of the strengths and weaknesses of scripting languages to select an implementation language **CO3:** Analyse basic PHP syntax for variable use, and standard language constructs, such as conditionals and loops. **CO4:** Construct the syntax and use of PHP object-oriented classes. **CO5:** Assess application programming languages
13013000 Elective-I PHP & My SQL Lab	**CO1:** Define PHP programming language. **CO2:** Demonstrate the basics of PHP object-oriented programming concepts **CO3:** Build of Array concepts **CO4:** Create some real time software modules. **CO5:** Create logical based system programs
13012300 Summer Internship or Summer Project	**CO1:** Understand the real-time working of organizations. **CO2:** Demonstrate professional knowledge, skills and attitude along with the experience needed to constitute a successful career. **CO3:** Analyze career opportunities in their areas of interest. **CO4:** Build aptitude for gaining supervised professional experiences. **CO5:** Create competency and skills to take decisions during crisis and conflict situations.
13003100 Ability & Skill Enhancement - V	**CO1:** Express and build leadership quality **CO2:** Recall the traits of Successful Entrepreneurs, and Entrepreneurial qualities **CO3:** Classify the differences between organizational decision making process, entrepreneurial decision making process **CO4:** Create work related skills and prepare effective interview questions to conduct effective interviews. **CO5:** Enhance employability skills

10.2 Mapping: Semester – V

13012400	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	2	2	3	-	3	-	3	3	2	3
CO2	3	-	3	3	2	2	2	3	-	-	2	3
CO3	2	2	2	2	2	3	3	1	3	3	3	3
CO4	-	3	2	-	-	-	2	3	2	3	-	3
CO5		3	2		3		3	3		3		

13012500	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	2	2	-	1	3	-	3	3	1	3
CO2	3	-	3	3	3	2	2	3	-	-	3	3
CO3	2	2	2	2	2	3	3	1	3	3	3	3
CO4	-	3	2	-	1	-	2	3	2	3	-	3
CO5		3		3		3		3	3	3		

13012600	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	2	2	-	1	3	-	3	3	1	3
CO2	3	-	3	3	3	2	2	3	-	-	3	3
CO3	2	2	2	2	2	3	3	1	3	3	3	3
CO4	-	3	2	-	1	-	2	3	2	3	-	3
CO5	3		3		3		3		3	3	3	

13012700	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	-	2	-	1	3	-	3	3	2	3
CO2	3	-	3	3	3	2	2	3	-	-	3	3
CO3	2	2	3	2	2	3	3	2	3	3	3	3
CO4	1	3	3	-	2	-	2	3	2	3	-	3
CO5	3		3		3	3		3	3		3	

13012800	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	-	2	-	1	3	-	3	3	2	3
CO2	3	-	3	3	3	2	2	3	-	-	3	3
CO3	2	2	3	2	2	3	3	2	3	3	3	3
CO4	1	3	3	-	2	-	2	3	2	3	-	3
CO5		3	3	3		3	3	3	3		3	

13012900	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	-	2	-	1	3	-	3	3	2	3
CO2	3	-	3	3	3	2	2	3	-	-	3	3
CO3	2	2	3	2	2	3	3	2	3	3	3	3
CO4	1	3	3	-	2	-	2	3	2	3	-	3
CO5	2		3	3	2	3		3	2	3	2	2

13013000	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	-	2	-	1	3	-	3	3	2	3
CO2	3	-	3	3	3	2	2	3	-	-	3	3
CO3	2	2	3	2	2	3	3	2	3	3	3	3
CO4	1	3	3	-	2	-	2	3	2	3	-	3
CO5	3		3	3	3	3		3		3		

13012300	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	3	3	3	3	2	2	2	-	3
CO2	-	2	3	-	2	2	2	-	3	3	3	3
CO3	2	-	-	3	-	2	-	3	2	-	2	3
CO4	3	3	2	2	2	-	-	2	-	3	2	2
CO5	3	3	3	3	3	3	3	3	3	3	3	3

13003100	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	3	2	2					3	2	2
CO2	2			3	2	2		2		3		2
CO3	3	3				2		3	2	3	3	2
CO4		2	3	3	2	3		3	2	3		2
CO5	3	3	2	2	3	2	3	2	3	2	3	2

10.3 Lesson Plans: Semester - V

13012400 – Analysis and Design of Algorithm

Unit	Particulars	Class No.	Pedagogy of Class
UNIT I	Basic of Algorithm Analysis & Design, Algorithm Design Techniques		
UNIT I	Algorithm Definition, Analysing algorithms	C1	Lecture
UNIT I	Order arithmetic, time and space complexity, Stack & Queues	C2	Lecture
UNIT I	Heaps & Heap Sort, Sets and Disjoint Set	C3	Lecture
UNIT I	Union & Find Algorithms	C4	Lecture
UNIT I	Sorting in linear time	C5	Lecture
UNIT I	Tower of Hanoi	C6	Lecture
	Clarification Class	C7	Clarification Class
UNIT II	Divide & Conquer, Greedy Method		
UNIT II	Divide & Conquer: General Method	C8	Lecture
UNIT II	Merge Sort	C9	Lecture
UNIT II	Solving Recurrences by substitution method	C10	Lecture
	Recursive Tree Method.	C11	Lecture
	Home Assignment 1		Take Home Assignments
	Presentation 1	C12	Presentation
UNIT II	Greedy Method: General Strategy	C13	Lecture
UNIT II	Job Sequencing with Deadlines	C14	Lecture
UNIT II	Job Sequencing with Deadlines	C15	Lecture
	Guest Lecture	C16	Guest lecture
UNIT II	Knapsack problem	C17	Lecture
	Activity	C18	Activity
UNIT II	Knapsack problem	C19	Lecture
	Class Room Assignment 1	C20	Class Room Assignment
UNIT II	Dijkstra Algorithm	C21	Lecture
UNIT II	Dijkstra Algorithm	C22	Lecture
UNIT II	Minimum spanning trees	C23	Lecture
UNIT II	Minimum spanning trees	C24	Lecture
	Activity	C25	Activity
	Clarification Class	C26	Clarification Class
	Class Room Assignment 2	C27	Class Room Assignment
UNIT III	Dynamic Programming		
UNIT III	Use of table instead of recursion	C28	Lecture
UNIT III	All pair shortest Path	C29	Lecture
	Presentation 3	C30	Presentation
UNIT III	0/1 knapsack	C31	Lecture
	Webinar	C32	Webinar
UNIT III	Matrix Chain Multiplication	C33	Lecture
	Class Room Assignment 3	C34	Class Room Assignment
	Guest Lecture	C35	Guest lecture
UNIT III	Optimal binary search tree	C36	Lecture

UNIT III	Longest Common Subsequence	C37	Lecture
UNIT III	Traveling salesperson problem	C38	Lecture
	Clarification Class	C39	Clarification Class
	Presentation 3	C40	Presentation
	Quiz	C41	Quiz
	Seminar	C42	Seminar
	Home Assignment		Take Home Assignments
UNIT IV	Backtracking & Problem Clauses		
UNIT IV	Backtracking: 8 queens problem	C43	Lecture
UNIT IV	Backtracking: 8 queens problem	C44	Lecture
UNIT IV	graph colouring	C45	Lecture
UNIT IV	graph colouring	C46	Lecture
UNIT IV	graph colouring	C47	Lecture
UNIT IV	sum of subset	C48	Lecture
	Class Room Assignment 4	C49	Class Room Assignment
UNIT IV	sum of subset	C50	Lecture
	Webinar	C51	Webinar
	Clarification Class	C52	Clarification Class
UNIT IV	P, NP	C53	Lecture
UNIT IV	NP- Hard	C54	Lecture
UNIT IV	NP-complete	C55	Lecture
UNIT IV	NP-complete	C56	Lecture
	Home Assignment 3		Take Home Assignments
	Presentation 4	C57	Presentation
UNIT IV	basic concept of NP Hard & NP Complete problem	C58	Lecture
UNIT IV	basic concept of NP Hard & NP Complete problem	C59	Lecture
UNIT IV	Clarification Class	C60	Clarification Class

13012500 – Analysis and Design of Algorithm Lab

S. No.	Particulars	Class No.	Pedagogy of Class
1	Linear Search & Its Time Complexity Computation.	P1-P2	Practical
2	Binary Search & Its Time Complexity Computation.	P3-P4	Practical
3	Insertion Sort & Its Time Complexity Computation	P5-P6	Practical
4	Merge Sort & Its Time Complexity Computation	P7-P8	Practical
5	Merge Sort & Its Time Complexity Computation	P9-P10	Practical
6	Quick Sort & Its Time Complexity Computation	P11-P12	Practical
7	Quick Sort & Its Time Complexity Computation	P13-P14	Practical
8	Topological ordering of vertices in a given graph	P15-P16	Practical
9	Topological ordering of vertices in a given graph	P17-P18	Practical
10	Heap Sort & Its Time Complexity Computation	P19-P20	Practical
11	Heap Sort & Its Time Complexity Computation	P21-P22	Practical
12	Minimum cost spanning tree	P23-P24	Practical
13	Clarification Class	P25-P26	Clarification Class
14	Activity	P27-P28	Activity
15	Clarification Class	P29-P30	Clarification Class

13012600 – Data Warehousing and Data Mining

Unit	Particulars	Class No.	Pedagogy of Class
UNIT 1	DATA MINING		
UNIT 1	Introduction of Syllabus, Introduction of Data Mining, What kind data to be mined, Data Mining Functionalities	C1	Lecture
UNIT 1	Classification of Data Mining System, Data Mining Task	C2	Lecture
UNIT 1	Major issues in Data Mining System, Descriptive Data pre processing	C3	Lecture
UNIT 1	Knowledge Discovery in Data Mining	C4	Lecture
UNIT 1	Home Assignment No.1		Take Home Assignments
UNIT 1	Data Cleaning, Data Integration, Data Transformation and Hierarchy concept generation	C5	Lecture
UNIT 1	Class Assignment No. 1	C6	Class Room Assignment
UNIT 2	DATA WAREHOUSE AND OLAP TECHNOLOGY		
UNIT 2	What is Data Warehouse, Multi dimensional Analysis, Warehouse Architecture, data warehouse implementation , Usage	C7	Lecture
UNIT 2	OLAP Data Mining Pattern	C8	Lecture
UNIT 2	OLAM Data Mining Pattern	C9	Lecture
UNIT 2	Presentation No. 1	C10	Presentation
UNIT 2	Association and Corelations, Efficient and Scable Pattern	C11	Lecture
UNIT 2	From Association Mining to Correlation Analysis	C12	Lecture
UNIT 2	Home Assignment No.2		Take Home Assignments
UNIT 3	CLASSIFICATION AND PREDICTION		
UNIT 3	Introduction, Issues, Classification, Why we needed classification	C13	Lecture
UNIT 3	Classification by Decision Tree	C14	Lecture
UNIT 3	Rule Based Classification	C15	Lecture
UNIT 3	Class Assignment No. 2	C16	Class Room Assignment
UNIT 3	Classification by Back Propagation, Lazy Learners	C17	Lecture
UNIT 3	Home Assignment No. 3		Take Home Assignments
UNIT 3	Other Classification Methods	C18	Lecture
UNIT 3	Predication, Error and Accuracy Measures	C19	Lecture
UNIT 3	Evaluating the accuracy of Predictor	C20	Lecture
UNIT 3	Cluster Analysis, Types of Data in Cluster Analysis	C21	Lecture
UNIT 3	Presentation No. 2	C22	Presentation
UNIT 3	Major Clustering Methods	C23	Lecture
UNIT 3	Partioning Methods	C24	Lecture
UNIT 3	Class Assignment No. 3	C25	Class Room Assignment
UNIT 3	Guest Lecture 1	C26	Guest lecture
UNIT 4	MINING COMPLEX TYPES OF DATA		

UNIT 4	Multidimensional Analysis and descriptive Mining of Complex data	C27	Lecture
UNIT 4	Mining Spatial Database	C28	Lecture
UNIT 4	Multimedia Database	C29	Lecture
UNIT 4	Seminar 1	C30	Seminar
UNIT 4	Mining World Wide web	C31	Lecture
UNIT 4	Application and Trends in Data Mining	C32	Lecture
UNIT 4	Data Mining Applications	C33	Lecture
UNIT 4	Webinar 1	C34	Webinar
UNIT 4	Data Mining System Products	C35	Lecture
UNIT 4	Research Prototypes	C36	Lecture
UNIT 4	Guest Lecture 2	C37	Guest lecture
UNIT 4	Activity	C38	Activity
UNIT 4	Social Impacts on Data Mining	C39	Lecture
UNIT 4	Trends in Data Mining	C40	Lecture
UNIT 4	Webinar 2	C41	Webinar
UNIT 1	Clarification Class 1	C42	Clarification Class
UNIT 2	Clarification Class 2	C43	Clarification Class
UNIT 3	Clarification Class 3	C44	Clarification Class
UNIT 4	Clarification Class 4	C45	Clarification Class

13012700 – Mobile Computing

Unit	Particulars	Class No.	Pedagogy of Class
Unit I	Introduction of MOC and their history, Applications, Issues.	C1	Lecture
Unit I	Market of Mobile Communications, Frequency of Radio Transmission.	C2	Lecture
Unit I	Analog and Digital Signals, Antennas, Signal Propagation, Transmission Path of Propagation.	C3	Lecture
Unit I	About Multiplexing, Frequency Multiplexing, Time Division Multiplexing and their Signal Diagram.	C4	Lecture
Unit I	Code Division Multiplexing, Space Division Multiplexing, Wavelength Division Multiplexing.	C5	Lecture
Unit I	Modulation: Amplitude, Phase, Frequency Shift Keying, Multicarrier Modulation	C6	Lecture
Unit I	Spread Spectrum: Direct Sequence, Frequency Hopping, Cellular System		Lecture
	Clarification Class 1	C7	Clarification Class
	Class Room Assignment 1	C8	Class Assignment
	Presentation 1	C9	Presentation
	Take Home Assignments 1		Home Assignments
Unit II	Motivation for a specialized MAC, Hidden and exposed terminals, Near and far terminals	C10	Lecture
Unit II	Introduction to SDMA, FDMA, TDMA	C11	Lecture
Unit II	Fixed TDM, Classical Aloha, Slotted Aloha, Carrier sense multiple access	C12	Lecture
Unit II	Demand assigned multiple access, PRMA packet reservation multiple access, Reservation TDMA	C13	Lecture
Unit II	Multiple access with collision avoidance	C14	Lecture
Unit II	Polling, Inhibit sense multiple access, CDMA	C15	Lecture
Unit II	Spread Aloha multiple access, Mobile communications	C16	Lecture
Unit II	Comparison of S/T/F/CDMA	C17	Lecture
	Clarification Class 2	C18	Clarification Class
	Class Room Assignment 2	C19	Class Assignment
	Presentation 2	C20	Presentation
	Quiz 1	C21	Quiz
	Webinar 1	C22	Webinar
	Guest lecture 1	C23	Guest lecture
Unit III	GSM: Mobile services, System architecture, Radio interface	C24	Lecture
Unit III	Protocols, Localization and calling, Handover	C25	Lecture
Unit III	Security, New data services	C26	Lecture
Unit III	DECT: System architecture, Protocol architecture	C27	Lecture
Unit III	Elementary Knowledge on Satellite systems: History, Applications	C28	Lecture
Unit III	Basics and architecture: GEO	C29	Lecture
Unit III	MEO, Routing, Localization, Handover	C30	Lecture
Unit III	LEO Basics and Architecture	C31	Lecture
	Clarification Class 3	C32	Clarification Class
	Class Room Assignment 3	C33	Class Assignment

	Presentation 3	C34	Presentation
	Take Home Assignments 2		Home Assignments
Unit IV	Introducing the Mobile Internet, Services for the mobile Internet	C35	Lecture
Unit IV	Business opportunities	C36	Lecture
Unit IV	Implementing WAP Services: WML: WML Variables	C37	Lecture
Unit IV	Contexts: Variable Substitution, Setting Variables, Browser Contexts	C38	Lecture
Unit IV	The Mobile Internet Standard	C39	Lecture
Unit IV	Challenges and Pitfalls of Making the Internet Mobile	C40	Lecture
Unit IV	Overview of the Wireless Application Protocol	C41	Lecture
Unit IV	WML Script: Data types, Variables, and Conversions	C42	Lecture
Unit IV	Operators and Expressions	C43	Lecture
Unit IV	Operand Conversions, Assignment Operators, Arithmetic Operators	C44	Lecture
Unit IV	Bitwise Operators, Shift Operators, Logical Operators	C45	Lecture
Unit IV	Increment and Decrement Operator , Comparison Operators	C46	Lecture
Unit IV	Type Operators, The Conditional Operator, The Comma Operator	C47	Lecture
Unit IV	Precedence and Associativity	C48	Lecture
Unit IV	WML Script Statements	C49	Lecture
Unit IV	Expressions as Statements, Blocks of Statements	C50	Lecture
Unit IV	Conditions, Loops	C51	Lecture
Unit IV	Returning from a Function, Other Statements	C52	Lecture
Unit IV	WML Script, Dialogs	C53	Lecture
Unit IV	WML Design Architecture	C54	Lecture
	Clarification Class 4	C55	Clarification Class
	Class Room Assignment 4	C56	Class Assignment
	Quiz 2	C57	Quiz
	Webinar 2	C58	Webinar
	Seminar	C59	Seminar
	Guest lecture 2	C60	Guest lecture

13012800 – Web Security Services

Unit	Particulars	Class No.	Pedagogy of Class
Unit I	Introduction WSS		
Unit I	Introduction to web Service Technologies	C1	Lecture
Unit I	Introduction to web services, Security for Web Services and Security Goals,	C2	Lecture
Unit I	Need of security and Privacy in web services,	C3	Lecture
Unit I	applications of web service security, SOA	C4	Lecture
Unit I	Web Services Principles, Web Services Architecture	C5	Lecture
Unit I	Web Services Technologies and Standards,	C6	Lecture
Unit I	SOAP	C7	Lecture
Unit I	Web Services Description Language (WSDL).	C8	Lecture
Unit I	Clarification Class (SOA)	C9	Clarification Class
Unit I	Tutorial	C10	Tutorial
Unit I	Class Room Assignment1	C11	Class Room Assignment
	Presentation 1	C12	Presentation
	Take Home Assignments 1		Take Home Assignments
Unit II	Introduction to Web Service Threats		
Unit II	Web Service Threats	C13	Lecture
Unit II	Vulnerabilities, and Countermeasures	C14	Lecture
Unit II	Threats and Vulnerabilities, Threats Modelling,	C15	Lecture
Unit II	Vulnerability Categorizations and Catalogues	C16	Lecture
Unit II	Vulnerability Categorizations and Catalogues	C17	Lecture
Unit II	Threats and Vulnerabilities Modeling.	C18	Lecture
Unit II	Threats and Vulnerabilities Metrics.	C19	Lecture
Unit II	Clarification Class (Metrics)	C20	Clarification Class
Unit II	Tutorial(T)	C21	Tutorial
Unit II	Class Room Assignment2	C22	Class Room Assignment
Unit II	Presentation 2	C23	Presentation
	Take Home Assignments 2		Take Home Assignments
Unit II	Webinar	C24	Webinar
Unit III	Standards (Web Service Security)		
Unit III	Standards for Web Service Security	C25	Lecture
Unit III	The Concept of Standard Web Services Security, Standards Framework	C26	Lecture
Unit III	An Overview of Current Standards, XML Data Security	C27	Lecture
Unit III	Security Assertions Markup Language (SAML), SOAP Message Security,	C28	Lecture
Unit III	Key and Trust Management standards,	C29	Lecture
Unit III	Standards for Policy Specification,	C30	Lecture
Unit III	Access Control Policy Standards,	C31	Lecture
Unit III	Implementations of Web Services Security Standards.	C32	Lecture
Unit III	Class Room Assignment3	C33	Class Room Assignment
Unit III	Activity	C34	Activity

Unit III	Clarification Class	C35	Clarification Class
Unit III	Presentation 3	C36	Presentation
Unit IV	Introduction to DIM		
Unit IV	Digital Identity Management	C37	Lecture
Unit IV	Trust Negotiation: Overview of Digital Identity Management	C38	Lecture
Unit IV	Overview of Existing Proposals Liberty Alliance,	C39	Lecture
Unit IV	WS-Federation, Comparison of Liberty Alliance	C40	Lecture
Unit IV	WS-Framework, Other Digital Identity Management Initiatives	C41	Lecture
Unit IV	Discussion on Security of Identity Management Systems,	C42	Lecture
Unit IV	Business Processes.	C43	Lecture
	Webinar	C44	Webinar
	Quiz	C45	Quiz
	Guest lecture	C46	Guest lecture
Unit IV	Clarification Class	C47	Clarification Class
Unit IV	Class Room Assignment4	C48	Class Room Assignment
Unit V	Access Control for Web Services	C49	Lecture
Unit V	Approaches to Enforce Access Control for Web Services	C50	Lecture
Unit V	WSAC: An Adaptive Access Control Model for Stateless,	C51	Lecture
Unit V	WSAC: An Adaptive Access Control Model for Stateless,	C52	Lecture
Unit V	Web Services, The WS-AC Model,	C53	Lecture
Unit V	WS-AC Identity Attribute Negotiation,	C54	Lecture
Unit V	WS-AC Identity Attribute Negotiation,	C55	Lecture
Unit V	Tutorial	C56	Tutorial
	Quiz	C57	Quiz
Unit V	WS-AC Parameter Negotiation.	C58	Lecture
Unit V	WS-AC Parameter Negotiation.	C59	Lecture
	Seminar	C60	Seminar

13012900 – Elective-I PHP & My SQL

Unit	Particulars	Class No.	Pedagogy of Class
Unit I	Introduction to PHP: What is PHP How PHP better than other Benefits Of Using PHP MYSQL Server Client Environment	C1	Lecture
Unit I	Web Browse Web Server Installation & Configuration Files.	C2	Lecture
Unit I	Development Concept: How PHP Script Work PHP Syntax Write your First PHP Program Embed PHP In HTML/HTML In PHP	C3	Lecture
Unit I	PHP Data Type Variable In PHP Contents In PHP Operator In PHP	C4	Lecture
Unit I	PHP Data Type Variable In PHP Contents In PHP Operator In PHP	C5	Lecture
Unit I	Control Structure, Looping, Switch Statement	C6	Lecture
Unit I	Function: User-defined, Pre-defined, Array: Indexed, Associative, Multidimensional	C7	Lecture
Unit I	Date Time, Mail Function, Hash functions, Include(), Required(), Super-Global Variables, isset(), isempty() functions	C8	Lecture
	Clarification Class	C9	Clarification Class
	Class Room Assignment	C10	Class Room Assignment
	Presentation	C11	Presentation
Unit II	Array: What is Array Syntax Associative Array Numeric Array Multi-Dimensional Array	C12	Lecture
Unit II	String Function Chr() strlen() strpos() strcmp()	C13	Lecture
Unit II	Working with File Opening File Reading File Writing File Closing File, Appending File Uploading File	C14	Lecture
Unit II	OOPs Concept Class & Object Access Modifier Properties of Object Encapsulation and abstraction	C15	Lecture
Unit II	Inheritance Polymorphism, Function overriding Abstract class	C16	Lecture
Unit II	State Management Creating Cookies Set Cookies Destroying Cookies Creating Session Set Session Destroying Session	C17	Lecture
Unit II	Error Handling & Exception Introduction to Error Try, catch, throw Block Handling	C18	Lecture
	Clarification Class	C19	Clarification Class
	Class Room Assignment	C20	Class Room Assignment
	Presentation	C21	Presentation
	Quiz	C22	Quiz
	Webinar	C23	Webinar
	Guest lecture	C24	Guest lecture
	Take Home Assignments		Take Home Assignments
Unit III	Introduction to MYSQL What is Database? Understanding an RDBMS Understanding Tables, Record & Fields SQL Language	C25	Lecture

Unit III	Working with MYSQL Admin Working with PHP My Admin Types Data Type	C26	Lecture
Unit III	Creating Database & Tables Dropping	C27	Lecture
Unit III	Database & Tables Adding Fields Selecting Table Alerting Fields Properties	C28	Lecture
Unit III	MySQL Function in PHP Database	C29	Lecture
Unit III	Connections Managing Database	C30	Lecture
Unit III	Connections Performing Queries Closing Connection	C31	Lecture
	Clarification Class	C32	Clarification Class
	Class Room Assignment	C33	Class Room Assignment
	Presentation	C34	Presentation
	Take Home Assignments		Take Home Assignments
Unit IV	SQL Queries Create Database & Table Drop Database & Table Insert Record Select Record Deleting Record Modifying Record WHERE Clause Using Operators Sorting Records Eliminating Duplicates Grouping Records, Having Clause Joining Tables Subqueries Using Table And Column Aliases	C35	Lecture
Unit IV	SQL Queries Create Database & Table Drop Database & Table Insert Record Select Record Deleting Record Modifying Record WHERE Clause Using Operators Sorting Records Eliminating Duplicates Grouping Records, Having Clause Joining Tables Subqueries Using Table And Column Aliases	C36	Lecture
Unit IV	SQL Queries Create Database & Table Drop Database & Table Insert Record Select Record Deleting Record Modifying Record WHERE Clause Using Operators Sorting Records Eliminating Duplicates Grouping Records, Having Clause Joining Tables Subqueries Using Table And Column Aliases	C37	Lecture
Unit IV	SQL Queries Create Database & Table Drop Database & Table Insert Record Select Record Deleting Record Modifying Record	C38	Lecture
Unit IV	WHERE Clause Using Operators Sorting Records Eliminating Duplicates Grouping Records, Having Clause Joining Tables Subqueries Using Table And Column Aliases	C39	Lecture
	Clarification Class	C40	Clarification Class
	Class Room Assignment	C41	Class Room Assignment
	Presentation	C42	Presentation
	Webinar	C43	Webinar
	Seminar	C44	Seminar
	Guest lecture	C45	Guest lecture
	Take Home Assignments		Take Home Assignments

13013000 – Elective-I PHP & My SQL Lab

S. No.	Particulars	Class No.	Pedagogy of Class
1	1. Create a Php webpage and print "hello world" 2. Create a Php program to find odd or even number from given number.	P1-P2	Practical
2	4. Write a PHP program to swap two numbers. 5. Write a PHP Program to demonstrate the variable function: a. Gettype() b. Settype()	P3-P4	Practical
3	6. Write a PHP Program to demonstrate the variable unction a. isset() b. unset() 7. Give the example of variable function: a. strval() b. floatval() c. intval() d. print_r() e. var_dump()	P5-P6	Practical
4	8. Give the example of string function a. substr() b. substr() c. strcmp() d. strcasecmp() e. strpos() f. strpos() 9. Write a PHP program that demonstrate form element (input elements).	P7-P8	Practical
5	10. Write a PHP program that demonstrate passing variable using URL. i. Write a PHP program that demonstrate use of session:1 ii. Write a PHP program that demonstrate use of session:2 11. Write a program that demonstrate use of cookies: 1 Write a program that demonstrate use of cookies: 2	P9-P10	Practical
6	12. Write a PHP program to create a database using MySQL 13. Write a PHP program to drop a database using MySQL.	P11-P12	Practical
7	14. Write a PHP program to create a table in MySQL. 15. Write a PHP program to insert record into a table using MySQL.	P13-P14	Practical
8	16. Write a PHP program to drop table using MySQL.	P15-P16	Practical
9	17. Write a program to update table:6	P17-P18	Practical
10	18. Write a PHP program to select data and show into table format	P19-P20	Practical
11	19. Create a student Registration in PHP and Save and Display the student Records.	P21-P22	Practical

12	20. Write a program to Develop student registration form and display all the submitted data on another page.	P23-P24	Practical
13	Presentation	P25-P26	Presentation
14	Clarification Class	P27-P28	Clarification Class
15	Quiz	P29-P30	Quiz

13003100 – Ability & Skill Enhancement Module – V

Unit	Particulars	Class No.	Pedagogy of Class
Unit I	What is leadership? Traits of Leadership, Identifying leaders and traits of Leadership	C1	Lecture
Unit I	What is leadership? Traits of Leadership, Identifying leaders and traits of Leadership	C2	Activity
Unit I	Movie/ Story/ Interviews of leaders: Identify leadership qualities	C3	Activity
Unit I	Leadership: Debate/ Screening of a debate	C4	Activity
Unit I	Leadership: Debate	C5	Activity
Unit I	Leadership: Group Discussion	C6	Group discussions
Unit I	Leadership: Presentations on leaders	C7	Group discussions
Unit I	Leadership: Presentations on leaders	C8	Presentation
Unit I	Clarification Class I	C9	Clarification Class
Unit II	What is Entrepreneurship, Traits of Successful Entrepreneurs	C10	Lecture
Unit II	Movie/ Story/Interviews of Entrepreneurs: Identify Entrepreneurial qualities,	C11	Activity
Unit II	Entrepreneurs: Group Discussion	C12	Activity
Unit II	Entrepreneurs: Debate	C13	Debate
Unit II	Presentation on Entrepreneurs	C14	Presentation
Unit II	Presentation on Entrepreneurs	C15	Presentation
	Take Home Assignments I		Home Assignments
Unit III	What are organizational skills, how to develop them,	C16	Webinar
Unit III	Skills needed to become a successful entrepreneur/administrator	C17	Quiz
Unit III	Organizational skills can be developed by discipline making a system, rules, delegation of power at workplace, etc	C18	Presentation
Unit III	Employability Skills: How to enhance employability skills	C19	Guest lecture
Unit III	Employability Skills: why do we need them	C20	Presentation
Unit III	Class Room Assignment-1	C21	Class Assignment
Unit III	Employability Skills: different workplaces, having different needs, different skills	C22	Activity
Unit III	how to recognize different work skills	C23	Class Assignment
Unit III	Process of decision making- steps, its basics, and the basics of organizational decision making process	C24	Activity
Unit III	entrepreneurial decision making, how to make a right decision at right time, dilemma.	C25	Activity
Unit IV	Clarification Class II	C26	Clarification Class
Unit IV	Conducting Interviews with Leaders/ Entrepreneurs	C27	Class Assignment
	Take Home Assignments II		Home Assignments
Unit IV	Preparing Questions	C28	Class Assignment
Unit IV	Preparing Questions	C29	quiz
Unit V	Clarification Class III	C30	Clarification Class

11.1 Semester VI	
Course	**Course outcomes: - After completion of these courses students should be able to**
13013100 Software Testing and Quality Assurance	**CO1:** Show modern software testing processes in relation to software development and project management. **CO2:** Illustrate test strategies and plans, design test cases, prioritize and execute them. **CO3:** Organize incidents and risks within a project. **CO4:** Discover various automation tools **CO5:** Create test strategies
13013200 Theory of Computation	**CO1:** Define are the concepts of formal languages of finite automata techniques **CO2:** Illustrate Finite Automata's for different Regular Expressions and Languages **CO3:** Construct context free grammar for various languages **CO4:** Distinguish various problems of applying normal form techniques, push down automata and Turing Machines **CO5:** Support in participation in GATE, PGECET and other competitive examinations
13013300 Elective-II Unix & Shell Programming	**CO1:** How to describe and use the UNIX operating system. **CO2:** Demonstrate and use the fundamental UNIX system tools and utilities. **CO3:** Identify and write shell scripts in order to perform basic shell programming. **CO4:** Examine and understand the UNIX file system. **CO5:** Explain the UNIX file system with its practical use.
13013400 Elective-II Unix & Shell Programming Lab	**CO1:** Recall UNIX structure, commands, and utilities. **CO2:** Explain and understand the UNIX file system. **CO3:** Construct shell scripts in order to perform shell programming. **CO4:** Classify knowledge about text processing utilities, process management and system operation of UNIX. **CO5:** Justify physical points of vulnerability
13013500 Cloud Computing	**CO1:** Infer the core concepts of the cloud computing paradigm **CO2:** Apply fundamental concepts in cloud infrastructures to understand the trade offs in power, efficiency and cost, and then study how to leverage and manage single and multiple data centers to build and deploy cloud applications that are resilient, elastic and cost-efficient. **CO3:** Contrast system, network and storage virtualization and outline their role in enabling the cloud computing system model. **CO4:** Illustrate the fundamental concepts of cloud storage and

	demonstrate their use in storage systems such as Amazon S3 and HDFS. **CO5:** Justify how to leverage and manage single and multiple datacenters
13013600 Major Project	**CO1:** Choose the alternative solutions, compare them, and select the optimum one. **CO2:** Classify the various skills and perform well in teams. **CO3:** Determine the practical problems of the society and find the better solution. **CO4:** Design and develop hardware and/or software for their project specific problem. **CO5:** Students will be able to prepare a SRS report
13003200 Ability & Skill Enhancement – VI	**CO1:** Learn about verbal reasoning & English aptitude **CO2:** Develop a winning attitude **CO3:** Learn the ways to understand news and be a journalist. **CO4:** Learn the ability to prepare reports on major national and international news. **CO5:** Conduct chat shows, panel discussions, parliamentary debates etc.

11.2 Mapping: Semester – VI

13013100	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	-	2	-	1	3	-	3	3	2	3
CO2	3	-	3	3	3	2	2	3	-	-	3	3
CO3	2	2	3	2	2	3	3	2	3	3	3	3
CO4	1	3	3	-	2	-	2	3	2	3	-	3
CO5	3	3		3		3		3		3	3	

13013200	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	-	2	-	1	3	-	3	3	2	3
CO2	3	-	3	3	3	2	2	3	-	-	3	3
CO3	2	2	3	2	2	3	3	2	3	3	3	3
CO4	1	3	3	-	2	-	2	3	2	3	-	3
CO5		3	3		3		3		3	3	3	

13013300	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	-	2	-	1	3	-	3	3	2	3
CO2	3	-	3	3	3	2	2	3	-	-	3	3
CO3	2	2	3	2	2	3	3	2	3	3	3	3
CO4	1	3	3	-	2	-	2	3	2	3	-	3
CO5		2	2	3	3		3	3		3		2

13013400	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	-	2	-	1	3	-	3	3	2	3
CO2	3	-	3	3	3	2	2	3	-	-	3	3
CO3	2	2	3	2	2	3	3	2	3	3	3	3
CO4	1	3	3	-	2	-	2	3	2	3	-	3
CO5	1		3	3		3	2		2	3	3	

13013500	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	-	2	-	1	3	-	3	3	2	3
CO2	3	-	3	3	3	2	2	3	-	-	3	3
CO3	2	2	3	2	2	3	3	2	3	3	3	3
CO4	1	3	3	-	2	-	2	3	2	3	-	3
CO5		3		3		3		3		3		3

13013600	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	-	2	-	1	3	-	3	3	2	3
CO2	3	-	3	3	3	2	2	3	-	-	3	3
CO3	2	2	3	2	2	3	3	2	3	3	3	3
CO4	1	3	3	-	2	-	2	3	2	3	-	3
CO5		3	3		3		3		3		3	3

13003200	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2		3	2	3		3		3	2	2
CO2	2	2	3					2	3	3		2
CO3		2			3	2		3		3	3	2
CO4	2	2	3	3	2	2			3	3	3	3
CO5	3	3		3	3		3	3	2		2	2

11.3 Lesson Plans: Semester – VI

13013100 – Software Testing and Quality Assurance

Unit	Particulars	Class No.	Pedagogy of Class
Unit I	Software Development Life Cycle	C1	Lecture
Unit I	Software Development Life Cycle	C2	Lecture
Unit I	Software Testing – Psychology of Testing,	C3	Lecture
Unit I	Software Testing – Psychology of Testing,	C4	Lecture
Unit I	Verification and Validation, Testing Team and Development Team	C5	Lecture
Unit I	Verification and Validation, Testing Team and Development Team	C6	Lecture
Unit I	Characteristics of Test Engineers	C7	Lecture
Unit I	Levels of Testing	C8	Lecture
Unit I	Levels of Testing	C9	Lecture
Unit I	Top-Down versus Bottom-Up Testing, Types of Testing – Black Box	C10	Lecture
Unit I	Top-Down versus Bottom-Up Testing, Types of Testing – Black Box	C11	Lecture
Unit I	Black Box Testing	C12	Lecture
Unit I	White Box Testing	C13	Lecture
Unit I	White Box Testing	C14	Lecture
Unit I	Gorilla Testing, Beta Testing, Field Testing	C15	Lecture
Unit I	Gorilla Testing, Beta Testing, Field Testing	C16	Lecture
Unit I	Performance, Stress and Acceptance Testing	C17	Lecture
Unit I	Testing Criteria for Completion of Testing	C18	Lecture
Unit I	Manual Testing and its Limitations.	C19	Lecture
	Clarification Class-1	C20	Clarification Class
	Activity- 1	C21	Quiz/Activity
	Class Room assignment -1	C22	Class Room Assignment
Unit II	Overview of Testing Tools – Need for Automated Testing Tools,	C23	Lecture
Unit II	Overview of Testing Tools – Need for Automated Testing Tools,	C24	Lecture
Unit II	Taxonomy of Testing Tools	C25	Lecture
Unit II	Functional/Regression Testing Tools,	C26	Lecture
Unit II	Functional/Regression Testing Tools,	C27	Lecture
Unit II	Performance Testing Tools	C28	Lecture
Unit II	Testing Management Tools	C29	Lecture
Unit II	Source Code Testing Tools	C30	Lecture
Unit II	How to select a Testing Tool. • WinRunner – Overview of WinRunner	C31	Lecture
Unit II	How to select a Testing Tool. • WinRunner – Overview of WinRunner	C32	Lecture
Unit II	How to select a Testing Tool. • WinRunner – Overview of WinRunner	C33	Lecture
Unit II	Testing Applications using WinRunner	C34	Lecture
Unit II	Testing Applications using WinRunner	C35	Lecture
	Clarification Class-2	C36	Clarification Class
	Presentation-1	C37	Presentation

	Guest Lecture -1	C38	Guest Lecture
	Class Room assignment -2	C39	Class Room Assignment
	Webinar-1	C40	Webinar
	Take Home Assignment-1		Take Home Assignment
Unit III	Software Quality Assurance	C41	Lecture
Unit III	Software Quality Assurance	C42	Lecture
Unit III	Criteria for the Success of Software Project	C43	Lecture
Unit III	Process-Oriented Software Development, the Management Process.	C44	Lecture
Unit III	Process-Oriented Software Development, the Management Process.	C45	Lecture
Unit III	Metrics in Software Development, Documentation	C46	Lecture
Unit III	Metrics in Software Development, Documentation	C47	Lecture
	Clarification Class-3	C48	Clarification Class
	Presentation-2	C49	Presentation
	Class Room assignment -3	C50	Class Room Assignment
	Seminar-1	C51	Seminar
	Activity- 2	C52	Quiz/Acitivity
	Take Home Assignment-2		Take Home Assignment
Unit IV	Quality Standards, ISO 9000 Series Standards	C53	Lecture
Unit IV	Quality Standards, ISO 9000 Series Standards	C54	Lecture
Unit IV	Quality Process Implementation Issues	C55	Lecture
Unit IV	Quality Process Implementation Issues	C56	Lecture
Unit IV	Quality Process Implementation Issues	C57	Lecture
Unit IV	Clarification Class-4	C58	Clarification Class
	Presentation-3	C59	Presentation
	Class Room assignment -4	C60	Class Room Assignment

13013200 – Theory of Computation

Unit	Particulars	Class No.	Pedagogy of Class
Unit I	Finite State Machine		
Unit I	Recursive definitions, Regular Expressions, definitions of Finite State Machine, Transition Graphs	C1	Lecture
Unit I	Deterministic & Non Deterministic	C2	Lecture
Unit I	Finite State Machines,	C3	Lecture
Unit I	Thomson's & Subset Algorithm to convert regular Expression to NDFSM & NDFSM to FSM	C4	Lecture
Unit I	Thomson's & Subset Algorithm to convert regular Expression to NDFSM & NDFSM to FSM	C 5,6	Lecture
Unit I	Thomson's & Subset Algorithm to convert regular Expression to NDFSM & NDFSM to FSM	C 7,8	Lecture
Unit I	Regular Grammar left linear and right linear.	C 9,10	Lecture
Unit I	Finite State Machine with output (Moore machine and Melay Machine)	C11,12	Lecture
Unit I	Conversion of Moore machine to Melay Machine & Vice-Versa,	C13	Lecture
Unit I	Conversion of Moore machine to Melay Machine & Vice-Versa,	C14	Lecture
Unit I	Pumping Lemma, Properties and limitations of finite state machine	C15,16	Lecture
Unit I	Presentation 1	C17	Presentation
Unit I	Clarification Class 1	C18	Clarification Class
	Take Home Assignments 1		Take Home Assignments
	Activity 1	C19	Activity
Unit II	Context free Grammar design	C20	Lecture
Unit II	Normal Form CNF, GNF	C 21,22	Lecture
Unit II	Push down Stock machine, Context free Grammar	C23,24	Lecture
Unit II	Presentation 2	C25	Presentation
Unit II	Properties of context free grammar: Union, Closure & Intersection, Pumping lemma for context free grammar	C26,27	Lecture
Unit II	Properties of context free grammar: Union, Closure & Intersection, Pumping lemma for context free grammar	C28,29	Lecture
Unit II	Webinar 1	C30	Webinar
Unit II	Take Home Assignments 2		Take Home Assignments
Unit II	Parser Design and Push Down stock machine, CYK algorithm, Earley's Algorithm	C31,32	Lecture
Unit II	Clarification Class 2	C33	Clarification Class
Unit II	Class Room Assignment 1	C34	Class Room Assignment
Unit III	Turing machine, Post machine,	C35	Lecture
Unit III	Conversion of Turing to Post-Wang and vice versa, Combining Turing machine, Chomsky Hierarchy.	C 36	Lecture
Unit III	Conversion of Turing to Post-Wang and vice versa, Combining Turing machine, Chomsky Hierarchy.	C37,38	Lecture

Unit III	Presentation 3	C39	Presentation
Unit III	Conversion of Turing to Post-Wang and vice versa, Combining Turing machine, Chomsky Hierarchy.	C40	Lecture
Unit III	Church's Thesis, Primitive Recursion Functions, Godelization	C41	Lecture
Unit III	Universal Turing machine	C42	Lecture
Unit III	Clarification Class 3	C43	Clarification Class
Unit III	Class Room Assignment 2	C44	Class Room Assignment
Unit IV	Halting Problem, Turing Enumerability, Turing Acceptability and Turing Decidabilities.	C45,46	Lecture
Unit IV	Halting Problem, Turing Enumerability, Turing Acceptability and Turing Decidabilities.	C47	Lecture
Unit IV	Guest lecture 1	C48	Guest lecture
Unit IV	Class Room Assignment 3	C49	Class Room Assignment
Unit IV	Webinar 2	C50	Webinar
Unit IV	Unsolvable problems about Turing machines,	C51,52	Lecture
Unit IV	Unsolvable problems about Grammar and similar system Computation Complexity: P, NP and NP complete problems	C 53,54	Lecture
Unit IV	Activity 2	C55	Activity
Unit IV	Unsolvable problems about Grammar and similar system Computation Complexity: P, NP and NP complete problems	C56	Lecture
Unit IV	Unsolvable problems about Grammar and similar system Computation Complexity: P, NP and NP complete problems	C57	Lecture
Unit IV	Seminar	C58	Seminar
Unit IV	Class Room Assignment 4	C59	Class Room Assignment
Unit IV	Clarification Class 4	C60	Clarification Class

13013300 – Elective-II Unix & Shell Programming

Unit	Particulars	Class No.	Pedagogy of Class
Unit I	The UNIX Operating System, File system, General-purpose utilities		
Unit I	Unix Architecture	C1	Lecture
Unit I	Feature of Unix	C2	Lecture
Unit I	Posix and the single Unix Specification	C3	Lecture
Unit I	Locating Commands	C4	Lecture
Unit I	Internal and External commands	C5	Lecture
Unit I	Command Structure	C6	Lecture
Unit I	Flexibility of Command usage	C7	Lecture
Unit I	Man browsing the Manual pages online	C8	Lecture
Unit I	understanding the man documentation	C9	Lecture
Unit I	further help with man -k, apropos and what is	C10	Lecture
Unit I	Cal, date, echo, printf, who, uname, tty, passwd,	C11	Lecture
Unit I	Unix operating system	C12	Lecture
	clarification Class1	C13	Clarification Class
	Class Room Assignment-1	C14	Class Room Assignment
	Home Assignment-1		Take Home Assignments
Unit I	what is File Name, parent-child relationship, pwd, mkdir, rmdir	C15	Lecture
Unit I	Home variable: the home directory	C16	Lecture
Unit I	Unix File System	C17	Lecture
Unit II	The Bourne Shell, Simple filters, Advanced Filters – I, Advanced Filters - II		
Unit II	cat, cp, rm, mvwc, od, cmp, com, diff, gzip, gunzip	C18	Lecture
Unit II	ls -l, -d option, file ownership, file permission, changing file ownership	C19	Lecture
Unit II	vi basic, saving text and quitting	C20	Lecture
Unit II	Navigation, editing text, repeating last command	C21	Lecture
Unit II	searching for pattern, substitution redirection: three standard file	C22	Lecture
Unit II	pipes, tee, command substitution	C23	Lecture
Unit II	ps, system processes -e or -a	C24	Lecture
Unit II	mechanism of process creation, internal and external command	C25	Lecture
Unit II	process state and zombies, nice: job execution with low priority, killing process with signal	C26	Lecture
Unit II	at and batch command, job control, cron and time command	C27	Lecture
	Clarification Class2	C28	Clarification Class
	Presentation 1	C29	Presentation
	Home Assignment-2		Take Home Assignments
	Class Room Assignment-2	C30	Class Room Assignment
Unit III	Line editing with ex, Vi editor The Process, communication and scheduling		
Unit III	cut, paste, sort, uniq, tr, grep command	C31	Lecture

Unit III	basic regular expression, sed, line addressing	C32	Lecture
Unit III	read, command line argument	C33	Lecture
Unit III	exit amnd exit status of command	C34	Lecture
	Seminar-1	C35	Seminar
Unit III	case conditional, expr, while, f or, set and shift, trap interrupting a command	C36	Lecture
Unit III	Activity1	C37	Activity
Unit III	debugging shell script with set -x	C38	Lecture
	Class Room Assignment-3	C39	Class Room Assignment
	Clarification Class3	C40	Clarification Class
	Presentation 2	C41	Presentation
	Guest Lecture-1	C42	Guest lecture
UNIT IV	Programming with the Shell Introduction to System administration		
UNIT IV	root: the system administrator login	C43	Lecture
UNIT IV	the administrator privileges	C44	Lecture
UNIT IV	maintaining security	C45	Lecture
UNIT IV	user management	C46	Lecture
UNIT IV	startup and shutdown, managing disk apce	C47	Lecture
UNIT IV	device files, cpio, tar	C48	Lecture
	Clarification Class4	C49	Clarification Class
	Presentation 3	C50	Presentation
	Class Room Assignment-4	C51	Class Room Assignment
	awk filtering, splitting line into fields, variables and expressions, comparison operator	C52	Lecture
	array	C53	Lecture
	Webinar-1	C54	Webinar
	control flow	C55	Lecture
	chop function, string handling function	C56	Lecture
	for each, split, join, grep command	C57	Lecture
	export shell variables, running a script in current shell	C58	Lecture
	Webinar-2	C59	Webinar
	Guest Lecture-2	C60	Guest lecture

13013400 – Elective-II Unix & Shell Programming Lab

S. No.	Particulars	Class No.	Pedagogy of Class
1	Basic Commands in unix, VI editor	P1	Practical
2	Shell Programming, File Permission	P2	Practical
3	Factorial of any number, Write a program to check whether a given string is palindrome or not.	P3	Practical
4	Simple Interest, Global and Internal Variables, Extern Variables	P4	Practical
5	Activity1	P5	Activity
6	Bitwise operators, Size of data Types, Switch Statement	P6	Practical
7	Area of Circle	P7	Practical
8	Nested If-else, Do while	P8	Activity
9	For Loop, other scrpitng Programms	P9	Practical
10	Nano and emacs editor in linux	P10	Practical
11	c Programs in Linux	P11	Practical
12	To search a pattern using grep and fgrep command	P12	Practical
13	Linux Administration command	P13	Practical
14	Linux Networking	P14	Practical

13013500 – Cloud Computing

Unit	Particulars	Class No.	Pedagogy of Class
Unit I	Introduction To Cloud Computing		
Unit I	Introduction To Cloud Computing, The vision of cloud computing	C1	Lecture
Unit I	The cloud computing reference model	C2	Lecture
Unit I	Characteristics and benefits - Challenges ahead - Historical developments	C3	Lecture
Unit I	Distributed systems - Virtualization, Building cloud computing environments	C4	Lecture
Unit I	Application development - Infrastructure and system development	C5	Lecture
Unit I	Computing platforms and technologies	C6	Lecture
	Clarification Class 1	C7	Clarification Class
	Class Room Assignment 1	C8	Class Room Assignment
	Presentation 1	C9	Presentation
Unit II	Principles of Parallel and Distributed Computing		
Unit II	Parallel vs. distributed computing -	C10	Lecture
Unit II	Elements of parallel computing-Hardware architectures for parallel processing	C11	Lecture
Unit II	Approaches to parallel programming-Laws of Caution	C12	Lecture
Unit II	Cloud Computing Architecture Introduction	C13	Lecture
Unit II	The cloud reference model - Types of clouds - Economics of the cloud.	C14	Lecture
Unit II	Clarification Class 2	C15	Clarification Class
Unit II	Class Room Assignment 2	C16	Class Room Assignment
Unit II	Presentation 2	C17	Presentation
Unit II	Guest lecture 1	C18	Guest lecture
	Take Home Assignments 1		Take Home Assignments
Unit III	Virtualization		
Unit III	Introduction - Characteristics of virtualized environments	C19	Lecture
Unit III	Virtualization and cloud computing - Taxonomy of virtualization techniques	C20	Lecture
Unit III	Pros and cons of virtualization Technology example: VMware: full virtualization	C21	Lecture
Unit III	Cloud Computing Economics Cloud infrastructure - Economics of private clouds	C22	Lecture
Unit III	Software productivity in the cloud -	C23	Lecture
Unit III	Economies of scale: public vs. private clouds.	C24	Lecture
	Clarification Class 3	C25	Clarification Class
	Class Room Assignment 3	C26	Class Room Assignment
	Activity/Quiz 1	C27	Quiz
	Seminar 1	C28	Seminar
	Take Home Assignments 2		Take Home Assignments

Unit IV	Cloud Platforms in Industry		
Unit IV	Amazon web services: Compute services - Storage services	C29	Lecture
Unit IV	Communication services - Additional services	C30	Lecture
Unit IV	Google App Engine: Overview -Architecture and core concepts	C31	Lecture
Unit IV	Application life cycle - Cost model – Observations	C32	Lecture
Unit IV	Microsoft azure: Azure core concepts	C33	Lecture
Unit IV	SQL azure - Windows azure platform appliance	C34	Lecture
	Clarification Class 4	C35	Clarification Class
	Class Room Assignment 4	C36	Class Room Assignment
	Activity/Quiz 2	C37	Quiz
Unit V	Cloud Applications		
Unit V	Cloud Applications Overview	C38	Lecture
Unit V	Healthcare: ECG analysis in the cloud	C39	Lecture
Unit V	Biology: protein structure prediction	C40	Lecture
Unit V	Biology: gene expression data analysis	C41	Lecture
Unit V	Geoscience: satellite image processing	C42	Lecture
	Clarification Class 5	C43	Clarification Class
	Webinar 1	C44	Webinar
	Presentation 3	C45	Presentation

13003100 – Ability & Skill Enhancement - VI

Unit	Particulars	Class No.	Pedagogy of Class
Unit I	Logical Sequence of Words	C1	Lecture
Unit I	Verbal Analogy	C2	Lecture
Unit I	Classification	C3	Activity
Unit I	Blood Relation Test	C4	Activity
Unit I	Syllogism	C5	Activity
Unit I	Reading Comprehension	C6	Class Room Assignment
Unit II	How to develop a winning attitude	C7	Lecture
Unit II	How to have a winning and positive mindset, how to win in difficult situations	C8	Presentation
Unit II	How to have a winning and positive mindset, how to win in difficult situations	C9	Presentation
Unit II	Positive thinking, passion dedication, confidence, well preparation focus, hard work, planning never give up, etc.- some traits that help in developing winning	C10	Lecture
Unit III	Reading Current News - Assignment	C11	Presentation
Unit III	Comparing & Analysing the news	C12	Presentation
Unit III	Write an editorial	C13	Activity
	Clarification Class I	C14	Clarification Class
Unit III	News Vocabulary	C15	Activity
Unit III	News Vocabulary		Take Home Assignments
Unit III	Presentation on any major news (political/social/sports/economics)	C16	Presentation
Unit III	Presentation on any major news (political/social/sports/economics)	C17	Presentation
Unit IV	Chat Show	C18	Activity
Unit IV	Panel Discussion	C19	Group discussions
Unit IV	Panel Discussion -	C20	Group discussions
Unit IV	Parliamentary debate	C21	Activity
Unit IV	News Inspired Theatrical Performance	C22	Activity
Unit IV	Clarification Class II	C23	Clarification Class
Unit V	Preparing a report on major National/International News	C24	Lecture
Unit V	Insights/ review of major news papers and news channels	C25	Lecture
	Take Home Assignment		Take Home Assignments
Unit V	Clarification Class III	C26	Clarification Class
Unit V	Preparing a report on major National/International News	C27	Activity
Unit V	Insights/ review of major news papers and news channels	C28	Lecture
Unit V	Insights/ review of major news papers and news channels	C29	Activity
	Clarification Class IV	C30	Clarification Class

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