JABALPUR ENGINEERING COLLEGE, JABALPUR (M.P.)
Choice Based Credit System (CBCS)
Scheme of Examination w.e.f.
Bachelor of Engineering (Computer Science & Engineering)

SEMESTER III

S.No	Subject Category	Subject Code	Subject Name	Theory End Sem	Minor I	Minor II	Quiz	Assignments / Tutorials / Problem	Seminar	Practical End Sem	Lab Work	Viva Voce / Assignments	L	T	P	Total Credit
				60	10	10	5	5	10	10	20	20	2	1	2	4
1	DC	CS-231	OBJECT ORIENTED CONCEPT WITH C++	60	10	10	5	5	10				3	1		4
2	DC	MA-232	DISCRETE STRUCTURES	60	10	10	5	5	10	10	20	20	2	1	2	4
3	DC	CS-233	DATA STRUCTURE - II	60	10	10	5	5	10	10	20	20	2	1	2	4
4	DC	CS-234	ELECTRONICS & DIGITAL CIRCUITS	60	10	10	5	5	10	10	20	20	2	1		3
5	DC	CS-235	PRINCIPLES OF COMMUNICATION	60	10	10	5	5	10				2			2
6	HU	HU-236	COMMUNICATION SKILLS	60	10	10	5	5	10				2			2
7		CS-237	IDEA GENERATION									50			4	2
8		CS-238	LEARNING THROUGH EXPERTS									50		2	4	2
9	DC	CS-239	COMPUTER PROGRAMMING - II DOT NET							10	20	20			4	1
			TOTAL	360	60	60	30	30	60	40	80	130	13	7	12	26

L : Lecture   T : Tutorial   P : Practical

Note :
1. End Sem Theory Exam Min.Pass Marks 19 out of 60 and,4out of 10 for Practical Exam
2. For ' Idea Generation ', Learning through Experts';there will be no examination and credits will be awarded only on the basis of internal assessment.

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Course Content						
Subject Code	Subject Name	L	T	P	Max Marks	Credit
CS-231	Object Oriented Concept with C++	2	1	2	150	4

Course Contents

Concept of Object Oriented methodology: Role of programming methodology in software development, Comparison between the concepts of structured-oriented programming (SOP) and object-oriented programming (OOP), Need for object oriented programming. Fundamental concepts of object-oriented programming (OOP): abstraction, encapsulation, modularity, data hierarchy through inheritance, Information Hiding, polymorphism and its types, parallelism and stability.

Elements of object oriented: Object, Class, message passing, Relationship among objects:- links, aggregation, Relationship among classes:- association, aggregation, using, instantiation, meta-class. Implementation of relationship.

Beginning with C++: What is C++, Difference between C and C++, C++ program life cycle.

Functions in C++: Different forms of functions, function prototyping, call by value; call by Reference, Inline and friend Functions, Command Line Arguments

Encapsulation and Abstraction in C++: Classes and Objects in C++, defining classes, defining member functions, declaration of objects to class, access to member variables from objects etc, Initialization and assignment for objects, Different forms of member functions, dependence on access specifiers (i.e. Private, public, protected), static data members, Constructor and Destructor in C++: constructors, parameterized constructors Multiple constructors in class dynamic initialization of object destructors.

Inheritance in C++: Introduction, types of inheritance, single inheritance, multiple inheritance, multilevel inheritance, hierarchical inheritance, hybrid inheritance etc, virtual base class, abstract class, constructors in derived class.

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Polymorphism in C++: types of polymorphism, function overloading, **operator overloading:-** introduction, defining operator overloading, overloading -(unary, binary operators), overloading binary operators using friend function, Rules for overloading operators. **Function overriding:-** introduction to pointers, pointers to objects, this pointer, pointers to derived class, virtual functions, abstract class, pure virtual function. Introduction to C++ templates.

REFERENCES:

1. Herbert Schildt, " C++ the complete reference", III edition, TMH 1999
2. Balagurusamy, Entrepreneurial, "object oriented programming with C++", TMH
3. Barkakatin," object oriented programming in C++", PHI 1995

LIST OF EXPERIMENTS:

1. Program to demonstrate use of function overloading.
2. Write a function which accepts object as a parameter and returns object.
3. Write a program to demonstrate the virtual base class.
4. Write a program to demonstrate use of polymorphism (virtual function).
5. Write a program to overload ++ operator to increment age of person by one month.
6. Write a program to illustrate the use of scope resolution operator.
7. Write a program to find the square root using inline function.
8. Write a program to illustrate the use of friend function.
9. Create two employee objects and display each object's yearly salary.
10. Give each employee a 10% raise and display each Employee's yearly salary again.
11. Write C++ program to create five object of book, get information of book using getdata() function including name, price, publication and author.

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B.E. THIRD SEMESTER (COMPUTER SCIENCE AND INFORMATION TECHNOLOGY)

COURSE CONTENT

SUB. CODE	SUB. NAME	L	T	P	MAX. MARKS	CREDITS
MA-232	DISCRETE STRUCTURE	3	1	0	60	4

MA-232

COURSE CONTENT:

Set Theory, Relation, Function Set Theory: Definition of sets, countable and uncountable sets, Venn Diagrams, proofs of some general identities on sets Relation: Definition, types of relation, composition of relations, Pictorial representation of relation, Equivalence relation, Partial ordering relation.

Function: Definition, , one to one, into and onto function, inverse function, composition of functions, recursively defined functions, pigeonhole principle. Theorem proving Techniques: Mathematical induction.

Posets, Hasse Diagram and Lattices: Introduction, ordered set, Hasse diagram of partially, ordered set, isomorphic ordered set, well ordered set, properties of Lattices, bounded and complemented lattices.

Recurrence Relation and Generating Function: Introduction to Recurrence Relation and Recursive algorithms , Linear recurrence relations with constant coefficients, Homogeneous solutions, Particular solutions, Total solutions , Generating functions , Solution by method of generating functions.

Algebraic Structures: Definition, Properties, types: Semi Groups, Monoid, Groups, Abelian group, properties of groups, Subgroup, cyclic groups, Cosets, Normal subgroup, Homomorphism and isomorphism of Groups, Rings and Fields and finite fields : definition and examples

Propositional Logic : Proposition, first order logic, Basic Logical Operation, truth tables, tautologies, contractions, Algebra of Proposition, logical implications, logical equivalence, Rules of inference , Predicates, the statement function, Variables and Quantifiers, predicate formulas, free and bound variables, The Universe of Discourse.

Graph Theory: Introduction and basic terminology of graphs, Planer graphs, Multigraphs and weighted graphs, Isomorphic graphs, Paths, Cycles and connectivity, Shortest path in weighted graph, Introduction to Eulerian paths and circuits, Hamiltonian paths and circuits, Graph coloring, chromatic number.

Reference Books:

1 Elements of Discrete Mathematics by C.L. Liu Tata Mc Graw-Hill Edition.
2. Discrete Mathematical Structure with Application in CS by Trembley ,J.P & Manohar;, Mc Graw Hill.
3. Graph Theory with application to Engineering and computer science by Deo , Narsingh ; PHI.
4. Discrete Mathematics by Seymour Lipschutzand and Mark Lipson, Schaum's Outlines, Tata McGraw- Hill Pub.

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Computer - Science

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Course Content						
Subject Code	Subject Name	L	T	P	Max Marks	Credit
CS - 233	Data Structure -II	2	1	2	150	4

COURSE CONTENT:

Trees: Basic terminology, Binary Trees: Array and Linked Representation of Binary trees, Traversing Binary trees, Complete Binary Tree, Extended Binary Trees, Threaded Binary trees, Binary Search Tree (BST), AVL Trees, B-tree, B+tree, Application of binary tree: Algebraic Expression, Huffman coding Algorithm, parse tree.

Sorting: Selection Sort, Insertion Sort, Bubble Sort, Quick Sort, Merge Sort, Heap Sort, Radix sort algorithms and their Complexities.

Searching & Hashing: Sequential search, binary search, Hash Table, Hash Functions, Collision Resolution Strategies.

Graphs: Introduction, Representation of Graphs: Adjacency List, Adjacency Matrices. Graph Traversal: Depth First Traversal, Breadth First Traversal, Connected Component and Spanning Trees, Minimum Cost Spanning Tree, Application: Dijkstra's Algorithm for shortest path.

EVALUATION: Evaluation will be continuous an integral part of the class followed by final examination.

Reference:

1. R. Kruse et al, Data Structures and Program Design in C, Pearson Education Asia, Delhi-2002

2. ISRD Group: Data structures using C, TMH

3. Lipschutz, Data structure (Schaum), TMH

4. Horowitz and Sahani, Fundamental of data Structures, Galgotia Publication Pvt. Ltd., N Delhi.   5. A. M. Tenenbaum, Data Structure using C & C++, Prentice-Hall of India Pvt. Ltd., New Delhi.

6. Trembley and Sorenson, Data Structure, TMH

7. Pai, Data structure and algorithm, TMH

8. Thomas H. Corman et al, Introduction to Algorithm, AWL

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Course Content						
Subject Code	Subject Name	L	T	P	Max Marks	Credit
CS-234	**Electronics and Digital Circuits**	2	1	2	150	4

Semiconductor device, theory of P-N junction, temperature dependence and break down characteristics, junction capacitances, Zener diode, Transistors BJT, FET, MOSFET: types, working principal, characteristics, and region of operation, load line biasing method, Transistor as an amplifier, Feedback amplifier, negative feedback, voltage-series, voltage shunt, current series and current shunt feedback.

Switching characteristics of diode and transistor, turn ON, OFF time, reverse recovery time, transistor as switch, Multivibrators, Bistable, Monostable, Astable multivibarators. Operational amplifier characteristics, slew rate, full power bandwidth, offset voltage, bias current, application ,inverting , non inverting amplifier , summer , averager , differentiator, integrator, differential amplifier , instrumentation amplifier , log and antilog amplifier , voltage to current and current to voltage converters , comparators.

Number systems & codes, Binary arithmetic , Boolean algebra and switching function, Minimization of switching function, Concept of prime implicant , Karnaugh map method, Quine & McCluskey's method, Cases with don't care terms, Multiple output switching function.

Introduction to logic gates, Universal gate, Analysis and design procedure of Combinational circuits, Half adder, Half subtractor, Full adder, Full subtractor circuits, Series & parallel addition, BCD adders, Look-ahead carry generator. Decoders, Encoders, Multiplexers, Demultiplexers, Introduction to various semiconductor memories & designing with ROM and PLA.

Analysis and design procedure of synchronous Sequential circuits, Introduction to Shift Registers, Counters, Synchronous & asynchronous counters.

Text Books
1. Digital Design, PHI, 2/e and digital logic and computer design, PHI, by M. Morris Mano
2. Microprocessor Arch. Programming & Application with 8085 by R.S. Gaonkar
3. Digital Computer & Electronics by A.P. Malwino and J.A. Brown, TMH, 3/e
4. 0000 to 8085 Introduction to Microprocessors by P.K. Ghosh & P.R. Sridhar, PHI, 2/e
5. Logic Design Theory, by N.N. Biswas, PHI
6. Milliman Halikias -Integrated Electronics; TMH Pub.
7. Gayakwad; OP-amp and linear Integrated Circuits; Pearson Education
8. Salivahanan; Electronic devices and circuits; TMH
9. Miliman Grabel; Micro electronics , TMH
10. RobertBoylestad & Nashetsky; Electronics Devices and circuit Theory; Pearson Ed.

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Course Content

Subject Code	Subject Name	L	T	P	Max Marks	Credit
CS-235	PRINCIPLES OF COMMUNICATION	2	1		100	3

Data and signal-Analog and digital signals, Time and frequency domain, Composite signals, Bandwidth, bit rate, bit length, Baseband and broadband transmission, Attenuation, distortion, noise, Nyquist bit rate ,Shannon capacity ,Throughout, delay ,Jitter, Bandwidth delay product.

Sampling theorem, quantization, PCM, Delta modulation, Adaptive delta modulation, DPCM, bandwidth of PCM and delta modulation, ASK, BPSK, QPSK, DPSK, BFSK.

Data transmission – Parallel and serial transmission, synchronous and Asynchronous transmission, Simplex, half duplex and full duplex , unipolar and polar line codes, Non return to zero codes, return to zero codes, bipolar line codes, bauds , modem, Line configurations Point to point and point to multipoint configuration, Multiplexer: TDM, FDM, WDM, Data compression devices, Inverse multiplexer.

Digital interface standards: RS-232 standard, hand shaking, connecting a DTE in RS-232 C, RS –449, RS-422A and RS-423A standards, High-speed desktop serial interfaces, Remote digital transmission carrier ISDN, Packet data network, Modems, multispeed modems, high speed modems, Error Correcting modems, data compression in modems, Short-wave modems.

Data Integrity, sources of error control approaches, Implementation of error control, Echo checking, parity checking and cyclical purity, Hamming code, checksums, Cyclical Redundancy check, Security and security measures, Transmission media-Guided and unguided media, twisted pair, Unshielded twisted pair and Shielded twisted pair, coaxial cable.

Text Book:
1. Data & Computer Communication, William Stallings – Pearson Education.
References:
1 Data & Network Communication, Michael A. Miller – DELMAR (Thomson learning) / Vikas Publication.
2. Understanding Data Communication & Networks, William A Shay – Thomson Learning / Vikas Publication.

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COURSE CONTENT & GRADE   (w.e.f. July 2016)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
BE III	COMMUNICATION SKILL	HU-236	Min "D"	Min "D"	5.0

COMMUNICATION SKILL

Max:60

Course Objectives:

- Student will be able to learn and understand the four major Skills of Communication i.e. LSRW (Listening, Speaking, Reading and Writing)
- Student will be able to write effective job application to show employers that they deserve to be shortlisted for an interview
- Student will be able to meet high professional expertise with the help of much developed written and communication skills
- Students' comprehension skills will be enhanced.

Constituents of Technical Communication: Fundamental of Grammar usage, Requisites of Sentence Construction, Proper Use Tenses; antonyms, idioms and phrases, synonyms, homophones; The art of Condensation, Paragraph Development Techniques, Writing Bibliography and References

Basics of Technical Communication: Distinction between Technical and General Communication, Flow of Communication, 7 C's of Effective Communication, Overcoming the Barriers to Communication, Role of Feedback in communication.

Listening and Reading Skills for Effective Communication: Importance of Listening in Communication, Difference between Listening and Hearing, Types of Listening. Techniques of Reading, SQ3R, Proof Reading.

Developing Oral Communication: Interpersonal Communication, Facilitators and Impediments of interview and Group Discussion, Presentation Strategies: Defining Purpose, Organizing Contents, Preparing Outline, Audio-Visual Aids, Nuances of Delivery, Importance of Paralanguage and Kinesics in Communication, Audience Awareness, Setting and Achieving Goals

Written Communication: Writing Curriculum Vitae, Letter and Cover Letter and Job Application; Letter Components and Layouts, Principles of Effective Letter Writing, E-mail etiquettes, Notice Agenda and Minutes, Writing Proposals: Nature and Significance, Types of Proposals, Parts of a Formal Proposal; a brief recap of Formats of Report Writing.

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