ODL BCA

BACHELOR OF COMPUTER APPLICATIONS (BCA)

PROGRAMME GUIDE

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INTRODUCTION

The Bachelor of Computer Applications (BCA) programme builds a strong foundation in programming and computer applications, preparing learners for software development, front-end JavaScript frameworks, cyber security, and mobile application development. The programme emphasizes hands-on learning and industry-relevant technologies such as JavaScript frameworks, Node.js, wireless networks, and digital security, enabling learners to pursue careers in the IT industry.

PROGRAMME OUTCOMES

Immerse yourself in a transformative BCA Programme that offers a comprehensive learning experience designed to build strong foundations in computing and programming. Learners develop core competencies in areas such as web programming, data structures, and operating systems, while enhancing professional skills through community development initiatives and soft skills training. The programme further introduces advanced concepts in software engineering, artificial intelligence, front-end frameworks, and wireless and mobile networks, preparing graduates for diverse and dynamic roles in the IT industry.

1. **Domain Knowledge:** Ability to apply exploration to study and analyze problems in different areas of information technology. To enhance the core knowledge of the students.
2. **Knowledge enhancement:** Comprehend the fundamentals, principles, applications, and importance of computational concepts.
3. **Life-long learning:** Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of upcoming information technology changes.
4. **Modern tool usage:** Ability to use the modern programming languages, tools, techniques, and skills necessary for designing, developing, and deploying software-based applications.
5. **Environment and sustainability:** Understand the impact of sciences and computers to craft solutions in a global, economic, environmental, and societal context.
6. **Higher Education:** Capability to move on to higher-level learning based on computer science fundamentals.
7. **Employability:** Ability to get employment opportunities in corporate/government/private sectors or to be a successful entrepreneur.

PROGRAMME SPECIFIC OUTCOMES

PSOs are statements that describe what the graduates of a specific engineering program should be able to do:

1. **PSO1:** Ability to analyze, interpret and present findings effectively using mathematical and communication skills.
2. **PSO2:** Understand the fundamentals and applications of programming, data structures, databases, networking and Cyber Security.

3. **PSO3:** Amalgamate knowledge of information technology and computational tools for simulation.
4. **PSO4:** Ability to effectively apply computer science concepts to analyze, design, and develop cost-effective, efficient, and secure solutions to societal problems.

SALIENT FEATURES

- **Projects:** Seminar and Project driven courses are designed to enhance technical and presentation skills.
- **Contemporary Curriculum:** Instill knowledge in the major areas of computing such as Programming, Databases, Web Development, etc.
- **Interdisciplinary Minors:** Minor elective gives the students a choice to develop expertise in the interdisciplinary areas of interest, for example, Management and computers.
- **Holistic Development:** Participation in technical events, sports, and cultural activities help in the holistic development of students.
- **Professional Enhancement:** In addition to core curricula, the course offers subjects like communication, analytical and soft skills to enhance personality and employability.
- **Software Skills:** The curriculum is equipped with 21st-century digital technologies for game designing, animations, and web development.

PROGRAMME CODE: OL1124

DURATION OF THE PROGRAMME:

Minimum Duration: 3 years

Maximum Duration: 6 years

MEDIUM OF INSTRUCTION/EXAMINATION:

The medium of Instruction and Examination shall be English.

PROGRAMME STRUCTURE BACHELOR OF COMPUTER APPLICATIONS(BCA)						
Term	**Core Courses (CR I, CR II, CR III A, CR III B) CR I+II – (8+4) 12 x 4 Credits CR III (A) - 1 x 4 Credits CR III (B) - 1 x 8 Credits**	**Discipline Specific Electives (DSE) 4 x 4 Credits**	**Ability Enhancement Courses (AECC) 4 x 4 Credits**	**Skill Enhancement Courses (SEC) 4 x 4 Credits**	**Generic Electives (GE) 4 x 4 Credits**	**Credits**
I	Discipline Specific Core- I Discipline Specific Core- II Discipline Specific Core- III		**AECC- I** Environmental Sciences **AECC-II** English Communication Skills			**20**
II	Discipline Specific Core- IV Discipline Specific Core- V Discipline Specific Core- VI Discipline Specific Core- VII		**AECC-III** Advanced English Communication Skills			**20**
III	Discipline Specific Core- VIII Discipline Specific Core- IX Discipline Specific Core- X		**AECC-IV** Community Development Project Or Soft Skills		**GE-I** (Accounting, English, Gen. Mgt., Law and Taxation, Math's, Sales and Mkt.)	**20**
IV	Discipline Specific Core- XI Discipline Specific Core- XII	**DSE- I**		**SEC-I**	**GE-II**	**20**
V	**CR-III (B)** Field Project Or 2 courses from the GE basket 1 & 2 from the other area which is not chosen as Generic Elective (GE) area.	**DSE-II** **DSE-III**		**SEC-II**	**GE-III**	**24**
VI	**CR-III (A)** Term Paper Or 2 courses from the GE basket 1 & 2 from the other area which is not chosen as Generic Elective (GE) area.	**DSE-IV**		**SEC-III** **SEC-IV**	**GE-IV**	**20**
Total	**60 Credits**	**16 Credits**	**16 Credits**	**16 Credits**	**16 Credits**	**124**

PROGRAMME SCHEME BACHELOR OF COMPUTER APPLICATIONS (BCA)					
COURSE CODE	**COURSE TITLE**	**Cr.**	**CA**	**ETE (Theory)**	**ETE (Practical)**
TERM 1					
DECAP170	FUNDAMENTALS OF INFORMATION TECHNOLOGY	4	30	40	30
DECAP172	PROGRAMMING METHODOLOGY	4	30	40	30
DEMTH136	DISCRETE STRUCTURES	4	30	70	0
DEENG139	ENGLISH COMMUNICATION SKILLS	4	30	70	0
DECHE110	ENVIRONMENTAL SCIENCES	4	30	70	0
TERM 2					
DECAP200	DATABASE MANAGEMENT SYSTEMS	4	30	40	30
DECAP202	OBJECT ORIENTED PROGRAMMING	4	30	40	30
DECAP256	COMPUTER NETWORKS	4	30	40	30
DECAP268	COMPUTER SYSTEM ARCHITECTURE	4	30	40	30
DEENG140	ADVANCED ENGLISH COMMUNICATION SKILLS	4	30	70	0
TERM 3					
DECAP214	FUNDAMENTALS OF WEB PROGRAMMING	4	30	40	30
DECAP267	DATA STRUCTURES	4	30	40	30
DECAP462 OR DEPES201	COMMUNITY DEVELOPMENT PROJECT OR SOFT SKILLS	4	0 30	0 0	100 70
DECAP560	OPERATING SYSTEM	4	30	70	0
GE-I	GENERIC ELECTIVE- I	4	30	70	0
TERM 4					
DECAP509	SOFTWARE ENGINEERING	4	30	70	0
DECAP653	ARTIFICIAL INTELLIGENCE	4	30	70	0
DSE-I	DISCIPLINE SPECIFIC ELECTIVE I	4	30	40	30
SEC-I	SKILL ENHANCEMENT COURSE I	4	30	70/40	30/0
GE-II	GENERIC ELECTIVE II	4	30	70	0
TERM 5					
DSE-II	DISCIPLINE SPECIFIC ELECTIVE II	4	30	40	30
DSE-III	DISCIPLINE-SPECIFIC ELECTIVE III	4	30	40	30
SEC-II	SKILL ENHANCEMENT COURSE II	4	30	70/40	30/0
GE-III	GENERIC ELECTIVE III	4	30	70	0

DECAP463	FIELD PROJECT OR 2 courses from the GE basket 1 & 2 from the other area which is not chosen as Generic Elective (GE) area.	8	30	0	70
			30	70	0

TERM6					
DSE-IV	DISCIPLINE SPECIFIC ELECTIVE IV	4	30	40	30
SEC-III	SKILL ENHANCEMENT COURSE III	4	30	70/40	30/0
SEC-IV	SKILL ENHANCEMENT COURSE IV	4	30	70/40	30/0
GE-IV	GENERIC ELECTIVE IV	4	30	70	0
	TERM PAPER	4	30	0	70
	OR 1 course from the GE basket 3 of the same area which is chosen in lieu of Field Project in Term 5.		30	70	0
TOTAL CREDITS		**124**			

DISCIPLINE SPECIFIC ELECTIVE (DSE) BASKET 1								
S. No	**Course Code**	**Course Title**	**Cr.**	**CA**	**ETE (Theory)**	**ETP (Practical)**	**Elective Area**	**Term**
1	DECAP916	FRONT-END WEB UI FRAMEWORKS AND TOOLS	4	30	40	30	Web Development	4
2	DECAP495	WIRELESS AND MOBILE NETWORK	4	30	40	30	Network Security	4

DISCIPLINE-SPECIFIC ELECTIVE (DSE) BASKET 2								
S. No	**Course Code**	**Course Title**	**Cr.**	**CA**	**ETE (Theory)**	**ETP (Practical)**	**Elective Area**	**Term**
1	DECAP917	FRONT-END JAVASCRIPTFRAMEWORKS	4	30	40	30	Web Development	5

2	DECAP496	CRYPTOGRAPHY AND SECURITY RISK MANAGEMENT	4	30	40	30	Network Security	5

DISCIPLINE-SPECIFIC ELECTIVE (DSE) BASKET 3								
S. No	**Course Code**	**Course Title**	**Cr.**	**CA**	**ETE (Theory)**	**ETP (Practical)**	**Elective Area**	**Term**
1	DECAP918	MULTIPLATFORM MOBILE APP DEVELOPMENT WITH WEB TECHNOLOGIES	4	30	40	30	Web Development	5
2	DECAP497	CYBER SECURITY AWARENESS	4	30	40	30	Network Security	5

DISCIPLINE-SPECIFIC ELECTIVE (DSE) BASKET 4								
S. No	**Course Code**	**Course Title**	**Cr.**	**CA**	**ETE (Theory)**	**ETP (Practical)**	**Elective Area**	**Term**
1	DECAP919	SERVER-SIDE DEVELOPMENT WITH NODEJS	4	30	40	30	Web Development	6
2	DECAP498	DIGITAL FORENSIC	4	30	40	30	Network Security	6

GENERIC ELECTIVE (GE) BASKET 1								
S. No	**Course Code**	**Course Title**	**Cr.**	**CA**	**ETE (Theory)**	**ETP (Practical)**	**Elective Area**	**Term**
1	DEACC105	FINANCIAL ACCOUNTING	4	30	70	0	Accounting	3
2	DEBSL101	BUSINESS LAW	4	30	70	0	Law & Taxation	3
3	DEMGN101	BUSINESS ORGANISATION AND MANAGEMENT	4	30	70	0	General Management	3
4	DEMKT201	PRINCIPLES OF MARKETING	4	30	70	0	Sales & Marketing	3
5	DEENG112	INDIAN WRITING IN ENGLISH	4	30	70	0	English	3
6	DEMTH137	CALCULUS	4	30	70	0	Mathematics	3
GENERIC ELECTIVE (GE) BASKET 2								
S. No	**Course Code**	**Course Title**	**Cr.**	**CA**	**ETE (Theory)**	**ETP (Practical)**	**Elective Area**	**Term**
1	DEACC204	COST ACCOUNTING	4	30	70	0	Accounting	4
2	DEBSL102	COMPANY LAW	4	30	70	0	Law & Taxation	4
3	DEECO113	BUSINESS ECONOMICS	4	30	70	0	General Management	4
4	DEMGN251	SPREADSHEET MODELLING (USING EXCEL)	4	30	70	0	Sales & Marketing	4
5	DEENG114	BRITISH POETRY AND DRAMA 14TH-18TH CENTURIES	4	30	70	0	English	4
6	DEMTH159	MULTIVARIATE CALCULUS	4	30	70	0	Mathematics	4

GENERIC ELECTIVE (GE) BASKET 3								
S. No	**Course Code**	**Course Title**	**Cr.**	**CA**	**ETE (Theory)**	**ETP (Practical)**	**Elective Area**	**Term**
1	DEACC210	CORPORATE ACCOUNTING	4	30	70	0	Accounting	5
2	DEBSL301	INCOME TAX LAW AND PRACTICE	4	30	70	0	Law & Taxation	5
3	DEFIN302	FUNDAMENTALS OF FINANCIAL MANAGEMENT	4	30	70	0	General Management	5
4	DEMKT309	DIGITAL MARKETING	4	30	70	0	Sales & Marketing	5
5	DEENG115	BRITISH LITERATURE 18TH-20TH CENTURIES	4	30	70	0	English	5
6	DEMTH256	DIFFERENTIAL EQUATIONS	4	30	70	0	Mathematics	5

GENERIC ELECTIVE (GE) BASKET 4								
S. No	**Course Code**	**Course Title**	**Cr.**	**CA**	**ETE (Theory)**	**ETP (Practical)**	**Elective Area**	**Term**
1	DEACC301	MANAGEMENT ACCOUNTING	4	30	70	0	Accounting	6
2	DEBSL304	GOODS AND SERVICES TAX AND CUSTOMS LAW	4	30	70	0	Law & Taxation	6
3	DEMGN358	E-COMMERCE	4	30	70	0	General Management	6
4	DEMKT312	SELLING SKILLS	4	30	70	0	Sales & Marketing	6
5	DEENG316	WOMEN'S WRITING	4	30	70	0	English	6
6	DEMTH290	REAL ANALYSIS	4	30	70	0	Mathematics	6

SKILL ENHANCEMENT COURSES (SEC)								
S. No	**Course Code**	**Course Title**	**Cr.**	**CA**	**ETE (Theory)**	**ETP (Practical)**	**Elective**	**Term**
1	D EPEA204	ANALYTICAL SKILLS	4	30	70	0	SEC-I	4
2	DECAP392	FUNDAMENTALS OF JAVA PROGRAMMING	4	30	40	30	SEC-II	5
3	DECAP460	FUNDAMENTALS OF PYTHON	4	30	40	30	SEC-III	6

4	DECAP512	OPEN-SOURCE WEB APPLICATION DEVELOPMENT	4	30	70	0	SEC-IV	6

Note:

1. Students can adopt only one area from discipline specific elective basket that will be applicable for the whole program.
2. In the case of the Community Development Project, students may also choose Soft Skills course.
3. Students can adopt only one area from the generic elective basket that will be applicable for the whole program.
4. In lieu of Field Project, the student may also choose 2 courses from the GE basket 1 & 2 from the other area which is not chosen as Generic Elective (GE) area.
5. In lieu of Term Paper, the student may choose 1 course from the GE basket 3 of the same area which is chosen in lieu of Field Project in Term 5.
6. If the student opts for Field Project in Term 5, then he/she is not allowed to opt for course in lieu of Term Paper in Term 6.
7. If the student opts for courses in place of Field Project in Term 5, then he/she is not allowed to opt for the Term Paper in Term 6.

Course Code	DECAP170	Course Title	FUNDAMENTALS OF INFORMATION TECHNOLOGY		
			WEIGHTAGE		
			CA	ETE(Th.)	ETE (Pr.)
			30	40	30

Course Outcomes: Through this course, students will be able to

CO1: understand basic concepts and terminology of information technology.

CO2: have a basic understanding of personal computers and their operations.

CO3: understand various software and hardware, and various security issues.

CO4: familiarize students with complete fundamentals and the packages commonly used in computing software.

CO5: gain writing skills and various presentation aspects using word processing software.

Unit No.	Contents
Unit1	**Computer Fundamentals:** Characteristics & Generation of Computers, Block diagram of Computer. Application of IT in various sectors. **Data Representation:** Binary Number System, Octal, Hexadecimal, decimal and their Conversion.
Unit2	**Memory:** Types, Units of memory, RAM, ROM, Secondary storage devices – HDD, Flash Drives, Optical Disks: DVD, SSD **I/O Devices** – Keyboard, Mouse, LCDs, Scanner, Plotter, Printer& Latest I/O devices in market
Unit3	**Processing Data:** Transforming data into information, how computers represent data, how computers process data, Machine cycles, Memory, Registers, The Bus, Cache Memory
Unit4	**Operating Systems:** operating system basics, Purpose of the operating system, types of operating system, providing a user interface, Running Programs, Sharing Information, Managing Hardware, Enhancing an OS with utility software.
Unit5	**Data Communication**: Local and Global reach of the network, Digital and Analog Transmission, Data communication with standard telephone lines and Modems, Using Digital Data Connections, Wireless networks
Unit6	**Networks:** Sharing data anytime anywhere, uses of a network, Common types of a network, Hybrid Networks, how networks are structured, Network topologies and Protocols, Network Media, Network Hardware
Unit7	**Graphics and Multimedia:** Understanding graphics File Formats, Getting Images into your Computer, Graphics Software, Multimedia Basics
Unit8	**Data Base Management Systems**: The Database, The DBMS, Working with a database, Databases at Work, Common Corporate Database Management Systems
Unit9	**Software Programming and Development:** What is computer Program, hardware/Software Interaction, planning a Computer Program, how programs Solve Problems
Unit 10	**Programming Languages and Programming Process:** Categories of Programming Languages, Machine and Assembly Language, Higher Level Languages, WWW development languages, The SDLC of Programming
Unit11	**Internet:** Basic Internet terms: Web Page, Website, Home page, Browser, URL, Hypertext, ISP, Web Server, HTML, DHTML, XML, Introduction to client side and server side scripting. **Applications:** WWW, e-mail, Instant Messaging, Internet Telephony, Videoconferencing,

	Web Browser & its environment
Unit12	**Understanding The Need of Security Measures:** Basic Security Concepts, Threats to Users, Threats to Hardware, Threat to Data, Cyber Terrorism. **Taking Protective Measures:** Keeping your System Safe, Protecting Yourself, protecting your Privacy, Managing Cookies, Spyware and other BUGS, keeping your data secure, Backing Up data, Safeguarding your hardware
Unit13	**Cloud Computing and IoT**: SaaS, PaaS, IaaS, Public and Private Cloud; Virtualization, Virtual Server, Cloud Storage, Database Storage, Resource Management, Service Level Agreement, Basics of IoT and its applications
Unit14	**Futuristic World of Data Analytics:** Introduction to Big data and Analysis Techniques: Elements, Variables, and Data categorization, Levels of Measurement, Data management and indexing, Introduction to statistical learning and overview of various tools used for data analysis

LABORATORY WORK:

1. Hardware familiarizing with various I/O Peripheral devices, and storage devices.
2. Familiarity with DOS, Implementing various internal and external command sin DOS.
3. MS-Windows: Familiarizing with windows operating system; using built-in accessories; managing files and folders using windows explorer; working with control panel; installing hardware and software.
4. MS-Office (or any other Office Suite), meaning and features, its components.
5. MS-Word (or any other word processor): Creating Document Files, Saving, Closing Files, Page Settings, and Formatting Text. Spell Checking, Thesaurus, Creating Tables, Adding rows, columns. Printing Documents, Setting Print Settings, creating labels and mail merge, taking Printout
6. MS-Excel-Working with worksheets, formulas & functions, Inserting charts, printing in Excel.
7. MS Power Point-Views, Designing, viewing, presenting & Printing of Slides.
8. Internet: Navigating with Internet Explorer; surfing the net, using search engines; using email facility.

READINGS:

1. FUNDAMENTAL COMPUTER CONCEPTS by WILLIAM S. DAVIS
2. FUNDAMENTAL COMPUTER SKILLS by FENG-QI LAI, DAVID R. HOFMEISTER

Course Code	DECAP172	Course Title	PROGRAMMING METHODOLOGY

WEIGHTAGE		
CA	ETE(Th.)	ETE (Pr.)
30	40	30

Course Outcomes: Through this course, students will be able to

CO1: develop programming skills and familiar with the programming environment with the C Program structure.

CO2: declaration of variables and constants.

CO3: understand arrays, its declaration and uses.

CO4: implement, test, debug, and document programs in C.

Unit No.	Content
Unit-1	**Introduction:** Introduction to Programming, Program concept, Characteristics of programming, stages in program development, Algorithms, Notations, Flowchart, and Types of programming methodologies.
Unit-2	**Constant and Variable:** Machine Language, Assembly Language, High-Level Languages, C Program Structure, Character Set, Identifiers and Keywords, Constants and Variables.
Unit-3	**Unformatted and Formatted I/O:** Functions- printf(), scanf(), getchar(), putchar(), gets(), puts(), Expressions.
Unit-4	**Data Types & Operators:** Various data types - data range, size, Unary and Binary operators, Arithmetic Operators, Relational Operators, Logical Operators, Conditional Operators, Assignment Operators, Bitwise Operators.
Unit-5	**Control Structure:** Designing structured programs by using Top-Down design, Type conversion, and Type modifiers, if statements - simple if, if-else, multiple if, if-else ladder, nested if, switch-case statement, while, do-while & for statements, break and continue statements, go to statement.
Unit-6	**Functions:** Function Definition and Prototypes, Scope rules - Local and Global scope of functions, Function arguments - passing arguments by value and passing arguments by reference, Return Type of function, Recursion, Library Functions.
Unit-7	**Arrays:** Declaring arrays in C, Defining and Processing 1-dimensional and 2-dimensional arrays, Passing array as an argument to function, Multi-dimensional Arrays.
Unit-8	**Array Applications:** Sorting and Searching, Character Arrays.
Unit-9	**Strings:** Defining and Initializing strings, Reading and Writing strings, Processing of strings, String Library Functions - strcat(), strcpy(), strcmp(), strlen(), strrev().
Unit-10	**Storage Classes:** Storage class specifiers, Scope of a variable, Auto, Static, Extern, Register, Static variables and functions, Const Qualifier.
Unit-11	**Pointers:** Pointer data type, Pointer declaration, Initialization, accessing values using pointers, Pointer expressions, and arithmetic, Operations on Pointers.
Unit-12	**Dynamic Memory Management:** Dynamic Memory Management functions, malloc(), calloc(), realloc() and free(), Pointers and arrays, Pointers and functions.
Unit-13	**Structures and Unions:** Structure declaration, definition, and initialization accessing structures in functions, Structures and Pointers, the array of structures, nested structures, Self-referential structures, and Unions.
Unit-14	**File Structure:** Categories of files, opening and closing files, file opening modes, Text, and binary files, Reading and writing in files, appending in files, Creating Header files, Preprocessor Directives, and Macros.

LABORATORY WORK:

1. **Data Types & Operators:** Various data types - data range, size, Unary and Binary operators, Arithmetic Operators, Relational Operators, Logical Operators, Conditional Operators, Assignment Operators, Bitwise Operators.
2. **Control Structure:** if statements - simple if, if-else, multiple if, if-else ladder, nested if, switch-case statement, while, do-while & for statements, break and continue statements, go to statement.
3. **Functions:** Function Definition and Prototypes, Scope rules - Local and Global scope of functions, Function arguments - passing arguments by value and passing arguments by reference, Return Type of function, Recursion, Library Functions.
4. **Arrays:** Declaring arrays in C, Defining and Processing 1-dimensional and 2-dimensional arrays, Passing array as an argument to function, Multi-dimensional Arrays.
5. **Pointers:** Pointer declaration, Initialization, accessing values using pointers, Pointer expressions and arithmetic, Operations on Pointers.
6. **Structures and Unions:** Structure declaration, definition and initialization, accessing structures in functions, Structures and Pointers, an array of structures, nested structures, Self-referential structures, Unions.
7. **File Structure:** Opening and closing files, file opening modes, Text and binary files, Reading and writing in files, appending in files, and Creating Header files.

READINGS:

1. C: THE COMPLETE REFERENCE by HERBERT SCHILDT, MC GRAW HILL.
2. PROGRAMMING IN ANSI C by E. BALAGURUSWAMY, MC GRAW HILL.

Course Code	DEMTH136	Course Title	DISCRETE STRUCTURES

WEIGHTAGE	
CA	ETE (Th.)
30	70

Course Outcomes: Through this course, students will be able to
CO1: write formal logical arguments using propositional logic.
CO2: discuss problem solving through the basics of combinatorics.
CO3: relate basic discrete structures and algorithms.
CO4: apply the concepts of trees to find the shortest path.
CO4: discuss properties of graphs and be able to relate these to practical examples.
CO5: determine when a recursive solution is appropriate for a problem.

Unit No.	Content
Unit-1	Sets, Description of a Set, Types of Sets, Subsets, Power Set, Venn Diagrams, Operation on Sets (Union, Intersection and Difference), Laws of Set Theory
Unit-2	Cartesian product of sets, Relations, Functions, Some functions and their graphs (Identity, Polynomial, Modulus function and greatest integer function). One-One and onto functions
Unit-3	Introduction to logic, Propositions and compound propositions, Basic logical operations (Conjunction, Disjunction, Negation), Propositions and truth tables
Unit-4	Tautologies and contradiction, Logical equivalence, Conditional and biconditional statements
Unit-5	Introduction to Logic Gates, Combinations of Gates, Implementation of Logic Expressions with Logic Gates and Switching circuits
Unit-6	Introduction to Recursion, Recurrence Relation, Solving Recurrence Relation, Linear Homogenous Recurrence Relation with constant coefficient and their solution
Unit-7	Introduction and Basic terminology of Graphs, Multigraphs, Degree of a vertex, Handshaking theorem, Sub graphs, Homeomorphic and Isomorphic graphs
Unit-8	Paths, Connectivity, Connected Components, Distance and Diameter, Cut points and bridges
Unit-9	Eulerian Graphs, Hamiltonian Graphs, Euler theorem, Maps, Regions, Euler Formula
Unit-10	Planar graphs, Kuratowski's Theorem (without proof)
Unit-11	Graph coloring, Chromatic Number of a Graph, Complete graph and its coloring, Regular and Bipartite Graphs and their coloring
Unit-12	Labeled and Weighted Graph, Shortest Path in weighted Graphs, Dijkstra's Algorithm to find the shortest path
Unit-13	Introduction to Tree, Rooted Tree, Binary Tree
Unit-14	Spanning Tree, Minimum Spanning Tree, Kruskal and Prims Algorithms to find minimum spanning tree

READINGS:

1. DISCRETE MATHEMATICS (SCHAUM'S OUTLINES) (SIE) by SEYMOUR LIPSCHUTZ, MARC LIPSON, VARSHA H. PATIL, 2007 MCGRAW HILL EDUCATION

Course Code	DEENG139	Course Title	ENGLISH COMMUNICATION SKILLS

WEIGHTAGE	
CA	ETE (Th.)
30	70

Course Outcomes: Through this course, students will be able to

CO1: identify deviant use of English both in written and spoken forms and understand the importance of writing in academic life.

CO2: reorganize and correct the errors of usage to write simple sentences without committing errors of spelling and grammar.

CO3: assess their own ability to improve their competence in using the language.

CO4: understand and appreciate English spoken by people from different regions and read independently unfamiliar texts with comprehension.

CO5: use language for speaking with confidence in an intelligible and acceptable manner.

CO6: understand the importance of reading for life and develop an interest in reading.

Unit No.	Content
Unit-1	**Grammar**: introduction to the sentence structure in English
Unit-2	**Grammar:** introduction to articles
Unit-3	**Grammar:** introduction to parts of speech
Unit-4	**Grammar:** common errors
Unit-5	**Listening Skills:** introduction to the importance of listening skills
Unit-6	**Listening Skills**: types of listening – informational, critical, empathetic listening
Unit-7	**Listening Skills**: problems with listening to unfamiliar dialects
Unit-8	**Speaking Skills**: aspects of pronunciation, introduction to vowels, consonants and diphthongs
Unit-9	**Speaking Skills**: fluency in speaking, intelligibility in speaking
Unit-10	**Reading Skills**: introduction to reading skills, types of texts – narrative, descriptive, extrapolative
Unit-11	**reading skills**: essential skills for reading comprehension – decoding, fluency, vocabulary, reasoning and background knowledge
Unit-12	**writing skills**: introduction to writing skills, cohesion and coherence, expansion of given sentence
Unit-13	**writing skills**: reorganizing jumbled sentences into a coherent paragraph, paragraph writing
Unit-14	**Composition**: introduction to letter writing, types of letters, notices, complaints, appreciation, conveying sympathies

READINGS:

1. OXFORD PRACTICE GRAMMAR by JOHN EASTWOOD, OXFORD UNIVERSITY PRESS
2. TEXTBOOK OF ENGLISH PHONETICS FOR INDIAN STUDENTS by BALASUBRAMANIAN, LAKSHMI PUBLICATIONS
3. OXFORD ADVANCED LEARNER'S DICTIONARY OF ENGLISH by DEUTER, M ET.AL. (, OXFORD UNIVERSITY PRESS
4. INTERMEDIATE GRAMMAR, USAGE AND COMPOSITION by TOCKOO, M. L., A. E. SUBRAMANIAM, P. R. SUBRAMANIAM, ORIENT BLACKSWAN PVT. LTD.

Course Code	DECHE110	Course Title	ENVIRONMENTAL SCIENCES

WEIGHTAGES	
CA	ETE (Th.)
30	70

Course Outcomes: Through this course, students will be able to
CO1: observe the current environmental issues and associated problems.
CO2: illustrate the basic knowledge of the environment and its various components.
CO3: devise new approaches to reduce various types of environmental pollution.
CO4: identify the environmental policies and practices.

Unit No.	Content
Unit-1	**Multidisciplinary nature of environmental studies, Scope and importance:** Concept of sustainability and sustainable development, Land resources: Land degradation, soil erosion and desertification.
Unit-2	**Deforestation**: Causes and impacts due to mining, dam building on the environment, forests, biodiversity and tribal populations.
Unit-3	**Water**: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water, Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs.
Unit-4	**Ecosystem, structure and function of ecosystem, Energy flow in an ecosystem**: food chains, food webs and ecological succession ecological pyramids, Case studies of the following ecosystems: a) forest ecosystem b) grassland ecosystem c) desert ecosystem d) aquatic ecosystem.
Unit-5	**Levels of biological diversity**: genetic, species and ecosystem diversity, Biogeographic zones of India, Biodiversity patterns and global biodiversity hot spots, India as a mega diversity nation, Endangered and endemic species in India.
Unit-6	**Threats to biodiversity**: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions, Conservation of biodiversity: In-situ and ex-situ conservation of biodiversity, Ecosystem and biodiversity services: ecological, economic, social, ethical, aesthetic and Informational value.
Unit-7	**Environmental pollution**: Types, causes, effects and controls; Air pollution, Ill-effects of Fireworks.
Unit-8	**Environmental pollution**: Types, causes, effects and controls: water, soil and noise pollution, Nuclear hazards and human health risks, Pollution case studies.
Unit-9	Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture.
Unit-10	**Environment Laws**: Environment Protection Act, Air (Prevention & Control of Pollution) Act, Water (Prevention and Control of Pollution) Act, Wildlife Protection Act, Forest Conservation Act.
Unit-11	**International agreements**: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD), Nature reserves, tribal populations and rights, and human-wildlife conflicts in Indian context, Solid waste management: Control measures of urban and industrial waste
Unit-12	**Human population growth**: Impacts on environment, human health and welfare.
Unit-13	**Disaster management**: floods, earthquakes, cyclones and landslides, Environmental movements: Chipko, Silent valley, Bishnois of Rajasthan.
Unit-14	**Environmental ethics**: Role of Indian and other religions and cultures in environmental conservation, Environmental communication and public awareness

READINGS:

1. PERSPECTIVE IN ENVIRONMENTAL STUDIES by ANUBHA KAUSHIK, C P KAUSHIK, NEW AGE INTERNATIONAL PUBLISHERS
2. TEXT BOOK OF ENVIRONMENTAL STUDIES by D. DAVE AND S. S. KATEWA, CENGAGE LEARNING

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Course Code	DECAP200	Course Title	DATABASE MANAGEMENT SYSTEMS

WEIGHTAGE		
CA	ETE(Th.)	ETE (Pr.)
30	40	30

Course Outcomes: Through this course, students will be able to

CO1: understand the database concepts and database management system software.

CO2: identify the basic concepts and various data models used in database design ER modeling concepts and architecture use and design queries using SQL.

CO3: discuss the normalization theory and apply such knowledge to the normalization of a database.

CO4: apply and relate the concept of transaction, concurrency control and recovery in the database.

CO5: examine the recovery system and be familiar with cloud databases and distributed databases.

Unit No.	Content
Unit-1	**Introduction to fundamentals of DBMS:** Database applications, Purpose of database systems, Components of DBMS, DBMS Architecture, Different Data Models, Data Independence, Various types of constraints
Unit-2	**Database design and ER model:** Overview of the Design process, Entity-relationship model, constraints, ER Diagrams, ER Design issues, Weak entity sets, extended ER features
Unit-3	**Relational Databases:** Relational Model, Structure of Relational databases, fundamental, additional and extended relational algebra operations, Views, DDL statements in SQL, DML statements in SQL, JOINS
Unit-4	**SQL (DDL):** Implementation of Data Definition Language, Datatypes, Schema definition, Basic structure of SQL Queries- CREATE, ALTER, DROP, RENAME, TRUNCATE
Unit-5	**SQL (DML):** DML commands - SELECT, INSERT, DELETE and UPDATE operations, implementation of constraints, implementation of joins, Nested subqueries, Complex queries, Views, Joined relations.
Unit-6	**Relational Languages**: Tuple Relational calculus, Domain relational calculus, Query by Example, Data log, Set Operations – UNION, INTERSECT, EXCEPT, Aggregate Functions, NULL values.
Unit-7	**Relational Database Design:** Features, Atomic Domains and first normal form, Functional dependency theory decomposition using functional dependencies, decomposition using Multivalued dependencies, more normal forms, database design process.
Unit-8	**Transaction Management:** Concept of Transaction, Transaction State, Implementation of atomicity and durability, concurrent execution, Serializability, Recoverability, Implementation of Isolation, testing for Serializability.
Unit-9	**Concurrency Control:** Lock-based protocols, Timestamp based protocols, Validation based protocols, Deadlock handling, Insert and Delete operations, Weak levels of consistency
Unit-10	**SQL (DCL/TCL):** implementation of GRANT, REVOKE, ROLLBACK, COMMIT, SAVEPOINT, implementation of aggregate functions, implementation of inbuilt character functions, implementation of inbuilt numeric functions, implementation of inbuilt date & time functions
Unit-11	**Recovery system:** Failure classification, storage structure, recovery and atomicity, log-based recovery, recovery with concurrent transactions, buffer management, failure with loss of non-volatile storage.
Unit-12	**Distributed Databases:** Distributed Databases, Data Fragmentation, Replication and Allocation Techniques, Semi Join, Homogeneous and Heterogeneous Databases, Distributed Data Storage, Distributed Transactions.
Unit-13	**Cloud-Based Databases:** From collaborative to the Cloud – A short history, Introduction to

	Client-Server Computing, Peer-to-Peer Computing, Distributed Computing, Grid Computing, Collaborative Computing, Cloud Computing. Functioning of Cloud Computing, Differences between Distributed computing and Cloud computing.
Unit-14	**Introduction to PL/SQL:** Introduction to PL/SQL blocks, conditional statements, loops, cursors and triggers.

LABORATORY WORK:

1. **SQL (DDL):** Implementation of Data Definition Language, data types, schema definition, Basic structure of SQL Queries- CREATE, ALTER, DROP, RENAME, TRUNCATE
2. **SQL (DML):** DML commands - SELECT, INSERT, DELETE and UPDATE operations, implementation of constraints, implementation of joins, Nested sub queries, Complex queries, Views, Joined relations.
3. **SQL (DCL/TCL):** implementation of GRANT, REVOKE, ROLLBACK, COMMIT, SAVEPOINT, implementation of aggregate functions, implementation of inbuilt character functions, implementation of inbuilt numeric functions, implementation of inbuilt date & time functions.
4. **Introduction to PL/SQL:** Introduction to PL/SQL blocks, conditional statements, loops, cursors and triggers.

READINGS:

1. DATABASE SYSTEM CONCEPTS by H. F. KORTH & A. SILBERSCHATZ, TATA MCGRAW HILL, NEW DELHI, THE YEAR 2006.
2. SQL, PL/SQL THE PROGRAMMING LANGUAGE OF ORACLE by IVAN BAYROSS, BPB PUBLICATION.
3. FUNDAMENTALS OF DATABASE SYSTEMS by ELMASRI & NAVATHE, ADDISON & WEISELY, NEW DELHI.
4. DATABASE SYSTEMS by C. J. DATE, PRENTICE HALL OF INDIA, NEW DELHI.
5. SIMPLIFIED APPROACH TO DBMS by P. BHATIA & G. SINGH, KALYANI PUBLISHERS.
6. UNDERSTANDING SQL by MARTIN GRUBER, BPB PUBLICATION, NEW DELHI.
7. RELATIONAL DATABASE: THEORY & PRACTICE by VAL OCCARDI, BPB PUBLICATION, NEW DELHI

Course Code	DECAP202	Course Title	OBJECT-ORIENTED PROGRAMMING

WEIGHTAGE		
CA	ETE(Th.)	ETE (Pr.)
30	40	30

Course Outcomes: Through this course, students will be able to

CO1: familiarize with the basic concepts of object-oriented programming.

CO2: understand the object construction, memory allocation and deallocation.

CO3: develop programs using object-oriented concepts like encapsulation, inheritance and polymorphism.

CO4: analyse the different behavior of overloaded operations in different situations.

Unit No.	Content
Unit-1	**Principles of OOP:** introduction, procedural vs object-oriented programming, basic concepts of object-oriented programming, object-oriented languages, benefits of OOP's
Unit-2	**Basics of C++:** C Vs C++, a simple C++ program, compiling & linking, tokens, keywords, identifiers & constants, data types, reference variables
Unit-3	**Operators and type casting:** operators in C++, scope resolution operator, member de-referencing operators, type casting: implicit and explicit type casting
Unit-4	**Control structures:** decision-making controls, iter ative controls and jumping controls
Unit-5	**Pointers and structures:** main function, function prototyping, handling pointers, C structures and limitations
Unit-6	**Classes and objects:** specifying class, a sample C++ program with class, access specifiers, defining member functions, nesting of member functions
Unit-7	**More on classes and objects:** function definition inside the class and outside the class, private member functions, arrays within the class, memory allocation of objects
Unit-8	**Handling functions:** function calling mechanisms: call by Value, call by address & call by reference, objects as function arguments
Unit-9	**More on functions:** inline functions, making outside function inline, friend functions
Unit-10	**Static members and polymorphism:** Static Data Members & Static Functions, Function Overloading
Unit-11	**Constructors and destructors:** constructors, parameterized constructors, copy constructors and dynamic constructors, multiple constructors in a class
Unit-12	**More on constructors and destructors:** constructors with default arguments, dynamic initialization of objects, destructors
Unit-13	**Inheritance:** defining derived classes, single inheritance, making a private member inheritable, multilevel inheritance, hierarchical inheritance, multiple inheritances, hybrid inheritance
Unit-14	**File handling:** file handling operations: open, close, read and write

LABORATORY WORK:

Implementation of C++ Programming Concepts (Classes and objects, inline functions, friend functions, constructor and destructors, function overloading, inheritance, working with files)

READINGS:

1. OBJECT ORIENTED PROGRAMMING WITH C++ by E BALAGURUSAMY, MC GRAW HILL
2. LET US C++ by YASHAVANT KANETKAR, BPB PUBLICATIONS
3. OBJECT ORIENTED PROGRAMMING IN C++ by ROBERT LAFORE, GALGOTIA PUBLICATIONS 3. THE C++ PROGRAMMING LANGUAGE by BJARNE STROUSTRUP, PEARSON

Course Code	DECAP256	Course Title	COMPUTER NETWORKS

WEIGHTAGE		
CA	ETE(Th.)	ETE (Pr.)
30	40	30

Course Outcomes: Through this course, students will be able to

CO1: examine the importance of data communication in daily activities.

CO2: recognize the different networking devices and their functionalities.

CO3: utilize the role of protocols in networking and analyze the services and features of the various layers of the network.

CO4: validate the program, date and hardware is available to everyone on the network without regard to the physical location of the resource and the users.

Unit No.	Content
Unit-1	**Introduction to computer networks:** definition, characteristics, applications and classification of computer networks –PAN, LAN, MAN, WAN, internetworks, network topology.
Unit-2	**Data communication:** data communication components, characteristics, transmission impairments, transmission modes, protocol – its composition and functions.
Unit-3	**Network models:** layered architecture, benefits of layered architecture, OSI reference model, TCP/IP protocol suite, functions of layers in OSI and TCP/IP models.
Unit-4	**Physical layer:** services of a physical layer, transmission medium – wired and wireless, networking devices.
Unit-5	**Data link layer - error detection and correction methods:** one and two-dimensional parity method, hamming code, cyclic redundancy check (CRC); framing-character stuffing, bit stuffing.
Unit-6	**Data link layer - flow and error control protocols:** protocols for noiseless and noisy channels - simplest protocol, stop-and-wait protocol; stop-and-wait ARQ, go-back-n ARQ, selective repeat ARQ.
Unit-7	**Data link layer - medium access control protocols:** pure ALOHA and slotted ALOHA, persistent and non-persistent CSMA, CSMA/CD, CSMA/CA
Unit-8	**Network layer - logical addressing:** IPV4 addressing, Classful addressing, classless addressing, subnetting, network address translation, IPV6 addressing, address resolution protocol (ARP), reverse address resolution protocol
Unit-9	**Network layer – routing: unicast routing:** routing characteristics, routing algorithms, comparison of routing algorithms. **Broadcast and multicast routing:** broadcast routing, multicast routing, routing in Adhoc networks.
Unit-10	**Transport layer - protocols:** services of the transport layer, connection-oriented and connectionless services, connection establishment, connection release, TCP, UDP.
Unit-11	**Transport layer - congestion control and QoS:** general principles of congestion control, congestion avoidance and prevention policies; quality of service- types of traffic, traffic shaping, leaky bucket algorithm, token bucket algorithm.
Unit-12	**Application layer – services and protocols:** remote login (TELNET), file transfer protocol (FTP), domain name system (DNS), e-mail - simple mail transfer protocol

	(SMTP), post office protocol (POP), internet message access protocol (IMAP).
Unit-13	**Internet and WWW:** internet basics, hypertext transfer protocol (HTTP), world wide web (www), security on the internet – IPsec, VPN.
Unit-14	**Network Security:** goals of network security, principles of cryptography, message integrity, securing e-mail, operational security: firewalls, types of firewalls.

LABORATORY WORK:

1. **Network models:** layered architecture, benefits of layered architecture, OSI reference model, TCP/IP protocol suite, functions of layers in OSI and TCP/IP models.

2. **Network layer - logical addressing:** IPV4 addressing, Classful addressing, classless addressing, subnetting, network address translation, IPV6 addressing, address resolution protocol (ARP), reverse address resolution protocol.

READINGS:

1. DATA COMMUNICATION AND NETWORKING by B.A. FOROUZAN, MCGRAW HILL EDUCATION
2. DATA AND COMPUTER COMMUNICATIONS by WILLIAM STALLINGS, PEARSON

Course Code	DECAP268	Course Title	COMPUTER SYSTEM ARCHITECTURE

WEIGHTAGE		
CA	ETE(Th.)	ETE (Pr.)
30	40	30

Course Outcomes: Through this course, students will be able to

CO1: classify the functioning of digital systems and discuss the working of gates and circuits.

CO2: identify the factors influencing the design of hardware and software elements of computer system.

CO3: evaluate the various processor components and their interconnection.

CO4: analyze the types of instructions and interrupts in the computer system.

Unit No.	Content
Unit-1	**Binary Systems:** Number System, Number System Conversions, Complements, Fixed point and floating-point representation
Unit-2	**Boolean algebra:** Basic definitions of Boolean algebra, Axiomatic definition of Boolean algebra, Basic theorems and properties, Boolean functions, Karnaugh map & tabulation methods
Unit-3	**Implementation of combinational logic design:** Logic gates and combinational circuits, Binary adder and subtractor, Decimal adder, Encoder and decoder Multiplexer and demultiplexer, Binary parallel adders
Unit-4	**Design of synchronous sequential circuits:** Sequential circuits, Latches and flip-flops, Analysis of clocked sequential circuits, State reduction and state assignment, Design of counters, Shift registers and ripple-counters
Unit-5	**Register Transfer and Microoperations:** Register Transfer Language, Register Transfer, Bus and Memory Transfer, Arithmetic Microoperations, Logic Microoperations, Shift Microoperations
Unit-6	**Instruction Codes and Instruction Cycle:** Instruction codes, Common Bus System, Timing and control, Instruction Cycle, Types of instructions
Unit-7	**Machine Language:** Introduction of Machine Language, Assembly Language, Assembler Basics, program loops
Unit-8	**Machine Programming:** Arithmetic and Logic Operation programming, Subroutines, Input-Output programming, Programming loops
Unit-9	**Register Organization:** General Register Organization, Organization of stacks, Reverse Polish Notation
Unit-10	**Addressing Modes:** Addressing Modes, RISC Instructions, Zero Address Instructions, One Address Instructions, Two Address Instructions, three address Instructions
Unit-11	**Pipeline processing:** Instruction and arithmetic pipeline, Pipeline hazards and their resolution, Parallel processing
Unit-12	**Memory technology:** Cache memory and memory hierarchy, Virtual memory and memory management unit, Memory hierarchy, Associative memory, Cache memory
Unit-13	**I/O subsystems:** Input-output devices, Interfacing with IO devices, Concept of handshaking, DMA data transfer, Asynchronous data transfer
Unit-14	**Hardware description logic:** Introduction to hardware description language, HDL for combinational circuits

Laboratory Work

Implementation of combinational logic design: Logic gates and combinational circuits, Binary adder and subtractor, Decimal adder, Encoder and decoder Multiplexer and demultiplexer, Binary parallel adders

READINGS:

1. COMPUTER SYSTEM ARCHITECTURE by MORRIS MANO, PEARSON
2. DIGITAL-LOGIC AND COMPUTER DESIGN by MORRISMANO, M., PRENTICEHALL
3. COMPUTER ARCHITECTUREA QUANTITATIVE APPROACH by DAVIDAPATTERSON, PRENTICEHALL

Course Code	DEENG140	Course Title	ADVANCED ENGLISH COMMUNICATION SKILLS

WEIGHTAGE	
CA	ETE(Th.)
30	70

Course Outcomes: Through this course, students will be able to

CO1: read and understand longer pieces of discourse independently.

CO2: read and compare two texts for evaluating them.

CO3: summarise a text for the benefit of peers orally or in writing.

CO4: write a review of a text read for academic purposes or for pleasure.

CO5: understand the purpose and process of communication.

Unit No.	Content
Unit-1	Reading texts of different genres and varying length
Unit-2	Different strategies of comprehension
Unit-3	Reading and interpreting non-linguistic texts
Unit-4	Reading and understanding incomplete texts (Cloze of varying lengths and gaps; distorted texts.)
Unit-5	Analyzing a topic for an essay or a report
Unit-6	Editing the drafts arrived at and preparing the final draft
Unit-7	Re-draft a piece of text with a different perspective (Manipulation exercise)
Unit-8	Summarise a piece of prose or poetry
Unit-9	Using phrases, idioms and punctuation appropriately
Unit-10	Introduction to communication – principles and process
Unit-11	Types of communication – verbal and non-verbal
Unit-12	Identifying and overcoming problems of communication
Unit-13	Communicative competence
Unit-14	Cross-cultural communication

READINGS:

1. ACADEMIC WRITING by BAILEY, STEPHEN (2003), LONDON AND NEW YORK, ROUTLEDGE.
2. FLUENCY IN ENGLISH PART II by DEPARTMENT OF ENGLISH, DELHI UNIVERSITY (2006), NEW DELHI, OUP GRELLET, F (1981).
3. DEVELOPING READING SKILLS: A PRACTICAL GUIDE TO READING SKILLS by NEW YORK, CUP HEDGE, T. (2005). WRITING. LONDON, OUP
4. COMMUNICATION SKILLS by KUMAR, S AND PUSHPLATA (2015), NEW DELHI, OUPLAZAR, G. (2010).
5. LITERATURE AND LANGUAGE TEACHING by CAMBRIDGE, CUP NUTTALL, C (1996).
6. TEACHING READING SKILLS IN A FOREIGN LANGUAGE. LONDON by MACMILLAN NUTTALL, C (1996).

Course Code	DECAP214	Course Title	FUNDAMENTALS OF WEB PROGRAMMING

WEIGHTAGE		
CA	ETE(Th.)	ETE
30	40	30

Course Outcomes: Through this course, students will be able to
CO1: understand the website layout creation using HTML language.
CO2: apply the website planning, management and maintenance techniques.
CO3: apply dynamic website creation using JavaScript and jQuery.
CO4: illustrate logic implementation on a web page.
CO5: understand how to manage versatile data on a web page.

Unit No.	Content
Unit-1	**Internet Basic:** Basic concepts, communicating on the internet, internet domains, establishing connectivity to the internet, client IP address, IP address, TCP/IP
Unit-2	**HTML Introduction: i**ntroduction, web server, web client/ browser, HTML tags
Unit-3	**HTML Command and Structure & Formatting: c**ommonly used HTML commands, structure of HTML program, formatting, text styles, text effects
Unit-4	**HTML List and Graphics:** HTML lists, types of lists, adding graphics to HTML document
Unit-5	**Creating Tables & Frames:** creating tables, linking documents, frames
Unit-6	**DHTML:** cascading style sheets, class, external style sheets
Unit-7	**Introduction to Java Script:** JavaScript and web, <script> tag and browser compatibility. data types: numeric, text, Boolean, type casting, arrays, operators and expressions in JavaScript
Unit-8	**Programming Constructs in JavaScript:** programming constructs, conditional and looping statements
Unit-9	**Functions in JavaScript:** functions, user defined functions, dialog boxes
Unit-10	**DOM Model & Browser Objects:** understanding DOM model, objects in HTML, browser objects, window, history, location, navigator, and document object.
Unit-11	**Handling Events Using JavaScript:** handling events using JavaScript
Unit-12	**HTML Forms:** properties and methods, button, text, text area, checkboxes, radio buttons, select and option elements
Unit-13	**Built-in Objects in JavaScript:** built-in objects in JavaScript, string objects, math objects, date objects, user-defined objects
Unit-14	**Basics of JQuery:** Introduction to JQuery, JQuery events, animations and effects using JQuery DOM using JavaScript: DOM concept in JavaScript, windows navigator, locations object with methods

LABORATORY WORK:

1. **HTML Command and Structure & Formatting: c**ommonly used HTML commands, structure of HTML program, formatting, text styles, text effects.
2. **Introduction to JavaScript:** JavaScript and web, <script> tag and browsers compatibility. data types: numeric, text, boolean, type casting, arrays, operators and expressions in JavaScript.
3. **HTML Forms:** properties and methods, button, text, text area, checkboxes, radio buttons, select and option elements.

READINGS:

1. HTML: THE COMPLETE REFERENCE by THOMAS A. POWELL, OSBORNE, MCGRAW HILL EDUCATION
2. WEB ENABLES COMMERCIAL APPLICATION DEVELOPMENT USING HTML, DHTML, JAVASCRIPT, PERL by IVAN BAYROSS, BPB PUBLICATIONS

Course Code	DECAP267	Course Title	DATA STRUCTURES

WEIGHTAGE		
CA	ETE(Th.)	ETE (Pr.)
30	40	30

Course Outcomes: Through this course, students will be able to
CO1: understand how basic data structures are represented in memory.
CO2: comprehend the computational efficiency of the principal algorithms for searching and sorting.
CO3: implement various data structures using sequential and linked representations.
CO4: apply appropriate data structures to solve real-world problems efficiently.
CO5: analyze the alternate implementations of data structures to enhance performance.
CO6: demonstrate different methods for traversing binary trees.

Unit No.	Course Contents
Unit-1	**Basic concepts**: introduction to data structures and algorithms, data structure Operations
Unit-2	**The complexity of algorithms**: asymptotic notations for complexity, control structures,
Unit-3	**Introduction to pointers**: advantages, pointer arithmetic, self-referential structures
Unit-4	**Arrays:** the concept of arrays: single-dimensional, two-dimensional, memory representation of arrays
Unit-5	**Operations on arrays**: searching, traversal, insertion, deletion, concatenation and merging of two arrays
Unit-6	**Linked lists:** introduction to a linked list, dynamic memory allocation, representation of linked lists in memory, traversing a linked list, searching linked list, insertion and deletion into the linked list
Unit-7	**Doubly linked lists:** traversing a doubly-linked list, insertion and deletion from doubly linked lists, circular linked list
Unit-8	**Introduction to stacks**: representation of stacks, implementation of stacks using sequential and linked representation
Unit-9	**Introduction to queues**: representation of queues, implementation of queues using sequential and linked representation
Unit-10	**More on stacks and queues**: circular queues, deque, recursion
Unit-11	**Trees**: the concept of trees, representation of binary trees, binary search trees, traversal: recursive and non-recursive, searching, insertion and deletion in binary search trees
Unit-12	**Graphs**: terminology of graphs, depth-first search, breadth-first search
Unit-13	**Searching:** linear and binary search
Unit-14	**Sorting**: bubble sort, shell sort, insertion sort, selection sort, merge sort, radix sort

LABORATORY WORK:

Implementation of data structures concepts (arrays, singly linked list, doubly linked list, stacks, queues, binary search tree, depth-first search, breadth-first search, sorting and searching)

READINGS:

1. DATA STRUCTURES by SEYMOUR LIPSCHUTZ, MCGRAW HILL EDUCATION
2. DATA STRUCTURES USING C by REEMA THAREJA, OXFORD UNIVERSITY PRESS
3. DATA STRUCTURE USING C by MANOJ KUMAR, EAGLE PRAKASHAN
4. DATA STRUCTURES USING C by E BALAGURUSAMY, TATA MCGRAW HILL, INDIA
5. DATA STRUCTURE AND ALGORITHM USING C by RS SALARIA, KHANNA PUBLISHERS

Course Code	DECAP560	Course Title	OPERATING SYSTEM

WEIGHTAGE	
CA	ETE(Th.)
30	70

Course Outcomes: Through this course, students will be able to
CO1: understand the services and design of an operating system**.**
CO2: experiment with various process management and memory management techniques in Operating system.
CO3: evaluate the performance of different disk scheduling techniques.
CO4: visualize the importance of the software development process.

Unit No.	Content
Unit-1	Introduction to operating system: Introduction, Types of operating systems, System components
Unit-2	Operating system services, System calls, Types of System Calls
Unit-3	Process: Process concept, Process states, Operations on processes
Unit-4	Process Management: Process control block, Context switching, Process scheduling
Unit-5	Inter process communication, Threads and Multithreading, a case study on windows/Linux
Unit-6	CPU Scheduling: Introduction, Types of scheduling, Scheduling Criteria.
Unit-7	Scheduling Algorithms, a case study on Windows/Linux
Unit-8	Process Synchronization: Background, Critical section problem, Semaphores, Concept of serializability
Unit-9	Deadlocks: Deadlock Characterization, Methods for handling deadlocks, Deadlock Prevention, Deadlock avoidance, Recovery from Deadlock, a case study on Windows/Linux
Unit-10	Memory Management: logical versus physical address space, Address Binding, Dynamic Loading & Dynamic Linking
Unit-11	Memory Management: Overlays, Swapping, Contiguous Allocation, Paging, Segmentation, Segmentation with Paging
Unit-12	Memory Management: Page Replacement Algorithms, Allocation of frames, Thrashing, Working-set model, a case study on Windows/Linux
Unit-13	Protection: Introduction, File Access Methods, Access Matrix.
Unit-14	Disk Management: Disk structure, disk scheduling, FCFS scheduling, SSTF scheduling, SCAN scheduling, C-SCAN scheduling, a case study on Windows/Linux

READINGS:

1. OPERATING SYSTEMS CONCEPTS by A SILBERSCHARTZ AND GALVIN, ADDISON-WESLEY
2. OPERATING SYSTEMS CONCEPTS AND DESIGN by MILAN MILANKOVIC, MCGRAW HILL EDUCATION
3. MODERN OPERATING SYSTEM by ANDREW S. TANENBAUM, PRENTICE HALL
4. THE DESIGN OF THE UNIX OPERATING SYSTEM by MAURICE J. BACH, PEARSON
5. BEGINNING LINUX PROGRAMMING by NEIL MATTHEW, WILEY
6. OPERATING SYSTEMS: PRINCIPLES AND DESIGN by CHOUDHURY, PABITRA PAL, PHI LEARNING PVT. LTD.

Course Code	DEPES201	Course Title	SOFT SKILLS

WEIGHTAGE	
CA	ETE(Th.)
30	70

Course Outcomes: Through this course, students will be able to

CO1: identify and acquire traits and skills required in the corporate world.

CO2: make an effective resume and a digital profile to create a strong personal brand.

CO3: apply successful answering techniques during an interview.

CO4: practice group discussion and group interaction to effectively contribute in formal settings.

Unit No.	Content
Unit-1	**Introduction to Soft Skills-** What are soft skills, types of soft skills, role of soft skills in personal and professional life
Unit-2	**Soft Skills for career success-** vertical career planning, understanding the industry expectations, soft skills for management job profiles, social and professional etiquette
Unit-3	**Professional Grooming –** what is grooming, elements of professional grooming, professional grooming for men, professional grooming for women, professional grooming do's and don'ts for job interviews
Unit-4	**Personal branding-** What is personal branding, pillars of personal branding, importance of personal branding, role of personal branding in corporate
Unit-5	**Communication Skills Part 1 -** elements of effective communication, verbal and non-verbal communication, barriers to effective communication, presentation skills, overcoming fear of presentation, conversation etiquette
Unit-6	**Communication Skills Part 2-** types of speeches, purpose of a speech, how to write a speech, how to initiate and conclude a speech
Unit-7	**Interpersonal Skills –** elements of interpersonal skills, conversation etiquette, types of conversations, handling criticism and giving feedback, phrases for good conversations
Unit-8	**Resume writing -** importance of resume, elements of resume, sample resume formats common errors, designing personalized curriculum vitae, digital profiling
Unit-9	**Digital Profiling-** importance of digital profiling, elements of digital profiling, how to create an impactful LinkedIn Profile, Netiquette
Unit-10	**Group Discussions Part 1-** need and importance of group discussion, skills required for effective group discussion, do's and don'ts of group discussion, phrases for effective group discussions
Unit-11	**Group Discussion Part 2-** types of group discussion topics, point generation techniques for all types of group discussion topics, key word approach, SPELT technique, POPBEANS technique, VAP approach, Pros and Cons
Unit-12	**Interview Skills Part 1-** self-assessment through SWOT analysis, pre-interview preparation, elements of self-introduction
Unit-13	**Interview Skills Part 2-** types of interview questions, questions related to knowledge, skills and attitude, successful answering techniques
Unit-14	**Interview Skills Part 3-** STAR technique of handling situational questions, handling stress-based interview questions, preparing for asynchronous interviews, online interview etiquette

READINGS:

1. SOFT SKILLS FOR EVERYONE by JEFF BUTTERFIELD, CENGAGE LEARNING
2. PERSONALITY DEVELOPMENT AND SOFT SKILLS by BARUN K MITRA, OXFORD UNIVERSITY PRESS
3. SOFT SKILLS FOR HOSPITALITY by AMITABH DEVENDRA, OXFORD UNIVERSITY PRESS
4. STEP AHEAD WITH SOFT SKILLS by SIMRAN LUTHRA, OXFORD UNIVERSITY PRESS
5. SOFT SKILLS-KNOW YOURSELF AND KNOW THE WORLD by DR. K. ALEX, S. CHAND & COMPANY

Course Code	DECAP509	Course Title	SOFTWARE ENGINEERING

WEIGHTAGE	
CA	ETE (Th.)
30	70

Course Outcomes: Through this course, students will be able to

CO1: apply theoretical foundation of software engineering in practical software development.

CO2: analyze the need for software maintenance activities.

CO3: discuss the software life cycle models.

CO4: apply software engineering practices to create complex software designs.

CO5: identify the importance of the software development process.

Unit No.	Content
Unit-1	**Introduction to software engineering:** define software engineering, software process, software engineering practices
Unit-2	**Software process models:** software development life cycle (SDLC), classical software development lifecycle model, prototyping model, V model, incremental model, introduction to the agile method of software development
Unit-3	**Requirement engineering:** requirement engineering, requirement eliciting/gathering, negotiating requirement, validating requirement, requirement analysis, stakeholder analysis
Unit-4	**Software Requirement Specification:** software requirement specification document, characteristics of a good SRS, functional and non-functional requirement
Unit-5	**Design:** design process, design concepts, coupling, cohesion, data flow diagram (DFD), flow chart, architectural design, component-based design, object-oriented design, class-based components, use case diagram, class diagram, activity diagram
Unit-6	**User interface design:** golden rules, interface design models, interface design process, interface design activities
Unit-7	**Standards**: good coding practices, coding standards, code reusability, documentation, documentation standards
Unit-8	**Software testing:** test design, test planning, test case definition, test case template
Unit-9	**Testing strategies:** black-box testing, white box testing, sanity testing, smoke testing
Unit-10	**Testing levels:** unit testing, integration testing, system testing, acceptance testing, regression testing
Unit-11	**Bugs:** bug/defect definition, bugs life cycle, bug tracking, bug tracking tool (Bugzilla overview)
Unit-12	**Software maintenance:** software maintenance, software supportability, reengineering, business process reengineering, software reengineering, restructuring, the economics of reengineering
Unit-13	**Product metrics:** measure, metrics and indicators, measurement principles, function-based metrics, metrics for specification quality
Unit-14	**Software process improvement:** approaches to SPI, maturity models, SPI process

READINGS:

1. AN INTEGRATED APPROACH TO SOFTWARE ENGINEERING by PANKAJ JALOTE, NAROSA PUBLISHING HOUSE
2. SOFTWARE ENGINEERING: A PRACTITIONER'S APPROACH by ROGER S. PRESSMAN, MCGRAW HILL EDUCATION
3. FUNDAMENTALS OF SOFTWARE ENGINEERING by RAJIB MALL, PRENTICE HALL

Course Code	DECAP653	Course Title	ARTIFICIAL INTELLIGENCE

WEIGHTAGE	
CA	ETE (Th.)
30	70

Course Outcomes: Through this course, students will be able to

CO1: validate the problem-solving and learning methods of Artificial Intelligence.
CO2: identify problems that may be solved using artificial intelligence and machine learning.
CO3: develop intelligent systems by assembling solutions to concrete computational problems.
CO4: demonstrate awareness and a fundamental understanding of various applications of AI techniques.
CO5: apply basic principles of AI in solutions that require problem-solving, inference, perception, knowledge representation, and learning.
CO6: demonstrate an ability to share in discussions of AI, its current scope and limitations, and societal implications.

Unit No.	Contents
Unit-1	**Introduction:** Introduction to artificial intelligence, Types of Intelligence, Applications of AI, Approaches of artificial intelligence, Difference between human and machine intelligence
Unit-2	**Formulating Problems:** Problem-solving, formulating problems-Water jug problem, 8 Puzzle problem, Missionaries and cannibals' problem, States and State-space, Problem types
Unit-3	**Uninformed Search Strategies:** Introduction to uninformed search strategies, Depth-first search, Breadth-first search, Heuristic functions
Unit-4	**Informed Search Strategies:** Introduction to informed search strategies, best first search, A*algorithm, Iterative deepening A*(IDA), Small memory A*(SMA)
Unit-5	**Game Playing:** Introduction to game playing, Applications of game playing, Perfect decision game, Imperfect decision game, Evaluation function, Alpha-beta running
Unit-6	**Reasoning-Representation: Inference**, Propositional Logic, Predicate logic (first order logic), Logical reasoning, Forward chaining, Backward chaining
Unit-7	**AI language sand tools**: Lisp, Prolog, Resolution and clausal form
Unit-8	**Planning**: Basic representation of plans, Partial order planning, Planning in the block's world, Hierarchical planning, Conditional planning
Unit-9	**Constraints:** Representation of resource constraints, Temporal constraints, Total Order Planning
Unit-10	**Uncertainty:** Introduction to uncertainty, Basic probability, Bayes rule, Belief networks, Prior probability, Posterior Probability,
Unit-11	**Fuzzy set and fuzzy logic:** Default reasoning, Fuzzy sets and fuzzy logic, Decision theoretic expert systems, Decision trees
Unit-12	**Learning and its types:** Introduction to machine learning, Need of learning, Types of learning, Supervised learning, Unsupervised learning, Inductive learning, Rule-based learning, Reinforcement learning
Unit-13	**Artificial Neural Network:** Neural network and artificial neural network, how neurons activate
Unit-14	**Natural language processing:** Introduction to NLP, Phases of natural language processing, Formal grammar and parsing

READINGS:

1. ARTIFICIAL INTELLIGENCE A MODERN APPROACH by STUART RUSSELL AND PETERNORVIG, PEARSON
2. ARTIFICIAL INTELLIGENCE by GEORGEF. LUGER, PEARSON
3. ARTIFICIAL INTELLIGENCE by RICH, KNIGHT, MCGRAW HILL EDUCATION

Course Code	DECAP916	Course Title	FRONT-END WEB UI FRAMEWORKS AND TOOLS

WEIGHTAGE		
CA	ETE(Th.)	ETE (Pr.)
30	40	30

Course Outcomes: Through this course, students will be able to
CO1: associate the front-end web framework.
CO2: define applications with front-end web frameworks.
CO3: reframe the web applications using a front-end web framework.
CO4: compose programs with HTML and CSS-based design templates for typography.

Unit No.	Content
Unit-1	**Introduction to bootstrap:** Introduction to Bootstrap 4 and UI Development
Unit-2	**GIT:** Configuring GIT, creating a repository, GIT Basic Commands, Linking GIT with the Cloud Repository, what is a Full Stack developer, Starting a GIT basics project
Unit-3	**NodeJS and NPM:** Getting Started with NodeJS and NPM, Setting Up Bootstrap, Front-End Frameworks
Unit-4	**Responsive Design:** Responsive Design, Grid system, Using Flex
Unit-5	**Navigation:** Navigability, Navigation bar, and breadcrumbs
Unit-6	**Navigability Elements:** Pagination, Labels, Badges, Typographic elements
Unit-7	**Bootstrap CSS:** Tables, Buttons, Images
Unit-8	**Forms:** Using Icons and Fonts, Forms, Showing content
Unit-9	**Tabs and Pills:** Working with tabs and pills
Unit-10	**Collapse and Modals:** Working with Collapse, working with accordions, Displaying content with modals
Unit-11	**Tooltips:** Using tooltips, using popovers, Working with carousel
Unit-12	**jQuery:** jQuery Basics, Selectors, Event Handling
Unit-13	**SASS:** Working with SASS, Working with Less
Unit-14	**NPM Scripts:** Implementing Tools with NPM Scripts, Grunt, Task Automator, Gulp

LABORATORY WORK:

1. Experiment to configure the GIT and basic GIT commands.
2. Experiment to implement a basic GIT project.
3. Experiment to introduce the NodeJS and NPM and configure the bootstrap.
4. Experiment to create responsive designs.
5. Experiment work with navigability elements.
6. Experiment to work with forms and images.
7. Experiment to work with tabs and pills.
8. Experiment working with tooltips, popovers, and carousels.
9. Experiment to work with jQuery and SASS.
10. Experiment to work with NPM scripts, Grunt, Gulp and Task animator.

READINGS:

1. LEARNING BOOTSTRAP by ARAVIND SHENOY, ULRICH SOSSOU, PACKT PUBLISHING
2. BOOTSTRAP RESPONSIVE WEB DEVELOPMENT by JAKE SPURLOCK, O'REILLY.

Course Code	DECAP495	Course Title	WIRELESS AND MOBILE NETWORK

WEIGHTAGE		
CA	ETE(Th.)	ETE (Pr.)
30	40	30

Course Outcomes: Through this course, students will be able to

CO1: define the need of modern network architectures from a design and performance perspective.

CO2: recognize the major concepts involved in wide-area networks (WANs) local area networks (LANs) Wireless LANs (WLANs) and mobile network.

CO3: demonstrate various networking concepts relevant to modern wireless systems.

CO4: analyze various wireless services, operations and standards.

Sr. No.	Topics
1.	**Introduction to wireless and Mobile Networks:** Transmission Fundamentals, Communication Networks, Protocols and the TCP/IP Suite, The Cellular revolution, The global cellular networks
2.	**Cellular Wireless Networks**: Principles of Cellular Networks, First Generation Analog, Second Generation TDMA, Second Generation CDMA, Third Generation Systems
3.	**Modulation Techniques**: Signal Encoding, Digital Data Analog Signals, Analog Data Digital Signals, Analog Data Analog Signals
4.	**Spectrum Modulation Techniques**: Spread Spectrum Modulation, Frequency Hopping Spread Spectrum, CDMA
5.	**Multiple Access in Wireless System**: Multiple Access Scheme, Frequency Division Multiple Access
6.	**Multiple Access Technology**: Time Division Multiple Access, Code Division Multiple Access, Space Division Multiple Access
7.	**Mobile Adaptive Computing**: Mobile Adaptive Computing, Mobility Management, Data Dissemination and Management
8.	**Wireless LAN Technology:** Overview of LAN, Infrared LANs, Spread Spectrum LANs, Narrowband Microwave LANs
9.	**Wi-Fi and IEEE802.11:** IEEE 802.11 Architecture and Services, IEEE 802.11 Medium Access Control.
10.	**Wireless LAN Standards:** IEEE 802.11 Physical Layer, Wi-Fi Protected Access.
11.	**Introduction to Mobile Middleware**: Middleware for Application Development, Adaptation and Agents, Service Discovery Middleware, Finding Needed Services
12.	**Wireless Application Protocol and Mobile IP:** Mobile IP395, Wireless Application Protocol, Internet Control Message Protocol, Message Authentication
13.	**Wireless Security:** Introduction to wireless security and Approaches to Security in the wireless system.
14.	**Security in Wireless Networks:** Security in Wireless Personal Area Network, Security in Wireless Local Area Networks, Security in Wireless Metropolitan Area Networks (802.16), Security in Wide Area Networks

READINGS:

1. PRINCIPLES OF WIRELESS NETWORKS by KAVEH PAHLAVAN, PEARSONFUNDAMENTALS OF
2. WIRELESS NETWORKING by RON PRICE, MCGRAW HILL EDUCATION
3. WIRELESS NETWORKS FIRST-STEP by JIM GEIER, CISCO PRESS
4. WIRELESS COMMUNICATIONS & NETWORKS by WILLIAM STALLINGS, PEARSON

Course Code	DECAP917	Course Title	FRONT-END JAVASCRIPT FRAMEWORKS

WEIGHTAGE		
CA	ETE(Th.)	ETE (Pr.)
30	40	30

Course Outcomes: Through this course, students will be able to
CO1: associate client-side JavaScript frameworks and the MVC design pattern.
CO2: define single-page applications in AngularJS for typography.
CO3: construct a functional front-end web application using AngularJS.
CO4: compose web contents using reusable components.

Unit No.	Content
Unit-1	**Introduction**: what is Angular, architecture, development environment
Unit-2	**Angular Projects/Programs:** your first Angular app, the structure of Angular projects, web pack, promise
Unit-3	**Type Script fundamentals:** declaring variables, types, type assertions, arrow functions
Unit-4	**Classes and Objects in Angular**: interfaces, classes, objects, constructors, access modifiers, access modifiers in constructor parameters, properties, modules
Unit-5	**Angular fundamentals:** building blocks of angular apps, components, generating, components using Angular CLI, templates directives, services, dependency injection
Unit-6	**Displaying data and handling events**: property binding, attribute binding, adding bootstrap class binding, style binding, template variables, two-way binding, pipes
Unit-7	**Directives**: commonly used angular directives,
Unit-8	**Building re-usable components**: component API
Unit-9	**Template-driven forms**: building a bootstrap form, types of forms, ngModel, adding validation, specific validation errors, styling invalid input fields, cleaner templates ngForm, ngModel Group
Unit-10	**Form Handling in Angular:** control classes and directives, disable the submit button, work with check boxes, work with drop-down lists, work with radio buttons
Unit-11	**Consuming HTTP services**: JSONPlace Holder, getting data, creating data, updating data deleting data, handling errors
Unit-12	**Routing and navigation:** routing in a nutshell, configuring routes. Router Outlet
Unit-13	**Authentication and authorization**: application overview, architecture, JSON web tokens, starter code. implementing login, implementing logout
Unit-14	**Deployment**: preparing for deployment, deploying to GitHub pages, deploying to firebase

READINGS:

1. ANGULARJS: UP AND RUNNING- ENHANCED PRODUCTIVITY WITH STRUCTURED WEB APPS by BRAD GREEN, SHYAM SESHADRI, O'REILLY
2. LEARNING ANGULARJS A GUIDE TO ANGULARJS DEVELOPMENT by KEN WILLIAMSON, O'REILLY

Course Code	DECAP496	Course Title	CRYPTOGRAPHY AND SECURITY RISK MANAGEMENT

WEIGHTAGE		
CA	ETE(Th.)	ETE (Pr.)
30	40	30

Course Outcomes: Through this course, students will be able to

CO1: describe computer and network security fundamental concepts and principles.

CO2: create concepts with different cryptographic algorithms.

CO3: identify the different functionalities in a risk management process.

CO4: understand the different systems as well as security attacks.

Unit No.	Content
Unit-1	**Computer Security and Privacy**: Introduction to security and privacy, Security Threats, assets, vulnerabilities, Software security, User Authentication and its types, Network Security
Unit-2	**Introduction to cryptography:** Symmetric & asymmetric encryption, Concept of Block Cipher and Stream Cipher
Unit-3	**Cryptocurrency:** Introduction to Cryptocurrency and Bitcoin, Decentralization, Mechanics of Bitcoin, Storage and Usage of Bitcoins, Bitcoin mining, Bitcoin anonymity and its future
Unit-4	**Introduction to Risk Management**: Information security fundamentals, Security design principles, Information security challenges, Risk management and its cycle
Unit-5	**Risk Assessment and Analysis Techniques:** Risk profiling and formulating, Security services and controls, Risk Assessment techniques
Unit-6	**Building and Running a Risk Management Programme**: Threat and Vulnerability Management, A Blueprint for Security
Unit-7	**PUBLIC KEY CRYPTOGRAPHY AND RSA**: Principles Public key crypto Systems, Diffie Hellman Key Exchange, RSA algorithm, Key Management, Elliptic Curve Arithmetic, Elliptic Curve Cryptography
Unit-8	**MESSAGE AUTHENTICATION AND HASH FUNCTIONS**: Authentication Requirement, Authentication Function, Message Authentication Code, Hash Function, Security of Hash Function and MACs.
Unit-9	**DIGITAL SIGNATURE**: Digital Signature, Authentication Protocol, Digital Signature Standard.
Unit-10	**IP SECURITY:** Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management
Unit-11	**AUTHENTICATION APPLICATION**: Kerberos, X.509 Authentication Service, Public Key Infrastructure.
Unit-12	**EMAIL SECURITY:** Pretty Good Privacy (PGP) and S/MIME.
Unit-13	**WEB SECURITY**: Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET), Intruders, Viruses and related threats.
Unit-14	**FIREWALL**: Firewall Design principles, Trusted Systems.

READINGS:

1. CRYPTOGRAPHY AND NETWORK SECURITY: PRINCIPLES AND PRACTICE by WILLIAM STALLINGS, PEARSON
2. SECURITY RISK MANAGEMENT, BUILDING AN INFORMATION SECURITY RISK MANAGEMENT PROGRAM FROM THE GROUND UP by EVAN WHEELER, SYNGRESS (ELSEVIER)
3. CRYPTOGRAPHY AND NETWORK SECURITY by ATUL KAHATE, MCGRAW HILL EDUCATION

Course Code	DECAP918	Course Title	MULTIPLATFORM MOBILE APP DEVELOPMENT WITH WEB TECHNOLOGIES

WEIGHTAGE		
CA	ETE(Th.)	ETE (Pr.)
30	40	30

Course Outcomes: Through this course, students will be able to
CO1: develop cross-platform mobile apps for phones and tablets.
CO2: apply web development skills to build apps that are indistinguishable from native iOS or Android projects.
CO3: develop mobile applications targeting multiple platforms with a single codebase.
CO4: analyze the integration of angular and ionic.

Unit No.	Content
Unit-1	**Introduction to Ionic course**: introduction, what is ionic, look at the ionic platform,
Unit-2	**Angular and Ionic:** what is angular, our first ionic app
Unit-3	**Angular basics module introduction:** understanding components, installing Angular with the CLI installing the IDE
Unit-4	**Angular Project Structure**: understanding the folder structure
Unit-5	**Components:** the app component, creating our first component
Unit-6	**Ionic components**: basics module introduction, core app building blocks, Ionic components, setting up a non-angular ionic project
Unit-7	**Ionic Components**: basic ionic components, component categories, Ionic grid, adding icons, using slots, CSS utility attributes, Ionic elements,
Unit-8	**JavaScript and Ionic**: JavaScript logic and layout, controller components
Unit-9	**Angular and Ionic**: why use angular, creating and analyzing a new ionic angular project, how both works
Unit-10	**Additional Angular Features:** adding and loading a new page, integrating angular features
Unit-11	Building native apps with capacitor module introduction, general information,
Unit-12	**Creating Apps:** creating an android / iOS app, wrap up
Unit-13	Debugging error messages & console.log (), browser Dev Tools & breakpoints,
Unit-14	**UI Debugging**: debugging the UI & performance debugging android / iOS apps

READINGS:

1. LEARNING IONIC – BUILD REAL TIME AND HYBRID MOBILE APPLICATIONS WITH IONIC by ARVIND RAVULAVARU, PACKT PUBLISHING
2. MOBILE APP DEVELOPMENT WITH IONIC 2 CROSS-PLATFORM APPS WITH IONIC, ANGULAR, AND CORDOVA by CHRIS GRIFFITH, O'REILLY
3. HYBRID MOBILE DEVELOPMENT WITH IONIC - BUILDING HIGHLY INTERACTIVE MOBILE APPS by GAURAV SAINI, PACKT PUBLISHING

Course Code	DECAP497	Course Title	CYBER SECURITY AWARENESS

WEIGHTAGE		
CA	ETE(Th.)	ETE (Pr.)
30	40	30

Course Outcomes: Through this course, students will be able to

CO1: utilize the basic knowledge about computer security, basic cyber-attack skills and corresponding detection and defense techniques.

CO2: identify an in-depth understanding of the root cause of cyber-attacks.

CO3: identify how to exploit a simple vulnerable service and how to patch a service.

Unit No.	Content
Unit-1	**Cyber security overview**: introduction, security from a global perspective, vulnerability naming schemes, zero-day vulnerabilities, attacks on the power grid and utility networks
Unit-2	**Introduction to cyber-crime**: classification of cyber-crimes, reasons for commission of cyber-crimes, kinds of cyber-crime, domain name system protection, router security, cyberstalking, forgery and counterfeiting, software piracy and crime related to IPRS, cyber terrorism, phishing, computer vandalism, computer hacking,
Unit-3	**Malicious Software:** Malware and its types, adware, spyware, browser hijacking software, virus, worms, Trojan horse, Scareware
Unit-4	**Security Design Principles:** Fundamental Security Design principles, Attack surfaces ad attack trees, A model for network security, Various Standards of security
Unit-5	**Cyber threats and their defense:** email and phishing defensive measures, web-based attacks, database protection, botnet defensive measures
Unit-6	**Cyber Attacks:** Creating and distributing viruses over the internet, spamming, cross-site scripting, online auction fraud, cyber-squatting, logic bombs, web jacking, internet time thefts, denial of service attack, salami attack, data diddling, email spoofing
Unit-7	**Vulnerabilities and exploitation:** techniques to gain a foothold, web exploit tools, social engineering, DNS amplification attack
Unit-8	**User Authentication:** electronic user authentication principles, password-based authentication, token-based authentication, biometric authentication, remote user authentication, authentication with hash, encryption, antivirus, steganography
Unit-9	**Digital Signatures:** Model of Digital Signature, the importance of digital signature, Encryption with Digital Signature,
Unit-10	**Safe Browsing Guidelines:** Safe browsing guidelines for social networking sites, general tips on using social networking platforms safely, posting personal details, friends, followers and contacts, status updates, sharing online content, revealing your location, sharing videos and photos, instant chats, joining and creating groups, events and communities, email security tips
Unit-11	**Securing Passwords:** Generating secure passwords, a guideline for setting secure passwords using password manager, what is a password manager? Why you should use it? How does it work? Some popular password managers. enabling two-step verification, securing computers using free antivirus
Unit-12	**Firewalls:** introduction to firewalls, stateless packet filtering Vs stateful packet filtering, gateways and its applications, types of firewall, the architecture of firewall, emerging firewall technology, design principles, characteristics, configuration
Unit-13	**Fundamentals of cryptography:** introduction to cryptography and its importance, block ciphers vs stream ciphers, public-key cryptography characteristics
Unit-14	**Intrusion detection/prevention system:** introduction, types of intrusion detection,

	honeypots, detection of polymorphic worms, distributed intrusion detection system and standards

READINGS:

1. CYBER SECURITY ESSENTIALS by JAMES GRAHAM, RYANOLSON, RICKHOWARD, CRCPRESS
2. NETWORK SECURITY ESSENTIALS (APPLICATION AND STANDARDS) by WILLIAM STALLINGS, PEARSON
3. INTRODUCTION TO COMPUTER NETWORK SAND CYBER SECURITY by CHWAN-HWA(JOHN) WU,J.DAVIDIRWIN, CRCPRESS

Course Code	DECAP919	Course Title	SERVER-SIDE DEVELOPMENT WITH NODE.JS		
			WEIGHTAGE		
			CA	ETE(Th.)	ETE (Pr.)
			30	40	30

Course Outcomes: Through this course, students will be able to
CO1: write and launch Node apps.
CO2: construct Express web servers and APIs.
CO3: integrate Node apps with Mongoose and MongoDB.
CO4: demonstrate deployment of Node apps to production.

Unit No.	Content
Unit-1	**Getting setup**: Installing Node, what is Node, why should I use Node, installing Atom, Hello World example.
Unit-2	**Node.js Fundamentals:** using require, requiring your own files, using 3rd party modules
Unit-3	**Introduction to no demon and its use:** restarting app with Nodemon, getting input from the user, simplified input with Yargs.
Unit-4	**Working with JSON**: introduction to JSON and reading and writing contents with JSON files
Unit-5	**Note App:** adding and saving notes, refactoring for reusability, removing a note, reading notes and reusability
Unit-6	**Debugging node.js applications**: debugging node.js applications, debugging via chrome dev tools, listing notes
Unit-7	**Concepts of advanced Yargs**: requiring arguments and advanced Yargs, arrow functions.
Unit-8	**Web Servers**: hello express, creating a web server, rendering templates with data,
Unit-9	**Concepts of GitHub**: advanced templating, express middleware, adding version control (git), setting up GitHub & SSH key.
Unit-10	**Application Deployment:** deploying your apps, adding a new feature and deploying.
Unit-11	**Concept of MongoDB**: MongoDB, Mongoose, and REST APIs: installing MongoDB and RoboMongo (windows)
Unit-12	**Building a NoSQL vocabulary:** building a NoSQL vocabulary
Unit-13	**Data writing using MongoDB**: connecting to Mongo and writing data, the ObjectId, fetching data, setting up the repo, deleting documents, updating data
Unit-14	**Mongoose setup**: the Mongoose ORM, setting up mongoose, validators, types and defaults, installing postman.

READINGS:

1. WEB DEVELOPMENT WITH MONGODB AND NODE.JS by JASON KROL, PACKT PUBLISHING, PACKT PUBLISHING
2. WEB DEVELOPMENT WITH NODE AND EXPRESS by TODD BROWN, O'REILLY
3. NODE.JS IN PRACTICE by ALEX YOUNG, MARC HARTER, BEN NOORDHUIS, WILEY

Course Code	DECAP498	Course Title	DIGITAL FORENSIC

WEIGHTAGE		
CA	ETE(Th.)	ETE (Pr.)
30	40	30

Course Outcomes: Through this course, students will be able to

CO1: analyze and conduct digital investigations that conform to accepted professional standards.

CO2: identify potential security breaches of computer data that suggest violations of legal, ethical, moral, policy and/or societal standards.

CO3: review and access relevant technical and legal information and emerging industry trends.

CO4: apply a solid foundation in file systems, hardware and mobile devices for the digital investigation of information resources from unauthorized activities.

Unit No.	Content
Unit-1	**Key technical concepts**: Bits, bytes, numbering system, file extensions, data types
Unit-2	**Memory concepts**: Storage and memory concepts, computing environment, file systems
Unit-3	**Introduction to Digital Forensics**: introduction, needs and uses of digital forensics, the scope of digital forensics
Unit-4	**Role of forensic examiner**: Role of the forensic examiner in the judicial system, Lockard's Exchange Principle, Documenting Crime Scene
Unit-5	**Collecting evidence**: Crime Scenes and Evidence, various digital forensic tools, Disk Cloning
Unit-6	**Crime scene investigation**: Chain of Custody, Live System Versus Dead System, Hashing
Unit-7	**Challenges and concerns of Digital Forensic:** Standards and controls, Cloud Forensics, Solid State Drives
Unit-8	**Windows System Artifacts**: Deleted Data, Hibernation File, Registry, Print Spooling, Metadata, Restore Points and Shadow Copy concept, Link Files
Unit-9	**Anti-forensics**: Hiding Data, Passwords Attacks, Steganography, Data Destruction
Unit-10	**Legal Aspects in Forensics**: Electronic Discovery, Searches with warrants, Expert Testimony, Searches without warrants
Unit-11	**Internet and Email Forensics**: Functioning of internet, Role of Web Browser in Digital Forensics, Email Forensics
Unit-12	**Social media as evidence in digital forensics:** Role of social networking sites in Digital Forensics, various criminal techniques
Unit-13	**Network Forensics**: Network Security Tools, Incident Response in Networks, Network Evidence and Investigation
Unit-14	**Mobile Device Forensics**: Cell Phone Evidence, Cell Phone Forensics Tools, Global Positioning System (GPS)

READINGS:

1. THE BASICS OF DIGITAL FORENSICS: THE PRIMER FOR GETTING STARTED IN DIGITAL FORENSICS by JOHN SAMMONS, SYNGRESS (ELSEVIER)
2. DIGITAL FORENSICS AND INCIDENT RESPONSE by GERARD JOHANSEN, PACKT PUBLISHING

Course Code	DEACC105	Course Title	FINANCIAL ACCOUNTING

WEIGHTAGE	
CA	ETE(Th.)
30	70

Course Outcomes: Through this course, students will be able to

CO1: compare the importance of Generally Accepted Accounting Principles concerning IFRS.

CO2: analyze transactions in accounting and compute the value of assets.

CO3: prepare financial statements in accordance with appropriate standards.

CO4: solve the problems related to hiring purchase and dissolution of the partnership.

CO5: describe the main elements of branch accounting.

CO6: record the business transactions in various types of vouchers using accounting software and generating accounting reports.

Unit No.	Content
Unit-1	**Introduction to accounting-** accounting as an information system, users of financial accounting information, need of financial information, qualitative characteristics, advantages and limitations of accounting, branches of accounting, cash basis and accrual basis of accounting.
Unit-2	**Accounting principles-** nature of financial accounting principles – Basic concepts and conventions: entity, money measurement, going concern, cost, realization, accruals, periodicity, consistency, prudence (conservatism), materiality and full disclosures.
Unit-3	**Business Income-** measurement of business income, net income: the accounting period, the continuity doctrine and matching concept, objectives of measurement, revenue recognition, recognition of expenses.
Unit-4	**Financial accounting standards-** concept, benefits, the procedure for issuing accounting standards in India, salient features of First-Time Adoption of Indian Accounting Standard (Ind-AS) 101, International Financial Reporting Standards (IFRS): - Need and procedures.
Unit-5	**Accounting Process-** recording of a business transaction in journal, ledger posting, preparation of trial balance including adjustments.
Unit-6	**Depreciation accounting-** the concept of depreciation, factors in the measurement of depreciation, methods of computing depreciation: straight-line method and diminishing balance method.
Unit-7	**Inventory Valuation-** meaning, the significance of inventory valuation, inventory record systems, periodic and perpetual, methods: FIFO, LIFO and Weighted Average and salient features of IND AS 2.
Unit-8	**Final Accounts-** conceptual framework of capital and revenue expenditures and receipts, preparation of financial statements of non-corporate business entities.
Unit-9	**Dissolution of Partnership Firm-** accounting of dissolution of the partnership firm including insolvency of partners, sale to a limited company and piecemeal distribution
Unit-10	**Accounting for Hire-Purchase and Installment Systems-** Journal entries and ledger accounts in the books of hire vendors and hire purchasers for large value items including default and repossession.
Unit-11	**Branch accounting 1-** concept of dependent branches, accounting aspects, debtors' system, stock and debtors' system, branch final accounts system and wholesale basis system,
Unit-12	**Branch accounting 2-** independent branches, concept and accounting treatment and preparation of consolidated profit and loss account and balance sheet.

Unit-13	**Computerized Accounting Systems 1-** computerized accounts by using any popular accounting software, creating a company, configuring and features settings
Unit-14	**Computerized Accounting Systems 2-** creating accounting ledgers and groups, creating stock items and groups, vouchers entry, generating reports, selecting and shutting a company.

READINGS:

1. INTRODUCTION TO FINANCIAL ACCOUNTING by CHARLES T. HORNGREN AND DONNA PHILBRICK, PEARSON EDUCATION
2. FINANCIAL ACCOUNTING by P.C. TULSIAN, PEARSON
3. FINANCIAL ACCOUNTING by HANIF AND MUKHERJEE, MCGRAW HILL EDUCATION
4. ADVANCED ACCOUNTANCY by S.N. MAHESHWARI AND S.K. MAHESHWARI, VIKAS PUBLISHING HOUSE

Course Code	DEBSL101	Course Title	BUSINESS LAW

WEIGHTAGE	
CA	ETE(Th.)
30	70

Course Outcomes: Through this course, students will be able to

CO1: apply the statutory provisions related to Contract Act in business organizations.

CO2: apply the statutory provisions related to Sales of Goods Act in business enterprises.

CO3: develop understanding of the various provisions related to Limited Liability Partnership Act.

CO4: analyze the legal issues related to Negotiable Instruments.

CO5: apply statutory provisions related to IPR laws and Consumer Protection Act.

Unit No.	Content
Unit-1	**The Indian Contract Act, 1872:** introduction, meaning, essentials of a valid contract, kinds of contract, offer and acceptance, definition of an offer, modes of making an offer, essentials of a valid offer, definition of acceptance, and essentials of a valid acceptance
Unit-2	**The Indian Contract Act, 1872:** introduction, meaning, and consent, elements of free consent, coercion (section 15), undue influence (section 16), difference between coercion and undue influence, misrepresentation (section 17), mistake of law, contract without consideration is void-exceptions
Unit-3	**The Indian Contract Act, 1872:** introduction, minor, legal status of contracts with minor, minors' liability for necessaries, necessaries for a minor, persons of unsound mind, position of agreements by persons of unsound mind, persons disqualified by law, performance of contract, types of performance, performance of reciprocal promises, types of reciprocal promises, rules for the performance of reciprocal promises, effects of preventing the performance of reciprocal promises
Unit-4	**The Indian Contract Act, 1872:** introduction, Meaning, Modes of Discharging a Contract, Remedies for Breach of Contract, Different Types of Damages
Unit-5	**Special Contracts:** introduction, contingent contract, quasi contract, contract of indemnity and guarantee, consideration for guarantee [section 127], types of guarantees, rights of surety, sureties liabilities, discharge of surety from liability
Unit-6	**Special Contracts:** introduction, meaning and definition of bailment and its kinds, duties and rights of bailer and bailee, rights of a bailee and bailer, termination of bailment, finder of lost goods, definition of agency, consideration for agency, constitution and proof of agency, kinds of agent, rights and duties of an agent, duties of an agent.
Unit-7	**The Sale of Goods Act 1930:** introduction, meaning of contract of sale, sale and agreement to sell, difference between sale and agreement to sell, goods and their classification, meaning of price, passing of property in goods
Unit-8	**The Sale of Goods Act, 1930:** meaning and types of conditions, meaning and types warranties
Unit-9	**The Sale of Goods Act, 1930:** introduction, concept of doctrine of caveat emptor, exceptions to doctrine of caveat emptor, rights of an unpaid seller
Unit-10	**Limited Liability Partnership Act, 2008:** introduction, meaning of limited liability partnership, important definitions, essentials of a limited liability partnership (LLP), designated partners, relationship of partners, incorporation of an LLP, meaning, types of partnership, meaning of company, and difference between LLP, partnership, and company

Unit-11	**Consumer protect Act, 2019:** introduction, meaning and aim of consumer protection Act 2019, features of consumer protection act 2019, definition, duties of e-commerce entity and liabilities of marketplace e-commerce entities, rights of a consumer, manner of lodging a complaint, consumer dispute redressal agencies
Unit-12	**Negotiable Instruments Act, 1881:** introduction, meaning of negotiable instruments, features of negotiable instruments, types of negotiable instruments, definition, compare and contrast between promissory note, bill of exchange and cheque
Unit-13	**Negotiable Instruments Act, 1881:** introduction, meaning of holder and holder in due course, holder vs. holder in due course, essentials to become holder in due course, meaning and essentials of endorsements, types of endorsements, meaning and types of crossing of cheque, bouncing of cheque, remedies against cheque bounce
Unit-14	**Intellectual property rights:** introduction, meaning of intellectual property rights, background of intellectual property rights in india, types of intellectual property rights, patent, processing the application, trademark, copyrights, validity

READINGS:

1. A TEXTBOOK OF MERCANTILE LAW by P. P. S. GOGNA, S. CHAND & COMPANY
2. ELEMENTS OF MERCANTILE LAW by N.D. KAPOOR, S. CHAND & COMPANY
3. A MANUAL OF BUSINESS LAWS by S.N MAHESHWARI, S.K. MAHESHWARI, IMALAYA PUBLISHING HOUSE PVT. LTD
4. MERCANTILE LAW by S S GULSAN, EXCEL BOOKS
5. MERCANTILE LAW by M C KUCHCHAL, VIKAS PUBLISHING HOUSE
6. LEGAL ASPECTS OF BUSINESS by DANIEL ALBUQUERQUE, OXFORD & IBH

Course Code	DEMGN101	Course Title	BUSINESS ORGANIZATION AND MANAGEMENT

WEIGHTAGE	
CA	ETE(Th.)
30	70

Course Outcomes: Through this course, students will be able to

CO1: enumerate the concept of business organization.

CO2: analyze the significance of management functions and important organizational behaviour elements at different levels of organization.

CO3: develop and sharpen understanding of how different management approaches can be used to enhance organization effectiveness.

CO4: integrate skills to align individual and organizational objectives.

CO5: assess the application of management theories in real life decision making.

CO6: evaluate the managerial issues in different functional areas of organization.

Unit No.	Content
Unit-1	**Foundation of Indian business**: Small and Medium Enterprises, Problems and government policy, India's experience of liberalization and globalization, technological innovations and skill development, make in India movement, social responsibility and ethics, emerging opportunities in business, franchising, outsourcing, and e-commerce
Unit-2	**Business enterprises**: limited liability partnership, choice of form of organization, forms of business organisation, sole proprietorship, joint Hindu family firm, partnership firm, joint stock company, cooperative society, government - business interface, rationale and forms of public enterprises, international business, multinational corporations
Unit-3	**Management and organization**: the process of management: planning, organizing- basic considerations, departmentation, functional, project, matrix and network, delegation and decentralization of authority, groups and teams
Unit-4	**Decision making and control system:** decision making process and strategy formulation, control concept and process
Unit-5	**Leadership**: leadership concept and styles, trait and situational theory of leadership
Unit-6	**Motivation:** motivation concept and importance, Maslow need hierarchy theory, Herzberg two factors theory
Unit-7	**Communication**: communication process and communication barriers in an organization
Unit-8	**Functional area of marketing management**: marketing management marketing concept, marketing mix product life cycle, pricing policies and practices
Unit-9	**Functional area of financial management:** financial management concept and objectives, sources of funds equity shares debentures venture capital and lease finance, securities market role of SEBI
Unit-10	**Functional area of human resources management:** human resource management concept and functions, basic dynamics of employer employee relations
Unit-11	**Organizational culture**: characteristics and functions of organizational culture, types and levels of organizational culture, dimensions and elements of organizational culture, creating and sustaining organizational culture
Unit-12	**Organizational change:** concepts and process of change, managing resistance to change
Unit-13	**Conflict management**: functional and dysfunctional conflict, levels and process of conflict, conflict resolution and management styles

Unit-14	**Stress management:** stress and stress symptoms, types and causes of stress, managing stress

READINGS:

1. ESSENTIALS OF MANAGEMENT by KOONTZ AND WEIHRICH, TATA MCGRAW HILL, INDIA
2. BUSINESS ORGANIZATION AND MANAGEMENT by C.B GUPTA, SULTAN CHAND AND SONS
3. BUSINESS ORGANISATION AND MANAGEMENT by CR BASU, TATA MCGRAW HILL, INDIA

Course Code	DEMKT201	Course Title	PRINCIPLES OF MARKETING

WEIGHTAGE	
CA	ETE(Th.)
30	70

Course Outcomes: Through this course, students will be able to

CO1: enumerate the concepts of marketing and adopt the marketing concepts in different business scenarios.

CO2: describe the dynamic nature of the environment and enhance the ability to apply marketing models and theories for taking better and informed marketing decisions.

CO3: analyze various situations and decisions involving segmentation, targeting and positioning, Decisions involving price and marketing communications.

CO4: apply the knowledge, concepts, and tools necessary to understand the challenges and issues of marketing in a growing international and global context.

Unit No.	Content
Unit-1	**Marketing management today:** Marketing scope and concept, the evolution of marketing, selling vs marketing, marketing process and marketing mix
Unit-2	**The marketing environment:** Analysing the marketing environment, customer life-cycle and its stages, customer acquisition and retention and competitive analysis
Unit-3	**Market planning and research:** Approaches to market planning and its process, marketing research process and marketing information system
Unit-4	**Buying behaviour:** Consumer markets and consumer buyer Behaviour, business markets and business buyer behaviour
Unit-5	**Segmentation and targeting:** Market segmentation, targeting and positioning, market measurement and demand forecasting
Unit-6	**Product management:** Managing product, product differentiation and positioning, new product development and product life cycle
Unit-7	**Brand management:** Managing brands and brand equity
Unit-8	**Pricing decisions:** Meaning and significance of price, factors influencing pricing, pricing methods and pricing strategies
Unit-9	**Distribution management:** Physical distribution and marketing logistics, marketing channels, creating and managing dealer network, retailing and wholesaling
Unit-10	**Integrated marketing communication:** sales promotions, advertising, public relations, sales management, personal selling, direct marketing and digital marketing
Unit-11	**Customer relationship management**: Marketing strategy, customer service and customer relationship management process
Unit-12	**Creating sustainable competitive value and growth:** Marketing organization, marketing performance and control
Unit-13	**Broadening horizons:** Services Marketing, rural marketing and retail management
Unit-14	**Contemporary issues in marketing:** Sustainable marketing, social responsibility, marketing ethics and global marketing strategies for Indian firms

READINGS:

1. MARKETING MANAGEMENT by PHILIP KOTLER AND KEVIN LANE KELLER, PEARSON EDUCATION INDIA
2. MARKETING MANAGEMENT by RAJAN SAXENA, MCGRAW HILL EDUCATION
3. MARKETING MANAGEMENT INDIAN CONTEXT GLOBAL PERSPECTIVE by V.S. RAMASWAMY AND S. NAMAKUMARI, SAGE PUBLICATIONS

Course Code	DEENG112	Course Title	INDIAN WRITING IN ENGLISH

WEIGHTAGE	
CA	ETE(Th.)
30	70

Course Outcomes: Through this course, students will be able to

CO1: employ an insight about the oeuvre of Indian writers.

CO2: compare the historical context in which these texts were written.

CO3: illustrate the various writing dimensions of Indian writers.

Unit No.	Content
Unit-1	**Nissim Ezekiel:** *Night of the Scorpion*: Ezekiel's position in Indian poetry, Ezekiel's contribution in post-colonial writings, major thematic concerns, rural versus urban India
Unit-2	**Nissim Ezekiel:** *Goodbye Party for Miss Pushpa T.S.*: poetic craftsmanship, symbolism and imagery, major thematic concerns
Unit-3	**R. K. Narayan:** *Swami and Friends*: Narayan is one of the leading figures of Indian Literature in English
Unit-4	**R. K. Narayan:** *Swami and Friends*: the friction of British Colonial India
Unit-5	**R. K. Narayan:** *Swami and Friends*: irony and humor of childhood, the evolution of self, the portraiture of adolescence
Unit-6	***Train to Pakistan*:** the trauma of partition as faced by the Indian subcontinent
Unit-7	***Train to Pakistan*:** the intermingling of history and literature, third-person narrative
Unit-8	***Train to Pakistan*:** social structure and cultural understanding, character-analysis
Unit-9	**Mulk Raj Anand:** *Untouchable*: plot, characterization, themes, narrative technique
Unit-10	**Mulk Raj Anand:** themes, narrative technique
Unit-11	**Kiran Desai:** *The Inheritance of Loss*: plot, characterization
Unit-12	**Kiran Desai:** *The Inheritance of Loss*: themes, narrative technique
Unit-13	**Meenakshi Mujkherjee:** *The Perishable Empire*: Essays on Indian Writing in English (Select Sections): the Indian imagination in English, historical, social and literary reasons for the growth of Indian Writing, emergence of novel in the sub-continent, post-colonial and post-modernist tendencies in (later) Indian Writing in English
Unit-14	**Meenakshi Mujkherjee:** *The Perishable Empire*: Essays on Indian Writing in English (Select Sections): the emergence of novel in the sub-continent, post-colonial and post-modernist tendencies in (later) Indian Writing in English

READINGS:

1. THE INHERITANCE OF LOSS by KIRAN DESAI, PENGUIN BOOKS INDIA
2. UNTOUCHABLE by MULK RAJ ANAND, PENGUIN BOOKS INDIA.

Course Code	DEMTH137	Course Title	CALCULUS

WEIGHTAGE	
CA	ETE(Th.)
30	70

Course Outcomes: Through this course, students will be able to

CO1: assimilate the notions of limit of a sequence and convergence of a series of real numbers.

CO2: describe the limit and examine the continuity of a function at a point.

CO3: understand the concept of various mean value theorems.

CO4: demonstrate tracing of curves in Cartesian and polar coordinate systems.

CO5: apply derivative tests in optimization problems appearing in social sciences, physical sciences, life sciences and a lot of other disciplines.

Unit No.	Content
Unit-1	Real numbers, Sequences of real numbers, Convergence of sequences and series, Bounded and monotonic sequences
Unit-2	Definite integral as a limit of sum, Integration of irrational algebraic functions and transcendental functions
Unit-3	Reduction formulae, Definite integrals
Unit-4	Epsilon-delta definition of limit of a real valued function, Limit at infinity and infinite limits
Unit-5	Continuity of a real valued function, Properties of continuous functions, Intermediate value theorem, Geometrical interpretation of continuity, Types of discontinuity, uniform continuity
Unit-6	Differentiability of a real valued function, Geometrical interpretation of differentiability, Relation between differentiability and continuity, Differentiability and monotonicity
Unit-7	Chain rule of differentiation, Darboux's theorem, Rolle's theorem
Unit-8	Lagrange's mean value theorem, Cauchy's mean value theorem and their geometrical interpretations
Unit-9	Successive differentiation and Leibnitz theorem
Unit-10	Maclaurin's and Taylor's theorems for expansion of a function, Taylor's theorem in finite form with Lagrange, Cauchy forms of remainder
Unit-11	Maxima and minima of a function
Unit-12	Curvature, Asymptotes of general algebraic curves, Parallel asymptotes, Oblique Asymptotes
Unit-13	Symmetry, Concavity and convexity, Points of inflection, Tangents at origin, Multiple points, Position and nature of double points
Unit-14	Tracing of cartesian, polar and parametric curves

READINGS:

1. CALCULUS by GEORGE B. THOMAS JR., JOEL HASS, CHRISTOPHER HEIL & MAURICE D. WEIR (2018) (13TH EDITION), PEARSON
2. CALCULUS by HOWARD ANTON, I. BIVENS & STEPHAN DAVIS (2016). (10TH EDITION), WILEY INDIA.
3. CALCULUS by MONTY J. STRAUSS, GERALD L. BRADLEY & KARL J. SMITH (2011) (3RD EDITION), PEARSON.

Course Code	DEACC204	Course Title	COST ACCOUNTING

WEIGHTAGE	
CA	ETE(Th.)
30	70

Course Outcomes: Through this course, students will be able to:

CO1: understand various cost concepts and costing techniques.

CO2: classify various techniques of inventory control and methods of pricing material issues.

CO3: analyze cost accounting techniques to evaluate and project business performance.

CO4: analyze various managerial issues based on cost information.

CO5: describe and recognize the peculiarities involved in the costing of the service sector

CO6: use the various cost accounting techniques in rational decision-making.

Unit No.	Content
Unit-1	**Introduction to cost accounting:** importance, objectives and advantages of cost accounting, limitations, difference between cost accounting and financial accounting, cost centers and cost classification, role of a cost accountant, elements of cost, single or output costing, preparation of cost sheet
Unit-2	**Major components of cost:** techniques of material control, concepts and objectives of material control, methods of pricing of material issues, treatment of material losses, labor cost and various wage plans, labor turnover, idle time, overtime, fringe benefits
Unit-3	**Overhead cost:** classification, allocation, apportionment and absorption of overheads, under- and over absorption, capacity levels and costs, capacity levels and costs, treatments of special items of overheads
Unit-4	**Process costing: m**eaning and features of process costing, abnormal losses and abnormal gain, Inter-process profits, Preparation of process cost accounts, equivalent production, joint product and by-products
Unit-5	**Job and batch costing:** applicability of job and batch costing in industries, objectives of job costing, job costing procedures, batch costing procedures, economic batch quantity (EBQ)
Unit-6	**Contract costing:** features of contract costing, distinction between contract costing and job costing, escalation clause, notional and estimated profits, preparation of contract accounts in case of complete, incomplete and near to completion contracts
Unit-7	**Service costing:** characteristics of the service sector, units of cost in different service sectors, uses of costing methods in the service sector, pricing of the service sector, costing methods used in the service sector, pricing of the service sector
Unit-8	**Standard costing and variance analysis:** objectives of standard cost and standard costing, advantages and limitations of standard costing, setting standards, meaning of variance analysis, material variances, labor variances
Unit-9	**Book Keeping in Cost Accounting:** Integral and non-integral systems, reconciliation of cost and financial accounts
Unit-10	**Marginal Costing and CVP Analysis:** concept, nature and importance of Marginal Costing, CVP Analysis, P/V ratio, break-even point and margin of safety, applications of marginal costing for decision making in organizations, make or buy decisions and product mix decision
Unit-11	**Life cycle costing:** concept of LCC, elements and categories of project life cycle costs, LCC process, analysis of alternative courses of action in life cycle costing, optimization of

	project life cycle costs, practical applications of LCC, benefits of LCC
Unit-12	**Product life-cycle costing:** characteristics, uses, activities, and essential features of product life-cycle costing, costs in product life-cycle costing, cost control and product life-cycle costing, costs associated with different stages of product life-cycle costing, economic value added to the customer (EVC), experience curve and product life-cycle costing
Unit-13	**Activity-Based Costing:** identification of activities, creation of cost pools, determination of activity cost drivers, calculation of the activity cost driver rate and charging the cost of activities to products
Unit-14	**Uniform cost and inter-firm comparison:** objectives, benefits and limitations of uniform costing, requisites for installation of uniform costing, objectives and advantages of inter-firm comparisons

READINGS:

1. COST AND MANAGEMENT ACCOUNTING by M N ARORA, HIMALAYA PUBLISHING HOUSE PVT. LTD
2. COST ACCOUNTING by JAWAHAR LAL, SEEMA SRIVASTAVA, M. G. HILLS
3. MANAGEMENT ACCOUNTING by PARESH SHAH, OXFORD UNIVERSITY PRESS
4. PRINCIPLES AND PRACTICE OF COST ACCOUNTING by BHATTACHARYYA, ASISHK., PHI LEARNING PVT LTD

Course Code	DEBSL102	Course Title	COMPANY LAW

WEIGHTAGE	
CA	ETE(Th.)
30	70

Course Outcomes: Through this course, students will be able to

CO1: apply the legal provisions involved in the formation of the company.

CO2: analyze the legal provisions applicable for raising share capital, borrowing power, charges and its management.

CO3: interpret and recognize the legal issues involved in day-to-day company management and CSR activities.

CO4: examine the validity to various meetings held in the company.

CO5: illustrate the practical aspects related to duties, appointment and removal of directors, Committee formulation, transparency and disclosure.

CO6: identify the grounds and application of provisions related to winding up of company under Companies Act and IBC and recognize the administration machinery of companies.

Unit No.	Content
Unit-1	**Introduction to companies act, 2013**: Nature and types of company, lifting the corporate veil, difference between company, partnership and limited liability partnership
Unit-2	**Incorporation of company**: Legal provisions related to incorporation of company by MCA, legal position of promoter
Unit-3	**Company documents:** Memorandum of association, articles of association, doctrine of constructive notice, doctrine of indoor management
Unit-4	**Prospectus**: Types of prospectuses, legal consequences of misstatement in prospectus
Unit-5	**Raising of capital**: Share and share capital, alteration of share capital
Unit-6	**Company management**: Types of directors, appointment of directors, removal of directors, resignation by directors, remuneration of directors, position of directors, powers and duties of directors
Unit-7	**Borrowing powers of a company:** Ultra vires the company, ultra vires the directors
Unit-8	**Charges:** Creation of charges, registration, modification and satisfaction of charges; register of charges, inspection of charges, punishment for contravention, rectification by central government in register of charges
Unit-9	**Board committees**: Committees of board of directors- audit committee, nomination and remuneration committee, stakeholders relationship committee, corporate social responsibility committee, ethic committee, risk committee, corporate compliance committee
Unit-10	**Corporate social responsibility**: Applicability of CSR, types of CSR activities, CSR committee and expenditure, net profit for CSR, reporting requirements
Unit-11	**Transparency and disclosures:** Board's report, annual return, annual report, website disclosures, policies
Unit-12	**Company meetings**: Types of meetings and essentials of valid meeting
Unit-13	**Winding up of companies**: Meaning and modes of winding up- compulsory winding up, winding up under IBC act-CIRP and voluntary winding up
Unit-14	**Other legal aspects**: Insider-trading, whistle-blowing, insider-trading, meaning and legal provisions, whistle-blowing: concept and mechanism, administration of company law [including national company law tribunal(NCLT), national company law appellate tribunal (NCLAT), special courts]

READINGS:

1. A TEXT BOOK OF COMPANY LAW (CORPORATE LAW) by P.P.S. GOGNA, S. CHAND & SONS
2. ELEMENTS OF COMPANY LAW by N.D. KAPOOR, SULTAN CHAND & SONS (P) LTD.
3. LEGAL ASPECTS OF BUSINESS by DANIEL ALBUQUERQUE, OXFORD & IBH
4. A HANDBOOK ON CORPORATE AND OTHER LAWS by MANISH BHANDARI

Course Code	DEECO113	Course Title	BUSINESS ECONOMICS

WEIGHTAGE	
CA	ETE(Th.)
30	70

Course Outcomes: Through this course, students will be able to

CO1: discuss the interplay of business and economics.

CO2: analyze the economic functionality from the micro to the macro level.

CO3: describe the role of government in augmenting business using appropriate economic policy measures.

CO4: establish an ethical understanding and perspective on business situations.

CO5: outline the operations of markets under varying competitive conditions and prices as stabilize mechanisms.

CO6: identify the causes and consequences of unemployment, inflation and economic growth.

Unit No.	Content
Unit-1	**Business and economics**: introduction to business and economics, meaning business economics, forms of economic analysis, basic economic concepts, the basic economic questions and opportunity cost, production possibility curve
Unit-2	**Economic system**: scarcity and economic system, the market economic system, the command economic system, the mixed economy
Unit-3	**The price mechanism**: introduction to demand, supply and equilibrium, price determination about by the interaction of demand and supply
Unit-4	**Movements of curve price mechanism:** Disequilibrium and excess supply, along the curve and shifts of the curve, conditions of demand and supply, changes in equilibrium price and quantity
Unit-5	**Concept of elasticity**: introduction to elasticity concept, the elasticity of demand, measuring of price elasticity, factors affecting elasticity of demand
Unit-6	**Industry and market structure analysis**: form and structure of the market, perfect competition, monopoly, monopolistic competition, oligopoly.
Unit-7	**Production analysis**: analogy concept, precepts and techniques, technique and technology, stages of production, production strategy, production functions.
Unit-8	**Revenue and cost analysis:** Cost concept, revenue concept, average revenue, marginal revenue and total revenue, the relationship among cost, revenue and production
Unit-9	**Macroeconomics environment of business**: introduction to the business environment, economic environment of business, a non-economic environment of business, economic and non-economic environment interaction,
Unit-10	**Income determination:** Circular flow of money, national income and measurement of national income
Unit-11	**National income equilibrium**: the concept of equilibrium, consumption and savings, investment theory, government sector, foreign sector,
Unit-12	**Inflation: the** concept of inflation**,** determination of equilibrium, multiplier concept, inflationary and deflationary gap
Unit-13	**Macroeconomic problems of fluctuations and growth**: introduction, recession, inflation, demand-cost inflation, unemployment, business cycle
Unit-14	**Theories of the Business cycle**: trade theory, investment theory, monetary theory, innovation theory, causes behind fluctuations in the business cycle.

READINGS:

1. PRINCIPLES OF ECONOMICS by DEVIGAVENGEDASALAM AND KARUNAGARAN MADHAVAN, OXFORD UNIVERSITY PRESS
2. BUSINESS ECONOMICS by MANAB ADHIKARY, EXCEL BOOKS
3. ECONOMICS FOR BUSINESS by IAN FRASER, JOHN GIONEA AND SIMON FRASER

Course Code	DEMGN251	Course Title	SPREADSHEET MODELLING (USINGEXCEL)

WEIGHTAGE	
CA	ETE(Th.)
30	70

Course Outcomes: Through this course, students will be able to

CO1: demonstrate working knowledge of organizing and displaying large business data.

CO2: analyze complex business data with spreadsheet applications.

CO3: examine managerial problems using spreadsheet modeling.

CO4: apply macros for automating tasks in spreadsheet.

Unit No.	Content
Unit-1	**Introduction to Spreadsheets**: history and importance of spreadsheet, navigating a spreadsheet, crafting formulas, common errors in spreadsheets, differences between Sheets and Excel
Unit-2	**Basic functions and utilities**: data entry, introduction to fill handles, managing rows and columns, protecting worksheets and workbooks
Unit-3	**Spreadsheet Calculations**: Introduction to the range, absolute and relative references, formulas and functions, calculation across sheets
Unit-4	**Formatting Spreadsheets**: formatting the excel sheet, introduction to borders, alignment tools, introduction to number formats
Unit-5	**Data Analysis**: find and replace functions, text functions, filtering, sorting, conditional formatting
Unit-6	**Spreadsheet Printing**: introduction to spreadsheet printing, print preview and adjustments, orientation, margins and scale, headers and footers
Unit-7	**Charts and Graphs**: basic chart types, move and resize charts, change chart styles and types, Modification chart elements
Unit-8	**Elementary Modelling**: IF statement analysis, nested if, COUNTIF and COUNTIFS, SUMIF and SUMIFS, AVERAGEIF and AVERAGEIFS
Unit-9	**Lookup Functions**: Vlookup, Hlookup, Index and match function
Unit-10	**Pivot Table and its Applications**: introduction to pivot table, filter data using slicers in multiple pivot table, visualize aggregate data using pivot table
Unit-11	**VBA Macros programming I**: create and record a macro in a spreadsheet, Msgbox, declaring variables, writing a subroutine and function in VBA
Unit-12	**VBA Macros programming II**: IF Then statement, Case statement, For loop, While loop and Do until, worksheet and range object
Unit-13	**Sensitivity Analysis**: goal seek, data table, scenario Analysis
Unit-14	**Simulation and Optimization**: Monte Carlo simulations, introduction to solver, linear programming for optimization, Intrinsic value calculation models

READINGS:

1. MICROSOFT EXCEL 2016: DATA ANALYSIS AND BUSINESS MODELING by WINSTON, WAYNE L., PHI LEARNING PVT. LTD.
2. BUSINESS DATA ANALYSIS USING EXCEL by DAVID WHIGHAM, OXFORD UNIVERSITY PRESS

Course Code	EENG114	Course Title	BRITISH POETRY AND DRAMA:14TH-18TH CENTURIES

Course Code	
CA	ETE(Th.)
30	70

Course Outcomes: Through this course, students will be able to

CO1: relate texts to the social, cultural and political contexts.

CO2: articulate a critical position and interpretation.

CO3: use textual or critical evidence to support an interpretation.

Unit No.	Content
Unit-1	**Shakespeare's Sonnets:** When to the sessions of sweet silent thought
Unit-2	**Shakespeare's Sonnets**: Let me not to the marriage of true minds
Unit-3	**Shakespeare's Sonnet**: Since brass, nor stone, nor earth, nor boundless sea
Unit-4	**John Milton:** Paradise Lost, Lines 1 to 16: introduction, themes
Unit-5	**John Milton:** Paradise Lost, Lines 1 to 16: critical analysis, stylistic analysis
Unit-6	**Shakespeare:** Macbeth: introduction, plot construction, characterization,
Unit-7	**Shakespeare**: Macbeth: themes, critical analysis
Unit-8	**John Donne:** Go and Catch a Falling Star: introduction, theme,
Unit-9	**John Donne:** Go and Catch a Falling Star: critical analysis, stylistic features
Unit-10	**Alexander Pope:** The Rape of the Lock, Canto 1: introduction, themes
Unit-11	**Alexander Pope:** The Rape of the Lock, Canto 1: critical analysis, stylistic analysis
Unit-12	**Ben Jonson:** Volpone: Jacobean era, city comedy/beast fable
Unit-13	**Ben Jonson:** Volpone: themes and issues
Unit-14	**Ben Jonson:** Volpone: satire, parasitism, animalization

READINGS:

1. THE RAPE OF THE LOCK by ALEXANDER POPE, Unique Publisher
2. SHAKESPEARE'S SONNETS by WILLIAM SHAKESPEARE, PENGUIN CLASSICS
2. PARADISE LOST by JOHN MILTON, OXFORD UNIVERSITY PRESS
3. THE COMPLETE ENGLISH POEMS by JOHN DONNE, PENGUIN CLASSICS
4. MACBETH by WILLIAM SHAKESPEARE, RUPA PUBLICATIONS
5. VOLPONE by JONSON BEN, CAMBRIDGE UNIVERSITY PRESS

Course Code	DEMTH159	Course Title	MULTIVARIATE CALCULUS

WEIGHTAGE	
CA	ETE(Th.)
30	70

Course Outcomes: Through this course, students will be able to

CO1: learn conceptual variations while advancing from one variable to several variables in calculus.

CO2: describe the limit and examine the continuity of a function at a point.

CO3: get in depth knowledge of techniques for the evaluation of multiple integrals.

CO4: learn various applications of double and triple integrals.

CO5: realize importance of Green, Gauss and Stokes' theorems in other branches of mathematics.

Unit No.	Content
Unit-1	Functions of several variables, Limit and continuity of functions of two and three variables
Unit-2	Partial differentiation, Total differentiability and differentiability, Sufficient condition for differentiability, Chain rule for one and two independent parameters, Tangent planes
Unit-3	Jacobian, Euler's theorem for homogeneous functions, Taylor's theorem for functions of two variables and more variables
Unit-4	Extrema of functions of two and three variables, Method of Lagrange multipliers, constrained optimization problems
Unit-5	Double integration over rectangular region, Double integration over nonrectangular region, Double integrals in polar co-ordinates
Unit-6	Triple integrals, Triple integral over a parallelepiped and solid regions, Change of order of integration
Unit-7	Change of variables in double integrals and triple integrals, Cylindrical and spherical co-ordinates
Unit-8	Area and volume by using double integral, Volume by using triple integral
Unit-9	Limit, continuity and differentiability of vector functions
Unit-10	Gradient of a scalar field and directional derivatives, maximal and normal property of the gradient, Tangent planes
Unit-11	Definition of vector field, divergence and curl of vector field
Unit-12	Line integrals, Applications of line integrals: Mass and Work
Unit-13	Fundamental theorem for line integrals, Conservative vector fields, independence of path, Green's theorem
Unit-14	Surface integrals, Integrals over parametrically defined surfaces, Stoke's theorem, The Gauss divergence theorem

READINGS:

1. CALCULUS by GEORGE B. THOMAS JR., JOEL HASS, CHRISTOPHER HEIL & MAURICE D. WEIR (2018). THOMAS' (14TH EDITION), PEARSON EDUCATION.
2. MULTIVARIABLE CALCULUS by JAMES STEWART (2012) (7TH EDITION), BROOKS/COLE, CENGAGE.
3. CALCULUS (3RD EDITION) by MONTY J. STRAUSS, GERALD L. BRADLEY & KARL J. SMITH (2011), PEARSON EDUCATION. DORLING KINDERSLEY (INDIA) PVT. LTD.

Course Code	DEACC210	Course Title	CORPORATE ACCOUNTING

WEIGHTAGE	
CA	ETE(Th.)
30	70

Course Outcomes: Through this course, students will be able to

CO1: identify and illustrate issues relating to raising funds through internal and external sources.
CO2: apply the accounting provisions for redemption of preference shares and debentures.
CO3: solve the accounting problems using the provisions of amalgamation and its accounting treatment.
CO4: illustrate thorough knowledge of cash flow statement and the ability to apply them to solve problems.
CO5: appraise the conceptual framework and provisions of managerial remuneration.
CO6: apply the accounting provisions related to preparation of final accounts of companies.

Unit No.	Content
Unit-1	**Accounting for share capital**: introduction to share capital, pro-rata allotment of shares, forfeiture of shares, reissue of forfeited shares.
Unit-2	**Right issue:** provisions related to issue of right shares, accounting treatment **Bonus issue:** legal provisions for issue of bonus shares, accounting entries.
Unit-3	**Redemption of preference shares:** concept, legal provisions for redemption, accounting entries.
Unit-4	**Redemption of debentures:** redemption of debentures through sinking fund, purchase from the open market. **Buyback of shares:** concept of buyback of shares, legal provisions for buyback of shares.
Unit-5	**Underwriting of shares:** concept, liability of underwriters. **Managerial remuneration:** provisions related to managerial remuneration.
Unit-6	**Final accounts of companies**: form and content of profit and loss account, form and content of balance sheet as per the sixth schedule, accounting treatment.
Unit-7	**Valuation of shares:** introduction, need for valuation of shares, methods for valuation of shares.
Unit-8	**Cash flow statement:** concept, preparation of cash flow statement.
Unit-9	**Amalgamation I**: introduction to amalgamation, types of amalgamation, methods of purchase consideration, amalgamation in the nature of merger, accounting treatment.
Unit-10	**Amalgamation II:** amalgamation in the nature of purchase, accounting treatment in the books of transferor company, accounting treatment in the books of transferee company.
Unit-11	**Internal reconstruction:** alteration of share capital, procedure of reducing share capital, accounting entries.
Unit-12	**Statement of changes in equity:** introduction, financial statement presentation, IFRS for SMEs, changes in accounting policies, format of changes in equity.
Unit-13	**Accounts of Holding Companies/Parent Companies:** preparation of consolidated balance sheet with one subsidiary company, Relevant provisions of Accounting Standard: 21 (ICAI).
Unit-14	**Accounts of Banking Companies**: difference between balance sheet of banking and non-banking companies, prudential norms, asset structure of a commercial bank, non-performing assets (NPA).

READINGS:

1. CORPORATE ACCOUNTING by JAIN S. P., NARANG K. L., KALYANI PUBLISHERS
2. CORPORATE ACCOUNTING by S.N. MAHESHWARI, S.K. MAHESHWARI, VIKAS PUBLISHING HOUSE
3. CORPORATE ACCOUNTING by P.C. TULSIAN, TATA MCGRAW HILL, INDIA
4. CORPORATE ACCOUNTING by A. MUKHERJEE, H HANIF, MCGRAW HILL EDUCATION

Course Code	DEBSL301	Course Title	INCOME TAX LAW AND PRACTICE

WEIGHTAGE	
CA	ETE(Th.)
30	70

Course Outcomes: Through this course, students will be able to

CO1: memorize and describe the basic principles of direct tax laws.

CO2: apply the rules associated with the calculation of income under the head salaries, house property, business or profession, capital gains and other sources.

CO3: demonstrate the various statutory deductions available to individuals.

CO4: examine the regulatory guidelines related to computation of total income and income tax of individuals.

CO5: apply critical thinking and problem-solving skills to resolve income tax issues.

CO6: use the provisions of the Income-tax act for e-filing of Income-tax returns.

Unit No.	Content
Unit-1	**Introduction to Basic concepts of Income tax law:** income, agricultural income, person, asses see, assessment year, previous year, gross total income, total income.
Unit-2	**Identification of Residential status**: scope of total income on the basis of residential status, residential status of person, incidence of tax, exempted incomes under section 10.
Unit-3	**Concepts of revenue and capital receipts and expenditures:** capital receipts vs. revenue receipts, tests of distinction, capital expenditure vs. revenue expenditure
Unit-4	**Computation of income under the head salaries**: computation of salary income, allowances, perquisites,
Unit-5	**Computation of income under the head house property** : Basic terminology, Determination of annual value under different situations, Deductions u/s 24
Unit-6	**Computation of income under the head capital gains**: Meaning and types of capital gain, Basis of charge, Computation, Exemptions u/s 54
Unit-7	**Computation of income under the head business and profession**: Difference between business and profession, Allowable and disallowed expenses, Computation of Book Profits and total income under the head Business and Profession
Unit-8	**Provisions of depreciation**: Concept, Conditions and rates, Methods and computation
Unit-9	**Computation of income from other sources**: General incomes, Specific incomes **Agricultural income**: Integration of agricultural income with non-agricultural income, Tests, Definition
Unit-10	**Clubbing of income:** Assess ability of income from assets transferred to spouse, sons, wife or another person for the benefit of spouse. Assessment of Individual's income in different cases
Unit-11	**Set off and carry forward of losses**: Set-off inter head provisions, Set-off intra head provisions, Carry forward provisions
Unit-12	**Deductions from total income** :Provisions relevant to Deductions under section 80C to 80U; Rebates and reliefs
Unit-13	**Assessment of individuals**: Computation of total income after set-off of losses less deductions under sections 80C to 80U, Rounding off of income as well as tax, Computation of total income and tax liability

Unit-14	**Filing of return**: Meaning of PAN, Provisions of PAN, Filing Application of PAN under Income Tax Act, E-filing of ITR forms & TDS, Provision & Procedures of Compulsory On-Line filing of returns for specified assesses

READINGS:

1. STUDENTS' GUIDE TO INCOME TAX, UNIVERSITY EDITION by SINGHANIA, VINOD K. AND MONICA SINGHANIA, TAXMANN PUBLICATIONS PVT. LTD., NEW DELHI.
2. SYSTEMATIC APPROACH TO INCOME TAX by AHUJA, GIRISH AND RAVI GUPTA, BHARAT LAW HOUSE, DELHI.

Course Code	DEFIN302	Course Title	FUNDAMENTALS OF FINANCIAL MANAGEMENT	
			WEIGHTAGES	
			CA	ETE(Th.)
			30	70

Course Outcomes: Through this course, students will be able to

CO1: analyze the role of financial management and the key strategies and techniques used to manage cash, marketable securities, accounts receivable and inventory.

CO2: identify the major sources of short-term and long-term financing available to the firm.

CO3: observe concept of time value of money and effect of dividend policy on the value of firm.

CO4: interpret the capital structure decisions of the firm.

CO5: develop the understanding of Company Capital budgeting methods and decisions.

Unit No.	Content
Unit-1	**Financial Management**: introduction to financial management, scope and applications of finance, financial goal profit maximization / wealth maximization
Unit-2	**Financial Management Functions**: finance function, role of finance manager, Controller and Treasury functions in respect to Financial Management
Unit-3	**Sources of finance**: short term sources, medium term sources, long term sources of finance.
Unit-4	**Time value of money**: concept, meaning of TVM, future value of cash flow, present value of cash flow, future value of annuity, present value of annuity, perpetuity, difference between annuity and perpetuity.
Unit-5	**Practical Applications of Time value of Money:** numerical aspects to understand perpetuity, annuity of single cash flow, compound interest, simple interest.
Unit-6	**Cost of capital**: introduction, relevance of cost of capital, components of cost of capital-cost of debt, cost of preference capital, cost of equity capital, weighted average cost of capital, CAPM techniques.
Unit-7	**Capital structure:** introduction, concept of optimum capital structure, relevance theories of capital structure, irrelevance theories of capital structure.
Unit-8	**Capital budgeting**: introduction, nature of capital budgeting, capital budgeting decisions types, non-discounting techniques, discounting techniques.
Unit-9	**Leverage**: meaning, types of leverage, financial leverage, operating leverage, combined leverage.
Unit-10	**Dividend theory**: introduction, objectives of dividend policy, forms of dividend, dividend relevance, dividend irrelevance.
Unit-11	**Working capital management**: introduction to working capital, working capital determinants, operating cycle, liquidity and profitability trade-off.
Unit-12	**Inventory management**: introduction, objectives, need, inventory management techniques, ABC Analysis.
Unit-13	**Cash management**: introduction, meaning, importance, objectives, need, techniques for cash collection.
Unit-14	**Receivables management**: introduction, meaning, determinants of investment in receivables, scope of receivables management, credit policy.

READINGS:

1. ESSENTIALS OF FINANCIAL MANAGEMENT by PANDEY I. M, VIKAS PUBLISHING HOUSE
2. BASIC FINANCIAL MANAGEMENT by KHAN M Y, JAIN P K, McGraw HILL EDUCATION
3. FINANCIAL MANAGEMENT THEORY AND PRACTICE by GUPTA SHASHI, K., SHARMA R.K, KALYANI PUBLISHERS
4. FUNDAMENTALS OF FINANCIAL MANAGEMENT by SHARAN VYUPTKESH, PEARSON

Course Code	DEMKT309	Course Title	DIGITAL MARKETING

WEIGHTAGE	
CA	ETE(Th.)
30	70

Course Outcomes: Through this course, students will be able to

CO1: apply and analyse digital marketing activities in achieving business objectives.

CO2: to develop skills relevant to marketing campaigns for enhancing business reach.

CO3: examine marketing metrics and collect consumer data using digital media.

CO4: improve the brand identity and develop the customer base using real-world techniques.

Unit No.	Content
Unit-1	**Introduction to Digital Marketing-** Digital vs. Traditional Marketing, Digital Marketing Channels, ROI between Digital and traditional marketing, Creating an initial digital marketing plan and Content Management.
Unit-2	**Search Engine Basics**- Introduction to Search Engines and Websites, Difference between Blog, Portal and Website, Static and Dynamic Websites.
Unit-3	**Keyword Research** - Keyword Research, Types of Keywords, Business Analysis & Categorization, Google Keyword Planner, Market Research and Analysis, New Keyword Ideas and Finalizing the Keywords List.
Unit-4	**On-page Webmaster Tools**- Introduction to on page Webmaster Tools, Verification Process in GWMT, Selecting Target Location, On page Analysis Methodology and Fundamental On-page Factors.
Unit-5	**Optimization Techniques** - Website Speed, the Domain name in SEO, URL Optimization, Title and Meta Tag Optimization, Sitemaps Generation, Using Robot.txt in Site URL, Redirecting Techniques, Canonical Links and Rich Snippets.
Unit-6	**Off-Page Optimization-** Link Building, Types of Linking Methods, Linking Building Methodology, Links Analysis Tools, Directory Submissions, Social Bookmarking, Blogging & Commenting and Guest Blogging.
Unit-7	**Search Engine Optimization**- Local SEO, Importance of Local SEO, Local SEO Ranking Signals, Local SEO Negative Signals, Citations and Local Submissions, Website Position Analysis and Website Monthly Reports.
Unit-8	**Paid Marketing Techniques-** Google Account setup, Account Structure, Campaigns settings, Ad Group setup, Keyword Match Types, Keyword Research Tools and Understanding Ad Auction.
Unit-9	**Bidding and Quality Score-** Factors to improve Quality Score, Types of CPCs, Bidding strategies, Bidding strategies, Ad Guidelines and Ad Extensions
Unit-10	**Display Advertising-** Benefits of Display Advertising, creating a Display Campaign, Bidding Strategies, Targeting Option in Display Network, Examples of Good and Bad Ads, Display Ad Builder and Conversion Tracking.
Unit-11	**Web Analytics and reporting-** Key Performance Metrics [KPI] in Analytics, Traffic reports and Behaviour reports
Unit-12	**Social Media Marketing**- Introduction to SMM, Facebook Marketing, Facebook Advertising and Email Marketing.

Unit-13	**Budgeting and implementation**- Digital Marketing Budget, resource planning, cost estimation, cost budgeting, cost control for effective planning and implementing digital marketing techniques
Unit-14	**Visual Marketing-** Visual Perception, Choosing the Right Image, Visual marketing tools, Planning and Organizing the content and blogging to brand yourself

READINGS:

1. UNDERSTANDING DIGITAL MARKETING: MARKETING STRATEGIES FOR ENGAGING THE DIGITAL GENERATION by RYAN, D. (2014), KOGAN PAGE LIMITED.
2. THE BEGINNER'S GUIDE TO DIGITAL MARKETING, DIGITAL MARKETER by PULIZZI, J. (2014) EPIC CONTENT MARKETING, MCGRAW HILL EDUCATION.

Course Code	DEENG115	Course Title	BRITISH LITERATURE 18TH-20TH CENTURIES

WEIGHTAGE	
CA	ETE(Th.)
30	70

Course Outcomes: Through this course students should be able to

CO1: identify the main images and symbols in the texts.
CO2: evaluate the scenario in the genre of 18th century plays.
CO3: relate literary texts to significant social, cultural, political and historical issues.
CO4: analyse the literary texts to explore the themes and the main issues.

Unit No.	Content
Unit-1	William Congreve -*The Way of the World*: Plot, characterization.
Unit-2	William Congreve -*The Way of the World*: Themes, narrative technique.
Unit-3	Jonathan Swift -*Gulliver's Travels (Three)*: Plot, characterization.
Unit-4	Jonathan Swift -*Gulliver's Travels (Three)*: Themes, narrative technique.
Unit-5	Jonathan Swift -*Gulliver's Travels (Four)*: Plot, characterization.
Unit-6	Jonathan Swift -*Gulliver's Travels (Four)*: Themes, narrative technique
Unit-7	Samuel Johnson- *'London'*: Introduction, critical appreciation.
Unit-8	Samuel Johnson- *'London'*: Stylistic features, themes.
Unit-9	Thomas Gray - *'Elegy Written in a Country Churchyard'*: Introduction, stylistic features.
Unit-10	Thomas Gray - *'Elegy Written in a Country Churchyard'*: Critical appreciation, themes.
Unit-11	Laurence Sterne- *The Life and Opinions of Tristram Shandy, Gentleman*: Plot, characterization.
Unit-12	Laurence Sterne- *The Life and Opinions of Tristram Shandy, Gentleman*: Themes, narrative technique.
Unit-13	Dreams-Children - *A Reverie by Charles Lamb*: Introduction, summary
Unit-14	Dreams-Children - *A Reverie by Charles Lamb*: Themes, critical analysis.

READINGS:

1. THE WAY OF THE WORLD by WILLIAM CONGREVE, DOVER PUBLICATIONS
2. GULLIVER'S TRAVELS (PENGUIN CLASSICS) by SWIFT, JONATHAN, PENGUIN BOOKS INDIA

Course Code	DEMTH256	Course Title	DIFFERENTIAL EQUATIONS

WEIGHTAGE	
CA	ETE(Th.)
30	70

Course Outcomes: Through this course, students will be able to

CO1: understand the genesis of ordinary differential equations.

CO2: illustrate the solution of exact differential equations.

CO3: develop the solution of homogeneous and non-homogeneous equations.

CO4: discuss solution of higher order differential equations by using various methods.

CO5: analyze and compute the series solutions of a linear differential equation of an arbitrary order.

CO6: formulate mathematical models in the form of ordinary differential equations.

Unit No.	Content
Unit-1	Definition, formation and solution of differential equations, Equations in which variables are separable, Homogeneous equations, Linear differential equations and equations reducible to linear form
Unit-2	Exact differential equations of first order, integrating factors, rules to find integrating factor
Unit-3	First order higher degree equations solvable for x, y, p, Clairaut's equation, Introduction to singular solutions, Picard's method of successive approximations
Unit-4	Basic theory of linear differential equations, Solutions of homogeneous linear ordinary differential equations with constant coefficients
Unit-5	Wronskian and its properties, Solutions of non-homogeneous linear ordinary differential equations with constant coefficients
Unit-6	Method of variation of parameters, method of undetermined coefficients, Solution of the Cauchy-Euler equation
Unit-7	Genesis of Partial differential equations (PDE), Concept of linear and non-linear PDEs, Methods of solution of Simultaneous differential equations of the form: $dx/P(x,y,z) = dy/Q(x,y,z) = dz/R(x,y,z)$
Unit-8	Lagrange's method for PDEs of the form: $P(x,y,z)p+Q(x,y,z)q=R(x,y,z)$, where $p=\partial z/\partial x$ and $q=\partial z/\partial y$; Solutions passing through a given curve
Unit-9	Solution of Homogeneous Partial Differential Equation, irreducible equations
Unit-10	Reducible and irreducible homogeneous equations and their solutions in various possible cases, solution of non-homogeneous PDEs
Unit-11	Orthogonal trajectories of one-parameter families of curves in a plane, Minimum velocity of escape from Earth's gravitational field
Unit-12	Newton's law of cooling, Malthusian and logistic population models
Unit-13	Free and forced mechanical oscillations of a spring suspended vertically carrying a mass at its lowest tip
Unit-14	Phenomena of resonance, LCR circuits, surfaces orthogonal to a given system of surfaces

READINGS:

1. DIFFERENTIAL EQUATIONS BY SHIPLEY L. ROSS, JOHN WILEY & SONS

2. ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS by DR. M.D. RAISINGHANIA (2013), S CHAND PUBLISHING
3. ELEMENTS OF PARTIAL DIFFERENTIAL EQUATIONS by IAN N. SNEDDON (2006), DOVER PUBLICATIONS.
4. ADVANCED ENGINEERING MATHEMATICS (10TH EDITION) by ERWIN KREYSZIG (2011), J. WILEY & SONS

Course Code	DEACC301	Course Title	MANAGEMENT ACCOUNTING

WEIGHTAGE	
CA	ETE(Th.)
30	70

Course Outcomes: Through this course, students will be able to

CO1: analyze the financial statement of various companies.

CO2: use of ratio analysis to evaluate the performance and resolve the issues of various entities.

CO3: prepare cash, sales, flexible and production budgets.

CO4: apply the concepts of marginal costing for decision making in organizations.

CO5: use the various techniques of profitability analysis to interpret the performance of the organization.

CO6: define the meaning of transfer pricing and various methods of calculating transfer pricing.

CO7: focus on the applicability of transfer pricing methods in industry.

Unit No.	Content
Unit-1	**Introduction to management accounting**: Meaning and nature of management accounting, objectives, scope and limitations of management accounting, distinction between management accounting, financial accounting & cost accounting
Unit-2	**Management discussion and analysis report**: Management discussion and analysis report, directors report, auditors report, corporate governance report, concept of IFRS
Unit-3	**Financial statement analysis**: Meaning of financial statement analysis, objectives and importance, comparative statement analysis (horizontal analysis), common size statement analysis (vertical analysis)
Unit-4	**Ratio analysis I**: Meaning and scope of ratio analysis, advantages and limitations, users of ratios, liquidity ratios, efficiency ratios
Unit-5	**Ratio analysis II:** Solvency ratios, profitability ratios, leveraged ratios, Du Pont control chart
Unit-6	**Profitability analysis**: Income measurement analysis, revenue analysis, cost of sales analysis, expense analysis, variation analysis
Unit-7	**Risk and return**: Calculating return, types of risk, relationship between risk and return
Unit-8	**Budgeting**: Concept of budgeting, meaning of budgetary control, budgeting process, advantages and limitations of budgeting, types of budgets, preparation of cash budget, flexible budget, sales budget and production budget, zero base budgeting
Unit-9	**Absorption costing and marginal costing**: Need for marginal costing, difference between absorption costing and marginal costing, marginal cost equation, break-even analysis, CVP analysis, effects of certain changes on P/V ratio
Unit-10	**Decision making:** Steps in decision making process, concept of relevant costs and benefits, various short term decision making situations – profitable product mix, acceptance or rejection of special/export offers, make or buy, addition or elimination of a product line, sell or process further, operate or shut down. Pricing decisions: major factors influencing pricing decisions, various methods of pricing
Unit-11	**Artificial intelligence and analytics** : Finance and accounting transformation by AI
Unit-12	**Transfer pricing**: Concept of transfer pricing, types of transfer pricing, methods for calculating transfer price
Unit-13	**Management information system:** Meaning, objectives, characteristics, nature and scope, advantages and limitations, introduction to reporting, meaning and objective of preparing reports, kinds of reports, elements and types of reports, levels of management and reporting
Unit-14	**Responsibility accounting**: Meaning and prerequisites, steps involved in responsibility

	accounting, advantages and limitations of responsibility accounting, types of responsibility centers

READINGS:

1. COST AND MANAGEMENT ACCOUNTING by M. N. ARORA, VIKAS PUBLISHING HOUSE
2. MANAGEMENT ACCOUNTING by DEBARSHI BHATTACHARYYA, PEARSON
3. MANAGEMENT ACCOUNTING by MY KHAN, PK JIAN, MCGRAW HILL EDUCATION
4. COST & MANAGEMENT ACCOUNTING by MN ARORA, HIMALAYA PUBLISHING HOUSE PVT. LTD
5. COST & MANAGEMENT ACCOUNTING by MN ARORA, VIKAS PUBLISHING HOUSE

Course Code	DEBSL304	Course Title	GOODS AND SERVICES TAX AND CUSTOMS LAW

WEIGHTAGE	
CA	ETE(Th.)
30	70

Course Outcomes: Through this course, students will be able to

CO1: describe provisions of goods and services tax and customs law in India.

CO2: calculate the tax payable under GST and custom duty.

CO3: analyze taxation cases using the provisions of GST and customs law in actual practice.

CO4: examine the provisions relevant to registration and filing of GST return.

CO5: determine taxable event and valuation under GST.

CO6: describe the provisions of reverse charge and composition scheme under GST.

Unit No.	Content
Unit-1	**Overview of GST**: Basic terminology, benefits, taxes subsumed in GST, structure, GST council, GST network
Unit-2	**Taxable event in GST**: Supply of goods & services, place of supply, time of supply, mixed &composite supplies, classification of goods & services
Unit-3	**Valuation under GST**: Transaction value, valuation rules
Unit-4	**Input tax credit**: Requirements, eligible and ineligible input tax credit, reversal of ITC, recovery of ITC
Unit-5	**Reverse charge**: General provisions, procedure of reverse charge, supply of goods & services liable for reverse charge
Unit-6	**Composition scheme**: Eligibility, procedure to avail the scheme, effective date, validity & withdrawal from scheme, switch over
Unit-7	**Registration under GST**: Requirements & procedure for registration, persons liable for registration, voluntary registration, cancellation of registration
Unit-8	**Tax invoice**: Tax invoice in respect of goods, tax invoice in respect of services, contents of tax invoice
Unit-9	**Tax payment under GST**: Electronic payment of tax & other dues, sequence of discharge of tax, interest on delayed payment of tax
Unit-10	**Filing of GST Return** : Types of GST returns, Taxpayers liable to file return, Due dates for GST returns, Procedure to file GST return online
Unit-11	**Overview of customs law**: Basic concepts, charge of duty, types of customs duty, valuation of customs duty
Unit-12	**Procedures in customs law**: Import procedure, export procedure
Unit-13	**Officers of customs:** Classes of officers, appointment of officers, powers of officers, searches, seizure and arrest, offences, penalties
Unit-14	**Baggage rules** : Basic terms, general free allowance

READINGS:

1. GST LAW & PRACTICE WITH CUSTOMS & FTP by V.S. DATEY, TAXMANN PUBLISHER
2. GOODS AND SERVICES TAX by H.C. MEHROTRA & V.P. AGARWAL, SAHITYA BHAWAN PUBLICATIONS

Course Code	DEMGN358	Course Title	E-COMMERCE

WEIGHTAGE	
CA	ETE(Th.)
30	70

Course Outcomes: Through this course, students will be able to

CO1: identify different kinds of e-commerce sites and the differentiation strategy behind them.

CO2: develop value in an online setting and design a suitable payment system.

CO3: develop a website, taking care of its security and reliability.

Unit No.	Content
Unit-1	**Electronic business- understanding new internet economy and business**: objectives of e-business, transition from traditional business to e-business, e-business and e-commerce, advantages of e-business
Unit-2	**E-business models**: e-business structure, evolution of e-business and its stages, e-business models based on functionality, e-business models based on transactions
Unit-3	**E-business competitive and business strategy**: competitive advantage and competitive strategy, role of technology in building competitive advantage, building competitive advantage through e-business
Unit-4	**E-market**: electronic market, internet advertising, e-business advertising- types, classification of e-markets
Unit-5	**Value creation and business strategies in e-age**: value drivers of e-business, e-business strategies and strategic challenges, e- business value chain
Unit-6	**E-business applications**: characteristics, classification, current trends in e business
Unit-7	**E-procurement and e-fulfillment:** e-procurement model, e-procurement process, e-procurement infrastructure, e-SCM, e-SCM evolution
Unit-8	**Creating e-business plan**: Developing a business plan be written, elements of e-business plan, phases/aspects of e-business plan, what should be avoided while writing an e-business plan
Unit-9	**Building and launching e-business**: e-business launching considerations, checklist for launching an e-business, challenges in e-business transition, types of changes in e-businesses, stages of e business process reengineering in e-business change
Unit-10	**Online payment systems**: traditional payment methods, online payment system characteristics, online payment methods, security and risk handling in online payments, fraud detection in online payments
Unit-11	**Design and development of a business website**: prerequisites for designing in-house websites, steps involved in website development, security issues involved in websites
Unit-12	**Constructing e-business enterprise Applications**: trends, problems due to lack of integration, cross-functional integrated applications, integrated application frameworks
Unit-13	**Enterprise resource planning (ERP) for e-business**: basics of ERP, ERP decision, ERP applications, ERP implementation
Unit-14	**Security and reliability of e-business**: risk analysis- information classification, computer viruses, worms and Trojans, other threats, e-business security policy

READINGS:

1. E- BUSINESS by PARAG KULKARNI, SUNITA JAHIRABADKAR, PRADIP CHANDE, OXFORD
2. ELECTRONIC COMMERCE: A MANAGER'S GUIDE by RAVI KALAKOTA, ANDREW B.WHINSTON,PEARSON

Course Code	DEMKT312	Course Title	SELLING SKILLS

WEIGHTAGE	
CA	ETE(Th.)
30	70

Course Outcomes: Through this course, students will be able to

CO1: articulate the selling concepts and develop skills to critically handle sales situation and upcoming sales opportunity.

CO2: illustrate product information persuasively with special emphasis on how to sell on value rather than price and differentiate company product.

CO3: formulate the objection handling and sales closing techniques to sell the products and services.

CO4: develop relationship marketing strategies and to devise approaches to retain customers.

Unit No.	Content
Unit-1	**Developing a personal selling philosophy:** relationship selling opportunities, the evolution of selling models that complement the marketing concept
Unit-2	**Developing a relationship strategy:** creating value with a relationship strategy, communication styles: a key to adaptive selling today
Unit-3	**Ethics: The foundation for relationship in selling:** making ethical decisions, factors influencing the ethics of salespeople
Unit-4	**Developing a product strategy:** creating product solutions, and product-selling strategies that add value
Unit-5	**Developing a customer strategy:** the buying process and buyer behavior, developing and qualifying a prospect base
Unit-6	**Developing a presentation strategy:** approaching the customer with adaptive selling, determining customer needs with a consultative questioning strategy
Unit-7	**Creating consultative presentation:** negotiating buyer concerns, formal integrative negotiation
Unit-8	**Adapting the close and confirming partnership:** guidelines for closing the sale, recognizing the closing clues, specific methods for closing the sale
Unit-9	**Servicing the sale:** building long-term partnerships with customer service, current development in customer service
Unit-10	**Building partnership:** customer service methods to strengthen the partnership, partnering with unhappy customers
Unit-11	**Opportunity Management:** a four-dimensional process, time management, time-consuming activities, time management methods
Unit-12	**The key to greater sales productivity:** territory management, records management, stress management
Unit-13	**Management of sales force:** applying leadership skills to sales management, recruitment and selection of salespeople
Unit-14	**Orientation and Training:** sales force motivation, compensation plan, assessing sales force productivity

READINGS:

1. SELLING TODAY: PARTNERING TO CREATE VALUE by GERALD L. MANNING, MICHAEL HEARNE & BARRY L. REECE, PEARSON
2. ABC'S OF RELATIONSHIP SELLING THROUGH SERVICE by CHARLES M. FUTRELL, TATA MCGRAW HILL, INDIA
3. THE SPIN SELLING FIELDBOOK by NEIL RACKHAM, TATA MCGRAW HILL, INDIA

Course Code	DEENG316	Course Title	WOMEN'S WRITING

WEIGHTAGE	
CA	ETE(Th.)
30	70

Course Outcomes: Through this course students should be able to
CO1: identify different terms related to women's writing.
CO2: develop critical thinking.
CO3: analyze different themes in the text and match with real life events.

Unit No.	Content
Unit-1	**Introduction to Women's Writing**: The confessional mode in women's writing, sexual politics, race, caste and gender.
Unit-2	**Introduction to Women's Writing**: Difference feminism, discrimination, empowerment
Unit-3	**Emily Dickinson 'I cannot live with you'**: Introduction to the poet, the metaphor of a love relationship, a model for human existence
Unit-4	**Emily Dickinson 'I cannot live with you'**: Traditional resurrection, a critical appreciation of the poem
Unit-5	**Eunice De Souza 'Advice to Women', 'Bequest':** Introduction to the poet, analysis of the poem: a critical appreciation, themes.
Unit-6	**Eunice De Souza 'Advice to Women', Sylvia Plath 'Daddy'**: Introduction to the Sylvia Plath, analysis of the poem, a critical appreciation of the poem, themes.
Unit-7	**Alice Walker 'The Color Purple**: Introduction to Alice Walker, background, character analysis.
Unit-8	**Alice Walker's The Color Purple**: Plot construction, themes, critical analysis
Unit-9	**Terms pertaining to women's writing**: Gender identity, sexual harassment, gender harassment.
Unit-10	**Terms pertaining to women's writing**: Superwoman syndrome, womanism.
Unit-11	**Katherine Mansfield 'Bliss'**: Introduction to Katherine Mansfield, background, character analysis.
Unit-12	**Katherine Mansfield 'Bliss'**: Plot construction, themes, critical analysis
Unit-13	**Mahashweta Devi 'Draupadi'**: Introduction to Mahashweta Devi, background, character analysis.
Unit-14	**Mahashweta Devi 'Draupadi'**: Plot construction, themes, critical analysis.

READINGS:

1. A GLOSSARY OF LITERARY TERMS by M.H. ABRAMS, CENGAGE LEARNING
2. THE COLOR PURPLE by ALICE WALKER, ORION PUBLISHING
3. BREAST STORIES by MAHASWETA DEVI, SEAGULL PUBLICATION
4. THE COLLECTED SHORT STORIES OF KATHERINE MANSFIELD by KATHERINE MANSFIELD, W B SAUNDERS (ELSEVIER)

Course Code	DEMTH290	Course Title	REAL ANALYSIS

WEIGHTAGE	
CA	ETE(Th.)
30	70

Course Outcomes: Through this course, students will be able to

CO1: review the algebraic and order structure of the real line with examples of different sets.

CO2: analyze the role of Cauchy's criteria for convergence of the sequences in the advanced topics of analysis.

CO3: apply their understanding of how real numbers are constructed by the sequences of rational numbers.

CO4: practice the concept of convergence for infinite series using various tests.

CO5: learn some of the properties of Riemann integrable functions and the applications of the fundamental theorems of integration.

Unit No.	Content
Unit-1	**The Real Number System and its Properties-I:** Algebraic and order properties of $\mathbb{R}$, absolute value of a real number, supremum and infimum of a nonempty subset of $\mathbb{R}$.
Unit-2	**The Real Number System and its Properties-II:** The completeness property of $\mathbb{R}$, Archimedean property, density of rational numbers in $\mathbb{R}$.
Unit-3	**Basic Topology-I:** Definition and types of intervals, nested intervals property, neighborhood of a point in $\mathbb{R}$, open, closed and perfect sets in $\mathbb{R}$.
Unit-4	**Basic Topology-II:** Connected sets in $\mathbb{R}$, connected sets and continuous functions, compact subsets of $\mathbb{R}$, compact sets and continuous functions, uniform continuity.
Unit-5	**Sequences-I:** Bounded and monotonic sequences, convergent sequence and its limit, limit theorems, monotone convergence theorem.
Unit-6	**Sequences-II:** Subsequences, Bolzano-Weierstrass theorem, limit superior and limit inferior, Cauchy sequence, Cauchy's convergence criterion.
Unit-7	**Series-I:** Convergence and divergence of infinite series of positive real numbers, necessary condition for convergence, Cauchy criterion for convergence
Unit-8	**Series-II:** Tests for convergence of positive term series, basic comparison test, limit comparison test, D'Alembert's ratio test, Cauchy's n^{th} root test, Cauchy integral test
Unit-9	**Series-III:** Alternating series, Leibniz test, Absolute and conditional convergence, Rearrangement of series and Riemann's rearrangement theorem.
Unit-10	**Riemann Integration-I:** Riemann integrability of bounded functions, examples of R-integrable and non-integrable functions, necessary and sufficient condition for Riemann integrable function (Statement only), Algebra of Riemann integrable functions.
Unit-11	**Riemann Integration-II:** Integrability of continuous and monotonic functions, fundamental theorem of integral calculus, first mean value theorem.
Unit-12	**Sequence and Series of Functions:** Pointwise and uniform convergence of sequence and series of functions, Weierstrass M-test.
Unit-13	**Implications of Uniform Convergence:** Uniform convergence and continuity, uniform convergence and differentiability, uniform convergence and integration.
Unit-14	**Improper Integrals:** Improper integrals and tests for improper integrals, beta and gamma functions.

READINGS:

1. INTRODUCTION TO REAL ANALYSIS (4TH EDITION) by ROBERT G. BARTLE & DONALD R. SHERBER, WILEY INDIA.
2. PRINCIPLES OF MATHEMATICAL ANALYSIS by WALTER RUDIN, MCGRAW HILL.
3. ELEMENTARY ANALYSIS: THE THEORY OF CALCULUS (2ND EDITION) by K. A. ROSS, SPRINGER.
4. MATHEMATICAL ANALYSIS: A MODERN APPROACH TO ADVANCED CALCULUS by T. M. APOSTOL, PEARSON EDUCATION.

Course Code	DEPEA204	Course Title	ANALYTICAL SKILLS

WEIGHTAGE	
CA	ETE (Th.)
30	70

Course Outcomes: Through this course, students will be able to

CO1: apply the basic concepts of reasoning and quantitative aptitude.

CO2: apply the learned concepts to solve the company-specific reasoning and quantitative Aptitude tests.

CO3: analyze the problem and use logic to interpret and handle different situations.

Unit No.	Content
Unit-1	**Number system:** Types of numbers, rules of divisibility, multiplicity and squaring of numbers, HCF and LCM of numbers
Unit-2	**Average:** Average of numbers, Arithmetic Mean, Real-life examples of average, Application-based questions
Unit-3	**Number series:** Series Completion, Analogy, Classification
Unit-4	**Alphabet series:** Series Completion, Analogy, Classification
Unit-5	**Coding-Decoding**: Letter Coding, Direct Letter Coding, Number / Symbol Coding, deciphering message word codes, number and symbol codes for messages
Unit-6	**Percentage:** Concept of Percentage, Comparison based questions, Application-based questions
Unit-7	**Profit and Loss:** Profit or Loss, Cost price, Selling price, Calculation of profit and loss percent, Application-based questions, conceptual formulae
Unit-8	**Simple interest: the** concept of simple interest, general formulas, application-based questions
Unit-9	**Compound interest:** basic concepts and formula-based questions, the difference between simple interest and compound interest
Unit-10	**Alphabet Test:** Alphabetical order of words, Letter-word problems, Word formation by unscrambling letters
Unit-11	**Number Test:** Number Test, Position switching of numbers
Unit-12	**Ranking and Time Sequence Test:** Ranking Test, Time Sequence Test
Unit-13	**Direction Sense Test:** direction puzzle, sense the directions correctly
Unit-14	**Blood Relation:** Coded Relations, relation-based puzzle

READINGS:

1. A MODERN APPROACH TO NON-VERBAL REASONING by R S AGGARWAL, S Chand Publishing
2. QUANTITATIVE APTITUDE FOR COMPETITIVE EXAMINATIONS by R S AGGARWAL, S CHAND PUBLISHING
3. QUANTITATIVE APTITUDE by ABHIJIT GUHA, TATA MCGRAW HILL, INDIA

Course Code	DECAP392	Course Title	FUNDAMENTALS OF JAVA PROGRAMMING

WEIGHTAGE		
CA	ETE(Th.)	ETE (Pr.)
30	40	30

Course Outcomes: Through this course, students should be able to

CO1: perceive the importance of using object-oriented programming concepts in Java.

CO2: understand the accessibility of fields and methods of an object and the use of String and String Builder classes.

CO3: develop user-defined exceptions to control unexpected situations.

CO4: facilitate the input and output operations on the file.

Unit No.	Content
Unit-1	**Introduction**: introduction to object-oriented programming, features of Java Language, java classes, objects, the main method, access control
Unit-2	**Methods:** defining fields and methods, method arguments and return values, declaring, instantiating and initializing objects, variables, and its types, and control flow constructs.
Unit-3	**Encapsulation & Polymorphism:** encapsulation, polymorphism, overloading a method
Unit-4	**Constructors**: constructors & its types, overloading constructor, static methods and variables
Unit-5	**String manipulations:** working with strings: String, String Buffer and String Builder classes.
Unit-6	**Inheritance & Interfaces:** an overview of inheritance, working with subclasses and super classes, overriding methods in the superclass.
Unit-7	**More on Inheritance:** Creating and extending abstract classes, using Interfaces
Unit-8	**Nested classes:** nested classes, inner classes, wrapper classes
Unit-9	**Packages:** built-in packages in Java, user-defined packages,
Unit-10	**More on Packages:** creating and importing packages, adding classes to packages, introduction to Java API
Unit-11	**Exception Handling**: introduction to exceptions, built-in and user-defined exceptions, catching and throwing exceptions
Unit-12	**More on Exception handling:** propagation of exceptions handling multiple exceptions, throws Vs throw.
Unit-13	**File handling:** basics of input and output in Java, stream classes, read and write data from the console
Unit-14	**More on File Handling:** file stream classes, using streams to read and write files, random access files.

Laboratory Work:

Implementation of Java Programming Concepts (Classes and objects, constructor, method overloading, string manipulations, inheritance, exception handling and working with files)

READINGS:

1. PROGRAMMING WITH JAVA by E. BALAGURUSAMY, MC GRAW HILL PUBLICATION
2. JAVA: THE COMPLETE REFERENCE by HERBERT SCHILDT, MCGRAW HILL EDUCATION
3. CORE JAVA: AN INTEGRATED APPROACH by DR. R. NAGESWARA RAO, DREAMTECH PRESS PUBLICATION

Course Code	DECAP460	Course Title	FUNDAMENTALS OF PYTHON

WEIGHTAGE		
CA	ETE(Th.)	ETE (Pr.)
30	40	30

Course Outcomes: Through this course, students should be able to
CO1: understand the properties and applications of the python programming language.
CO2: apply programming constructs of python to develop programs.
CO3: implement the input and output operations on files.
CO4: analyze real-life situation-specific problems and perceive solutions.

Sr. No.	Topics
Unit-1	**Introduction to python:** installation and setting up the path, working with python, basic syntax
Unit-2	**Python basics:** understanding python variables, understanding python blocks, applications of python
Unit-3	**Data types and operators:** declaring and using numeric data types: int, float, complex, use of string data type, use of tuple data type, python basic operators
Unit-4	**Program flow control:** conditional blocks using if, else and elif, simple for loops in python
Unit-5	**Program flow control:** use of while loops in python, loop manipulation using a pass, continue, break and else
Unit-6	**Handling strings:** accessing strings, string length, string traversal, string comparison, find function, for loop using string
Unit-7	**Lists:** accessing lists, operations, slices, deletion, for loop using a list
Unit-8	**Tuples:** accessing tuples, operations, working, functions and methods
Unit-9	**Sets:** access set items, add set items, remove set items, set methods
Unit-10	**Dictionaries:** accessing values in dictionaries, working with dictionaries, properties, functions, for loop using dictionaries
Unit-11	**Functions:** defining a function, calling a function, types of functions, function arguments
Unit-12	**Text files:** printing on screen, reading data from keyboard, opening and closing files, reading and writing files
Unit-13	**Classes and objects:** creating classes, creating instance objects, accessing attributes
Unit-14	**OOP features: an** overview of OOP Terminology, constructor

Laboratory Work:

Implementation of Java Programming Concepts (Classes and objects, constructor, method overloading, string manipulations, inheritance, exception handling and working with files)

READINGS:

1. PROGRAMMING WITH JAVA by E. BALAGURUSAMY, MC GRAW HILL PUBLICATION
2. JAVA: THE COMPLETE REFERENCE by HERBERT SCHILDT, MCGRAW HILL EDUCATION
3. CORE JAVA: AN INTEGRATED APPROACH by DR. R. NAGESWARA RAO, DREAMTECH PRESS PUBLICATION

Course Code	DECAP512	Course Title	OPEN-SOURCE WEB APPLICATION DEVELOPMENT

WEIGHTAGE	
CA	ETE (Th.)
30	70

Course Outcomes: Through this course, students will be able to

CO1: develop dynamic web applications using PHP.

CO2: apply database concepts to effectively manage data using server site script.

CO3: summarize the different aspects of server site and client site scripts.

CO4: apply the parsing technique to read data from other sources.

Unit No.	Content
Unit-1	**My SQL**: current and future versions of MySQL, installing MySQL. basic security guidelines. privilege system and working with user privileges
Unit-2	**Apache Server**: versions of apache. choosing the appropriate installation method. installing on windows, Apache configuration file structure, apache log file, starting apache for the first time
Unit-3	**PHP**: versions of PHP. installation of PHP. PHP. Ini basics. testing installation
Unit-4	**Building Blocks of PHP**: variables, data types, operators & expressions, constants, switching flow, loops, code blocks and browser output
Unit-5	**Functions**: meaning, calling, defining a function. the return value from the user-defined function, saving state with 'static' function. testing for the existence of function
Unit-6	**Arrays**: what are arrays, creating arrays, array-related functions
Unit-7	**Objects**: creating an object. object inheritance
Unit-8	**Working with String, Dates & Time**: formatting string with PHP. using date and time functions with PHP. other string, date/time functions
Unit-9	**Forms**: creating a simple input form. accessing form input with user-defined arrays, Html and PHP code on a single page. using hidden fields to save state. redirecting user. working with file upload
Unit-10	**Cookies**: introducing cookies, setting cookies, deleting cookies with Php, session function overview, starting the session, working with session variables. destroying sessions and unsetting variables
Unit-11	**Files and Directories**: include files with include (). validating files. creating files, deleting files, opening a file for reading, writing, appending
Unit-12	**Images**: understanding the image creation process, necessary modifications to PHP, drawing a new image, modifying existing images, image creation from user input
Unit-13	**Stored Procedures**: what are transactions, what are stored procedures
Unit-14	**Connecting to MySQL with PHP**: working with MySQL data

READINGS:

1. TEACH YOURSELF PHP, MYSQL & APACHE, by MELONI, PEARSON EDUCATION
2. OPEN-SOURCE DEVELOPMENT WITH LAMP: USING LINUX, APACHE, MYSQL, PERL & PHP by JAMES LEE, PEARSON EDUCATION
3. PHP: A BEGINNER'S GUIDE by VASWANI, VIKRAM by TATA MC-GRAW HILL