Programme: BCA

Computer Applications

Scheme and Syllabi

w.e.f. Academic Session 2023-2024

BUEST

SCHOOL OF ENGINEERING & EMERGING TECHNOLOGIES

SEMESTER –I

Sr.No	Code	Course Title	L	T	P	Credit
1	UCA-101	Fundamentals of Computers and Information Technology	3	1	4	5.5
2	UMA-121	Mathematics-I	3	1	0	3.5
3	UCA-103	Programming in C	3	1	4	5.5
4	UMG-104	Introduction to Financial Accounting and Accounting Packages	3	1	0	3.5
5	UCA-107	Internet and Web Technologies	3	1	0	3.5
6	UPD-101	Personality Development Programme	2	0	0	2

Total Hours: 30

SEMESTER –II

Sr.No	Code	Course Title	L	T	P	Credit
1	UCA-151	Data Structures Using C	3	1	4	5.5
2	UMA-161	Mathematics-II	3	1	0	3.5
3	UHU-101	Effective Communication Skills	3	1	0	3.5
4	UEC-161	Digital Circuits and Logic Design	3	1	0	3.5
5	UCA-153	Management Information System	3	1	0	3.5
6	UPD-151	Personality Development Programme	2	0	0	2

Total Hours: 26

SEMESTER –III

Sr.No	Code	Course Title	L	T	P	Credit
1	UCA-201	Introduction to Operating System	3	1	4	5.5
2	UMG-225	Principles of Management and Introduction to ERP	3	1	0	3.5
3	UMA-221	Mathematics-III	3	1	0	3.5
4	UCA-202	Database Management System	3	1	4	5.5
5	UCA-203	Object Oriented Programming in C++	3	1	4	5.5
6	UPD-201	Personality Development Programme	2	0	0	2

Total Hours: 34

SEMESTER –IV

Sr.No	Code	Course Title	L	T	P	Credit
1	UCA-251	Introduction to Linux	3	1	4	5.5
2	UCA-252	Introduction to Data Science	3	1	0	3.5
3	UCA-253	Computer Networks	3	1	0	3.5
4	UCA-254	System Analysis and Design	3	1	0	3.5
5	UCA-255	Introduction to Python	3	1	4	5.5
6	UPD-251	Personality Development Programme	2	0	0	2

Total Hours: 30

SEMESTER –V

Sr.No	Code	Course Title	L	T	P	Credit
1	UCA-301	Artificial Intelligence and Machine Learning	3	1	4	5.5
2	UCA-302	Object Oriented Programming with Java	3	1	4	5.5
3	UCA-303	Computer Organization and Architecture	3	1	0	3.5
4	UMA-321	Operation Research	3	1	0	3.5
5	UCA-304	Minor Project Lab	0	0	4	2
6	UXX-XX	Open Elective -1	3	1	0	3.5
7	UPD-301	Personality Development Programme	2	0	0	2

Open Elective 1						
1	UMG-476	Human Ethics & values	3	1	0	3.5
2	UEC-462	Biomedical Instrumentation	3	1	0	3.5
3	UEC-463	Television Engineering	3	1	0	3.5
4	UEE-403	Energy Management	3	1	0	3.5
5	UEE-452	Non-Conventional Electrical Power Generation	3	1	0	3.5
6	UCE-312	Advance Construction Techniques and Project Management	3	1	0	3.5

Total Contact Hours: 34

SEMESTER-VI

Sr.No	Code	Course Title	L	T	P	Credit
1	UCA-351	Software Engineering	3	1	0	3.5
2	UCA-352	Cyber Security	3	1	0	3.5
3	UCA-353	Computer Graphics	3	1	4	5.5
4	UCA-XXX	Departmental Elective-I	3	1	0	3.5
5	UCA-354	Major Project	0	0	4	2
6	UPD-351	Personality Development Programme	2	0	0	2
7	UXX-XXX	Open Elective -2 / Open Elective- 3	3	1	0	3.5
Departmental Elective 1						
1	UCA-391	Block Chain	3	1	0	3.5
2	UCA-392	Mobile Computing	3	1	0	3.5
3	UCA-393	Deep Learning	3	1	0	3.5
4	UCA-394	E-Commerce	3	1	0	3.5
5	UCA-395	Introduction to IOT	3	1	0	3.5
6	UCA-396	Data Warehousing & Data Mining	3	1	0	3.5
Open Elective 2						
1	UMG-450	Entrepreneurship Development & Enterprise Management	3	1	0	3.5
2	UEC-464	Satellite Communication	3	1	0	3.5

3	UEC-465	Digital Signal Processing & Applications	3	1	0	3.5
4	UEE-457	Transformer Engineering	3	1	0	3.5
5	UEE-411	Direct Energy Conversion	3	1	0	3.5
6	UCE-311	Advance Concrete Technology	3	1	0	3.5
7	UCE-409	Geographic Information Systems for Resources Management	3	1	0	3.5
8	UME –464	Renewable Energy Sources	3	1	0	3.5
9	UME – 466	Automation & Robotics	3	1	0	3.5
Open Elective 3						
1	UMG-475	Total Quality Management	3	1	0	3.5
2	UEC-466	Optical Communication	3	1	0	3.5
3	UEC-467	Principles of Digital Communication	3	1	0	3.5
4	UCE-476	Disaster Management	3	1	0	3.5
5	UCE-412	Building Project and Estimates	3	1	0	3.5
6	UEE-456	Hydro Power Station Design	3	1	0	3.5
7	UEE-408	Illumination Engineering	3	1	0	3.5
8	UME – 459	Engineering inIndustry &Entrepreneurship	3	1	0	3.5
9	UME – 458	Emerging Automative Technologies	3	1	0	3.5

Total Contact Hours: 30

SEMESTER I

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name:- Fundamentals of Computers and Information Technology
Course Code: - UCA-101

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 4 5.5

UNIT 1

What are computers? The evolution of computers, Classification of computers. Block Diagram: Input output devices, Description of Computer Input Units, Other Input Methods, and Computer Output Units.
Computer Memory: Memory Cell, Memory Organization, Read Only Memory, Serial Access Memory, Physical Devices Used to construct Memories, Magnetic Hard disk, floppy Disk Drives, Compact Disk Read Only Memory, Magnetic Tape Drives.

UNIT 2

Low level and high-level languages, assemblers, compilers, interpreters, linkers, algorithms, flow charting, decision tables, pseudo code, software concepts: system & application software packages. Computer Generation & Classifications: First Generation of Computers, The Second Generation, The Generation, The fourth Generation, The Fifth Generation, Classification of Computers, Distributed Computer System, Parallel Computers.

UNIT 3

Operating System concepts, different types of operating systems, structure of operating system, DOS/UNIX/LINUX commands, working with Windows, Windows 9x/NT/XP, Data Processing, File Systems and Database Management Systems, different types of Database Management System.

UNIT 4

Basic elements of a communication system, Data transmission modes, Data Transmission speed, Data transmission media, Digital and Analog Transmission, Network topologies, Network Types (LAN, WAN and MAN), OSI & TCP/IP Model, Internet: Network, Client and Servers, Host & Terminals, TCP/IP, World Wide Web, Hypertext, Uniform Resource Locator, Web Browsers, IP Address, Domain Name, Internet Services Providers, Internet Security, Internet Requirements, Web Search Engine, Net Surfing, Internet Services, Intranet.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

LIST OF PRACTICALS:

1. Linux installation, up gradation, Installation and removal of packages and installation of a peripheral devices (Printer) - installation steps and configuration.
2. Starting and stopping services in run level.
3. Scientific problem-solving using decision making and looping.
4. Simple programming for one dimensional and two-dimensional arrays.
5. Solving problems using String functions
6. Programs with user defined functions – Includes Parameter Passing
7. Program using Recursive Function and conversion from given program to flow chart.
8. Program using structures and unions.

Text Book:

1. Alex Leon & Mathews Leon, "Fundamentals of Information Technology", Leon Techworld, 1999.
2. Vikas Gupta, "Comdex Computer Kit", Wiley Dreamtech, Delhi, 2004
3. P. K. Sinha & Priti Sinha , "Computer Fundamentals", BPB Publications, 1992.
4. V. Raja Raman, "Introduction to Computers", PHI, 1998.

Reference Books:

1. Alex Leon & Mathews Leon, "Introduction to Computers", Vikas Publishing House,1999.
2. Norton Peter, "Introduction to computers", 4th Ed., TMH, 2001

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Mathematics-I
Course Code: -UMA-121

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 0 3.5

UNIT 1: MATRICES AND DETERMINANTS

MATRICES: Definition, Types of Matrices, Addition, Subtraction, Scalar Multiplication and Multiplication of Matrices

DETERMINANTS: Definition, Minors, Cofactors, Properties of Determinants, Adjoint, Inverse, Cramers Rule, Rank of Matrix Dependence of Vectors, Eigen Vectors of a Matrix, Cayley-Hamilton Theorem (without proof).

UNIT 2: LIMITS & CONTINUITY

Limit at a Point, Properties of Limit, Computation of Limits of Various Types of Functions, Continuity at a Point, Continuity Over an Interval, Intermediate Value Theorem, Type of Discontinuities.

UNIT 3: DIFFERENTIATION

Derivative, Derivatives of Sum, Differences, Product & Quotients, Chain Rule, Derivatives of Composite Functions, Logarithmic Differentiation, Rolle's Theorem, Mean Value Theorem, Expansion of Functions (Maclaurin's & Taylor's), Indeterminate Forms, L' Hospitals Rule, Maxima & Minima, Concavity, Asymptote, Singular Points, Curve Tracing, Successive Differentiation & Liebnitz Theorem.

UNIT 4: INTEGRATION

Indefinite Integral: Integration as inverse process of differentiation. Integration of a variety of functions by substitution, by partial fractions and by parts, Evaluation of simple integrals of the following types and problems based on them.

Definite Integral: Definite integrals as a limit of a sum, Fundamental Theorem of Calculus (without proof).Basic properties of definite integrals and evaluation of definite integrals.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Applications in finding the area under simple curves, especially lines, circles/ parabolas/ellipses (in standard form only), Area between any of the two above said curves (the region should be clearly identifiable).

Text Books:

1. Kresyig E., "Advanced Engineering Mathematics", 5th Edition, John Wiley & Sons,1999.
2. B.S. Grewal, "Elementary Engineering Mathematics", 34th Ed., 1998..
3. H.K. Dass, "Advanced Engineering Mathematics", S. Chand & Company, 9th RevisedEdition, 2001.

Reference Books:

1. Shanti Narayan, "Integral Calculus", S. Chand & Company, 1999.
2. Shanti Narayan, "Differential Caluculs", S.Chand & Company, 1998.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Programming in C
Course Code: - UCA-103

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 4 5.5

UNIT 1

Introduction to Programming: To introduce the different stages of Software life cycle; Programming Methodologies; Different stages of program life cycle. Introduction of algorithmic thinking, Flowcharts, Pseudo Code, problem statement Modular programming, Top Down and Bottom up approaches, Concept of High Level Languages, Low Level Languages, Assembly Languages, Compiler, Interpreter, Type of errors.

UNIT 2

Data types and ASCII character set, Coding Standards, To appreciate good Programming style Operators and expressions: Constants and Variables, Data types, Declaring Variables, Storage Classes, Different types of expressions and their Evaluation, Conditional Expression, Assignment statement, Enumerated data type, Redefining/ Creating data types, Library functions, Type casting. To appreciate good Programming style, Input/output: Unformatted and formatted I/O Functions (Character and strings I/O, Scanf ( ).

UNIT 3

To introduce do while, while and for loops. Problem Solving in terms of sub-problems. Reusability of functions by solving bigger problems using solutions of smaller problems. recursive functions.

Pointers: Definition, Need of pointers, declaring Pointers, Accessing Values via Pointers, Pointer arithmetic, Types of pointers. Array & strings: Introduction to arrays, Declaring arrays, Initializing arrays, Processing arrays, Pointers to arrays, Passing arrays as arguments to functions, Introduction to strings, Pointers to strings, Passing strings and Arrays of strings as arguments to a function, Programming examples to illustrate the use of arrays and strings.

UNIT 4

Testing: Unit testing and different Test Case generation techniques. To introduce different debugging techniques. To introduce code review and code review checklist.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Structures: Declaring a structure type, Declaring Variables of structure type, Initializing Structures, Accessing Elements of structures, arrays of structures, nested structures, Pointers to structures.
Data files: Definition of data files, different ways of file processing (standard I/O and system I/O), description of various library functions for file handling, updating files.

LIST OF PRACTICALS:

1. Write a program to find the largest of three numbers (if-then-else).
2. Write a program to find the largest number out of ten numbers (for statement).
3. Write a program to find the average male height & average female heights in the class (input is in form of sex code, height).
4. Write a program to find roots of quadratic equation using functions and switch statement.
5. Write a program using arrays to find the largest and second largest no.
6. Write a program to produce ASCII equivalent of given number
7. Write a program to find divisor or factorial of a given number.
8. Write a recursive program for Factorial of a number.
9. Write a program to print Fibonacci sequence of numbers is 0, 1, 1, 2, 3, 5, 8…….
10. Write a program that takes two operands and one operator from the user perform the operation and then print the answer
11. Write a program to find sum of digits of a number.
12. Write a program to find reverse of a number.
13. Write a program to check if a number is Armstrong number
14. Write a program to check if an entered number is palindrome.
15. Write a program to print the following outputs:

```
1
2  2
3  3  3
4  4  4  4
5  5  5  5  5
```

Text Book:

1. Let Us C by Yashwant Kanetkar

Reference Books:

1. Dromey R.G., How to solve it by computers, Prentice Hall of India, New Delhi
2. Kernighan., Ritchie, ANSI C Language, Prentice Hall of India, New Delhi

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: -Introduction to Financial Accounting & Accounting Packages
Course Code:-UMG-104

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 0 3.5

UNIT 1

Basic Accounting: Introduction, importance and scope, concepts and conventions- Generally accepted accounting principles-double entry framework.

UNIT 2

Basic concepts of Journals, ledgers, purchase book, sales book, cashbook. Preparation of financial statements: Profit and loss account and balance sheet.

UNIT 3

Nature, scope, advantage and limitations of management accounting.

Sources of raising of capital in corporate undertaking –simple treatment to issue of shares, forfeiture of shares and re – issue of forfeited shares.

UNIT 4

Application of computers in accounting.

Text Books:

1. Bhattacharya & Deaden Accounting for management (Vikas 1986)
2. R.L Gupta & V.K Gupta Financial Accounting (Part I and Part II)
3. S.N. Maheshwari Fundamental Accountancy

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Reference Books:

1. Antony & Reece Accounting Principal
2. Jawahar Lal Managerial Accounting

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Internet and Web Technologies

Course Code: - UCA-107

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr

3 1 0 3.5

Unit–1: Introduction to Internet:
World Wide Web, Web Browser, Web Server, Uniform Resource Locator, Multipurpose internet mail Extension, Hypertext Transfer Protocol, Security, XHTML, History of HTML & XHTML, Syntax, Document Structure, Text mark-up, Images, Hypertext links, Lists, Tables, Forms, Frames.

Cascading Style Sheets: Introduction, Levels of Style Sheets, Style specification format, Selector, Forms, Property, Value form, Font Properties, List Properties, Color, Alignment, Box Model, Background Images, and tags.

Unit-2: JavaScript

Object Orientation and JavaScript, Syntactic features, Primitives, Operations, Expressions, Output & Input, Control statements, Object creation and Modification, Arrays, Functions, Constructors, Pattern Matching using regular expressions, JavaScript Execution, Environment, Changing Colors & Fonts, Dynamic Content, Stacking Elements, Locating the mouse Cursor, Reacting to a mouse click, Dragging and Doping Elements.

Unit – 3: XML

Syntax, Document Structure, Document Type definition, Namespaces, XML schemas, displaying raw XML Documents, Displaying XML Documents with CSS, XSLT Style Sheets, XML Processor.

Unit-4: PERL

History, Applications, Scalars, Assignment statement , Control Statements, Arrays, Hashes, References, Functions, Pattern Matching, File Input & Output, Using Perl for CGI Programming, Common Gateway Interface, Linkage, Query String format, CGI pm module, Cookies.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Text Book:

1. Robert W. Sebesta, "Programming with World Wide Web" , Pearson Education.

Reference Books:

1. Jamsa, " HTML & Web Design: Tips and Techniques", Tata McGraw Hill.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Personality Development Programme
Course Code: -UPD-101

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr

2 0 0 2

UNIT 1

Self-Awareness & Self Development: Assessment, Evaluation, Discipline, Appraisal, Self-Awareness, Criticism, Self-Esteem Positive thinking, Thoughtfulness and responsible approach, Perceptions And Attitudes.

UNIT 2

Communication: Definition communication and interpersonal communication. Language and verbal codes. Nonverbal communication and behavior. Culture, gender, and personality in interpersonal communication. Perception. Listening. Emotion. Social cognition and the self.

UNIT 3

Time Management: Conducive environment. Setting priorities. Eliminating non-priorities, Goal setting. Right habits. 80/20 rule

Unit 4

Creative Writing: This unit attempts to cover those aspects of writing that go beyond the boundaries of technical or professional forms of writing and encourage the learner to explore the artistic and imaginative elements of writing: Storywriting**,** Dialogue writing

Text Book:

1. Hurlock, E.B (2006). Personality Development, 28th Reprint. New Delhi: Tata McGrawHill.
2. Stephen P. Robbins and Timothy A. Judge(2014), Organizational Behavior 16th Edition:Prentice Hall.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

3. Andrews, Sudhir. How to Succeed at Interviews. 21st (rep.) New Delhi.Tata McGraw- Hill1988.
4. Heller, Robert.Effective leadership. Essential Manager series. Dk Publishing, 2002
5. Hindle, Tim. Reducing Stress. Essential Manager series. Dk Publishing, 2003
6. Lucas, Stephen. Art of Public Speaking. New Delhi. Tata -Mc-Graw Hill. 2001
7. Mile, D.J Power of positive thinking. Delhi. Rohan Book Company, (2004).
8. Pravesh Kumar. All about Self-Motivation. New Delhi. Goodwill Publishing House. 2005
9. Smith, B . Body Language. Delhi: Rohan Book Company. 2004

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

SEMESTER II

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: -Data Structures using C
Course Code:- UCA-151

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 4 5.5

Unit 1

Preliminaries: Concept & notation, common operation on data structures, algorithm complexity, time-space tradeoff between algorithm, physical & logical representation of different data structures.

Arrays: Arrays defined, representing arrays in memory, Various operation (traversal, insertion, deletion), Multidimensional arrays, Sequential allocation, Address calculation, Sparse arrays.

Linked List: Definition, type (linear, circular, doubly linked, inverted), representing linked lists in memory, advantages of using linked list over arrays, various operations on Linked list (traversal, insertion, deletion).

Unit 2

Stacks: Definition & concepts of stack structure, Implementation of stacks, Operation on stacks (push & pop), Application of stacks (converting arithmetic expression from infix notation to polish and their subsequent evaluation, quick sort technique to sort an array, recursion).

Queue: Definition & concept of queues, implementation of queue, operation on queues (insert & delete), Type of queues (circular queue, priority queue).

Unit 3

Trees Structures: Tree, Binary Trees, Tree Traversal Algorithms (Pre-Order, In-Order, Post-Order), Threaded Trees, Trees in various Sorting & Searching Algorithms & their Complexity (Heap Sort, Binary Search Trees).
Graphs: Description of graph structure, implementing graphs in memory, Graph traversals (Depth First Searching, Breadth First Searching, Shortest Paths Problems).

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Unit 4

Storage Management: Fixed block storage allocation, First-fit Storage Allocation, Storage Release, Buddy System, Garbage Collection.

Sorting & Searching: Selection sort, Bubble sort, Merge sort, Radix sort, Quick sort, Sequential search, Linear search and their complexity.

File Structure: Structure and Processing of Sequential, Indexed Sequential and Direct files.

LIST OF PRACTICALS:

1. Write a C program that uses functions to perform the following:
   a) Create a singly linked list of integers.
   b) Delete a given integer from the above linked list.
   c) Display the contents of the above list after deletion.
2. Write a C program that uses functions to perform the following:
   a) Create a doubly linked list of integers.
   b) Delete a given integer from the above doubly linked list.
   c) Display the contents of the above list after deletion.
3. Write a C program that uses stack operations to convert a given infix expression into its postfix Equivalent, Implement the stack using an array.
4. Write C programs to implement a double ended queue ADT using
   a) array
   b) doubly linked list
5. Write a C program that uses functions to perform the following:
   a) Create a binary search tree of characters.
   b) Traverse the above Binary search tree recursively in Post order.
6. Write a C program that uses functions to perform the following:
   a) Create a binary search tree of integers.
   b) Traverse the above Binary search tree non recursively in inorder.
7. Write C programs for implementing the following sorting methods to arrange a list of integers in ascending order:
   a) Insertion sort
   b) Merge sort
8. Write C programs for implementing the following sorting methods to arrange a list of integers in ascending order:
   a) Quick sort
   b) Selection sort
9. Write a C program for implementing Heap sort algorithm for sorting a given list of integers in ascending order.
10. Write C programs for implementing the following graph traversal algorithms:
    a)Depth first traversal
    b)Breadth first traversal

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Text Books:

1. Jean Paul Tremblay & Paul G. Sorenson: An Introduction to Data Structures with Applications: Tata McGraw Hill.

2. Robert L. Kruse: Data Structures & Program Design: PHI

Reference Books:

1. Horowitz & Sahni: Fundamentals of Data Structuresin Pascal: Galgotia Publishers.
2. Aho, Hopcroft & Ullman: Data Structures and Alogorithms: Addison Wesley.
3. T.A. Standish: Introduction to Data Structures.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Mathematics-II
Course Code:-UMA-161

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 0 3.5

Unit 1

SETS: Sets, Subsets, Equal Sets Universal Sets, Finite and Infinite Sets, Operation on Sets, Union, Intersection and Complements of Sets, Cartesian Product, Cardinality of Set, Simple Applications.
RELATIONS AND FUNCTIONS: Properties of Relations, Equivalence Relation, Partial Order Relation Function: Domain and Range, Onto, Into and One to One Functions, Composite and Inverse Functions, Introduction of Trigonometric, Logarithmic and Exponential Functions

Unit 2

TRIGONOMETRY: Introduction, Positive and negative angles. Measuring angles in radians and in degrees and conversion from one measure to another. Definition of trigonometric functions with the help of unit circle. Signs of trigonometric functions. Domain and range of trigonometric functions. Deducing trigonometric functions.
INVERSE TRIGONOMETRY: Definition, range, domain, principal value branch. Graphs of inverse trigonometric functions Elementary properties of inverse trigonometric functions.

Unit 3

3D COORDINATE GEOMETRY: Review of 2D Coordinate Geometry: Equations of Straight Lines, Circle, Ellipse, Parabola, Hyperbola. 3D Coordinate Geometry: Coordinates in Space, Direction Cosines, Angle Between Two Lines, Projection of Join of Two Points on a Plane, Equations of Plane, Straight Lines, Conditions for a line to lie on a plane, Conditions for Two Lines to be Coplanar, Shortest Distance Between Two Lines, Equations of Sphere, Tangent plane at a point on the sphere. Equations of Ellipsoid, Paraboloid, Hyperboloid and Cylinder in Cartesian coordinate.
VECTOR ALGEBRA: Definition of a vector in 2 and 3 Dimensions; Double and Triple Scalar and Vector Product and their Applications.

Unit 4

MULTIPLE INTEGRATION: Double Integral in Cartesian and Polar Coordinates to find Area, Change of Order of Integration, Triple Integral to Find Volume of Simple Shapes in Cartesian Coordinates.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Text Books:

1. Kolman, Busby and Ross, "Discrete Mathematical Structure", PHI, 1996.
2. H.K. Dass, "Advanced Engineering Mathematics"; S.Chand & Co., 9th Revised Ed.,2001.

Reference Books:

1. S.K. Sarkar, "Discrete Maths"; S. Chand & Co., 2000

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: -Effective Communication Skills
Course Code:-UHU-101

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 0 3.5

Unit 1

Concepts and Fundamentals: Meaning of communication, Importance of communication, Communication scope, Process of communication, Communication models and theories, Essentials of good communication - The seven Cs of communication, Factors responsible for growing importance of communication, Channels of communication, Verbal and Non-Verbal communication, Formal and Informal communication, Barriers of communication,

Unit 2

Written Communication: Objectives of written Communication, Media of written communication, Merits and demerits of written communication, Planning business messages,
Writing Letters: Business letters, Office memorandum, Good news and bad news letters, Persuasive letters, Sales letters, Letter styles/ layout,
Report Writing: Meaning & Definition, Types of report (Business report & Academic report), Format of report, Drafting the report, Layout of the report, Essential requirement of good report writing,
Language Skills: Improving command in English, Choice of words, Common problems with verbs, adjectives, adverbs, pronouns, conjunctions, punctuation, prefix, suffix etc,

Unit 3

Oral Communication: Principles of effective oral communication, Media of oral communication, Advantages of oral communication, Disadvantages of oral communication, Styles of oral communication.
Interviews: Meaning & Purpose, Art of interviewing, Types of interview, Interview styles, Essential Features, Structure, Guidelines for Interviewer, Guide lines for interviewee.
Meetings: Definition, Kind of meetings, Advantages and disadvantages of meetings/committees, Planning and organization of meetings,
Job Application: Types of application, Form & Content of an application, drafting the application, Preparation of resume,
Project Presentations: Advantages & Disadvantages, Executive Summary, Charts Distribution of time (presentation, questions & answers, summing up), Visual presentation,

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Unit 4

Guidelines for using visual aids, Electronic media (power-point presentation).Arts of Listening: Good listening for improved communications, Art of listening, Meaning, nature and importance of listening, Principles of good listening, Barriers in listening

Business Negotiation: Definition of negotiation, Factors that can influence negotiation, what skills do we need to negotiate, Negotiation process (preparation, proposals, discussions, bargaining, agreement, implementation).

Text Books:

1. English Grammar and Composition by Prof. M. Krishna swami
2. High School English Grammar and Composition by Wren and Martin.
3. English Grammar and Composition by Prof. M. Krishna swami.

Reference Books:

1. Patterns of English structures by A.S. Hornby. (Macmillian publications recommended)
2. McGraw, SJ;Basic Managerial Skills for All, Prentice Hall of India, New Delhi 1991

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: -DIGITAL CIRCUIT & LOGIC DESIGN
Course Code:-UEC-161

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 0 3.5

Unit 1

Introduction: Overview of number system and codes. Elements and functions of digital Logic gates, Gate propagation delay time, logic gates applications.

Unit 2

Boolean algebra: Boolean operations, SOP and POS forms, and simplification using karnaugh maps, Realization of expressions using goals.

Combinational logical circuits: design of Binary Adder-Serial, Parallel, Carry look ahead type.

Unit 3

Full subtractor, code converters, MUX and DEMUX, encoders and encoders.

Sequential logic circuits: Flip flop: R-S, J-K, Master slave J-K, D and T flip-flops using nand gates.

Unit 4

Counters: Design of asynchronous and synchronous, updown and programmable counters.

Registers: shift registers, various types and their applications.

Detection and correction codes, detecting and correcting an error.

Text Books:

1. D. Morris Mano Digital Circuits of logic design (PHI)

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

2. T.C. Bartee Digital and electronic circuits (McGraw Hill)
3. Malvino Digital computer electronics

Reference Books:

1. Floyd Digital fundamentals
2. R.P. Jain Modern digital electronics
3. Tauls and Schillings Digital integrated electronics

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: -Management Information System
Course Code:- UCA-153

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 0 3.5

Unit 1

The meaning and role of MIS: What is MIS? Decision support systems, systems approach, the systems view of business, MIS Organization within the company. Management Organizational theory and the systems approach: Development of organization theory, management and organizational behavior, management, information, and the systems approach.

Unit 2

Information Systems for decision making: Evolution of an information system, Basic Information Systems, decision making and MIS, MIS as a technique for making programmed decisions, decision assisting information systems.

Strategic and project planning for MIS: General business planning, appropriate MIS response, MIS planning – general, MIS planning – details

Unit 3

Conceptual system design: Define the problems, set system objectives, establish system constraints, determine information needs, determine information sources, develop alternative conceptual designs and select one, document the system concept, prepare the conceptual design report.

Unit 4

Implementation, evaluation and maintenance of the MIS: Plan the implementation, acquire floor space and plan space layouts, organize for implementation, develop procedures for implementation, train and operating personnel, computer related acquisitions, develop forms for data collection and information, dissemination, develop the files, test the system, cut over, document the system, evaluate the MIS, control and maintain the system.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Pitfalls in MIS development: Fundamental weaknesses, soft spots in planning, design problems, implementation: The TAR PIT.

Text Books:

1. R. G. Murdick, J. E. Ross and J. R. Clagget, "Information Systems for Modern Management", 3rd Edition by, PHI – 1994.

Reference Books:

1. Parker, Charles Case, Thomas, "Management Information System: Strategy & Action", 2nd Edition, TMH, 1993.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Personality Development Programme
Course Code: -UPD-151

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr

2 0 0 2

UNIT 1

Goal Setting: Assessment, Context Setting, Discipline, Appraisal, Goal Setting, Self-Esteem, Positive thinking, Thoughtfulness and responsible approach, Perceptions And Attitudes

UNIT 2

Body Language: Gestures. Handshake. Posture and body moment. Touch. Space. Voice Inconsistencies

UNIT 3

Stress Management: Introduction: Stress In Today's Time, Identifying The Stress Source, Signs Of Stress, Ways To Cope With Stress, Healthier Ways To Deal With Stress

UNIT 4

Email Writing: Email communication is important type of written communication. Communications are conducted among business firms, organizations and companies mostly via emails. Moreover email provides most authentic and secure means of communication: Subject line, Salutation, Body text, Signature.

Text Book:

1. Hurlock, E.B (2006). Personality Development, 28th Reprint. New Delhi: Tata McGrawHill.
2. Stephen P. Robbins and Timothy A. Judge(2014), Organizational Behavior 16th Edition:Prentice Hall.
3. Andrews, Sudhir. How to Succeed at Interviews. 21st (rep.) New Delhi.Tata McGraw- Hill1988.
4. Heller, Robert.Effective leadership. Essential Manager series. Dk Publishing, 2002
5. Hindle, Tim. Reducing Stress. Essential Manager series. Dk Publishing, 2003
6. Lucas, Stephen. Art of Public Speaking. New Delhi. Tata -Mc-Graw Hill. 2001
7. Mile, D.J Power of positive thinking. Delhi. Rohan Book Company, (2004).
8. Pravesh Kumar. All about Self-Motivation. New Delhi. Goodwill Publishing House. 2005
9. Smith, B . Body Language. Delhi: Rohan Book Company. 2004

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

SEMESTER III

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Introduction to Operating System
Course Code: - UCA-201

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L	T	P	Cr.
3	1	4	5.5

Unit 1

Introduction: Definition of The Operating System, Functions of An Operating System, Different Types Of Systems - Simple Batch System, Multi-Programmed Batched System, Time Sharing System, Personal Computer Systems, Parallel Systems, Distributed Systems, Real Time Systems, Computer System Structure-operation, I/O structure, storage structure, hardware protection, Operating System Services. Basic concept of multiprogramming, multitasking and multiprocessing, goals and major functions of operating system.
Memory Management: Memory management schemes with advantages and disadvantages- Paging, Segmentation and Paged Segmentation.

Unit 2

Process Management: Process, process state transition, Process control Block, Independent and cooperating process, Scheduling Algorithms, with necessary examples and demo on Windows
Process Synchronization: The Critical Section Problem, Synchronization Hardware, Semaphores, Classical Problems of Synchronization, Critical Regions.
Deadlocks: Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock. Inter-Process Communication: Threads, Concurrency, Critical section, Mutual Exclusion, Semaphore

Unit 3

File Management: Introduction to File system, file types and file operations, file operation commands, file access rights, file storage management. File System Interface: File Concept, Access Methods–sequential, direct, index, Directory Structure–single-level, two–level, tree-structured, acyclic-graph, general graph.
File System Implementation: File System Structure, Allocation Methods-contiguous allocation, linked allocation, indexed allocation, Free Space Management-bit vector, linked list, grouping, counting, Directory Implementation–linear list, hash table, Efficiency and Performance, Recovery – consistency checking, backup and restore

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Unit 4

Device Scheduling: Illustrate the concept of I/O channels, interrupts and the structure of an I/O system with necessary examples and demo on Windows. Disk Structure, Disk Scheduling, FCFS, SSTF, SCAN, C-SCAN, Look Scheduling, Selection of A Scheduling Algorithm, Disk Management-disk formatting, boot block, bad blocks. Security: problem, authentication–passwords, program threats, system threats- worms, viruses, threat monitoring, encryption.

LIST OF PRACTICALS:

1. Simulation of the CPU scheduling algorithms
   a) Round Robin
   b) SJF
   c) FCFS
   d) Priority
2. Simulation of MUTEX and SEMAPHORES.
3. Simulation of Bankers Deadlock Avoidance and Prevention algorithms.
4. Implementation of Process Synchronization (Reader-Writer, Sleeping Barber and Dining Philosopher's Problem)
5. Simulation of page Replacement Algorithms
   a) FIFO
   b) LRU
   c) LFU
6. Simulation of paging techniques of memory management.
7. Simulation of file allocation Strategies
   a) Sequential
   b) Indexed
   c) Linked
8. Simulation of file organization techniques:
   a) Single Level Directory
   b) Two Level Hierarchical

Text Book:

1. Silberschatz and Galvin, Operating System Concepts, John Wiley & Sons, Sixth edition
2. Andrew Tanenbaum, Modern Operating Systems, Pearson Education

Reference Books:

1. Charles Crowley, “Operating Systems: A Design-Oriented Approach”
2. MilanMilenkovic, “Operating Systems: concepts and design”, McGraw-Hill

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: -Principles OF Management Introduction to ERP

Course Code: -UMG-225

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L	T	P	Cr.
3	1	0	3.5

Unit 1

Forms of business organizations and ownership: Sole proprietorship, Partnership, Joint Stock Company, Public & Private undertakings, Government companies.

Management: Meaning & definition of management, nature, scope and its various functions.

Unit 2

Planning: nature and purpose, types, steps in planning, decision making:Strategic, tactical and operational decision, decision making process, rationality in decision making.

Organizing: nature, importance, the organizing process, organizational objectives, formal and informal organization, organization chart, and span of management: factors determining effective span Motivation: theories of Motivation; hierarchy of needs theory, theory of X and theory of Y.

Leadership:styles, theories of leadership: trait approach and situational approach, managerial grid.

Controlling: meaning &nature, steps in controlling, essentials of effective control systems.

Unit 3

Introduction To ERP: Evolution of ERP. What is ERP? Reasons for the growth of ERP, Scenario and Justification of ERP in India, Evaluation Of ERP, Various ModulesOf ERP, Advantage of ERP.

An overview of Enterprise, Integrated Management Information, Business Modeling, ERP for Small Business, ERP for make to order companies, Business Process Mapping for ERP Module Design, Hardware Environment and its Selection for ERP Implementation

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Unit 4

ERP and Related Technologies, Business Process Reengineering (BPR), Management Information System (MIS), Executive Information System (EIS), Decision support System (DSS), Supply Chain Management (SCM).

ERP Modules, Introduction, Finance, Plant Maintenance, Quality Management, Materials Management.

Text Books:

1. Koontz Essentials of management
2. L.M.Prasad Principles & Practices of Management

Reference Books:

1. Y. K. Bhushan Management
2. Prof. ParagDiwan An Executive's Encyclopedia of Management Practices

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: -Mathematics-III
Course Code: -UMA-221

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L	T	P	Cr.
3	1	0	3.5

Unit 1

Complex Variables: Complex Number System, Algebra of Complex Numbers, Polar Form, Powers and Roots, Functions of Complex Variables, Elementary Functions, General Power of Functions, Inverse Trigonometric and Hyperbolic Functions.
Vector Calculus: Differentiation of Vectors, Scalar and Vector Fields, Gradient, Directional Derivatives, Divergence and Curl and their Physical Meaning, Line Integral and Green's Theorem.

Unit 2

Fourier Series: Periodic Functions, Fourier Series, Fourier Series of Even and Odd Functions, Dirichlet Condition, Half Range Series.
Ordinary Differential Equations of First Order: Variable- Separable Method, Homogeneous Differential Equations, Exact Differential Equations, Linear Differential Equations, Bernoulli's Differential Equations, Differential Equations of First Order and First Degree by Integrating Factor.

Unit 3

Group: definition of Group, Groups of numbers, groups of residues, groups of matrices, Groups of functions, Groups of subsets of a set, Properties of Groups, characterization of Groups, cyclic Groups.

Ring: commutative ring, ring with unity, Ring of Polynomials, ring of functions, Elementary properties of ring. Fields.

Unit 4

Graph theory: Various types of graphics, simple and multigraphs , directed and undirected graphs, Eulerian and Hamiltonian graph, graph connectivity, traversals, graph optimizations, Graph coloring, trees, spanning trees, rooted trees, binary trees

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Text Books

1. A.B. Mathur and V.P. Jaggi, "Advanced Engineering Mathematics", Khanna Publishers, 1999.
2. H.K. Dass, "Advanced Engineering Mathematics", S. Chand & Co., 9th Revised Ed.,2001.

Reference Books

1. R. K. Jain, SRK Iyengar, "Numerical Methods for Scientific & EngineeringComputation", New Age International Pvt. Ltd., 3rd Edition, 1999.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: -Database Management System
Course Code:- UCA-202

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 4 5.5

Unit 1

Introduction: Characteristics of database approach, data models, DBMS architecture and data independence.

E-R Modeling: Entity types, entity set, attribute and key, relationships, relation types, roles and structural constraints, weak entities, enhanced E-R and object modeling, Sub Classes: Super classes, inheritance, specialization and generalization.

Unit 2

File Organization: Indexed sequential access files, implementation using B++ trees, hashing, hashing functions, collision resolution, extendible hashing, dynamic hashing approach: Implementationand performance.

Unit 3

Relational Data Model: Relational model concepts, relational constraints, relational algebra.

SQL: SQL queries, programming using SQL. EER and ER to relational Mapping: Data base design using EER to relational language

Unit 4

Data Normalization: Functional dependencies, Normal form up to 3rd normal form.

Concurrency Control: Transaction processing, locking techniques and associated, database recovery, security and authorization. Recovery Techniques, Database Security

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

LIST OF PRACTICALS:

1. Draw E-R diagram and convert entities and relationships to relation table for a given scenario. Two assignments shall be carried out i.e. consider two different scenarios (eg. bank, college).
2. Write relational algebra queries for a given set of relations.
3. Perform the following:
   a. Viewing all databases, creating a Database, viewing all Tables in a Database
   b. Creating Tables (With and Without Constraints), Inserting/Updating/Deleting Records in table
   c. Saving (Commit) and Undoing (rollback)
4. Perform the following: a. Altering a Table, Dropping/Truncating/Renaming Tables, Backing up / Restoring a Database.
5. For a given set of relation schemes, create tables and perform the following Simple Queries, Simple Queries with Aggregate functions, Queries with Aggregate functions (group by and having clause), Queries involving- Date Functions, String Functions, Math Functions Join Queries- Inner Join, Outer Join Subqueries- With IN clause, With EXISTS clause.
6. For a given set of relation tables perform the following a. Creating Views (with and without check option), Dropping views, Selecting from a view.
7. Write a Pl/SQL program using FOR loop to insert ten rows into a database table.
8. Given the table EMPLOYEE (EmpNo, Name, Salary, Designation, DeptID) write a cursor to select the five highest paid employees from the table.
9. Illustrate how you can embed PL/SQL in a high-level host language such as C/Java And demonstrates how a banking debit transaction might be done.
10. Given an integer i write a PL/SQL procedure to insert the tuple (i, 'xxx') into a given relation.

Text Books:

1. "Fundamentals of Database Systems", Elmasri, Navathe, Third ed, Addison Wesley
2. "An introduction to Database Systems", C.J.Date, Sixth ed, Narosa Publications

Reference Books:

1. “Database system concepts”, Henry F Korth, Abraham Silberschatz, Second ed., McGraw-Hill.
2. International editions, Computer Science series(1991).

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: -Object Oriented Programming in C++

Course Code: - UCA-203

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 4 5.5

Unit 1

Introduction: Introducing Object-Oriented Approach, Relating to other paradigms (functional, data decomposition).Basic terms and ideas: Abstraction, Encapsulation, Inheritance, Polymorphism, Review of C, Difference between C and C++ - cin, cout, new, delete operators.

Unit 2

Classes and Objects: Encapsulation, information hiding, abstract data types, Object & classes, attributes, methods, C++ class declaration, State identity and behavior of an object, Constructors and destructors, instantiation of objects, Default parameter value, object types, C++ garbage collection, dynamic memory allocation, Meta class/abstract classes.

Unit 3

Inheritance and Polymorphism: Inheritance, Class hierarchy, derivation – public, private & protected, Aggregation, composition vs classification hierarchies, Polymorphism, Categorization of polymorphism techniques, Method polymorphism, Polymorphism by parameter, Operator overloading, Parametric polymorphism, function / Constructor Overloading, Overriding inheritance methods, Types of Inheritances.

Unit 4

Generic function – Template Class, Friend Function, Friend Classes, Virtual Base Class, This pointer, Nested/Local Classes, Early/Late binding.

Files and Exception Handling: Persistent objects, Streams and files, Namespaces, Exception handling, Generic Classes.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

LIST OF PRACTICALS:

1. Write a c++ program to define a class Bank Account including the following class members. Data Members:, cust name, accno, balance. Member Functions:
   - **a.** Getdata(custname,accno,balance).
   - **b.** Display(accno).
   - **c.** Deposit(acno,amt).
   - **d.** Withdraw (accno,amt) updation after checking the balance.
   - **e.** To display name & balance of all the records.
2. Write function using polymorphism to Reverse an integer, reverse a float (23.8 8.23), to reverse a string.
3. Let A be a class with member function to addmat(), B be a class with member function multimat(). Let readmat() and printmat()be two friend functions to both classes. Using the above concept write a program to find the sum and product of two matrices. (Take different matrices for addition and multiplication).
4. Write a c++ program to read an integer number and find the sum of all digits until it reduces to a single digit using constructor and default constructor.
5. Write a c++ program to create a class complex and perform the following operations using friend function: Addition of two complex numbers and Multiplication of two complex numbers.
6. Write a c++ program to calculate age of a person by passing object as arguments. Create two objects O1 and O2. O1 reads the current date in the format of DD/MM/YYYY and O2 reads the date of birth in the same format.
7. Write a c++ program to transform the amount from one account to another account using objects as function arguments.
8. Write a c++ program to store the following information in base class with members Ename,Ecode,Design and the Derived class with data members year of experience , age. Construct an object oriented database to carry out the following using single inheritance:
   - **a)** Input records
   - **b)** Display records
   - **c)** Delete record
   - **d)** Sort the records by employee name
9. Write a c++ program to store the following information in base class (name of patient, age, sex). Another base class consists of (ward number, bed number, nature of illness). The derived class consists of (date of admission). Construct an object oriented database to carry out the following using multiple inheritance:
   - **a)** Input records
   - **b)** Display records
   - **c)** Delete particular patient record
   - **d)** Sort records by patient name
10. Write a c++ program to implement multilevel inheritance:
    - **a)** College—> name_id, location,dept
    - **b)** Student—>name ,reg_no, course,age
    - **c)** DOB—>date, month, year, place
11. Write a function template to sort N numbers in ascending/descending order.
12. Write a class template to implement linked implementation of queue for operations Qinsert, Qdelete, Qempty, Qfull.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Text Books:

1. Douglas V. Hall: Microprocessors and Interfacing: Programming & Hardware: Tata McGraw-Hill.
2. Malvino& Leach: Digital Electronics & Fundamentals: Tata McGraw Hill.

Reference Books:

1. Liu &Gibbson: Microcomputer Systems the 8086/8088 Family – Architecture, Programming & Design: PHI.
2. Morris M. M.: Digital Logic and Computer Design: PHI

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Personality Development Programme
Course Code: -UPD-201

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr

2 0 0 2

UNIT 1

Personal success factors: SWOT analysis, Handling Failure, Knowing yourself, Identifying one's strength and failures, Importance Of First Impression.

UNIT 2

Managing self: Ego, Pride, Emotions, Achievements, Confidence improvement, Complex problem solving and creativity, Recognition of one's own limitations and deficiencies, Determining How Well You Perceive What's Going On Around You, Interpersonal Skills

UNIT 3

Creating Right Impression: Introduction, Basic etiquettes, Seek permission, Ask for help, Grooming, Professional Environment, Do's and Don'ts.

Text Book:

1. Hurlock, E.B (2006). Personality Development, 28th Reprint. New Delhi: Tata McGrawHill.
2. Stephen P. Robbins and Timothy A. Judge(2014), Organizational Behavior 16th Edition:Prentice Hall.
3. Andrews, Sudhir. How to Succeed at Interviews. 21st (rep.) New Delhi.Tata McGraw- Hill1988.
4. Heller, Robert.Effective leadership. Essential Manager series. Dk Publishing, 2002
5. Hindle, Tim. Reducing Stress. Essential Manager series. Dk Publishing, 2003
6. Lucas, Stephen. Art of Public Speaking. New Delhi. Tata -Mc-Graw Hill. 2001
7. Mile, D.J Power of positive thinking. Delhi. Rohan Book Company, (2004).
8. Pravesh Kumar. All about Self-Motivation. New Delhi. Goodwill Publishing House. 2005
9. Smith, B . Body Language. Delhi: Rohan Book Company. 2004

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

SEMESTER IV

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: -Introduction to Linux
Course Code: -UCA-251

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 4 5.5

UNIT 1

INSTALLING LINUX AS A SERVER: Linux and Linux Distributions; Major differences between Windows 2000 and Linux; Single Users vs Multiuser vs Network Users; Separation of the GUI and the Kernel; Domains; Active Directory

GNOME AND KDE: The History of X Windows; The Downside; Enter KDE and GNOME; About CRON About KDE ; Licensing issues; Starting X Windows and KDE; KDE Basics; The KDE Control Center; About GNOME ; Starting X Windows and GNOME; GNOME Basics; The GNOME Configuration Tool.

UNIT 2

MANAGING USERS: Home Directories; Passwords; Shells; Startup Scripts; Mail; User Databases; The / etc /passwd File; The / etc / shadow File; The / etc /group File; User Management Tools; Command-Line User Management; User LinuxConf to Manipulate Users and Groups; SetUID and SetGID Programs

UNIT 3

THE COMMAND LINE: An Introduction to BASH; Job Control; Environment Variables; Pipes; Redirection; Command-Line Shortcuts; Documentation Tools; The man Command; the text info System; File Listings; Owner ships and permissions; Listing Files; File and Directory Types; Change Ownership; Change Group; Change Mode; File Management and Manipulation; Process Manipulation; Miscellaneous Tools;

UNIT 4

BOOTING AND SHUTTING DOWN: LILO; Configuring LILO; Additional LILO options; Adding a New Kernel to Boot; Running LILO;The Steps of Booting; Enabling and disabling Services.

FILE SYSTEMS: The Make-up File Systems; Managing File Systems; Adding and Partitioning a Disk; Network File Systems; Quota Management.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

LIST OF PRACTICALS:

l. Linux installation, up gradation, Installation and removal of packages and installation of a peripheral devices (Printer) - installation steps and configuration.

2. Starting and stopping services in run level. The service command.

3. Managing process- viewing status, killing, restarting etc using ps.

4. Adding and deleting user accounts, changing passwords.

5. Changing the environment variables like PATH

6. Scheduling jobs using cron .

7. Mounting and unmounting external file systems

8. Setting the value of umash changing the permissions, changing owner and groups

9. Archiving and Backup using tar. Restoring backup

10. Compressing and uncompressing files using any one tool

Text Books:

1. A.B. Mathur and V.P. Jaggi, "Advanced Engineering Mathematics", Khanna Publishers, 1999.
2. H.K. Dass, "Advanced Engineering Mathematics", S. Chand & Co., 9th Revised Ed., 2001.

Reference Books:

1. R. K. Jain, SRK Iyengar, "Numerical Methods for Scientific & EngineeringComputation", New Age International Pvt. Ltd., 3rd Edition, 1999

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: -INTRODUCTION TO DATA SCIENCE

Course Code:- UCA-252

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 0 3.5

UNIT 1

Data Science - An Overview: Introduction to Data Science, Definition and description of Data Science, history and development of Data Science, terminologies related with Data Science, basic framework and architecture, difference between Data Science and business analytics, importance of Data Science in today's business world, primary components of Data Science, users of Data Science and its hierarchy, overview of different Data Science techniques, challenges and opportunities in business analytics, different industrial application of Data Science techniques

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UNIT 2

Mathematics and Statistics in Data Science: Role of mathematics in Data Science, importance of probability and statistics in Data Science, important types of statistical measures in Data Science : Descriptive, Predictive and prescriptive statistics, introduction to statistical inference and its usage in Data Science, application of statistical techniques in Data Science, overview of linear algebra : matrix and vector theory, role of linear algebra in Data Science, exploratory data analysis and visualization techniques, difference between exploratory and descriptive statistics, EDA and visualization as key component of Data Science.

UNIT 3

Machine Learning in Data Science: Role of machine learning in Data Science, different types ofmachine learning techniques and its broad scope in Data Science: Supervised, unsupervised, reinforcement and deep learning, difference between different machine learning techniques, brief introduction to machine learning algorithms, importance of machine learning in today's business, difference between machine learning classification and prediction.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

UNIT 4

Computers in Data Science: Role of computer science in Data Science, various components of computer science being used for Data Science, role of relation data base systems in Data Science: SQL, NoSQL, role of data warehousing in Data Science, terms related with data warehousing techniques, importance of operating concepts and memory management.

Data Science Project Management: Data Science project framework, execution flow of a Data Science project, various components of Data Science projects, stakeholders of Data Science project, industry use cases of Data Science implementation, challenges and scope of Data Science project management, process evaluation model, comparison of Data Science project methods, improvement in success of Data Science project models

Text Books:

1. Data Science from Scratch: First Principles with Python 1st Edition by JoelGrus.
2. Principles of Data Science by SinanOzdemir, (2016) PACKT.
3. Data Science For Dummies by Lillian Pierson (2015)

Reference Books:

1. Data Science for Business: What You Need to Know about Data Mining and Data-Analytic Thinking by Foster Provost, Tom Fawcett
2. Data Smart: Using Data Science to Transform Information into Insight 1st Edition by John W. Foreman. (2015) Wiley Publication

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: -Computer Networks

Course Code:- UCA-253

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 0 3.5

UNIT 1

Data communications concepts: Digital and analog parallel and serial synchronous and asynchronous, simplex, half duplex, full duplex, multiplexing.

Communication channels: Wired transmissions: Telephone lines, leased lines, switch line, coaxial cables-base band, broadband, optical fiber transmission.

UNIT 2

Wireless transmission: Microwave transmission, infrared transmission, laser transmission, radio transmission, and satellite transmission.

Communication switching techniques; Circuit switching, message switching, packet switching.

UNIT 3

Network reference models; Network topologies, OSI references model, TCP/IP reference model, comparison of OSI and TCI reference model.

UNIT 4

Data link layer design issue: Services provided to the network layer, framing, error control, flow control HDLC, SDLC, data link layer in the internet (SLIP, PPP).

MAC sub layer: CSMA/CD, IEEE standards, FDM, TDM, CDMA.

The Network Layer: Design Issues, Routing Algorithms: Optimality principled, shortest path routing,Concept of Internet Working.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Text Books:

1. Tannenbaum, Andrew Computer Networks (PHI)
2. S.K. Bansandra Computer Today (Galgotia)

Reference Books:

1. Black, Ullysee Data Communication System (PHI)
2. Stalling Data and Computer Communications (PHI)

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - System Analysis and Design
Course Code: - UCA-254

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 0 3.5

UNIT 1

System Concepts: Definition, characteristics, elements & types of system.
System development life cycle: Recognition of need: Feasibility study, system analysis-introduction.

UNIT 2

Information collection, interviews, questionnaires, observation, record searching and document analysis, analysis tools, data flow diagram, data dictionary, decision tree, structured English and decision table.

UNIT 3

System Design: The process and stages of systems design, input/output and file design;

UNIT 4
System Implementation: System implementation, system testing, implementation process and implementation methods; system maintenance.

Text Books:

1.Awad Elias N. System analysis and design (Galgotia)

Recommended Books:

1.Sen James A. Analysis and design of information system (Tata McGraw)

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: -Introduction to Python

Course Code:- UCA-255

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 4 5.5

UNIT 1

Introduction to Python, Setting up the environment, Installing Python, Running python program, Python's execution model, Guidelines on how to write good, The Python culture, A note on the IDEs.
Built-in Data Types: Numbers, Immutable sequences, Mutable sequences, Set types, Mapping types – dictionaries, The collections module, Final considerations
Iterating and Making Decisions: Conditional programming, Looping, Putting this all together.

UNIT 2

Advanced Concepts: Functions, the Building Blocks of Code: Use of functions, Scopes and name resolution, Input parameters, Return values, Recursive functions, Anonymous functions, Function attributes, Built-in functions, importing objects.
Lists and Nested List: Introduction, accessing list, Operations, working with lists, Library Functionand Methods with Lists**:** Introduction, Accessing tuples.
Dictionaries: Introduction, accessing values in dictionaries, Working with dictionaries,
OOP, Decorators, and Iterators: Decorators, Class and object namespaces, Attribute shadowing, initializing an instance, Accessing a base class, Multiple inheritance, Static and class methods, Private methods and name mangling, The property decorator, Operator overloading, Polymorphism.

UNIT 3

Exception Handling: Definition Exception, Exception handling Except clause, Try finally clause. User Defined Exceptions. Static and Final Keyword, Access Modifiers and specifiers, scope of a class.
Modules: Importing module, Math module, Random module.

UNIT 4

Web Development: The Edges – GUIs and Scripts: Scripting-The imports, Parsing Arguments, The business logic, GUI application- The import, The layout logic, The business logic, The tkinter.tixmodule,The

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

turtle module, wxPython, PyQt, and PyGTK, The principle of least astonishment, Threading considerations. Web Development Done Right: Django design philosophy, The Django URL dispatcher, Setting up Django, Adding the Entry model.

Cloud Native Python

Building Microservices in Python: Modeling microservices, Building microservices, Testing the RESTful API. Building a Web Application in Python: Getting started with applications, working with Observables and AJAX, Binding data for the adduser template.

LIST OF PRACTICAL

1. Write a python code to find given number is prime or not
2. Write a python code to find LCM and GCM of a given list
3. Write a python code to find mean and standard deviation of a given list of numbers
4. Write a python code to add and delete element from a dictionary using functions
5. Write a python code to print 10 student details using class and lists
6. Write a python code to find student from a given list using class
7. Write a python code to inherit employee class to student class
8. Write a python code to build simple GUI calculator
9. Write a python code to build web page with student registration form
10. Write a python code to build web pages with sign-in and sing-up forms
11. Write a python code to build Rest api for product
12. Write a python code to build Ajax enabled web application for product

Text Books:

1. "Python in a Nutshell" by Alex Martelli, Oreilly Publication.
2. Think Python" by Allen Downey, Green Tea Press

Reference Books:

1. Core Python Programming by Wesley J. Chun, Pearson Education.
2. An Introduction to Python by Guido Van Russom, Fred L.Drake, Network Theory Limited.
3. Beginning Python: From Novice To Professional By Magnus Lie Hetland, Second

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Personality Development Programme
Course Code: -UPD-251

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr

2 0 0 2

UNIT 1

Leadership Skills: Leader: Introduction, Roles, Responsibilities, Vision and mission, Empowering and delegation, motivating others, Organizational skills, Teambuilding, Organizing and conducting meeting, Decision making, giving support, Coaching /guiding, Mentoring and counseling, Appraisal, Feedback, Handling Conflicts, Power and politics.

UNIT 2

Public Speaking : Self-esteem, Thinking skills, Confidence, Critical thinking, Personal development, Communication skills, Social connections, Personal satisfaction, Expand your professional network

UNIT 3

Newspaper Report Writing: Committee reports and news-paper reports, Two topics should be given in the examination and students should attempt one out of two.

Text Book:

1. Hurlock, E.B (2006). Personality Development, 28th Reprint. New Delhi: Tata McGrawHill.
2. Stephen P. Robbins and Timothy A. Judge(2014), Organizational Behavior 16th Edition:Prentice Hall.
3. Andrews, Sudhir. How to Succeed at Interviews. 21st (rep.) New Delhi.Tata McGraw- Hill1988.
4. Heller, Robert.Effective leadership. Essential Manager series. Dk Publishing, 2002
5. Hindle, Tim. Reducing Stress. Essential Manager series. Dk Publishing, 2003
6. Lucas, Stephen. Art of Public Speaking. New Delhi. Tata -Mc-Graw Hill. 2001
7. Mile, D.J Power of positive thinking. Delhi. Rohan Book Company, (2004).
8. Pravesh Kumar. All about Self-Motivation. New Delhi. Goodwill Publishing House. 2005
9. Smith, B . Body Language. Delhi: Rohan Book Company. 2004

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

SEMESTER V

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Artificial Intelligence and Machine Learning
Course Code: - UCA-301

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr

3 1 4 5.5

UNIT 1

Introduction to AI: Definition of Artificial Intelligence (AI), Problems, Techniques, Architecture of AI machines, logic family, Classification of logic.
Introduction to LISP: List manipulations, Functions, Predicates, Conditionals, Input, output local variables. Iteration, Recursion, Lists, Arrays.
Problems Spaces & Search: Defining a problem as a space Search, Production systems and its Architecture, Problem characteristics, Production system characteristics.

UNIT 2

Heuristic Search Techniques: Generate and test, Hill Climbing, Best – first search (A*), Problem Reduction (AO*), Constraint satisfaction, Means End Analysis.
Game Playing And Search: Introduction Min-Max Algorithm, Alpha-beta cut off. Examples of games.
Knowledge representation, Knowledge representation using Predicate logic, Introduction to predicate calculus, Resolution, use of predicate calculus, Knowledge representation using other logic-Structured representation of knowledge.

UNIT 3

Introduction To Machine Learning: Examples of Machine Learning Problems, Structure of Learning, learning versus Designing, Training versus Testing, Characteristics of Machine learning tasks, Predictive and descriptive tasks, Machine learning Models: Geometric Models, Logical Models, Probabilistic Models. Features: Feature types, Feature Construction and Transformation, Feature Selection. Classification: Binary Classification- Assessing Classification performance, Class probability Estimation- Assessing class probability Estimates, Multiclass Classification. Regression: Assessing performance of Regression- Error measures, Over fitting- Catalysts for Over fitting, Case study of Polynomial Regression. Theory of Generalization: Effective number of hypothesis, Bounding the Growth function, VC Dimensions, Regularization theory. Support Vector Machines, Soft Margin SVM.

UNIT 4

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Probabilistic Models: Normal Distribution and Its Geometric Interpretations, Naïve Bayes Classifier, Discriminative learning with Maximum likelihood, Probabilistic Models with Hidden variables: Estimation-Maximization Methods, Gaussian Mixtures, and Compression based Models. Trends In Machine Learning: Model and Symbols- Bagging and Boosting, Multitask learning, Online learning and Sequence Prediction, Data Streams and Active Learning, Deep Learning, Reinforcement Learning.

LIST OF PRACTICALS:

1. Write a program to find a factorial of a number.
2. Write a program to the maximum of two numbers.
3. Write a program to illustrate the use of predicate not/fail.
4. To find the various relationships of a family.
5. Write a program for hill climbing algorithm
6. Implement Naïve Bayes Classifier Algorithm.
7. Implement K-means Clustering Algorithm.
8. Implement Support Vector Machine.

Text Books:

1. Introduction to Artificial Intelligence & Expert System by D.W. Patterson, Prentice hall of India, New Delhi
2. Sameer Dhanrajani, AI and Analytics, Accelerating Business Decisions, John Wiley & Sons.
3. Patrick Naughten & Herbert Schildt, " The Complete Reference Java ." Tata McGraw Hill.
4. Mitchell T.M., Machine Learning, McGraw Hill (1997).

Reference Books:

1. Artificial Intelligence & Soft Computing for Beginners, 3rd Edition-2018, by Anindita Das, Shroff Publisher.
2. Alpaydin E., Introduction to Machine Learning, MIT Press (2010).

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Object Oriented Programming with Java
Course Code: - UCA-302

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L	T	P	Cr
3	1	4	5.5

UNIT 1

Introduction To Object Oriented Programming: Data Abstraction, Encapsulation, Inheritance (Public, Protected And Private), Polymorphism, Information Hiding. JAVA Virtual Machine, JDK

Java Elements: Data Types, Literal and Variables, Operators–Arithmetic, Bit-wise, Relational, Boolean Logical, Assignment, The '?' Operator, Operator Precedence, Control Statements–Selection (if, switch), Iteration Statements (while, do-while, for) Jump Statements (break, continue, return), Arrays (One-dimensional, Multi-Dimensional).

Introducing Classes: Class Fundamentals, Declaring Objects, Methods, Constructors, 'This' Keyword, Over loading Methods.

UNIT 2

Inheritance: Inheritance Basics, Protected Members, Method Overriding, Multiple Inheritance, Functions.

Packages: Importing Inbuilt Packages and sub Packages, Creation of User-Defined Packages and sub-packages, importing user defined packages, Hiding a class in the package.

Exception Handling: Fundamental, Exception Types, Uncaught Exceptions, Try And Catch, Dealing With Exceptions (try, throw, throws, finally). User-Defined Exceptions.

UNIT 3

Multithreading–Java Thread Model, The Main Thread, Creating a Thread, Creating Multiple Threads, Thread Priorities, Synchronization, Inter-thread Communication, Multithreading.

Java Applets: Applet Basics, The Applet Class, Applet Architecture, An Applet Skeleton, Applet Display Methods, Layouts (Flow, Grid)

Event Handling: Delegation Event Model, Event Classes and Interfaces, Mouse Events, **Keyboard Events**: Coding on Events, Adaptor Classes, AWT Classes and controls.

UNIT 4

JDBC Basics - Java Database Connectivity: JDBC Oracle Connection and Prepared Statement, SQL Queries through JAVA

Swings: JApplet, JFrame, JComponent, JTables, Tabbed Panes, Scroll Panes.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Servlets: Lifecycle; Servlet Parameters, Handling HTTP Request and Response, Using Cookies, Session tracking.

JAVA Beans: Advantage of Beans, Bean Properties and Methods.

LIST OF PRACTICALS:

1. To write a java program to illustrate the multilevel inheritance using database creation as an example.
2. To write a java program to illustrate the dynamic memory dispatch and method overriding concept with a simple example.
3. Write a java program that implements a multi-thread application that has three threads. First thread generates random integer every 1 second and if the value is even, second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of cube of the number.
4. a. Develop an applet that displays a simple message.
   b. Develop an applet that receives an integer in one text field and computes its factorial value and returns it in another text field, when the button named ―compute‖ is clicked.
5. Write a program that creates a user interface to perform integer division. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 and Num2 were not integers, the program would throw a Number Format Exception. If Num2 were zero, the program would throw an Arithmetic Exception Display the exception in a message dialog box.
6. Write a Java program to read copy content of one file to other by handling all file related exceptions.
7. Develop simple calculator using Swings.

Text Books:

1. Patrick Naughten & Herbert Schildt, " The Complete Reference Java ." Tata McGraw Hill.

Reference Books:

1. Gilbert, Stephan D. And William B. Hccarthy, " Object Oriented Programming In Java ", 1997, The Waite Group Press.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name:- Computer Organization & Architecture
Course Code:- UCA-303

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr

3 1 0 3.5

UNIT 1

Register Transfer and Micro-operations: Register Transfer Language, Register Transfer, Bus and Memory Transfers, Arithmetic Micro-operations, Logic Micro-operations, Shift Micro operations, Arithmetic logic shift unit.
Basic Computer Organizations and Design: Instruction Codes, Computer Registers, Computer Instructions, Timing and Control.

UNIT 2

Basic Computer Organizations and Design: Instruction Cycle, Memory-Reference Instructions, Register reference instructions, Input - Output Instructions, Design of Accumulator Logic Shift Unit , Central Processing Unit: Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes.

UNIT 3

Computer Arithmetic: Introduction, Multiplication Algorithms, Division Algorithms, for fixed point-members.
Input-Output Organization: Peripheral Devices, Input-Output Interfaces, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access (DMA)

UNIT 4

Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory, Memory Management Hardware

Text Books:

1. Morris Mano, Computer System Architecture, 3rd Edition, Prentice-Hall of India Private Limited, 1999.
2. WIliam Stallings, Computer Organization and Architecture, 4th Edition, Prentice Hall of India Private Limited, 2001.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Reference Books:

1. Harry & Jordan, Computer Systems Design & Architecture, Addison Wesley, Delhi, 2000.
2. Malvino, "Digital Computer Electronics: An Introduction to Microcomputers" ,McGraw Hill, 1993.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Operation Research
Course Code: - UMA-321

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 0 3.5

UNIT 1

Origin & development of O.R., Nature & Characteristics features of O.R., Models & Modeling in Operation Research. Methodology of O.R., General methods for solving O.R. Models, O.R. & Decision making, Application, Use & Limitations of O.R.

UNIT 2

Linear Programming: formulation, Graphical, Big Method & Simplex Method, Duality in L.P.: Conversion of Primal to Dual only.
Transportation Problems: Test for Optimality, Degeneracy in Transportation Problems. Unbalanced Transportation.

UNIT 3

Assignment Problems, Traveling Salesman Problem.
Decision Making: Decision Making Environment, Decision under uncertainty, Decision under risk, Decision tree Analysis.

UNIT 4
Integer Programming and Dynamic Programming: Concept and Advantages only.

Text Books:

1. Kanti Sawrup, P.K. Gupta and Manmohan, "Operations Research", Sultan Chand & Sons,Seventh Ed.1994.

Reference Books :

1. S.D. Sharma, Operations Research", Kedar Nath Ram Nath and Co. Meerut, Tenth Ed. 1992.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Personality Development Programme
Course Code: -UPD-301

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr

2 0 0 2

UNIT 1

Personality Development: Types of personality, Personality analysis through body language and individual habits, Physical aspects of personality, Emotional stability, Memory training, Mind and mental development, Mental blocks, Manners and art of living.

UNIT 2

Interpersonal skills: Communication, Courtesy, Flexibility, Integrity, Attitude, Professionalism, Team work, Responsibility.

UNIT 3

Strong Work Ethics: Elements, Integrity, Emphasis on Quality work, Values and trust

UNIT 4

Business Etiquette: Workplace etiquette, Table manners and meal etiquette, Professionalism, Communication etiquette, Meetings etiquette.

Text Book:

1. Hurlock, E.B (2006). Personality Development, 28th Reprint. New Delhi: Tata McGrawHill.
2. Stephen P. Robbins and Timothy A. Judge(2014), Organizational Behavior 16th Edition:Prentice Hall.
3. Andrews, Sudhir. How to Succeed at Interviews. 21st (rep.) New Delhi.Tata McGraw- Hill1988.
4. Heller, Robert.Effective leadership. Essential Manager series. Dk Publishing, 2002
5. Hindle, Tim. Reducing Stress. Essential Manager series. Dk Publishing, 2003
6. Lucas, Stephen. Art of Public Speaking. New Delhi. Tata -Mc-Graw Hill. 2001

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

7. Mile, D.J Power of positive thinking. Delhi. Rohan Book Company, (2004).
8. Pravesh Kumar. All about Self-Motivation. New Delhi. Goodwill Publishing House. 2005
9. Smith, B . Body Language. Delhi: Rohan Book Company. 2004

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Open Elective-1

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Human Ethics and Values
Course Code: - UMG-476

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 0 3.5

UNIT 1

Introduction –Need, Basic Guidelines and Content: Understanding the need, Basic guidelines, Content and process for value Education Self Exploration – What is it? – its content and process, Natural Acceptance and Experiential Validation – as the mechanism for self-explanation, Continuous Happiness and Prosperity – A look at basic Human Aspirations

UNIT 2

Process for Value Education: Right Understanding, Relationship and Physical Facilities, Basic requirements for fulfillment of aspirations of every human being with their correct priority, Understanding Happiness and prosperity correctly, A critical appraisal of the current scenario Method to fulfill the above human aspirations, Understanding and living in harmony at various levels

UNIT 3

Understanding Harmony in the Human Being: Understanding human being as a co-existence of the sentient 'I' and the material 'Body' , Understanding the needs of Self ('I') and 'Body' – Sukh and Suvidh, Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer)

UNIT 4

Harmony in Myself: Understanding the characteristics and activities of 'I' and harmony in 'I, Understanding the harmony of I with the Body, Sanyam and Swasthya, Correct appraisal of Physical needs, Meaning of Prosperity in detail, Programs to ensure Sanyam and Swasthya, Practice exercises and Case Studies will be taken up in Practice Sessions relationship.

Text Book:

1. R R Gaur, R,Sangal, G.P Bagaria, 2009, A Foundation Course in value Education(English)
2. Pradeep Kumar Ramancharla, 2013, A foundation course in value education (Telugu)

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Reference Books:

1. R R Gaur, R Sangal G P Bagaria, 2009, Teacher's Manual (English)
2. Pradeep Kumar Ramancharla, 2013, Teacher's Manual (Telugu)

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Biomedical Instrumentation
Course Code:-UEC-462

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

LT P Cr.

3 1 0 3.5

UNIT 1

Introduction to Biomedical Signals Tasks in Biomedical Signal Processing, Computer Aided Diagnosis, Examples of Biomedical signals: ECG, EEG, EMG.
Review of linear systems: Fourier Transform and Time Frequency Analysis (Wavelet) of biomedical signals, Processing of Random & Stochastic signals, spectral estimation, Properties and effects of noise in biomedical instruments, Filtering in biomedical instruments

UNIT 2

Cardio-logical Signal Processing Pre-processing, QRS Detection Methods, Rhythm analysis, Arrhythmia Detection Algorithms, Automated ECG Analysis, ECG Pattern Recognition, Heart rate variability analysis.

UNIT 3

Adaptive Noise, Cancelling Principles of Adaptive Noise Cancelling, Adaptive Noise Cancelling with the LMS adaptation, Algorithm, Noise Cancelling Method to Enhance ECG Monitoring, Fetal ECG Monitoring.

UNIT 4

Neurological Signal Processing Modeling of EEG Signals, Detection of spikes and spindles, Detection of Alpha, Beta and Gamma Waves, Auto Regressive (A.R.) modeling of seizure EEG, Sleep Stage analysis, Inverse Filtering, Least squares and polynomial modeling.

Text Books:

1 D.C.Reddy,―Biomedical Signal Processing: Principles and techniques‖, Tata McGraw Hill, New Delhi, 2005.
2 Willis J Tompkins, Biomedical Signal Processing, Prentice Hall, 1993.
3 R. Rangayan, ―Biomedical Signal Analysis‖, Wiley 2002.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Reference Books:

1 Bruce, ―Biomedical Signal Processing & Signal Modeling,‖ Wiley, 2001.
2 K. Najarian and R. Splinter, ―Biomedical Signal and Image Processing‖, Second Edition, The CRC Press.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Television Engineering
Course Code: -UEC-463

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L	T	P	Cr.
3	1	0	3.5

UNIT 1

Principles Of Tv:

Picture elements, Theory of line, frame and field frequencies Blanking, Synchronization, interfacing, resolution, vertical resolution, horizontal resolution and video bandwidth, Use of AM in video and FM in audio, Block Diagram of TV Transmitter and Receiver, Construction of composite video signal.

UNIT 2

Television Cameras And Picture Tubes:

Spectrum of light and eye response, Image orthicon, plumbicon, vidicon (Principles of operation, Construction and working),TV picture tube details, Modulation system used for sound and picture, VSB working, TV transmitter.

UNIT 3

Tv Receiver:

Block Diagram of TV Receiver, Tuner Circuits, Choice of IF amplifier, A.M. & F.M. detectors, Receiver sweep circuits, Video Frequency amplifier, synch. Pulse representation, deflection circuits.

UNIT 4

Colour Tv: Hue, Saturation and luminance, Luminance and colour signal generation, Types of colour picture tubes (Basic principles and construction), colour subcarrier and colour triangle, NTPC, PAL, SECAM systems, Colour TV transmission & reception, Block Diagram of digital TV with merits.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Text Books

1. Monochrome &Colour TV: R.R Gulati: New Age Pub.

Reference Books:

1. Basic Television: G.M Grob : McGraw Hills
2. T.V. Engg : Dhake : Tata McGraw Hills

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Energy Management
Course Code: - UEE-403

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 0 3.5

UNIT 1

Introduction: Review of different Energy Sources, Concept of Energy Management, Supply side management, Demand side management, Energy crisis, Energy Efficiency, Energy Scenario in India audits Conservation program, Computer Aided Energy Management System, Energy Conservation :Energy Conservation needs and Objectives, Energy Conservation in Domestic sector, Energy Conservation in Industrial sector.

UNIT 2

Energy Audit: Need For Energy Audit, Types of Energy Audits, National Energy Plan and its impact on Energy Conservation, Energy audit team, Energy Audit Reporting format, Energy Audit Instruments.

UNIT 3

Energy Efficient Technology: Life-cycle assessment, Energy efficient Motors, BIS Specifications for Energy Efficient Motors, Energy Efficient lighting sources, Power Quality .

UNIT 4

Energy Audits Practice: Energy Audits of building systems, Electrical systems, Maintenance and Energy Audits.

Text Books

1. Handbook of Energy Audits by Albert Thuman – Fairman Press Inc.
2. Energy basis for man and nature by Howard T.Odum & Elisbeth C.Odum.

Reference Books:

1. Energy Management by Umesh Rathore, Kataria Publications

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Non Conventional Electrical Power Generation
Course Code:-UEE-452

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 0 3.5

UNIT 1

Introduction: Energy situation and renewable energy sources: Global Energy scenario, World Energy consumption, Energy in developing countries, Fire wood crisis, Indian energy scene, Non-conventional renewable energy sources, Potential of renewable energy sources

UNIT 2

Wind Energy: Origin of wind, Basic principle of wind energy, Conversion, Component of wind energy conversion system, Type of windmills, Wind electrical Generations in India.

Solar Energy: Introduction, Solar radiation, Solar energy collector, Solar thermal power generation, Low temperature application of solar energy.

UNIT 3

Geo-thermal Power Plants: Introduction, Geothermal sources, Comparison of Geo thermal energy with other energy forms, Development of Geothermal power in India.

Physical and thermochemical methods of bioconversion: Introduction, Biomass definition and potential, Physical method of bio conversion, Thermo chemical methods.

UNIT 4

Wave, Tidal and OTEC: Introduction, Basic principle of tidal power, Wave energy, Component of Tidal power plant, Ocean Thermal Energy Conversions, Advantages and disadvantages of tidal power generation.

Small and Mini Hydropower System: Introduction, Site development, Generation and electrical equipment, System of regulation of Hydroelectric Power in India.

Text Books:

1. Renewable Energy Sources by Maheshwar Dyal.
2. Small and mini Hydropower system by Tata Mc Graw Hill.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

3. An Introduction to power plant technology by G.D.Rai.

Reference Books:

1. Solar Energy by Suhas.P.Sukhatma, Tata Mc Graw Hill.
2. Modern Power Plant Engg. by Joel

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Advance Construction Techniques and Project Management
Course Code:-UCE-312

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 0 3.5

UNIT 1

Introduction: Materials - Modular co-ordination, Standardization and tolerances-system for prefabrication.Pre-cast concrete manufacturing techniques, Moulds –construction design, maintenance and repair.

UNIT 2

Construction Techniques: Pre-casting techniques: Planning, analysis and design considerations. Handling techniques: Transportation Storage and erection of structures.

UNIT 3

CPM: Introduction: Network techniques, Work break down, Classification of activities, Rules for developing networks, Network development-logic of network, Allocation of time to various activity, Fulkerson's rule for numbering events, Network analysis, Determination of project schedules, Critical path Ladder construction, Float in activities, Shared float, Updating, Resources allocation, Sources smoothing and resources leveling.

PERT: Probability concept in network, Optimistic time, Pessimistic time, Most likely time, Lapsed time, Deviation, Variance, Standard deviation, Slack critical path, Probability of achieving completion time, Central limit theorem.

UNIT 4

Cost-Time Analysis: Cost versus time, Direct cost, Indirect cost, Total project cost and optimum duration. Contracting the network for cost optimization, Steps in time cost optimization, Illustrative examples.

Inspection & Quality Control: Introduction, Principles of inspection, Enforcement of specifications, Stages in inspection , Quality control and testing of structures, Statistical analysis.

Text Books:

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

1 Krishnaraju, N., Advanced Concrete Technology, CBS Publishers, 1985.
2 Nevile, A.M., Concrete Technology, Prentice Hall, Newyork, 1985.

Reference Books:

1 Construction Planning &Management by P.S. Gehlot&B.M.Dhir.
2 PERT & CPM -Principles & Applications by L.S.Srinath

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

SEMESTER VI

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: -Software Engineering

Course Code:- UCA-351

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 0 3.5

UNIT 1

Introduction: Software Crisis, Software Processes & Characteristics, Software life cycle models, Waterfall, Prototype, Evolutionary and Spiral Models

Software Requirements analysis & specifications: Requirement engineering, requirement elicitation techniques like FAST, QFD, requirements analysis using DFD, Data dictionaries & ER Diagrams, Requirement's documentation, Nature of SRS, Characteristics & organization of SRS.

UNIT 2

Software Project Management Concepts: The Management spectrum, The People The Problem, The Process Software Project Planning: Size Estimation like lines of Code & Function Count, Cost Estimation Models, COCOMO, Risk Management.

UNIT 3

Software Design: Cohesion & Coupling, Classification of Cohesiveness & Coupling, Function Oriented Design, Object Oriented Design

Software Metrics: Software measurements: What & Why, Token Count, Halstead Software Science Measures, Design Metrics, Data Structure Metrics.

UNIT 4

Software Testing: Testing Process, Design of Test Cases, Types of Testing, Functional Testing, Structural Testing, Test Activities, Unit Testing, Integration Testing and System Testing. Debugging Activities
Software Maintenance: Management of Maintenance, Maintenance Process, Reverse Engineering, Software Re-engineering, Configuration Management, Documentation.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Text Books:

1. K. K. Aggarwal & Yogesh Singh, "Software Engineering", 2nd Ed., New Age International, 2005.
2. R. S. Pressman, "Software Engineering – A practitioner's approach", 5th Ed., McGraw Hill Int. Ed., 2001.
3. Stephen R. Schach, "Classical & Object Oriented Software Engineering", IRWIN,1996.

Reference Books :

1. James Peter, W. Pedrycz, "Software Engineering: An Engineering Approach", John Wiley & Sons.
2. I. Sommerville, "Software Engineering", Addison Wesley, 2002.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: -Cyber Security

Course Code: - UCA-352

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

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3	1	0	3.5

UNIT 1

Systems Vulnerability: Scanning Overview, Open Port / Service Identification, Banner /Version Check, Traffic Probe, Vulnerability Probe, Vulnerability Examples.

UNIT 2

Network Defense tools: Firewalls and Packet Filters,: Overview, Protects a Network, Packet Characteristic to Filter, Stateless Vs Stateful Firewalls, Network Address Translation (NAT) and Port Forwarding.

UNIT 3

Web Application Tools: Scanning for web vulnerabilities tools: Nikto, W3af, HTTP utilities - Curl, Open SSL and Stunnel, Application Inspection tools – Zed Attack Proxy.

UNIT 4

Cyber Crime Introduction to Cyber Crime and law's , Types of Cybercrime, Ethical Hacking, Cyberspace and Criminal Behavior.

Cyber Investigation Introduction to Cyber Crime Investigation, Firewalls and Packet Filters, password Cracking.

Text Book

1. Marjie T. Britz - Computer Forensics and Cyber Crime: An Introduction – Pearson, 2013
2. Chwan-Hwa (John) Wu,J. David Irwin - Introduction to Computer Networks and Cybersecurity - CRC Press, 2013

Reference Books

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

1. Bill Nelson, Amelia Phillips, Christopher Steuart - Guide to Computer Forensics and Investigations - cengage Learning, 2013

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: -Computer Graphics

Course Code:- UCA-353

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 4 5.5

UNIT 1

Introduction to Computer Graphics: Computer Graphics and their applications. Overview of graphics system.
Display Devices: CRT Monitors (Random - Scan and Raster Scan, DVST, Plasma – Panel Display, LED and LCD Monitors.

UNIT 2

Elementary Drawing: Points and various line drawing Algorithms and their comparisons efficiency contact. Cycle generating algorithms. Other objects like ellipses, arcs, section spirits.
Two Dimensional Transformations: Basic Transformations. Ceiling, Translation, Rotation, Deflection, Shrew Matrix representation of Basic transformations and homogenous coordinates.

UNIT 3

Composite Transformations. Windowing and clipping. Windowing concedes, clipping and its algorithms. Window-to-view port transformations. Three Dimensional concepts. 3 D Coordinate Systems. 3 transformations. translation, scaling, rotation, projections, parallel projections. Perspective projection.

UNIT 4

Implementation in C: C programming for drawing 2 D objects – line rectangle, arc., circle and ellipse. C Programming for 2-D and 3-D transformations which include translation, rotation, scaling, reflection and shear.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

LIST OF PRACTICALS:

1. To write a C-program for displaying text in different sizes, different colors and different font styles by using graphics functions.
2. To write a C-program for creating simple two-dimensional shape of house, car, fish, man using lines, circles etc.
3. Write a C-program for performing the basic 2D transformations such as translation, Scaling, Rotation, shearing and reflection for a given 2D object
4. Write a C-program for generating a curve for a given set of control points
5. Write C-programs for designing simple animations using transformations
6. Write a Program to print your name in Hindi script on console output in C.
7. Write a program of Translation, Rotation, and Scaling using Composite Transformation
8. Program to implement Standard Perspective Projection in 3-Dimensions.

Text Books:

1. Dhamdhere, "Systems Programming and operating systems", TMH, 1996.
2. David F Rogers “Procedural Elements for Computer Graphics”
3. Foley, Vandam, Feiner & Huges “Computer Graphics Principles and Practice”

Reference Books :

1. Donovan, "System Programming". (McGraw-Hill), 1991.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Personality Development Programme
Course Code: -UPD-351

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr

2 0 0 2

UNIT 1

Accountability: Drive for results, Honesty, Integrity, Ability to change, Clear Vision, Direction, Problem Solving

UNIT 2

Problem Solving Resilience: Active Listening, Research, Creativity, Brain storm the solution, Being Connected, Flexible

UNIT 3

Interview Readiness: Understand the importance of a first impression. Understand that personal appearance includes dress, body art, and personal care. Behavioral, conceptual and futuristic questions. Understand effective communication and appropriate interaction. Statement of purpose.

UNIT 4

Mock Interviews: Doing a mock interview is a great way to practice for an actual job interview. It gives you an idea of what you need to do and sets your expectations. Practice so that you will see areas where you can improve. By the time the real job interview arrives, you're well-prepared

Text Book:

1. Hurlock, E.B (2006). Personality Development, 28th Reprint. New Delhi: Tata McGrawHill.
2. Stephen P. Robbins and Timothy A. Judge(2014), Organizational Behavior 16th Edition:Prentice Hall.
3. Andrews, Sudhir. How to Succeed at Interviews. 21st (rep.) New Delhi.Tata McGraw- Hill1988.
4. Heller, Robert.Effective leadership. Essential Manager series. Dk Publishing, 2002
5. Hindle, Tim. Reducing Stress. Essential Manager series. Dk Publishing, 2003
6. Lucas, Stephen. Art of Public Speaking. New Delhi. Tata -Mc-Graw Hill. 2001

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

7. Mile, D.J Power of positive thinking. Delhi. Rohan Book Company, (2004).
8. Pravesh Kumar. All about Self-Motivation. New Delhi. Goodwill Publishing House. 2005
9. Smith, B . Body Language. Delhi: Rohan Book Company. 2004

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Departmental Elective - 1

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Block Chain
Course Code: - UCA-391

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr

3 1 0 3.5

UNIT 1

Basics: Distributed Database, Two General Problem, Byzantine General problem and Fault Tolerance, Hadoop Distributed File System, Distributed Hash Table, ASIC resistance, Turing Complete. Cryptography: Hash function, Digital Signature - ECDSA, Memory Hard Algorithm Zero Knowledge Proof.

UNIT 2

Blockchain:Introduction,Advantageoverconventionaldistributeddatabase,BlockchainNetwork,MiningMechanism, Distributed Consensus, Merkle Patricia Tree, Gas Limit, Transactions and Fee, Anonymity, Reward, Chain Policy, Life of Block chain application, Soft & HardFork, Private and Public blockchain. Distributed Consensus: Nakamo to consensus, Proof of Work, Proof of Stake, Proof of Burn, Difficult Level, Sybil Attack, Energy utilization and alternate.

UNIT 3

Crypto currency: History, Distributed Ledger ,Bit coin protocols-Mining strategy and rewards, Ethereal-Construction, DAO, Smart Contract, GHOST, Vulnerability ,Attacks, Side chain, Name coin, Crypto currency Regulation: Stakeholders, Roots of Bitcoin, Legal Aspects-Cryto currency Exchange, Black Market and Global Economy.

UNIT 4

Block chain Applications: Internet of Things, Medical Record Management System, Domain Name Service and future of Block Chain.

Text Books:

1. Dhamdhere, "Systems Programming and operating systems", TMH, 1996.

Reference Books:

1. Donovan, "System Programming". (McGraw-Hill), 1991.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Mobile Computing

Course Code :- UCA-392

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr

3 1 0 3.5

UNIT 1

Mobile Database: Introduction, Fully Connected Information Space, Types of Mobility.
Fundamentals of Database Technology: Conventional Database, Architecture, Database Processing, Serialization of Transaction, Advanced Transaction Model.

UNIT 2

Data Processing and Mobility: Introduction, Effect of mobility on the management of data, Data Categorization, Location dependent data distribution.

UNIT 3

Transaction management in Mobile Database systems: Mobile Database systems, Transaction execution in MDS, Mobile Transaction Model, Execution model on ACID transaction framework, pre-write transaction execution model, data consistency in intermittent connectivity.

UNIT4

Mobile database Recovery: Introduction, Log Management in Mobile Database systems, Mobile database recovery scheme.

Text Books:

1. Mobile Database Systems By Kumar Vijay, John Willy &Sons

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Deep Learning
Course Code:- UCA-393

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr

3 1 0 3.5

UNIT 1

Basics of Deep leaning Deep learning architectures: Convolutional Neural Networks : Neurons in Human Vision-The Shortcomings of Feature Selection-Vanilla Deep Neural Networks Don't Scale-Filters and Feature Maps-Full Description of the Convolutional Layer-Max Pooling-Full Architectural Description of Convolution Networks-Closing the Loop on MNIST with Convolutional Networks-Image Pre-processing Pipelines Enable More Robust Models-Accelerating Training with Batch Normalization-Building a Convolutional Network for CIFAR-10-Visualizing Learning in Convolutional Networks Leveraging Convolutional Filters to Replicate Artistic Styles-Learning Convolutional Filters for Other Problem Domains-Training algorithms.

UNIT 2

Memory Augmented Neural Networks Neural Turing Machines-Attention-Based Memory Access-NTM Memory Addressing Mechanisms-Differentiable Neural Computers-Interference-Free Writing in DNCs-DNC Memory Reuse-Temporal Linking of DNC Writes, Understanding the DNC Read Head-The DNC Controller Network Visualizing the DNC in Action-Implementing the DNC in Tensor Flow-Teaching a DNC to Read and Comprehend.

UNIT 3

Deep Reinforcement Learning: What Is Reinforcement Learning? Markov Decision Processes (MDP)-Explore Versus Exploit-Policy versus Value Learning-Pole-Cart with Policy Gradients-Q-Learning and Deep Q-Networks-Improving and Moving Beyond DQN.

UNIT 4

Deep Unsupervised Learning and Recent Trends: Autoencoders (standard, sparse, denoising, contractive, etc), Variational Auto encoders, Adversarial Generative Adversarial Networks, Autoencoder and DBM , Multi- task Deep Learning, Multi-view Deep Learning.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Applications of Deep Learning to Computer Vision: Image segmentation, object detection, automatic image captioning, Image generation with Generative adversarial networks, video to text with LSTM models. Attention models for computer vision tasks. Applications of Deep Learning to NLP: Applications of Deep learning for computer vision, Deep Learning Applications at the Enterprise Scale, Deep Learning Models for Healthcare Applications.

Text Books:

1. Ian Goodfellow and YoshuaBengio and Aaron Courville, Deep Learning, MIT Press, 2016.
2. Nikhil Buduma, Nicholas Locascio, "Fundamentals of Deep Learning: Designing Next-Generation Machine Intelligence Algorithms", O'Reilly Media, 2017

Reference Books

1. Bishop, C. ,M., Pattern Recognition and Machine Learning, Springer, 2006 Raúl Rojas, Neural Networks : A Systematic Introduction, Springer, 1996

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: -E-Commerce

Course Code: - UCA-394

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr

31 0 3.5

UNIT 1

Electronic Commerce- Frame work, anatomy of E-Commerce applications, E-Commerce Consumer applications, E-Commerce organization applications. Consumer Oriented Electronic commerce - Mercantile Process models

UNIT 2

Electronic payment systems - Digital Token-Based, Smart Cards, Credit Cards, Risks in Electronic Payment systems.

Inter Organizational Commerce - EDI, EDI Implementation, Value added networks.

UNIT 3

Intra Organizational Commerce - work Flow, Automation Customization and internal Commerce, Supply chain Management.

Corporate Digital Library - Document Library, digital Document types, corporate Data Warehouses.

Advertising and Marketing - Information based marketing, Advertising on Internet, on-line marketing process, market research.

UNIT 4

Consumer Search and Resource Discovery - Information search and Retrieval, Commerce Catalogues, Information Filtering.

Multimedia - key multimedia concepts, Digital Video and electronic Commerce, Desktop video processing, Desktop video conferencing.

Text Book

1. Frontiers of Electronics Commerce by Ravi lalakota, Andrew Whinston published by Addison Wesley

2. Enterprise Resource Planning – Concepts and practice by K. Garg and N.K. Venkita Krishna published by PRENTICE HALL OF INDIA

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Reference Books

1. The SAP/3 Handbook by John Antonio, Fernandz published by TMZ
2. The E-Business Revolution by Denial Amor published by Addison Welsey

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: -Introduction to IOT

Course Code:- UCA-395

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

LT P Cr.

3 1 03.5

UNIT 1

Introduction to IoT : M2M to IoT-The Vision-Introduction, From M2M to IoT, M2M towards IoT-the global context, A use case example, Differing Characteristics

M2M to IoT – A Market Perspective– Introduction, Some Definitions, M2M Value Chains, IoT Value Chains, An emerging industrial structure for IoT, The International driven global value chain and global information monopolies.

UNIT 2

IoT Technology Fundamentals & Architecture : M2M and IoT Technology Fundamentals- Devices and gateways, Local and wide area networking, Data management, Business processes in IoT, M2M and IoT Analytics, Knowledge Management IoT Architecture-State of the Art – Introduction, State of the art, Architecture Reference Model- Introduction, Reference Model, and architecture.

Cloud Computing Basics : Cloud computing components- Infrastructure-services- storage applications-database services –Deployment models of Cloud- Services offered by Cloud- Benefits, and Limitations of Cloud Computing – Issues in Cloud security- Cloud security services and design principle.

UNIT 3

IoT – Privacy, Security, and Governance: Introduction, Overview of Governance, Privacy and Security Issues, Contribution from FP7 Projects, Security, Privacy and Trust in IoT-Data-Platforms for Smart Cities, First Steps Towards a Secure Platform, Smartie Approach. Data Aggregation for the IoT in Smart Cities, Security.

UNIT 4

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

IoT Applications : Introduction, IoT applications for industry: Future Factory Concepts, Brownfield IoT, Smart Objects, Smart Applications, Four Aspects in your Business to Master IoT, Value Creation from Big Data and Serialization, IoT for Retailing Industry, IoT For Oil and Gas Industry, Opinions on IoT Application and Value for Industry, Home Management, eHealth.

Text Books

1. Vijay Madisetti and ArshdeepBahga," Internet of Things (a Hands-on-approach)", VPT 1st edition.2014
2. FrancisdaCosta,"Re thinking the Internet of Things: A Scalable Approach to Connecting Everything", ApressPublications,1st Edition. 2013.
3. CunoPfister,"Getting Started with the Internet of Things",OReillyMedia.2011
4. Kyung,C.-M.,Yasuura,H., Liu,Y., Lin,Y.-L., Smart Sensors andSystems, Springer International Publishing, 2015

Reference Links:

1. https://www.coursera.org/specializations/iot
2. https://www.edx.org/course/introduction-to-the-internet-of-things-iot

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: -Data Warehousing and Data Mining

Course Code:- UCA-396

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

LT P Cr.

3 10 3.5

UNIT 1

Data warehousing and OLAP: Data Warehouse basic concepts, Data Warehouse Modeling, Data Cube and OLAP: Characteristics of OLAP systems, Multidimensional view and Data cube, Data Cube Implementations, Data Cube operations. Implementation of OLAP and overview on OLAP Software.

UNIT 2

Data Mining and its Applications: Introduction, What is Data Mining, Motivating Challenges, Data Mining Tasks, Which technologies are used, which kinds of applications are targeted by Data Mining Which technologies are used, which kinds of applications are targeted by Data Mining, Types of Data, Data Mining Applications, Data Preprocessing.

UNIT 3

Association Analysis: Basic Concepts and Algorithms, Frequent Item set Generation, Rule Generation, Compact Representation of Frequent Item sets

UNIT 4

Classification: Methods, Improving accuracy of classification, Basics, General approach to solve classification problem, Decision Trees, Rule Based Classifiers, Nearest Neighbor Classifiers. Bayesian Classifiers.

Text Books

1. Jiawei Han and Micheline Kamber: Data Mining - Concepts and Techniques, 2nd Edition, Morgan Kaufmann Publisher, 2006.

Reference Books

1. Pang-Ning Tan, Michael Steinbach, Vipin Kumar: Introduction to Data Mining, Addison- Wesley, 2005.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Open Elective-2

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Entrepreneurship Development &Enterprise Management
Course Code:-UMG-450

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 0 3.5

UNIT 1

Developing Entrepreneurship, Element for a program, Developing Entrepreneurship competencies: Need & process of development, Social determinants of Entrepreneurship growth. Entrepreneurship development programs, Entrepreneurship orientation & awareness programme, New enterprise creation programme.

UNIT 2

Existing Entrepreneurship programmes for existing enterprising for survival & growth. Evolution of various EDP programme in India, Managing growth & transition, The organization life cycle, Chasing Entrepreneurship roles. Auto- collimator.

UNIT 3

Entrepreneurship & new venture opportModuleies, Planning for new ventures. Concept of planning paradigm, Pre-start-up, Early growth & later growth stage.

UNIT 4

Incentive & subsidies available for Entrepreneurship growth. Guidance for project report preparation, Location, Environmental and managerial problems of new enterprise management, Managing family business. Some case studies of family run business in India.

Text Books:

1. Small Business and Entrepreneurship, by S. Anil Kumar (Author)
2. Entrepreneurship, by Alpana Trehan (Author)

Reference Books:

1. Entrepreneurial Development, by Nuzhath Khatoon (Author).

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Satellite Communication
Course Code:-UEC-464

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr

3 1 0 3.5

UNIT 1

Introduction to Satellite Communication Origin, Brief History, Current state and advantages of Satellite Communication, Active & Passive satellite, Orbital aspects of Satellite Communication, Angle of Evaluation, Propagation Delay, Orbital Spacing, System Performance

UNIT 2

Satellite Link Design Link design equation, system noise temperature, C/N & G/T ratio, atmospheric & econospheric effects on link design, complete link design, interference effects on complete link design, earth station parameters, Earth space propagation effects, Frequency window, Free space loss, Atmospheric absorption, Rainfall Attenuation, Ionospheric scintillation, Telemetry, Tracking and command of satellites.

UNIT 3

Satellite Multiple Access System FDMA techniques, SCPC & CSSB systems, TDMA frame structure, burst structure, frame efficiency, super-frame, frame acquisition & synchronization, TDMA vs FDMA, burst time plan, beam hopping, satellite switched, Erlang call congestion formula, DA-FDMA, DA-TDMA.

UNIT 4

Satellite Services INTELSAT, INSAT Series, VSAT, Weather forecasting, Remote sensing, LANDSAT, Satellite Navigation, Mobile satellite Service. Laser & Satellite Communication Link analysis, optical satellite link Tx & Rx, Satellite, beam acquisition, tracking & pointing, cable channel frequency, head end equation, distribution of signal, n/w specifications and architecture, optical fibre CATV system.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Text Books

1. Dennis Roddy, ―Satellite Communications‖, McGraw Hill, 1996.

Reference Books:

1. Trimothy Pratt, Charles W. Bostian,-Satellite Communications‖, John Wiley & Sons, 1986.
2. Dr. D.C. Aggarwal, ―Satellite Communications‖, Khanna Publishers, 2001.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Digital Signal Processing& Applications
Course Code:-UEC-465

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 0 3.5

UNIT 1

Classification of signals, Singularity functions, Classification of system, Manipulation of Discrete time signals: Signal analysis, Signal characteristics. Typical discrete time signals, Operation on signals, Properties of linear time-invariant digital systems, Sampling of analog signals and sampling rate conversion. Z-transform: Properties of Z-transform. Inverse Z-transform – analysis of discrete time systems, Convolution.

UNIT 2

System function, Difference equation, IIR filter design: Analog filter approximation, Butter worth, Chebyshev and Elliptic filters, Bilinear transformations, Impulse invariance technique, Digital frequency band transformations.FIR filter design: Window technique, Equiripple approximation technique, Frequency sampling technique.

UNIT 3

Discrete Fourier Transform (DFT) : Inverse Discrete time Fourier Transform, Properties of DFT (circular convolution). Fast Fourier Transform (FFT), Decimation-in-time (DIT) algorithm-decimation-in-frequency algorithm-FFT,Radix-2 DIT and DIF implementation.

UNIT 4

Applications of DSP in Voice, RADAR and Image Processing.TMS320CXX*SERIES PROCESSORS :*Architecture, Memory, Interrupts, Addressing modes, Assembly language programming.

Text Books:

1. David.K.Defatta, Joseph G,Lucas & William S.Hodgkiss, Digital signal processing
2. Sanjit K and Mitra, digital signal processing

Reference Books:

1. Farooq Hussain, Digital signal processing

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Transformer Engineering
Course Code:-UEE-457

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 0 3.5

UNIT 1

Introduction to Transformers: Transformer Types, Transformer Losses, Operating Principles, Instrument Transformers, Transformer Construction, Auto –Transformer, Transformer connections.
Transformer Maintenance : Insulation Testing, High Potential Testing, Turns Ratio Testing, Polarity Testing, Power Facto, Excitation Current, DC Winding Resistance, Polarization Recovery, Insulating Fluid, Dielectric, Dissolved Gas Analysis.

UNIT 2

Materials for Transformers: Insulating oil, Insulating paper, Pressboard and wood, Insulated copper conductor for windings, Crepe paper, Sealing materials, Cold – rolled grain oriented electrical steel sheet.
Winding and Insulation: Types of windings, Surge voltage, Heat transfer, Insulation design, Auto-collimator

UNIT 3

Cooling: Air Cooled Oil-Immersed**,** Water-Cooled**,** Forced-Oil Cooling, Self-Cooling with Air Blast Temperature Limits, Transformer loading.
Magnetic Circuit: Materials, Design of magnetic circuit, Optimum design of core

UNIT 4

Tap Changers: Off - circuit tap changer, On load tap changer, Automatic control of tap changer. Transformer Auxiliaries: Buchholz relay, Temperature indicators, Oil level indicators oil preservation systems.

Text Books:

1. Transformers by BHEL, Bhopal, Tata McGraw Hill.
2. Transformer Engineering by SV Kulkarni and SA Khaparde Marcel & Dekks Inc.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

3. Transformer Engineering design and practices, SV Kulkarni, SA Khaparde, Marcel Dekker IncNew york.
4. Electrical Machines byJ. Nagrath&D.P.Kothari, Tata McGraw Hill
5. Electrical Machines by Husain Ashfaq ,DhanpatRai& Sons
6. Electric Machine and Tranformers by Irving L.Kosow, Prentice Hall of India.
7. Fundamentals of Electrical Machines by B.R. Gupta &VandanaSinghal, New Age International

Reference Books:

1. Electric Machinery by A.E. Fitggerald, C.KingsleyJr and Alexander Kusko, McGraw Hill, International Student Edition.
2. The Performance and Design of DC machines by A.E. Clayton, Pitman &Sons
3. The Performance and Design of AC machines by M.G. Say, Pitman & Sons

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name:- Direct Energy Conversions
Course Code:-UEE-411

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 0 3.5

UNIT 1

Introduction: Conventional generation (Thermal, Hydro etc), Alternative generation processes

Thermionic Generation: The basic thermionic diode generator and its analysis, Cross held devices, Anode and cathode materials, Experimental thermionic generator.

UNIT 2

Mhd Generation: Principles of MHD generation, Electrical conditions, Faraday generator, Hall generator, Comparison of generators, Choice of generator parameters, Other generator configurations.

Experimental Mhd Generation: Open cycle working, Closed cycle operation, Liquid metal systems, Auto-collimator

UNIT 3

Thermoelectric Generation : Seeback effect, Peltier effect, Thomson effect, EMF relationship, Generator analysis, Material selection, Experimental thermoelectric generation.

UNIT 4

Fuel cells : Principles of fuel cells, Thermodynamics of the fuel cell Choice of fuels and operating condition Polarization and its effect Redox cell Overall efficiency Practical Fuel cells – various types.

Text Books:

1. Direct Energy Conversion by R.A.Coombe.

Reference Books:

1. Non-Conventional Energy Sources By –S.Rao.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name:- Advance Concrete Technology
Course Code:-UCE-311

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 0 3.5

UNIT 1

Introduction: Structure of hydrated Cement, Special Cements, Chemical admixtures, Concept of Green Concrete using Mineral Admixtures, Corrosion protection, Fire resistance, Sulphate attack on concrete, Diffusion of chlorides in concrete, Evaluation of concrete strength, NDT Techniques

UNIT 2

Concrete mix design: Principles of Concrete mix design, Methods of Concrete mix design, Design of high strength concrete and High performance concrete, Auto- collimator

UNIT 3

Properties of concrete: Rheological behavior of fresh Concrete Properties of fresh concrete Properties of hardened concrete**,** Strength, Elastic properties**,** Creep and Shrinkage**,** Variability of concrete strength

UNIT 4

Modern Trends in concrete: Modern trends in concrete manufacture, Placement techniques
Methods of transportation, Placing of concrete, Curing Techniques, Extreme whether concreting, Special concreting methods, Vacuum dewatering of concrete, Under water concreting
Special concrete: GModuleing, Shortcrete, Light weight Concrete, Mass concrete ,Fly-ash Concrete Fibre reinforced Concrete Polymer Concrete Ferro Reinforcement in concrete Utilization of waste Material Epoxy resins and screeds for rehabilitation- properties and application

Text Books

1. Krishnaraju, N., Advanced Concrete Technology, CBS Publishers, 1985.
2. Nevile, A.M., Concrete Technology, Prentice Hall, Newyork, 1985.

Reference Books

1. A.R. Santhakumar, :Concrete Technology" Oxford University Press, 2006

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Geographic Information Systems for Resources Management
Course Code:-UCE-409

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 0 3.5

UNIT 1

Principles of GIS: Introduction to the basic Components and structure of GIS, Geographic concepts Geographical Entities and Spatial data formats will be introduced.

UNIT 2

Introduction to ArcGIS: Introduction to ArcGIS Software, Components (ArcMap, ArcCatalog and ArcToolbox).

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UNIT 3

Spatial data formats: Data Types The differences between raster and vector formats Non-native data formats and metadata. Data analyses and function are highly dependent on these spatial data.

UNIT 4

Map Projection: Overview of geographic coordinate systems and Map projections. Essential to geo-reference spatial data and superimpose spatial datasets

Spatial data Analysis: An overview of multiple vector-based and raster-based (local, Focal, Zonal, and Global), Spatial operations will be provided. Queries, The Field calculator Raster calculator and model maker provide operational tools to conduct spatial analyze within the Arc GIS Environment.

Text Books:

1. Heywood L, Comelius. S and S. Carver (2006) An Introduction to Geographic Information System, Dorling Kinderseley (India) Pvt. Ltd.
2. Burrough P A 2000 P A McDonnell (2000) Principles of Geographic Information Systems, London: Oxford University Press

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Reference Books:

1. Lo.C.P., Yeung. K.W Albert(2002) Concepts and Techniques of Geographic Information Systems, Prentice-Hall of India Pvt. Ltd. New Delhi

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name:-Renewable Energy Sources
Course Code:-UME-464

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 0 3.5

UNIT 1

Scenario of Renewable Energy (RE) Sources: Needs of renewable energy Advantages and limitations of Represent energy scenario of conventional and RE sources

Wind Energy Energy available from wind Basics of lift and drag Basics of wind energy conversion system Effect of density Angle of attack and wind speed Windmill rotors Horizontal and vertical axes rotors Drag Lift Torque and power coefficients Tip speed ratio Solidity of turbine Wind turbine performance curves Wind energy potential and site selection Basics of wind farm

UNIT 2:

Bio Energy : Types of biogas plants Biogas generation Factors affecting biogas generation Advantages and disadvantages Biomass energy Energy plantation Gasification Types and applications of gasifies.

Ocean Energy: OTEC principle Open, closed and hybrid cycle OTEC system Energy from tides Estimation of tidal powerTidal power plants Single and double basin plant Site requirements Advantages and limitations, Auto- collimator

UNIT 3:

Solar Energy Energy available from the sunspectral distribution Solar radiation outside the earth's atmosphere and at the earth's surface Solar radiation geometry instruments for solar radiation measurements. Empirical equations for prediction of availability of solar radiation, radiation on tilted surface Solar energy conversion into heat Types of solar collectors. Evacuated and non-evacuated solar air heater. Concentrated collectors Thermal analysis of liquid flat plate collector Air heater and cylindrical parabolic collector Solar energy thermal storage Heating and cooling of buildings olar pumping Solar cooker Solar still Solar drier Solar refrigeration and air conditioning Solar pondHeliostat Solar furnace Photovoltaic system for power generation Solar cell modules and arrays Solar cell types Material Applications Advantages and disadvantages

UNIT 4:

Economic Analysis: Initial and annual cost Basic definitions Present worth calculations Repayment of loan in equal annual installments Annual savings Cumulative saving and life cycle cost Economic analysis of add on solar system Payback period Clean development mechanism .

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Demonstration of following equipment should be given to the students: Solar water heater , Solar air heater , Pyranometer ,Pyrhelioemeter Solar PV system Wind mill Biogas plant Gasifier Solar cooker

Text Books:

1. Solar Energy: Principles of Thermal Collection and Storage, S. P. Sukhatme and J. K. Nayak, McGraw-Hill Education
2. Solar Engineering of Thermal Processes, John A. Duffie, William A. Beckman, John Wiley, New York
3. Non-conventional energy resources, Shobh Nath Singh, Pearson India

Reference Books:

1. Non-conventional energy resources, Shobh Nath Singh, Pearson India
2. Solar Energy Engineering, Soteris Kalogirou, Elsevier/Academic Press.
3. Principles of Solar Energy, Frank Krieth & John F Kreider, John Wiley, New York

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name:-Automation & Robotics
Course Code:-UME-466

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 0 3.5

Unit 1:

Introduction to Automation: Concept of Automation, Reasons for Automating, Arguments for and against Automation, Automation Strategies, Economic Considerations Low cost Automation Advantages of Automation.

Fluid Control Components: Fluid power control elements Hydraulic & Pneumatic valves Flow and direction control valves Metering valve Hydraulic Servo System Fluid power symbols

Control Systems: Adaptive control Sequence control Programmable controllers Computer process control

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Unit 2:

Transfer Device, Feeders & Material Handling: Detroit- Type Automation Analysis of Automated flow lines Automated assembly System Automated Material Handling

Automated Inspection & Testing: Automated Inspection Principles and Methods Sensor technologies for automated inspection Co-ordinate measuring machines Other contact inspection methods Machine vision Optical Inspection methods Non-Contact Inspection Methods

Unit 3:

Robotics*:* Basic Concepts: Definition and origin of robotics Different types of robotics Various generation of robots Degrees of freedom Asimov's laws of robotics Dynamic stabilization of robots.

Power Sources and Sensors: Hydraulic, Pneumatic and electric drives, Determination of HP of motor and gearing ratio, Path determination Micro machines in robotics Machine vision Ranging Laser Acoustic Magnetic Fiber optic and tactile sensors

Unit 4:

Manipulators, Actuators and Grippers Construction of manipulators Manipulator dynamics and force control Electronic and pneumatic manipulator control circuits End effectors Various types of grippers Design Consideration

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Industrial Applications: Applications of Robots, Welding, parts handling / transfer. Assembly operations Parts sorting Parts inspection Future applications

Text Books:

1. Automation Production System & Computer Integrated Manufacturing. Mikell P. Grover
2. Robotics & Flexible Automation S.R. Deb

Reference Books:

1. Pneumatic Control and Hydraulic Control S.R. Majundar
2. Ghosh, Control in Robotics and Automation: Sensor Based Integration, Allied Publishers, Chennai, 1998.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Open Elective – 3

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Total Quality Management
Course Code:-UMG-475

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 0 3.5

UNIT 1:

Introduction to TQM & ISO 9000Total Quality Control Customer Focus & Total waste Elimination (TWE), Quality Assurance. Quality of Design & Development, Inspection & Measurement workforce Teams, Bench marking TQM for Sales Marketing Management.

UNIT 2:

Business Process Re-engineering & Information Technology. Quality control SQC/ SPC, Technology & Product Quality, Quality for After Sales Services Technology & Product Quality.

UNIT 3:

Organization for Quality: Reliability as quality characteristics, Quality leadership, Quality linked productivity**,** Total Quality, Culture Quality and environment, Cost of Quality

UNIT 4:

Cost of Quality, Quality Control for Export Modules, Quality Maturity and Discipline, Total commitment for Quality, TQM Implementation, ISOm 9000 series of standards, ISO 9000-1, ISO 9000-2, ISO 9000-3.

Text Books:

1. TQM & ISO 14000: K.C.Arora.
2. Total Quality Control: Armand V. Feigenbaum.
3. Total Quality Management: Joseph.A.Patrick, Diana.S.Furr.

Reference Books:

1. Total Quality Management – Text: Joel E. Ross Cases & Readin
2. Total Quality Control Essentials: Sarv Singh Soin

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name:- Optical Communication
Course Code:-UEC-466

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.
3 1 0 3.5

Unit 1:

Need for Fiber Optic Communications System Role of Fiber Optic communication technology, Basic Block Diagram Advantages & Disadvantages of Optical Fiber Communication, Structure of optical wave guide, Light propagation in optical fiber using ray theory, Electromagnetic Mode Theory, Step Index Fiber, Graded Index Fiber, Attenuation- Bending Loses, Scattering, Absorption, Dispersion – Intermodal, Chromatic, limitations & remedies.

Unit 2:

Light sources & Transmitters : Light Emitting Diodes, Hetero junction & DH structure, Laser diodes, Principle of action, Characteristics, Efficiency, Block Diagram and typical circuits of Transmitter.

Unit 3:

Receivers, Photodiodes –Working, Power relationship, PIN photodiodes, Avalanche photodiode, Block Diagram & typical circuits of receiver.

Unit 4:

Fiber Cable Connection: Splicing, Connectors, Components of Fiber Optic Networks, Transceivers, Semiconductor, Optical amplifiers ,Principle of operation, Gain, Bandwidth, Cross talk, Noise, Applications, Advantages & Disadvantages. Erbium Doped Fiber Amplifiers (EDFAs), Operation, Gain, Noise, Components of EDFA module.

TEXT BOOKS

1. Fiber Optic Comm. Systems, D.K.Mynbaev
2. Optical Fiber Comm, John M.Senior

REFERENCE BOOKS

1. Optical Fiber Comm, G.Keiser

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Principles of Digital Communication
Course Code:-UEC-467

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 0 3.5

Unit 1:

Pulse Modulation: Sampling process, Pulse – amplitude modulation , Other forms of pulse modulation, Bandwidth – noise trade off, Quantization process, Pulse code modulation, Noise considerations in PCM system, ISI & Eye pattern in PCM, Time- division multiplexing ,Digital multiplexers, Differential pulse code modulation , Delta modulation, Adaptive Delta Modulation.

Unit 2:

Digital Modulation Techniques: Binary phase , Shift keying, Differential phase shift keying, Differentially – encoding PSK (DEPSK), Quadrature phase shift keying (QPSK), M-ary PSK, Amplitude shift keying(ASK),Quadrature amplitude shift keying (QASK). Binary frequency shift keying, Similarity of BFSK and BPSK, M-array FSK, Minimum shift keying (MSK)

Unit 3:

Data Transmission: A base band signal receiver, Probability of error, The optimum filter, White noise: the matched filter, Probability of error of the matched filter, Coherent reception: Correlation, Phase shift keying (PSK),Frequency shift keying (FSK), Non coherent detection of FSK, Differential PSK

Unit 4:

Spread Spectrum Modulation: Pseudo-noise sequences, Direct sequence spread spectrum, Processing gain, Frequency HOP spread spectrum, Liner Block Codes, Convolution codes.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Text Books:

1. Communication System : Simon Haykins, John wiley.
2. Principles of communication system: Taub and schilling: TMH.

Reference Books:

1. Electronics Communication System: Wayne Tomasi: Pearson Edu.
2. Communication system analog and digital: sanjay sharma.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name:-Disaster Management
Course Code:-UCE-476

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 0 3.5

Unit 1:

Understanding Disasters: Understanding the Concepts and definitions of Disaster, Hazard, Vulnerability ,Risk, Capacity–Disaster and Development, Awareness During Disaster, Search and Rescue, Needs Assessment and Disaster management.

Unit 2:

Types Of Disaster And Its Control: Geological Disasters Earthquakes Landslides Tsunami Mining. **Hydro-Meteorological Disasters** Floods Cyclones Lightning Thunder-storms Hail storms Avalanches Droughts Cold and eat waves.

Biological Disasters : Epidemics Pest attacks forest fire.

Technological Disasters : Chemical Industrial Radio logical Nuclear

Manmade Disasters: Building collapse Rural and urban fire Road and rail accidents Nuclear, radiological Chemicals and biological disasters Global Disaster Trends–Emerging Risks of Disasters–Climate Change and Urban Disasters.

Unit 3:

Disaster Management In India- Disaster Profile of India –Mega, Disasters of India and Lessons Learnt Disaster Management Act 2005, Institutional and Financial Mechanism National Policy on Disaster Management, National Guidelines and Plans on Disaster Management, Role of Government (local, state and national), Non-Government and Inter-Governmental Agencies

Unit 4:

Geo-informatics in Disaster Management : GIS, GPS , RS ,Disaster Communication System , Early Warning and Its Dissemination , Land Use Planning ,Development Regulations Disaster Safe Designs, Constructions in India

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Text Books:

1. S.K.Duggal, "Earthquake resistant design of structures", Oxford University Press
2. Ulrich ranke, "Natural Disaster Risk Management: Geosciences and Social Responsibility"
3. Michael Beach , "Disaster Preparedness and Management"

Reference Books:

1. Rajesh Anand,N.C.Jana,Sudhir Singh, "Disaster Management and Sustainable Development Emerging issues and concerns"
2. B C Bose, "Introduction to Disaster Management"

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name:-Building Project and Estimates
Course Code:-UCE-412

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 0 3.5

Unit 1:

Procedure of Estimating Methods of Estimating : Main item of work, Deduction for openings; Degree of accuracy. Methods of Building Estimates Individual Wall Method Center Line method Arch masonary calculation

Unit 2:

Estimate of RCC works Estimate of RC Slab RCC Beam: RCC T-beam slab and RCC column with foundation Road Estimating Estimate of Earthwork Estimate of Pitching of Slopes Estimate of Earthwork of road from longitudinal sections Estimate of Earthwork in hill roads Canal estimate Earthwork in canals Different cases Breached sections/ Breach closures.

Unit 3:

Specifications Purpose and Method of writing specifications: Detailed Specifications for Brickwork
RCC, Plastering, Mosaic Flooring, R.R Stone Masonary Analysis of Rates Preparing analysis of rates for the following items works: Concrete , RCC Works , Brickwork in foundation and superstructure Plastering preparing lead statements.

Unit 4:

PWD accounts and procedure of works: Organization of Engineering department, Work charged establishment; Contract , Tender, Tender Notice, Tender Schedule, Plinth Area, FLOOR Area, Carpet Area, Approximate Estimate, Plinth Area estimate, Revised Estimate Supplementary estimate. Annual budgets of work, Cash flow allocations yearly, TF Accounts of materials USR Valuation, Cost, Price & Value, Methods of Valuation, Out Goings, Depreciation, Methods for estimating cost depreciation, Valuation of Building. Contracts, Types of Contracts, Contract Law, EMD, Tenders, Acceptance of contract, Branch of contract, Cancellation of contract, Re-tendering- work order , Running pavement, Final Bill, Deviation orders, Completion Certificate

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Text Books:

1. Estimating & Costing in Civil Engineering by B.N. Dutta
2. Valuation of real properties by S.C. Rangwal, Charotar Publishing House

Reference Books:

1. Estimating and Costing by M. Chakraborty , S. Chand publishing house

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name:-Hydro Power Station Design
Course Code:-UEE-456

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 0 3.5

Unit 1:

Introduction Hydrology: Stream flow, Hydrographs, Flow duration curves, Mass curve, Storage, Investigation of site.

Unit 2:

Types of dams: Arrangement and location of hydro-electric station, Types of hydroelectric plants and their fields of use, Principle of working of a hydroelectric plant.

Unit 3:

Power to be developed: Size of plant and choice of Modules, Types of turbines and their characteristics, Design of main dimensions of turbines.

Unit 4:

Draft tubes, Turbine setting, Penstock dimensions, Scroll case, Preliminary design of penstock, Characteristics of generators. Various design aspects of mini and micro hydel plants.

Text Books:

1. Power Station Design by M.V.Deshpande.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name:-Illumination Engineering

Course Code:-UEE-408

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.
3 1 0 3.5

Unit 1:

Introduction: Laws of illumination Inverse Square law and Lambert's Cosine law Their application in lighting calculations. Brief idea of methods of lighting calculations General Principles Of Illumination Definitions: Modules of light, Definitions of flux, Solid angles, Luminous intensity and brightness, Glare, polar curves.

Unit 2:

Colour: Nomenclature of colour, Production of colour light and mixing colours, Colours contrast Colour matching.
Electric Light Sources: Brief description of characteristics of starting and application of the following lamps Incandescent lamp. Sodium Vapour lamp. Mercury Vapour lamp Fluorescent lamp Neon lamp

Unit 3:

General Illumination Design (LUMEN METHOD)Room index and Utilization factor Maintenance factor Types of lighting schemes Design of lighting schemes with practical examples. Minimum level of illumination required for: Domestic. Commercial Educational .Health Industrial buildings. Flood lighting of building Road lighting factory lighting.

Unit 4:

Maintenance and Economics**:** Maintenance of luminaire, Luminaire depreciation caused by dust and differentiate light production, Lighting economics, Instruments used in photometric measurements.

Text Books:

1. NPTEL Notes

Reference Books:

1. Utilization Of Electric Power and Electric Traction by: J.B.GUPTA

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Engineering In Industry & Entrepreneurship
Course Code:-UME-459

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr.

3 1 0 3.5

Unit 1:

Introduction and its Development: Industrial Engineering, ConceptFunctionsFields of applicationOrigin and development of factory system**.** Effects of Industrial Revolution**.** Principles of scientific management.Pioneers of Scientific Management**.** F.W.Taylor**,** Henry L.Gantt, Frank B. Gilberth, Henri Fayol etc.Administration and Organistion, Organisation Structure, Authority and Responsibility,Types of organization, Line: FunctionalLine and Staff and Committee. Wage Incentive Plans: Concept: Characteristics of good wage incentive planMethods of Wage PaymentClassification of Wage Incentive PlansFactors influencing wage rates.

Unit 2:

Plant Location & Plant Layout:Factors effecting plant locationSelection of plant siteQuantitative techniques of plant location decisionPlant layoutPrinciples of layout design. Product Development and Design:Product and its classification, Productdesign considerations, Product development. Product characteristicsStandardizationProduct Simplification and DiversificationValue engineering and its role in product design and cost rationalization.Ergonomics:Role of ergonomics in industryEffect of physical environment on performance. Production, Planning and Control: ConceptObjectivesNeed and functions of P.P.C. Functions of planning routing, SchedulingDispatching and follow up and progress report.Production control charts.Route and process charts.Operation chartsMachine load chartsGantt chartsProgress chartsBar chart.

Unit 3:

Inspection and Quality Control**:** Definition and functions of InspectionInspection methodsDefinition, Objectives and principles of Quality controlStatistical Quality Control (SQC) Economics of Quality Control. Introduction to statistical methods of quality controlTime and Method Study (Work Study):Their importance in scientific management.Definition and objectives Various time estimatesLevel of performance Allowances Time recording techniques Procedure of method study Various charts and diagrams Classification of motion Principles of motion Economy Introduction to MRP,JIT and TQM Definitions Objectives and benefits

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Unit 4:

Entrepreneurship Development: Entrepreneurship, Role of entrepreneurship in Indian economy, Characteristics of entrepreneur, Types of entrepreneurs, Some myths and realities about entrepreneurship. Role and scope of small scale industries, Concept of small scale and ancillary industries undertaking, How to start a small scale industry, Steps in launching own venture. Infrastructure facilities available for entrepreneurship development in India.

Text Books:

1. Industrial Management: Spregiel. John Wiley & Sons. N.York, 1961.

Reference Books:

1. Industrial Organisation: Kimball and Kimball. Vakils Feffer & Simsons Pvt. Ltd. Bombay, 1971

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Emerging Automotive Technologies
Course Code:-UME-458

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P CR.

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Unit 1:

Fuel Cell Technology for Vehicles: What is fuel cell, Type of fuel cellAdvantage of fuel cell.Current state of the technology.Potential and challenges. Advantages and disadvantages of hydrogen fuel

Unit 2:

Latest Engine Technology Features: Advances in diesel engine technologyDirect fuelinjection Gasoline engine. Diesel particular emission control. Throttling by wire. Variable Valve Timing,Method used to effect variable Valve Timing. Electromagnetic Valves. Camless engine actuation.
42 Volt System: Need**,** Benefits, Potentials and challenges.Technology Implications for theAutomotive Industry.Technological evolution that will occur as a result of the adoption of 42 volt systems.

Unit 3:

Electrical and Hybrid Vehicles: Types of hybrid systemsObjective and Advantages of hybrid SystemsCurrent StatusFuture developments and prospects of hybrid vehicles
Integrated Starter Alternator: Starts stop operationPower Assist. Regenerative braking.Advanced lead acid batteries. Alkaline batteriesLithium batteriesDevelopment of new energyStorage systems. Deep discharge and rapid charging ultra-capacitors.

Unit 4:

X-By Wire Technology: What is X-By WireAdvantage over hydraulic systemsUse ofAutomotive micro controllersTypes of censors. Use of actuators in an automobile environment.
Vehicle Systems: Constantly Variable TransmissionBenefitsBrake by wireAdvantages overpower braking systems.Electrical assist. SteeringSteering by wireAdvantages of steering by wire.Semi-active and fully active suspension system.Advantages of fully active suspension system.

Text Books:

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

1. Advanced Vehicle technologies by Heinz Heisler – SAE International Publication.
2. Electric and Hybrid Electric Vehicles by Ronald K.Jurgen – SAE International Publication.

Reference Books:

1. Batteries for Electric Vehicles by DAJ Rand, R.Woods and R.M.Dell – SAE International Publication.
2. Electronics Braking, Traction and Stability Control – SAE Hardboud papers.
3. Electronics steering and suspension systems – SAE Hardboud papers.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.