M.D. UNIVERSITY, ROHTAK

SCHEME OF STUDIES AND EXAMINATION

B.TECH (Computer Science and Engineering)

Common with

B.Tech. (Information Technology)

&

B.Tech. (Computer Science and Information Technology)

SEMESTER 3rd& 4th

Modified Scheme effective from 2020-21

COURSE CODE ANDDEFINITIONS

Course Code	Definition
L	Lecture
T	Tutorial
P	Practical
BSC	Basic ScienceCourses
ESC	EngineeringScienceCourses
HSMC	Humanities and Social Sciences includingManagementcourses
PCC	Professional Core Courses
LC	Laboratory Courses
MC	Mandatory Courses
PT	Practical Training
S	Seminar

B.Tech. (Computer Science and Engineering)

Common with B.Tech. (Information Technology) &

B.Tech. (Computer Science and Information Technology)

Scheme ofStudies/Examination w.e.f. 2019-20

Semester-3

Sr. No.	Course Code	Course Title	Hours per week			Total Contact Hrs. per week	Credit	Examination Schedule (Marks)				Duration of Exam (Hours)
			L	T	P			Mark of Class work	Theory	Practical	Total	
1	PCC-CSE-201G	Database Management Systems	3	0	0	3	3	25	75		100	3
2	PCC-CSE-203G	Data Structures & Algorithms	3	0	0	3	3	25	75		100	3
3	ESC-CSE-205G	Digital Electronics	3	0	0	3	3	25	75		100	3
4	PCC-CSE-207G	Python Programming	3	0	0	3	3	25	75		100	3
5	BSC-MATH-203G	Mathematics - III (Multivariable Calculus and Differential Equations)	2	0	0	2	2	25	75		100	3
6	HSMC-01G	Economics for Engineers	3	0	0	3	3	25	75		100	3
7	LC-CSE-209G	Database Management Systems LAB	0	0	3	3	1.5	25		25	50	3
8	LC-ESC-211G	Digital Electronics LAB	0	0	3	3	1.5	25		25	50	3
9	LC-CSE-213G	Data Structures & Algorithms LAB Using C	0	0	3	3	1.5	25		25	50	3
10	LC-CSE-215G	Python Programming LAB	0	0	3	3	1.5	25		25	50	3
Total							23				800	

B.Tech. (Computer Science and Engineering)

Common with B.Tech. (Information Technology) &

B.Tech. (Computer Science and Information Technology)

Scheme ofStudies/Examination w.e.f. 2019-20

Semester-4

Sr. No.	Course Code	Course Title	Hours per week			Total Contact Hrs. per week	Credit	Examination Schedule (Marks)				Duration of Exam (Hours)
			L	T	P			Mark of Class work	Theory	Practical	Total	
1	PCC-CSE-202G	Discrete Mathematics	3	1	0	3	4	25	75		100	3
2	PCC-CSE-204G	Computer Organization&Architecture	3	0	0	3	3	25	75		100	3
3	PCC-CSE-206G	OperatingSystem	3	0	0	3	3	25	75		100	3
4	PCC-CSE-208G	ObjectOriented Programming	3	0	0	3	3	25	75		100	3
5	HSMC-02G	Organizational Behaviour	3	0	0	3	3	25	75		100	3
6	*MC-106G	Environmental Sciences	3	0	1	4	0	-	-	-	-	3
7	PCC-CSE-210G	Web Technologies	3	0	0	3	3	25	75		100	3
8	LC-CSE-212G	OperatingSystem LAB	0	0	3	3	1.5	25		25	50	3
9	LC-CSE-214G	ObjectOriented Programming LAB Using C++	0	0	3	3	1.5	25		25	50	3
10.	LC-CSE-216G	Web Technologies Lab	0	0	2	2	1	25		25	50	3
						Total	23				750	

*__MC-106G__ is a mandatory non –credit course in which the students will be required passing marks in theory.

NOTE: At the end of 4th semester each student has to undergo Practical Training of 4/6 weeks in an Industry/ Institute/ Professional Organization/ Research Laboratory/ training centre etc. and submit typed report along with a certificate from the organization & its evaluation shall be carried out in the 5th Semester.

Database Management System

Coursecode	PCC-CSE-201G				
Category	Professional Core Course				
Coursetitle	Database Management System				
Scheme and Credits	L	T	P	Credits	Semester 3
	3	0		3	
Class work	25 Marks				
Exam	75 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Objectives of the course

a. To understand the different issues involved in the design and implementation of a database system.
b. To study the physical and logical database designs, database modeling, relational, hierarchical, and network models
c. To understand and use data manipulation language to query, update, and manage a database
d. To develop an understanding of essential DBMS concepts such as: database security, integrity, concurrency, distributed database, and intelligent database, Client/Server (Database Server), Data Warehousing.
e. To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 6 parts of 2.5 marks each from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

Unit: 1

Database system architecture: Data Abstraction, Data Independence, Data Definition Language(DDL),DataManipulationLanguage(DML). **Data models:** Entity-relationshipmodel,networkmodel,relationalandobjectorienteddata models, integrityconstraints, datamanipulation operations.

Unit: 2

Relationalquerylanguages: Relationalalgebra,Tuple anddomainrelationalcalculus,SQL3, DDL and DML constructs, Open source and Commercial DBMS - MYSQL, ORACLE, DB2, SQL server.

Relational database design: Domain and data dependency, Armstrong's axioms,Normal forms, Dependency preservation, Lossless design.

Query processing and optimization: Evaluation of relational algebra expressions, Queryequivalence, Join strategies, Query optimization algorithms.

Unit: 3

Storage strategies: Indices, B-trees, hashing,

Transaction processing: Concurrency control, ACID property, Serializability ofscheduling, Locking and timestamp based schedulers, Multi-version and optimistic Concurrency Control schemes, Database recovery.

Unit: 4

Database Security: Authentication, Authorization and access control, DAC, MAC andRBAC models, Intrusion detection, SQL injection.

Advanced topics: Object oriented and object relational databases, Logical databases, Webdatabases, Distributed databases, Data warehousing and data mining.

Suggested books:

"Database System Concepts", 6th Edition by Abraham Silberschatz, Henry F. Korth, S. Sudarshan, McGraw-Hill.

Suggested reference books

"Principles of Database and Knowledge – Base Systems", Vol 1 by J. D. Ullman, Computer Science Press.

"Fundamentals of Database Systems", 5th Edition by R. Elmasri and S. Navathe, Pearson Education

"Foundations of Databases", Reprint by Serge Abiteboul, Richard Hull, Victor Vianu, Addison-Wesley

Course Outcomes

1. For a given query write relational algebra expressions for that query and optimize the developed expressions
2. For a given specification of the requirement, design the databases using E R method and normalization.
3. For a given specification, construct the SQL queries for Open source and Commercial DBMS -MYSQL, ORACLE, and DB2.
4. For a given query optimize its execution using Query optimization algorithms
5. For a given transaction-processing system, determine the transaction atomicity, consistency, isolation, and durability.
6. Implement the isolation property, including locking, time stamping based on concurrency control and Serializability of scheduling.

Data Structure & Algorithms

Coursecode	PCC-CSE-203G				
Category	Professional Core Course				
Coursetitle	Data Structure & Algorithms				
Scheme and Credits	L	T	P	Credits	Semester 3
	3	0		3	
Class work	25 Marks				
Exam	75 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 6 parts of 2.5 marks each from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

Objectives of the course:

1. To impart the basic concepts of data structures and algorithms.
2. To understand concepts about searching and sorting techniques
3. To understand basic concepts about stacks, queues, lists, trees and graphs.
4. To enable them to write algorithms for solving problems with the help of fundamental data structures

Unit 1:

Introduction: Basic Terminologies: Concept of Data Structure, Choice of right Data Structure, Algorithms , how to design and develop algorithm , Complexity of algorithm. Operations: insertion, deletion, traversal etc.; Analysis of an Algorithm, **Searching:** Linear Search and Binary Search Techniques and their complexity analysis.

Unit 2:

Stacks and Queues: Stack and its operations: Algorithms and their complexity analysis, Applications of Stacks: Expression Conversion and evaluation -corresponding algorithms and complexity analysis. queue, Types of Queue: Simple Queue, Circular Queue, Priority Queue; Operations on each types of Queues: Algorithms and their analysis.

Unit 3:

Linked Lists: Singly linked lists: Representation in memory, Algorithms of several operations: Traversing, Searching, Insertion into, Deletion from linked list; Linked representation of Stack and Queue, Header nodes, Doubly linked list: operations on it and algorithmic analysis; Circular Linked Lists: all operations their algorithms and the complexity analysis.
Trees: Basic Tree Terminologies, Different types of Trees: Binary Tree, Threaded BinaryTree, Binary Search Tree, AVL Tree; Tree operations on each of the trees and their algorithms with complexity analysis. Applications of Binary Trees. B Tree, B+ Tree: definitions, algorithms and analysis.
Unit 4:

Sorting and Hashing: Objective and properties of different sorting algorithms:Selection Sort, Bubble Sort, Insertion Sort, Selection Sort Quick Sort, Merge Sort, Heap Sort; Performance and Comparison among all the methods.

Graph: Basic Terminologies and Representations, Graph search and traversal algorithms andcomplexity analysis.Minimum Spanning Tree: Kruskal's Algorithm, Prim's Algorithm.

Suggested books:

"Fundamentals of Data Structures", Illustrated Edition by Ellis Horowitz, Sartaj Sahni, Computer Science Press.

Suggested reference books:

Algorithms, Data Structures, and Problem Solving with C++", Illustrated Edition by Mark Allen Weiss, Addison-Wesley Publishing Company
"How to Solve it by Computer", 2nd Impression by R.G. Dromey, Pearson Education.

Course outcomes

1. For a given algorithm student will able to analyze the algorithms to determine the time and computation complexity and justify the correctness.
2. For a given Search problem (Linear Search and Binary Search) student will able to implement it.
3. For a given problem of Stacks, Queues and linked list student will able to implement it and analyze the same to determine the time and computation complexity.
4. Student will able to write an algorithm Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort and compare their performance in term of Space and Time complexity.
5. Student will able to implement Graph search and traversal algorithms and determine the time and computation complexity.

DIGITAL ELECTRONICS

Coursecode	PCC-CSE-205G				
Category	Professional Core Course				
Coursetitle	Digital Electronics				
Scheme and Credits	L	T	P	Credits	Semester 3
	3	0	0	3	
Class work	25 Marks				
Exam	75 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 6 parts of 2.5 marks each from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

UNIT1:

FUNDAMENTALSOFDIGITAL SYSTEMSAND LOGICFAMILIES

Digitalsignals,digital circuits,AND, OR,NOT, NAND, NORand Exclusive-ORoperations, Booleanalgebra,examples ofICgates,numbersystems-binary, signed binary, octal hexadecimal number,binary arithmetic,one'sandtwo'scomplementsarithmetic,codes,error detectingand correctingcodes.

UNIT2:

COMBINATIONAL DIGITALCIRCUITS

Standardrepresentationfor logicfunctions,K-maprepresentation,and simplificationoflogic functionsusingK-map,minimizationoflogicalfunctions.Don'tcareconditions,Multiplexer, De-Multiplexer/Decoders,Adders,Subtractors,BCDarithmetic,carry lookaheadadder,serial adder,ALU,elementaryALUdesign,popularMSI chips,digitalcomparator,parity checker/generator,codeconverters,priorityencoders,decoders/drivers fordisplay devices,Q-M method of function realization.

UNIT3:

SEQUENTIAL CIRCUITSAND SYSTEMS

A1-bitmemory,thecircuitpropertiesofBistablelatch,theclockedSRflipflop, J-K-TandD typesflipflops,applicationsof flipflops,shift registers,applicationsof shiftregisters, serialto parallelconverter, paralleltoserialconverter,ringcounter, sequencegenerator,ripple

(Asynchronous)counters, synchronouscounters,counters design using flipflops, specialcounter IC's,asynchronous sequential counters, applications of counters.

UNIT4:

A/D ANDD/A CONVERTERS

Digitaltoanalog converters: weightedresistor/converter,R-2RLadderD/Aconverter, specificationsforD/Aconverters,examplesofD/AconverterlCs,sampleandholdcircuit, Analogto digital converters: quantization and encoding, parallel comparator A/Dconverter, successiveapproximationA/Dconverter,countingA/Dconverter,dualslopeA/Dconverter,

SEMICONDUCTOR MEMORIES AND PROGRAMMABLE LOGIC DEVICES

Memoryorganization and operation, expandingmemorysize, classificationand characteristics of memories, sequential memory, read only memory (ROM), read and write memory(RAM), contentaddressablememory (CAM),ROMasaPLD,Programmablelogicarray,Programmablearray logic,complex Programmable logic devices (CPLDS), Field Programmable GateArray(FPGA).

CourseOutcomes:

At the end ofthis course,students will demonstrate the abilityto

1. Understand workingof logic families andlogicgates.
2. Designand implement Combinational and Sequential logic circuits.
3. Understand the process of Analog to Digital conversion and Digital to Analog conversion.
4. Use PLDs to implement the given logical problem.

REFERENCES:

1. R. P. Jain, "Modern DigitalElectronics",McGrawHillEducation, 2009.
2. M. M.Mano, "Digital logic and Computerdesign",Pearson Education India,2016.
3. A. Kumar,"Fundamentals ofDigitalCircuits",Prentice HallIndia, 2016.
4. Nasib Singh Gill and J B Dixit, "Digital Design and Computer Organization", University Science Press, New Delhi

Python Programming

Coursecode	PCC-CSE-207G				
Category	Professional Core Course				
Coursetitle	Python Programming				
Scheme and Credits	L	T	P	Credits	Semester 3
	3	0	0	3	
Class work	25 Marks				
Exam	75 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 6 parts of 2.5 marks each from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

Objectives of the course:

- To impart the basic concepts of Python programming.
- To understand syntax of Python language
- To create dynamic applications in Python language.
- To implement object oriented concepts using Python language

Detailed contents:

Unit 1:

Introduction: Installing Python; basic syntax, interactive shell, editing, saving, and running a script; data types; variables, assignments; numerical types; arithmetic operators and expressions; Loops and selection statements, Control statementsString manipulations: subscript operator, indexing, slicing a string; text files: reading/writing text and numbers from/to a file; creating and reading a formatted file

Unit 2: Lists, dictionary and Design with functions: Basic list operators, replacing, inserting, removing an element; searching and sorting lists; dictionary literals, adding, and removing keys,

accessing and replacing values; traversing dictionaries. Hiding redundancy, complexity; arguments and return values; Program structure and design. Recursive functions.

Unit 3: **Simple graphics and image processing**: Simple graphics, Turtle operations, Manipulating turtle screen, Drawing two dimensional shapes, examining an object attributes, Taking a random walk, Color and RGB scheme, Image processing: Image manipulation operations, properties of images, image module, copying, blurring and reducing image. Graphical User Interfaces: Terminal based and GUI based programs,Simple GUI-Based Programs, Windows and Window Components, Input and Output with Entry Fields, Defining and Using Instance Variables, Other Useful GUI Resources.

Unit 4: Object Oriented concepts: Classes and OOP: classes, objects, attributes and methods; defining classes; design with classes, data modelling; persistent storage of objects, Inheritance, polymorphism, operator overloading; abstract classes; exception handling, try block. Multithreading: Threads and Processes,Sleeping Threads,Producer, Consumer, and Synchronization,The Readers and Writers Problem, SharedCell Class,Thread-Safe Class

Course outcomes

- For a given conceptual problem student will able to analyze the problem and write a program in python with basic concepts.
- For a given problem of Strings and texts, student will able to analyze the problem and write a program in python with basic concepts involving strings and texts.
- The knowledge of list and dictionary will enable student to implement in python language and analyze the same.
- Student will able to write a program using functions to implement the basic concepts of object oriented programming language

Suggested books:

“Fundamentals of Python: First Programs” Kenneth Lambert, Course Technology, Cengage Learning, 2012

Suggested reference books:

“Introduction to Computer Science Using Python: A Computational Problem-Solving Focus”,By Charles Dierbach, John Wiley & Sons, December 2012,

Mathematics-III (Multivariable Calculus and Differential Equations)

Coursecode	BSC-MATH-203G				
Category	Basic Science Course				
Coursetitle	Mathematics-III (Multivariable Calculus and Differential Equations)				
Scheme and Credits	L	T	P	Credits	Semester 3
	2	0		2	
Class work	25 Marks				
Exam	75 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 6 parts of 2.5 marks each from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

Unit-I

Multivariable Differential Calculus: Limit, Continuity and Partial derivatives, Homogeneous functions, Euler's Theorem, Total derivative, Maxima, Minima and Saddle points, Lagrange's method of undetermined multipliers

Unit-II

Multivariable Integral Calculus: Double integral, Change of order of integration, Change of variables, Applications of double integral to find area enclosed by plane curves, Triple integral

Unit-III

Ordinary Differential Equations of first order: Linear and Bernoulli's equations, Exact differential equations, Equations reducible to exact differential equations, Applications of differential equations of first order and first degree to simple electric circuits, Newton's law of cooling, Heat flow and Orthogonal trajectories

Unit-IV

Ordinary Differential equations of second and higher order: Linear differential equations of second and higher order, Complete solution, Complementary function and Particular integral, Method of variation of parameters to find particular integral, Cauchy's and Legendre's linear equations, Simultaneous linear differential equations with constant coefficients, Applications of linear differential equations to oscillatory electric circuits

Reference Books:

1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, Pearson Education.
2. Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons.
3. B. V. Ramana, Higher Engineering Mathematics, Tata McGraw-Hill Publishing Company Limited.
4. N. P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications.
5. B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers.
6. W. E. Boyce and R. C. DiPrima, Elementary Differential Equations and Boundary Value Problems,Wiley India.
7. S. L. Ross, Differential Equations, Wiley India.
8. E. A. Coddington, An Introduction to Ordinary Differential Equations, Prentice Hall India.
9. E. L. Ince, Ordinary Differential Equations, Dover Publications

Course Outcomes

The students will learn:

1. To deal with functions of several variables and evaluate partial derivative.
2. The mathematical tools needed in evaluating multiple integrals and their usage.
3. The effective mathematical tools for the solutions of ordinary differential equations that model physical processes.

ECONOMICSFORENGINEERS

Course code	HSMC- 01G				
Category	Humanities and Social Sciences includingManagementcourses				
Course title	Economics For Engineers				
Scheme and Credits	L	T	P	Credits	Semester 3
	3	0	0	3	
Branches (B. Tech.)	Common For All Branches				
Class work	25 Marks				
Exam	75 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

CourseObjectives:

1.Acquaintthestudentstobasicconceptsofeconomicsandtheiroperationalsignificance.

2.Tostimulatethestudentstothinksystematicallyandobjectivelyabout contemporary economicproblems.

UNIT-1

Definition of Economics- Various definitions, types of economics- Micro and MacroEconomics, nature of economic problem, Production Possibility Curve, Economic laws and their nature, Relationship between Science, Engineering, Technology and Economic Development.

Demand- Meaning of Demand, Law of Demand, Elasticity of Demand- meaning,factors effecting it, its practical application and importance,

UNIT 2

Production- Meaning of Production and factors of production, Law of variable proportions, and Returns to scale, Internal external economies and diseconomies of scale. Various concepts of cost of production- Fixed cost, Variable cost, Money cost, Realcost, Accounting cost, Marginal cost, Opportunity cost. Shape of Average cost, Marginal cost, Total cost etc. in short run and long run.

UNIT-3

Market- Meaning of Market, Types of Market- Perfect Competition, Monopoly,

Monopolistic Competition and Oligopoly (main features).

Supply- Supply and law of supply, Role of demand & supply in price determination andeffect of changes in demand and supply on prices.

UNIT-4

Indian Economy- Nature and characteristics of Indian economy as under developed,developing and mixed economy (brief and elementary introduction), Privatization - meaning, merits and demerits.

Globalization of Indian economy - merits and demerits.

Banking- Concept of a Bank, Commercial Bank- functions, Central Bank- functions,Difference between Commercial & Central Bank.

COURSEOUTCOMES:

1.Thestudentswillabletounderstandthebasicconceptofeconomics.

2.Thestudentwillabletounderstandtheconceptofproductionandcost.

3.Thestudentwillabletounderstandtheconceptofmarket.

4.Thestudentwillabletounderstandtheconceptofprivatization,globalizationandbanks.

REFERENCES:

1.JainT.R.,EconomicsforEngineers,VKPublication.

2.ChopraP.N.,PrincipleofEconomics,KalyaniPublishers.

3.DewettK.K.,Moderneconomictheory,S.Chand.

4.H.L.Ahuja.,Moderneconomictheory,S.Chand.

5.DuttRudar&SundhramK.P.M.,IndianEconomy.

6.MishraS.K.,ModernMicroEconomics,PragatiPublications.

7.SinghJaswinder,ManagerialEconomics,dreamtechpress.

8.ATextBookofEconomicTheoryStonierandHague(Longman'sLandon).

9.MicroEconomicTheory–M.L.Jhingan(S.Chand).

10.MicroEconomicTheory-H.L.Ahuja(S.Chand).

11.ModernMicroEconomics:S.K.Mishra(PragatiPublications).

12.EconomicTheory-A.B.N.Kulkarni&A.B.Kalkundrikar(R.Chand& Co).

Database Management System Lab

Course code	LC-CSE-209G				
Category	Professional Core Course				
Course title	Database Management System Lab				
Scheme and Credits	L	T	P	Credits	Semester 3
	0	0	3	1.5	
Branches (B. Tech.)	Computer Science and Engineering				
Class work	25 Marks				
Exam	25 Marks				
Total	50 Marks				
Duration of Exam	03 Hours				

Course Objectives:

- Keep abreast of current developments to continue their own professional development
- To engage themselves in lifelong learning of Database management systems theories and technologies this enables them to purse higher studies.
- To interact professionally with colleagues or clients located abroad and the ability to overcome challenges that arises from geographic distance, cultural differences, and multiple languages in the context of computing.
- Develop team spirit, effective work habits, and professional attitude in written and oral forms, towards the development of database applications.

Contents:

i. Creation of a database and writing SQL queries to retrieve information from the database.
ii. Performing Insertion, Deletion, Modifying, Altering, Updating and Viewing records based on conditions.
iii. Creation of Views, Synonyms, Sequence, Indexes, Save point.
iv. Creating an Employee database to set various constraints.
v. Creating relationship between the databases.
vi. Study of PL/SQL block.
vii. Write a PL/SQL block to satisfy some conditions by accepting input from the user.
viii. Write a PL/SQL block that handles all types of exceptions.
ix. Creation of Procedures.

x. Creation of database triggers and functions

xi. Mini project (Application Development using Oracle/ MySQL)

a) Inventory Control System

b) Material Requirement Processing.

c) Hospital Management System.

d) Railway Reservation System.

e) Personal Information System.

f) Web Based User Identification System.

g) Time Table Management System.

h) Hotel Management

Digital Electronics Lab

Course code	LC-CSE-211G				
Category	Professional Core Course				
Course title	Digital Electronics Lab				
Scheme and Credits	L	T	P	Credits	Semester-3
	0	0	3	1.5	
Branches (B. Tech.)	Computer Science and Engineering				
Class work	25 Marks				
Exam	25 Marks				
Total	50 Marks				
Duration of Exam	03 Hours				

Implementation all experiments with help of Bread- Board.

1. Study of Logic Gates: Truth-table verification of OR, AND, NOT, XOR, NAND and NOR gates; Realization of OR, AND, NOT and XOR functions using universal gates.
2. Half Adder / Full Adder: Realization using basic and XOR gates.
3. Half Subtractor / Full Subtractor: Realization using NAND gates.
4. 4-Bit Binary-to-Gray & Gray-to-Binary Code Converter: Realization using XOR gates.
5. 4-Bit and 8-Bit Comparator: Implementation using IC7485 magnitude comparator chips.
6. Multiplexer: Truth-table verification and realization of Half adder and Full adder.
7. Demultiplexer: Truth-table verification and realization of Half subtractor and Full subtractor.
8. Flip Flops: Truth-table verification of JK Master Slave FF, T-type and D-type FF.
9. Asynchronous Counter: Realization of 4-bit up counter and Mod-N counter.
10. Synchronous Counter: Realization of 4-bit up/down counter and Mod-N counter.
11. Shift Register: Study of shift right, SIPO, SISO, PIPO, PISO & Shift left operations.
12. DAC Operation: Study of 8-bit DAC , obtain staircase waveform.
13. ADC Operations: Study of 8-bit ADC

Data Structures and Algorithms Lab Using C

Course code	LC-CSE-213G				
Category	Professional Core Course				
Course title	Data Structures and Algorithms Lab Using C				
Scheme and Credits	L	T	P	Credits	Semester-3
	0	0	3	1.5	
Branches (B. Tech.)	Computer Science and Engineering				
Class work	25 Marks				
Exam	25 Marks				
Total	50 Marks				
Duration of Exam	03 Hours				

Data Structures Lab List of practical exercises, to be implemented in C Language.

1. Write a menu driven program that implements following operations (using separate functions) on a linear array:
    - Insert a new element at end as well as at a given position
    - Delete an element from a given whose value is given or whose position is given
    - To find the location of a given element
    - To display the elements of the linear array
2. Write a menu driven program that maintains a linear linked list whose elements are stored in on ascending order and implements the following operations (using separate functions):
    - Insert a new element
    - Delete an existing element
    - Search an element
    - Display all the elements
3. Write a program to demonstrate the use of stack (implemented using linear array) in converting arithmetic expression from infix notation to postfix notation.
4. Program to demonstrate the use of stack (implemented using linear linked lists) in evaluating arithmetic expression in postfix notation.
5. Program to demonstration the implementation of various operations on a linear queue represented using a linear array.
6. Program to demonstration the implementation of various operations on a circular queue represented using a linear array.
7. Program to demonstration the implementation of various operations on a queue represented using a linear linked list (linked queue).
8. Program to illustrate the implementation of different operations on a binary search tree.

9. Program to illustrate the traversal of graph using breadth-first search
10. Program to illustrate the traversal of graph using depth-first search.
11. Program to sort an array of integers in ascending order using bubble sort.
12. Program to sort an array of integers in ascending order using selection sort.
13. Program to sort an array of integers in ascending order using insertion sort.
14. Program to sort an array of integers in ascending order using radix sort.
15. Program to sort an array of integers in ascending order using merge sort.
16. Program to sort an array of integers in ascending order using quick sort.
17. Program to sort an array of integers in ascending order using heap sort.
18. Program to sort an array of integers in ascending order using shell sort.
19. Program to demonstrate the use of linear search to search a given element in an array.
20. Program to demonstrate the use of binary search to search a given element in a sorted array in ascending order.

Python Programming Lab

Course code	LC-CSE-215G				
Category	Professional Core Course				
Course title	Python Programming Lab				
Scheme and Credits	L	T	P	Credits	Semester-3
	0	0	3	1.5	
Branches (B. Tech.)	Computer Science and Engineering				
Class work	25 Marks				
Exam	25 Marks				
Total	50 Marks				
Duration of Exam	03 Hours				

Objectives

- To write, test, and debug simple Python programs.
- To implement Python programs with conditionals and loops.
- Use functions for structuring Python programs.
- Represent compound data using Python lists, tuples, and dictionaries.
- Read and write data from/to files in Python.

List of Programs

1. Compute the GCD of two numbers.
2. Find the square root of a number (Newton‘s method)
3. Exponentiation (power of a number)
4. Find the maximum of a list of numbers
5. Linear search and Binary search
6. Selection sort, Insertion sort
7. Merge sort
8. First n prime numbers
9. Multiply matrices
10. Programs that take command line arguments (word count)
11. Find the most frequent words in a text read from a file
12. Simulate elliptical orbits in Pygame
13. Simulate bouncing ball using Pygame

Outcome:

- Write, test, and debug simple Python programs.
- Implement Python programs with conditionals and loops

- Develop Python programs step-wise by defining functions and calling them.
- Use Python lists, tuples, dictionaries for representing compound data.
- Read and write data from/to files in Python.

Discrete Mathematics

Coursecode	PCC-CSE-202G				
Category	Professional Core Course				
Coursetitle	Discrete Mathematics				
Scheme and Credits	L	T	P	Credits	Semester - 4
	3	1		4	
Class work	25 Marks				
Exam	75 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 6 parts of 2.5 marks each from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

Unit-I

Sets, Relation, Function and Propositional Logic: Operations and Laws of Sets, Cartesian Products, Representation of relations, Binary Relation, Equivalence Relation, Partial Ordering Relation, POSET, Hasse Diagram, Lattices and its types, Function, Bijective functions, Inverse and Composite Function, Finite and infinite Sets, Countable and Uncountable Sets, Cantor's diagonal argument and The Power Set theorem, **S**chroeder-Bernstein theorem, Propositions, Logical operations, Conditional Statements, Tautologies, Contradictions, Logical Equivalence, The use of Quantifiers

Unit-II

Basic Counting Techniques and Recurrence Relation: Pigeon-hole principle, Permutation and Combination**,** the Division algorithm: Prime Numbers, The GCD: Euclidean Algorithm, The Fundamental Theorem of Arithmetic., Linear recurrence relation with constant coefficients, Homogenous Solutions, Particular Solutions, Total Solutions, Solving recurrence relation using generating functions

Unit-III

Algebraic Structures: Definitions and examples of Algebraic Structures with one Binary Operation: Semi Groups, Monoids, Groups; Congruence Relation and Quotient Structures, Permutation Groups, Cyclic groups, Normal Subgroups, Definitions and examples of Algebraic Structures with two Binary Operation: Rings, Integral Domain, Fields; Boolean Algebra and Boolean Ring, Identities of Boolean Algebra, Duality, Representation of Boolean Function, Disjunctive and Conjunctive Normal Form

Unit-IV

Graphs and Trees: Graphs and their properties, Degree, Connectivity, Path, Cycle, Sub Graph, Isomorphism, Multigraph and Weighted graph, Shortest path in Weighted graphs, Eulerian paths and circuits, Hamiltonian path and circuits, Planar Graphs, Euler's formulae, Graph Colouring, Trees, Binary trees and its traversals, Trees Sorting, Spanning tree, Minimal Spanning tree

Reference Books:

1. Kenneth H. Rosen, Discrete Mathematics and its Applications, Tata McGraw – Hill
2. Satinder Bal Gupta: A Text Book of Discrete Mathematics and Structures, University Science Press, Delhi.
3. C. L. Liu and D. P. Mohapatra, Elements of Discrete Mathematics A Computer Oriented Approach, Tata McGraw – Hill.
4. J.P. Tremblay and R. Manohar, Discrete mathematical structures with applications to computer science, TMG Edition, TataMcgraw-Hill
5. Discrete Mathematics, Babu Ram, Pearson Publication
6. Discrete Mathematics, SemyourLipschutz and Marc Lipson, Schaum's outline

Course Outcomes

The students will learn

1. To solve mathematical problems based on concepts of set theory, relations, functions and lattices.
2. To express logic sentence in terms of quantifiers and logical connectives.
3. To apply basic counting techniques to solve permutation and combination problems.
4. To solve recurrence relations.
5. To classify algebraic structure of any given mathematical problem.
6. To evaluate Boolean functions and simplify expressions using the properties of Boolean algebra
7. To develop the given problem as graph networks and solve with techniques of graph theory.

Computer Organization & Architecture

Course code	PCC-CSE-204G				
Category	Professional Core Course				
Course title	Computer Organization & Architecture				
Scheme and Credits	L	T	P	Credits	Semester-IV
	3	0	0	3	
Branches (B. Tech.)	Computer Science and Engineering				
Class work	25 Marks				
Exam	75 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 6 parts of 2.5 marks each from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

Objectives of the course:

To expose the students to the following:

- How Computer Systems work & the basic principles
- Instruction Level Architecture and Instruction Execution
- The current state of art in memory system design
- How I/O devices are accessed and its principles.
- To provide the knowledge on Instruction Level Parallelism
- To impart the knowledge on micro programming
- Concepts of advanced pipelining techniques.

Unit 1

Data representation: Data Types, Complements, Fixed-Point Representation, Conversion of Fractions, Floating-Point Representation, Gray codes, Decimal codes, Alphanumeric codes, Error Detection Codes.

Register Transfer and Microoperations : Register Transfer Language, Register Transfer, Bus and Memory Transfers, Arithmetic Microoperations, Logic Microoperations, Shift Microoperations, Arithmetic Logic Shift Unit.

Unit 2

Basic Computer Organization and Design : Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory-Reference Instruction, Input-Output Instruction, Complete Computer Description, Design of Basic Computer, Design of Accumulator Logic.

Central Processing Unit : General Register Organization, Stack organization, Instruction Format, Addressing Modes, Data Transfer and Manipulation, Program Control, RISC, CISC.

Unit 3

Pipelining: Parallel Processing, Amdahl's law, Pipelining, Arithmetic Pipeline, Instruction Pipeline, Pipeline Hazards, RISC Pipeline.

Parallel Processors: Introduction to Parallel Processors, Concurrent access to memory andCache Coherency.

Vector Processing : Vector Operations, Memory Interleaving, Supercomputers, Array Processors: Attached Array Processor, SIMD Array Processor.

Unit 4

Input-output Organization : I/O deviceinterface, I/O transfers–program controlled, interrupt driven and DMA, Privileged and Non-Privileged Instructions, Software Interrupts.

Memory organization: Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Associative Mapping, Direct Mapping, Set-Associative Mapping, Writing into Cache, Cache Initialization, Virtual Memory.

Suggested books:

1) "Computer System Architecture", 3rd Edition by M.Morris Mano, Pearson.
2) "Computer Organization and Design: The Hardware/Software Interface", 5th Edition by David A. Patterson and John L. Hennessy, Elsevier.
3) "Computer Organization and Embedded Systems", 6th Edition by CarlHamacher, McGraw Hill Higher Education.

Suggested reference books:

1) "Computer Architecture and Organization", 3rd Edition by John P. Hayes, WCB/McGraw-Hill
2) "Computer Organization and Architecture: Designing for Performance", 10th Edition by William Stallings, Pearson Education.
3) "Computer System Design and Architecture", 2nd Edition by Vincent P. Heuring and Harry F. Jordan, Pearson Education.

Course outcomes :

1) Draw the functional block diagram of a single bus architecture of a computer and describe the function of the instruction execution cycle, RTL interpretation of instructions, addressing modes, instruction set.
2) Write assembly language program for specified microprocessor for computing

   16 bit multiplication, division and I/O device interface (ADC, Control circuit, serial port communication).
3) Write a flowchart for Concurrent access to memory and cache coherency in Parallel Processors and describe the process.
4) Given a CPU organization and instruction, design a memory module and analyze its operation by interfacing with the CPU.
5) Given a CPU organization, assess its performance, and apply design techniques to enhance performance using pipelining, parallelism and RISC methodology.

Operating System

Course code	PCC-CSE-206G				
Category	Professional Core Course				
Course title	Principles of Operating System				
Scheme and Credits	L	T	P	Credits	Semester-4
	3	0	0	3	
Branches (B. Tech.)	Computer Science and Engineering				
Class work	25 Marks				
Exam	75 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 6 parts of 2.5 marks each from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

UNIT 1:

Introduction: Concept of Operating Systems, Generations of Operating systems, Types of Operating Systems, OS Services.

Processes: Definition, Process Relationship, Different states of a Process, Process State transitions, Process Control Block (PCB), Context switching. Thread: Definition, Various states, Benefits of threads, Types of threads, Multithreading.

Process Scheduling: Foundation and Scheduling objectives, Types of Schedulers, Scheduling criteria: CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time; Scheduling algorithms: Pre-emptive and Non-pre-emptive, FCFS, SJF, SRTF, RR Scheduling.

UNIT 2:

Inter-process Communication: Critical Section, Race Conditions, Mutual Exclusion, The Producer\ Consumer Problem, Semaphores, Event Counters, Monitors, Message Passing, Classical IPC Problems: Reader's & Writer Problem, Dinning Philosopher Problem etc.

Deadlocks: Definition, Necessary and sufficient conditions for Deadlock, Deadlock Prevention, and Deadlock Avoidance: Banker's algorithm, Deadlock detection and Recovery.

UNIT 3:

Memory Management: Basic concept, Logical and Physical address map, Memory allocation: Contiguous Memory allocation – Fixed and variable partition–Internal and External fragmentation and Compaction; Paging: Principle of operation – Page allocation – Hardware support for paging, Protection and sharing, Disadvantages of paging.

Virtual Memory: Basics of Virtual Memory – Hardware and control structures – Locality of reference, Page fault, Working Set, Dirty page/Dirty bit – Demand paging, Page Replacement algorithms: Optimal, First in First Out (FIFO), Optimal Page Replacement and Least Recently used (LRU).

UNIT 4:

File Management: Concept of File, Access methods, File types, File operation, Directory structure, File System structure, Allocation methods (contiguous, linked, indexed), efficiency and performance.

Disk Management: Disk structure, Disk scheduling - FCFS, SSTF, SCAN, C-SCAN, Disk reliability, Disk formatting, Boot-block, Bad blocks. Case study on UNIX and WINDOWS Operating System.

Comparative Study of Latest Operating System: Evolution, Architecture and Characteristics of various Operating systems like MS-Windows, Ubuntu, Mac OS, Fedora, Solaris, Free BSD, Chrome OS, CentOS, Debian, Deepin

Suggested books:

- Operating System Concepts Essentials, 9th Edition by AviSilberschatz, Peter Galvin, Greg Gagne, Wiley Asia Student Edition.
- Operating Systems: Internals and Design Principles, 5th Edition, William Stallings, Prentice Hall of India.

Suggested reference books:

- Operating System: A Design-oriented Approach, 1st Edition by Charles Crowley, Irwin Publishing
- Operating Systems: A Modern Perspective, 2nd Edition by Gary J. Nutt, Addison-Wesley
- Design of the Unix Operating Systems, 8th Edition by Maurice Bach, Prentice-Hall of India
- Understanding the Linux Kernel, 3rd Edition, Daniel P. Bovet, Marco Cesati, O'Reilly and Associates

Course Outcomes:

CO1: Understand the structure and architectural components of OS to analyze and design the applications to run in parallel. Moreover, students would be able to develop scheduling algorithms to optimize various parameters like CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time for research purpose.

CO2: Understand the design issues associated with Operating system (e.g. Mutual exclusion, Deadlock detection etc.) to gain insight towards developing algorithms/techniques for efficient deadlock handling.

CO3: For a given specification of memory organization, develop the techniques for optimally allocating memory to processes by increasing memory utilization and for improving the access time.

CO4: Design and implement file management system for a given specification. Identify, use and evaluate the disk management policies with respect to various performance evaluation parameters.

Object Oriented Programming

Course code	PCC-CSE-208G				
Category	Professional Core Course				
Course title	Object Oriented Programming				
Scheme and Credits	L	T	P	Credits	Semester-4
	3	0	0	3	
Branches (B. Tech.)	Computer Science and Engineering				
Class work	25 Marks				
Exam	75 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 6 parts of 2.5 marks each from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

Course Objectives

1. To understand how the C++ is superset of C by incorporating the Object oriented features in C language.
2. To apply the syntax and semantics of C++ Programming language.
3. To learn the designing of C++ classes.
4. To learn how to efficiently use the memory using Pointers and Dynamic Memory Management
5. To learn how to implement different types of constructors and the use of destructor.
6. To learn how to implement the concept of data abstraction and encapsulation.
7. To learn how to perform different types of overloading i.e. operators and functions.
8. To learn how inheritance helps to reuse the code.
9. To learn how we can implement dynamic binding with polymorphism.
10. To learn the use of exception handling in C++ programs.
11. To learn how to design and use of generic classes with templates.

Unit - I

Object-Oriented Programming Concepts: Introduction, comparison between procedural programming paradigm and object-oriented programming paradigm, basic concepts of object-oriented programming — concepts of an object and a class, interface and implementation of a

class, operations on objects, relationship among objects, abstraction, encapsulation, data hiding, inheritance, overloading, polymorphism, messaging.

Classes and Objects: Specifying a class, creating class objects, accessing class members, access specifiers, static members, use of const keyword, friends of a class, empty classes, nested classes, local classes, abstract classes, container classes, bit fields and classes.

Unit - II

Inheritance: Introduction, defining derived classes, forms of inheritance, ambiguity in multiple and multipath inheritance, virtual base class, object slicing, overriding member functions, object composition and delegation, order of execution of constructors and destructors.

Pointers and Dynamic Memory Management: Declaring and initializing pointers, accessing data through pointers, pointer arithmetic, memory allocation (static and dynamic), dynamic memory management using new and delete operators, pointer to an object, this pointer, pointer related problems - dangling/wild pointers, null pointer assignment, memory leak and allocation failures.

Unit - III

Constructors and Destructors: Need for constructors and destructors, copy constructor, dynamic constructors, explicit constructors, destructors, constructors and destructors with static members, initializer lists.

Operator Overloading and Type Conversion: Overloading operators, rules for overloading operators, overloading of various operators, type conversion - basic type to class type, class type to basic type, class type to another class type.

Virtual functions & Polymorphism: Concept of binding - early binding and late binding, virtual functions, pure virtual functions, abstract clasess, virtual destructors.

Unit - IV

Exception Handling: Review of traditional error handling, basics of exception handling, exception handling mechanism, throwing mechanism, catching mechanism, rethrowing an exception, specifying exceptions.

Templates and Generic Programming: Template concepts, Function templates, class templates, illustrative examples.

TEXT BOOKS, AND/OR REFERENCE MATERIAL:

1. BjraneStroustrup, “C++ Programming language”,3rd edition, Pearson education Asia(1997)

2. LaforeR.”Object oriented Programming in C++”,4th Ed. Techmedia,New Delhi(2002).

3. Yashwant Kenetkar,”Let us C++”,1stEd.,Oxford University Press(2006)

4. B.A. Forouzan and R.F. Gilberg,CompilerScience,”A structured approach using C++” Cengage Learning, New Delhi.

Course Outcomes

After the completion of the course, the students will

- Understand the concept of Object Oriented Programming through C++.
- Identify importance of object oriented programming and difference between Procedural programming and object oriented programming features.
- be able to make use of objects and classes for developing programs.
- be able to use various object oriented concepts to solve different problems.
- be able to develop the programs /Projects using some advanced features of C++ Programming.

ORGANIZATIONAL BEHAVIOUR

Course code	HSMC-02G				
Category	Humanities and Social Sciences includingManagementcourses				
Course title	ORGANIZATIONAL BEHAVIOUR				
Scheme and Credits	L	T	P	Credits	Semester 4
	3	0	0	3	
Branches (B. Tech.)	Common to all branches				
Class work	25				
Exam	75				
Total	100 Marks				
Duration of Exam	03 Hours				

The objective of this course is to expose the students to basic concepts of management and provide insights necessary to understand behavioral processes at individual, team and organizational level.

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 6 parts of 2.5 marks each from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

SYLLABUS

UNIT - 1

Introduction of Management- Meaning, definitions, nature of management; Managerial levels, skills and roles in an organization; Functions of Management: Planning, Organizing, staffing, Directing & Controlling, Interrelationship of managerial functions, scope of management & Importance of management. Difference between management and administration.

UNIT - 2

Introduction of organization:- Meaning and process of Organization, Management v/s Organization; **Fundamentals of Organizational Behavior:** Concepts, evolution, importance andrelationship with other Fields; Contemporary challenges and opportunities of OB. **Individual Processes and Behavior**-**Personality**- Concept, determinants andapplications; **Perception-** Concept, process and applications, **Learning**- Concept (Brief Introduction) ; **Motivation-** Concept, techniques and importance

UNIT - 3

Interpersonal Processes- **Teams and Groups**- Definition of Group, Stages of groupdevelopment, Types of groups, meaning of team, merits and demerits of team; difference between team and group, **Conflict-** Concept, sources, types, management of conflict; **Leadership:** Concept, function, styles & qualities of leadership. **Communication –** Meaning, process, channels of communication, importance and barriersof communication.

UNIT 4

Organizational Processes: Organizational structure - Meaning and types oforganizational structure and their effect on human behavior; **Organizational culture -** Elements, types and factors affecting organizational culture. **Organizational change:** Concept, types & factors affecting organizational change, Resistance to Change.

Course Outcomes: By the end of this course the student will be able to:

1. Students will be able to apply the managerial concepts in practical life.
2. The students will be able to understand the concept of organizational behavior at individual level and interpersonal level.
3. Students will be able to understand the behavioral dynamics in organizations.
4. Students will be able to understand the organizational culture and change

Suggested Books:

1. Robbins, S.P. and Decenzo, D.A. Fundamentals of Management, Pearson Education Asia, New Delhi.

2. Stoner, J et. al, Management, New Delhi, PHI, New Delhi.
3. Satya Raju, Management – Text & Cases, PHI, New Delhi.
4. Kavita Singh, OrganisationalBehaviour: Text and cases. New Delhi: Pearson Education.
5. Pareek, Udai, Understanding OrganisationalBehaviour, Oxford University Press, New Delhi.
6. Robbins, S.P. & Judge, T.A., OrganisationalBehaviour, Prentice Hall of India, New Delhi.
7. GhumanKarminder, Aswathappa K., Management concept practice and cases, Mc Graw Hill education.
8. Chhabra T. N., Fundamental of Management, Sun India Publications-New Delhi

Web Technologies

Course code	LC-CSE-210G				
Category	Professional Core Course				
Course title	Web Technologies				
Scheme and Credits	L	T	P	Credits	Semester 4
	3	0	0	3	
Branches (B. Tech.)	Computer Science and Engineering				
Class work	25 Marks				
Exam	75 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 6 parts of 2.5 marks each from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

Objectives of the course:

- To impart the basic concepts of Web Technologies
- To understand various client side technologies
- To create web pages
- To create dynamic applications on web through server side technologies

Detailed contents:

Unit 1:

Introduction: Concept of Internet- History of Internet, Protocols of Internet, World Wide Web, URL, Web Server, Web Browser.

HTML and CSS: History of HTML, Structure of HTML Document: Text Basics, Document: Images and Multimedia, Links and webs, Document Layout, Cascading Style Sheet: Need for CSS, introduction to CSS, basic syntax and structure using CSS, inline, internal and external CSS

Unit 2: XML: Introduction of XML- Some current applications of XML, Features of XML, Anatomy of XML document, structuring data, XML namespace, Document Type Definitions and Schemas, Document object model, DOM methods, XSL, SAX, SOAP

Unit 3: **PHP:** PHP Introduction, Structure of PHP, PHP Functions, String processing and regular expression, viewing client/server environment variable, form processing, Connecting to a database, cookies, operator precedence

Unit 4:AJAX: AJAX with PHP, PHP Code and the Complete AJAX Example, AJAX Database, Working of AJAX livesearch with PHP, Ajax PHP Database Form, AJAX PHP MySQL Database, connect, create DB, create table, insert data, select query

Suggested books:

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

Suggested reference books:

1. Paul Deitel , Harvey Deitel, Abbey Deitel ,"Internet and world wide web – How to Program", Prentice Hall

Course outcomes

- For a given conceptual problem student will able to understand the basic process of Web Technologies and their application domains
- For a given problem the student will able to analyze the problem and select which technique is most suitable for developing a website.
- The knowledge of various techniques will enable student to implement in these dynamic techniques using various tools to make interactive web pages.
- Student will able to write a program using these technologies to implement the basic concepts of web.

Operating System Lab

Course code	LC-CSE-212G				
Category	Professional Core Course				
Course title	Operating System Lab				
Scheme and Credits	L	T	P	Credits	Semester 4
	0	0	3	1.5	
Branches (B. Tech.)	Computer Science and Engineering				
Class work	25 Marks				
Exam	25 Marks				
Total	50 Marks				
Duration of Exam	03 Hours				

Contents:

1 Introduction to UNIX File System.

2. File and Directory Related Commands in UNIX.

3. Essential UNIX Commands for working in UNIX environment.

4. I/O Redirection and Piping

5. Introduction to VI Editors.

6. Introduction of Processes in UNIX

7. Communication in UNIX and AWK.

8. Introduction of the concept of Shell Scripting.

9. Decision and Iterative Statements in Shell Scripting.

10. Writing the Shall Scripts for unknown problems.

Suggested Books:

1. UNIX Shell Programming by YashavantKanetkar.
2. UNIX Concepts and Applications by Sumitabha Das

Course Outcomes.

Co1: Understand the structure and architectural components of UNIX Operating System to analyze and design the problem. Moreover, students would be able to know the Basic Introduction of UNIX Operating System.

Co2: Basic Introduction of UNIX Commands that are used for operating the UNIX.

Co3: Introduction of Shell Scripting and VI Editor.so that the students get familiar with writing the UNIX scripts in UNIX editor.

Co4: Students will establish themselves as effective professionals by solving real problems with UNIX Shell Scripting knowledge and with attention to teamwork, critical thinking and problem solving skills by Writing Shell Scrips of unknown problems

Object Oriented Programming Lab Using C++

Course code	LC-CSE-214G				
Category	Professional Core Course				
Course title	Object Oriented Programming Lab Using C++				
Scheme and Credits	L	T	P	Credits	Semester 4
	0	0	3	1.5	
Branches (B. Tech.)	Computer Science and Engineering				
Class work	25 Marks				
Exam	25 Marks				
Total	50 Marks				
Duration of Exam	03 Hours				

Contents:

1. [Classes and Objects] Write a program that uses a class where the member functions are defined inside a class.
2. [Classes and Objects] Write a program that uses a class where the member functions are defined outside a class.
3. [Classes and Objects] Write a program to demonstrate the use of static data members.
4. [Classes and Objects] Write a program to demonstrate the use of const data members.
5. [Constructors and Destructors] Write a program to demonstrate the use of zero argument and parameterized constructors.
6. [Constructors and Destructors] Write a program to demonstrate the use of dynamic constructor.
7. [Constructors and Destructors] Write a program to demonstrate the use of explicit constructor.
8. [Initializer Lists] Write a program to demonstrate the use of initializer list.
9. [Operator Overloading] Write a program to demonstrate the overloading of increment and decrement operators.
10. [Operator Overloading] Write a program to demonstrate the overloading of binary arithmetic operators.
11. [Operator Overloading] Write a program to demonstrate the overloading of memory management operators.
12. [Inheritance] Write a program to demonstrate the multilevel inheritance.
13. [Inheritance] Write a program to demonstrate the multiple inheritance.
14. [Inheritance] Write a program to demonstrate the virtual derivation of a class.
15. [Polymorphism] Write a program to demonstrate the runtime polymorphism.

16. [Exception Handling] Write a program to demonstrate the exception handling.
17. [Templates and Generic Programming] Write a program to demonstrate the use of function template.
18. [Templates and Generic Programming] Write a program to demonstrate the use of class template.

Web Technologies Lab

Course code	LC-CSE-216G				
Category	Professional Core Course				
Course title	Web Technologies Lab				
Scheme and Credits	L	T	P	Credits	Semester 4
	0	0	2	1	
Branches (B. Tech.)	Computer Science and Engineering				
Class work	25 Marks				
Exam	25 Marks				
Total	50 Marks				
Duration of Exam	03 Hours				

Contents:

HTML :

1. Simple HTML using
   a. Heading elements
   b. Text Elements
   c. Logical Styles
   d. Physical Styles
   e. Ordered , Unordered and Definition list
2. Hyper Links
   a. Image Link → Link to page containing Images and Videos
   b. File Link
   c. Single Page Link
3. Using Frames
   a. Navigation Frame
   b. Floating Frame
   c. Inline Frame
4. Registration Form with Table

CSS:

Inline Style , Internal Style ,and External Style Sheets

XML :

1. Create a any catalog
2. Display the catalog created using CSS or XSL

PHP:

1. File operation
2. Regular Expression, Array, Math, String, Date functions

MC-106G : (ENVIRONMENT SCIENCE)

Course code	MC-106G				
Category	Mandatory Course				
Course title	Environmental Sciences				
Scheme and Credits	L	T	P	Credits	Semester 4
	3	0	1	0	
Branches (B. Tech.)	Common For All Branches				
Class work	25 Marks				
Exam	75 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Theory 75 Marks Field Work 25 Marks (Practical/Field visit)

Unit-1 The Multidisciplinary nature of environment studies. Definition, scope and importance. (2 lecture)

Unit-2 Natural Resources :

Renewable and non-renewable resources :

Natural resources and associated problems.

a) Forest resources : Use and over-exploitation : deforestation, case studies. Timber extraction, mining dams and their effects on forests and tribal people.

b) Water resources : Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.

c) Mineral resources : Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

d) Food resources : World food problems, changes, caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, Water logging, salinity, case studies.

e) Energy resources : Growing energy needs; renewable and non-renewable energy sources, use of alternate energy sources, case studies.

f) Land resources : Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

* Role of an individual in conservation of natural resources.

* Equitable use of resources for sustainable lifestyles.

(8 lectures)

Unit-3 Ecosystems :

* Producers, consumers and decomposers.
* Energy flow in the ecosystem.
* Ecological succession.
* Food chains, food webs and ecological pyramids.
* Introduction, types, characteristic features, structure and function of the following eco-system :

a. Forest ecosystem.

b. Grassland ecosystem.

c. Desert ecosystem.

d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) (6 lectures)

Unit-4 Biodiversity and its conservation

* Introduction - Definition : Genetic, Species and ecosystem diversity.
* Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values.
* Biodiversity at global, National and local levels.
* India as a mega-diversity nation.
* Hot-spots of biodiversity.
* Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts.
* Endangered and endemic species of India.
* Conservation of biodiversity : In-situ and ex-situ conservation of biodiversity.

(8 lectures)

Unit-5 Environmental pollution :

Definition, causes, effects and control measures of :

a) Air pollution.

b) Water pollution

c) Soil pollution

d) Marine pollution

e) Noise pollution

f) Thermal pollution

g) Nuclear hazards

* Solids waste management: causes, effects and control measures of urban and industrial wastes.
* Role of an individual in prevention of pollution.
* Pollution case studies.
* Disaster management : floods, earthquake, cyclone and landslides.

(8 lectures)

Unit-6 Social issues and the Environment:

* From unsustainable to sustainable development.
* Urban problems related to energy.
* Water conservation, rain water harvesting, watershed management.
* Resettlement and rehabilitation of people : its problems and concerns case studies.
* Environmental ethics : Issues and possible solutions.
* Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
* Wasteland reclamation.
* Consumerism and waste products.
* Environment Protection Act.
* Air (Prevention and Control of pollution) Act.
* Water (Prevention and Control of pollution) Act.
* Wildlife Protection Act.
* Forest Conservation Act.
* Issues involved in enforcement of environmental legislation.
* Public awareness. (7 lectures)

Unit-7 Human population and the Environment.

Population growth, variation among nations.

Population explosion- Family Welfare Programme.

Environment and human health.

Human Rights.

Value Education.

HIV/AIDS.

Woman and Child Welfare

Role of Information Technology in Environment and human health.

Case Studies. (6 lectures)

Unit-8 Field Work :

* Visit to a local area to document environmental assets - river/forest/grassland/hill/mountain.
* Visit to a local polluted site-urban/Rural/ Industrial/ Agricultural.
* Study of common plants, insects, birds.
* Study of simple ecosystems- pond, river, hill slopes, etc. (Field work equal to 10 lecture hours).

References

1. Agarwal, K.C. 2001 Environmental Biology, Nidi Pub. Ltd. Bikaner.
2. Bharucha, Frach, The Biodiversity of India, MApin Publishing Pvt. Ltd. Ahmedabad-380013, India, E-mail : mapin@icenet.net

(R).

3. Brunner R.C. 1989, Hazardous Waste Incineration, Mc. Graw Hill Inc. 480p.
4. Clark R.S., Marine pollution, Slanderson Press Oxford (TB).
5. Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Pub. House, Mumbai 1196 p.
6. De A.K., Environmental Chemistry, WileyEastern Ltd.
7. Down to Earth, Centre for Science and Environment (R).
8. Gleick, H.P., 1993. Water in crisis, Pacific Institute for Studies in Dev. Environment & Security Stockholm Env. Institute, Oxford Univ. Press, 473p.
9. Hawkins R.E. Encyclopedia of Indian Natural History, Bombay Natural HistorySociety, Bombay(R).
10. Heywood, V.H. & Watson, R.T. 1995. Global Biodiversity Assessment, Cambridge Uni. Press 1140p.
11. Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws. Himalaya Pub. House, Delhi 284p.
12. Mackinney, M.L. & Schoch, RM 1996, Environmental Science systems & solutions, Web enhanced edition. 639p.
13. Mhaskar A.K., Mayyer Hazardous, Tekchno-Science Publications (TB).
14. Miller T.G. Jr. Environmental Science, Wadsworth Publishing Co. (TB).
15. Odum, E.P. 1971, Fundamentals of Ecology. W.B. Saunders Co. USA, 574p.
16. Rao M.N. & Datta, A.K. 1987 Waste Water Treatment. Oxford & TBH Publ. Co. Pvt. Ltd. 345p.
17. Sharma, B.K. 2001, Environmental Chemistry, Goal Publ. House, Meerut.
18. Survey of the Environment, The Hindu (M).
19. Townsend C., Harper J. and Michael Begon. Essentials of Ecology, Blackwell Science (TB).
20. Trivedi R.K., Handbook of Environmental Laws, Rules, Guidelines, Comliances and Standards, Vol. I and II Enviro Media (R).
21. Tridevi R.K. and P.K. Goal, Introduction to air pollution, Techno Science Publications (TR).
22. Wagner K.D., 1998, Environmental Management, W.B. Saunders co. Philadelphia, USA 499p.
23. Atext book environmental education G.V.S. Publishers byDr. J.P. Yadav.

(M) Magazine

(R) Reference

(TB) Textbook

The scheme of the paper will be under :

The subject of Environmental Studies will be included as a qualifying paper in all UG Courses and the students will be required to qualify the same otherwise the final result will not be declared and degree will not be awarded.

The duration of the course will be 40 lectures. The examination will be conducted along with the semester examinations.

Exam. Pattern : In case of awarding the marks, the paper will carry 100 marks. Theory: 75 marks, Practical/ Field visit : 25 marks. The structure of the question paper will be :

Part- A: Short Answer Pattern	:	15marks
Part- B : EssayType with inbuilt choice	:	60marks
Part-C : Field Work (Practical)	:	25marks

Instructions for Examiners :

Part- A : Question No. 1 is compulsory and will contain five short- answer type question of 3 marks each covering the entire syllabus.

Part-B : Eight essay type questions (with inbuilt choice) will be set from the entire syllabus and the candidate will be required to answer any four of them. Each essay type question will be of 15 marks.

The examination of the regular students will be conducted by the concerned college/Institute. Each student will be required to score minimum 40% marks separately in theory and practical/Field visit. The marks in this qualifying paper will not be included in determining the percentage of marks obtained for the award of degree. However, these marks will be shown in the detailed marks certificate of the students.