Invertis Institute of Engineering

&Technology INVERTIS UNIVERSITY

Invertis Village
Bareilly-Lucknow NH-24, Bareilly

Effective from the batches admitted in 2014-15
onwards

DEPARTMENT OF
COMPUTER SCIENCE AND
ENGINEERING

Vision of the Institute

To develop responsible citizens who would 'think global and act local' and become the change agents of society to meet the challenges of future.

Mission of the Institute

To impart high quality Engineering and Management education to the budding professionals and provide the ambience needed for developing requisite skills to make a mark of excellence in Education, Business and Industry.

Departmental Vision

To produce a new generation of Computer Engineers by providing enhanced knowledge in Computer Engineering recognized worldwide for excellence. This would be guided by extensive research in technology and management for industrial and social needs for sustainable development.

Departmental Mission

Our endeavor is to make the department the highest seat of learning, prepare Engineers equipped with strong conceptual Foundation coupled with practical insight meet global Business changes.

Program Educational Objectives
(PEOs)

PEO 1 **Graduates will be able to analyze, design and propose a feasible solution to computer engineering problems by applying basic principles of mathematics, science and engineering.**

PEO 2 Graduates will be inculcated with necessary professional skills, effective oral and written communication to be productive engineers.

PEO 3 Graduates will be able to work as a team in intra and interdisciplinary end over for development of new ideas and products to serve in contemporary societal contexts.

PEO 4 Graduates will be able to face challenges of the world economic order by incorporating expertise gained by faculty in consultancy work, for educating students, involving modern tools and techniques.

PEO 5 Graduates will achieve a high level of technical and managerial expertise to achieve excellence, outstanding leadership to succeed in positions in software development profession with higher threshold start in employment background.

PROGRAM OUTCOMES (POs)

Engineering Graduates will be able to:

PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: **Graduates will be able to apply technical skills and modern engineering tools for computer engineering day to day practice.**

PSO2: Graduates will be able to participate in critical thinking and problem solving of computer engineering field that requires analytical and design requirements.

PSO3: Graduates will be able to pursue of lifelong learning and professional development to face the challenging and emerging needs of our society.

Scheme of Instruction & Syllabi

of

Diploma in Computer Science and Engineering

(Three Year Diploma Course)

II and III Year

(Effective Session 2014-15)

Invertis Institute of Engineering &Technology
INVERTIS UNIVERSITY
Invertis Village, Bareilly-Lucknow NH-24, Bareilly

STUDY AND EVALUATION SCHEME
Diploma in Computer Science and Engineering
(Effective from session 2014-2015)
YEAR II, SEMESTER III

S. No.	Course Code	SUBJECT	PERIODS			EVALUATION SCHEME					TOTAL	Credit
						SESSIONAL EXAM.				E-SEM.		
			L	T	P	CT	TA	AT	TOTAL			
THEORY												
1	DCS301	Digital Electronics	3	1	0	20	10	10	40	60	100	4
2	DCS302	Operating Systems	3	1	0	20	10	10	40	60	100	4
3	DCS303	Programming in 'C'	3	1	0	20	10	10	40	60	100	4
4	DCS304	Discrete Structures	3	1	0	20	10	10	40	60	100	4
5	DCS305	IT Infrastructure	3	1	0	20	10	10	40	60	100	4
PRACTICAL/TRAINING/PROJECT												
6	DEC351	Digital Electronics Lab	0	0	4	-	-	-	50	50	100	2
7	DCS352	Operating Systems Lab (UNIX/LINUX)	0	0	4	-	-	-	50	50	100	2
8	DCS353	Programming in 'C' Lab	0	0	4	-	-	-	50	50	100	2
9	DCS355	IT Infrastructure Lab	0	0	4	-	-	-	50	50	100	2
10	GP301	Discipline & General Proficiency	-	-	-	-	-	-	100	-	100	1
		TOTAL	15	5	16	100	50	50	500	500	1000	29

STUDY AND EVALUATION SCHEME
Diploma in Computer Science and Engineering
(Effective from session 2014-2015)
YEAR II, SEMESTER IV

S. No.	Course Code	SUBJECT	PERIODS			EVALUATION SCHEME					TOTAL	Credit
						SESSIONAL EXAM.				E-SEM.		
			L	T	P	CT	TA	AT	TOTAL			
THEORY												
1	DCS401	Data Structures with 'C'	3	1	0	20	10	10	40	60	100	4
2	DCS402	OOP's with C++	3	1	0	20	10	10	40	60	100	4
3	DCS403	Computer Organization	3	1	0	20	10	10	40	60	100	4
4	DCS404	E-commerce	3	1	0	20	10	10	40	60	100	4
5	DAS405	Industrial Management	3	1	0	20	10	10	40	60	100	4
PRACTICAL/TRAINING/PROJECT												
6	DCS451	Data Structures Lab	0	0	4	-	-	-	50	50	100	2
7	DCS452	OOPs Lab	0	0	4	-	-	-	50	50	100	2
8	DCS453	Computer Organization Lab	0	0	4	-	-	-	50	50	100	2
9	DCS454	E-commerce Lab	0	0	4	-	-	-	50	50	100	2
10	GP401	Discipline & General Proficiency	-	-	-	-	-	-	100	-	100	1
		TOTAL	15	5	16	100	50	50	500	500	1000	29

STUDY AND EVALUATION SCHEME
Diploma in Computer Science and Engineering
(Effective from session 2014-2015)
YEAR III, SEMESTER V

S. No.	Course Code	SUBJECT	PERIODS			EVALUATION SCHEME					TOTAL	Credit
						SESSIONAL EXAM.				E-SEM.		
			L	T	P	CT	TA	AT	TOTAL			
THEORY												
1	DCS501	DBMS	3	1	0	20	10	10	40	60	100	4
2	DCS502	JAVA	3	1	0	20	10	10	40	60	100	4
3	DCS503	Management Information System	3	1	0	20	10	10	40	60	100	4
4	DCS504	Computer Hardware and Maintenance	3	1	0	20	10	10	40	60	100	4
5	DCS505	Computer Graphics	3	1	0	20	10	10	40	60	100	4
PRACTICAL/TRAINING/PROJECT												
6	DCS551	DBMS Lab	0	0	4	-	-	-	50	50	100	2
7	DCS552	JAVA Lab	0	0	4	-	-	-	50	50	100	2
8	DCS554	Repaired and Maintenance Lab	0	0	4	-	-	-	50	50	100	2
9	DCS555	Computer Graphics Lab	0	0	4	-	-	-	50	50	100	2
10	GP501	Discipline & General Proficiency	-	-	-	-	-	-	100	-	100	1
		TOTAL	15	5	16	100	50	50	500	500	1000	29

L-Lecture, **T-** Tutorial , **P**- Practical , **CT –** Cumulative Test ,**TA –**Teacher Assessment , **AT –** Attendance , **E-Sem –** End Semester Marks

STUDY AND EVALUATION SCHEME
Diploma in Computer Science and Engineering
(Effective from session 2014-15)
YEAR III, SEMESTER VI

S. No.	Course Code	SUBJECT	PERIODS			EVALUATION SCHEME					TOTAL	Credit
						SESSIONAL EXAM.				E-SEM.		
			L	T	P	CT	TA	AT	TOTAL			
THEORY												
1	DCS601	**Web Technology**	3	1	0	20	10	10	40	60	100	4
2	DCS602	**Software Engineering**	3	1	0	20	10	10	40	60	100	4
3	DCS603	**Computer Networks**	3	1	0	20	10	10	40	60	100	4
4	DAS604	**Environment and Ecology**	2	0	0	10	05	05	20	30	50	2
5	DCS604	**Introduction to Cloud Computing**	3	1	0	20	10	10	40	60	100	4
PRACTICAL/TRAINING/PROJECT												
6	DCS651	**Web Technology Lab**	0	0	4	-	-	-	50	50	100	2
7	DCS652	**Project Lab**	0	0	6	-	-	-	100	150	250	6
8	DCS653	**Industrial Training and Seminar**	0	0	2	-	-	-	100	-	100	2
9	GP601	**Discipline & General Proficiency**	-	-	-	-	-	-	100	-	100	1
		TOTAL	11	03	12	70	35	35	490	410	1000	29

L-Lecture, **T-** Tutorial , **P**- Practical , **CT –** Cumulative Test ,**TA –**Teacher Assessment , **AT –** Attendance , **E-Sem –** End Semester Marks

STUDY AND EVALUATION SCHEME
Diploma in Computer Science and Engineering
(Effective from session 2014-2015)
YEAR II, SEMESTER III

S. No.	Course Code	SUBJECT	PERIODS			EVALUATION SCHEME					TOTAL	Credit
						SESSIONAL EXAM.				E-SEM.		
			L	T	P	CT	TA	AT	TOTAL			
THEORY												
1	DCS301	Digital Electronics	3	1	0	20	10	10	40	60	100	4
2	DCS302	Operating Systems	3	1	0	20	10	10	40	60	100	4
3	DCS303	Programming in 'C'	3	1	0	20	10	10	40	60	100	4
4	DCS304	Discrete Structures	3	1	0	20	10	10	40	60	100	4
5	DCS305	IT Infrastructure	3	1	0	20	10	10	40	60	100	4
PRACTICAL/TRAINING/PROJECT												
6	DEC351	Digital Electronics Lab	0	0	4	-	-	-	50	50	100	2
7	DCS352	Operating Systems Lab (UNIX/LINUX)	0	0	4	-	-	-	50	50	100	2
8	DCS353	Programming in 'C' Lab	0	0	4	-	-	-	50	50	100	2
9	DCS355	IT Infrastructure Lab	0	0	4	-	-	-	50	50	100	2
10	GP301	Discipline & General Proficiency	-	-	-	-	-	-	50	-	50	1
		TOTAL	15	5	16	100	50	50	450	500	950	29

L-Lecture, **T-** Tutorial , **P**- Practical , **CT –** Cumulative Test ,**TA –**Teacher Assessment , **AT –** Attendance , **E-Sem –** End Semester Marks

DCS-301	Digital Electronics	**L T P**	**4 Credits**
		3 1 0	

Pre-requisites: None

Course Objectives:
- Understand the concepts of various components.
- Understand concepts that underpin the disciplines of analog and digital electronic logic circuits.
- Understand various Number systems and Boolean algebra, the Boolean expression using Boolean algebra and design it using logic gates.
- Understand Design and implementation of combinational circuits.
- Understand Design and develop sequential circuits.

Detailed Syllabus

Unit-1
Introduction:-Define digital and analog signals and systems, difference between analog and digital signals, Need of digitization and applications of digital systems Number System : Decimal, Binary, Octal, and Hexadecimal systems; Binary Arithmetic, BCD and Gray code. Boolean algebra and the 'Demerger's Theorems.

Unit-2
Logic Gates: BUFFER, NOT, AND, OR, NAND, NAND, NOR, X-OR, and X_NOR gates Combinational Logic Circuits: SOP and POS forms, reduction and inter conversion of forms, logic design using K maps.

Unit-3
Adder & Subtract or circuits : Half adder, full adder, half subtract or, full subtract or; design of all these circuits. using discrete gates. Flip-Flops: RS flip-flop, J-K, D-, T-flip-flops; Racing problem and the Master-Slave J-K flip-flop.

Unit-4
Sequential Logic Circuits: Design of asynchronous and synchronous up/down counters, Shift Registers:SIPO, SISO, PIPO, and PISO register Multiplexers, demultiplexers; decoders and encoders.

Unit-5
Analog to digital and digital to analog converters: Basic terms and definitions, Conversion methods, Types of converters.

Text Books:
1. Malvino & Leach "Digital Principles and Applications", Tata McGraw Hill, Delhi.
2. Gayakwad R.A. "Op-Amps and Linear Integrated Circuits", Prentice Hall of India, Delhi.
Reference Books:
1. Taub & Schilling "Digital Electronics", Tata McGraw Hill, Delhi.

2. Nagrath IJ. "Electronics Analog and Digital", Prentice Hall of India Ltd Delhi.
3. Jain R.P. "Modern Digital Electronics", Tata McGraw Hill Delhi.

COURSE OUTCOMES: After the completion of the course the student will be able to:-

CO1	Understand the concepts of various components to design stable analog circuits.
CO2	Represent numbers and perform arithmetic operations.
CO3	Minimize the Boolean expression using Boolean algebra and design it using logic gates.
CO4	Analyze and design combinational circuit.
CO5	Design and develop sequential circuits.

DCS-302	Operating System	L T P 3 1 0	4 Credits

Pre-requisites: None

Course Objectives:
- To understand the main components of an OS & their functions.
- To study the process management and scheduling.
- To understand various issues in Inter Process Communication (IPC) and the role of OS in IPC.
- To understand the concepts and implementation Memory management policies and virtual memory.
- To understand the working of an OS as a resource manager, file system manager, process manager, memory manager and I/O manager and methods used to implement the different parts of OS.
- To understand the concept of file organization and access mechanism.

Detailed Syllabus

Unit- 1
Introduction to Operating system, Functions of Operating System, Classification of Operating systems: Batch, Interactive, Time sharing, Real Time System, Multiprocessor Systems, Multiuser Systems. Operating System Components, Operating System services.

Unit- 2
Process, Process states, Process Transition Diagram, Process Control Block (PCB), CPU Scheduling: Objectives of Scheduling, Types of Scheduler, Scheduling types, Scheduling Criteria, Scheduling Algorithms: FCFS, SJF, SRT, Priority, Round Robin.

Unit- 3
Deadlock: System model, Necessary Condition for Deadlock, Resource Allocation Graph, Recovery from deadlock.

Unit- 4
Memory Management: Logical Address, Physical Address, Memory Fragmentation, Paging, Introduction to Virtual memory, Page replacement algorithms: FIFO, LRU, Thrashing.

Unit- 5
I/O Management and Disk Scheduling: I/O devices, I/O buffering, Disk scheduling: FCFS, SSTF, C-SCAN, C-LOOK.

Text Book:
1. Silberschatz, Galvin and Gagne, "Operating Systems Concepts", Wiley.
2. Milenekovie, "Operating System Concept", McGraw Hill, Delhi.

3. Petersons, "Operating Systems", Addision Wesley.
4. Dietal, "An Introduction to Operating System", Addision Wesley.
5. Sibsankar Halder and Alex A Aravind, "Operating Systems", Pearson Education

Reference Books:
1. D M Dhamdhere, "Operating Systems : A Concept based Approach", 2nd Edition, TMH
2. William Stallings, "Operating Systems: Internals and Design Principles", 6th Edition, Pearson Education

COURSE OUTCOMES: After the completion of the course the student will be able to:-

CO1	Describe the important computer system resources and the role of operating system in their management policies and algorithms.
CO2	Understand the process management policies and scheduling of processes by CPU.
CO3	Evaluate the requirement for process synchronization and coordination handled by operating system.
CO4	Describe and analyze the memory management and its allocation policies.
CO5	Identify, use and evaluate the storage management policies with respect to different storage management technologies.
CO6	Set file access permissions and protect and secure files.

DCS-303	Computer Programming using C	L T P 3 1 0	4 Credits

Pre-requisites: None

Course Objectives:

- To impart adequate knowledge on the need of programming languages and problem-solving techniques.

- To enable effective usage of arrays, structures, functions, pointers and to implement the memory management concepts.

- To study the advantages of user defined data type which provides flexibility for application development.

- To teach the basics of pre-processors available with C compiler.

Detailed Syllabus

Unit-1
Algorithm and Programming Development steps in development of a program, Flow charts, Algorithm development, Program Debugging.
Program Structure:- I/o statements, assign statements. Constants, variables and data types, Operators and Expressions, Standards and Formatted, Use of Header & Library files.

Unit-2
Control Structures: Introduction, Decision making with IF – statement, IF – Else and Nested IF, While and do-while, for loop, Break and switch statements.

Unit-3
Functions:- Introduction to functions, Global and Local Variables, Function Declaration, Standard functions, Parameters and Parameter Passing, Call –by value/reference, Recursion.

Unit-4
Introduction to Arrays, Array Declaration and Initialization, Single and Multidimensional Array. Arrays of characters.

Unit-5
Pointers:- Introduction to Pointers, Address operator and pointers, Declaring and Initializing pointers.

Text Books:
1.Salaria RS, Application Programming in C , Khanna Book Publishing Co (P) Ltd. New Delhi.
2.Schaum Series, Programming in C , McGraw Hills Publishers, New York.

References Books:
3.Yashwant Kanetkar, Exploring – BPB Publications, New Delhi.

COURSE OUTCOMES: At the end of the course, the student will be able to:-

CO1	Understand the components of computing systems
CO2	Choose data types and structures to solve mathematical and scientific problems
CO3	Develop modular programs using control structures
CO4	Understand the concepts of pointers and C Preprocessors

DCS-304	Discrete Structures	L T P 3 1 0	4 Credits

Pre-requisites: None

Course objectives:

- To develop logical thinking and its application to computer science (to emphasize the importance of proving statements correctly.

- To have substantial experience to comprehend formal logical arguments.

- To express mathematical properties formally via the formal language of propositional logic and predicate logic.

- To understand basic mathematical objects such as sets, functions, and relations and will also be able to verify simple mathematical properties that these objects possess.

- The subject enhances one's ability to reason and ability to present a coherent and mathematically accurate argument.

Detailed Syllabus

Unit-1
Set Theory: Introduction, Types of set, Subsets, Operation of sets, Cartesian Products of setsMultisets, Venn Diagrams

Unit-2
Relations: Definition, Operations on relations, Properties of relations, Composite Relations, equivalence relation,Equality of relations, Order of relations, Matrix Representation of relations.

Unit-3
Functions: Definition, Classification of functions, Operations on functions, Difference between function and a relation,Even and odd functions.
Natural Numbers: Introduction, Mathematical Induction: principle of mathematical Induction
Partial order sets: Definition, Partial order sets, Combination of partial order sets or Component of Poset, Hasse diagram.

Unit-4
Boolean Algebra: Introduction, Axioms and Theorems of Boolean algebra, Algebraic manipulation of Boolean expressions. Simplification of Boolean Functions, Logic gates, Digital circuits.
Propositional Logic: Proposition, well formed formula, Truth tables, Tautology, Satisfiability, Contradiction, Algebra of proposition.

Unit-5

Graphs: Definition and terminology, Representation of graphs, simple graph,Multigraph and pseudo graph,Matrix representation of graph, Bipartite graphs, Planar graphs, Euler and Hamiltonian paths.

Text Book*:*

   1. ThomasKoshy, Discrete Mathematics with Applications, Elsevier Pub. 2008

Reference Books:

1. Kenneth H. Rosen, Discrete Mathematics and Its Applications, 6/e, McGraw-Hill, 2006.
2. B. Kolman, R.C. Busby, and S.C. Ross, Discrete Mathematical Structures, 5/e, Prentice Hall, 2004.
3. E.R. Scheinerman, Mathematics: A Discrete Introduction, Brooks/Cole, 2000.
4. R.P. Grimaldi, Discrete and Combinatorial Mathematics, 5/e, Addison Wesley, 2004.
5. Jean Paul Trembley, R Manohar, Discrete Mathematical Structures with Application to Computer Science, McGraw-Hill, Inc. New York, NY, 1975.
6: Swapan Kumar Sarkar: Discrete Mathematics, S.CHAND & Company Ltd.

COURSE OUTCOMES: After the completion of the course the student will be able to:-

CO1	Be able to construct simple mathematical proofs and possess the ability to verify them.
CO2	Have substantial experience to comprehend formal logical arguments.
CO3	Be skillful in expressing mathematical properties formally via the formal language of propositional logic and predicate logic.
CO4	Be able to specify and manipulate basic mathematical objects such as sets, functions, and relations and will also be able to verify simple mathematical properties that these objects possess.
CO5	Gain experience in using various techniques of mathematical induction (weak, strong and structural induction) to prove simple mathematical properties of a variety of discrete structures.

DCS-305	IT Infrastructure	**L T P** **3 1 0**	**4 Credits**

Pre-requisites: None

Course Objectives:

- To understand underlying principles of IT infrastructure and management services.

- To understand IT systems, service delivery and service support process for providing a quality service.

- To understand the basics of storage management.

- To study policies for security management and mitigate security related risks in the organization.

- To understand the IT and cyber ethics and study cyber forensics law and cyber crimes.

Detailed Syllabus

Unit-1
Information Technology, Computer Hardware, Computer Software, Network and Internet, Computing Resources, Design Issues, Requirements, IT System Management Process

Unit-2
Service Delivery Process, Service Level Management, Financial Management, Service Management, Capacity Management, Availability Management

Unit-3
Service Support Process, Configuration Management, Incident Management, Problem Management, Change Management, Release Management Backup & Storage, Archive & Retrieve, Disaster Recovery,

Unit-4
Space Management, Database & Application Protection, Bare Machine Recovery, Data Retention Security, Computer and internet Security, Physical Security,

Unit-5
Introduction to Cyber Ethics, Intellectual Property, Privacy and Law, Computer Forensics, Ethics and Internet, Cyber Crimes

Reference Books:
1. Godbole, "Information Systems Security" Willey
2. Sood, "Cyber Laws Simplified" McGraw Hill
3. P.Gupta, 'IT infrastructure & its Management" PHI

COURSE OUTCOMES: After the completion of the course the student will be able to:-

CO1	To describe basic IT infrastructure, storage management, security measures, cyber ethics, computer forensics, cyber laws and electronic commerce.
CO2	To summarize the design requirements for IT systems, service delivery and service support process for providing a quality service.
CO3	To relate various service delivery and service support process for development of a quality product.
CO4	To focus on various storage and security schemes to provide availability and safety of IT system.
CO5	To test the data collected at any cyber crime scene and organize it to find out the sequence of events responsible for present situation using computer forensic schemes.

DCS-401 DATA STRUCTURES WITH "C"

Pre-requisites: None

L	T	P	C
3	1	0	4

Course Objectives:

CO1	Demonstrate familiarity with major algorithms and data structures.
CO2	Provide basic understanding of complexity and arrays.
CO3	Demonstrate understanding of the abstract properties of various data structures such as stacks, queues, linked lists, trees and graphs.
CO4	Understand and apply fundamental algorithmic problems including Tree traversals, Graph traversals, and shortest paths.
CO5	Demonstrate understanding of various searching algorithms
CO6	Demonstrate understanding of various sorting algorithms, including bubble sort, insertion sort, selection sort, merge sort, quick sort and heap sort.

Detailed Syllabus

Unit-1
Introduction: Basic Terminology, Elementary Data Organization, Structure operations, Algorithm complexity.
Arrays: Array Definition, Representation and Analysis, Single and Multidimensional Arrays, application of arrays.

Unit– 2
Stacks: Implementation of stack, Operations on Stacks: Push & Pop, Application of stack: Conversion of Infix to Prefix and Postfix Expressions, Evaluation of postfix expression using stack.
Queues: Array implementation of queues, Operations on Queue: Create, Add, Delete.

Unit – 3
Linked list: Representation and Implementation of Singly Linked Lists, Traversing and Searching of Linked List, Overflow and Underflow, Insertion and deletion to/from Linked Lists.

Unit-4
Trees: Basic terminology, Binary Trees, Binary tree representation, Tree traversal (pre-order, post-order and in-order).

Unit – 5
Searching and Hashing: Sequential search, binary search, comparison and analysis, Concept of Hashing.
Sorting: Algorithms and their analysis- Insertion Sort, Bubble Sort, Quick Sort, Merge Sort.

Text Books:

1. Horowitz and Sahani, "Fundamentals of data Structures", Galgotia Publication Pvt. Ltd., New Delhi.
2. R. Kruse etal, "Data Structures and Program Design in C", Pearson Education Asia, Delhi2002.
3. A. M. Tenenbaum, "Data Structures using C & C++", Prentice-Hall of India Pvt. Ltd., New Delhi.
4. K Loudon, "Mastering Algorithms with C", Shroff Publisher & Distributors Pvt. Ltd.

Course Outcomes: After the completion of the course the student will be able to:

CO1	Understand the concepts of data structure, data type and array data structure.
CO2	Analyze algorithms and determine their time complexity.
CO3	Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithms.
CO4	Apply fundamental algorithmic problems including Tree traversals, Graph traversals, and shortest paths.
CO5	Implement and know when to apply standard algorithms for searching.
CO6	Implement the various sorting algorithms, including bubble sort, insertion sort, selection sort, merge sort, quick sort and heap sort.

DCS-402 OOP's with C++

Pre-requisites: None

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L T P C
3 1 0 4
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Course Objectives:

CO1	To introduce fundamentals of object oriented programming using C++.
CO2	Compare C, C++ and Java and study the various features provide by C++.
CO3	To introduce the C++ programming constructs.
CO4	To introduce various data types used in C++.
CO5	To introduce various operators used in C++.
CO6	To introduce the use of class, object, method, constructors , abstract class, nested class, in C++ programming.

Detailed Syllabus

Unit-1
History of C++. Basic concept of OOPs-Objects, Classes, Object. Difference between C , C++ & Java.

Unit-2
Encapsulation, Data Abstraction, Inheritance, Polymorphism.

Unit-3
Structure of a C++ program, Comments, Variables, Identifiers, Data types. Declaration of variables, Initialization of variables, Constants.

Unit-4
Operator and control structures, Types of Operators. Priority of Operators. Arrays- Initializing arrays, Strings.

Unit-5
Classes and objects- Introduction to class, Class Definition, Classes and Objects, Access specifiers – Private, Public and Protected. Member functions of the class. Constructor and destructor.

References:
1. Herbert Schildt, "C++ the Complete Reference ", III edition, TMH 1999
2. Balagurusamy, Entrepreneurial "Object Oriented programming with C++", TMH
3. Barkakatin "objects oriented programming in C++" PHI 1995.

Course Outcomes: After the completion of the course the student will be able to:

CO1	The students will be familiar with the basic concepts of C++.
CO2	The Students will be able to understand platform independency of the software.
CO3	The students will be familiar with C++ programming constructs
CO4	The students will be familiar with the various data types used in C++.
CO5	The students will be familiar with the various operators used in C++.
CO6	Develop the program by using classes, object, nested classes, constructors, abstract class etc.

DCS-403 COMPUTER ORGANIZATION

Pre-requisites: None

L T P C
3 1 0 4

Course Objectives:

CO1	To understand the main components and architecture of modern computer.
CO2	To understand the number system used in digital computer.
CO3	To understand the in depth architecture and organization of a modern computer with its various processing units.
CO4	To understand the various instruction types and formats.
CO5	To understand the principles of I/O in computer systems.
CO6	To understand the memory hierarchy and management system of computer.

Detailed Syllabus

Unit-1

Introduction: Digital computer generation, computer types and classifications, Stored program concept Von Neumann architecture , functional units and their interconnections, buses, types of buses and bus arbitration.

Unit-2

Number representation (sign magnitude, 1's and 2's complement), IEEE standard for floating point representation. Addition and subtraction of signed 2's complement numbers, Booths multiplication algorithm.

Unit-3

Central Processing Unit: Processor organization, general register organization, stack organization and addressing modes, Instruction types, Instruction formats, instruction cycle.

Unit -4

Input / Output: Peripheral devices: I/O devices, I/O interface, Interrupts, types of interrupts, Modes of Data Transfer: Programmed I/O, interrupt initiated I/O and Direct Memory Access.

Unit-5

Memory: Basic concept and hierarchy, semiconductor RAM memories, ROM memories. Cache memories: concept, address mapping and replacement. Auxiliary memories: magnetic disk, magnetic tape and optical disks Introduction to concept of virtual memory.

Reference Books :

1. William Stalling, " Computer Organization", PHI

2. Morris Mano," Computer System Architecture", PHI
3. Vravice,Hamacher & Zaky, "Computer Organization", TMH
4. John P Hays, " Computer Organization", McGraw Hill

Course Outcomes: After the completion of the course the student will be able to:

CO1	Understand the architecture and components of modern computer.
CO2	Understand the number system.
CO3	Understand the processor organization of a modern computer
CO4	Understand the different instruction types.
CO5	Identify, use and evaluate the performance of various input and output devices.
CO6	Can understand the need and importance of cache memory and the memory hierarchy.

DCS-404 E-COMMERCE

Pre-requisites: None

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Course Objectives:

CO1	Understand concept of E-Commerce and its types.
CO2	Be familiarized with technologies for E-Commerce.
CO3	Understand different types of Online Payment systems.
CO4	Understand selling and marketing on web.
CO5	Be familiarized with concept of E-Business and E-Business Models.
CO6	Understand various E-Business Strategies and E-Governance.

Detailed Syllabus

Unit-1
Electronic Commerce: Overview, Definitions, Advantages & Disadvantages of E-Commerce, Threats of E–Commerce, Rules & Regulations for Controlling E–Commerce, Cyber Laws.

Unit-2
Technologies: Relationship between E–Commerce & Networking, Different Types of Networking for E–Commerce, Internet, Intranet & Extranet Requirement for E–Commerce.

Unit-3
Business Models of E–commerce: Model Based on Transaction Type, E–Governance. E–Strategy: Overview, Strategic Methods for developing E–commerce.

Unit-4
Introduction to E–Payment System: Payment through card system, E–Cheque, E–Cash, E–Payment Threats & Protections. E–Marketing:. Home shopping, Tele-marketing, Risk of E – Commerce: Overview, Security for E – Commerce,

Unit-5
Security Standards, Introduction to Cryptography, Introduction to Password Systems. E-Commerce relation with ERP and Internet, Future Directions in e-commerce

References :
1. E-Commerce,M.M. Oka, EPH
2. Kalakotia, Whinston : Frontiers of Electronic Commerce , Pearson Education.
3. Bhaskar Bharat : Electronic Commerce - Technologies & Applications.TMH
4. Loshin Pete, Murphy P.A. : Electronic Commerce , Jaico Publishing Housing.
5. Murthy : E – Commerce , Himalaya Publishing.
6. E – Commerce : Strategy Technologies & Applications, Tata McGraw Hill.
7. Global E-Commerce, J. Christopher & T.H.K. Clerk, University Press
8. Beginning E-Commerce, Reynolds, SPD

9. Krishnamurthy, E-Commerce Mgmt, Vikas

Course Outcomes: After the completion of the course the student will be able to:

CO1	Define and differentiate various types of E-Commerce.
CO2	Describe Hardware and Software Technologies for E-Commerce.
CO3	Explain payment systems for E-Commerce.
CO4	Describe the process of Selling and Marketing on web.
CO5	Define and Describe E-Business and its Models.
CO6	Discuss various E-Business Strategies and about E-Governance.

DAS-405 Industrial Management

Pre-requisites: None

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Course Objectives:

CO1	Define and understand the knowledge of management
CO2	Get the value of communication: formal and informal communication
CO3	Human and industrial relations
CO4	Overview of personal development
CO5	Reconciliation of human and industry

Detailed Syllabus

Unit-1
PRINCIPLES OF MANAGEMENT: Definition of management, Administration organization, Functions management, Planning, Organizing, Co-ordination and control, Structure and function of industrial organizations, Leadership- Need for leadership, Factors to be considered for accomplishing effective leadership,

Unit-2
Communication -Importance, Processes, Barriers to communication, Making communication, Effective, formal and informal communication, Motivation - Factors determining motivation, Positive and negative motivation, Methods for improving motivation, Incentives, Pay promotion and rewards, Controlling - Just in time.

Unit-3
HUMAN AND INDUSTRIAL RELATIONS: Human relations and performance in organization, Understand self and others for effective behavior, Industrial relations and disputes, Characteristics of group behavior and Trade unionism, Mob psychology, Labor welfare, Workers participation in management.

Unit-4
PERSONNEL MANAGEMENT:
Responsibilities of human resource management - Policies and functions, Selection - Mode of selection - Procedure - training of workers, Job evolution and Merit rating - Objectives and importance wage and salary administration - Classification of wage.

Unit-5
INTELLECTUAL PROPERTY RIGHTS: Introduction to IPR (Patents, Copy Right, Trade Mark),Protection of undisclosed information, Concept and history of patents, Indian and International Patents Acts and Rules, Patentable and Nonpatentable invention including product versus Process.
Text Book:

1. L.M.Prasad, "Principal of Management", S. Chand Publications.
2. T.N Chhabra, "Principal and Practice of Management", Dhanpat Rai & Sons.

Course Outcomes: After the completion of the course the student will be able to:

CO1	Define and understand the knowledge of management	
CO2	Get the value of communication: formal and informal communication	
CO3	Human and industrial relations	
CO4	Overview of personal development	
CO5	Reconciliation of human and industry	

DCS-451: DATA STRUCTURES WITH 'C' LAB

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1. Implementation of two Addition of Matrices.

2. Implementation of two Multiplication of Matrices.

3. Implementation of Transpose of Matrix.

4. Implementation of Reverse an input string.

5. Implementation of Binary Search.

6. Implementation of Bubble Sort.

7. Implementation of Insertion sort.

8. Implementation of Quick Sort.

9. Implementation of Stack Using Array.

10. Implementation of Queue Using Array.

11. Implementation of Stack Using Single Linked List.

12. Implementation of Postfix Expression Evaluation.

DCS-452: OOP's WITH C++ LAB

1. Write a Program in C++ to print your name.

2. Write a Program in C++ to add two numbers.

3. Write a Program in C++ to find average of three numbers.

4. Write a Program in C++ to find whether a given number is even or odd.

5. Write a Program in C++ to find greatest of three numbers.

6. Write a program in C++ to print first 10 natural numbers.

7. Write a Program in C++ to input 10 numbers in an array and print them.

8. Write a Program in C++ to input a 2*2 matrix and print all its elements.

9. Write a program in C++ to transpose a Matrix.

10. Define a class stack in C++ with 3 Public Members with following Description:

   a) A data member top=-1

   b) Stack [100].

   c) Public members functions:

   d) A function PUSH( ) to insert value into the stack.

   e) A function POP() to delete an element from the stack.

   f) A function DISPLAY( ) to display the stack.

DCS-453: COMPUTER ORGANIZATION LAB

1. Bread Board Implementation of Flip-Flops.

2. Bread Board implementation of counters & shift registers.

3. Bread Board implementation of Binary Adder.

4. Bread Board implementation of Seven Segment Display.

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DCS-454: E-Commerce LAB

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As per Requirement of Syllabus.

DCS501	DBMS	**L T P** **3 1 0**	**4 Credits**

Pre-requisites: None

Course Objectives:

The objective of the course is to present an introduction to database management systems, with an emphasis on how to organize, maintain and retrieve - efficiently, and effectively - information from a DBMS.

DETAILED SYLLABUS

Unit-1

Basic Concepts of DBMS

Introduction to Database Management System, Data Base Vs file oriented approach, Basic DBMS terminology.

Unit-2

DBMC Architecture

Data independence, General Architecture of a Data Base Management Software, Components of DBMS, Advantages and Disadvantages of DBMS.

Unit-3

Data Modeling

Introduction to Data Models, Entities, Attributes, Introduction to entity sets, relationships sets and Attributes.

Unit-4

Entities and Relationships

KEYS in entity & relationship sets: (a) super key, (b) candidate key, (c) primary key, (d) unique key, E-R Diagrams, Database Security & Integrity.

Unit-5

Structured Query Language

Elementary ideas of Structured Query Language – SQL Commands –SQL Data Types, Basic Queries in SQL- Data Definition Language (DDL), Creating Tables, Inserting Values into a

Table, Updating Column(s) of a Table, Deleting Row(s) From a Table, Dropping Columns.

Reference Books:

1. Database Management Systems by Henry F. Korth .

2. Fundamentals of Database Systems by Shamkant B. *Navathe.*

Course Outcomes: After the completion of the course the student will be able to:

CO1	Describe the fundamental elements of relational database management systems.
CO2	Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL .
CO3	Design ER-models to represent simple database application scenarios
CO4	Convert the ER-model to relational tables, populate relational database and formulate SQL queries on data.
CO5	Improve the database design by normalization.

DCS502	JAVA	L T P 3 1 0	4 Credits

Pre-requisites: None

Course Objectives:

Objective of this course is to provide the ability to design console based, GUI basedand web based applications. Students will also be able to understand integrated development environment to create, debug and run multi-tier and enterprise-level applications.

DETAILED SYLLABUS

Unit-1

The Java Language: History and evolution of Java, Java's Lineage. Object Orientation concepts; Class, Object and its significance. Environment variable. Data Types, Variables and Array: Strongly typed Language, Primitive type, Non Primitive type, Scope & lifetime of the variables, Type Conversion and casting, Automatic Type promotions, Control Statements: Selection Statement, Iteration Statement.

Introducing classes: Class Fundamentals, Creating and Operating Objects, Constructor & initialization code block, Access Control, Modifiers, methods, Abstract Class & Interfaces, Defining Methods, Argument Passing Mechanism, Method Overloading.

Unit-2

Inheritance: Use and Benefits of Inheritance in OOP, Types of Inheritance in Java, Inheriting Data Members and Methods. Overloading concept & Overriding Super Class Methods.

Package: Organizing Classes and Interfaces in Packages. Package as Access Protection Defining Package CLASSPATH Setting for Packages.

Unit-3

Exception Handling: The Idea behind Exception ,Exceptions & Errors Types of Exception, Control Flow In Exceptions, Use of try, catch, finally, throw, throws in Exception Handling, In-built and User Defined Exceptions, Checked and Un-Checked Exceptions,

Unit-4

Thread : Understanding Threads, Needs of Multi-Threaded Programming, Thread Life-Cycle, Thread Priorities, Synchronizing Threads, Inter Communication of Threads.

The Java Library:

Array & String: Defining an Array, Initializing & Accessing Array, Multi–Dimensional Array, and Operation on String, Mutable & Immutable String.

Unit-5

Database Programming using JDBC: Introduction to JDBC, JDBC Drivers & Architecture.

Text Book:

1. Herbert Schieldt, "The Complete Reference: Java" Seventh Edition, TMH.

References:

1. Herbert Schieldt" Java Programming Cook Book" McGraw Hill.

2. Core Java™ 2 Volume I - Fundamentals, Seventh Edition Prentice Hall PTR

3. Core Java™ 2 Volume II - Fundamentals, Seventh Edition Prentice Hall PTR

Course Outcomes: After the completion of the course the student will be able to:

CO1	Read and understand Java-based software code of medium-to-high complexity.
CO2	Use standard and third party Java's API's when writing applications.
CO3	Understand the basic principles of creating Java applications with graphical user interface (GUI).
CO4	Create rich user-interface applications using modern API's such as JAVAFX.
CO5	Understand the fundamental concepts of computer science: structure of the computational process, algorithms and complexity of computation.

DCS503	Management Information System	L T P 3 1 0	4 Credits

Pre-requisites: None

Course Objectives:

The objective of the course is to describe the role of information technology and decision support systems in business and record the current issues with those of the firm to solve business problems. To introduce the fundamental principles of computer-based information systems analysis and design and develop an understanding of the principles and techniques used.

DETAILED SYLLABUS

Unit-1

Introduction to Information system, Types of Information system, System Vs MIS, What is MIS, Importance and Need of MIS, Network and Internet, Types of information system TPS,DSS,MIS.Assumptions & limitations of each system.

Unit-2

Structure of MIS, MIS vs Data Processing, Knowlwdge requirement of MIS, Information flow in MIS, MIS and Information Resource Management, Service Management, Availability

Management.

Unit-3

Information system in Businees, Problem with MIS, Causes and solution, Problem Management, The Planning Process, Controlling process in an organization, Database Backup & Storage, Archive & Retrieve, Disaster Recovery, Database & Application Protection.

Unit-4

Internet , Intranet, Extranet, Computer and internet Security, Access Management. Intrusion Detection, Security Information Management, Identity management, Release management.

Unit-5

Inputs and outputs, Processors, Controls, Feedback, Environment, Boundaries and Interface, Examples of System, System Development Life Cycle, Problems Identification, Types of Feasibility - Operational, Technical, Economical, System Analysis, System Design, Testing,

Implementation.

Text Books:-

1. Goel Ritendra, *Computer Application in Management*, New Age International Publishers,

NewDelhi.

2. Chowdhury G.G., *Text Retrieval Systems in information Management*, New Age

International

Publishers, New Delhi.

3. S.Shahjahan., Management Information System, New Age International Publishers, NewDelhi.

4. O Brian, "Introduction to Information System", MCGRAW HILL

Course Outcomes: After the completion of the course the student will be able to:

CO1	Relate the basic concepts and technologies used in the field of management information systems.
CO2	Compare the processes of developing and implementing information systems.
CO3	Outline the role of the ethical, social, and security issues of information systems
CO4	Translate the role of information systems in organizations, the strategic management processes, with the implications for the management.
CO5	Apply the understanding of how various information systems like DBMS work together to accomplish the information objectives of an organization

DCS504	COMPUTER HARDWARE & MAINTENANCE	L T P 3 1 0	4 Credits

Pre-requisites: None

Course Objectives:

The objective of this course is to provide the students much needed knowledge of computer hardware and networking, enabling them to identify and rectify the onboard computer hardware, software and network related problems in Engine Room Integrated Automation systems and Navigational equipment on Bridge. With the help of this course the participant will be able to understand the hardware specifications that are required to run operating system and various shipboard application programs.

DETAILED SYLLABUS

Unit-1

Component and peripheral devices, Connected with computer. Mother Board : BUS, Motherboard components, Battery, Connections on the Mother Board, Keeping CPU cool, Mother board trouble shooting.

Unit-2

Key Board: Switches, Keyboard organization, Key board type trouble shooting. Mouse: Mouse type, Connecting Mouse, Trouble shooting Mouse.HDD : Magnetic recording, Data Encoding Method, HDD feature, Head barking, HDD trouble shooting.

Unit-3

Printers : Image formation method, Printing mechanism, DMP, Ink Jet, Laser Printer. How printer works and Troubleshooting.

Unit-4

Network : Setting up N/W, Trouble Shooting N/W, Make your own computer.

Unit-5

Software Installation, Windows and other S/w, Boot Process, How to use Pen deive and other devices. Power Supply: Operating characteristics, Types and

maintenance.

Reference Books:

1. **Computer Hardware**: Installation, Interfacing, Troubleshooting and **Maintenance**" by James K L
2. Microprocessors, **Pc Hardware** and Interfacing" by Mathivanan.

Course Outcomes: After the completion of the course the student will be able to:

CO1	Understand basic concept & structure of Computer Hardware & Networking Components.
CO2	Identify the existing configuration of the computers & peripherals.
CO3	Upgrading the same as & when required.
CO4	Apply their knowledge about computer peripherals to identify/rectify problems on board
CO5	Integrate the PC's into Local Area Network & re-install OS & various shipboard applications.

DCS505	COMPUTER GRAPHICS	L T P 3 1 0	4 Credits

Pre-requisites: None

Course Objectives:

   The main objective of this module is to introduce to the students the concepts of computer graphics. It starts with an overview of interactive computer graphics, two dimensional system and mapping, then it presents the most important drawing algorithm, two-dimensional transformation; Clipping, filling and an introduction to 3-D graphics.

DETAILED SYLLABUS

Unit-1

Introduction and Line Generation: Graphic Displays- Random scan displays, Raster scan displays, Frame buffer and video controller, Points and lines, Line drawing algorithms, Circle generating algorithms, Mid-point circle generating algorithm.

Unit-2

Transformations: Basic transformation, Matrix representations and homogenous coordinates,

Composite transformations, Reflections and shearing.

Windowing and Clipping: Viewing pipeline, Viewing transformations, 2-D Clipping algorithms-Line clipping algorithms such as Cohen Sutherland line clipping algorithm, Polygon clipping –Sutherland Hodgeman polygon clipping.

Unit-3

Three Dimensional: 3-D geometric primitives, 3-D Object representation, 3-D Transformation, 3-D viewing, projections, 3-D Clipping.

Unit-4

Curves and Surfaces: Quadric surfaces, Spheres, Ellipsoid, Blobby objects, introductory concepts of Spline, B-spline and Bezier curves and surfaces.

Unit-5

Hidden Lines and Surfaces: Back Face Detection algorithm, Depth buffer method, A-buffer

method, Scan line method, basic illumination models – Ambient light, Diffuse reflection, Specular reflection and Phong model, Combined approach, Warn model, Intensity Attenuation, Color consideration, Transparency and Shadows.

Text Books:

1. Donald Hearn and M Pauline Baker, "Computer Graphics C Version", Pearson Education

2. Amrendra N Sinha and Arun D Udai," Computer Graphics", TMH

References:

3. Donald Hearn and M Pauline Baker, "Computer Graphics with OpenGL", Pearson Education

4. Steven Harrington, "Computer Graphics: A Programming Approach", MH

5. Rogers, "Procedural Elements of Computer Graphics", McGraw Hill

Course Outcomes: After the completion of the course the student will be able to:

CO1	Explain the core concepts of computer graphics, including viewing, projection, perspective, modelling and transformation in two and three dimensions.
CO2	Apply the concepts of colour models, lighting and shading models, textures, ray tracing, hidden surface elimination, anti-aliasing, and rendering.
CO3	Interpret the mathematical foundation of the concepts of computer graphics.
CO4	Describe the fundamentals of animation, parametric curves and surfaces, and spotlighting.
CO5	Identify a typical graphics pipeline and apply graphics programming techniques to design and create computer graphics.

STUDY AND EVALUATION SCHEME
Diploma in Computer Science and Engineering
(Effective from session 2014-15)
YEAR III, SEMESTER VI

S. No.	Course Code	SUBJECT	PERIODS			EVALUATION SCHEME					TOTAL	Credit
						SESSIONAL EXAM.				E-SEM.		
			L	T	P	CT	TA	AT	TOTAL			
THEORY												
1	DCS601	Web Technology	3	1	0	20	10	10	40	60	100	4
2	DCS602	Software Engineering	3	1	0	20	10	10	40	60	100	4
3	DCS603	Computer Networks	3	1	0	20	10	10	40	60	100	4
4	DAS604	Environment and Ecology	2	0	0	10	05	05	20	30	50	2
5	DCS604	Introduction to Cloud Computing	3	1	0	20	10	10	40	60	100	4
PRACTICAL/TRAINING/PROJECT												
6	DCS651	Web Technology Lab	0	0	4	-	-	-	50	50	100	2
7	DCS652	Project Lab	0	0	6	-	-	-	100	150	250	6
8	DCS653	Industrial Training and Seminar	0	0	2	-	-	-	100	-	100	2
9	GP601	Discipline & General Proficiency	-	-	-	-	-	-	100	-	100	1
		TOTAL	11	03	12	70	35	35	490	410	1000	29

L-Lecture, **T-** Tutorial , **P**- Practical , **CT –** Cumulative Test ,**TA –**Teacher Assessment , **AT –** Attendance , **E-Sem –** End Semester Marks

DCS 601Web Technology

Pre-requisites: None

Course Objectives:

CO1	Student will come to aware of cyber law.
CO2	student will be familiar with client server architecture
CO3	able to develop a web application using java technologies
CO4	Students will gain the skills and project-based experience needed for entry into web application and development careers

Detailed Syllabus

Unit-1
Introduction to Web Based System Development:
History of web, Growth of the Web, Protocols, governing the web, Introduction to Cyber Laws in India,

Unit-2
HTML: HTML Formatting Tags, Links, List, Tables, Frames, Forms, Comments in HTML.

Unit-3
Web Scripting: DHTML, JavaScript Introduction, documents, and documents, forms, Statements, Functions, Object in JavaScript, Events and Event Handling Arrays, FORMS, Buttons, Checkboxes, Text fields and Text areas.

Unit-4
XML: Introduction, Displaying an XML document, Data Interchange with an XML document, document type definitions.
Unit-5
Designing web pages of your polytechnic etc.
Text Books
1. Beginning Visual C# 2008, John Wiley, Wrox, May 2008.
2. Microsoft .Net for Programmers, Fergal Grimes, SPI, 2002
References:

1. Programming with C#, E. Balagurusamy, TMH, 1st Edition.
2. Collaborative Web Development, Burdman, Addison Wesley, 1st Edition, 1999.
3. Developing E-Commerce Sites, Sharma, Sharma, Addison Wesley, 1st Edition.

Course Outcomes: After the completion of the course the student will be able to:

CO1	Students are able to examine the security issues as well as judge the website policies according to cyber law.

CO2	To design and create the website using HTML and java scripts.
CO3	Students are able to create and design the server-side java applications valdation using java script.
CO4	Student can create xml files for client and server based program.

DCS-602 Software Engineering

Pre-requisites: None

Course Objectives:

CO1	It will give us information about various SDLC's , Software Characteristics and the need of Software engineering.

CO2	By this Students will understand various technicalities of documentation and its importance
CO3	Student will understand various designing techniques along with software measurement and matrices.
CO4	Students will understand the coding, testing and software maintenance along with various testing mechanisms.

Detailed Syllabus

Unit-1
Introduction to Software Engineering: Software Components, Software Characteristics, Software Engineering Processes, Software Quality Attributes. Software Development Life Cycle (SDLC)Models: Water Fall Model, Prototype Model, Spiral Model.

Unit-2
Software Requirement Specifications (SRS)
Requirement Engineering Process: Elicitation, Analysis, Documentation, Review. Feasibility Study, Data Flow Diagrams, SRS Document.
Unit-3
Software Design: Basic Concept of Software Design, Modularization, Structure Charts, Pseudo Codes, Flow Charts, Coupling and Cohesion Measures, LOC and Function Point (FP) Based Measures.

Unit-4
Software Testing: Testing Objectives, Unit Testing, Integration Testing, Acceptance Testing, Regression Testing, Top-Down and Bottom-Up Testing. Introduction to Structural Testing (White Box Testing), FunctionalTesting (Black Box Testing), Alpha and Beta Testing.

Unit-5
Software Maintenance: Need for Maintenance, Categories of Maintenance: Preventive, Corrective and Perfective Maintenance. Software Configuration Management Activities, Change Control Process. Introduction to Software Risk Analysis and Management.
Text book
1. R. S. Pressman, Software Engineering: A Practitioners Approach, McGraw Hill.
2. Rajib Mall, Fundamentals of Software Engineering, PHI Publication.

References:
   1. K. K. Aggarwal and Yogesh Singh, Software Engineering, New Age International Publishers.
   2. Pankaj Jalote, Software Engineering, Willey

Course Outcomes: After the completion of the course the student will be able to:

CO1	To develop, maintain and evaluate large-scale software systems
CO2	Apply various testing techniques to test the software.
CO3	To meet ethical standards and legal responsibilities

CO4	To work as an effective member or leader of software engineering teams

DCS603 COMPUTER NETWORKS

Pre-requisites: None

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Course Objectives:

CO1	Study the basic taxonomy and terminology of the computer networking and enumerate the layers of OSI model and TCP/IP model.
CO2	Acquire knowledge of OSI model
CO3	Study various terminology of networking.

CO4	Study various cryptography techniques for data security.
CO5	To study various data transfer and compression techniques.

Detailed Syllabus

Unit-1
Introduction Concepts: Goals and Applications of Networks, Advantages of computer network. Network Topologies, Types of Transmission Media, Switching methods.

Unit-2
Introduction to OSI reference model**,** Types of Error, Detection and Correction, Sliding Window protocols.

Unit-3
Connecting devices: Repeater, hub, bridge. Routing, IP address, IPv6. Introduction to Congestion control

Unit-4
Introduction to Data compression techniques, Cryptography.

Unit-5
File Transfer, Access and Management, Electronic mail, HTTP, WWW, Introduction to Firewalls.
Text Books:-

1. *Forouzen, "Data Communication and Networking", TMH*
2. *A.S. Tanenbaum, Computer Networks, Pearson Education*

Reference Book:-

3. *W. Stallings, Data and Computer Communication, Macmillan Press*
4. *AnuranjanMisra, "Computer Networks", Acme Learning*
5. *G. Shanmugarathinam, "Essential of TCP/ IP", Firewall Media*

Course Outcomes: After the completion of the course the student will be able to:

CO1	Describe the functions of each layer in OSI and TCP/IP model.
CO2	Apply cryptography techniques to protect data.
CO3	Able to compress the data for data transfer.
CO4	Classify the routing protocols and analyze how to assign the IP addresses for the given network.
CO5	Well known about the networking.

DAS604 ENVIRONMENT AND ECOLOGY

Pre-requisites: None

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Course Objectives:

CO1	
CO2	
CO3	
CO4	
CO5	
CO6	

Detailed Syllabus

Unit-1
Introduction to Environmental Science - Definition and scope and need for public awareness
Ecosystems ,Concept, structure and functions, restoration of damaged ecosystems
Biodiversity – Definition, description at national and global level, threats and conservation

Unit-2
Natural Resources - Renewable and non-renewable and their equitable use for sustainability,
Material cycles – carbon, nitrogen and sulphur cycle. Conventional and Non-conventional
Energy Sources – fossil fuel-based, hydroelectric, wind, -nuclear and solar energy, biomass,
biodiesel, hydrogen as an alternative fuel.

Unit-3
Transportation and industrial growth Social Issues Related to Environment–Sustainable
development, reset lement and rehabilitation Environmental ethics.

Unit-4
Environmental Changes and Human Health Environmental Pollution–Definition, causes and
effects, control measures for water, air, soil, noise, thermal pollution,

Textbook:
Environmental Studies, J Krishna wamy , R J Ranjit Daniels, Wiley India.
Reference Books:
1.Environmental Science, Bernard J. Nebel, Richard T. Right, 9780132854467, Prentice Hall
   Professional 1993.
2.Environment and Ecology, R K Khandal, 978-81-265-4277-2, Wiley India.
3.Environmental Science, 8th Ed ISV, Botkin and Keller, 9788126534142,Wiley India.
4.Environmental Studies, R Rajagopalan, 978-0195673937, Oxford University Press
5.Textbook of Environmental Science and Technology, M.Anjireddy, BS Publications

Course Outcomes: After the completion of the course the student will be able to:

CO1	
CO2	
CO3	
CO4	
CO5	

DCS604 Introduction to Cloud Computing

Pre-requisites: None

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Course Objectives:

CO1	Study the basic terminology of cloud computing.
CO2	Study the various models of cloud computing.
CO3	Study various devices used in cloud computing for data transfer.
CO4	Study the various security policies.

Detailed Syllabus

Unit-1
Define cloud computing, Components of a computing cloud, Differentiating types of cloud:
Public, Private, Hybrid,
Unit-2
Cloud Computing Models: Software as a service: SaaS, Platform as a service: PasS,
Hardware as a service: HasS, Infrastructure as a service: IasS**.**
Unit-3
Connecting devices: Repeater, hub, bridge. Routing, gateways, Network Types, IP Classes
and subnets, CIDR

Unit-4
Introduction to Cloud security, User Authentication, Firewall and Cloud database
Unit-5
Amazon, Google, IBM Cloud, Microsoft and others adopting the cloud, Simple Storage
Service-S3, Overview of buckets and Object, Amazon elastic block storage EBS.

Text Books:
1. Cloud Computing: Principles and Paradigms, Editors: Raj Kumar Buyya, James
   Bromberg, Andrej M Goscinski, Wiley, 2011.
2. Visible Ops private Cloud: FromVirtulization to private Cloud in 4 Practical's
   steps,Andi Mann, Kurt Milne, Jeanne Mcrain IT Ptocess Institute , In: first edition(
   April8,2011)
Reference Book:
▪ Cloud Computing Explained: Implementation Handbook for Enterprises, John Rotan,
   Recursive Press (November 2, 2009)

Course Outcomes: After the completion of the course the student will be able to:

CO1	Ability to use current techniques, skills, and tools necessary for computing practice
CO2	Technical design the technical ability to design a prescribed engineering sub-system
CO3	Design assessment the ability to develop and assess alternative system designs based on technical and non-technical criteria
CO4	Critically analyze case studies to derive the best practice model to apply when developing and deploying cloud based applications.