Integral University Lucknow
Study & Evaluation Scheme
B. Tech. (Computer Science & Engg.)

YEAR II, Semester- III

S. No.	Subject Code	Category	Subject	Periods				Evaluation Scheme				Subject Total
								Sessional			Exam.	
				L	T	P	C	CT	TA	Total	ESE	
1	CS-204	DC	Data Structure using C	3	1	0	4	25	15	40	60	100
2	CS-205	DC	Object Oriented Programming & C++	3	1	0	4	25	15	40	60	100
3	BM-225	ESA	Principles of management and Engineering economics	3	1	0	4	25	15	40	60	100
4	EC-209	ESA	Digital Electronics	3	1	0	4	25	15	40	60	100
5		DE	Departmental Elective 1	3	1	0	4	25	15	40	60	100
6	ES-202/CS-203	ESA	Disaster management/ Cyber Law & Information Security	2	1	0	3	25	15	40	60	100
*	BM226	HM	Human Values and Professional Ethics	3	0	0	0	-	-	-	50	50
7	CS 208	DC	Data Structure using C Lab	0	0	2	1	30	30	60	40	100
8	CS-209	DC	Web Technology lab	0	0	2	1	30	30	60	40	100
9	CS 210	DC	Object oriented Programming Lab using C++	0	0	2	1	30	30	60	40	100
10	EC-214	ESA	Digital Electronics Lab	0	0	2	1	30	30	60	40	100
			Total	**19**	**7**	**8**	**27**	**270**	**210**	**480**	**520**	**1000**

*Audit Course (HU 203): This is compulsory audit course in which a student must to be clear this paper with 50% passing marks up to the final year and marks will not be included in result.

L-Lecture **T-T**utorial **P-**Practical **C-**Credits **CT-**Class Test

TA-Teacher Assessment

Sessional Total (CA) = Class Test + Teacher Assessment

Subject Total = Sessional Total (CA) + End Semester Examination (ESE)

DC- Departmental Core **HM-** Humanities
DE- Departmental Elective
ESA- Engineering Sciences & Arts (Foundation Course & Engineering Courses)

Departmental Elective 1
1. Discrete Structure (CS-206)
2. Computer Graphics (CS-207)

Integral University, Lucknow
Department of Computer Science & Engineering
B.Tech (CSE), 2nd Year/3rd Semester
Subject Name: Data Structure Using C, Subject Code: CS-204
SYLLABUS REVISED-2016
w.e.f. July-2016

L T P C
3 1 0 4

UNIT 1
Introduction to Data Structures: Basic Terminology, Elementary Data Organization, Data Structure Operations. Algorithms, Analysis of Algorithms, Complexity of Algorithms, Time-Space Tradeoff.
Arrays: Array Definition, Representation and Analysis, Single and Multi Dimensional Arrays, Address Calculation, Application of Arrays, Character String Representation, Character String Operation, Sparse Matrices & Vectors.
Linked List: Representation and Implementation of Singly Linked List, Traversing, Searching of Linked List, Insertion & Deletion to/from Linked List, Underflow & Overflow. Circular Linked List, Doubly Linked List, Two-way Header List, Polynomial Representation & Addition, Generalized Linked List, Garbage Collection and Compaction. **C program based on above concept.** [9]

UNIT 2
Stacks: Array Representation and Implementation of Stack, Operations on Stacks: Push & Pop, Linked Representation of Stack, Application of Stack: Conversion of Infix to Prefix and Postfix Expressions, Evaluation of Postfix Expression using Stack.
Recursion: Recursive Definition and Processes, Recursion in C, Example of Recursion, Tower of Hanoi Problem.
Queues: Array and Linked Representation and Implementation of Queues, Operations on Queue: Create, Add, Delete, Full and Empty; Circular Queues, D-queues and Priority Queues. **C program based on above concept.** [9]

UNIT 3
Trees: Basic Terminology, Binary Trees, Binary Tree Representation, Algebraic Expressions, Complete Binary Tree, Extended Binary Trees, Array and Linked Representation of Binary Trees, Traversing Binary Trees, Threaded Binary Trees, Traversing Threaded Binary Trees, Huffman Algorithm, Binary Search Tree (BST), Insertion and Deletion in BST, Path Length, AVL Trees, B-trees. **C program based on above concept.** [8]

UNIT 4
Searching and Hashing: Sequential Search, Binary Search, Comparison and Analysis, Hash Table, Hash Functions, Collision Resolution Strategies, Hash Table Implementation.
Sorting: Insertion Sort, Bubble Sort, Quick Sort, Two Way Merge Sort, Heap Sort. **C program based on above concept.** [7]

UNIT 5
Graphs: Terminology & Representations, Graphs & Multi-Graphs, Directed Graphs, Sequential Representations of Graphs, Adjacency Matrices, Traversal, Connected Component and Spanning Trees, Minimum Cost Spanning Trees, **C program based on above concept.**
File Handling:
Physical Storage Media File Organization, Organization of Records into Blocks, Sequential Files, Indexing and Hashing, Primary Indices, Secondary Indices [7]

REFERENCES
1. A. M. Tannenbaum. "Data Structure Using C/C+"
2. Horowitz And Sahani "Fundamental of Data Structure", Galgotia Publication
3. Lipschutz "Data Structure", Schaum series.

Integral University, Lucknow
Department of Computer Science & Engineering
B.Tech (CSE), 2nd Year/3rd Semester
Subject Name: Object Oriented Programming & C++, Subject Code: CS-205
SYLLABUS REVISED-2016
w.e.f. July-2016

L T P C
3 1 0 4

UNIT 1
Object Oriented Programming: Concepts, Comparison with other approaches, **Designing:** Object Modeling, Dynamic Modeling, Functional Modeling, **Modeling Concepts and Terminologies:** Links and Association, Generalization, Aggregation and Specialization, Abstract Class & Concrete Class , Meta Data, Candidate Keys, Constraints, Events and States, Operations, Data Flow Diagram, Study of Model specifying static structure, behavior at various states and its impact.

[8]

UNIT 2
Program Planning: Algorithms, Flowcharts, Pseudo code; **Introduction and Overview of C++:** Evolution of C++, Advantages and Limitations; Structure of C++ program; Analysis of a program; Compilation and Execution on Windows, Unix and Linux; Stages of Compilation; **Components of a C++ Program**: characters, Identifiers, Keywords, Tokens, Literals, Statements, Expressions and Input / Output. **C++ programs based on above concept.**

[8]

UNIT 3
Basics: Data Types, Variables, Constants, Operators, Expressions, Control Statements, Library Functions and Pre-processor Directives; Arrays; Pointers; String Handling; Structure & Union; Dynamic Memory Management.
Objects and Classes: Concept, Sample Program and Analysis, Types of Classes, Access Specifier, **C++ programs based on above concept.** [8]

UNIT 4
Objects and Classes continued: Constructors and Destructors; Functions: Invoking a Function, Recursive Function, Member Functions, Inline Functions, Friend functions; **Inheritance:** Types and Implementation, Virtual Base Class; **Polymorphism:** Operator Overloading, Function Overloading; *Pointers:* This pointer, Pointer to objects, Pointer to derived classes, Virtual Functions**. C++ programs based on above concept.** [8]

UNIT 5
Return objects from functions; Exception handling.
File Handling: File Streams, File Attributes, File operations: create, read/ write, open, save, update, Access Records Randomly; Templates; **Case Study:** Design and Implementation. **C++ programs based on above concept.** [8]

REFERENCES
1. Rum Baugh, etal:" Object oriented design and modeling". PHI 1993. Budd, "Object Oriented Programming", Addison Wesley.'
2. Robert Lafore, "Object Oriented Programming in C++", Techmedia.
3. E. Balagurusamy, "Programming in C++", TMH.
4. K.R. Venugopal" Mastering in C++", TMH publication
5. Bjarne Stroustrup, "C++ Programming Language", Addison Wesley

Integral University, Lucknow
Department of Computer Science & Engineering
B.Tech (CSE), 2nd Year/3rd Semester
Subject Name: Principle Of Management And Engineering Economics, Subject Code: BM 225
SYLLABUS REVISED-2016
w.e.f. July-2016

L T P C
3 1 0 4

UNIT 1

Nature and Significance of Economics. Meaning of Science. Engineering and Technology and their Relationship with Economic Development. [8]

UNIT 2

The Concept of Demand and Supply. Elasticity of Demand and Supply, Indifference Curve Analysis, Price Effect. Income Effect and Substitution Effect. [8]

UNIT 3

Functions of Money, Value of Money, Inflation and Measures to Control it, Brief Idea of Functions of Banking System viz Commercial and Central Banking, Business Fluctuations.
[8]

UNIT 4

Definition, Nature and Significance of Management, Evaluation of Management Thought, Contributions of Max Weber. Taylor and Fayol. [8]

UNIT 5

Factors of Individual Behaviour, Perception. Learning and Personality Development Interpersonal Relationship and Group Behaviour. [8]

REFERENCES
1. Dewett, K.K. / Modern Economic Theory / S. Chand
2. Luthers Fred / Organizaional Behaviour
3. Prasd 1. M. / Principles of Management
4. A. W. Stonier & D. C. Horgne / A textbook of Economics Theory / Oxford Publishing House Pvt. Ltd.

Integral University, Lucknow
Department of Computer Science & Engineering
B.Tech (CSE) , 2ⁿᵈ Year/3ʳᵈ Semester
Subject Name: Digital Electronics, Subject Code: EC-209
SYLLABUS REVISED-2016
w.e.f. July-2016

L T P C
3 1 0 4

UNIT 1
Wave shaping: RC High Pass Circuit, Low Pass Circuit, Response to Sine, Step, Pulse and Square Wave Inputs. RC Circuit as a Differentiator, Integrator and Compensated Attenuator. Number Systems, Review of Boolean Algebra, Minimization of Boolean Functions, K-Map, Don't Care Input Combinations, Tabular Method.   [8]

UNIT 2
Logic families: Use of Diode, Transistor, and MOSFET as a Digital Circuit Element; Formation of Basic Logic Gates, and Study of their Input-Output Characteristics, Fan-in, Fan-out, Noise Margin, Circuit Concept and Comparison of Various Logic Families- TIL, IIL, ECL, NMOS and CMOS. Tristate Logic, Open Collector Output Circuits; Interfacing between Logic Families; Power Consumption, Gate Delay.   [8]

UNIT 3
Combinational Circuits: Decoders, Encoders, Three State Devices, Multiplexer Demultiplexer, Comparator, Adder, Sub Tractor, ALU, Hazards and its Avoidance.   [8]

UNIT 4
Sequential Circuit: Latches, Flip Flops, Shift Registers, Counters; Synchronous and Asynchronous Sequential Circuits, Multivibrators.   [8]

UNIT 5
Memory: ROM, PROM, EPROM & EEPROM; RAM, SRAM and DRAM; PLA, PAL, PLD; FPGA, Bi CMOS circuits.   [8]

REFERENCES
1. Mano, M. Morris / "Digital Design" / Prentice Hall /
2. Mano, M. Morris / "Digital Logic and computer Design" / PHI
3. Gopalan, k. "Go pal" / Introduction to Digital Microelectronic circuits" / TMH.
4. Jacob Mill man and Herbert Taub / Pulse, Digital and switching wave forms "TMH
5. Malvino, A.P. and Leach. Donald P. / "Digital Principles and applications"/ TMH.
6. R. P. Jain, Modem Digital Electronics, TMH.
7. J. M. Yarbrough, Digital Logic: Applications and Design' Vikas Publishing.

Integral University, Lucknow
Department of Computer Science & Engineering
B.Tech (CSE), 2nd Year/3rd Semester
Subject Name: Discrete Structure, Subject Code: CS 206
SYLLABUS REVISED-2016
w.e.f. July-2016

L T P C
3 1 0 4

UNIT 1
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, Type of Functions, One to One, Into and Onto Function, Inverse Function, of Functions, Recursively Defined Functions.
Theorem Proving Techniques: Mathematical Induction Simple and Strong), Pigeonhole Principle, Prove by Contradiction. [8]

UNIT 2
Algebraic Structures: Definition, Properties, Types: Semi Groups, Monoid, Groups, Abelian Group, Properties of Groups, Subgroup, Cyclic Groups, Cosets, Factor Group, Permutation Groups, Normal Subgroup, Homomorphism and Isomorphism of Groups, Example and Standard Results, Rings and Fields: Definition and Standard Results.
[8]

UNIT 3
Posets, Hasse Diagram and Lattices: Introduction, Ordered Set, Hasse Diagram of Partially, Ordered Set, Isomorphic Ordered Set, Well Ordered Set, Properties of Lattices, Bounded I and Complemented Lattices.
Boolean Algebra: Basic Definitions, Sum of Products and Product of Sums, Form in Boolean Algebra, Logic Gates and Karnaugh Maps.
Tree: Definition, Rooted Tree, Properties of Trees, Binary Search Tree, Tree Traversal.
[9]

UNIT 4
Propositional Logic: Proposition, First Order Logic, Basic Logical Operation, Truth Tables, Tautologies, Contradictions, Algebra of Proposition, Logical Implications, Logical Equivalence, Predicates, Universal And Existential Quantifiers. [7]

UNIT 5
Combinatorics & Graphs: Recurrence Relation, Generating Function, Simple Graph, Multi Graph, Graph Terminology, Representation of Graphs, Bipartite, Regular, Planar and Connected Graphs, Connected Components in a Graph, Euler Graphs, Hamiltonian Path and Circuits, Graph Coloring, Chromatic Number, Isomorphism and Homomorphism of Graphs.
[8]

REFERENCES
1. Liptschutz, Seymour, "Discrete Mathematics", McGraw Hill.
2. Trembley, J.P & R. Manohar, "Discrete Mathematical Structure with Application to Computer Science", McGraw Hill.
3. Kenneth H. Rosen, "Discrete Mathematics and its applications", McGraw Hill.
4. Deo, Narsingh, "Graph Theory With application to Engineering and Computer.Science.", PHI.
5. Krishnamurthy, V., "Combinatorics Theory & Application", East-West Press Pvt. Ltd., New Delhi.

Integral University, Lucknow
Department of Computer Science & Engineering
B.Tech (CSE) , 2ⁿᵈ Year/3ʳᵈ Semester
Subject Name: Computer Graphics , Subject Code: CS-207
SYLLABUS REVISED-2016
w.e.f. July-2016

L T P C
3 1 0 4

UNIT 1
Introduction: Representing Pictures, Pixels and Frame Buffers, Vector and Character Generation. Graphics Primitives: Display Devices, Primitive Devices, Display File Structure, Display Control Text. Line Drawing Algorithms: Digital Differential Analyzer, Bresenham's Algorithms. Circle Generation: Bresenham's, Mid Point Algorithm.   [8]

UNIT 2
Polygon: Polygon Representation, Entering Polygons, Filling Polygons: Flood Fill Algorithm, Boundary-Fill Algorithm and Scan-line Polygon Filling Algorithm.
Segments: Segments Table, Creating Deleting and Renaming Segments, Visibility, Image Transformations.   [8]

UNIT 3
Two Dimensional Transformations: Representation of Points, Homogeneous Coordinates. Transformation: Translation, Rotation, Scaling, Reflection, Shearing. Windowing : Introduction, Viewing Transformation- Window to Viewport Coordinate Transformation Multiple Windowing. Clipping: Line Clipping- Cohen-Sutherland, Midpoint Subdivision, Cyrus-Beck Algorithm, Polygon Clipping-Sutherland-Hodgman.   [8]

UNIT 4
Three Dimensional Transformation: 3-D Geometry Primitives, Transformations: Translation, Rotation, Scaling, Reflection, Shearing. Projection: Orthographic, Axonometric, Oblique, Perspective.   [7]

UNIT 5
Hidden Line and Surface: Back Face Removal Algorithms, Hidden Line Methods: Floating Horizon, Z-Buffer, Painter's Algorithm, Warnock's Algorithm. Introduction to Curve Generation, Bezier, Hermite and B-spline Algorithms and their Comparisons.   Surface Rendering: Simple Illumination Model, Phong & Gourad Shading.
Animation: Introduction, Design of Animation Sequences, Keyframe System, Parameterized System, Morphing, Motion Specification.   [9]

REFERENCES :
1. Rogers, "Procedural Elements of Computer Graphics", McGraw Hill.
2. Rogar and Adams, "Mathematical Elements of Computer Graphics", McGraw Hill.
3. Newman and Sproul, "Principle of Interactive Computer Graphics", Mc G raw Hill.
4. Steven Harrington, "Computer Graphics", A programming Approach 2nd Edition.
5. Hearn & Baker, "Computer Graphics.

L T P
2 1 0

Objective: The objective of this course is to familiarize the students with basic management principles relating to disaster management and mitigation techniques.

UNIT 1

Concept of Disaster Management. Types of disaster and their impact:Natural and Man made like- Earthquakes, Floods,Droughts, Cyclones,Avalanches,Forest Fires, Terrorism related disaster etc.
Assessment of Human and Economic Losses.

UNIT 2

Impact of Extensive Industrialization, Impact of Global Warming and Environmental degradation, National and Global Disaster.

UNIT 3

National Policy for Disaster Management, Elementary knowledge of the disaster management Act 2005. Types of Responses: Central, State, District level, People's community participation in Disaster management.
Post Disaster management and Rehabilitation measures.

UNIT 4

Capacity building for meeting disasters. Long- term measures for prevention of Disasters. Mitigation techniques/ Strategies: Early Warning Systems, Data sharing at National and International Levels.

Integral University, Lucknow
Department of Computer Science & Engineering
B.Tech (CSE) , 2nd Year/3rd Semester
Subject Name: Cyber Law And Information Security, Subject Code: CS-203
SYLLABUS REVISED-2016
w.e.f. July-2016

L T P C
2 1 0 3

Unit1
Fundamentals of Cyber Law: Jurisprudence of Cyber Law, Object and Scope of the IT Act 2000, Introduction to Indian Cyber Law, Unicitral Model Law, ISP Guideline.
Intellectual property issues and cyber space, Indian perspective, Overview of Intellectual property related legislation in India, Patent, Copy Right, Trademark law, Law related to semiconductor layout & design.   [7]

Unit 2
E - Commerce: Security Threats to E - Commerce, Virtual Organization, Business Transactions on Web, E-Governance and EDI, Concepts in Electronics payment systems, E-Cash, Credit/Debit Cards, E- Agreement, Legal recognition of electronic and digital records, E-Commerce Issues of privacy, Wireless Computing- Security challenges in Mobile devices.
Digital Signatures - Technical issues, legal issues, Electronic Records, Digital Contracts, Requirements of Digital Signature System.   [8]

Unit 3
Investigation and Ethics: Cyber Crime, Cyber jurisdiction, Cyber crime and evidence act, Treatment of different countries of cyber crime, Ethical issues in data and software privacy, Plagiarism, Pornography, Tampering computer documents, Data privacy and protection, Domain Name System, Software piracy, Issues in ethical hacking.
Internet security threats: Hacking, Cracking, Sneaking, Viruses, Trojan horse, Malicious Code & logic bombs.
Introduction to biometric security and its challenges, Finger prints.
Cyber crime forensic: CASE STUDY in Cyber Crime.   [8]

Unit 4
Information security- Information Systems and its Importance, Role of Security in Internet and Web Services, Principles of Information Security, Classification of Threats and attacks, Security Challenges, Security Implication for organizations, Security services - Authentication, Confidentiality, Integrity, Availability and other terms in Information Security, Information Classification and their Roles.
Introduction to Cryptography, Issues in Documents Security, Keys: Public Key, Private Key, Firewalls, Basic Concepts of Network Security, Perimeters of Network protection & Network attack, Need of Intrusion Monitoring and Detection.   [9]

References:
1. Harish Chander "Cyber Law and IT Protection" , PHI Publication, New Delhi
2. Merkov, Breithaupt," Information Security", Pearson Education
3. "Cyber Law in India" - Farooq Ahmad-Pioneer books.
4. K. K. Singh, Akansha Singh "Information Security and Cyber law", Umesh Publication, Delhi

Integral University, Lucknow
Department of Computer Science & Engineering
B.Tech (CSE), 2nd Year/3rd Semester
Subject Name: Human Values & Professional Ethics, Subject Code: BM-226
SYLLABUS REVISED-2016
w.e.f. July-2016

L T P C
3 0 0 0

Unit-1   **6**

Human Value Education: Understanding the need, basic guidelines, content and process for Value Education, Self Exploration - Its content and process; 'Natural Acceptance' and Experiential Validation- as the mechanism for self exploration, Continuous Happiness and Prosperity- A look at basic Human Aspirations, Right understanding, Relationship and Physical Facilities- the basic requirements for fulfillment of aspirations of every human being with their correct priority, Understanding Happiness and Prosperity correctly.

Unit-2   **6**

Introduction to Ethical Concept: Definition of industrial ethics and values, Ethical rules of industrial worker. Values and Value Judgments. Moral Rights and Moral rules, Moral character and responsibilities. Privacy, Confidentiality, Intellectual Property and the Law. Ethics as Law

Unit-3   **6**

Professional Responsibility: The basis and scope of Professional Responsibility, Professions and Norms of Professional Conduct, Ethical Standards versus Profession, Culpable mistakes, the Autonomy of professions and codes of ethics. Employee status and Professionalism. Central Professional Responsibilities of Engineers: The emerging consensus on the Responsibility for safety among engineers, hazards and risks.

Unit-4   **6**

Engineers Ethics: Senses of 'Engineering Ethics' - variety of moral issues - types of inquiry - moral dilemmas - moral autonomy - Kohlberg's theory - Gilligan's theory - consensus and controversy – Models of Professional Roles - theories about right action - Self-interest - customs and religion - uses of ethical theories. Valuing Time – Co-operation – Commitment.

Unit-5   **6**

Global Issues: A Glimpse of Life Stories: **Life story of Prophet Mohammad**, Mahatma Gandhi, Swami Vivekanand, Marie Curie and Steve Jobs.
Multinational corporations - Environmental ethics - computer ethics - weapons development - engineers as managers-consulting engineers-engineers as expert witnesses and advisors -moral leadership

Reference Readings:

Text Book
1. R R Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in Value Education.
2. Mike Martin and Roland Schinzinger, "Ethics in Engineering", McGraw-Hill, New York 1996.
3. Govindarajan M, Natarajan S, Senthil Kumar V. S, "Engineering Ethics", Prentice Hall of India, New Delhi, 2004.

Relevant CDs, Movies, Documentaries & Other Literature:
1. Value Education website, *http://www.uptu.ac.in*
2. Story of Stuff, *http://www.storyofstuff.com*
3. Al Gore, *An Inconvenient Truth*, Paramount Classics, USA
4. Charlie Chaplin, *Modern Times*, United Artists, USA
5. IIT Delhi, *Modern Technology – the Untold Story*
6. The Hundred, Michael Hart

Integral University, Lucknow
Faculty of Engineering
B.Tech. (CSE), 2nd year /3rd semester
Subject Name: Data Structure using C Lab, Subject Code: CS-208
w.e.f. July-2016

L T P C
0 0 2 1

Write Programs for the Following:-

1. To implement traversing, insertion and deletion in arrays.

2. To implement, addition, Multiplication of Two sparse Matrices.

3. To implement insertion, deletion and pattern matching of a substring in a given string using linked list.

4. To implement Insertion and deletion in Singly Linked List at Given Location as well as for a Given Item in sorted List.

5. To Implement Insertion and deletion in Circular Linked List.

6. To implement insertion and Deletion in Stack and Queue using arrays and pointer.

7. To implement Fibonacci Series and Tower of Hanoi Using Recursion.

8. Creation of Trees and Tree Traversal Algorithms: Recursive and Non-Recursive.

9. Creation of Graphs and Graph Traversal Algorithms.

10. Sorting:
    a. Insertion Sort
    b. Quick Sort
    c. Merge Sort
    d. Bubble Sort
    e. Heap Sort

11. Implementation of Sparse Matrix and Polynomial using Linklist.

Integral University, Lucknow
Faculty of Engineering
B.Tech. (CSE), 2nd year /3rd semester
Subject Name: Web Technology Lab, Subject Code: CS-209
w.e.f. July-2016

L T P C
0 0 2 1

LIST OF EXPERIMENTS

1. Design a simple webpage using HTML and DHML.

2. Design a simple webpage using HTML5.

3. Write inline, internal and external CSS for a Web Page.

4. Design a Navigation Menu using HTML and CSS

5. Design a dynamic web page with validation using JavaScript.

6. Design a Responsive Web Page.

7. Design a complete student registration form using Server Side Scripting language.

8. Design a Login module using Server Side Scripting language.

9. Create a Simple program to demonstrate XML.

10. Design a simple Website using HTML, CSS and JavaScript or Bootstrap.

Integral University, Lucknow
Faculty of Engineering
B.Tech. (CSE), 2nd year /3rd semester
Subject Name: Object Oriented Programming Lab using C++, Subject Code: CS-210
w.e.f. July-2016

L T P C
0 0 2 1

1. Programs Using Functions

   - Functions with default arguments

   - Implementation of Call by Value, Call by Address and Call by Reference

2. Simple Classes for understanding objects, member functions and Constructors

   - Classes with primitive data members

   - Classes with arrays as data members

   - Classes with pointers as data members – String Class

   - Classes with constant data members

   - Classes with static member functions

3. Compile time Polymorphism

   - Operator Overloading including Unary and Binary Operators.

   - Function Overloading

4. Runtime Polymorphism

   - Inheritance

   - Virtual functions

   - Virtual Base Classes

   - Templates

5. File Handling

   - Sequential access

   - Random access

Integral University, Lucknow
Faculty of Engineering
B.Tech. (CSE), 2nd year /3rd semester
Subject Name: Digital Electronics Lab, Subject Code: EC-214
w.e.f. July-2016

L T P C
0 0 2 1

1. Realize OR, NOR,XOR,XNOR gates using NAND gate and verify its truth table
2. Design and study of 1-bit Magnitude Comparator
3. Design of Shift Registers
4. (a)   Design and test a CODE CONVERTER from decimal number to binary number. Use diode and LED's.
   (b)   Measure voltage drop across the diodes, LED's and resistor R. Find the current flowing through LED.
5. (a)   Assemble the Half Adder circuit using X-OR and AND gates. Verify the truth   table for Half Adder.
   (b)   Using two Half Adder and an OR gate, assemble Full Adder circuit, verify truth   table.
   (c)   Express sum and carry with all the minterms in minimization possible?
6. Display of decimal digits using 7 segments LED display and a suitable decoder.
   (a)   Use a BCD to 7 segment decoder 0-9 digits.
   (b)   Study the 7 segment LED display. Is it common anode or common cathode type? What is a suitable value of R for bright display of digit?
   (c)   Design a BCD to 7-segment decoder using NAND gates. Use K-maps and don't   care terms to implement the design with minimum number of gates.
7. STUDY OF FLIP-FLOPS
   (a)   Design and test J-K, F/F using NAND gates.
   (b)   Study J-K Master- Slave F/F IC 74LS76. Make special observations of edge triggering, preset and clear.
   (c)   Make and test D-F/F and T-F/F and verify its truth table
8. STUDY OF COUNTER
Design MOD-10 Counter using Master - Slave F/F (7476) and logic gates. (7400 & 7408) Verify its truth table.
9. Study and verify 4-bit adder/subtractor circuit using IC7483 and IC7486.
10. STUDY THE X-OR GATE IV MODULE (7486)
    (a) Verify the truth table and record the voltage levels.
    (b) Design a 3-input X-OR gate using 2-input X-OR gate. Obtain its truth table
        $F_1 = A + B + C$
    (c) Design a 3-input X-NOR gate using 7486 & 7402. Obtain its truth table. $F_2 = A \odot B \odot C$
    (d) Find the expression of F_1 and F_2 as sum of product (SOP) and compare F_1 and F_2.