

B. Tech. Electrical and Computer Engineering (ECO)
KURUKSHETRA UNIVERSITY, KURUKSHETRA

SEMESTER-V

(Scheme of Examinations w.e.f. 2025-26 onwards)

S. No.	Course No./ Code	Subject	L:T:P	Hours /Week	Credits	Examination Schedule (Marks)				Duration of exam (Hours)
						End Semester Exam	Internal Assessment	Practical Exam	Total	
1	B24-ECO-301	Operating System	3:0:0	3	3	70	30	--	100	3
2	B24-ECO-303	Python Programming	3:0:0	3	3	70	30	--	100	3
3*	B24-EE-301	Control System	3:0:0	3	3	70	30	--	100	3
4*	B24-EE-307	Microprocessor and Microcontroller	3:0:0	3	3	70	30	--	100	3
5*	B24-EE-309	Power System-I	3:0:0	3	3	70	30	--	100	3
6*	B24-HSM-202	Innovation, Startups and Entrepreneurship	3:0:0	3	3	70	30	--	100	3
7	B24-ECO-305	Python Programming Lab	0:0:2	2	1	--	40	60	100	3
8*	B24-EE-315	Microprocessor and Microcontroller Lab	0:0:2	2	1	--	40	60	100	3
9*	B24-EE-317	Power System-I Lab	0:0:2	2	1	--	40	60	100	3
10*	B24-EE-319	Industrial Training-I	0:0:2	2	1	--	100	--	100	3
11**	B24-VAC-302/ B24-VAC-304/ B24-VAC-306/ B24-VAC-308/ B24-VAC-310	Hindi Language Skills / Sanskrit Language Skills/ German Language Skills/ Japanese Language Skills/ French Language Skills	2:0:0	2	1	--	100	--	100	3
TOTAL				28	23	420	500	180	1100	

*The subject is common with B. Tech. Electrical Engineering

**B23-VAC Courses are value-added courses, and the approved content may be offered to the students through the concerned departments (UTDs) or institutes (within the university campus) or the MOOC platform.

B. Tech. Electrical and Computer Engineering (ECO)
KURUKSHETRA UNIVERSITY, KURUKSHETRA
SEMESTER-VI

(Modified Scheme of Examinations w.e.f. 2025-26 onwards)

S. No.	Course No./ Code	Subject	L:T:P	Hours/ Week	Credits	Examination Schedule(Marks)				Duration of Exam (Hours)
						End Semester Exam	Internal Assessment	Practical Exam	Total	
1	B24-ECO-302	Data Base Management System	3:0:0	3	3	70	30	--	100	3
2	B24-ECO-304	Introduction to AIML	3:0:0	3	3	70	30	--	100	3
3*	B24-EE-306	Power System-II	3:0:0	3	3	70	30	--	100	3
4*	B24-EE-308	Power System Protection and Relaying	3:0:0	3	3	70	30	--	100	3
5	--	Program Elective-I	3:0:0	3	3	70	30	--	100	3
6	--	Program Elective-II	3:0:0	3	3	70	30	--	100	3
7	B24-ECO-310	AIML Lab	0:0:2	2	1	--	40	60	100	3
8	B24-ECO-312	DBMS Lab	0:0:2	2	1	--	40	60	100	3
9*	B24-EE-312	Power System-II Lab	0:0:2	2	1	--	40	60	100	3
10*	B24-EE-314	Project-I	0:0:4	4	2	--	40	60	100	3
11	B24-MAC-301	Constitution of India	2:0:0	2	1	--	100	--	100	3
TOTAL				30	24	420	440	240	1100	

*The subject is common with B. Tech. Electrical Engineering

Note:

- The course of both Program Elective and Open Elective will be offered at 1/3rd strength or 20 students (whichever is smaller) of the section.
- All students have to undertake the industrial training for 6 to 8 weeks after the 6th semester, which will be evaluated in the 7th semester.

Program Elective-I	Program Elective-II
B24-ECP-302 Compiler Design	*B24-EEP-310 Computer Networks
B24-ECP-304 Power Electronics and Drives	*B24-EEP-312 Electromagnetic Theory
*B24-EEP-306 Signals and Systems	*B24-EEP-314 High Voltage Engineering and FACTS Devices
*B24-EEP-308 Soft Computing	B24-ECP-316 Internet Technology and Management

B24-ECO-301		Operating System					
Lecture	Tutorial	Practical	Credit	End Semester Exam	Internal Assessment	Total	Duration of Exam
3	-	-	3	70	30	100	3Hrs.
Purpose: To familiarize the students with basics, process, memory and file management by operating System.							
Course Outcomes (CO)							
CO1	Understanding of types of operating system.						
CO2	Understanding of process management by Operating System.						
CO3	Understanding of memory management by Operating System.						
CO4	Understanding of file management by Operating System.						

UNIT-I

Evolution of Operating Systems: Types of operating systems - Different views of the operating, systems – Principles of Design and Implementation. The process concept – system programmer's view of processes – operating system's views of processes – operating system services for process management.

UNIT-II

Structural overview, Concept of process and Process synchronization, Process Management and Scheduling, Hardware requirements: protection, context switching, privileged mode; Threads and their Management; Tools and Constructs for Concurrency, Detection and Prevention of deadlocks, Mutual Exclusion: Algorithms, semaphores – concurrent programming using semaphores.

UNIT-III

Memory Management paging, virtual memory management, Contiguous allocation –static, dynamic partitioned memory allocation – segmentation. Non-contiguous allocation – paging –Hardware support – Virtual Memory, Dynamic Resource Allocation.

UNIT – IV

File Systems: A Simple file system – General model of a file system – Symbolic file system –Access control verification – Logical file system – Physical file system – allocation strategy module – Device strategy module, I/O initiators, Device handlers – Disk scheduling, Design of IO systems, File Management.

Text Books:

1. Operating System Concepts – Abraham Silberschatz, Galvin, Greg Gagne, 8th edition, Wiley-India, 2009.
2. Modern Operating Systems – Andrew S. Tanenbaum, 3rd Edition, PHI.
3. Operating Systems: A Spiral Approach – Elmasri, Carrick, Levine, TMH Edition.

Note: The paper setter will set the paper as per the question paper templates provided.

B24-ECO-303		Python Programming					
Lecture	Tutorial	Practical	Credit	End Semester Exam	Internal Assessment	Total	Duration of Exam
3	-	-	3	70	30	100	3Hrs.
Purpose: To familiarize the students with Python lists, tuples, dictionaries and simple programming							
Course Outcomes (CO)							
CO1	Develop algorithmic solutions to simple computational problems.						
CO2	Develop and execute simple Python programs.						
CO3	Write simple Python programs using conditionals and looping for solving problems.						
CO4	Read and write data from/to files in Python programs.						

UNIT-I

Python interpreter and interactive mode, debugging; values and types: int, float, boolean, string, and list; variables, expressions, statements, tuple assignment, precedence of operators, comments; Illustrative programs: exchange the values of two variables.

UNIT-II

Conditionals: Boolean values and operators, conditional (if), alternative (if-else), chained conditional (if-elif-else); Iteration: state, while, for, break, continue, pass; Fruitful functions: return values, parameters, local and global scope, function composition, recursion; Strings: string slices, immutability, string functions and methods, string module; Lists as arrays. Illustrative programs: square root, gcd, sum an array of numbers, linear search, binary search.

UNIT-III

Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters; Tuples: tuple assignment, tuple as return value; Dictionaries: operations and methods; Advanced list processing – list comprehension; Illustrative programs: simple sorting, histogram, Students' marks statement, Retail bill preparation.

UNIT – IV

Files and exception: text files, reading and writing files, format operator; command line arguments, errors and exceptions, handling exceptions, modules, packages; Illustrative programs: word count, copy file.

Text Books:

1. Paul Deitel and Harvey Deitel, "Python for Programmers", Pearson Education, 1st Edition, 2021.
2. G Venkatesh and Madhavan Mukund, "Computational Thinking: A Primer for Programmers and Data Scientists", 1st Edition, Notion Press, 2021.
3. John V Guttag, "Introduction to Computation and Programming Using Python: With Applications to Computational Modeling and Understanding Data", "Third Edition, MIT Press 2021. GE3151 Syllabus: Problem Solving and Python Programming
4. Eric Matthes, "Python Crash Course, A Hands-on Project-Based Introduction to Programming", 2nd Edition, No Starch Press, 2019.
5. Martin C. Brown, "Python: The Complete Reference", 4th Edition, McGraw-Hill, 2018.

Note: The paper setter will set the paper as per the question paper templates provided.

B24-EE-301		Control System					
Lecture	Tutorial	Practical	Credit	End Semester Exam	Internal Assessment	Total	Duration of Exam
3	-	-	3	70	30	100	3 Hrs.
Purpose: Students will grasp fundamental concepts of Control systems and will be able to analyze transient, frequency response of these systems and also will be able to tell about the stability of the control systems.							
Course Outcomes (CO)							
CO1	To understand the basics of open loop and closed loop feedback systems.						
CO2	To find steady state time response and stability analysis of a simple control system.						
CO3	To plot Root Locus, Bode Plot, Nyquist Plot and to find stability as well error in response.						
CO4	To determine the controller or compensator configuration.						

UNIT-I

Introduction to control systems: Introduction, classification of control systems, open and closed loop systems. Mathematical models of physical systems, Transfer functions for different types of systems, block diagrams; Signal flow graphs.

Signal flow graphs: Signal flow graphs, basic properties of signal flow graph, signal flow graph algebra, signal flow graph for control systems and Mason's gain formula.

UNIT-II

Time Domain Analysis: Time domain performance criterion, time response of first order systems and second order systems, steady state errors and error constants, types of control systems.

Stability analysis: BIBO stability, Necessary conditions for stability, Routh's stability criterion, difficulties in formulation of Routh's table, application of Routh's stability criterion to linear feedback systems, relative stability analysis, root-loci and root contours, sensitivity analysis.

UNIT-III

Frequency Response analysis: Co-relation between time and frequency response – 2nd order systems only.

Bode plots & Nyquist plot: Nyquist plots, Bode Plots, Nyquist stability criterion, Gain margin & Phase margin, relative stability using Nyquist Criterion, frequency response specifications.

UNIT – IV

Design of Control Systems: Introduction, Design with the PD Controller, PI Controller and PID Controller, Design with Phase-Lead Controller, Phase- Lag Controller, and Lead-Lag Controller. Concept of state, state variable and state model, state models for linear continuous time systems, concept of controllability and observability.

Text Book: Control System Engg.: I. J. Nagrath & M. Gopal ; New Age India.

Reference Books:

1. Automatic Control Systems: B.C. Kuo; 8th Ed., Wiley India.
2. Modern Control Engg: K. Ogata; 5th Ed., Pearson Education.
3. Control Systems: Principles & Designing: Madan Gopal; TMH.

Note: The paper setter will set the paper as per the question paper templates provided.

B24-EE-307		Microprocessor and Microcontroller					
Lecture	Tutorial	Practical	Credit	End Semester Exam	Internal Assessment	Total	Duration of Exam
3	-	-	3	70	30	100	3Hrs.
Purpose: Students will grasp the structure, working and application of 8086 Microprocessor and 8051 Microcontroller.							
Course Outcomes (CO)							
CO1	To learn the architecture 8086 Microprocessor.						
CO2	To learn the instruction set of 8086 Microprocessor and assembly language programming of 8086 Microprocessor.						
CO3	To learn about 8051 Microcontroller and interfacing of 8086 with different types of Memories.						
CO4	To learn about interfacing of interrupts, basic I/O Interfacing with 8086 Microprocessor.						

UNIT-I

8086 CPU ARCHITECTURE: 8086 Block diagram; description of data registers, address registers; pointer and index registers, PSW, Queue, BIU and EU. 8086 Pin diagram descriptions. Generating 8086 CLK and reset signals using 8284. Microprocessor BUS types and buffering techniques, 8086 minimum mode and maximum mode CPU module.

UNIT-II

8086 INSTRUCTION SET: Instruction formats, addressing modes, Data transfer instructions, string instructions, logical instructions, arithmetic instructions, transfer of control instructions; process control instructions; Assembler directives.

8086 PROGRAMMING TECHNIQUES: Writing assembly Language programs for logical processing, arithmetic processing, timing delays; loops, data conversions.

UNIT-III

8051 Microcontroller MAIN MEMORY SYSTEM DESIGN: 8051 Architecture- Registers, Pin diagram, I/O ports functions, Internal Memory organization. Memory devices, 8086 CPU Read/Write timing diagrams in minimum mode and maximum mode. Address decoding techniques. Interfacing SRAMS; ROMS/PROMS.

UNIT-IV

BASIC I/O INTERFACE: Intel's 8255 - description and interfacing with 8086. ADCs and DACs, - types, operation and interfacing with 8086. 8086 Interrupt mechanism; interrupt types and interrupt vector table. Applications of interrupts, Intel's 8259.

Text Books:

1. D.V. Hall, Microprocessors and interfacing: programming and hardware., McGraw Hill 3rd ed.
2. A. K. Ray and K.M. Bhurchandi, "Advanced Microprocessors and Peripherals", TMH.
3. Liu, Gibson, "Microcomputer Systems: The 8086/88 Family", 2nd Edition, PHI.
4. Barry B. Brey, "The Intel Microprocessors-Architecture, Programming and Interfacing", 8th Edition, PHI
5. Kenneth Ayala, "The 8086 Microprocessor: Programming & Interfacing the PC", Cengage Learning, Indian Edition, 2008.
6. "The 8051 Microcontroller and Embedded Systems – using assembly and C ", Muhammad Ali Mazidi and Janice Gillespie Mazidi and Rollin D. McKinlay; PHI, 2006 / Pearson, 2006.
7. "The 8051 Microcontroller", Kenneth J. Ayala, 3rd Edition, Thomson/Cengage Learning.

Reference Books:

1. Kip Irvine, "Assembly language for IBM PC", PHI, 2nd Edition, 1993
2. Uffenback, "The 8086 Family Design" PHI, 2nd Edition.

Note: The paper setter will set the paper as per the question paper templates provided.

B24-EE-309		Power System –I					
Lecture	Tutorial	Practical	Credit	End Semester Exam	Internal Assessment	Total	Duration of Exam
3	-	-	3	70	30	100	3Hrs.
Purpose: To enable students to analyze power system networks, network parameters, modelling of transmission lines							
Course Outcomes (CO)							
CO1	Understand the concepts of power systems.						
CO2	Understand the various power system components.						
CO3	Understand various transmission line modeling.						
CO4	Understand various line insulators and line supports.						

UNIT- I

Evolution of Power Systems: Typical power system. Underground and Overhead system, AC and DC transmission system, Effects of increase in Voltage on transmission line efficiency, Comparisons of the cost of the conductor in the overhead system. Conductor size and Kelvin's Law, Growth of power systems, Indian overview. Brief overview of Radial and ring main system.

UNIT- II

Overhead Transmission Lines: Inductance and capacitance calculation of single-phase and three-phase overhead line, Corona loss, Factors affecting Corona loss, Bundled conductors, Skin effects, Proximity effect.

Underground Cables: General Overview, its composition and grading.

UNIT- III

Transmission line modelling: Short transmission line, Medium transmission line: Nominal-T and Nominal pi model, Generalized circuit constant, Ferranti Effect, Long transmission line, Surge impedance, Surge impedance loading, Power flow through a transmission line.

UNIT IV

Overhead Line Insulator: Introduction, Properties of insulator material, types of Insulators, String efficiency, Methods of improving string efficiency.

Mechanical Design of Overhead Line: Main components of overhead line, Line supports, conductor material, cross arm, Guys and Stays, Tension and Sag, Vibrations and vibration damper.

Text Books/References:

1. Power System analysis and Stability by S.S. Vadhera.
2. Electrical Power System by C.L. Wadhwa.
3. Electrical Power System by Ashfaq Hussain.
4. Elements of Power System Analysis by W.D. Stevenson.
5. Electric Power System by B.M. Weddy.
6. The transmission and Distribution of Electric energy by H. Cotton.
7. Modern Power System Analysis by I.J. Nagrath and D.P. Kothari.

Note: The paper setter will set the paper as per the question paper templates provided.

B24-HSM-202		Innovation, Startups and Entrepreneurship					
Lecture	Tutorial	Practical	Credit	End Semester Exam	Internal Assessment	Total	Duration of Exam
3	-	-	3	70	30	100	3 Hours
Purpose	The objective of this Course is to inspire students and help them imbibe an entrepreneurial mindset.						
Course Outcomes (CO)							
CO 1	Understanding the essence of innovation and features of innovative processes, models and methods of innovative entrepreneurship, and the role of innovation as a major factor in creating the value of companies.						
CO 2	Understanding the dynamic role of entrepreneurship and small businesses, types of business structure, organising and managing a Small Business.						
CO 3	Understanding the concept of start-ups, Control Strategic Marketing Planning, concept of incubation and prototype, new Product Development, Business Plan Creation.						
CO 4	Understanding risk analysis in business, financing methods, role of government in supporting entrepreneurship.						

UNIT -I

Introduction to Innovation and Entrepreneurial Idea Generation and Identifying Business Opportunities, Management Skills for Entrepreneurs, Innovations and their forms, Innovation - features and characteristics, Factors initiating innovations, Innovation process and its stages, Statistical measurement of innovation, Model of innovation, Source of innovation, Technological transfer, Information technology to support innovation, difference between technological and non-technological innovation

UNIT-II

Introduction to Entrepreneurship and Start – Ups - Definitions, Traits of an entrepreneur, Intrapreneurship, Entrepreneurial Motivation ,Functions of Entrepreneur, Concept, Growth of Entrepreneurship in India, Types of Business Structures, Similarities /differences between entrepreneurs and managers, Business Ideas and their implementation, Discovering ideas and visualizing the business, Activity map, Types of startups, role of entrepreneurs in economic development, future of entrepreneurs, entrepreneurial process

UNIT -III

Start ups - Initial idea generation and planning stages, and incubation referring to the development process of identifying and developing new ideas for products, services, or processes, and creating a working model or prototype to test the feasibility of the concept.

Market Analysis – Identifying the target market, Competition evaluation and Strategy Development, Five Cs of Opportunity Identification, Market Opportunity Identification in emerging technology companies, Process of creating and growing a new business venture, Business plan of the innovation project.

UNIT -IV

Risk Analysis: Risk management in venture projects, Financing and Protection of Ideas- Financing methods available for start-ups in India, Communication of Ideas to potential investors – Investor Pitch, Patenting and Licenses, Exit strategies for entrepreneurs, bankruptcy, and succession and harvesting strategy, venture capital, angel investment, and crowd funding.

Government support- programs and initiatives aimed at supporting the development of new ideas, innovations, and startups, funding and mentorship, IPR - legal protection of a person's or organization's rights to their invention, brand, or creative work

Suggested Readings:

1. Shruti N Shetty, (2018), Design the Future: Simplifying Design Thinking to Help You, Notion Press
2. "Entrepreneurship development small business enterprises", Pearson, Poornima M Charantimath, 2013.
3. Roy Rajiv, "Entrepreneurship", Oxford University Press, 2011.
4. "Innovation and Entrepreneurship", HarperBusiness- Drucker, F. Peter, 2006.
5. "Entrepreneurship", Tata McGraw-Hill Publishing Co., Ltd. New Delhi- Robert D. Hisrich, Mathew J. Manimala, Michael P Peters and Dean A. Shepherd, 8th Edition, 2012
6. The Three-Box Solution: A Strategy for Leading Innovation By Vijay Govindarajan Boutellier, Roman; Gassmann, Oliver; von Zedtwitz, Maximilian (2000). Managing Global Innovation. Berlin: Springer.. ISBN 3-540-66832-2.

7. Brown K. and Stephen P. Osborne (2005) Managing change and innovation in public service organisation. New York: Routledge
8. Cappellin R. and Wink R. (2009). International Knowledge and Innovation Networks: Knowledge Creation and Innovation in Medium-technology Clusters. UK: Edward Elgar Publishing Limited.
9. Eveleens, C. (2010). Innovation management: A literature review of innovation process models and their implications. Working Paper HAN University of Applied Sciences.
10. Entrepreneurship Development- S.Chand & Co.,Delhi- S.S.Khanka 1999
11. Small-Scale Industries and Entrepreneurship. Himalaya Publishing House, Delhi –Vasant Desai 2003.
12. Entrepreneurship Management -Cynthia, Kaulgud, Aruna, Vikas Publishing House, Delhi, 2003.
13. Entrepreneurship Ideas in Action- L. Greene, Thomson Asia Pvt. Ltd., Singapore, 2007.

Note: The paper setter will set the paper as per the question paper templates provided.

B24-ECO-305		Python Programming Lab					
Lecture	Tutorial	Practical	Credit	Practical Exam	Internal Assessment	Total	Duration of Exam
-	-	2	1	60	40	100	3 Hrs.
Purpose: The students will familiarize themselves with data database system and SQL queries							
Course Outcomes (CO)							
CO1	To understand the basic structure of Python programming.						
O2	To learn about loops, control statements and recursion in Python.						
CO3	To understand the different operations on matrices.						
CO4	To understand file handling in Python.						

List of Experiments

1. Python Program to Print 'Hello world !'
2. Python Program to Add Two Numbers.
3. Python Program to Find the Square Root.
4. Python Program to Calculate the Area of a Triangle.
5. Python Program to Swap Two Variables.
6. Python Program to Generate a Random Number.
7. Python Program to Convert Celsius To Fahrenheit.
8. Python Program to Check if a Number is Odd or Even.
9. Python Program to Check Leap Year.
10. Python Program to Find the Largest Among Three Numbers.
11. Python Program to Check Prime Number.
12. Python Program to Find the Factorial of a Number.
13. Python Program to Display the multiplication Table.
14. Python Program to Print the Fibonacci sequence.
15. Python Program to Find the Sum of Natural Numbers.
16. Python Program to Find Factorial of Number Using Recursion.
17. Python Program to Add Two Matrices.
18. Python Program to Transpose a Matrix.
19. Python Program to Multiply Two Matrices.
20. Python Program to copy data from one file to another file.

Note: At least eight (8) experiments from the above list are mandatory to perform for the students.

B24-EE-315		Microprocessor and Microcontroller Lab					
Lecture	Tutorial	Practical	Credit	Practical Exam	Internal Assessment	Total	Duration of Exam
-	-	2	1	60	40	100	3 Hrs.
Purpose: Write the efficient Assembly Language Program for different problem statements and implement different system interfacing.							
Course Outcomes (CO)							
CO1	Understand the architecture of the 8086 Microprocessor.						
CO2	Learn the instruction set and assembly language programming for the 8086.						
CO3	To be able to write program using different implementations for the same problem.						
CO4	Use of programming language constructs in program implementation.						

LIST OF EXPERIMENTS

1. a) Familiarization with 8086 Trainer Kit.
b) Familiarization with Turbo Assembler and Debugger S/Ws.
2. Perform addition, subtraction, multiplication, and division using 8086 instructions.
3. Write a program that takes any two numbers as Input from the user through the input device (Keyboard) & Prints their sum on the standard output device (Screen) by giving appropriate messages to the user
4. Write a program to find out any power of number such that $Z = X^N$. Where N is programmable and X is unsigned number.
5. Write a program to generate the Fibonacci series up to 'n' terms.
6. Write a program to Move data between registers, memory, and ports using MOV, PUSH, POP, etc.
7. Write a program to arrange block of data in
(i) Ascending and (ii) Descending order.
8. Write a program to Implement AND, OR, XOR, NOT, and shift/rotate operations.
9. Write a program to convert between BCD and binary formats.
10. Write a program to generate a delay using loops.
11. Write a program to Search for an element in an array and return its position.
12. Write a program to Take a string input and reverse it.
13. Write a program to convert letters in a string between uppercase and lowercase.
14. Write a program to convert a decimal number to its hexadecimal equivalent.
15. Write a program to convert a hexadecimal string to a decimal number.
16. Write a programmable delay routine to cause a minimum delay = 2mS and a maximum delay = 20 minutes in the increments of 2mS.

NOTE: At least eight (8) experiments from the above list are mandatory to perform for the students.

B24-EE-317		Power System-I Lab					
Lecture	Tutorial	Practical	Credit	Practical Exam	Internal Assessment	Total	Duration of Exam
-	-	2	1	60	40	100	3 Hrs.

Purpose: The main objective of the course is to impart the students with the knowledge of various relays, insulators and transmission line modelling.

Course Outcomes (CO)

CO1	To understand various types of relays.
CO2	To study the parallel operation of the alternator.
CO3	To understand the concept of various insulators.
CO4	To understand the concept of transmission line modelling.

LIST OF EXPERIMENTS

1. Experiment to find out the dielectric strength of transformer oil.
2. Experiment to find zero sequence component of three phase line.
3. Draw the characteristics of thermal overload relay.
4. Experiment to study an IDMT over current relay & plot, it's characteristic curves i.e. graph between current & time.
5. Experiment to study differential relay characteristics.
6. Experiment to measure the ABCD parameters of a given transmission line, also study Ferranti effect.
7. Experiment to study Parallel operation of two alternators.
8. Experiment to plot the power angle characteristics of given transmission line.
9. Experiment to find the string efficiency of a string insulator with/without guard rings.
10. Experiment to study the characteristics of transmission line for t-network & pie- network.
11. Testing of a current transformer & find Ratio Error & Phase angle error for various burdens.
12. To study various types of distance relay.
13. Experiment to study fault current using sequence impedance network.

NOTE: At least eight (8) experiments from the above list are mandatory to perform for the students.

B24-EE-319		Industrial Training-I					
Lecture	Tutorial	Practical	Credit	End Semester Exam	Internal Assessment	Total	Duration of Exam
-	-	2	1	--	100	100	-

It is a course in which the students will be evaluated for the industrial training undergone during the semester break after the 4th semester examination, and students will be required to get passing marks to qualify.

B24-VAC-302	Hindi Language Skills						
Lecture	Tutorial	Practical	Credit	End Semester Exam	Internal Assessment	Total	Time
2	-	-	1	--	100	100	3

This course will be offered through NPTEL/MOOC online courses with the following link -

https://onlinecourses.nptel.ac.in/noc23_hs125/preview.

The syllabus of NPTEL/MOOC platform will be acceptable. Students can also learn online from videos and internal assessment can be made in the Institute by taking an internal exam of 100 marks.

B24-VAC-304		Sanskrit Language Skills					
Lecture	Tutorial	Practical	Credit	End Semester Exam	Internal Assessment	Total	Time
2	-	-	1	--	100	100	3 Hrs
Course Outcomes (CO) At the end of this course, student will							
CO 1	Learn behavioural science from Bhagwat Gita						
CO 2	Learn self awareness and spirituality from Bhagwat Gita						
CO 3	Learn mind management from Bhagwat Gita						
CO 4	Learn responsible behaviour from Bhagwat Gita						

SYLLABUS FOR SANSKRIT STUDIES

Unit 1	<u>BEHAVIOURAL SCIENCE</u> • Learning different personality types from Gita. BG 14.6-8 • Dealing with stress, depression and self-destructive urges. BG 2.14 • Overcoming procrastination and hyperactivity. BG 18.35-36 • Developing <i>sattva</i> - platform of controlled action. BG 18.33 • Balancing physical, mental and emotional health. BG 6.16-17, 6.5 • Increasing productivity in activity through spirituality. BG 2.47 • Mind Intelligence mechanism. BG 3.42-43 • Tapping the power of meditation. BG 6.10-15
Unit 2	<u>SELF-AWARENESS</u> • Understanding Different Layers of Self - Physical, Mental and Spiritual – BG 2.13 • Becoming Sensitive Towards Other Beings and Nature at Large – BG 5.18, 6.29-32 • Cultivating Culture of Respect – BG 13.8-12 • Dealing with Grief – BG 2.11, 2.27 • Holistic Wellbeing Through Self-Awareness – BG 6.5, 6.7 • Recognizing the Impermanence of the Body – BG 2.14 • Cultivating Detachment for True Self-Awareness – BG 2.71, 5.29 • Connecting with the Higher Self Through Meditation – BG 6.10 • Transcending Ego for Inner Peace – BG 3.27 • Self-Reflection for Personal Growth – BG 6.5 • Overcoming False Identification with the Body – BG 2.30 • Seeing the Divine in All Beings – BG 9.22
Unit 3	<u>MIND MANAGEMENT - ART OF MIND CONTROL</u> • The Root of Frustration & Anger – BG 2.62-63 • Discover the Real Reason Behind Lack of Motivation – BG 3.36, 3.41 • Controlling the Uncontrolled Mind – BG 6.26 • Understanding the Mind & Its Power – BG 6.6, 3.42 • Mind Like a Boat in Stormy Waters – BG 2.67 • Learn to Stay Calm Under Pressure – BG 2.14, 2.56 • The Peaceful Mind of a Wise Person – BG 2.70, 2.56 • Freedom from Attachment = Peace – BG 2.71, 5.26 • Peace Through Detachment – BG 2.71, 5.20

Unit 4**RESPONSIBLE ACTION**

- Understanding Intricacies of Action and Reaction - Karma, Vikarma & Akarma – BG 4.17
- Principles of Forbearance and Tolerance – BG 2.14, 12.13-14
- Coping with Adversities and Reversals in Life – BG 2.14-15, 18.11
- Becoming Responsible in Action - Karma Yogi – BG 3.7, 3.19, 3.30, 5.10
- Performing Actions Without Attachment to Results – BG 2.47, 3.19
- Acting in Accordance with Dharma – BG 3.35
- Surrendering the Fruits of Actions to God – BG 9.22, 18.66
- Selflessness in Actions – BG 18.9
- Discerning Between Right and Wrong Actions – BG 18.63
- Balanced Approach to Work and Rest – BG 6.17
- Purifying Intentions Behind Actions – BG 18.11
- Taking Responsibility for One's Actions and Their Impact – BG 3.16

B24-VAC-306	German Language Skills						
Lecture	Tutorial	Practical	Credit	End semester Exam	Internal assessment	Total	Duration of exam (Hours)
2	0	0	1	-	100	100	3 Hrs
Purpose	To learn about German Language Skills						
Course Outcomes (CO)							
CO1	Introduce students to basic German language.						
CO2	Enable basic communication in German (self-introduction, daily routine, etc.).						
CO3	Develop foundational skills in vocabulary and grammar.						
CO4	Develop foundational skills in reading, writing, listening, and speaking.						

Unit 1: Introduction & Basics

- German alphabet and pronunciation
- Greetings and farewells
- Introducing oneself and others
- Numbers (0–100)
- Days, months, seasons

Unit 2: Vocabulary Building I

- Family and relationships
- Professions and nationalities
- Countries and cities
- Colors and clothing
- Weather

Unit 3: Grammar I

- Nouns: gender, singular/plural
- Articles: definite (der/die/das), indefinite (ein/eine)
- Personal pronouns (ich, du, er, etc.)
- Verb conjugation (regular verbs in Präsens)
- Sentence structure: main clause word order

Grammar II

- Verbs: haben, sein, modal verbs (möchten, können)
- Question words (wer, was, wo, etc.)
- Negation (nicht, kein)
- Possessive pronouns (mein, dein, etc.)
- Accusative case basics

Unit 4: Vocabulary Building II

- Food and drink
- Daily routine
- Time and date
- House and furniture
- Hobbies and leisure

Communication Practice

- Simple dialogues (in café, at university, at home)
- Role plays (shopping, asking directions, introductions)
- Listening practice (audio exercises)
- Writing practice (short texts, filling forms)

Assessment (Optional/Recommended)

- Vocabulary quizzes
- Short written assignments
- Oral presentation or role-play
- Final test (basic grammar and vocabulary)

B24-VAC-308	Japanese Language Skills						
Lecture	Tutorial	Practical	Credit	End semester Exam	Internal assessment	Total	Duration of exam (Hours)
2	0	0	1	-	100	100	3 Hrs
Purpose	Learn about Japanese Language Skills						
Course Outcomes (CO)							
CO1	Introduce students to basic Japanese language.						
CO2	Enable basic communication in Japanese (self-introduction, daily routine, etc.).						
CO3	Develop foundational skills in vocabulary and grammar.						
CO4	Develop foundational skills in reading, writing, listening, and speaking.						

Unit 1: Introduction & Basics

- Alphabet and pronunciation
- Greetings and farewells
- Introducing oneself and others
- Numbers (0–100)
- Days, months, seasons

Unit 2: Vocabulary Building I

- Family and relationships
- Professions and nationalities
- Countries and cities
- Colors and clothing
- Weather

Unit 3: Grammar I

- Nouns: gender, singular/plural
- Articles: definite and indefinite
- Personal pronouns
- Verb conjugation (regular verbs in present tense)
- Sentence structure: main clause word order

Grammar II

- Common verbs (e.g., to be, to have, modal verbs)
- Question words
- Negation
- Possessive pronouns
- Basic cases or particles (as applicable)

Unit 4: Vocabulary Building II

- Food and drink
- Daily routine
- Time and date
- House and furniture
- Hobbies and leisure

Communication Practice

- Simple dialogues (e.g., in café, at university, at home)
- Role plays (shopping, asking directions, introductions)
- Listening practice (audio exercises)
- Writing practice (short texts, filling forms)

Assessment (Optional/Recommended)

- Vocabulary quizzes
- Short written assignments
- Oral presentation or role-play
- Final test (basic grammar and vocabulary)

B24-VAC-310	French Language Skills						
Lecture	Tutorial	Practical	Credit	End semester Examination	Internal assessment	Total	Duration of exam (Hours)
2	0	0	1	-	100	100	3 Hrs
Purpose	To learn about French Language Skills						
Course Outcomes (CO)							
CO1	Introduce students to basic French language.						
CO2	Enable basic communication in French (self-introduction, daily routine, etc.).						
CO3	Develop foundational skills in vocabulary and grammar.						
CO4	Develop foundational skills in reading, writing, listening, and speaking						

Unit 1: Introduction & Basics

- Alphabet and pronunciation
- Greetings and farewells
- Introducing oneself and others
- Numbers (0–100)
- Days, months, seasons

Unit 2: Vocabulary Building I

- Family and relationships
- Professions and nationalities
- Countries and cities
- Colors and clothing
- Weather

Unit 3: Grammar I

- Nouns: gender, singular/plural
- Articles: definite and indefinite
- Personal pronouns
- Verb conjugation (regular verbs in present tense)
- Sentence structure: main clause word order

Grammar II

- Common verbs (e.g., to be, to have, modal verbs)
- Question words
- Negation
- Possessive pronouns
- Basic cases or particles (as applicable)

Unit 4: Vocabulary Building II

- Food and drink
- Daily routine
- Time and date
- House and furniture
- Hobbies and leisure

Communication Practice

- Simple dialogues (e.g., in café, at university, at home)
- Role plays (shopping, asking directions, introductions)
- Listening practice (audio exercises)
- Writing practice (short texts, filling forms)

Assessment (Optional/Recommended)

- Vocabulary quizzes
- Short written assignments
- Oral presentation or role-play
- Final test (basic grammar and vocabulary)

B24-ECO-302		Data Base Management System					
Lecture	Tutorial	Practical	Credit	End Semester Exam	Internal Assessment	Total	Duration of Exam
3	-	-	3	70	30	100	3Hrs.
Purpose: To familiarize the students with Data Base Management system							
Course Outcomes (CO)							
CO1	To provide introduction to relational model and ER diagrams.						
CO2	To realize about Relational Model&SQL.						
CO3	To comprehend about the concept of functional dependencies& normalization.						
CO4	To learn the concept of Transaction Management &and concurrency control.						

UNIT-I

Introduction: DBMS an overview, Types of Database, Data Models-, Network, Hierarchical, Object Oriented and Relational Model, Levels of abstraction. Database Administrator role, Database Users, Three Schema architecture of DBMS, Advantages of DBMS.

Entity-Relationship Model: : Entities, Attributes and Entity Sets, Relation and Relationships sets, Primary key, Unique keys and Foreign Keys, Entity-Relationship Diagram- Conversion of ER Diagram to Relational Database. Weak Entity Sets.

UNIT-II

Relational Model: Structure of relational Databases, Relational Algebra and Relational Calculus, Operations on Relational Algebra, Operations on Relational Calculus, Tuple Relational Calculus, Domain Relational Calculus.

SQL : Concept of DDL, DML, and DCL. Basic Structure, Set operations, Aggregate Functions, Introduction to views, Nested Sub queries, Stored procedures and triggers.

UNIT-III

Dependencies :Functional Dependencies, Armstrong's axioms for functional dependency, Different anomalies in designing a Database, Normalization using functional dependencies.

Normal Forms-1st Normal form, 2nd Normal form, 3rd Normal form, Boyce-Codd Normal form, 4th normal form, 5th Normal form.

UNIT – IV

Transaction Management & Concurrency Control: ACID Properties, Transaction states, Serializability of Transaction, Testing for Serializability and concurrency control, Lock based concurrency control (2PL, Deadlock), Time stamping methods .

Recovery System: Types of Failures, Recovery Techniques and DeadLock.

Text Books:

1. Ramez Elmasri, Shamkant B. Navathe," Fundamentals of Database systems", Pearson.
2. Korth, Silberschatz, Sudarshan: database concepts, MGH.
3. R. Ramakrishnan and J. Gehrks database management system; MGH, International edition.
4. C. J. Date, Data Base Systems: 7th edition, Addison Wesley, Pearson Education, Chakrabarti, Advance database management systems, Wiley Dreamtech.

Note: The paper setter will set the paper as per the question paper templates provided.

B24-ECO-304		Introduction to AIML					
Lecture	Tutorial	Practical	Credit	End Semester Exam	Internal Assessment	Total	Duration of Exam
3	-	-	3	70	30	100	3Hrs.
Purpose: To introduce the students to signal characteristics and analysis, theory related to systems and its analysis.							
Course Outcomes (CO)							
CO1	Study of the introduction of Artificial Intelligence and its applications						
CO2	Study of basics of Python for machine learning						
CO3	Use and study the working of Python packages						
CO4	Study the methods and algorithms in machine learning						

UNIT-I

Introduction to Artificial Intelligence: Definition of AI, History of AI, Types of AI (Narrow, General, Super AI), Applications of AI, Definition of agents and environments, Rational agents, Tokenization, POS tagging, Syntax vs semantics, Simple chatbots

UNIT-II

Python for Machine Learning: -Python Data Structures, Python Programming Fundamentals, Conditions and Branching, Loops, Functions.

Python Packages: -Working with NUMPY, Working with Pandas.

UNIT-III

Introduction to Data Visualization: Introduction to Matplotlib and Seaborn, Basic Plotting with Matplotlib and Seaborn. Introduction to Data Pre-Processing, Importing the Dataset, Handling Missing data, Working with Categorical Data, Splitting the data into Train and Test Sets, Feature Scaling

UNIT – IV

Methods and Algorithms in Machine Learning: Supervised Learning.

Regression: Simple Linear Regression, Multiple Linear Regression, Polynomial Regression, Decision Tree, Random Forest. Classification: -Logistic Regression, K-Nearest Neighbours, Support Vector Machine, Naive Bayes, Decision Tree, Random Forest.

Reference Books:

1. Artificial Intelligence: A Modern Approach by Stuart Russell and Peter Norvig
2. AI with Python by Prateek Joshi
3. "Machine Learning for Absolute Beginners: A Plain English Introduction" by Oliver Theobald
4. Introduction to Machine Learning with Python: A Guide for Data Scientists - Andreas C. Müller & Sarah Guido.

Note: The paper setter will set the paper as per the question paper templates provided.

B24-EE-306		Power System-II					
Lecture	Tutorial	Practical	Credit	End Semester Exam	Internal Assessment	Total	Duration of Exam
3	-	-	3	70	30	100	3Hrs.
Purpose: To enable students to analyze power system networks, faults in power systems, transient and bus impedance algorithm.							
Course Outcomes (CO)							
CO1	Understand the concepts of per UNIT system.						
CO2	Understand the various faults in the power system.						
CO3	Understand the stability in the power system.						
CO4	Determine methods of impedance matrix calculation.						

UNIT-I

Introduction: Characteristics & representation of components of a power system, synchronous machines, transformers, lines cables & loads. Single line diagram of a power system, zero sequence impedance diagrams of power system with different types of connections of three phase transformers.

Per UNIT system: Per UNIT method of representing quantities, Advantages and disadvantages of per UNIT system, determination of base impedance, Per UNIT impedance of two winding transformers.

UNIT-II

Symmetrical faults: calculation of fault currents, use of current limiting reactors.

Unsymmetrical faults: symmetrical components transformation, sequence impedance of power system elements, Sequence network of power system, analysis of unsymmetrical faults- Single line to ground fault, Line –Line fault and Double line to ground fault.

UNIT-III

Power System Stability:- Steady state stability, methods of improving steady state stability, Transient stability, methods of improving transient stability, Swing equation, power flow in line, Power angle diagram.

UNIT-IV

Power Flow Studies: - Bus classification, Bus admittance matrix, Power flow equation, Load flow solution using Gauss-Seidel and Newton Raphson method, Decoupled and Fast decoupled methods, Comparison of load flow methods

Reference Books:

1. Elements of Power System Analysis by W.D. Stevenson.
2. Electric Power System by B.M. Weddy.
3. The transmission & Distribution of Electric Energy by H. Cotton.
4. Power System & Protection by S.S. VADHERA

Note: The paper setter will set the paper as per the question paper templates provided.

B24-EE-308		Power System Protection and Relaying					
Lecture	Tutorial	Practical	Credit	End Semester Exam	Internal Assessment	Total	Duration of Exam
3	-	-	3	70	30	100	3Hrs.
Purpose: The main objective of the course is to impart to the students the knowledge of different types of circuit breakers, relays and different types of protection schemes.							
Course Outcomes (CO)							
CO1	Study the arc formation and interruption.						
CO2	Understand the various types of circuit breakers						
CO3	Understand the different types of relays						
CO4	Study various types of protection schemes.						

UNIT 1

Neutral grounding: Need for neutral grounding, various types of neutral grounding

Circuit Interruption: Circuit interruption, theory of arc formation and its excitation in DC, AC circuits, restriking & recovery voltage, interruption of capacitive & inductive currents. Resistance switching

UNIT 2

Circuit-Breakers: Classification of circuit-breakers, Oil circuit breaker, Air blast circuit breaker, SF6 circuit breaker, Vacuum circuit breaker, HVDC circuit breaker. Breaker operating mechanisms, Types of circuit breaker mountings and enclosure, comparison between different types of circuit breakers.

UNIT 3

Protective Relaying System: features of good protective system, elements of relay, terms connected with relay, Electromagnetic attraction and induction relays, Over current Relay, Differential relay, distance or impedance relay, static relays: Need, Essential components of static relay, comparison with electromagnetic relay.

UNIT 4

Transformer Protection: Buchholz protection, Differential protection scheme,

Alternator protection: Stator and rotor protection, Merz Price Protection, Balance earth fault protection

Bus bar Protection: Differential over current protection, Frame leakage protection

Transmission line protection: Time graded protection, Current graded protection, and Differential protection

Reference Books:-

1. Power System Protection & Switchgear, Ravinder Nath, New Age
2. Power System Protection & Switchgear, Badri Ram, MGH
3. Protection & Switchgear, Bhalja, Maheshwari, Oxford
4. Switch gear and protection, J.B. Gupta, Katson Books

Note: The paper setter will set the paper as per the question paper templates provided.

B24-ECO-310		AIML Lab					
Lecture	Tutorial	Practical	Credit	Practical Exam	Internal Assessment	Total	Duration of Exam
-	-	2	1	60	40	100	3 Hrs.
Purpose: The students will familiarize with the application of Artificial Intelligence & Machine Learning..							
Course Outcomes (CO): As per experiments.							

List of Experiments

- Write a function that takes a list of numbers and returns the average.
- Count how many times each number appears in a list using a dictionary.
Example input: [1, 2, 2, 3, 3, 3]
Output: {1:1, 2:2, 3:3}
- Multiply two 2x2 matrices using NumPy.
- Write a program that calculates the standard deviation of a list using NumPy.
- Replace missing values (NaN) in a column with the column mean.
- Problem: Predict student scores based on hours studied.
Dataset:
Hours = [1, 2, 3, 4, 5]
Scores = [50, 55, 65, 70, 75]
Task: Fit a simple linear regression model.
Predict the score if a student studies for 6.5 hours
- Problem: Predict house prices based on size, number of rooms, and age.
Dataset:
Features: [Size (sqft), Rooms, Age]
X = [[1400, 3, 20], [1600, 4, 15], [1700, 4, 10], [1875, 5, 5]]
y = [250000, 280000, 310000, 340000]
Task: Train a multiple linear regression model.
Predict price for a 1800 sqft, 4-room, 8-year-old house.
- Predict employee salary based on experience level (in years).
Experience = [[1], [2], [3], [4], [5]]
Salary = [35000, 40000, 50000, 55000, 60000]
Task: Fit a decision tree regressor.
Predict salary for 3.5 years of experience.
- Predict sales based on advertisement budgets.
Features: [TV, Radio, Newspaper Budget]
X = [[230, 37, 69], [44, 39, 45], [17, 45, 69], [151, 41, 58]]
y = [22, 10, 9, 18]
Task: Train a random forest regressor.
Predict sales for a budget: TV=100, Radio=30, Newspaper=50.
- Classify whether a user will buy a product based on Age and Salary.
Features: [Age, Salary]
X = [[25, 50000], [30, 60000], [45, 80000], [35, 120000], [50, 90000]]
y = [0, 0, 1, 1, 1]
Task: Train a KNN classifier (k=3).
Predict if a 40-year-old with ₹85,000 salary will buy the product.
- Classify emails as spam (1) or not spam (0) based on frequency of key words.
Features: [free, click, win]
X = [[1, 0, 1], [0, 0, 0], [1, 1, 1], [0, 1, 0]]
y = [1, 0, 1, 0]
Task: Train an SVM classifier.
Predict class of email: \[1, 1, 0].

12. Classify news articles into sports or politics using word counts.
Features: [goal, election]
X = [[3, 0], [0, 4], [2, 0], [0, 5]]
y = ['sports', 'politics', 'sports', 'politics']
13. Predict pass/fail in an exam based on study hours and attendance.
Features: [Study_Hours, Attendance %]
X = [[5, 80], [3, 60], [9, 90], [1, 40], [6, 70]]
y = ['pass', 'fail', 'pass', 'fail', 'pass']
Task: Use Decision Tree and Random Forest classifiers.
Predict result for a student who studied 4 hours and has 75% attendance.

Note: At least eight (8) experiments from the above list are mandatory to perform for the students.

B24-ECO-312		DBMS Lab					
Lecture	Tutorial	Practical	Credit	Practical Exam	Internal Assessment	Total	Duration of Exam
-	-	2	1	60	40	100	3 Hrs.
Purpose: The students will familiarize themselves with data base system and SQL queries.							
Course Outcomes (CO)							
CO1	To understand basic DDL, DML and DCL commands.						
CO2	To learn about various integrity constraints & clauses.						
CO3	To understand the sub queries, nested queries, views & trigger.						
CO4	To learn various queries using different types of operators & functions.						

List of Experiments

1. Write the queries for creation of table in RDBMS.
2. Write the queries for data insertion, updation and deletion in RDBMS.
3. Write the queries for adding primary key, Unique keys and foreign keys in RDBMS.
4. To perform various set operations on relational database.
5. Create a database and perform the Group by clause, having clause and Order by Clause.
6. Write SQL queries for extracting data from more than one table.
7. Write SQL queries for sub queries and nested queries.
8. Write SQL queries to implement views.
9. Write trigger for before and after insertion, deletion and updation process.
10. Write a Sql query for Implementation of different types of operations in SQL:
 - Arithmetic Operator
 - Logical Operator
 - Comparison Operator
 - Special Operator
11. Implementation of different types of mathematical functions with suitable examples:
 - Number Function
 - Aggregate Function
 - Character/string Function
 - Date Function

Note: At least eight (8) experiments from the above list are mandatory to perform for the students.

B24-EE-312		Power System-II Lab					
Lecture	Tutorial	Practical	Credit	Practical Exam	Internal Assessment	Total	Duration of Exam
-	-	2	1	60	40	100	3 Hrs.
Purpose: The main objective of the course is to impart the students with the knowledge of programming in power system.							
Course Outcomes (CO)							
CO1	To develop the program for Y-bus and Z-bus.						
CO2	To develop the program load flow analysis.						
CO3	To develop the program for different mathematical operations.						
CO4	To develop the program for Gauss Seidel method.						

List of Experiments

1. Develop a program to do the following mathematical operations:

- i) Transpose of a matrix
- ii) Multiplication of two matrices
- iii) Addition & subtraction of two matrices

2. Write a program to formulate Y-Bus by non- singular transformation $Y_{Bus} = [A]$, $T = y [A]$.

3. Develop a program to solve a set of 4 simultaneous liner equations using Gaussian Elimination method.

4. Develop a program to calculate Z bus of a given network using building algorithm. Assume that no mutual coupling is involved in between the different elements.

5. The Gauss Seidel method to find the solution of following equations

$$X_1 + X_1X_2 + X_3 = 10$$

$$X_1 + X_2 + X_3 = 6$$

$$X_1X_2 - X_3 = 2$$

6. You have given with a 6 bus system. Apply load flow technique using Gauss Seidel method to solve up to two iterations.

7. Develop a program to find Eigen Values for given Matrix.

8. Develop a program to determine the bus impedance matrices for the given power system network.

9. Develop a program to determine the admittance matrices for the given power system network.

10. To conduct the load flow analysis of power system networks (not more than 6 bus) on any dedicated using Newton Raphson method.

Note: At least eight (8) experiments from the above list are mandatory to perform for the students.

B24-EE- 314		Project-I					
Lecture	Tutorial	Practical	Credit	Practical Exam	Internal Assessment	Total	Duration of Exam
-	-	4	2	60	40	100	3 Hrs.
Purpose: To develop teamwork, plan and implement the project, write a comprehensive report and develop effective presentation skills.							
Course Outcomes (CO): Upon completion of the course, students will be able to							
CO1	Identify and define a problem statement from the requirements raised from the literature survey /need analysis						
CO2	Build and Test circuits,/models /prototypes/hardware/software for developing real-life small applications						
CO3	Work in teams, write a comprehensive report and an effective presentation of the project work.						
CO4	Rapid prototyping, which will lead them towards entrepreneurship.						

Project-I Guidelines:

The Project-I is a team activity having 3-5 students in a team. This is circuit building and testing for developing small applications. The project may be a complete hardware or a hardware with a software aspect. It should encompass components, machines, automation and control, power system devices, analogue or digital ICs, microcontroller, software, etc. Based on a comprehensive literature survey/ need analysis, the student shall identify the title and define the aim and objectives of Project-I.

B24-MAC-301		Constitution of India					
Lecture	Tutorial	Practical	Credit	End semester exam	Internal Assessment	Total	Duration of Exam
2	-	-	1	-	100	100	3 Hrs.
Purpose: This course introduces students to the basic Philosophy of Indian Constitution.							
Course Outcomes (CO)							
CO1	To explain the basic structure of Indian Constitution.						
CO2	To understand the structure of Indian Union.						
CO3	To write down roles and powers of Governor.						
CO4	To explain the election process under Indian Constitution.						

UNIT-I

The Constitution - Introduction, The History of the Making of the Indian Constitution, Preamble and the Basic Structure, and its interpretation, Fundamental Rights and Duties, and a Brief overview of the Directive Principles of State Policy.

UNIT-II

Union Government, Structure of the Indian Union, President – Role and Power, Prime Minister and Council of Ministers, Brief overview of Lok Sabha and Rajya Sabha.

UNIT-III

State Government, Governor – Role and Power, Chief Minister and Council of Ministers, State Secretariat, distribution of powers between the state and the centre under the Indian Constitution.

UNIT-IV

Local Administration, District Administration, Municipal Corporation, Zila Panchayat.
Election Commission a. Role and Functioning b. Chief Election Commissioner c. State Election Commission

Suggested Learning Resources:

1. Ethics and Politics of the Indian Constitution Rajeev Bhargava Oxford University Press, New Delhi, 2008
- 2 The Constitution of India B.L. Fadia Sahitya Bhawan; New edition (2017)
- 3 Introduction to the Constitution of India DD Basu Lexis Nexis; Twenty-Third 2018 edition Suggested Software/Learning Websites:
1. <https://www.constitution.org/cons/india/const.html>
2. <http://www.legislative.gov.in/constitution-of-india>
3. <https://www.sci.gov.in/constitution>
4. <https://www.toppr.com/guides/civics/the-indian-constitution/the-constitution-ofindia/>

Note: The paper setter will set the paper as per the question paper templates provided.

B24-ECP-302		Compiler Design					
Lecture	Tutorial	Practical	Credit	End Semester Exam	Internal Assessment	Total	Duration of Exam
3	-	-	3	70	30	100	3Hrs.
Purpose: To acquaint with the knowledge and application aspects related Compiler Design.							
Course Outcomes (CO)							
CO1	To get familiarize with the Introduction to Compiler Design, Lexical Analyzer etc.						
CO2	To get familiarize with the Syntax Analysis.						
CO3	To get familiarize with the further reading of parsing, algorithm and parser.						
CO4	To get familiarize with the Intermediate Code Generation & Code Optimization.						

UNIT-I

Introduction: -Introduction to Compiler Design, Linker and Loader in Compiler Design, Phases of Compiler, Compiler vs Interpreter, Lexical Analysis.

Role of Lexical Analyzer-Tokens, Lexemes, and Patterns, Regular Expressions

UNIT-II

Syntax Analysis (Parsing) :-Role of the Parser, Context-Free Grammars (CFGs), Parse Trees and Abstract Syntax Trees.

Top-Down Parsing: Recursive Descent Parsing, LL(1) Parsing

Bottom-Up Parsing: Shift-Reduce Parsing, LR(0), SLR(1), LALR(1), and Canonical LR(1)

UNIT-III

Syntax Analysis and Parsing: Introduction to Syntax Analysis, FIRST Set in Syntax Analysis

Follow Set in Syntax Analysis, Classification of Context-Free Grammar, Ambiguous Grammar

Introduction to Parsing: -Types of Parsers: Classification of Top-Down Parsers , Recursive Descent Parser, Predictive Parser, Construction of LL(1) Parsing Table, LL(1) Parsing Algorithm

Classification of Bottom-Up-Parsers: -Shift Reduce (SR) Parser, Operator Precedence Parser, LR Parser, LR(0) Parser, SLR Parser.

UNIT-IV

Intermediate Code Generation: Intermediate Code Generation in Compiler Design, Introduction to Intermediate Representation, Three Address Code, Basic Blocks in Compiler Design, Control Flow Graph, Code Optimization, Code Optimization, Machine Dependent and Machine Independent Code Optimization, Peephole Optimization in Compiler Design.

References/Text:

1. Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, Compilers: Principles, Techniques, and Tools, Pearson Education
2. Andrew W. Appel, Modern Compiler Implementation in C / Java / ML, Cambridge University Press
3. D. M. Dhamdhare, Compiler Construction, McGraw Hill Education India

Note: The paper setter will set the paper as per the question paper templates provided.

B24-ECP-304		Power Electronics and Drives					
Lecture	Tutorial	Practical	Credit	End Semester Exam	Internal Assessment	Total	Duration of Exam
3	-	-	3	70	30	100	3Hrs.
Purpose: To familiarize the students with the Converter and Power switching device.							
Course Outcomes (CO)							
CO1	Introduction to Power Electronics and Thyristor Rectifiers will be acquainted.						
CO2	Various converters will be acquainted.						
CO3	Inverters Voltage control in 1-phase inverters will be acquainted.						
CO4	Basic DC & AC Drives will be acquainted.						

UNIT-I

Power switching devices:

Power Diode, Thyristor, MOSFET, IGBT: I-V Characteristics; Firing circuit for thyristor; Voltage and current commutation of a thyristor.

Thyristor rectifiers

Single-phase half-wave and full-wave rectifiers, Single-phase full-bridge thyristor rectifier with R-load and highly inductive load; Three-phase full-bridge thyristor rectifier with R-load and highly inductive load.

UNIT-II

DC-DC buck converter:

Elementary chopper with an active switch and diode, concepts of duty ratio and average voltage, power circuit of a buck converter, analysis and waveforms at steady state, duty ratio control of output voltage.

DC-DC boost converter:

Power circuit of a boost converter, analysis and waveforms at steady state, relation between duty ratio and average output voltage.

UNIT-III (Qualitative study only)

Single-phase voltage source inverter:

Power circuit of single-phase voltage source inverter, switch states and instantaneous output voltage, square wave operation of the inverter, concept of average voltage over a switching cycle, bipolar sinusoidal modulation and unipolar sinusoidal modulation, modulation index and output voltage.

UNIT-IV (Qualitative study only)

Electric Drives: Introduction to electric drives – Block diagram – advantages of electric drives- types of load – classification of load torque.

DC Drives: Single phase semi converter and single phase fully controlled converter drives. Dual Converters for Speed control of DC motor-1-phase and 3-phase configurations; Chopper controlled DC drives- Single quadrant chopper drives- Regenerative braking control- Two quadrant chopper drives- Four quadrant chopper drives.

AC Drives: Three phase induction motor speed control, Stator voltage control – stator frequency control.

References/Text:

1. Power Electronics, Dr. P.S. Bimbhra, Khanna Pub.
2. Fundamentals of Power Electronics" by Erickson and Maksimovic.
3. Power Electronics: Circuits, Devices, and Applications By Muhammad H. Rashid.
4. Electric Motor Drives Modeling, Analysis, and Control, Ramu Krishnan
5. Basics of Electrical Drives, S K Pillai, New Academic Science Limited

Note: The paper setter will set the paper as per the question paper templates provided.

B24-EEP-306		Signals and Systems					
Lecture	Tutorial	Practical	Credit	End Semester Exam	Internal Assessment	Total	Duration of Exam
3	-	-	3	70	30	100	3Hrs.
Purpose: To introduce the students to signal characteristics and analysis, theory related to systems and its analysis.							
Course Outcomes (CO)							
CO1	To understand the basic properties of signal & systems.						
CO2	To know the methods of characterization of LTI systems in time domain						
CO3	To analyse continuous time signals and system in the Fourier and Laplace domain						
CO4	To analyse discrete time signals and system in the Z transform domain						

UNIT-I

Introduction and Classification of signals: Definition of signal and systems, communication and control system as examples Classification of signals, Basic Operations on signals: Amplitude scaling, addition, multiplication, differentiation, integration, time scaling, time shift and time reversal. Exponential, sinusoidal, step, impulse and ramp functions.

System Classification and properties: Linear-nonlinear, Time variant-invariant, causal-noncausal, static-dynamic, stable-unstable, invertible.

UNIT-II

LTI system Properties: Properties of linear, time – invariant systems, convolution, interconnection of LTI systems, Time domain representation of LTI System, zero- input response, zero state response, impulse response, and stability, systems represented by differential and difference equations.

UNIT-III

Fourier Representation of Continuous and Discrete time Signals: Introduction to Fourier Transform & DTFT, Definition and basic problems. Properties of Fourier Transform: Linearity, Time shift, Frequency shift, Scaling, Differentiation and Integration, Convolution and Modulation, Parseval's theorem.

Sampling, discrete – time signals, models, operations, discrete – time systems, stability, discrete – time Fourier series, discrete – time Fourier transform.

UNIT – IV

Laplace Transform: Introduction to Laplace transform, Region of convergence for Laplace transform, Inverse Laplace transform, Properties of Laplace transform, Analysis and characterization of LTI systems using Laplace transform.

The Z-Transforms: Z transform, properties of the region of convergence, properties of the Z-transform, Inverse Z-transform, Causality and stability, Transform analysis of LTI systems. Applications: Modulation, types, benefits, window functions, Filtering, digital filters.

Text Book:

Alan V. Oppenheim, Alan S. Willsky, S. Hamid Nawab, Signals and Systems, Prentice Hall India,

Reference Books:

1. Signals and Systems: Tarun Kumar Rawat, Oxford University Press.
2. Signals and Systems: Haykin S., Veen B.V., John Wiley.

Note: The paper setter will set the paper as per the question paper templates provided.

B24-EEP-308		Soft Computing					
Lecture	Tutorial	Practical	Credit	End Semester Exam	Internal Assessment	Total	Duration of Exam
3	-	-	3	70	30	100	3Hrs.
Purpose: The main objective of the Soft Computing Techniques to Improve Data Analysis Solutions is to strengthen the dialogue between the statistics and soft computing research communities in order to cross-pollinate both fields and generate mutual improvement activities.							
Course Outcomes (CO)							
CO1	To learn the basic concepts of Soft Computing.						
CO2	Learn the Neural Networks, architecture, functions and various algorithms involved.						
CO3	Implementation of the Fuzzy Logic, Various fuzzy systems and their functions.						
CO4	Learn the implementation of Genetic algorithms, its applications and advances.						

UNIT-I

Soft Computing: Conventional AI to Computational Intelligence; Soft Computing Constituents and Applications.

Introduction to Non-traditional Meta-heuristic Optimization Techniques: Random Optimization, Simulated Annealing, Tabu Search, Ant Colony Optimization, Particle Swarm Optimization, Harmony Search, Memetic Algorithms, Other Evolutionary Algorithms such as Firefly Algorithm, Bee Algorithm, Shuffled Frog Leap algorithm, Bat algorithm etc.

Data Clustering Algorithms: K-Means, Fuzzy C-Means, Mountain Clustering, Subtractive Clustering.

UNIT-II

Fuzzy Set Theory: Fuzzy Sets & Classical Sets; Operations on Fuzzy Sets, Fuzzy Relations, Linguistic Variables.

Membership Functions: Introduction, Features, & Fuzzification, Methods of Membership Value Assignment; Defuzzification.

Fuzzy Systems: Crisp Logic, Predicate Logic, Fuzzy Logic; Fuzzy Rule Base and Approximate Reasoning, Fuzzy Quantifiers; Fuzzy Inference Systems, Fuzzy Decision Making, Fuzzy Logic Control System; Fuzzy Expert Systems.

UNIT-III

Neural Networks: Fundamental Concepts, Basic Models and Architecture; Machine Learning Using Neural Networks; Associative Memory Networks and their Applications.

Supervised Learning Neural Networks: Perceptron Networks, Radial Basis Function Networks; Back Propagation Neural Network: Architecture, Learning, Applications, & Research Directions; The Boltzman Machine.

Unsupervised Learning Networks: Competitive Learning networks; Kohonen Self-Organizing Networks; Hebbian learning; The Hopfield Network; Counter propagation Networks; Adaptive Resonance Theory: Introduction, Architecture, & Applications; Feed forward Networks; Reinforcement Learning.

UNIT-IV

Genetic Algorithms: Introduction to Genetic Algorithms (GA) and their Terminology; Traditional Optimization and Search Techniques vs. Genetic Algorithm; Operators in Genetic Algorithms; Problem Solving using Genetic Algorithm; Classification of Genetic Algorithms; Holland's Classifier Systems; Genetic Programming; Advantages and Limitations of Genetic Algorithm; Applications of Genetic Algorithm; Applications of GA in Machine Learning.

Text Books:

1. S.N. Sivanandam & S.N. Deepa, Principles of Soft Computing, Wiley Publications, 2nd Edition, 2011.
2. S. Rajasekaran & G.A. Vijayalakshmi Pai, Neural Networks, Fuzzy Logic & Genetic Algorithms, Synthesis & applications, PHI Publication, 2009.
3. N. K. Bose, Ping Liang, Neural Network fundamental with Graph, Algorithms & Applications, TMH, 1998.
4. Bart Kosko, Neural Network & Fuzzy System, PHI Publication, 1st Edition, 2009.
5. Rich E. Knight K, Artificial Intelligence, TMH, 3rd Edition, 2012.
6. George J Klir, Bo Yuan, Fuzzy sets & Fuzzy Logic, Theory & Applications, PHI Publication, 2009.
7. Martin T Hagen, Neural Network Design, Nelson Candad, 2008, Addison Wesley.

Note: The paper setter will set the paper as per the question paper templates provided.

B24-EEP-310		Computer Networks					
Lecture	Tutorial	Practical	Credit	End Semester Exam	Internal Assessment	Total	Duration of Exam
3	-	-	3	70	30	100	3Hrs.
Purpose: The main objective of the course is to introduce the architecture and layers of computer networks, and protocols used at different layers.							
Course Outcomes (CO)							
CO1	To introduce the basic concept of networking, types, networking topologies and layered architecture.						
CO2	To introduce the Data Link layer and its protocols, MAC and LAN protocols.						
CO3	To introduce the packet switching networks, routing algorithms and congestion control techniques.						
CO4	To introduce the concept of TCP/IP, its architecture and protocols.						

UNIT-I

Introduction: Networking goals, Applications of networking: web, ftp and email, Network Topologies analysis and comparison, Network types, Wireless network architecture, Switching approaches, Transmission media and their performance comparison, ISDN and B-ISDN.

Layered Architectures: Need for a layered architecture, OSI Reference model, TCP/IP architecture, layer protocols.

UNIT-II

Data Link layer: Peer to peer mechanism, Flow and Error control, Flow control mechanism: Stop and Wait, Sliding Window, Error control mechanism: Stop and Wait ARQ, Go Back-N ARQ and Selective repeat, Error detection and correction, Example of Data Link Protocols: PPP, HDLC protocol.

MAC and LAN Protocols: Multiple access protocols: ALOHA- pure and slotted ALOHA, CSMA, CSMA/CD, Channelization protocols: FDMA, TDMA, CDMA. Token ring, Ethernet, LAN standards 802.11, LAN Interconnected devices: Switch/Hub, Bridges, Router, Gateways.

UNIT-III

Packet Switching Networks: Packet Network topology, Methods: Datagrams and Virtual Circuits, Types of virtual circuits: X.25, Frame Relay, ATM. Routing Algorithms(distance vector, link state packet routing), Traffic Management and QoS – FIFO, Priority Queues, Fair Queuing, Congestion control techniques(choke packets, leaky bucket, token bucket).

UNIT-IV

TCP/IP: Architecture, Internet Protocols – IP packet, addressing, Subnet Addressing, IP routing, CIDR, ARP, RARP, ICMP, Reassembly, IPv6, UDP, Transmission Control Protocol – TCP, Reliable Stream Service, Operation Protocol, DHCP, Mobile IP, Internet Routing Protocols, Multicast Routing.

TEXT BOOK:

1. S. Tanenbaum (2003), Computer Networks, 4th edition, Pearson Education/ PHI, New Delhi, India.

REFERENCE BOOKS:

1. Behrouz A. Forouzan (2006), Data Communication and Networking, 4th Edition, McGraw-Hill, India.
2. Kurose, Ross (2010), Computer Networking: A top-down approach, Pearson Education, India.

Note: The paper setter will set the paper as per the question paper templates provided.

B24-EEP-312		Electromagnetic Theory					
Lecture	Tutorial	Practical	Credit	End Semester Exam	Internal Assessment	Total	Duration of Exam
3	-	-	3	70	30	100	3Hrs.
Purpose: To familiarize the students with the introductory concepts of Electric and Magnetic Fields and make them understand the phenomenon of propagation of electromagnetic waves and transmission lines.							
Course Outcomes (CO)							
CO1	Review and basics of electrostatics will be covered.						
CO2	Review and basics of Magneto-statics and Maxwell's equations will be covered.						
CO3	Fundamentals of uniform plane waves and their propagation in different mediums will be covered.						
CO4	Fundamentals of Transmission Lines and analysis.						

UNIT-I (With computational methods)

Electrostatics: Relevant Primer: Electrostatics fundamentals, Comparison of Cartesian, Cylindrical & Spherical Coordinate Systems, introductory multivariable calculus.

Divergence, curl and gradient, solenoidal and irrotational fields, basic idea of Stokes' Theorem, Gauss's Theorem and its Applications, Capacitance, Current Density and Continuity Equation.

UNIT-II(Qualitative analysis only)

Magnetic Field: Relevant Primer: Magnetostatics, Biot-Savart's Law, Ampere's circuital Law, Faraday's Law, Ampere's Force Law, Magnetic Circuits, magnetic materials and properties.

Maxwell Equations: Magnetic Vector Potentials, Differential Current Element, Maxwell's Equations in Point and Integral form, their physical interpretation and relation with circuit theory, Retarded Potentials.

UNIT-III (Qualitative analysis only)

The Uniform Plane Wave: Plane Wave, Deduction of Uniform plane wave equation & its Properties, Wave equations from Maxwell's equations, various media, Wave Equation for Free Space and Conducting Medium, Propagation. The Poynting Vector and its theorem. Skin Effect, reflection of Uniform Plane Waves.

UNIT-IV (With computational methods)

Transmission Lines: The Transmission Line Parameters and Equations, Primary & Secondary Constants, Propagation Constant, Phase and Group Velocities.

SC and OC Lines, Input Impedance Relations, Reflection Coefficient, VSWR, Smith Chart –its Configuration and Applications.

Text/Reference Books:

1. David K. Cheng, Field and Wave Electromagnetics, Addison Wesley.
2. K.D. Prasad, Antenna and Wave Propagation, Satya Prakashan.
3. Sadiku, Elements of Electromagnetics, 6th ed., Oxford Press.(Asian Edition).
4. J.D. Kraus, Electromagnetics, McGraw Hill Publications.

Note: The paper setter will set the paper as per the question paper templates provided.

B24-EEP-314		High Voltage Engineering and FACTS Devices					
Lecture	Tutorial	Practical	Credit	End Semester Exam	Internal Assessment	Total	Duration of Exam
3	-	-	3	70	30	100	3Hrs.
Purpose: The main objective of the course is to impart the knowledge of HVE, HVDC & FACTS devices.							
Course Outcomes (CO)							
CO1	To impart knowledge about Conduction and Break Down in Gases, liquid dielectrics and solid dielectrics.						
CO2	To impart knowledge about Generation of High Voltages and Currents.						
CO3	To acquaint students with the HVDC Transmission.						
CO4	To impart knowledge to students about facts devices.						

UNIT-I

Conduction and Break Down in Gases: Ionization processes, Townsend's criterion, breakdown in electronegative gases, time lags for breakdown, streamer theory, Paschen's law.

Break Down in Liquid Dielectrics: Conduction and breakdown in pure liquid and commercial liquid.

Break Down in Solid Dielectrics: Intrinsic breakdown, electromechanical break down, breakdown of solid, dielectric and composite dielectrics.

UNIT-II

Generation of High Voltages and Currents: Generation of high direct current voltages, generation of high alternating voltages, generation of impulse voltages, generation of impulse currents, tripping and control of impulse generators.

UNIT-III

HVDC Transmission: Development of HVDC Technology, Selection of converter configuration. Rectifier and Inverter operation. Control of HVDC converters and Systems. Harmonics in HVDC Systems, Harmonic elimination, AC and DC filters.

UNIT-IV

Introduction of Facts Concepts: Basic of flexible alternating current transmission system (FACTS) controllers, shunt, series, combined and other controllers, HVDC or FACTS, static VAR compensator (SVC) and static synchronous compensator (STATCOM), Static Synchronous Series Compensator (SSSC), Thyristor Controlled Series, Capacitor (TCSC). Solid State Contactors (SSC) and TSSC.

Suggested Books:

1. M. S. Naidu and V. Kamaraju, "High Voltage Engineering, Tata Mc-Graw Hill.
2. C. L. Wadhwa, "High Voltage Engineering", Wiley Eastern Ltd.
3. E. Kuffel and W. S. Zaengal, "High Voltage Engineering", Pergamon Press.
4. Hingorani N.G, "Understanding FACTS (Concepts and Technology of Flexible AC Transmission System)", Standard Publishers.
5. Song Y.H. and Johns A.T., "Flexible AC Transmission Systems", IEEE Press.
6. Ghosh A. and Ledwich G., "Power Quality Enhancement using Custom Power Devices", Kluwer Academic Publishers.
7. Mathur and Verma, "Thyristor-based FACTS controllers for Electrical Transmission Systems", IEEE Press.
8. Bollen M.H.J., "Understanding Power Quality and Voltage Sag", IEEE Press.
9. Padiyar K.R., "FACTS Controllers in Power Transmission and Distribution", New Age International Publisher.
10. Miller T.J.E., "Reactive Power Control in Electric Systems", John Wiley.
11. Kamakshaiah S, Kamaraju V, "HVDC Transmission", McGraw Hill Education.

Note: The paper setter will set the paper as per the question paper templates provided.

B24-ECP-316		Internet Technology and Management					
Lecture	Tutorial	Practical	Credit	End Semester Exam	Internal Assessment	Total	Duration of Exam
3	-	-	3	70	30	100	3Hrs.
Purpose: The main objective of the course is to introduce the protocols used in Internet, its architecture, and security aspect of Internet. Student will have an insight that how a search engine works and web crawls.							
Course Outcomes (CO)							
CO1	Describe Internet, its architecture, services and protocol.						
CO2	Implement a simple search engine.						
CO3	Implement a web crawler.						
CO4	Use java script technologies to make a website highly responsive, more efficient and user friendly.						

UNIT-I

THE INTERNET: Introduction to networks and internet, history, Internet, Intranet and Extranet, Working of Internet, Internet Congestion, Internet culture, business culture on internet, Collaborative computing and the internet, Modes of Connecting to Internet, Internet Service Providers (ISPs), Internet address, standard address, domain name, DNS, IPv6.Modems, Speed and time continuum, communications software, internet tools.

UNIT-II

WORLD WIDE WEB: Introduction, Miscellaneous Web Browser details, searching the www, Directories search engines and meta search engines, search fundamentals, search strategies, working of the search engines, Telnet and FTP, HTTP, Gopher Commands, TCP/IP, Introduction to Browser, Coast-to-coast surfing, hypertext markup language, Web page installation, Web page setup, Basics of HTML and formatting and hyperlink creation. Using FrontPage Express, Plug-ins.

UNIT-III

INTERNET PLATFORM AND MAILING SYSTEMS: Introduction, advantages and disadvantages, User Ids, Passwords, e-mail addresses, message components, message composition, mailer features, E-mail inner workings, E-mail management, MIME types, Newsgroups, mailing lists, chat rooms, secure mails, SMTP, PICO, Pine, Library cards catalog, online ref. works.

Languages: Basic and advanced HTML, Basics of scripting languages: XML, DHTML, JavaScript.

UNIT-IV

SERVERS: Introduction to Web Servers: PWS, IIS, Apache, Microsoft Personal Web Server, Accessing and using these servers.

Privacy and security topics: Introduction, Software Complexity, Attacks, security and privacy levels, security policy, accessibility and risk analysis, Encryption schemes, Secure Web document, Digital Signatures, Firewalls, Intrusion detection systems.

Text Books:

1. Steven Holzner, "HTML Black Book" Dreamtech press.
2. Web Technologies, Black Book, DreamtechPress
3. Web Applications: Concepts and Real-World Design, Knuckles, Wiley-India.
4. Internet and World Wide Web How to program, P.J. Deitel & H.M. Deitel. Pearson.

Note: The paper setter will set the paper as per the question paper templates provided.