GOVERNMENT COLLEGE OF ENGINEERING, JALGAON.

Department of Computer Engineering.

Scheme for B. Tech. (Computer Engineering)

SEM III

Course Code	Name of the Course	Group	Teaching Scheme Hrs /week				Evaluation Scheme							Credits
							Theory				Practical		Total	
			TH	TUT	PR	Total	ISA	ISE1	ISE2	ESE	ICA	ESE		
CO201	Discrete Structure and Graph Theory	D	3	---	---	3	10	15	15	60	---	---	100	3
ET221	Digital Electronics and Logic Design	B	3	---	---	3	10	15	15	60	---	---	100	3
CO202	Fundamentals of Data Structures Programming	D	3	1	---	4	10	15	15	60	---	---	100	4
CO203	Computer Organization	D	3		---	3	10	15	15	60	---	---	100	3
CO204	Object Oriented Technology	D	3	---	---	3	10	15	15	60	---	---	100	3
SH204	General Proficiency II	C	1	---	2	3	---	---	---	---	25	25	50	2
ET222	Digital Electronics and Logic Design Lab	B	---	---	2	2	---	---	---	---	50	---	50	1
CO205	Fundamentals of Data Structures Programming Lab	D	---	---	4	4	---	---	---	---	50	50	100	2
CO206	Software Lab-I	D	---	---	2	2	---	---	---	---	25	25	50	1
CO207	Object Oriented Technology Lab	D	---	---	2	2	---	---	---	---	25	25	50	1
Total			**16**	**1**	**12**	**29**	**50**	**75**	**75**	**300**	**175**	**125**	**800**	**23**

SEM IV

Course Code	Name of the Course	Group	Teaching Scheme Hrs /week				Evaluation Scheme							Credits
							Theory				Practical		Total	
			TH	TUT	PR	Total	ISA	ISE1	ISE2	ESE	ICA	ESE		
SH253	Numerical Methods and Probability Theory	A	3	1	---	4	10	15	15	60	---	---	100	4
CO251	Data Structures and Files	D	3	---	---	3	10	15	15	60	---	---	100	3
CO252	Computer Graphics	D	3	---	---	3	10	15	15	60	---	---	100	3
CO253	Data Communications	D	3	---	---	3	10	15	15	60	---	---	100	3
SH254	Humanities and Social Science	C	3	---	---	3	10	15	15	60	---	---	100	3
CO254	Application Development Lab	B	1	---	2	3					25	25	50	2
CO255	Data Structures and Files Lab	D	---	---	4	4	---	---	---	---	50	50	100	2
CO256	Computer Graphics Lab	D	---	---	2	2	---	---	---	---	25	25	50	1
CO257	Data Communications Lab	D	---	---	2	2	---	---	---	---	25	25	50	1
CO258	Software Lab-II	D	---	---	2	2	---	---	---	---	25	25	50	1
Total			**16**	1	**12**	**29**	**50**	**75**	**75**	**300**	**150**	**150**	**800**	**23**

TH :Theory Lecture, **TUT:Tutorial,** **PR:Practical**

ISA :Internal Sessional Assessment **ISE: In Semester Examination** **ESE: End Semester Examination** **ICA : Internal Contineous Accessment**

CO201 DISCRETE STRUCTURE AND GRAPH THEORY

Teaching Scheme: 03L + 00T, Total: 03 **Credit:** 03
Evaluation Scheme: 10 ISA + 15 ISE1 +15 ISE2 + 60 ESE **Total Marks:** 100
Duration of ESE: 03Hrs

COURSE DESCRIPTION:

This course introduce the student set theory, graph, tree, groups and rings concept and its algorithm and demonstrate to demonstrate how these concepts can be applied to solve nontrivial real life problems.

DESIRABLE AWARENESS/SKILLS:

Basics of elementary Mathematics

COURSE OBJECTIVES:

The objectives of offering this course are:

1 To use appropriate set, functions, or relation models to analyze practical examples, interpret the associated operations and terminology in context.
2 To determine number of logical possibilities and probability of events.
Learn logic and proof techniques to expand mathematical maturity.
3 To formulate problems precisely, solve the problems, apply formal proof techniques, and explain their reasoning clearly.

COURSE OUTCOMES:

On the successful completion of this course; student shall be;

1 Able to learn basic terminology, formal logic, mathematical induction, sets, relations, functions and recursion.
2 Able to understand discrete objects and relationships among them.
3 Able to design graphs, trees, groups and rings and related algorithms.
4 Able to demonstrate how these concepts can be applied to solve nontrivial real life problems.

RELEVANCE OF POS AND STRENGTH OF CO-RELATION:

Sr. No	Program Outcomes	Level of Operation
A	An ability to apply knowledge of mathematics, science, and engineering.	3
B	An ability to identify, formulates, and solves engineering problems.	3
C	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	2

1 - Weakly correlated **2 – Moderately correlated** **3 – Strongly correlated**

COURSE CONTENTS:

Logic and Set Theory: Propositions, conditional propositions, logical connectivity, prepositional calculus, universal and existential quantifiers, mathematical induction.

Set Theory: Set, Venn diagrams, operations on sets, combination of sets, finite and infinite sets, un-countably infinite sets, power set and products, principle of inclusion and exclusion.

Relations: Definitions, properties of binary relations, equivalence relations and partitions, partial ordering relations and lattices, chains and anti-chains.

Functions: Definitions, domain, range, one-to-one and on-to, inverse and composition, pigeonhole principle, discrete numeric functions and generating functions, job scheduling problem.

Recurrence Relations: Recurrence relation, linear recurrence relations with constant coefficients, homogeneous solutions, total solutions, solutions by the method of generating functions.

Graphs: Basic terminology, multi graphs and weighted graphs, paths and circuits, shortest path in weighted graph, Hamiltonian and Eulerian paths and circuits, factors of a graph, planer graph and traveling salesman problem.

Trees: Trees, rooted trees, path length in rooted trees, prefix codes, binary search trees, spanning trees and cut set, minimal spanning trees, Kruskal's and Prime's algorithms for minimal spanning tree.

Groups and Rings: Algebraic systems, groups, semi groups, monoid, subgroups, permutation groups, codes and group codes, isomorphism and auto orphisms, homomorphism and normal subgroups, ring, integral domain, field, ring homomorphism, polynomial rings and cyclic codes

Text Books:

1. Elements of Discrete Mathematics by C. LIU, 2nd Edition, Tata McGraw-Hill, 2002, ISBN 0-07-043476 X.
2. Discrete Mathematics, R. Johnson Baugh, 5th Edition, Pearson Education, 2001, ISBN 81 - 7808 - 279 – 9.

Reference Books:

1 Discrete Mathematics , N. Biggs, 2nd Edition, Oxford,2002 ISBN 0 -19 - 850717 - 8

2 Discrete Mathematics with Graph Theory , E. Goodaire, M. Parameter, 2nd edition, Pearson Education,2003 ISBN 81 - 7808 - 827 - 4

3 Graph theory with application to Engineering and Computer Science , N. Deo, Prentice Hall of India, 1990, 0 - 87692 - 145 – 4.

ET221 DIGITAL ELECTRONICS AND LOGIC DESIGN

Teaching Scheme: 03L+ 00T; Total: 03 **Credits:** 03
Evaluation Scheme: 10ISA+ 15 ISE1+ 15 ISE2+ 60 ESE **Total Marks:** 100
ESE Duration: 3Hrs.

COURSE DESCRIPTION:

This course introduces the student number system, digital logic family, Combinational Logic Circuits, Sequential Circuits and Counters, Semiconductor Memory, Timing Circuits and Analog/Digital Converters.

DESIRABLE AWARENESS/SKILLS:

Knowledge of basic electronics and basic electrical engineering.

COURSE OBJECTIVES:

The objectives of offering this course are

1 To make strong foundation of number system and various codes.
2 To strengthen the ability of students in the field of digital circuit analysis and design.
3 To make students familiar with logic families, programmable logic devices.

COURSE OUTCOMES:

On the successful completion of this course; student shall

1 Know common forms of number representation and their inter-conversions.
2 Be able to implement logical/arithmetic operations using combinational logic circuits.
3 Be able to apply concept of sequential circuits and memories for digital system design.
4 Be able to verify, test and design any digital logic circuit.

RELEVANCE OF POS AND STRENGTH OF CO-RELATION:

Sr. No	Program Outcomes	Level of Operation
A	An ability to design and conduct experiments, as well as to analyze and interpret data.	2
B	An ability to identify, formulate, and solve engineering problems.	3
C	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	3

1 - Weakly correlated **2 – Moderately correlated** **3 – Strongly correlated**

COURSE CONTENTS:

Number Systems and Codes: Types – Decimal, binary, octal and hexadecimal, representation of signed binary numbers, binary mathematics, binary codes – types - BCD codes, excess-3 codes, gray codes ,ASCII codes, error detecting and correcting codes, Boolean algebra, simplification of Boolean expression using k-map method (up to 4 variables) and its implementation using min term (SOP) /max term (POS) expression/universal gates.

Digital Logic Families: Characteristics of logic families, types - introduction to all types in brief, detail study of TTL (54XX/74XX), ECL and CMOS logic families & their interfacing.

Combinational Logic Circuits: Concept of combinational and sequential circuit, half & full adder / subtracter (7483) circuits, parallel adder BCD adder / subtracter, 1 bit / 2bit digital comparator(7485), code convertors binary to gray, gray to binary, BCD to 7-Segment, MUX(74151) and De-MUX(74154) and their applications, arithmetic and logic unit(74181).

Sequential Circuits and Counters: Flip-Flops - S-R, J-K, master slave J-K, T and D flip flops; conversion of flip flops, F/F applications - shift register & applications; counters – types – asynchronous and synchronous counters, design of MOD-N synchronous and asynchronous counter, 4bit UP/DOWN asynchronous counter, ring counter and Johnson counter.

Semiconductor Memory: Introduction, memory organization and operation, expansion of memory, classification and types of memory, read write memory, random access memory (RAM), multiport RAM, DDR RAM, read only memory (ROM), programmable read only memory (PROM), erasable programmable read only memory (EPROM) and flash memories, content addressable memory, first in first out (FIFO) memory, charge coupled devices memory.

Timing Circuits and Analog/Digital Converters: Introduction, timing circuits using logic gates, timing circuits using op-amp – astable and monostable multi-vibrator, Schmit's trigger, timer IC 555 and its application in timing circuits. Digital to analog converter, an example of DAC – IC0809- block diagram, pin diagram and operation, analog to digital convertor, an example of ADC – IC0808- block diagram, pin diagram and operation.

Text Books:

1. Modern Digital Electronics, R.P. Jain, 4th Edition, Tata McGraw Hill, 2010.
2. Digital Principals and Applications, Leach, Malvino, 5th Edition, Tata McGraw Hill, 2002.

Reference Books:

1. Digital Design: With an Introduction to the Verilog HDL , M. Morris Mano, Michael D. Ciletti 5th edition, Prentice Hall, 2012

CO202 FUNDAMENTALS OF DATA STRUCTURES PROGRAMMING

Teaching Scheme: 03L + 01T, Total: 04 **Credit:** 04
Evaluation Scheme: 10 ISA + 15 ISE1 +15 ISE2 + 60 ESE **Total Marks:** 100
Duration of ESE: 03Hrs

COURSE DESCRIPTION:

This course provides knowledge of data representation and how data is allocated in memory. It defines high level of abstraction of the needed linear data structure and Algorithm. Demonstrate and implement the linear data structure.

DESIRABLE AWARENESS/SKILLS:

Fundamentals Knowledge of C and basics of algorithm

COURSE OBJECTIVES:

The objectives of offering this course are

1. To provide an introduction to basic data structures and algorithm.
2. To understand fundamentals of design analysis and implementation of basic data structures and algorithm.
3. To understand analysis and evaluation of data structure.

COURSE OUTCOMES:

On the successful completion of this course; student shall be;

1. Able to understand the different ways of data representation.
2. Able to study the representation and use of primitive data types and built in data structures.
3. Able to develop the ability to synthesize and analyze algorithms.
4. Able to define high level of abstraction of the needed linear data structure and Algorithm.
5. Able to study the representation, implementation and applications of linear data structures .

RELEVANCE OF POS AND STRENGTH OF CO-RELATION:

Sr. No	Program Outcomes	Level of Operation
A	An ability to design and conduct experiments, as well as to analyze and interpret data.	3
B	An ability to identify, formulates, and solve engineering problems.	3
C	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	3

1 - Weakly correlated **2 – Moderately correlated** **3 – Strongly correlated**

COURSE CONTENT:

Functions: Parameter passing call by value and call by reference, functions and pointers, function returning pointer and pointer to function, pointer to pointer.

Structure and Union: Passing and returning structure as parameter for function, structure and pointer.

Recursion: Definition, writing recursive functions & how recursion works, file handling using C.

Introduction to Algorithm, Data structures & Analysis of algorithms: Introduction to Data Structures: Concept of data, data object, data structure, abstract data types (ADT), concept of primitive and non-primitive, linear and non-linear, static and dynamic, persistent and ephemeral data structures.

Analysis of algorithm: Frequency count and its importance in analysis of an algorithm, time complexity & space complexity of an algorithm, big 'o', 'Ω' and 'ɵ' notations, best, worst and average case analysis of an algorithm.

Linear Data Structures using Sequential Organization: Concept of sequential organization, concept of linear data structures, arrays as ADT, storage representation of array – row major and column major & their address calculation, multidimensional arrays.

Applications: Polynomial representation using array and structure, concept of sparse matrix, it's usage & representation using arrays, algorithms for sparse matrix operations like addition and simple transpose. Analysis of the algorithms used.

Sorting and searching techniques: Need of sorting and searching, sorting order & stability in sorting.

Sorting Techniques: Algorithms for bubble sort, selection sort, insertion sort, quick sort and merge sort. Analysis of each sorting technique for best, worst and average case, concept of internal & external sorting.

Searching Techniques: Algorithms for sequential search ,binary search, analysis of each searching technique for best, worst and average case.

Stacks: Concept of stack as ADT, Representation and implementation of stack using sequential organization.

Applications: Arithmetic expression conversion & evaluation, reversing a string, concept of multi-stack & its representation. Analysis of the algorithms used.

Queues: Concept of queue as ADT, representation and implementation of linear queue & circular queue using sequential.

Applications: Josephus problem, Job scheduling, Queue simulation, Categorizing data, Double ended queue, Multi-queue and Priority queue. Analysis of the algorithms used. (Implementation not expected).

Text Books:

1 Fundamentals of Data Structures in C, E. Horowitz by S.Sahani, S.Anderson-Freed, Universities Press ,2008 ,ISBN 10:8173716056.

2 Data Structures: A pseudo code approach with C, R. Gilberg, B. Forouzan, Cenage Learning, ISBN 9788131503140.

Reference Books:

1 Data Structures and Algorithms, A. Aho, J. Hopcroft, J. Ulman, Pearson Education, 1998, ISBN-0-201-43578-0

2 Data Structures using C and C++, Y. Langsam, M. Augenstin and A. Tannenbaum, 2nd Edition, Prentice Hall of India, 2002, ISBN-81-203-1177-9

3 An introduction to data structures with Applications, J. Tremblay, P. Soresan, 2nd edition, Tata McGraw-Hill International Editions, 1984, ISBN-0-07-462471-7.

CO203 COMPUTER ORGANIZATION

Teaching Scheme: 03L + 00T, Total: 03 **Credit:** 03
Evaluation Scheme: 10 ISA + 15 ISE1 +15 ISE2 + 60 ESE **Total Marks:** 100
Duration of ESE: 03Hrs

COURSE DESCRIPTION:

This course introduces Architecture of computers and basic of computer. It provides knowledge to student how memory is organize and how computer functions, how it control and its processing.

COURSE OBJECTIVES:

The objectivities of offering this course are

1 To provides detail of computer system's functional components, their characteristics, performance and interactions including system bus, different types of memory and input/output organization and CPU.
2 To covers the architectural issues such as instruction set program and data types. On top that, the students are also introduced to the increasingly important area of parallel organization.
3 To understand the structure, function and characteristics of computer systems
4 To understand the design of the various functional units of digital computers
5 To learn basics of Parallel Computer Architecture.

DESIRABLE AWARENESS/SKILLS:

Fundamentals of computer hardware

COURSE OUTCOMES:

On the successful completion of this course; student shall be;

1 Able to understand the structure, function and characteristics of computer systems.
2 Able to understand the design of the various functional units of digital computers.
3 Able to understand various memory and I/O organization.

RELEVANCE OF POS AND STRENGTH OF CO-RELATION:

Sr. No.	Program Outcomes	Level of Operation
A	An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.	1
B	An ability to communicate effectively.	3
C	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	1

1 - Weakly correlated **2 – Moderately correlated** **3 – Strongly correlated**

COURSE CONTENT:

Basic Structure of Computer: Brief history of computers, von neumann architecture, functional units, bus structures and interconnection networks, performance.
Data Types and Computer Arithmetic : Scalar data types, fixed and floating point numbers, signed numbers, integer arithmetic, 2's complement multiplication, booths algorithm, hardware implementation, division, restoring and non-restoring algorithms, floating point representations, IEEE standard, floating point arithmetic.
Control Unit Design: Machines instructions and addressing modes, single bus CPU, control unit operation, instruction sequencing, micro-operations, (register transfer).
Hardwired Control: Design methods, design examples: multiplier cu.
Micro-programmed Control: Basic concepts, microinstruction-sequencing and execution, micro-program control, applications of microprogramming, emulator
Processor Design: CPU architecture, register organization, instruction set - instruction types, instruction formats (Intel, Motorola processors), instruction cycles, instruction pipelining, types of operands, addressing modes (Intel, Motorola processors), ALU design-ALU organization.
Memory Organization : Characteristics of memory systems. internal and external ,memory, chip packaging. Main memory- ROM, PROM, EPROM, EEPROM, RAM: SRAM, DRAM, SDRAM, RDRAM, error correction
High-Speed Memories : Cache memory, organization and mapping, replacement algorithms, cache coherence, MESI protocol, interleaved and associative memories, performance characteristics, virtual memory: main memory allocation, segmentation, paging
Secondary Storage: Magnetic disk, tape, DAT, RAID, optical memory, CDROM, DVD
I/O Organization: Input/output systems, programmed i/o, interrupt driven i/o, i/o channels, direct memory access (DMA), buses and standard interfaces: synchronous, asynchronous, Parallel serial, PCI, SCSI, USB, ports
Peripherals: Keyboard, mouse, scanners, video displays, dot matrix, desk-jet and laser printers

Text Books:

1 Computer Organization by C, Hamacher, V. Zvonko, S. Zaky,McGraw Hill, 2002
2 Computer Organization and Architecture: Designing for performance, W. Stallings, 6th Edition, Prentice Hall of India, 2003, ISBN 81-203-2103-0

Reference Books:

1 Computer Architecture and Organization, J. Hays,2nd Edition, McGraw-Hill, 1988 ISBN 0 - 07 -100479-3
2 Computer Organization and Architecture: principles of structure and function, W. Stallings William, 2nd Ed, Maxwell Macmillan Editions, 1990 ISBN 0 - 02 -946297 - 5 .
3 Structured Computer Organization, A. Tanenbaum, 4th Ed, Prentice Hall of India, 1991 ISBN 81 - 203 -1553 - 7 .
4 Computer Organization: Hardware and Software, G. George, 2nd Edition, Prentice Hall of India, 1986 .
5 Computer Organization and Design: The Hardware Software Interface, D. Paterson, J. Hennesy, 2nd Edition, Morgan Kauffman, 2000 ISBN 981 - 4033 -588.

CO204 OBJECT ORIENTED TECHNOLOGY

Teaching Scheme: 03L + 00T, Total: 03 **Credit:** 03
Evaluation Scheme: 10 ISA + 15 ISE1 +15 ISE2 + 60 ESE **Total Marks:** 100
Duration of ESE: 03Hrs

COURSE DESCRIPTION:

This course introduces concept of object oriented modeling and design. This course introduces student with the knowledge of class communication, inheritance, polymorphism and exception handling.

COURSE OBJECTIVES:

The objectives of offering this course are

1 To learn and understand various Objects Oriented concepts along with their applicability contexts.
2 To give a problem, identify domain objects, their properties, and relationships among them.
3 To draw a class diagram for the interacting objects in problem domain
4 To identify and model/represent domain constraints on the objects and (or) on their relationships
5 To develop programming solutions for small problems on various O-O concepts
6 To understand and appreciate the capabilities and limitations of such programming paradigm

DESIRABLE AWARENESS/SKILLS:

Basics of C programming.

COURSE OUTCOMES:

On the successful completion of this course; student shall be;

1 Able to representation and implementation of data structures using OOP concepts.
2 Able to compare the benefits of static and dynamic data structures.
3 Able to use overloading and polymorphism in programming.
4 Able to study template, STL, exceptions, files and streams in OOP.

RELEVANCE OF POS AND STRENGTH OF CO-RELATION:

Sr. No	Program Outcomes	Level of Operation
A	An ability to design and conduct experiments, as well as to analyze and interpret data.	2
B	An ability to function on multi-disciplinary teams.	1
C	An ability to identify, formulates, and solve engineering problems.	1
D	An ability to communicate effectively.	3
E	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	1

1 - Weakly correlated **2 – Moderately correlated** **3 – Strongly correlated**

COURSE CONTENT:

Introduction to Object Oriented Programming: Introduction to procedural, modular, object-oriented and generic programming techniques, limitations of procedural programming, need of object-oriented programming,

Classes and Objects: Defining a class, data members and methods, Hungarian notation, public, private and protected members, inline member functions, static data members, static member functions, 'this' pointer, constructors, destructors, friend function, dynamic memory, allocation array of objects, pointers and classes.

Operator Overloading: Introduction, need of operator overloading, overloading the assignment, binary and unary operators, overloading using friends, rules for operator overloading, type conversions.

Inheritance and Polymorphism: Concept and need, single inheritance, base and derived classes, friend classes, types of inheritance, hybrid inheritance, member access control, static class, multiple inheritance, ambiguity, virtual base class, polymorphism, virtual functions, pure virtual functions.

Templates: Introduction, templates: function template and class template, function overloading vs. function templates, member function templates and template arguments.

Introduction to Generic Programming: Introduction to standard template library (STL), containers, iterators and algorithms, study of container template classes for vectors and stacks and related algorithms.

Exception Handling: Introduction, syntax for exception handling code: try and catch-throw, multiple exceptions, exceptions with arguments, introduction to RTTI

Managing Console I/O Operations: Introduction, C++ streams, stream classes, unformatted I/O, formatted I/O and I/O manipulators.

Files and Streams: Concept of a file, file operations, streams, opening and closing a file, detecting end-of-file, file modes, file pointer, structures and files, classes and files, sequential file processing, error handling.

Text Books:

1 The Waite Group's Object oriented Programming in C++, R. Lafore, 3rd Edition, Galgotia Publications, 2001, ISBN 81-7515-269-9.

2 Object Oriented Programming with C++ E. Balaguruswamy, Tata McGraw-Hill Publishing Company Ltd, New Delhi ISBN 0 - 07 - 462038 - X.

Reference Books:

1 C++ Programming Language, B. Stroustrup , 3rd Edition, Pearson Education, 1997, ISBN 0 - 201 - 327554

2 Object-Oriented Programming with ANSI and Turbo C++ , Ashok N. Kamthane, Pearson Education, 2006.

3 Object-Oriented Programming in C++, Rajesh K. Shukla, Wiley India, 2008. 3. Bjarne Stroustrup, “C++ Programming Language”, Third Edition, Addison Wesley, 2002.

4 Let Us C++, Yashavant P. Kanetkar, Second Edition, BPB Publications, 2003.

5 Mastering C++, Venugopal K.R, First Edition, TMH, 1999.

SH 204 GENERAL PROFICEINCY-II

Teaching Schemes: 01 L + 02PR; Total: 03 **Credits:** 02
Evaluation Scheme: 25 ICA + 25 ESE **Total Marks:** 50
Duration of ESE: 03Hrs

COURSE DESCRIPTION:

This course is mainly designed to inculcate human skills among students community. It includes both soft skill development and human behaviour at work. The student will learn the speaking, listening, drafting and presentation skills. Student will study the organization of meeting, GD/PI principles, general etiquettes & manners and organizational communication. This course will help to develop thinking ability, positive attitude, leadership ability, emotional competence and to perform well under varied circumstances.

DESIRABLE AWARENESS/SKILLS:

Basic principles of communication and English as a language.

COURSE OBJECTIVES:

The objectives of offering this course are

1. To strengthen the persona of student.
2. To learn use of concepts and applications of ICT based presentation skills.
3. To sharpen the soft skills to enhance employability.

COURSE OUTCOMES:

On the successful completion of this course; student shall be able to

1. Apply basic knowledge of public speaking, listening and presentation skills
2. Draft a document and write a technical/non-technical report.
3. Demonstrate good etiquettes and manners in his/her life and face GD/PI confidently.
4. Understand the organizational human behaviour.
5. Use ICT based presentation.

RELEVANCE OF POS AND STRENGTH OF CO-RELATION:

Sr No	Program Outcomes	Level of co-relation
A	Understand and adapt universal skills and culture without losing human and ethical values.	2
B	Communicate (oral and written) effectively both individually and within multidisciplinary teams.	3
C	Understand and apply contextual knowledge to assess and solve social, health, safety, legal cultural and environmental issues related to engineering practices in general and electronics engineering practices in particular.	1
D	Maintain quality, timeliness and continuous improvement.	2

1-Weakly correlated 2 – Moderately correlated 3 – Strongly correlated

COURSE CONTENT:

Organizational Communication:

Overview: Meaning, definition, classification, purpose and importance of communication; communication structure in organization, communication in conflict, crisis and cross-cultural setting; oral communication, reflection and empathy: two sides of effective oral communication; general etiquettes and manners; significance of body language in communication and assertiveness training.

Written Communication: Purpose of writing, clarity in writing, principles of effective writing, the 3x3 writing process for business communication, pre writing, writing, revising, specific writing features – coherence; technical report writing (IEEE standards).

Business Letters and Reports: Types of business letters, writing routine and persuasive letters, positive and negative messages; writing reports - purpose, kinds and objectives of reports; organization and preparing reports, short and long reports; writing proposals: structure & preparation; writing memos.

Group Communication: Meetings- planning, objectives, participants, timing, venue of meetings; meeting documentation: notice, agenda, agenda notes, book of enclosures and resolution & minutes of meeting.

Presentation skills: Elements of presentation – designing and delivering business presentations, advanced technological support for presentation, computer based power point presentation.

Employment communication: Introduction, Composing Application, Writing CVs, Group discussions, Interview skills, do's and don'ts at GD/PI; technology-enabled communication - communication networks, intranet, internet, videoconferencing.

Organizational Behavior

Overview: Definition, historical development, fundamental principles of OB, contributing disciplines, challenges and opportunities.

Individual Behavior: Foundations of individual behavior. Ability: Intellectual abilities, Physical ability, the role of disabilities.

Personality: Meaning, formation, determinants, traits of personality, big five and MBTI, personality attributes influencing OB.

Attitude and Perception: Formation and components of attitudes, positive attitude, impact of attitude on behavior and decision making. Process of perception, factors influencing perception, link between perception and individual behavior/decision making.

Emotions: Affect, mood and emotion and their significance, basic emotions, emotional intelligence, emotional quotient, emotion management at individual and group level.

Motivation: Meaning and significance; theories of motivation-needs theory, two factor theory; application of motivational theories.

Leadership: Meaning, functions and styles of leadership; leadership theories - trait theory, behavioral theories, path goal theory, charismatic leadership theory, situational theories-Fiedler's model; transactional and transformation leadership.

Group Behavior: Definition, types, formation of groups, building effective teams; conflict: meaning, nature, types, process of conflict, conflict resolution.

Topics for Assignment /Practical

Minimum ten number of assignments/practical shall be performed to cover entire curriculum of the course. The list given below is just a guideline.

1. Speech preparation and delivery.
2. Power point presentation on general topics/ latest trends
3. Preparation of meeting agenda/ conducting meeting / taking minutes of meeting
4. Demonstration of general etiquettes and manners through role playing.
5. Demonstration of attitude/leadership etc through role playing.
6. Conducting mock meeting and preparing related documents.
7. Writing application letter along with resume
8. Reporting positive and negative information to seniors
9. Preparing notice/ circular/ memo/ enquiries/ quotations
10. Conducting group discussions and personnel interview
11. Report writing/Paper presentation.
12. Drafting policies/ procedures/ rules
13. Sharing experience to motivate others or to demonstrate mood /emotion and their significance.
14. Determination of emotion quotient/Intelligent quotient and personality analysis.

Text Books:

1. Business Communication for Managers, Penrose, Rasberry, Myers, 5th edition, Cenage Learning, 2007
2. Business Communication, Rai and Rai, 2nd edition, Himalaya Publishing House, 2014
3. Organization Behavior, Suja R. Nair, Himalaya Publications, 2014
4. Organization Behavior, V.S.P.Rao, 1st edition, Excel Publications, 2009

Reference Books:

1. Business Communication, Raman and Singh, 2nd edition, Oxford Publication, 2012
2. Business Communication Today, Bovee, Thill, 6th edition, Schatzman, Pearson Education, 2000
3. Business Communication (BCOM), Lehman Sinha, 2nd edition, Cengage Learning, 2012
4. Organization Behavior, Stephen P. Robbins, 13th edition, Pearson Education, 2009
5. Organization Behavior, Fred Luthans, 12th edition, TMH, 2012
6. Organization Behavior, K. Ashwathappa, 7th edition, Himalaya Publications, 2007

NOTE:

- ICA – Internal Continuous Assessment shall support for regular performance of practical and its regular assessment. In addition; it shall be based on knowledge/skill acquired and record submitted by student (journal) based on practical performed by him/her. The performance shall be assessed experiment wise using internal continuous assessment format (S 10).
- ESE – The End Semester Examination (ESE) for this laboratory course shall be based on performance in one of the experiments performed by student in the semester followed by sample questions to judge the depth of understanding/knowledge or skill acquired by the student. It shall be evaluated by two examiners out of which one examiner shall be out of institute.

ET222: DIGITAL ELECTRONICS AND LOGIC DESIGN LAB

Teaching Scheme: 02P; Total: 02 **Credits:** 01
Evaluation Scheme: 50 ICA **Total Marks:** 50
Duration of ESE: 03 Hrs

Minimum five experiments from each group A and group B shall be performed to cover entire curriculum of course ET221. The list given below is just a guideline.

GROUP A

1. Implement Boolean expression using universal gates.
2. Design 4 bit Gray to Binary Code Convertor.
3. Realization of IC7483 as parallel adder /subtractor.
4. Verification of 4-bit Magnitude Comparator using IC7485.
5. Design and Implement BCD to 7 Segment display decoder.
6. Verify the truth table of multiplexer and de-multiplexer using IC's.
7. Verify the truth table of JK,T and D Flip-Flops using IC's
8. Verify arithmetic and logical operations using ALU using IC74181.

GROUP B

1. Design and implementation of 4 bit ripple counter using IC.
2. Design and implementation of ring counter/ shift register/shift counter
3. Realization of Decade counters using IC.
4. Astable multivibrator using NAND/NOR gates.
5. Monostable multivibrator using NAND/NOR gates.
6. Astable multivibrator using IC 741/555.
7. Monostable multivibrator using IC 741/555.
8. Study of ADC and DAC ICs.

NOTE:

- ICA – Internal Continuous Assessment shall support for regular performance of practical and its regular assessment. In addition; it shall be based on knowledge/skill acquired and record submitted by student (journal) based on practical performed by him/her. The performance shall be assessed experiment wise using internal continuous assessment format (S 10).

CO205 FUNDAMENTALS OF DATA STRUCTURES PROGRAMMING LAB

Teaching Scheme: 04P Total: 04 **Credit :** 02
Evaluation Scheme: 50 ICA + 50 ESE **Total Marks:** 100
Duration of ESE: 03Hrs

Minimum 12 experiments (six from Group A and six from Group B) shall be performed to cover entire curriculum of course CO202. The list given below is just a guideline. All assignments are to be implemented using open source technology (preferably). Every assignment should include use of syntax, use of command/function used for coding and printout of code with proper comment and output.

Group A

1. Write a program to perform Set operations - Union, Intersection, Difference, Symmetric Difference etc.
2. Write a program to perform various string operations such as Copy, Length, Concatenation and Reversing etc without using library functions.
3. Write a program to perform operations on matrices like addition, multiplication, saddle point & transpose etc using functions.
4. Write a program to perform following operations on any database using structure: Add, Delete, Modify, Display, Search & Sort etc.
5. Represent polynomial using structures or array and write a program to perform Addition and Evaluation given polynomial
6. Represent Circular Queue using Array and write a program to perform operations like Insert, Delete, and Display front and rear element.
7. Implement Stack as an Abstract Data Type (ADT) using Array. Use this ADT to perform expression conversions like infix to postfix, infix to prefix, prefix to infix, prefix to postfix, postfix to infix and postfix to prefix. [Any one]

Group B

1. Write a program to accept two unbounded number from user and perform addition using array.
2. Accept student information (e.g. RollNo, Name, Percentage etc.).
    a. Display the data in descending order of Percentage (Bubble Sort).
    b. Display data for Roll No specified by user (Linear Search).
    c. Display the number of passes and comparisons for different test cases (Worst, Average, Best case).
3. Accept Mobile user information (e.g. MobileNo, Name, BillAmount etc.).
    a. Display the data in descending order of MobileNo. (insertion Sort)
    b. Display the data in ascending order of Name (Selection Sort)
    c. Display details for Mobileno specified by user (Binary Search)
    d. Display the number of passes and comparisons for different test cases (Worst, Average, Best case)
4. Implement Sorting Methods using recursion- Quick Sort and Merge Sort.
5. Represent Sparse Matrix using array and perform Matrix Addition & Simple Transpose.

6. Write a simple application (Mini-Project) that covers all the concepts of course CO202 (Mandatory).

NOTE:

- ICA – Internal Continuous Assessment shall support for regular performance of practical and its regular assessment. In addition; it shall be based on knowledge/skill acquired and record submitted by student (journal) based on practical performed by him/her. The performance shall be assessed experiment wise using internal continuous assessment format (S 10).
- ESE – The End Semester Examination (ESE) for this laboratory course shall be based on performance in one of the experiments performed by student in the semester followed by sample questions to judge the depth of understanding/knowledge or skill acquired by the student. It shall be evaluated by two examiners out of which one examiner shall be out of institute.

CO206 SOFTWARE LAB-I

Teaching Scheme: 02P Total: 02 **Credit :** 01
Evaluation Scheme: 25 ICA + 25 ESE **Total Marks:** 50
Duration of ESE: 03Hrs

Minimum 10 experiments (Six from Group B and Four from Group C) shall be performed to cover curriculum from Group-A of CO206. The list given below is just a guideline. All assignments are to be implemented using open source technology only. Every assignment should include use of syntax, use of command/function used for coding and printout of code with proper comment and output. The concern faculty member must engage first six practical turns to cover syllabus of group-A.

Group A:

1. Introduction to Linux/Unix OS, commands of linux/unix.
2. Installing Linux (or any variant), and various software's.
3. Introduction to using different tools for identification of possible errors in C program .
4. DDD (Data Display Debugger) – introduction and usage.
5. IDE for code development
    a. Using DevCpp and/or VisualStudio
    b. Create a project, using multiple .c and .h files with cross-refrences
    c. Setting compiler options and linker options
    d. Understanding different settings
6. Shell scripting – variables, conditionals, loops, case-in and finding logged in users.
7. Parameter passing to C program from shell (argc / argv)
8. HTML, XML, XSD and HTML / XML parsing.

Group B:

1. Learn Linux and installation of various software's.
2. Learn and execute different command of Linux.
3. Write and debug 'C' program for arithmetic operations.
4. Write and debug 'C' program on linear search.
5. Write and debug 'C' program to perform any operation on matrix.
6. Using/Creating/Modifying/copying Files via C programs. Reading- from / writing-to files.
7. Creating a grade card preparation program from individual subject marks stored in files and creating the result.
8. Create and search a particular record from File.

Group C:

1. Creating simple calculator program.
2. Write a shell script for calculation of factorial.
3. Write a shell script for arithmetic operations using case-in.
4. Mini Project: Creating a simple website (Mandatory).
5. Translating date / time across different time-zones (with and without daylight saving)

NOTE:

- ICA – Internal Continuous Assessment shall support for regular performance of practical and its regular assessment. In addition; it shall be based on knowledge/skill acquired and record submitted by student (journal) based on practical performed by him/her. The performance shall be assessed experiment wise using internal continuous assessment format (S 10).
- ESE – The End Semester Examination (ESE) for this laboratory course shall be based on performance in one of the experiments performed by student in the semester followed by sample questions to judge the depth of understanding/knowledge or skill acquired by the student. It shall be evaluated by two examiners out of which one examiner shall be out of institute.

CO207 OBJECT ORIENTED TECHNOLOGY LAB

Teaching Scheme: 02P Total: 02 **Credit:** 01
Evaluation Scheme: 25 ICA + 25 ESE **Total Marks:** 50
Duration of ESE: 03Hrs

Minimum 12 experiments (six from group A and six from group B) shall be performed to cover entire curriculum of course CO204. The list given below is just a guideline. All assignments are to be implemented using open source technology (preferably). Every assignment should include use of syntax, use of command/function used for coding and printout of code with proper comment and output.

GROUP A

1. Write a C++ program to calculate multiplication of two numbers; use parameterized and default constructor.
2. Create two classes DM and DB which stores the value of distances. DM stores distances in meters and centimetres and DB in feet and inches. write a program that can read values for the class objects and add one object of DM with another object of DB. Use a friend function to carry out the addition operation. The object that stores the results may be a DM object or DB object, depending on the units in which the results are required. The display should be in the format of feet and inches or meters and centimetres depending on the object on display.
3. Write a C++ program to overload unary operator using member function.
4. Write a C++ program to overload binary operator using friend function.
5. Write a C++ program for calculating area of rectangle, triangle and circle using polymorphism.
6. Consider base classes Area having function to calculate area and Parameter having a function to calculate parameter; and derived class Rectangle. Use multiple inheritance to calculate area and parameter of rectangle.
7. Create a simple "Shape" hierarchy. A base class called Shape and derived classes called Circle, Square and Triangle. In the base class write a virtual function "draw" and override this in derived classes.
8. Consider a class Number having a function to accept and print a roll_no., a class Marks having function to accept and print marks of two subjects; and a class Student having function to display total of two subjects. Write a C++ program to calculate total of 2 subjects for a student using multilevel inheritance.
9. Generate record for student containing name, age, weight, height, blood group, phone number and address. Print and store the record in file.

GROUP B

1. Write a C++ program to perform matrix operation using Templates.
2. Write a program to perform various stack operations using Standard Template Library (STL).
3. Write a to perform various queue operations using STL.
4. Write a C++ program to demonstrate dynamic memory allocation.
6. Create a file having records of person with name, age, city and occupation. Write a C++ program to search a particular record of a person from file.
7. Write a simple application (Mini-project) that covers all the concept of Object Oriented Programming (Mandatory).

NOTE:

- ICA – Internal Continuous Assessment shall support for regular performance of practical and its regular assessment. In addition; it shall be based on knowledge/skill acquired and record submitted by student (journal) based on practical performed by him/her. The performance shall be assessed experiment wise using internal continuous assessment format (S 10).
- ESE – The End Semester Examination (ESE) for this laboratory course shall be based on performance in one of the experiments performed by student in the semester followed by sample questions to judge the depth of understanding/knowledge or skill acquired by the student. It shall be evaluated by two examiners out of which one examiner shall be out of institute.

SH 253 : NUMERICAL METHODS AND PROBABILITY THEORY

Teaching Scheme : 03L+01T Total: 04 **Credit:** 04
Evaluation Scheme: 10 ISA + 15 ISE1 +15 ISE2 + 60 ESE **Total Marks:** 100
Duration of ESE: 03Hrs

COURSE OBJECTIVES:

The prime objective of offering this course is to strengthen the

1 Students will understand second and higher order differential equations and their solutions by general method as well as some short cut methods. Also application of differential equations to electrical engineering problems are discussed which will allow them to apply to engineering problems.
2 Students will understand function of a complex variable, definition of analytic function and its use in solving real or complex integration. Cauchy Integral theorem and Cauchy residue theorem are very important tools in solving many problems. They will learn these techniques.
3 Students will understand integral transforms such as Laplace transform (L.T.) of a function in t-domain. They will learn L.T. and their inverses of various standard functions as well as special functions such as Heaviside function, Dirac delta function, error function etc. Also they will learn the techniques to solve Initial Value Problems through Laplace transform techniques.
4 Students will understand Fourier transforms, Fourier Sine Transforms, Fourier Cosine transforms and their Inverses which are again very useful in solving Initial Value Problems.
5 Students will also learn Z-Transform and their inverses.
6 Students will understand vector integration such as line integral, surface integral etc which is very much essential in various problems.
7 Students will also learn the important theorems of vector integration like Green's, Gauss' and Stokes' theorems.
8 Students will learn Maxwell's equations .

COURSE OUTCOMES:

On the successful completion of this course; student shall be able to

1 Able to apply methods of solving differential equations to the engineering problems they face in industry.
2 Able to understand analytic function of a complex variable. Able to apply Cauchy Integral theorem and Cauchy residue theorem to solve contour integrations.
3 Able to apply Laplace Transform and Inverse Laplace Transform which are very useful in solving Initial Value Problems.
4 Able to apply Laplace Transform in solving problems related to their engineering field and other future courses.
5 Able to use Fourier transforms, Fourier Sine Transforms, Fourier Cosine transforms, Z transforms and their Inverses to solve various integration problems.
6 Able to use mathematics in higher studies for analysis and optimal design of systems.

COURSE CONTENT:

Numerical Methods-I: Number system, decimal and binary numbers, error analysis, absolute, relative and percentage error. solution of algebraic and transcendental equations by Newton Raphson method, Regula-falsi method and secant method, solution of linear system of equations by Gauss elimination method, Gauss Siedal Method, Crout's method.

Numerical Methods-II: Numerical differentiation, numerical methods for ordinary differential equations- Picard's Method, Runge-Kutta IVth order method, Euler's modified method.

Statistics: Measures of central tendency, dispersion, moments, skewness and kurtosis, correlation coefficient, lines of regression, curve fitting, method of least square, straight lines, second degree parabola, exponential and power curves.

Random variables and Mathematical Expectations: Random variables: definition, properties and classification, probability function and distribution function, expectation: definition and properties, mean, variance, standard deviation in terms of expectations, moment generating function, characteristics function.

Special Probability distributions: Probability distribution: binomial distribution, Poisson distribution, normal distribution, uniform distribution, geometric distribution, log normal distribution, weibull distribution, chi-square distribution and student's t distribution.

Text books:

1. A text book of Engineering Mathematics (Vol-I and II) by P.N.Wartikar and J.N.Wartikar, 07th edition, Pune Vidhyarthi Griha Prakashan, Pune, 2013.
2. A text book of Engineering Mathematics, by N.P.Bali & Manish Goyal, 09th edition, Laxmi Prakashan, 2014.

Reference books:

1. Advanced Engineering Mathematics by Erwin Kreyszig, 8th edition ,Willey Eastern Ltd. Mumbai, 2013.
2. Higher Engineering Mathematics by B. S. Grewal, 33rd edition , Khanna Publication, New Delhi, 1996.
3. Advanced Engineering Mathematics by H. K. Dass, 12th edition, S. Chand Publication, New Delhi, 2003
4. Higher Engineering Mathematics by B. V. Ramana, 12th edition , Tata McGraw Hill, Delhi, 2011.
5. Numerical Method by S.R.K. Iyengar and S. R. Jain, 06th edition, New Age International Publishers, 2012.
6. Probability& Statistics by Shrinivasan, Spigal & Schiller, 02nd edition, Tata McGraw Hill, Delhi, 2016.

CO251 DATA STRUCTURES AND FILES

Teaching Scheme: 03L + 00T, Total: 03 **Credit:** 03
Evaluation Scheme: 10 ISA + 15 ISE1 + 15 ISE2 + 60 ESE **Total Marks:** 100
Duration of ESE: 03Hrs

COURSE DESCRIPTION:

This course introduces to student about data structure, how to allocate data in memory. To introduce various techniques for representation of the data in the real world.

COURSE OBJECTIVES:

The objectives of offering this course are

1. To describe the usage of various data structures
2. To teach efficient storage mechanisms of data for an easy access.
3. To design and implementation of various basic and advanced data structures.
4. To introduce various techniques for representation of the data in the real world
5. To develop application using data structures.
6. To teach the concept of protection and management of data.
7. To improve the logical ability

DESIRABLE AWARENESS/SKILLS:

Fundamentals of Data Structures Programming

COURSE OUTCOMES:

On the successful completion of this course; student shall be;

1. Able to learn the different ways of data representation.
2. Able to study how the data structures are allocated and used in memory.
3. Able to study the representation, implementation and applications of linear data structures

RELEVANCE OF POS AND STRENGTH OF CO-RELATION:

Sr. No	Program Outcomes	Level of Operation
A	An ability to design and conduct experiments, as well as to analyze and interpret data.	3
B	An ability to function on multi-disciplinary teams.	1
C	An ability to identify, formulates, and solves engineering problems.	3
D	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	3

1 - Weakly correlated **2 – Moderately correlated** **3 – Strongly correlated**

COURSE CONTENTS:

Linear data structures using linked organization: Concept of linked organization, singly linked list, doubly linked list, circular linked list. linked list as an ADT. representation of stack and queue using link list. representation and manipulations of polynomials using linked lists, comparison of a sequential and linked memory organization, concept of generalized linked list, representation polynomial using GLL.

Non-Linear Data Structures-Trees: Difference in linear and non-linear data structure, trees and binary trees-concept and terminology, expression tree. conversion of general tree to binary tree. binary tree as an ADT. recursive and non recursive algorithms for binary tree traversals, binary search trees, binary search tree as ADT, concept of threaded binary tree. preorder and inorder traversals of inorder threaded binary tree. applications of trees.

Non-Linear Data Structures-Graphs: Graph as an ADT, representation of graphs using adjacency matrix and adjacency list, depth first search and breadth first search traversal. Prim's and Kruskal's algorithms for minimum spanning tree.

Symbol Table: Notion of symbol table, AVL trees, Huffman's algorithm, heap data structure, min and max heap , heap sort implementation, applications of heap.

Hash tables : Basic concepts, hash function, characteristics of good hash function, different key-to-address transformations techniques, synonyms or collisions, collision resolution techniques-linear probing, quadratic probing, rehashing, chaining without replacement and chaining with replacement.

File Organization: External storage devices, files, file types and file organization (sequential, index sequential and Direct access), primitive operations and implementations for each type and comparison

Text Books:

1. Data Structures: A pseudo code approach with C, R. Gilberg, B. Forouzan, Cengage Learning, ISBN 9788131503140.
2. Data Structures using C and C++ , Y. Langsam, M. Augenstin and A. Tannenbaum, 2nd Edition, Prentice Hall of India, 2002, ISBN-81-203-1177-9.

Reference Books:

1. Fundamentals of Data Structures in C++, E. Horowitz, S. Sahni, D. Mehta, Galgotia Book Source, New Delhi, 1995, ISBN 16782928.
2. File organisation and processing, A. Tharp ,2008 ,Willey India edition ,9788126518685
3. Data Structures in C++ ,A. Drozdek,, 2nd Edition, Thomson Brookes /COLE Books, 2002, ISBN 981 – 240 – 079 – 6.
4. An introduction to data structures with Applications , J. Tremblay, P. Soresan, 2nd edition, Tata McGraw-Hill International Editions, 1984, ISBN-0-07-462471-7.

CO252 COMPUTER GRAPHICS

Teaching Scheme: 03L + 00T, Total: 03 **Credit:** 03
Evaluation Scheme: 10 ISA + 15 ISE1 + 15 ISE2 + 60 ESE **Total Marks:** 100
Duration of ESE: 03Hrs

COURSE DESCRIPTION:

This course introduces application of computer graphics and learning basic and fundamental computer graphics techniques and examines applications of modeling, design and visualization. This course equips students with fundamental knowledge and basic technical competence in the field of computer graphics.

DESIRABLE AWARENESS/SKILLS:

Basics commands of Graphics, C programming

COURSE OBJECTIVES:

The objectives of offering this course are

1 To Know and be able to describe the general software architecture of programs that use 3D computer graphics.
2 To learn basic and fundamental computer graphics techniques.
3 To examine applications of modeling, design and visualization.
4 To introduce to the students in the graphics mode, with the help of basic algorithms and methodologies .
5 The objective of the course is to equip students with fundamental knowledge and basic technical competence in the field of computer graphics
6 To Provide an understanding of how a computer draws the fundamental graphics primitives
7 To learn Computer Graphics methodologies/Algorithms and techniques .
8 To learn Implementation of Computer Graphics Algorithms.

COURSE OUTCOMES:

On the successful completion of this course; student shall be;

1 Able to understand the basics of computer graphics.
2 Able to be aware of applications of computer graphics.
3 Able to know the elements of computer graphics.
4 Able to give more emphasis on implementation aspect of Computer Graphics Algorithm.

RELEVANCE OF POS AND STRENGTH OF CO-RELATION:

Sr. No.	Program Outcomes	Level of Operation
A	An ability to apply knowledge of mathematics, science, and engineering .	2
B	An ability to function on multi-disciplinary teams.	1
C	An ability to identify, formulates, and solve engineering problems.	3
D	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	2

1 - Weakly correlated **2 – Moderately correlated** **3 – Strongly correlated**

COURSE CONTENTS:

Basic Concepts : Introduction to computer graphics, computer graphics application, interactive computer graphics, description of some graphics devices, input devices for operator interaction, active and passive graphics devices, display technologies, raster refresh (raster-scan) graphics displays, cathode ray tube basics, color CRT raster scan basics, video basics, the video controller, random-scan display processor, LCD displays,

Line and circle drawing algorithms: DDA algorithm, Bresenham's line algorithm, circle generation algorithm; ellipse generating algorithm; scan line polygon, fill algorithm, boundary fill algorithm, flood fill algorithm.

Two-Dimensional Transformations: Transformation conventions, 2D transformations, homogeneous coordinates and matrix representation of 2D transformations, translations and homogeneous coordinates, rotation, reflection, scaling, combined transformation, rotation about an arbitrary point, reflection through an arbitrary line;

Three-Dimensional Transformations: Introduction, three-dimensional scaling, three-dimensional shearing, three-dimensional rotation, three-dimensional reflection, three-dimensional translation, multiple transformation, rotation about an arbitrary axis in space, reflection through an arbitrary plane, matrix representation of 3D transformations, composition of 3d transformations, affine and perspective geometry, perspective transformations, orthographic projections, axonometric projections, oblique projections;

Polygons, Windowing & Clipping: Window to view port coordinates transformation, clipping operations-point clipping, line clipping (Cohen Sutherland clipping, Liang-Barsky line clipping, midpoint sub division) polygons, types of polygons, polygon filling, segments, generalized clipping, polygon clipping-Sutherland-Hodgeman polygon clipping.

Curves and Surfaces: Curve representation, parametric curves, parametric representation of a circle, parametric representation of an ellipse, parametric representation of a parabola, parametric representation of a hyperbola, representation of space curves, cubic splines, Bezier curves, b-spline curves, parametric cubic curves, Bezier surfaces, b-spline surfaces.

Solid Modelling: Solid modeling representation of solids, primitive instancing, sweep representations, boundary representations, spatial-partitioning representations, constructive solid geometry methods, octrees, binary, space partitioning trees.

Text Books:

1 Computer Graphics - Principles and Practice, J. D. Foley, A. Van Dam, S. K. Feiner and J. F. Hughes, Second Edition in C, Addison Wesley, 2nd Ed, 2003.

2 Procedural Elements for Computer Graphics, David F. Rogers, Tata McGraw Hill, Second edition.

Reference Books:

1 Computer Graphics, C Version, D. Hearn and M. P. Baker, Pearson, 2nd Ed, 2003.

2 Fundamentals of Multimedia, Ze-Nian Li, M. S. Drew, Pearson, 1st Ed, 2004.

3 Computer Graphics using OpenGL, F. S. Hill Jr., Pearson Education, 2003.

CO253 DATA COMMUNICATIONS

Teaching Scheme: 03L, Total: 03 **Credit:** 03
Evaluation Scheme: 10 ISA + 15 ISE1 + 15 ISE2 + 60 ESE **Total Marks:** 100
Duration of ESE: 03Hrs

COURSE DESCRIPTION:

This course introduces basic communication techniques and concept of data communication. Provide knowledge of networking and different topologies of network. It also provides encoding technique of data. Introduce the layered model of internet and its components.

COURSE OBJECTIVES:

The objectives of offering this course are

1 To learn and understand basic communication techniques.
2 To introduce students to the evolution of computer networks and the concepts data communication.
3 To introduce students the general principles of network design and compare the different network topologies.
4 To introduce students to the digital and analogue representations and channels.
5 To describe the mechanism and techniques of encoding.
6 To introduce students to the general principles of circuit and packet switching.
7 To provide students with in-depth knowledge of data link layer fundamental such as error detection, correction and flow control techniques; multiple access control techniques.

COURSE OUTCOMES:

On the successful completion of this course; student shall be;

1 Able to introduce the concepts of data communication.
2 Able to learn Data Communication Methods and Algorithm.
3 Able to introduce the layered model of internet and its components.
4 Able to provide in-depth knowledge of physical layer and data link layer technologies.

DESIRABLE AWARENESS/SKILLS:

Nill

RELEVANCE OF POS AND STRENGTH OF CO-RELATION:

Sr. No	Program Outcomes	Level Of Operation
A	An ability to design and conduct experiments, as well as to analyze and interpret data.	2
B	An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.	3
C	An ability to identify, formulates, and solves engineering problems.	1
D	An ability to communicate effectively.	3
E	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	1

1 - Weakly correlated **2 – Moderately correlated** **3 – Strongly correlated**

COURSE CONTENTS:

Introduction: Data communication, networks, internet, protocols and standards, network models: OSI, TCP/IP, analog and digital data, periodic analog signal, digital signal, transmission impairments, data rate limits, performance. signal conversion: digital-to-digital, analog-to-digital, analog-to-analog, digital-to-analog conversion.

Bandwidth Utilization and Transmission Media: Multiplexing spread spectrum, guided media and unguided media.

Switching: Circuit switched networks, datagram networks, virtual circuit networks, structure of switch.

Error Detection and Correction: Types of errors, redundancy, detection vs correction, fec vs retransmission, coding, modular arithmetic, block coding, linear block codes, cyclic codes, checksum, hamming code.

Data Link Control: Framing, flow control and error control protocols, protocols: stop-and-wait, go-back-n, selective-repeat, piggybacking, HDLC,PPP.

Medium Access, Ethernet and LAN: Random access: ALOHA, CSMA, CSMA/CD, CSMA/CA, controlled access, channelization, IEEE standards, different Ethernets, connecting devices, backbone networks, VLAN.

Multi-user digital: Modulation techniques such as frequency division multiple access (FDMA); time division multiple access (TDMA); code division multiple access (CDMA);

Text Books:

1 Data Communications and Networking, B. A. Forouzan, 4th Edition, Tata McGraw-Hill, 2008, ISBN: 0072515848
2 Communication Networks, Fundamental Concepts and Key Architectures, Alberto Leon Garcia and Indra Widjaja, 2nd Edition, Tata McGraw-Hill. 2004, ISBN-10: 007246352X

References:

1 Engineering Approach to Computer Networks, S. Keshav , Pearson Education, 1997, ISBN-13: 9780201634426
2 Computer Networking: A Top-Down Approach Featuring the Internet, J.F. Kurose and K. W. Ross, 2nd Edition, Pearson, 2003, ISBN-13: 9780201976991.
3 Data and computer Communication, William Stallings, 7th Edition, Pearson Education, SBN-81-297-0206-1

SH254 HUMANITIES AND SOCIAL SCIENCE

Teaching Scheme: 03L + 00T **Credit:** 03
Evaluation Scheme: 10 ISA + 15 ISE1 + 15 ISE2 + 60 ESE **Total Marks:** 100
Duration of ESE: 3 Hrs.

INTRODUCTORY SOCIOLOGY:

Introduction: Sociological Imagination; subject matter of sociology theoretical practice: Durkheim (Foundations of the Science of Society), Weber (Economy and Society), Marx (Political Economy), Foucault (Practices and Knowledge), Butler (Gender Performativity), and Burawoy (Public Sociology).

Indian Society: eminent Indian sociologists; caste, class, and tribe; women and children; health and education; science, technology and society; media and migration; globalization and social change; diaspora; a study on BIMARU states of India.

INTELLECTUAL PROPERTY LAW:

(a) The Patents act, 2002
(b) The Copyright Act, 1957
(c) The Trade markets Act, 1999
(d) Information Technology Act, 2000
(e) Offences under act.

MANAGEMENT AND ORGANIZATION:

PRINCIPLE OF MANAGEMENT:

(a) Element of management, planning, organization direction and control
(b) Organizational structure – line, line and staff, functional, divisional, project & Matrix Organizational.

HUMAN RESOURCE MANAGEMENT:

(a) function, Recruitment, selection, training promotion, discipline,
(b) job evolution,
(c) merit rating,
(d) incentive
(e) management of stress;
(f) spirituality at work.
(g) crisis management

INDUSTRIAL ECONOMICS:

Various definitions of economics: nature of economic problem, relation between science, engineering. technology and economics lecture.

Meaning: of demand, law of demand, elasticity of demand, practical importance and application of the concept of elasticity of demand lecture.

Meaning of production and factor of production: land, labor, capital, & organization –their characteristics and rewards, law of variable proportion, return to scale.

STRATEGIC HUMAN RESOURCE MANAGEMENT: Retrenchment strategies, meaning of retrenchment, understanding retrenchment and redundancy, selection of employees for retrenchment; meaning of downsizing, HR outsourcing, employee leasing.

Organizational culture, human side of mergers and acquisitions, three stage model of mergers and acquisitions, online recruitment, outsourcing recruitment, headhunting, assessment centers, cross-cultural training, 360Degree feedback,

Text Books:

1. Sociology Cambridge: Anthony Giddens, Polity Press, 2009 (Sixth Edition)
2. Social Change in Modern India, New Delhi: M.N.Srinivas, Orient Longman, 1985
3. Organizational behavior by L.M. Prasad-S Chand & sons
4. Modern Economics theory by K.K. Dwett, S. cahnd

References Books:-

1. Indian Village London: S. C. Dube, Routledge, 1955
2. Organizational behavior by Stephen P. Robbin & Seema Sanghi- pearson
3. Organizational Behaviour, 14thEd., New Jersey, Robins, S. P. & Judge, T. A.,Prentice Hall, 2010.
4. Modern Micro Economics Theory by - H.L.Ahuja -S.Chand
5. Environmental Pollution Control Engineering, C.S. Rao, New Age International Pvt. Ltd.
6. Environmental Issues in India, Rangarajan, Pearson Education
7. Personal management & industrial relation by P.C.Tripathi-S.chand
8. Industrial relation, Trade Union & Labour Relation by G.P.Sinha & PRN Sinha, Pearson
9. What is Sociology? An Introduction to the Discipline and Profession New Delhi: Prentice-Hall of India, Alex Inkeles, 1997

CO254 APPLICATION DEVELOPMENT LAB

Teaching Scheme: 01L+02P Total: 03 **Credit:** 02

Evaluation Scheme: 25 ICA + 25 ESE **Total Marks:** 50

Duration of ESE: 03Hrs

Minimum 10 experiments (Seven from Group B and Three from Group C) shall be performed to cover curriculum from Group-A of course CO254. The list given below is just a guideline. . All assignments are to be implemented using open source technology (preferably). Every assignment should include use of syntax, use of command/function used for coding and printout of code with proper comment and output.

Group A:

1. An Introduction to Java: Java as a programming tool, advantages of java, the java "white paper" buzzwords, java and the internet.
2. The Java Programming Environment: Installing the java software development kit, development environments, using the command line tools, using an integrated development environment, compiling and running programs from a text editor, graphical applications, applets
3. Fundamental Programming Structures in Java: A simple java program, comments, data types, variables, assignments and initializations, operators, strings., control flow, big numbers, arrays
4. Objects and Classes: Introduction to object-oriented programming, using existing classes, building your own classes, static fields and methods, method parameters, object construction, packages, documentation comments, class design hints, object serialization and deserialization.
5. Inheritance: Inheritance in Java, casting, method over riding, polymorphism, super, object class.
6. Interfaces and Inner Classes: interfaces, object cloning, inner classes, proxies.
7. Graphics Programming : Introduction to swing, creating a frame, frame positioning, displaying information in a panel, 2d shapes, colors, text and fonts, images.
8. Event Handling: Basics of event handling, the awt event hierarchy, semantic and low-level events in the awt, low-level event types, actions, multicasting, and the event queue.
9. User Interface Components with Swing: The model-view-controller design pattern, an introduction to layout management, text input, making choices, menus, sophisticated layout management, dialog boxes.
10. Applets: Applet basics, the applet html tags and attributes, multimedia, the applet context, jar files.
11. Exceptions and Debugging: Dealing with errors, catching exceptions, some tips on using exceptions debugging techniques, using a debugger
12. Streams and Files : Streams, the complete stream zoo, zip file streams putting streams to use object streams, file management
13. Collections: Collection interfaces, concrete collections, the collections framework
14 Multithreading: Creating thread and running it, multiple thread acting on single object, synchronization, thread communication, thread group, thread priorities, life cycle of thread
15. Networking, Internet Addressing, InetAddress, factory methods, instance methods, TCP/IP client sockets, URL, URL connection, TCP/IP server sockets, datagrams.
16. Java Database Connectivity (JDBC): Merging data from multiple tables: joining, manipulating databases with JDBC, prepared statements, transaction processing, stored procedures C

17. Servlets: Servlet overview and architecture, interface servlet and the servlet life cycle, HTTP get requests, handling HTTP post requests, redirecting requests to other resources, session tracking, cookies, session tracking with httpsession.
18. JavaServer Pages (JSP): Introduction, javaserver pages overview, first javaserver page example, implicit objects, scripting, standard actions, directives, custom tag libraries.

Group B:

1. Write a program to sort numbers.
2. Write a program for the implementation of Multiple inheritance using interfaces to calculate the area of a rectangle and triangle.
3. Write a program Event handling by anonymous class.
4. Write an example that counts the number of times a particular character, such as e, appears in a file. The character can be specified at the command line.
5. Write a program to draw a form using GUI components to accept details from a customer for a bank.
6. Write program using graphics method to draw an object ; provide direction buttons and move the object in the direction specified by user through button.
7. Write a program to use swing applet in java.
8. Write a program to demonstrate threads and use thread methods(start, run, interrupt, join, setName).

Group C:

1. Write a program to draw a sale/purchase form and store the data in database,using JDBC connectivity
2. Write a program to establish a connection using TCP/IP server socket.
3. Write a program to handle form data using servlet
4. Mini Project that covers the syllabus of the group-A (Mandatory).

Text Books:

1. JAVA: Complete Reference, Herbet Schildt, TMH, India.

Reference Books:

1. Core Java, Sun Publication, India.
2. Java How to program, Deital and Deital, Pearson Education
3. Advanced Java 2 Platform HOW TO PROGRAM, H. M.Deitel, P. J. Deitel, S. E. Santry Prentice Hall
4. Beginning Java™ EE 6 Platform with Glass Fish 3 From Novice to Professional, Antonio Goncalves – Apress publication

Note:

- **ICA –** Internal Continuous Assessment shall support for regular performance of practical and its regular assessment. In addition; it shall be based on knowledge/skill acquired and record submitted by student (journal) based on practical performed by him/her. The performance shall be assessed experiment wise using internal continuous assessment format **(S 10).**
- **ESE –** The End Semester Examination (ESE) for this laboratory course shall be based on performance in one of the experiments performed by student in the semester followed by sample questions to judge the depth of understanding/knowledge or skill acquired by the student. It shall be evaluated by two examiners out of which one examiner shall be out of institute.

CO255 DATA STRUCTRURES AND FILES LAB

Teaching Scheme: 04P Total: 04 **Credit :** 02
Evaluation Scheme: 50 ICA + 50 ESE **Total Marks:** 100
Duration of ESE: 03Hrs

Minimum 12 experiments (six from Group A and six from Group B) shall be performed to cover entire curriculum of course CO251. The list given below is just a guideline. . All assignments are to be implemented using open source technology (preferably). Every assignment should include use of syntax, use of command/function used for coding and printout of code with proper comment and output.

Group A

1. Create a singly linked list with options:
   a. insert (at front, at end, in the middle),
   b. delete (at front, at end, in the middle),
   c. Display,
2. Implement stack as an ADT using Linked List
3. Implement Queue as an ADT using Linked List
4. Accept input as a string and construct a Doubly Linked List for the input string with each Node contains, as a data one character from the string and performs:
   a) Insert
   b) delete
   c) Display forward
   d) Display backward.
5. Create binary tree and perform recursive and non-recursive traversals.
6. Create a binary search tree of mnemonics from assembly language (e.g. add, mult, div, sub etc.) and perform following operations:
   a) Insert b) Display Level wise
   c) Height of the tree d) search a node
7. Implement In order Threaded Binary Search Tree.

Group B

1. Represent a given graph using adjacency list or matrix and perform DFS and BFS. Use the map of the area around the college as the graph. Identify the prominent land marks as nodes and perform DFS and BFS on that
2. Represent graph using adjacency list or matrix and generate minimum spanning tree using Prism's algorithm.
3. Implementation of AVL Tree.
4. Implementation of Hash table using array and handle collisions using Linear probing with or without replacement.
5. Represent a single variable polynomial using Singly Linked List and perform Addition, Display and Evaluation.
6. Implement all primitive operations on Sequential file in C
7. Write a program to implement a small database mini project to understand persistent objects and operations on sequential files (eg library information, inventory systems,

automated banking system, reservation systems etc.) For example, write a program to create a database for reservation system using information such as Name, sex, age, starting place of journey and destination. Program should have following facilities

a) To display entire passenger list
b) To display particular record
c) To update record
d) To delete and sort record Use Exception Handling for data verification (Mandatory).

NOTE:

- **ICA –** Internal Continuous Assessment shall support for regular performance of practical and its regular assessment. In addition; it shall be based on knowledge/skill acquired and record submitted by student (journal) based on practical performed by him/her. The performance shall be assessed experiment wise using internal continuous assessment format **(S 10).**
- **ESE –** The End Semester Examination (ESE) for this laboratory course shall be based on performance in one of the experiments performed by student in the semester followed by sample questions to judge the depth of understanding/knowledge or skill acquired by the student. It shall be evaluated by two examiners out of which one examiner shall be out of institute.

CO256 C0MPUTER GRAPHICS LAB

Teaching Scheme: 02P Total: 02 **Credit :** 01
Evaluation Scheme: 25 ICA + 25 ESE **Total Marks:** 50
Duration of ESE: 03Hrs

Minimum 10 experiments (five from Group A and five from Group B) shall be performed to cover entire curriculum of course CO252. The list given below is just a guideline. All assignments are to be implemented using open source technology (preferably). Every assignment should include use of syntax, use of command/function used for coding and printout of code with proper comment and output.

Group A:

1. Write a program with menu option to input the line coordinates from the user to generate a line using Bresenham's method and DDA algorithm. Compare the lines for their values on the line.
2. Develop a program to generate a complete circle based on.
    a) Bresenham's circle algorithm
    b) Midpoint Circle Algorithm
3. Implement the Bresenham's / DDA algorithm for drawing line (programmer is expected to shift the origin to the center of the screen and divide the screen into required quadrants)
4. Write a program to implement a stretch band effect. (A user will click on the screen and drag the mouse / arrow keys over the screen coordinates. The line should be updated like rubber-band and on the right-click gets fixed).
5. Write a program to demonstrate shear transformation in different directions on a unit square situated at the origin.
6. Write a program to implement polygon filling.

Group B:

1. Write program to perform the following 2D and 3D transformations on the given input figure
    a) Rotate through
    b) Reflection
    c) Scaling
    d) Translation
2. Develop a program to clip a line using Cohen-Sutherland line clipping algorithm.
3. Write a program to draw Bezier and B-Spline Curves with interactive user inputs for control polygon defining the shape of the curve.
4. Write a program to demonstrate 2D animation such as clock simulation or rising sun.
5. Write a program to implement the bouncing ball inside a defined rectangular window.
6. Mini Project: Developing some graphics application (Mandatory).

NOTE:

- ICA – Internal Continuous Assessment shall support for regular performance of practical and its regular assessment. In addition; it shall be based on knowledge/skill acquired and record submitted by student (journal) based on practical performed by him/her. The performance shall be assessed experiment wise using internal continuous assessment format (S 10).
- ESE – The End Semester Examination (ESE) for this laboratory course shall be based on performance in one of the experiments performed by student in the semester followed by sample questions to judge the depth of understanding/knowledge or skill acquired by the student. It shall be evaluated by two examiners out of which one examiner shall be out of institute.

CO257 DATA COMMUNICATIONS LAB

Teaching Scheme: 02P Total: 02 **Credit :** 01
Evaluation Scheme: 25 ICA + 25 ESE **Total Marks:** 50
Duration of ESE: 03Hrs

Minimum 10 experiments (five from Group A and five from Group B) shall be performed to cover entire curriculum of course CO253. The list given below is just a guideline. All assignments are to be implemented using open source technology (preferably). Every assignment should include use of syntax, use of command/function used for coding and printout of code with proper comment and output.

Group-A

1) Comparative analysis of different types of network cables with Specifications
    a) Practical Study of different types of network cables –CAT-5, CAT – 6.
    b) Study of different parameters for cables like type, Bandwidth, Length, appli.
    c) Study of different cable specifications comparisons.
2) Implementation of Network performance calculator.
3) Network related commands such as ARP, IPCONFIG, PING, TRACERT, NSLOOKUP, GETMAC, NETSTAT etc.
4) I.T Infrastructure planning using Network Connecting Devices.
5) Network Connecting Devices Specifications and configurations.
    a) Define Repeater, Hub, Switch, Router
    b) Use of Repeater, Hub, Switch, Router
    c) Technical Specification and configuration of Repeater,Hub, Switch, Router

Group- B

1) Implementation of Stop and Wait Protocol
    a) Study of Stop and Wait mechanism.
    b) Prepare an algorithm for sender and receiver.
    c)Write separate module for sender and receiver.
    d)Test using simple data.
2) Implementation of Internet checksum
    a) Study of Internet Checksum mechanism logic.
    b) Prepare Algorithm for sender and receiver.
    c) Write simple programs for sender and receiver.
3) Crimping of cross-wire and straight-through UTP cable to inter-connect two computers
    a) Study of crimping tool.
    b) Study of color coding of Network cables.
    c) Crimping the cable using Crimping Tool
    d) Test the crimping by interconnecting two computers & using any standard software tool.
4) Interconnections of computers in Local Area Network to share resources.
    a) Configure and verify computers in LAN using controlpanel.
    b) Consider Printer as a shared resource.
    c) Consider any Disk Drive as a shared resource

d) Perform Sharing operation for printer & Disk Drive.

5) Implementation of cyclic redundancy check
   a) A simple Program should consist of a certain number of check bits, (checksum), are appended to the message being transmitted
6) Mini Project: Setting up a laboratory using any topology and prepare documentation of it (Mandatory).

NOTE:

- ICA – Internal Continuous Assessment shall support for regular performance of practical and its regular assessment. In addition; it shall be based on knowledge/skill acquired and record submitted by student (journal) based on practical performed by him/her. The performance shall be assessed experiment wise using internal continuous assessment format (S 10).
- ESE – The End Semester Examination (ESE) for this laboratory course shall be based on performance in one of the experiments performed by student in the semester followed by sample questions to judge the depth of understanding/knowledge or skill acquired by the student. It shall be evaluated by two examiners out of which one examiner shall be out of institute.

CO258 SOFTWARE LAB-II

Teaching Scheme: 02P Total: 02 **Credit :** 01
Evaluation Scheme: 25 ICA + 25 ESE **Total Marks:** 50
Duration of ESE: 03Hrs

Minimum 10 experiments (Six from Group B and Four from Group C) shall be performed to cover curriculum from Group-A of CO258. The list given below is just a guideline. All assignments are to be implemented using open source technology (preferably). Every assignment should include use of syntax, use of command/function used for coding and printout of code with proper comment and output. The concern faculty member must engage first six practical turns to cover syllabus of group-A.

Group A:

HTML: What is HTML, HTML Documents, Basic structure of an HTML document, Mark up Tags, Heading-Paragraphs, Line Breaks, HTML Tags. Introduction to elements of HTML, Working with Text,Working with Lists, Tables and Frames, Working with Hyperlinks, Images and Multimedia, Working with Forms and controls.

CSS: Concept of CSS, Creating Style Sheet, CSS Properties, CSS Styling(Background, Text Format, Controlling Fonts), Working with block elements and objects, Working with Lists and Tables, CSS Id and Class, Box Model(Introduction, Border properties, Padding Properties, Margin properties), CSS Advanced(Grouping, Dimension, Display, Positioning, Floating, Align, Pseudo class, Navigation Bar, Image Sprites, Attribute sector), CSS Color , Creating page Layout and Site Designs.

XML: Introduction and Overview of XML, Creating an XML Document , Defining Structure , Rules for Well-Formed and Valid XML, Tag Attributes and Naming Rules , Empty and Non-Empty Elements , XML Document Type Definition (DTD) ,Creating a DTD .

JSP:
Java Script : Introduction, Client-Side JavaScript, Server-Side JavaScript, JavaScript Objects, JavaScript Security,

Operators : Assignment Operators, Comparison Operators, Arithmetic Operators, % (Modulus), ++ (Increment), -- (Decrement), -(Unary Negation), Logical Operators, Short-Circuit Evaluation, String Operators, Special Operators, ? (Conditional operator), ,(Comma operator), delete, new, this, void

Statements : Break, comment, continue, delete, do ... while, export, for, for...in, function, if...else, import, labelled, return, switch, Array.

Group B:

1. Write a program using HTML basic Tags and design a web page.
2. Design a web page by using Hyperlink, frame, table using HTML
3. Design a calculator using HTML
4. Write a program and design a table using CSS
5. Design a web page using image tag in HTML.
6. Write a program in XML without CSS.
7. Design a web page in XML with CSS.

Group C:

1. Design a web page using Java Script to demonstrate if, if-else and switch statements.
2. Design a web page using java script to demonstrate call a function with an argument, function that returns a value.
3. Design a web page using java script to demonstrate for loop, while loop, do-while, break and continue a loop.
4. Design a web page using java script to demonstrate sort an array(alphabetically and ascending), sort numbers numerically and ascending and descending.
5. Design and host a website with the help of HTML and Java script (Commercial institute, portal or decided by the student and teacher)
6. Mini Project that covers the syllabus of the group-A (Mandatory).

Text Books:

1. HTML 5 in simple steps, Kogent Learning Solutions Inc., Dreamtech Press publication
2. A beginner's guide to HTML, NCSA,14th May,2003 publication Creating a Web Page and Web Site, Murray,Tom/Lynchburg

Reference Books:

1. HTML, XHTML, and CSS Bible, 5th ed Steven M. Schafer ,Wiley India publication
2. Beginning HTML, XHTML, CSS, and JavaScript, John Duckett, Wiley Ind publication

NOTE:

- ICA – Internal Continuous Assessment shall support for regular performance of practical and its regular assessment. In addition; it shall be based on knowledge/skill acquired and record submitted by student (journal) based on practical performed by him/her. The performance shall be assessed experiment wise using internal continuous assessment format (S 10).
- ESE – The End Semester Examination (ESE) for this laboratory course shall be based on performance in one of the experiments performed by student in the semester followed by sample questions to judge the depth of understanding/knowledge or skill acquired by the student. It shall be evaluated by two examiners out of which one examiner shall be out of institute.

GOVERNMENT COLLEGE OF ENGINEERING, JALGAON
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Equivalent/exemption in course of S. Y. B. Tech. (Computer Engineering) in autonomous curriculum if passed the courses from NMU, Jalgaon curriculum.

Sr. No.	Course as per autonomous curriculum in which exemption shall be granted (Course code & name)		Exempted if Passed as per NMU, Jalgaon examination (Paper No. & Subject Code)
1	CO201	Discrete Structure and Graph Theory	Discrete Structure & Graph Theory
2	ET221	Digital Electronics and Logic Design	Analog & Digital Electronics
3	CO202	Fundamentals of Data Structures Programming	Data Structures
4	CO203	Computer Organization	Computer Organization
5	CO204	Object Oriented Technology	Object Oriented Technology
6	SH204	General Proficiency II	**No Equivalence and hence no exemption (i.e. each student who is shifted from NMU, Jalgaon curriculum in to autonomous curriculum shall register and pass this course.)**
7	ET222	Digital Electronics and Logic Design Lab	Analog & Digital Electronics Lab
8	CO205	Fundamentals of Data Structures Programming Lab	Data Structures Lab
9	CO206	Software Lab-I	Computer Programming and Application Development Lab
10	CO207	Object Oriented Technology Lab	Object Oriented Technology Lab
11	SH253	Numerical Methods and Probability Theory	Engineering Mathematics-III and Discrete Structure & Graph Theory
12	CO251	Data Structures and Files	Data Structures
13	CO252	Computer Graphics	Computer Graphics
14	CO253	Data Communications	Data Communication
15	SH254	Humanities and Social Science	**No Equivalence and hence no exemption (i.e. each student who is shifted from NMU, Jalgaon curriculum in to autonomous curriculum shall register and pass this course.)**

16	CO254	Application Development Lab	Application Development Lab
17	CO255	Data Structures and Files Lab	Data Structures Lab
18	CO256	Computer Graphics Lab	Computer Graphics Lab
19	CO257	Data Communications Lab	Data Communication Lab
20	CO258	Software Lab-II	Application Development Lab

Important Notes:

1. If any student was admitted in second year (Computer Engineering) before the academic year 2015-16 and his/her odd semester (I^{st} semester) was granted under NMU, Jalgaon curriculum but even semester (II^{nd} semester) was not granted then such student shall be shifted in autonomous curriculum for even semester (II^{nd} semester) of the academic year 2015-16 or onward. He/she shall pass all the courses of odd semester (I^{st} semester) as per NMU, Jalgaon curriculum, if not. In addition; he/she shall register and pass all other courses of autonomous curriculum for which exemption is not granted as per above chart during even semester (II^{nd} semester) or whenever institute offers that subject. **In any case; any student shall not be declared as pass in S.Y.B.Tech**.(**Computer Engineering) without obtaining exemption or passing all courses of S.Y.B.Tech. (Computer Engineering) as per above chart.**

2. If any student who was admitted in second year engineering (Computer Engineering) before the academic year 2015-16 and failed second year engineering as per NMU, Jalgaon curriculum shall pass all the courses of second year engineering as per NMU, Jalgaon curriculum. Such student shall be eligible to take admission in T. Y. B. Tech. for the academic year 2016-17 or onward if his/her result is pass/ATKT as per NMU, Jalgaon result. In addition; he/she shall register and pass all the courses of S.Y.B.Tech. of autonomous curriculum for which exemption cannot be granted as per above chart; during the academic year of T.Y.B.Tech. or whenever institute offers that course. **To pass all such courses shall be the mandatory condition for the award of degree.**

3. The students who are directly admitted to S.Y. B. Tech. (Computer Engineering) after diploma in engineering (Computer discipline) shall register and pass the courses SH 204 General Proficiency and SH 153 Environmental Studies. In addition; any student who is directly admitted to S.Y. B. Tech. (Computer Engineering) after diploma in engineering (Non Computer discipline) shall register and pass the courses SH 204 General Proficiency, SH 153 Environmental Studies, CO101 Computer Fundamentals and C Programming. All such students shall register and pass all above courses during the academic year of S.Y.B.Tech. or whenever institute offers those courses. **To pass all such courses shall be the mandatory condition for the award of degree.**