B. TECH SECOND YEAR
COMPUTER SCIENCE & ENGINEERING

(Batch 2015)
Session (2016-17)

SCHEME OF PAPERS

THIRD SEMESTER (COMPUTER SCIENCE & ENGINEERING)

S. No.	Subject Code	Subject Name	L	T	P	Cr.
1.	ECE-209	Digital Electronic Circuits	3	1	0	3.5
2.	CPE-201	Computer Architecture	3	1	0	3.5
3.	CPE-202	Object Oriented Programming using C++	3	1	0	3.5
4.	CPE-203	Operating Systems	3	1	0	3.5
5.	CPE-205	Discrete Mathematical Structure	3	1	0	3.5
6.	CPE-210	Computer Peripheral and Interface	3	1	0	3.5
7.	ECE-259	Digital Electronic Circuits Lab	0	0	2	1.0
8.	CPE-252	Object Oriented Programming using C++ Lab	0	0	2	1.0
9.	CPE-253	Operating System and Hardware Lab	0	0	2	1.0
10.	**	Punjabi	3	0	0	
Total			18	6	6	24
						Total Contact Hours = 30

ECE-259, CPE-252 and CPE-253 are practical papers only. There will not be any theory examination for these papers.

* * In addition to above mentioned subjects, there will be an additional course on Punjabi as a qualifying subject.

B. TECH SECOND YEAR
COMPUTER SCIENCE & ENGINEERING

(Batch 2015)
Session (2016-17)

SCHEME OF PAPERS

FOURTH SEMESTER (COMPUTER SCIENCE & ENGINEERING)

S. No.	Subject Code	Subject Name	L	T	P	Cr.
1.	BAS-201	Numerical Methods & Applications	3	1	0	3.5
2.	CPE-206	Visual Programming using VB.NET	3	1	0	3.5
3.	CPE-207	Computer Networks	3	1	0	3.5
4.	CPE-208	Data Structures	3	1	0	3.5
5.	HSS-201	Management Practice & Organization Behaviour	3	1	0	3.5
6.		Elective I *	2	1	0	2.5
7.	BAS-251	Numerical Methods & Application Lab	0	0	2	1.0
8.	CPE-256	Visual Programming using VB.NET Lab	0	0	2	1.0
9.	CPE-258	Data Structures using C/C++ Lab	0	0	2	1.0
10.	CPE-259	Computer Networks Lab	0	0	2	1.0
11.	**	Environment and Road Safety Awareness				
		Total	17	6	8	24
						Total Contact Hours = 31

Elective Subjects – I *

S. No.	Subject Code	Subject Name	L	T	P	Cr.
1.	**CPE-211**	System Analysis & Design	2	1	0	2.5
2.	CPE-212	Managenent Information System	2	1	0	2.5
3.	**CPE-213**	E-Commerce	2	1	0	2.5

***Choose any one from the list**

CPE-256, CPE-258, CPE-259 and BAS-251 are practical papers only. There will not be any theory examination for these papers.

* * In addition to above mentioned subjects, there will be an additional course on Environment and Road Safety Awareness as a qualifying subject.

B. TECH THIRD YEAR
COMPUTER SCIENCE & ENGINEERING

(Batch 2015)
Session (2017-18)

SCHEME OF PAPERS

FIFTH SEMESTER (COMPUTER SCIENCE & ENGINEERING)

S. No.	Subject Code	Subject Name	L	T	P	Cr.
1.	CPE-301	System Programming	3	1	0	3.5
2.	CPE-302	Database Management System	3	1	0	3.5
3.	CPE-303	Algorithm Analysis & Design	3	1	0	3.5
4.	CPE-304	Theory of Computation	3	1	0	3.5
5.	CPE-305	Microprocessor & Assembly Language Prog.	3	1	0	3.5
6.	CPE-306	Software Engineering	3	1	0	3.5
7.	CPE-352	Database Management System Lab	0	0	2	1.0
8.	CPE-353	Algorithm Analysis & Design Lab	0	0	2	1.0
9.	CPE-355	Microprocessor & Assembly Language Prog. Lab	0	0	2	1.0
10.	STG-351	Summer Training **	-	-	-	6.0
11.		***Open Elective				
Total			18	6	6	30
Total Contact Hours = 30						

CPE-352, CPE-353 and CPE-355 are practical papers only. There will not be any theory examination for these papers.

**** Summer Training will be of 4 to 6 weeks duration in Industry / In House.**
*****Open Elective**

1. MICRO ECONOMIC ANALYSIS (M.A. BUSINESS ECONOMICS)
2. QUANTITATIVE TECHNIQUES (M.A. BUSINESS ECONOMICS)
3. THEORY AND PRACTICE OF WAR – I (M.A. DEFENCE & STRATEGIC STUDIES)
4. PROFESSIONAL PHOTOGRAPHY (B. TECH TV, FILM PRODUCTION AND MEDIA TECHNOLOGY)
5. EARLY HISTORY OF BUDDHISM (M.A. BUDDHIST STUDIES)
6. ORIGIN & DEVELOPMENT OF SIKHISM (M.A. BUDDHIST STUDIES)
7. PHILOSOPHICAL FOUNDATIONS OF EDUCATION (M.A. EDUCATION)
8. ENGLISH PHONETICS AND PHONOLOGY (M.A. ENGLISH)
9. ART AND CULTURAL HISTORY OF INDIA (M.A. FINE ARTS)
10. GROWTH & DEVELOPMENT OF PRINT MEDIA (M.A JOURNALISM AND MASS COMMUNICATION)
11. GURU NANAK DEV : METAPHYSICS & EPISTEMOLOGY (M.A. PHILOSOPHY)
12. INDIVIDUAL AND SOCIETY (M. A. SOCIAL WORK)
13. HUMAN GROWTH AND DEVELOPMENT (M. A. SOCIAL WORK)
14. WOMEN'S MOVEMENT IN INDIA (M.A. WOMEN'S STUDIES)
15. POSITIONAL ASTRONOMY (M.SC. ASTRONOMY & SPACE PHYSICS)

***Note regarding OPEN ELECTIVE:**

(i) It is an **over and above the** basic requirements for B. Tech. CSE degree
(ii) In addition to above open elective subjects, student can opt any other subject offered by university departments with the consent of ACD of CE department.

B. TECH THIRD YEAR
COMPUTER SCIENCE & ENGINEERING

(Batch 2015)
Session (2017-18)

SCHEME OF PAPERS

SIXTH SEMESTER (COMPUTER SCIENCE & ENGINEERING)

S. No.	Subject Code	Subject Name	L	T	P	Cr.
1.	CPE-307	RDBMS Using PL/SQL	3	1	0	3.5
2.	CPE-309	Compiler Design	3	1	0	3.5
3.	CPE-315	Network Security	3	1	0	3.5
4.	CPE-319	Java Programming	3	1	0	3.5
5.	CPE-357	RDBMS Using PL/SQL Lab	0	0	2	1.0
6.	CPE-361	Network Security Lab	0	0	2	1.0
7.	CPE-362	Java Programming Lab	0	0	2	1.0
8.		Elective-II *	3	1	0	3.5
9.		Elective-III **	3	1	0	3.5
Total			18	6	6	24
Total Contact Hours = 30						

ELECTIVE – II FOR SIXTH SEMESTER (COMPUTER SCIENCE & ENGINEERING)*

S. No.	Subject Code	Subject Name	L	T	P	Cr.
1	CPE-311	Parallel Computing	3	1	0	3.5
2	CPE-312	Multimedia Systems	3	1	0	3.5
3.	CPE-313	Software Project Management	3	1	0	3.5
4.	CPE-314	Distributed Computing	3	1	0	3.5
5.	MBA-5011	Foundation of Financial Accounting	3	1	0	3.5

***CHOOSE ANY ONE FROM THE LIST**

ELECTIVE – III FOR SIXTH SEMESTER (COMPUTER SCIENCE & ENGINEERING)**

S. No.	Subject Code	Subject Name	L	T	P	Cr.
1.	CPE-316	ATM Networks	3	1	0	3.5
2.	CPE-317	Grid Computing	3	1	0	3.5
3.	CPE-318	Business Intelligence	3	1	0	3.5
4.	CPE-320	Cloud Computing	3	1	0	3.5
5.	MBA-5012	Foundations of Managerial Accounting	3	1	0	3.5

****CHOOSE ANY ONE FROM THE LIST**

CPE-357, CPE-361 and CPE-362 are practical papers only. There will not be any theory examination for these papers.

B. TECH FOURTH YEAR
COMPUTER SCIENCE & ENGINEERING

(Batch 2015)
Session (2018-19)
SCHEME OF PAPERS

SEVENTH SEMESTER (COMPUTER SCIENCE & ENGINEERING)

S. No.	Subject Code	Subject Name	L	T	P	Cr.
1.	CPE-403	System Modeling & Simulation	3	1	0	3.5
2.	CPE-404	Artificial Intelligence	3	1	0	3.5
3.	CPE-407	Data Mining & Warehousing	3	1	0	3.5
4.	CPE-412	Computer Graphics	3	1	0	3.5
5.	CPE-454	Artificial Intelligence Lab	0	0	2	1.0
6.	CPE-455	Data Mining & Warehousing Lab	0	0	2	1.0
7.	CPE-456	Computer Graphics Lab	0	0	2	1.0
8.		Elective- IV *	3	1	0	3.5
9.		Elective – V **	3	1	0	3.5
Total			18	6	6	24
Total Contact Hours = 30						

ELECTIVE – IV FOR SEVENTH SEMESTER (COMPUTER SCIENCE & ENGINEERING)*

S. No.	Subject Code	Subject Name	L	T	P	Cr.
1.	CPE-405	Neural Computing	3	1	0	3.5
2.	CPE-408	Digital Image Processing	3	1	0	3.5
3.	CPE-409	Advanced Computer Architecture	3	1	0	3.5
4.	CPE-410	Object Oriented Analysis & Design Using UML	3	1	0	3.5
5.	CPE-411	Cyber Security	3	1	0	3.5
6.	MBA-5033	Foundation of International Business	3	1	0	3.5

*CHOOSE ANY ONE FROM THE LIST

ELECTIVE – V FOR SEVENTH SEMESTER (COMPUTER SCIENCE & ENGINEERING)**

S. No.	Subject Code	Subject Name	L	T	P	Cr.
1	ECE-403	Wireless & Mobile Communication	3	1	0	3.5
2	ECE-407	Nano Electronics	3	1	0	3.5
3	ECE-408	Biomedical Instrumentation	3	1	0	3.5
4	ECE-409	Optical Networks	3	1	0	3.5
5	MBA-5013	Foundations of Finance	3	1	0	3.5

*CHOOSE ANY ONE FROM THE LIST

CPE-454, CPE-455 and CPE-456 are practical papers only. There will not be any theory examination for these papers.

B. TECH FOURTH YEAR
COMPUTER SCIENCE & ENGINEERING

(Batch 2015)
Session (2018 - 19)

SCHEME OF PAPERS

EIGHTH SEMESTER (COMPUTER SCIENCE & ENGINEERING)

Code	Title of Paper	Total Credits
PRJ-451	Project Semester (One Semester Training in Industry)	20

Breakup of Marks:

Industrial Visit by Faculty Coordinator (150 Marks)
(Within 10—12 weeks of commencement of Training)

Presentation : 60 Marks
Viva Voce : 60 Marks
Report (Hard Copy) : 30 Marks

Evaluation by Faculty Coordinator is consolation with Industrial Coordinator during industrial visit.

Evaluation by a Team of Faculty Members in the Institute (250 Marks)
(Within One Week of completion of Training)

Presentation : 100 Marks
Viva Voce : 100 Marks
Report (Hard Copy) : 50 Marks

The Final Presentation and viva – voce will be conducted jointly by the faculty coordinator, external examiner and nominee of the Head to be appointed by the Head of the Department.

The Letter grade will be awarded to the students according to marks obtained by him/her out of total 400 marks.

B. TECH SECOND YEAR
COMPUTER SCIENCE & ENGINEERING

(Batch 2015)
Session (2016-17)

SCHEME OF PAPERS

THIRD SEMESTER (COMPUTER SCIENCE & ENGINEERING)

S. No.	Subject Code	Subject Name	L	T	P	Cr.
1	ECE-209	Digital Electronic Circuits	3	1	0	3.5
2	CPE-201	Computer Architecture	3	1	0	3.5
3	CPE-202	Object Oriented Programming using C++	3	1	0	3.5
4	CPE-203	Operating Systems	3	1	0	3.5
5	CPE-205	Discrete Mathematical Structure	3	1	0	3.5
6	CPE-210	Computer Peripheral and Interface	3	1	0	3.5
7	ECE-259	Digital Electronic Circuits Lab	0	0	2	1.0
8	CPE-252	Object Oriented Programming using C++ Lab	0	0	2	1.0
9	CPE-253	Operating System and Hardware Lab	0	0	2	1.0
10	**	Punjabi	3	0	0	
Total			18	6	6	24
Total Contact Hours = 30						

ECE-259, CPE-252 and CPE-253 are practical papers only. There will not be any theory examination for these papers.

* * In addition to above mentioned subjects, there will be an additional course on Punjabi as a qualifying subject.

Department of COMPUTER ENGINEERING

Punjabi University, Patiala.

General Instructions to the Paper Setters

(Common for B.Tech. in Computer Science & Engineering, Electronics and communication Engineering, Mechanical Engineering, Civil Engineering and Integrated BTech/MBA Branches)

Applicable to 2014 Batches onward

Pattern of Question Paper

TITLE OF SUBJECT (CODE----)

Bachelor of Technology (Branch) Section: ……..

End Semester Exam

TIME ALLOWED: 3 Hour

Roll. No…….

Maximum Marks: 50

Note:- Section C is compulsory. Attempt any six questions selection three questions from each section A & B.

Section-A (From Section A of the syllabus)

Q1. .....
Q2. .....
Q3. .....
Q4. ..... 3x5
Q5……..

Section-B (From Section B of the syllabus)

Q6. .....
Q7. .....
Q8. .....
Q9. ..... 3x5
Q10…….

Section-C (From whole syllabus)

Q11
a).....
b).....
c).....
d).....
e).....
f).....
g).....
h).....
i).....
j)……. 10x2=20

Note for the paper setter:

1. Total numbers of questions to be set are Eleven (11) as per the above format.
2. There will be five questions in each of the Sections A and B. Each question will be of five (05) marks. However, a question may be segregated into subparts.
3. Section C is compulsory and contains ten (10) sub-parts each of two (2) marks.
4. The maximum limit on numerical problems to be set in the paper is 35% while minimum limit is 20%.
5. The paper setter shall provide detailed marking instructions and solutions to numerical problems for evaluation purpose in the separate white envelopes provided for solutions.
6. The paper setters should seal the internal & external envelope properly with signatures & cello tape at proper place.
7. Log tables, charts, graphs, Design data tables etc. should be specified, whenever needed.
8. Use of Scientific calculator should be clearly specified.

ECE 209 DIGITAL ELECTRONIC CIRCUITS

L	T	P	CR
3	1	0	3.5

Section-A

Review of Number Systems and Codes : Binary, Octal and Hexadecimal number systems, Binary to decimal, Decimal to binary, Octal and hexadecimal to binary and binary to octal and hexadecimal conversions, BCD code, Gray code, Alphanumeric codes, Parity method for error detection.

Logic gates and Boolean Algebra: OR, AND and NOT operations and gates, NOR, NAND, XOR and XNOR operations and gates, Evaluating logic circuit outputs, Implementing circuits from Boolean expressions. Boolean theorems, DeMorgan's theorem, universality of NAND and NOR gates, IEEE/ANSI standard logic symbols.

Combinational Logic Circuits: Sum of product form, Product of sum form, Simplification of Boolean functions using algebraic and Karnaugh map methods. Half adder, Full adder, half subtractor, full subtractor circuits, parity generator and checker circuits, comparator circuit.

Combinational digital circuit design: Multiplexer, Demultiplexer, Code converters, Combinationallogic circuits. Some examples of Boolean gate ICs.

Section-B

Sequential Circuits: RS, JK, D and T flip-flops circuits and their conversions, Serial and parallel counters and shift registers, Universal shift registers, some examples of counter and shift register ICs.

Logic families and digital ICs: Characteristics of digital ICs, Classification of different logic families.

Memories: Semi-conductor memories, ROM and RAM, ROM using diodes, BJTs, and FETs. RAM cell. Memory organization and expansion. An idea about other types of memories.

Digital to Analog and Analog to Digital Converters: Variable register network, R-2R D/A converters. D/A accuracy and resolution, A/D converters, Simultaneous conversion and counter method.

Recommended Books:

1. R.J Tocci, “Digital Principles Circuit" Prentice Hall of India, New Delhi.
2. M.M. Mano, “Digital Design" Mcgraw Hill, USA
3. Morris M. Mano "Digital logic and Computer design" Prentice Hall of India New Delhi.
4. Malvino Leach, “Digital Principles and Applications" McGraw Hill, USA

CPE-201 COMPUTER ARCHITECTURE

L	T	P	Cr
3	1	0	3.5

Section-A

Introduction: Design of basic computer, Registers, Accumulator, Flags, Program Counter, Stack Pointer, Machine Instructions, Instruction Cycle, Machine Cycle, Components of CPU.

State Machine Concepts: Processor as a state machine, ALU and Data path, Data path Architecture.

Controller Design: Hardwired and Micro programmed Approach.

Micro program Control Organization: Control Memory Address Sequencing, Micro program Sequences, Microinstruction Formats, and Addressing modes.

Arithmetic Unit: Comparison and Subtraction of unsigned Binary Numbers, Addition, Subtraction, Multiplication Algorithm.

Section –B

Memory System: Memory - CPU interaction, Principle of locality (Temporal and Spatial).

Memory Organization: Interleaved Memory Organization, Memory Hierarchy, Main Memory, Virtual Memory, Cache Memory, Cache Organization (Direct, Fully Associative, Set Associative), Cache Coherence, Memory Management Hardware, Performance Considerations.

Input-Output Organization: I/O interfaces and Buses, I/O operations, Program driven Input-Output, Interrupt driven Input-Output, DMA, Priority Interrupt.

Pipeline Processing: Overview of Pipelining, Types of Pipelining, Pipeline Data path Design, Hazards (Data, Control, Structural), Stalling.

Recommended Books:

1. Computer System Architecture: M.M. Mano, Prentice Hall of India.
2. Structured Computer Organization: Andrew S. Tanenbaum, Prentice Hall of India
3. J.P. Hayes, Computer Systeui Architecture, Prentice Hall of India, New Delhi.
4. Ali leigh. System Architecture, South wester publishing co. New Delhi.
5. William Stallings, “Computer Organization and Architecture – Designing for Performance”, 6th Edition, Pearson Education, 2003.

CPE-202 OBJECT ORIENTED PROGRAMMING Using C++

L	T	P	Cr
3	1	0	3.5

Section - A

Introduction: - Review of basic concepts (Data types, tokens, operators, arrays, strings, structure). Concepts of OOPS, Comparison between procedural and OOPS, Elements of OOPS, its paradigm, its merits and demerits, functions, function overloading and function.

Classes and Objects :- Classes, creating a class, accessing class members, memory allocation for objects, array of objects, static objects, friend class, empty classes, nested classes, abstract classes and container class.

Constructor and Destructor :- Its need, Types of constructor- Default, Copy, Multiple, Dynamic, Destructor, Constructor and Destructor with static members, Order of execution of constructor and destructor.

Operator Overloading and type Conversion :- Definition, Rules for overloading, Overloading of unary and binary operators, Overloading NEW and DELETE operators, Type conversion- Basic type to class type, class type to basic type, class to class type.

Section - B

Inheritance: - Virtual base class, types of inheritance, typing conversions and visibility

Pointers and dynamic memory management :- Understanding pointers, accessing address of a variable, declaring and initialization, pointer arithmetic, pointer to pointer, pointer to function, pointer to array, array of pointers, pointer to object, this pointers, null pointers, dangling pointers and memory leak.

Polymorphism: - Virtual functions, Virtual destructors, Concept of binding- early and late, Virtual functions, Pure virtual functions, Polymorphism.

Exception Handling: - Basics of exception handling, Exception handling mechanisms, Throwing mechanisms, Catching mechanisms

Managing Data Files: - File streams, Hierarchy of file streams, Reading/Writing of files, accessing records randomly and sequentially and updating files.

Recommended Books:

1. Object Oriented Programming with C + + by Bala Guruswamy; TATA McGraw Hill Publishing Co. Ltd.
2. Turbo C + + Robert and Lafore: Galgolia Publications.
3. Satzinger, Object Oriented Analysis and Design with the unified process, Cengage Learning (Thomson)
4. C++ Primer Plus by Stephan & PRAT: Galgotia Publications

CPE-203 OPERATING SYSTEMS

L	T	P	Cr
3	1	0	3.5

Section-A

Basic Functions and Concepts of Operating Systems: Concept of an operating system, batch system, Multi-programmed, Time sharing, Personal Computer System, Parallel system, Real time system, Network Operating System and Distributed Operating System.
Features and Objective of Operating Systems: System components, operating system services, System calls, System Programmers, System Structure: Simple Structure, Layered Approach, Microkernel
Process Management: Concept of process, process states, process state transitions, process control block, operations of processes, deadlocks, CPU Scheduling algorithms, scheduling criteria

Section-B

Memory Management: Logical and physical address space, storage allocation and management techniques, swapping, concepts of multi programming, paging, segmentation, virtual memory, virtual storage management strategies, Demand Paging, Page Replacement Algorithms, Thrashing.
Information Management: File concept, Access method, Directory structure, Allocation methods, free space management, Directory implementation
Disk Management: Disk structure, Disk Scheduling, Disk Management. Swap Space Management.

Recommended Books:

1. Operating System: (Sixth Edition) 2005: Galvin Silberschatz, Addison Wesley Publishing Ltd.
2. Flynn "Understanding operating Systems", Cengage Learning (Thomson)
3. DM Dhamdhere, "Operating System r A Concept Based Approach", Tata Me Graw- Hill.
4. Operating Systems Design and Implementation: Andrew S. Tanembaum, PHI (Latest Edition).

CPE-205 DISCRETE MATHEMATICAL STRUCTURE

L	T	P	Cr
3	1	0	3.5

Section-A

Relations and Functions: Binary relations, composition of relations; Equivalence relations and partitions; partially ordered sets and Lattice Hasse diagrams; Functions, Injection, Surjection and Bisection; Composition of functions. Recursion and Recurrence Relations: Polynomials and their evaluation, recursion, iteration, sequences and discrete functions, Recurrence Relations, generating functions.

Graphs: Introduction to graphs, Graph terminology, Representing Graphs and Graph Isomorphism, Connectivity. Mathematical Logic: Statement and notations, normal forms, theory and inference for statement and calculus, predicate calculus, inference theory for predicate calculus. Graph Theory: Directed and undirected graphs and their matrix representations: Euclidean paths and cycles; Hamiltonian paths and cycles; shortest paths, Euler.'s formula.

Section-B

Boolean Algebra: Basic Circuits and theorems, Boolean expressions; Logic gates and relation of Boolean functions. Induction and Recursion: Principle of Mathematical induction; Recursive definition.

Algebraic Structures: Introduction to algebraic structures, semi groups; Groups and subgroups; Homomorphism and homomorphism of groups, Lagrange theorem.

Recommended Books:

1. J.P.Tremble: Discrete Mathematics Structure with application to Computer Science, McGraw Hill, 1987
2. Truss, Johan.K: Discrete Mathematics for Computer Scientist, Pearson Education, India.
3. Liu, C.L.: Elements of Discrete Mathematics, 4lh Edition, McGraw Hill, New York, 1998.

CPE - 210 COMPUTER PERIPHERAL & INTERFACES

L	T	P	Cr
3	1	0	3.5

SECTION-A

Working and Interfacing of various Peripheral Devices: Hard Disk (parameters : Head, Sector Cylinder, Seek/Access/Latency time) and its Working and Interfacing, Printers – Principle and Working of Dot Matrix Printers, Line Printers, Laser Printers, Drum Printer. Printer Adapter, Keyboard – Types, Functioning and Interfacing.

Other Devices: Construction and working of CD-ROM, DVD, USB Drives, Serial Port Devices. Internal and External Modems their working and Common fault diagnosis, UPS and its types, Mouse
Introduction to : Digitizer, Plotter, OCR, OMR, Audio Response Units, Magnetic Ink Readers, Bar Code Readers, Scanners.

SECTION-B

Display Devices: Overview of Raster Scan and vector graphics. CRT, TFT, LCD, LED Monitors, Touch Screens and their working. Elementary principles of scanning and picture formation,
Common faults of Hard Disk Drives and their diagnosis, Alignment of hard disk head, SCSI and IDE interfaces.
Communication: Serial Communication – RS232C, Parallel Communication – Centronix.
Introduction to I/O buses:ISA, PCI, SCSI, EISA, Local bus, VESA Local bus, PCI bus, PCI Express, Accelerated graphics port bus.
Input/ Output Driver software aspects:
Booting sequence, Role of device driver, DOS and UNIX/ LINUX device drivers.
Design & Integration of Peripheral devices to a computer system as a Case Study

References:

1. T.C. Bartee, Scott Muller: Digital Computer fundamentals, 6th Edition, Tata McGraw Hill.
2. Upgrading and repairing PC, 16th Edition, Que Publishing.
3. Douglas V Hall : Microprocessor & Interfacing Programming & H/W, 2nd Edition 1992, Tata McGraw Hill International
4. P. Pal Chandhari : Computer Organization and design, Prentice Hall of India Pvt. Ltd. 1994.
5. Del Corso, H.Kirrman, JD Nicond : Microcomputer buses & links" Academic Press 1986.
6. Scott Muller, "Upgrading and repairing PC"

ECE-259 DIGITAL ELECTRONIC CIRCUITS LAB

L	T	P	Cr
0	0	2	1.0

List of Experiments

Experiment 1.

i) Verify the truth table for different Logic Gates.
ii) Realize AND,OR, NOR, NOT functions using only NAND Gate.
iii) Realize AND,OR, NAND, NOT functions using only NOR Gate.
iv) Implement EX-OR, EX-NOR using AND.OR,NOT Gates
v) Implement EX-OR, EX-NOR using only NAND, NOR Gates

Experiment 2. Boolean Algebra:-

i) Verify laws of Multiplication.
ii) Verify laws of Addition.

Experiment 3. Make the circuit of Binary adder theortically.

i) Half-Adder.
ii) Full-Adder and then Verify.

Experiment 4. Make the circuit of binary subtractor theoretically.

i) Half-Subtractor
ii) Full-Subtractor and then Verify.

Experiment 5. Construct different types of FF.

i) RS-FF
ii) JK-FF
iii) D-FF
iv) T-FF

Experiment 6. Verify the Master-Slave J-Kflip flops and construct Master Slave FF from JK-FF.
Experiment 7. Verify the 4-bit magnitude comparator.
Experiment 8. Generate all the 0-9 digits from BCD to 7 segment decoder and then make K-Map.
Experiment 9. Make truth table for 16:1 mux and implement ACD+BA+ACB in it.
Experiment 10. Verify all the shift registers.

ii) SISO
iii) SIPO
iv) PISO
v) PIPO

Experiment 11. Verify decade Counters:

i) Verify and Design M-6 Counter:

Experiment 12. To Study & Verify ADC and DAC converter.

CPE - 252 OBJECT ORIENTED PROGRAMMING Using C++ LAB

L	T	P	Cr
0	0	2	1.0

List of Experiments:

1. Write a program to illustrate the working of different iterative controls.
2. Write a program to illustrate the use of conditional statements.
3. Write a program to illustrate difference between call by reference and call by value.
4. Write a program to illustrate use of classes and objects.
5. Write a program to illustrate the use of constructors and destructors in object oriented language.
6. Write a program to illustrate the use operator overloading in object oriented language.
7. Write a program to illustrate the use of inheritance and type of inheritance in object oriented language.
8. Write a program to illustrate the use virtual function in object oriented language.
9. Write a program to illustrate the use runtime polymorphism in object oriented language.
10. Write a program to illustrate the use of File Stream operation in object oriented language.

CPE-253 OPERATING SYSTEM AND HARDWARE LAB

L	T	P	Cr
0	0	2	1.0

Hardware Lab

List of Experiments:

1. Identification of various computer components: Motherboard, Processor, System buses , Expansion Buses and PC Power supplies Memories etc.
2. PC assembling

Operating Lab

List of Experiments:

1. Familiarization of UNIX/LINUX Environment.
2. Installation and Administration of UNIX/LINUX operating system.
3. Implementation of common commands of UNIX operating systems.
4. Working on vi editor using its different modes.
5. Redirection of input and output using Filters and Pipes.
6. Shell programming and its features.
7. Implementation of programs using shell scripts.

Recommended Books:

1. Forouzan UNIX and Shell Programming 1st Edition, Cengage Learning (Thomson)
2. Subhadeep Choudhury 'The A to Z of PC hardware and Maintenance', Dhannpat Rai & Co.

ਸਿਲੇਬਸ

ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ (ਮੁੱਢਲਾ ਗਿਆਨ)

ਅੰਡਰ ਗ੍ਰੈਜੂਏਟ ਪੱਧਰ ਤੇ ਪ੍ਰੋਫੈਸ਼ਨਲ ਕੋਰਸਾਂ ਲਈ ਕੁਆਲੀਫਾਇੰਗ ਪੰਜਾਬੀ (ਬੈਚ 2014 ਤੋ ਲਾਗੂ)

For Other State Students of
B. Tech & 5 Yr. Engineering Management Integrated Program Only

ਕੁੱਲ ਅੰਕ: 100 (ਮੋਖਿਕ ਪ੍ਰੀਖਿਆਂ 40 ਅੰਕ; ਬਾਹਰੀ ਪ੍ਰੀਖਿਆਂ 60 ਅੰਕ) ਪਾਸ ਅੰਕ 35

ਸਮਾਂ : 3 ਘੰਟੇ ਪੀਰੀਅਡ: 3 ਪ੍ਰਤੀ ਹਫ਼ਤਾ

ਭਾਗ ੳ

1) ਗੁਰਮੁਖੀ ਵਰਣਮਾਲਾ ਤੇ ਲੇਖਣ ਪ੍ਰਬੰਧ

ੳ) ਅੱਖਰ ਸਿੱਖਿਆ: ਤਰਤੀਬਵਾਰ ਤੇ ਭੁਲਾਵੇਂ ਅੱਖਰ

ਅ) ਅੱਖਰ ਬਣਤਰ: ਅੱਖਰ ਰੂਪ ਤੇ ਲਿਖਣ ਦੇ ਨਿਯਮ

2) ਗੁਰਮੁਖੀ ਅੱਖਰ ਤੇ ਪੰਜਾਬੀ ਧੁਨੀਆਂ ਦਾ ਪ੍ਰਬੰਧ

ੳ) ਸਵਰ ਤੇ ਵਿਅੰਜਨ: ਵਰਗੀਕਰਨ ਦੇ ਸਿਧਾਂਤ ਤੇ ਉਚਾਰਨ

ਅ) ਲਗਾਂਮਾਤਰਾਂ ਦੀ ਪਛਾਣ ਤੇ ਵਰਤੋ

ਭਾਗ ਅ

1) ਲਿਪੀ ਦੇ ਅੱਖਰਾ ਦੀ ਵਰਤੋ ਦੇ ਨਿਯਮ

ੳ) ਪੂਰੇ ਤੇ ਅੱਧੇ ਅੱਖਰ ਦੀ ਪਛਾਣ ਤੇ ਵਰਤੋ

ਅ) ਸਵਰ ਸੂਚਕ ਅੱਖਰਾ ਦੀ ਪਛਾਣ ਤੇ ਵਰਤੋ

2) ਪੰਜਾਬੀ ਸ਼ਬਦਾਵਲੀ ਨਾਲ ਜਾਣਪਛਾਣ।

ੳ) ਹਫਤੇ ਦੇ ਦਿਨ

ਅ) ਮਹੀਨਿਆ ਦੇ ਨਾਮ

ੲ) ਰੰਗਾ ਦੇ ਨਾਮ

ਸ) ਪੰਜਾਬੀ ਰਿਸਤਾਨਾਤਾ ਪ੍ਰਬੰਧ ਸ਼ਬਦਾਵਲੀ

ਭਾਗ ੲ

1) ਸ਼ਬਦ ਪ੍ਰਬੰਧ: ਸਬਦ ਜੋੜਾ ਦੀ ਵਰਤੋ

ੳ) ਦੋ ਅੱਖਰੀ ਸ਼ਬਦਾ ਦੇ ਸ਼ਬਦਜੋੜ

ਅ) ਤਿੰਨ ਅੱਖਰੀ ਸ਼ਬਦਾ ਦੇ ਸ਼ਬਦ ਜੋੜ

2) ਸ਼ਬਦਾਂ ਦੀਆ ਸ਼੍ਰੇਣੀਆਂ ਤੇ ਵਿਆਕਰਨਕ ਵਰਗਾ ਦੀ ਪਛਾਣ

ੳ) ਸ਼ਬਦਾ ਦੀਆ ਸ਼੍ਰੇਣੀਆਂ ਦਾ ਸਿਧਾਂਤ, ਪਛਾਣ ਤੇ ਵਰਤੋ, (ਨਾਵ, ਪੜਨਾਵ, ਵਿਸ਼ੇਸਣ, ਕਿਰਿਆ ਵਿਸ਼ੇਸਣ ਆਦਿ)

ਭਾਗ ਸ

1) ਸ਼ਬਦ ਬਣਤਰਾਂ ਤੇ ਵਿਆਕਰਨਕ ਇਕਾਈਆ ਦਾ ਸਿਧਾਂਤ ਤੇ ਵਰਤੋ

ੳ) ਪੰਜਾਬੀ ਸ਼ਬਦ ਬਣਤਰਾ ਦਾ ਸਿਧਾਂਤ, ਪਛਾਣ ਤੇ ਵਰਤੋ

(ਅਗੇਤਰ, ਪਿਛੇਤਰ, ਸਮਾਸ, ਦੁਹਰੁਕਤੀ)

ਅ) ਵਿਆਕਰਨਕ ਇਕਾਈਆ ਦਾ ਸਿਧਾਂਤ, ਪਛਾਣ ਤੇ ਵਰਤੋ

(ਵਾਕੰਸ਼, ਉਪਵਾਕ ਤੇ ਵਾਕ)

ਅੰਡਰ ਗ੍ਰੈਜੂਏਟ ਪੱਧਰ ਤੇ ਪ੍ਰੋਫੈਸ਼ਨਲ ਕੋਰਸਾਂ ਲਈ ਕੁਆਲੀਫਾਇੰਗ ਪੰਜਾਬੀ
2013, 2014 ਅਤੇ 2015 ਪ੍ਰੀਖਿਆਵਾਂ ਲਈ
ਸਿਲੇਬਸ

ਕੁਲ ਸਮਾਂ:100 ਲਿਖਤੀ:60 ਅੰਕ

ਸਮਾਂ:3 ਘੰਟੇ ਮੌਖਿਕ ਪ੍ਰੀਖਿਆ:40 ਅੰਕ

ਪੀਰੀਅਡ: 3 ਪ੍ਰਤੀ ਹਫ਼ਤਾ ਪਾਸ ਅੰਕ:35%

1. ਪੰਜਾਬੀ ਦੀ ਪਾਠਪੁਸਤਕ
(ਮੁੱਖ ਸੰਪਾਦਕ: ਬਲਦੇਵ ਸਿੰਘ ਚੀਮਾ, ਪ੍ਰਕਾਸ਼ਕ ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ)

ਭਾਗ ਪਹਿਲਾ ਪੰਜਾਬੀ ਸਾਹਿਤ

(ੳ) ਕਵਿਤਾ

(ਅ) ਕਹਾਣੀ

(ੲ) ਨਾਟਕ

ਭਾਗ ਦੂਜਾ ਪੰਜਾਬ ਸਭਿਆਚਾਰ ਅਤੇ ਲੋਕਧਾਰਾ
ਭਾਗ ਤੀਜਾ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਤੇ ਗੁਰਮੁਖੀ ਲਿਪੀ

ਅੰਕ ਵੰਡ ਅਤੇ ਪੇਪਰ ਸੈਟਰ ਲਈ ਹਦਾਇਤਾਂ

ਪੁਸਤਕ ਦੇ ਤਿੰਨ ਭਾਗ ਹਨ। ਪ੍ਰੰਤੂ ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੋ ਭਾਗਾਂ ਵਿਚ ਹੋਵੇਗਾ। ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦਾ ਪਹਿਲਾ ਭਾਗ ਪੁਸਤਕ ਦੇ ਪਹਿਲੇ ਭਾਗ ਉਤੇ ਆਧਾਰਿਤ ਹੋਵੇਗਾ। ਇਸ ਭਾਗ ਦੇ ਕੁਲ 36 ਅੰਕ ਹਨ। ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦਾ ਦੂਜਾ ਭਾਗ ਪੁਸਤਕ ਦੇ ਦੂਜੇ ਅਤੇ ਤੀਜੇ ਭਾਗ ਉਤੇ ਅਧਾਰਿਤ ਹੋਿਵੇਗਾ। ਇਸ ਭਾਗ ਦੇ ਕੁਲ 24 ਅੰਕ ਹੋਣਗੇ ਅਤੇ ਇਸ ਵਿਚ ਪੁਸਤਕ ਦੇ ਦੂਜੇ ਅਤੇ ਤੀਜੇ ਭਾਗ ਦੇ 1212 ਅੰਕ ਹੋਣਗੇ।

(1) ਪੁਸਤਕ ਦੇ ਪਹਿਲੇ ਭਾਗ ਦੇ ਤਿੰਨ ਉਪਭਾਗ ੳ, ਅ ਅਤੇ ੲ ਹਨ। ਇਨ੍ਹਾਂ ਤਿੰਨਾਂ ਉਪਭਾਗਾਂ ਵਿਚੋਂ ਹੇਠ ਅਨੁਸਾਰ ਸੁਆਲ ਪੁੱਛੇ ਜਾਣ।

(ੳ) ਇਸ ਵਿਚ ਕੁਲ 12 ਪ੍ਰਸ਼ਨ ਔਬਜੈਕਟਿਵ ਟਾਈਪ/ਮਲਟੀਪਲ ਚੋਣ ਵਾਲੇ ਹੋਣਗੇ। ਹਰ ਉਪਭਾਗ ਵਿੱਚੋਂ 4 ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਸਾਰੇ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਲਾਜ਼ਮੀ ਹੋਣਗੇ। ਅੰਕ 3 X 4 = 12

(ਅ) ਹਰ ਉਪ ਭਾਗ ਵਿਚੋਂ 5--5 ਲਘੂ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ ਜਿਨ੍ਹਾਂ ਵਿਚੋਂ ਹਰ ਭਾਗ ਵਿੱਚੋਂ 3 ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਲਾਜ਼ਮੀ ਹੋਣਗੇ। ਉੱਤਰ ਪੰਜ ਲਾਈਨਾਂ ਤੋਂ ਵੱਧ ਨਾ ਹੋਵੇ। ਅੰਕ 9 X 2 = 18

(ੲ) ਹਰ ਉਪ ਭਾਗ ਵਿਚੋਂ 1 ਪ੍ਰਸ਼ਨ ਪੁਛਿਆ ਜਾਵੇਗਾ। ਇਨ੍ਹਾਂ ਵਿਚੋਂ ਕੋਈ ਇਕ ਪ੍ਰਸ਼ਨ ਹੱਲ ਕਰਨਾ ਹੋਵੇਗਾ। ਉੱਤਰ ਇਕ ਸਫੇ ਤੱਕ ਸੀਮਤ ਹੋਵੇ। ਅੰਕ = 06

(2) ਪੁਸਤਕ ਦੇ ਦੂਜੇ ਅਤੇ ਤੀਜੇ ਭਾਗ ਵਿਚੋਂ ਪ੍ਰਸ਼ਨ ਇਸ ਪ੍ਰਕਾਰ ਪੁੱਛੇ ਜਾਣਗੇ।

(ੳ) ਹਰ ਭਾਗ ਵਿਚੋਂ 4 ਪ੍ਰਸ਼ਨ ਔਬਜੈਕਟਿਵ ਟਾਈਪ/ਮਲਟੀਪਲ ਚੋਣ ਵਾਲੇ ਹੋਣਗੇ। ਸਾਰੇ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਲਾਜ਼ਮੀ ਹੋਣਗੇ।
ਅੰਕ 4+4 = 8

(ਅ) ਹਰ ਇਕ ਭਾਗ ਵਿਚ 4 ਸੰਖੇਪ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। 8 ਪ੍ਰਸ਼ਨਾਂ ਵਿੱਚੋਂ ਕੁਲ 5 ਪ੍ਰਸ਼ਨ ਹੱਲ ਕਰਨੇ ਹੋਣਗੇ। ਹਰ ਭਾਗ ਵਿਚੋਂ 2 ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹਨ। ਅੰਕ 5 X 2 = 10

(ੲ) ਹਰ ਇਕ ਭਾਗ ਵਿਚੋਂ 1 ਪ੍ਰਸ਼ਨ ਪੁਛਿਆ ਜਾਵੇਗਾ। ਇਨ੍ਹਾਂ ਵਿਚੋਂ ਕੋਈ ਇਕ ਪ੍ਰਸ਼ਨ ਹੱਲ ਕਰਨਾ ਹੋਵੇਗਾ। ਉੱਤਰ ਇਕ ਸਫ਼ੇ ਤੱਕ ਸੀਮਤ ਹੋਵੇ। ਅੰਕ = 06

ਨੋਟ: ਮੌਖਿਕ ਪ੍ਰੀਖਿਆ ਪਾਠਪੁਸਤਕ ਤੇ ਹੀ ਅਧਾਰਿਤ ਹੋਵੇਗੀ। ਇਸ ਦੀ ਵਿਧੀ ਪ੍ਰੈਕਟੀਕਲ ਵਾਲੀ ਹੋਵੇਗੀ।

B. TECH SECOND YEAR
COMPUTER SCIENCE & ENGINEERING

(Batch 2015)
Session (2015-16)

SCHEME OF PAPERS

FOURTH SEMESTER (COMPUTER SCIENCE & ENGINEERING)

S. No.	Subject Code	Subject Name	L	T	P	Cr.
1	BAS-201	Numerical Methods & Applications	3	1	0	3.5
2	CPE-206	Visual Programming using VB.NET	3	1	0	3.5
3	CPE-207	Computer Networks	3	1	0	3.5
4	CPE-208	Data Structures	3	1	0	3.5
5	HSS-201	Management Practice & Organization Behaviour	3	1	0	3.5
6		Elective I *	2	1	0	2.5
7	BAS-251	Numerical Methods & Application Lab	0	0	2	1.0
8	CPE-256	Visual Programming using VB.NET Lab	0	0	2	1.0
9	CPE-258	Data Structures using C/C++ Lab	0	0	2	1.0
10	CPE-259	Computer Networks Lab	0	0	2	1.0
11	**	Environment and Road Safety Awareness				
		Total	17	6	8	24
						Total Contact Hours = 31

Elective Subjects – I *

S. No.	Subject Code	Subject Name	L	T	P	Cr.
1	CPE-211	System Analysis & Design	2	1	0	2.5
2	CPE-212	Management Information System	2	1	0	2.5
3	CPE-213	E-Commerce	2	1	0	2.5

***Choose any one from the list**

CPE-256, CPE-258,CPE-259 and BAS-251 are practical papers only. There will not be any theory examination for these papers.

* * In addition to above mentioned subjects, there will be an additional course on Environment and Road Safety Awareness as a qualifying subject.

Department of COMPUTER ENGINEERING

Punjabi University, Patiala.

General Instructions to the Paper Setters

(Common for B.Tech. in Computer Science & Engineering, Electronics and communication Engineering, Mechanical Engineering, Civil Engineering and Integrated BTech/MBA Branches)

Applicable to 2014 Batches onward

Pattern of Question Paper

TITLE OF SUBJECT (CODE----)

Bachelor of Technology (Branch) Section: ……..

End Semester Exam

TIME ALLOWED: 3 Hour

Roll. No…….

Maximum Marks: 50

Note:- Section C is compulsory. Attempt any six questions selection three questions from each section A & B.

Section-A (From Section A of the syllabus)

Q1. .....
Q2. .....
Q3. .....
Q4. ..... 3x5
Q5……..

Section-B (From Section B of the syllabus)

Q6. .....
Q7. .....
Q8. .....
Q9. ..... 3x5
Q10…….

Section-C (From whole syllabus)

Q11
a).....
b).....
c).....
d).....
e).....
f).....
g).....
h).....
i).....
j)……. 10x2=20

Note for the paper setter:

1. Total numbers of questions to be set are Eleven (11) as per the above format.
2. There will be five questions in each of the Sections A and B. Each question will be of five (05) marks. However, a question may be segregated into subparts.
3. Section C is compulsory and contains ten (10) sub-parts each of two (2) marks.
4. The maximum limit on numerical problems to be set in the paper is 35% while minimum limit is 20%.
5. The paper setter shall provide detailed marking instructions and solutions to numerical problems for evaluation purpose in the separate white envelopes provided for solutions.
6. The paper setters should seal the internal & external envelope properly with signatures & cello tape at proper place.
7. Log tables, charts, graphs, Design data tables etc. should be specified, whenever needed.
8. Use of Scientific calculator should be clearly specified.

BAS – 201 NUMERICAL METHODS & APPLICATION

L	T	P	Cr
3	1	0	3.5

Section-A

Solution of Algebraic and Transcendental Equations: Truncation error; Round-Off error; Absolute and Relative errors; Bisection method; Iteration method: Conditions for the convergence of the Iteration method, Acceleration of convergence-Aitken's δ^2 process; Newton-Raphson method: Conditions for the convergence; Comparison of Regula Falsi method and Secant method; Rate of convergence and geometrical representation of each method; Newton-Raphson method for system of non-linear equations.

Solution of system of non-homogeneous linear equations: Matrix inversion method; Gauss Elimination method: Partial and Complete Pivoting.; Gauss Jordan Elimination method; Triangularization method; Factorization method; Jacobi's method and Gauss-Seidal's method. Solution of Tridiagonal system of equations.
Eigen values and Eigen vectors of a matrix: Eigen values of Transpose of matrix, inverse of matrix, Hermitian matrix and Similar matrices; Iterative Methods to find Eigen values and Eigen vectors: Power method and Jacobi method. Diagonalization of a matrix. **Curve fitting:** Method of Least Squares-fitting a straight line, a second degree parabola and exponential curves.

Section-B

Numerical Differentiation and Integration: Numerical Differentiation using finite differences, Numerical Integration; Newton-Cotes methods, Trapezoidal rule, Simpson's 1/3 rule, Simpson's 3/8 rule.
Numerical Solution of Differential Equations: Numerical solution of first order ordinary differential equations using Taylor's series method; Picard's method; Euler's method; Improved Euler's method; Modified Euler's method; Runge-Kutta method of Second and Fourth order; Predictor-Corrector methods: Milne's method and Adam's method. Boundary values problems for ordinary differential equation by finite difference method.

RECOMMENDED BOOKS:

1. Numerical Methods for Mathematics, Science and Engineering by Mathews, Prentice-Hall of India. Ed. Second.
2. Numerical Methods for Scientist and Engineering Computation by M. K. Jain, S. R. K. Iyengar and R. K. Jain, New Age International Publisher, Ed. Fourth.
3. Introductory Methods of Numerical Analysis by S. S. Sastry

CPE-206 VISUAL PROGRAMMING USING VB.NET

L	T	P	Cr
3	1	0	3.5

Section A

Introduction to .NET: NET Framework features & architecture, CLR, Common Type System, MSIL, Assemblies and class libraries.

Introduction to Visual studio: Project basics, types of project in . Net, IDE of VB.NET-Menu bar, Toolbar, Solution Explorer, Toolbox, Properties Window, Form Designer, Output Window, Object Browser. Event driven programming: Methods and Events.

The VB.NET Language: Variables, Declaring variables, Data Type of variables, Scope & lifetime of a variable, Constants. Control flow statements: conditional statement, loop statement. Msgbox & Inputbox. Arrays, types of array, String.

Working with Forms: Loading, showing and hiding forms, controlling One form within another.GUI Programming with Windows Form: Textbox, Label, Button, Listbox, Combobox, Checkbox, PictureBox, Radio Button, Panel, Scroll bar, Timer, List View, Tree View, Toolbar, Status Bar. Their Properties, Methods and Events.

Common Dialog Controls: OpenFile Dilog, SaveFileDialog, FontDialog, ColorDialog, Print Dialog.

MDI: SDI vs MDI,Designing menus, Adding Menus.

Section B

Procedures And Classes: Collections, Subroutines, Functions, Passing variable, Number of Argument, Optional Argument, Returning value from function, classes. Object & Classes, Namespaces, Error Handling, Debugging.

Using ADO.Net: Connection, Data Adapter, Data Sets, Data Commands, Advance Data Bound Controls, Introduction to Crystal Reports.

Building a custom window control: Adding new properties, methods and events, testing a control, enhancing existing controls.

Introduction to Database Concepts: Data independence, DBMS Architecture, components of a database system, Advantages and disadvantages of Database system, Schemas, Instances, ER Model.

Introduction to Relational Database Management System: DDL statements: Table Creation and Management: Create Alter, Drop and Rename Table, create view, DML statements: select, insert, update and delete. TCL statement: Commit, Rollback. Integrity Constraints in SQL: Primary key**,** Foreign Key, Not Null, Unique, Check, Basic SQL Query,

Note: This subject is common to all branches. Only basics of Database concepts and SQL are covered.

RECOMMENDED BOOKS:

1. Brian Siler & Jeff Spotts, “Microsoft Visual Basic.Net”
2. Matthew MacDonald, “.NET Insight for VB Developers”
3. “Mastering in VB.Net”
4. “Using Microsoft Visual Basic.NET” by Brian Siler and Jeff Spotts, Pearson Education.
5. Prateek Bhatia, Database Management system, Kalayani Publishers
6. Korth and Silberschatz Abraham, Database Concepts, McGraw Hall, 1991

CPE -207 COMPUTER NETWORKS

L	T	P	Cr
3	1	0	3.5

Section-A

Introduction, history and development of computer networks, Types of computer networks: LAN, MAN, WAN, broadcast and point to point networks, Network topologies,

Layered Architecture: concept of layers, protocols, interfaces and services, The OSI Reference Model, The TCP/IP Reference Model, Comparison of OSI and TCP/IP Models

Physical Layer: Concept of Analog & Digital Signal, Bandwidth, Transmission Impairments: Attenuation, Distortion, Noise, Data rate limits: Nyquist formula, Shannon Formula, Switching: Circuit Switching, Message Switching and Packet Switching

Guided Transmission media: Twisted Pair, Co-axial Cables, Fiber Optics, Wireless Transmission: Radio and Microwave and Infrared Transmission, Comparison of Repeaters, Hubs, Switches

Section-B

Data Link Layer: Data link layer Design Issues, Error Detection and Correction, Elementary data link protocols: An Unrestricted Simplex Protocol, A Simplex Stop and Wait Protocol, A Simplex Protocol for a Noisy Channel. Sliding window protocols: A One Bit Sliding Window Protocol, A Protocol Using go back N, A Protocol using Selective Repeat, CSMA CSMA/CD Protocols

Network layer: IP Addressing, Routing algorithms:-Shortest Path Routing, Flooding, Distance Vector Routing and Link State Routing, Introduction to Congestion, Comparison of bridges, routers and Gateways.

Transport layer: Introduction to Elements of Transport Protocols UDP, TCP, Electronic-mail, WWW, Domain Name System

Recommended Books:

1. A. S. Tannenbaum. Computer Networks, 3rd Edition, Prentice-Hall.
2. D. E. Comer. Internetworking with TCP-IP: Principles, Protocols and Architecture, Vol I, 2nd Edition, Prentice Hall, 1991.
3. D. E. Comer and D. L. Stevens. Internetworking with TCP-IP: Design, Implementation, and Internals, Vol II, Prentice Hall, 1990.

CPE -208 DATA STRUCTURES

L	T	P	Cr
3	1	0	3.5

Section-A

Basic Data Structures and Operations on them: Arrays, Stacks and Queues and Their Applications, Linked and Sequential Representation. Linked List, Representation of Linked List, Multi-Linked Structures

Trees: Definitions and Basic Concepts, Linked Tree Representation, Representations in Contiguous Storage, Binary Trees, Binary Tree Traversal, Searching, Insertion and Deletion in Binary Trees, Binary Search Tree, Heap and Heap Sort Algorithm, AVL Trees.

Section-B

Graphs and Their Application, Sequential and Linked Representation of Graph-Adjacency Matrix, Operations on Graph, Traversing a Graph, Dijkstra's Algorithm for Shortest Distance, DFS and BFS, Minimal Spanning Tree.
File Organization: Sequential, Relative, Index Sequential, B-Tree, Multi-Key, Inverted File.

Searching and Sorting, use of Various Data Structures for Searching and Sorting, Linear and Binary Search, Bubble Sort, Insertion Sort, Shell Sort, Selection Sort. Merge Sort, Radix Sort, Quick Sort.
Hashing: Introduction to hash table, hash function, resolving collision by chaining and open addressing, deleting items from a hash table.

Recommended Books:

1. Data structures: a Pseudocode Approach with-C, IInd Edition,' Cengage Learning (Thomson).
2. Fundamentals of Data Structures, CBS Publishers and Distributors, Delhi, Ellis HorwitZ and Sartaj Sahni.
3. An introduction to data structures with applications, Mc-Graw Hill Inc., J.P. Trembley and P.G, Sorensen.
4. Data Structures and Program Design in C Prentice Hall of India, 1992, Robort L. Kruse, Bruce P. Leung, Cluvis L. Tundo.
5. Data Structure using (C & C++, Sanjeev Kumar, Khanna Publishers.
6. A Simplified Approach to Data Structures, Shroff Publications,Vishal Goyal, Lalit Goyal and Pawan Kumar.

HSS-201 MANAGEMENT PRACTICE & ORGANIZATION BEHAVIOUR

L	T	P	Cr
3	1	0	3.5

Section-A

Introduction to Management: Definition, Importance and functions of Management. Theories of Management; Classical, Neo-classical and Modern. Planning: Nature of planning, planning process, types of plans, Importance and Limitations of Planning. Introduction to MBO (Management by Objectives). Social responsibility of business.

Decision Making: Importance and Process. Organization: Process of Organizing, Organizing Principles, Organization Chart, Authority and Responsibility relationship, Steps in Delegation of Authority. Communication: Process, channels, medium of communication, communication barriers. Controlling: Steps, types of control system, essentials.of effective control system.

Section-B

Organizational Behaviour: Concept, features and importance. Personality: determinants and development. Role of Values and Attitudes in individual's behaviour. The concept of motivation and its theories. Perception: Concept, Process, Errors in perceptual accuracy, Role of perception in decision making

Learning: Classical and Operant conditioning theory, Reinforcement-kinds and administration. Concept of group dynamics. Leadership theories and styles. Organizational conflict: Concept, Dimensions, conflict management techniques. Introduction to concept of power and politics in work related organization. Organization culture and effectiveness

Recommended Books:

1. Aswathappa, K and Reddy G. Sudarsana, Management and Organisation Behaviour, Himalya Publishing House.
2. Pierce John L., Gardner Donald, Gardner Donald, Management and Organisational Behavior: An Integrated Perspective, Ed.1, Cengage Learning India
3. Laurie Mullins, Management and Organisation Behaviour, 7/e, Pearson Education.
4. Stephen, P. Robbins, Seema Sanghi and Timothi A Judge, Organizational Behavior 13/e, Pearson Education.
5. Stephen P. Robbins, Mary Coulter and Neharika Vohra, Management 10/e, Pearson Education.
6. Heinz, Weihrich and Harold Koontz, Essentials of Management, Tata McGraw Hill.
7. Gene Burton and Manab Thakur, Management Today: Principles and Practice, Tata McGraw-Hill.
8. P C Tripathy, P N Reddy, Principles of Management, Tata McGraw-Hill.
9. Dr. Neeru Vashishth, Principles of Management with case studies, Taxmann Publication.
10. L.M.Prasad, Principles & Practice of Management, Sultan Chand & Sons N Delhi
11. James Stoner, R Edward Freeman and Daniel R Gilbert, Management 6/e, Pearson Education.

BAS-251 NUMERICAL METHODS AND APPLICATION LAB

L	T	P	Cr
0	0	2	1.0

List of Experiments

1. WAP to implement Regular Falsi Method.
2. WAP to implement Secant Method.
3. WAP to implement Newton-Raphson Method
4. WAP to implement Gauss-Elimination Method
5. WAP to implement Gauss-Siedal Method
6. WAP to implement Trapezoidal Rule
7. WAP to implement Simpson's Rule
8. WAP to implement Euler's Method
9. WAP to implement Runge-Kutta Method
10. WAP to implement Predictor Corrector Method
11. WAP to implement Power Method

CPE – 256 VISUAL PROGRAMMING USING VB.NET LAB

L	T	P	Cr
0	0	2	1.0

1. Write windows applications to demonstrate control structures of VB.NET.

2. Write window applications to demonstrate various controls of VB.NET.

3. Write a Windows application that functions like a Mathematical Calculator.

4. Write a windows application that functions like a Stopwatch.

5. Write a Windows application demonstrating the use of string functions.

6. Write a Windows application demonstrating the use of Arrays.

7. Write a windows application that functions like a Notepad (using Menu Editor, Common Dialog Control, Textbox's properties).

8. Write a windows application demonstrating the use of ADO

9. Write a Windows application for building a user control.

10. Write a windows application demonstrating various MDI features supported in VB.NET.

11.Creation of tables, virtual tables and views in SQL.

12.Viewing the contents of data dictionary.

13.Insert, update, delete of rows tables in SQL.

14. Manipulation (Insert, Update, Delete) on Tables.

15. Adding constraints like: primary key, not Null, Foreign key.

CPE-258 DATA STRUCUTRE USING C/C++ LAB

L	T	P	Cr
0	0	2	1.0

1. Write a program to check whether a string is palindrome or not

2. Write a program to extract substring from given string.

3. Write a program to implement stack using arrays.

4. Write a program to implement queues using arrays.

5. Write a program to create a linked list and perform following operations:
   1) Insert element at beginning.
   2) Insert element at end.
   3) Insert element at given position.
   4) Delete element from beginning
   5) Delete element at end.
   6) Delete element from given position.

6. Take a list of number and create a sorted linked list from given list

7. Implement stack using linked representation.

8. Implement queue using linked representation.

9. Write a program to sort a given list of number using following algorithm.
   1. Bubble sort
   2. Insertion sort
   3. Selection sort
   4. Quick sort
   5. Radix sort

10. Write a program to implement linear and binary search algorithm.

CPE 259 COMPUTER NETWORKS LAB

L	T	P	Cr
0	0	2	1.0

List Of Experiments

1 Identification and study of various network components such as connectors: BNC, RJ-45, I/O box Cables: Co-axial, twisted pair, UTP, Fiber Optic, NIC (network interface card) , Switch , hub and router
2 Study of different types of Network Cables and Practically implementing the cross-wired cable and straight through cable using clamping tool
3 Study of Network IP addressing scheme and its configuration
4 Draw a detailed diagram of network cabling showing connections of 15 computers in Lab
5 Study of Network configuration commands
6 Study and installation of protocols to establish a LAN
7 Installation and Configuration of Peer to peer and client Server based Networks
8 Trouble Shooting of Networks using NMS
9 Study of Computer Network fundamental using packet tracer

Hardware Requirements

1. NIC card
2. RJ-45 Connector
3. Hub
4. Clamping Tool
5. Switch
6. Twisted Pair Cable
7. Co-axial Cable

Software Requirement
Packet Tracer
Network Management Software

\

CPE-211 SYSTEM ANALYSIS AND DESIGN

L	T	P	Cr
2	1	0	2.5

Section-A

Systems Concepts and Information Systems Environment: Introduction, characteristics of a system, Elements of a system, the system development Life Cycle, Agile Software Development, Role of a System Analyst.
System Planning and Initial Investigation, Information Gathering, The Tools of structured analysis, Feasibility Study, Cost/ Benefit Analysis.

Section-B

The process and stages of system Design, Input/Output and forms design, File Organization and database design.System testing and quality assurances, Implementation and software maintenance
Project Scheduling and software, Tools of Project Scheduling, Security, Jackson Structured Development Method, Information System Development, Disaster/Recovery, and Ethics in system development, Automated Tools of System Development.

Case study of the following systems
(I) Inventory Control
(II) Railway Reservation System
(III) University Management System
(IV) Hospital management System

Reference Books :

1. System analysis and design - Elias M.Awad.
2. System analysis and design –Perry Edwards
3. Analysis and design of information systems – James A.Senn
4. System analysis and Design by Elias M. AwadGalgotia Publication Pvt. Limited.
5. Systems Analysis and Design by Alan Dennis, Barbara Haley Wixom, Roberta Rot

CPE-212 MANAGEMENT INFORMATION SYSTEMS

L	T	P	Cr
2	1	0	2.5

Objective: The objective of the course is to help students integrate their learning from functional areas, decision-making process in an organization and role of Information Systems.

Section A

Introduction: Concept, Evolution and Meaning of MIS, Need of MIS, Nature and Scope of MIS, Characteristics of MIS, MIS functions, Structure of MIS, Challenges in the development of MIS, MIS function in an organization.

Information and Managerial Effectiveness: Information as a corporate resource, pervasiveness of information, types of information: Operational, Tactical and Strategic, Role of Information in Decision Making, Quality of information, Levels of management and Information needs of Management, Robert Anthony's level of Business Activities.

Decision Making Process: Programmed and Non- Programmed decisions, Structured vs. Unstructured, Management Information System and Decision Support Systems, Models and approaches to DSS, Simon model of Decision.

Section B

Introduction to Enterprise Management technologies: Introduction to Enterprise Resource Planning (ERP) system, SCM, CRM and Ecommerce, Introduction to MS Excel.

System Development Approaches: System Development Stages, System Development Models: Waterfall, Prototyping, Iterative, Spiral Model.

System Analysis and Design: Need for System Analysis, Analysis of existing System, System Analysis of New Requirements, Requirement Determination, Process, Methods of Requirement Gathering, Structured Analysis Tools: DFD, Data Dictionary, Trees, Tables, System Design: Conceptual and Physical, Objectives and Design Methods.

Reference Books :

1. MIS: Management Perspective, D.P. Goyal, Macmillan Business Books.
2. Arora& Bhatia: Management Information Systems,Excel Books
3. O'Brien James : Management Information Systems, Tata-McGraw Hill

CPE-213 E-COMMERCE

L	T	P	Cr
2	1	0	2.5

Section A

Introduction: Definition of Electronic Commerce, E-Commerce: technology and prospects, incentives for engaging in electronic commerce, needs of E-Commerce, advantages and disadvantages, framework, Electronic commerce and Electronic Business(C2C) (2G , G2G , B2G , B2P ,B2A,P2P,B2A,C2A,B2B,B2C), Impact of E-commerce on business, E-Commerce Models.
Network Infrastructure for E- Commerce: Internet and Intranet based E-commerce- Issues, problems and prospects, Network Infrastructure, Network Access Equipments, Broadband telecommunication (ATM, ISDN, FRAME RELAY). Building own website :Reasons for building own website, Benefits of website, Cost , Time , Reach, Registering a Domain Name, Web promotion, Target email , Banner Exchange , Shopping Bots.

Section B

Mobile Commerce: Introduction to Mobile Commerce, Mobile Computing Application, Wireless Application Protocols, WAP Technology, Mobile Information Devices, Web Security. Introduction to Web security, Firewalls & Transaction Security, Client Server Network, Emerging Client Server Security Threats, firewalls & Network Security.

Electronic payment System, Introduction, Types of Electronic payment system, Payment types, Traditional payment, Value exchange system, Credit card system, Electronic funds transfer, Paperless bill, Modern payment cash, Electronic cash , online Banking. EDI Application in business, E- Commerce Law, Forms of Agreement, Govt. policies and Agenda.
Internet Marketing The PROS and CONS of online shopping, The cons of online shopping, Internet marketing techniques, The E-cycle of Internet marketing, Personalisation e – Commerce-Governance for India E- Governance of India, Indian customer EDI system, Service centre,Imports,Exports.

References:

1. Ravi Kalakota, Andrew Winston, “Frontiers of Electronic Commerce”, Addison- Wesley.
2. Pete Lohsin , John Vacca “Electronic Commerce”, New Age International
3. Goel, Ritendra “E-commerce”, New Age International
4. Laudon, “E-Commerce: Business, Technology, Society”, Pearson Education
5. Bajaj and Nag, “E-Commerce the cutting edge of Business”, TMH
6. Turban, “Electronic Commerce 2004: A Managerial Perspective”, Pearson Education

ENVIRONMENT & ROAD SAFETY AWARENESS

Time Allotted: 3 hours Total Marks : 100
Total Lectures: 50 Pass Marks : 35
Written Paper : 75 Marks
Field Work : 25 Marks

Instructions

The written paper will have two parts. First part will be of 25 marks it will contain 10 questions, the students will attempt 5 questions of five marks out of this part. The answer to these questions should non-exceed 50 words each.

Part second will be of 50 marks and will contain 10 essay type questions. The candidates will attempt 5 questions out of this part and the answer to each question should not exceed 500 words. Each question will carry ten marks**.**

Unit 1: The Multidisciplinary nature of environmental studies

Definition, scope and importance, Need for public awareness (2 Lectures).

Unit 2 Natural Resources :

Renewable and non renewable resources:

Natural resources and associated problems.

a) Forest resources: Use and over - exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people, b) Water resources: Use and over utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems, c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, ease studies, d) Food Resources : World Food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging; salinity, case studies, e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, Case studies, F) Land resources: Land as a resource, land degradation, man included landslides, soil erosion and desertification.

Role of an individual in conservation of natural resources; Equitable use of resources for sustainable lifestyles.

Unit 3: Ecosystems

Concept of an ecosystem, Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem, Ecological succession, Food chains, food webs and ecological pyramids, Introduction, types, characteristic features, structure and functions of the following ecosystem:-Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) (6 lectures)

Unit 4: Biodiversity and its conservation

introduction - - Definition: species and ecosystem diversity, Biogeographically classification of India, Value of biodiversity: consumptives use, productive, social, ethical, aesthetic and option values, Biodiversity at global, National and local levels, India as a mega-diversity nation, Hot spots of biodiversity, Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, Endangered and endemic species of India, Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity. (8 Lectures)

Unit 5: Environmental Pollution

Definition : Causes, effects and control measures of:-Air Pollution, Water Pollution, Soil Pollution, Marine Pollution, Noise Pollution, Thermal Pollution, Nuclear Hazards, Solid waste Management Causes, effects and control meausers of urban and industrial wastes., Role of and individual in prevention of pollution, Pollution case studies, Disaster management : floods, earthquake, cyclone and landslides. (8 Lectures)

Unit 6: Social Issues and the Environment

From Unsustainable to Sustainable development, Urban problems related to energy, Water conservation, rain water harvesting, watershed management, Resettlement and rehabilitation of people; its problems and concerns Case studies, Environmental ethics: Issues and possible solutions - Climate change, global warning, acid rain, ozone layer depletion, nuclear accidents and holocaust, Case studies Wasteland reclamation, Consumerism and waste products., Consumerism and waste products, Environment Protection Act, Air (Prevention and Control of Pollution) Act, Water (Prevention and control of pollution) Act, Wildlife Protection Act, Forest Conservation Act, Issues involved in enforcement of environmental legislation, Public awareness.

(7 Lectures)

Unit 7: Human Population and the Environment

Population growth, variation among nations, Population explosion - Family Welfare Programme, Environment and human health, Human Rights, Value Education, HIV/ AIDS, Women and Child

Welfare, Role of Information Technology in Environment and human health, Case Studies (6 Lectures)

Unit 8: Field Work

Visit to a local area to document environmental areas, river/ forest/ grassland/ hill/ mountain, Visit to a local polluted site - Urban/ Rural/ Industrial/ Agriculture, Study of common plants, insects, birds, Study of simple ecosystems-pond, river, hill slopes, etc. (Field work Equal to 5 Lecture hours)

B. TECH THIRD YEAR
COMPUTER SCIENCE & ENGINEERING

(Batch 2015)
Session (2017-18)

SCHEME OF PAPERS

FIFTH SEMESTER (COMPUTER SCIENCE & ENGINEERING)

S. No.	Subject Code	Subject Name	L	T	P	Cr.
1	CPE-301	System Programming	3	1	0	3.5
2	**CPE-302**	**Database Management System**	3	1	0	3.5
3	CPE-303	Algorithm Analysis & Design	3	1	0	3.5
4	CPE-304	Theory of Computation	3	1	0	3.5
5	CPE-305	Microprocessor & Assembly Language Prog.	3	1	0	3.5
6	CPE-306	Software Engineering	3	1	0	3.5
7	CPE-352	Database Management System Lab	0	0	2	1.0
8	CPE-353	Algorithm Analysis & Design Lab	0	0	2	1.0
9	CPE-355	Microprocessor & Assembly Language Prog. Lab	0	0	2	1.0
10	STG-351	Summer Training **	-	-	-	6.0
		***Open Elective				
Total			18	6	6	30
Total Contact Hours = 30						

CPE-352, CPE-353 and CPE-355 are practical papers only. There will not be any theory examination for these papers.

** Summer Training will be of 4 to 6 weeks duration in Industry / In House.
***Open Elective

3. MICRO ECONOMIC ANALYSIS (M.A. BUSINESS ECONOMICS)
4. QUANTITATIVE TECHNIQUES (M.A. BUSINESS ECONOMICS)
5. THEORY AND PRACTICE OF WAR – I (M.A. DEFENCE & STRATEGIC STUDIES)
6. PROFESSIONAL PHOTOGRAPHY (B. TECH TV, FILM PRODUCTION AND MEDIA TECHNOLOGY)
7. EARLY HISTORY OF BUDDHISM (M.A. BUDDHIST STUDIES)
8. ORIGIN & DEVELOPMENT OF SIKHISM (M.A. BUDDHIST STUDIES)
9. PHILOSOPHICAL FOUNDATIONS OF EDUCATION (M.A. EDUCATION)
10. ENGLISH PHONETICS AND PHONOLOGY (M.A. ENGLISH)
11. ART AND CULTURAL HISTORY OF INDIA (M.A. FINE ARTS)
12. GROWTH & DEVELOPMENT OF PRINT MEDIA (M.A JOURNALISM AND MASS COMMUNICATION)
13. GURU NANAK DEV : METAPHYSICS & EPISTEMOLOGY (M.A. PHILOSOPHY)
14. INDIVIDUAL AND SOCIETY (M. A. SOCIAL WORK)
15. HUMAN GROWTH AND DEVELOPMENT (M. A. SOCIAL WORK)
16. WOMEN'S MOVEMENT IN INDIA (M.A. WOMEN'S STUDIES)
17. POSITIONAL ASTRONOMY (M.SC. ASTRONOMY & SPACE PHYSICS)

***Note regarding OPEN ELECTIVE:**

(iii) It is an over and above the basic requirements for B. Tech. CE degree
(iv) In addition to above open elective subjects, student can opt any other subject offered by university departments with the consent of ACD of CE department.

Department of Computer Engineering
Punjabi University, Patiala.
General Instructions to the Paper Setters
(Common for B.Tech. in Computer Engineering, Electronics and communication Engineering, Mechanical Engineering, Civil Engineering and Integrated BTech/MBA Branches)

Applicable to 2014 Batches onward

The B. Tech question paper structure will be as shown below:

Pattern of Question Paper

TITLE OF SUBJECT (CODE----)
Bachelor of Technology (Branch) Section: ……..
End Semester Exam

TIME ALLOWED: 3 Hour

Roll. No…….

Maximum Marks: 50

Note:- Section C is compulsory. Attempt any six questions by selecting three questions from each section A & B.

Section-A (From Section A of the syllabus)

Q1. .....
Q2. .....
Q3. .....
Q4. ..... 3x5
Q5……..

Section-B (From Section B of the syllabus)

Q6. .....
Q7. .....
Q8. .....
Q9. ..... 3x5
Q10…….

Section-C (From whole syllabus)

Q11
a).....
b).....
c).....
d).....
e).....
f).....
g).....
h).....
i).....
j)……. 10x2=20

Note for the paper setter:

1. Total numbers of questions to be set are Eleven (11) as per the above format.
2. There will be five questions in each of the Sections A and B. Each question will be of five (05) marks. However, a question may be segregated into subparts.
3. Section C is compulsory and contains ten (10) sub-parts each of two (2) marks.
4. The maximum limit on numerical problems to be set in the paper is 35% while minimum limit is 20%.
5. The paper setter shall provide detailed marking instructions and solutions to numerical problems for evaluation purpose in the separate white envelopes provided for solutions.
6. The paper setters should seal the internal & external envelope properly with signatures & cello tape at proper place.
7. Log tables, charts, graphs, Design data tables etc. should be specified, whenever needed.
8. Use of Scientific calculator should be clearly specified.

CPE-301 SYSTEM PROGRAMMING

L	T	P	Cr
3	1	0	3.5

Section-A

Introduction to systems software: Definition, features of system Programming, System Programming vs. Application Programming, type of system programs.
Machine Language: Basic concepts of machine structure of IBM-360, features of machine language of IBM-360. Assembly Language of IBM-360: Assembly language program structure, Example using Literals.
Assembler: Single pass assembler, two pass assembler and design procedure of an assembler.
Macro processor: Macro language and its features, macro instructions, features of macro facility, implementation, one pass macro pre-processor, two pass macro pre-processor.

Section - B

Compliers: Overview of compilation process, lexical analysis, syntax analysis, semantic analysis and intermediate code generation and code optimization techniques, complier vs. interpreter.
Linkers and loaders: Loader Scheme, Compile and Go Loader, Absolute Loader, Subroutine Linkage, Relocating Loaders, Direct Linking Loader.::
Operating system: Basic concepts of an operating system, memory management, processor management.

Recommended Books:

1. John.J.Donovan. "System Programming." McGraw-Hill, 1 99 1.
2. Ann. A.V.. Ullman Sethi R.,1.1).: Compilers: Principles, Techniques and Tools. Addison-Wesley Publishing Co., 1999.
3. D.M.Dhumdliere, "Systems Programming and Operating System" Tata MeGraw Hill. 2002.

CPE-302 DATABASE MANAGEMENT SYSTEM

L	T	P	Cr
3	1	0	3.5

Section-A

Introduction to Database Concepts: Difference between Database and non database system, Data independence, DBMS Architecture, components of a database system, Advantages and disadvantages of Database system, Intended Uses of a DBMS, Schemas, and Instances, Database Languages and Interfaces, Classification of Database Management Systems.

Data Models: Relational Model, Network Model, Hierarchical Model, ER Model: Design, issues, Mapping constraints, keys, ER diagram, weak entity sets, extended ER features, Design of an ER Database schema, Reduction of an ER Schema to tables, Comparison of Models.

Query Processing: in Relation Algebra: Fundamental and Additional Relational Algebra operators. Relational Calculus: Tuple and Domain Relational Calculus.

Relational Query Languages: SQL: Basic SQL Select Statements. Table Creation and Management: Create, Alter, Drop and Rename. Constraints: Primary key, Foreign key, Unique, Not null and Check. Data Manipulation: Insert, Update and Delete. Restricting rows in Select using Where clause, Comparison operators, Logical Operators, Order by clause.

Section-B

Database Design: Integrity Constraints: Domain constraints, Referential integrity, entity integrity, specify these constraints in SQL, specification of Additional Constraints as assertions and triggers.

Functional dependencies: Functional dependencies, Decomposition, Normalization using FD's MVD's and JD's Domain key normal form.

Query Optimization: Translating SQL Queries into Relational Algebra, Notation for Query Trees and Query Graphs, Heuristic Optimization of Query Trees, Transformation Rules for Relational Algebra Operations, Heuristic Algebraic Optimization Algorithm, Converting Query Trees into Query Execution Plans. Cost Components in Query Optimization, Using cost estimates in query optimization.

Joining Data from Multiple Tables: Equi, Non-Equal, Self and Outer Joins. Single-row and Group functions. Sub-queries. Introduction to Oracle Server and Data Dictionary. Additional Database Object: Sequences, Synonyms and Views.

Recommended Books:

1. Navathe and Elmasri, Fundamentals of Database Systems, Pearson education
2. Korth and Silberschatz Abraham, Database Concepts, McGraw Hall, 1991.
3. An introduction to database system by C.J.Date (Addison Welsey, Publishing house).
4. Bipin Desai, Database System, TMG
5. Prateek Bhatia, Database Management system, Kalayani Publishers

CPE-303 ALGORITHM ANALYSIS & DESIGN

L	T	P	Cr
3	1	0	3.5

Section A

Introduction: Algorithm, analyzing algorithms, internal and external sorting, sets, graphs, stacks, queues, trees, heaps, graphs, hashing.

Divide and Conquer: General method, binary search, Min-max problem, Merge sort, Quick sort, Strassen's matrix multiplication.

Greedy Method: General Method, Job sequencing with deadlines, Knapsack problem, minimum spanning trees, single source shortest paths.

Section B

Dynamic Programming: General Method multistage graphs, Optimal Binary search tree, All pairs shortest path, traveling salesman problem.

Backtracking: 8 queens problem, sum of subsets, graph coloring, knapsack problem.

Branch & Bound Method, 0/1 Knapsack problem, Traveling salesman problem.

Lower Bound Theory: Lower bound technique, Comparison trees for sorting and searching, some lower bound on parallel computation.

Problem classes: P, NP, NP-hard & NP-complete, deterministic and non-deterministic polynomial time algorithm.

Recommended Books:

1. Fundamentals of Computer Algorithm, Latest edition, By Horowitz Sahni, Galgotia Publication.
2. Algorithms, Latest Edition, By knuth.
3. Design & Analysis of Algorithm, Latest Edition, By Goodman, McGraw hill Publication.

CPE-304 THEORY OF COMPUTATION

L	T	P	Cr
3	1	0	3.5

Section-A

Sets, Relations and Languages: Sets, Relations and functions, finite and infinite sets, Closures and algorithms, alphabets and languages
Finite Automata: Deterministic Finite Automata (DFA), Non Deterministic Finite Automata (NDFA), Moore and Mealy Machine, Application of finite automata, Conversion of NDFA to DFA, Mealy to Moore and Moore to Mealy

Grammar: Definition of Grammars, Derivation & Language generated by Grammars, Chomsky Classification of Languages
Regular Expression and Languages: Regular expression, finite Automata and Regular expression, Properties of Regular Languages, Pumping lemma for regular languages, application of pumping lemma, Closure properties of regular languages, Minimization of finite Automata.

Section-B

Context free Grammar and Languages: Context free grammar: Parse Trees, Ambiguity in Grammar and Languages, Construction of Reduced Grammars
Properties of Context free languages – Normal forms for context free grammars, Chomsky Normal Form (CNF), Greibach Normal Form (GNF)

Pushdown Automata: Pushdown Automata: Deterministic Push down Automata, Equivalence of Push Down automata and Context free Grammar.
Turing Machines: Definition of Turing Machine, Application of Turing Machine in language accepting and computing.
Cellular Automata: Formal Language aspects, Algebraic Properties Universality & Complexity Variants.

Recommended Books:

1. K.L.P. Mishra, N. Chandrasekaran, “Theory of Computer Science, Automata, Languages and Computation”, PHI
2. J.E .Hopcroft, R. Motwani and J.D. Ullmn, “Introduction to Automata Theory, Language and Computation”, Pearson Education Asia, 2nd Edition.
3. B.M. Moret, “The Theory of Computation”, Pearson Education Asia.
4. H.R. Lewis and C.H. Papa dimitriou, “Elements of the theory of Computation”, Pearson Education Asia, 2nd Edition.

CPE-305 MICROPROCESSOR & ASSEMBLY LANGUAGE PROGRAMMING

L	T	P	Cr
3	1	0	3.5

Section-A

Introduction of Microprocessor: CPU, I/O devices, clock, memory, bus architecture, tri-state logic, address bus, data bus & control bus and their operations.

Semiconductor Memories: Development of semiconductor memory, internal structure and decoding, Read and Write timing diagrams, MROM, ROM, EPROM, EEPROM, DRAM.

Architecture of 8-bit Microprocessor: Intel 8085Amicroprocessor, Pin description and internal architecture.

Operation and Control of Microprocessor: Timing and control unit, op-code fetch machine cycle, memory read/write machine cycles, I/O read/write machine cycles, state transition diagram.

Instruction Set: Instruction format, Addressing modes; Data transfer, arithmetic, logical, branch, stack and machine control groups of instruction set.

Section-B

Assembly Language Programming: Assembler directives, simple examples; Subroutines, parameter passing to subroutines. Data transfer operations, 16-bit arithmetic instructions, 16-bit address operations.

Interfacing: Interfacing of memory chips, address allocation technique and decoding; Interfacing of I/O devices, LEDs and toggle-switches as examples , memory mapped and isolated I/O structure;

I/O techniques: CPU initiated unconditional and conditional I/O transfer, device initiated interrupt I/O transfer.

Code Conversions: BCD to binary to ASCII and vice-versa, BCD addition and subtraction, BCD to 7-segment LED code conversion.

Programmable Peripheral Interface: Intel 8255 A, pin configuration, internal structure of a port bit, modes of operation, bit SET/RESET feature, programming; ADC and DAC chips and their interfacing.

Interrupts: Interrupt structure of 8085A microprocessor, processing of vectored and non-vectored interrupts, latency time and response time; Handling multiple interrupts

Programmable Interval Timer: Intel 8253, pin configuration, internal block diagram of counter and modes of operation, counter read methods ,programming. 8257 DMA controller and 8259 interrupt controller. Serial I/O operations.

Recommended Books:

1. Hall, D. V., “Microprocessor and Interfacing-Programming and Hardware”, 2nd Ed., Tata McGraw-Hill Publishing Company Limited, 2008.
2. Gaonkar R. S., “Microprocessor Architecture, Programming and Applications”, 5th Ed., Penram International, 2007.
3. Stewart J, “Microprocessor Systems- Hardware, Software and Programming”, Prentice Hall International Edition,1990.
4. Short K. L., “Microprocessors and Programmed Logic”, 2nd Ed., Pearson Education, 2008.
5. B.Ram, Introduction to Microprocessors and Assembly Language.

CPE-306 SOFTWARE ENGINEERING

L	T	P	Cr
3	1	0	3.5

Section-A

Introduction to Software Engineering: Software Problem, Software Engineering, Approach, Software process, Characteristics of Software Engineering Process, software Development models.
Software Requirement Analysis and Specification: Software Requirement Specification, Problem Analysis, Requirement Specifications.
Software Project Planning: Cost estimation, cost estimation models, Project scheduling, Software Configuration management, Team Structure, Risk Management.

Section-B

Function oriented design: Design principles, Coupling Cohesion, Structured Design Methodologies
Object Oriented Design: OOAD, Classes and objects, inheritance and polymorphism, design notation and specification
Brief introduction to various standards related to Software Engineering
Coding: Top Down, bottom up approaches, structured programming, information hiding programming style, documentation,
Testing: Testing Fundamentals, White box testing, Black box testing, Functional testing, boundary value testing, cause effect, graphing.

Recommended Books:

1. Software Engineering Approach, By R. S Pressman
2. Software Engineering, SOMMERVILLE Pearson Education
3. An Integrated Approach to software Engineering. PANKAJ JALOTE

CPE-352 DATABASE MANAGEMENT SYSTEM LAB

L	T	P	Cr
0	0	2	1.0

OBJECTIVE:-

The students are required to do exercises / projects in database design like:

1. Creation of tables, virtual tables and views in SQL,
2. Viewing the contents of data dictionary
3. Changing of schema
4. Insert, update, delete of rows tables in SQL
5. Specification of various constraints in SQL: Integrity Constraints: Domain constraints, Referential integrity, entity integrity etc
6. Specification of Additional Constraints as assertions and triggers
7. Query processing in SQL

CPE 353 ALGORITHM ANALYSIS & DESIGN LAB

L	T	P	Cr
0	0	2	1.0

List of Experiments

1. Write a program to sort ‘n’ numbers using merge sort. Mention the numbers of comparisons made by the program.
2. Write a program to sort ‘n’ numbers using quick sort. Mention the numbers of comparisons made by the program.
3. Write a program for stressor's matrix multiplication.
4. Write a program for knapsack problem.
5. Write a program for minimum spanning trees.
6. Write a program for single source shortest paths.
7. Write a program of traveling salesman problem.
8. Write a program for all pairs shortest paths

CPE-355 MICROPROCESSOR & ASSEMBLY LANGUAGE PROGRAMMING LAB

L	T	P	Cr
0	0	2	1.0

LIST OF PRACTICAL

1. Introduction to 8085 kit.
2. Writing a few assembly language utility programs for logical, arithmetic, shift operations, code conversion and delay routines.
3. Writing assembly language programs for interfacing of following chips with 8085:
   a. Programmable peripheral interface, 8255
   b. Programmable interval timer, 8253
   c. Programmable keyboard/display interface, 8279
   d. DMA Controller, 8257
   e. Programmable Interrupt Controller, 8259
4. Interfacing of analog to digital converters with 8085
5. Interfacing of digital to analog converters with 8085

B. TECH THIRD YEAR
COMPUTER SCIENCE & ENGINEERING

(Batch 2015)
Session (2017-18)

SCHEME OF PAPERS

SIXTH SEMESTER (COMPUTER SCIENCE & ENGINEERING)

S. No.	Subject Code	Subject Name	L	T	P	Cr.
1	CPE-307	**RDBMS Using PL/SQL**	3	1	0	3.5
2	CPE-309	Compiler Design	3	1	0	3.5
3	CPE-315	**Network Security**	3	1	0	3.5
4	CPE-319	**Java Programming**	3	1	0	3.5
5	CPE-357	**RDBMS Using PL/SQL Lab**	0	0	2	1.0
6	CPE-361	**Network Security Lab**	0	0	2	1.0
7	CPE-362	**Java Programming Lab**	0	0	2	1.0
8		Elective-II *	3	1	0	3.5
9		Elective-III **	3	1	0	3.5
Total			18	6	6	24
Total Contact Hours = 30						

ELECTIVE – II FOR SIXTH SEMESTER (COMPUTER SCIENCE & ENGINEERING)*

S. No.	Subject Code	Subject Name	L	T	P	Cr.
1	CPE-311	Parallel Computing	3	1	0	3.5
2	CPE-312	Multimedia Systems	3	1	0	3.5
3	CPE-313	Software Project Management	3	1	0	3.5
4	CPE-314	Distributed Computing	3	1	0	3.5
5	MBA-5011	Foundation of Financial Accounting	3	1	0	3.5

***CHOOSE ANY ONE FROM THE LIST**

ELECTIVE – III FOR SIXTH SEMESTER (COMPUTER SCIENCE & ENGINEERING)**

S. No.	Subject Code	Subject Name	L	T	P	Cr.
1	CPE-316	ATM Networks	3	1	0	3.5
2	CPE-317	Grid Computing	3	1	0	3.5
3	CPE-318	Business Intelligence	3	1	0	3.5
4	CPE-320	Cloud Computing	3	1	0	3.5
5	MBA-5012	Foundations of Managerial Accounting	3	1	0	3.5

****CHOOSE ANY ONE FROM THE LIST**

CPE-357, CPE-361 and CPE-362 are practical papers only. There will not be any theory examination for these papers.

Department of Computer Engineering
Punjabi University, Patiala.
General Instructions to the Paper Setters
(Common for B.Tech. in COMPUTER SCIENCE & ENGINEERING, Electronics and communication Engineering, Mechanical Engineering, Civil Engineering and Integrated BTech/MBA Branches)

Applicable to 2014 Batches onward

Pattern of Question Paper
TITLE OF SUBJECT (CODE----)
Bachelor of Technology (Branch) Section: ……..
End Semester Exam
TIME ALLOWED: 3 Hour
Roll. No…….
Maximum Marks: 50

Note:- Section C is compulsory. Attempt any six questions selection three questions from each section A & B.

Section-A (From Section A of the syllabus)
Q1. .....
Q2. .....
Q3. .....
Q4. ..... 3x5
Q5……..

Section-B (From Section B of the syllabus)
Q6. .....
Q7. .....
Q8. .....
Q9. ..... 3x5
Q10…….

Section-C (From whole syllabus)
Q11
a).....
b).....
c).....
d).....
e).....
f).....
g).....
h).....
i).....
j)……. 10x2=20

Note for the paper setter:
1. Total numbers of questions to be set are Eleven (11) as per the above format.
2. There will be five questions in each of the Sections A and B. Each question will be of five (05) marks. However, a question may be segregated into subparts.
3. Section C is compulsory and contains ten (10) sub-parts each of two (2) marks.
4. The maximum limit on numerical problems to be set in the paper is 35% while minimum limit is 20%.
5. The paper setter shall provide detailed marking instructions and solutions to numerical problems for evaluation purpose in the separate white envelopes provided for solutions.
6. The paper setters should seal the internal & external envelope properly with signatures & cello tape at proper place.
7. Log tables, charts, graphs, Design data tables etc. should be specified, whenever needed.
8. Use of Scientific calculator should be clearly specified.

CPE-307 RDBMS USING PL/SQL

L	T	P	Cr
3	1	0	3.5

Section A

Introduction of DBMS:
DBMS architecture, Enhanced-ER (EER) Model Concepts: Specialization and Generalization, Union type, Constraints on Specialization and Generalization, Concept of Hierarchy and Lattice, EER-to-Relational Mapping.

Distributed Databases and Client-Server Architecture: Introduction to Distributed DBMS Concepts, Client-Server Architecture Overview, Data Fragmentation, Replication, and Allocation Techniques for Distributed Database Design, Types of Distributed Database Systems.

PL/SQL: Block Structure, Data Types, Creation of Variable, Scope, Nested Blocks, Control Structures. Records and Collections. Using SQL with PL/SQL: Cursors and its types. Subprograms: Stored and Local Procedures and Functions, Procedure vs Function.

Section B

Database Security: Types of Security, Control Measures, DB security and DBA, Access protection, Discretionary Access Control based on Granting and Revoking privileges. User Creation and Management in SQL: Creating a user, Assigning and Removing User Privileges, Creating and Assigning Roles.

Transaction processing: Introduction, Concurrency, Problems due to concurrency, ACID Properties, Schedule, Serializability. Serial, Non-serial and Conflict-Serializable Schedule

Concurrency control: Locks, Types of Locks: Binary and Two Phase Locking, Variations of Two Phase Locking. Deadlock: Deadlock Prevention Techniques, Deadlock Detection and Recovery. Database Recovery Concepts.

Packages: Specification and Body, Triggers and its types. Introduction to Objects: Creating, Storing and Manipulating Objects.

Recommended Books :

1. Navathe and Elmasri, Fundamentals of Database Systems, Pearson education
2. Korth and Silberschatz Abraham, Database Concepts, McGraw Hall, 1991.
3. An introduction to database system by C.J.Date (Addison Welsey, Publishing house) Latest edition.
4. Bipin Desai, Database System, TMG
5. Prateek Bhatia, Database Management system, Kalyani Publishers

CPE-309 COMPILER DESIGN

L	T	P	Cr
3	1	0	3

Section A

Introduction To Compiling:
Compilers – Analysis of the source program – Phases of a compiler – Cousins of the Compiler – Grouping of Phases – Compiler construction tools – Lexical Analysis – Role of Lexical Analyzer – Input Buffering – Specification of Tokens. Cross compiler .Introduction to LEX

Syntax Analysis And Semantic Analysis: Role of the parser –Writing Grammars –Context-Free Grammars – Role of Parser and Parse Tree, Top Down parsing – Recursive Descent Parsing – Predictive Parsing – Bottom-up parsing –Handle, Handle Pruning, Shift Reduce Parsing – Operator Precedent Parsing – LR Parsers – SLR Parser – Canonical LR Parser – LALR Parser. Error .Recovery Techniques for different Parsers. Introduction to YACC.
Symbol tables and their data structures. Synthesized and inherited attributes, Construction of syntax trees.

Section B

Intermediate Code Generation: Intermediate languages – Graphical representation, Three-address code, Implementation of three address statements (Quadruples, Triples, Indirect triples).Short Circuit Code , Back patching .

Code Generation: Issues in the design of code generator – The target machine – Runtime Storage management — Issues in efficient code generation , instruction costs, register utilization and evaluation order. Basic Blocks and Flow Graphs – Next-use Information A simple Code generator – DAG representation of Basic Blocks – Peephole Optimization.
Code Optimization And Run Time Environments: Introduction– Principal Sources of Optimization – Optimization of basic Blocks ,Loop Optimization– Introduction to Global Data Flow Analysis – Runtime Environments – Source Language issues – Storage Organization – Storage Allocation strategies – Access to non-local name Parameter Passing.

Recommended Books :

1. Alfred Aho, Ravi Sethi, Jeffrey D Ullman, “Compilers Principles, Techniques and Tools Pearson Education Asia, 2003.
2. Allen I. Holub “Compiler Design in C”, Prentice Hall of India, 2003.
3. C. N. Fischer and R. J. LeBlanc, “Crafting a compiler with C”, Benjamin Cummings, 2003.
4. J.P. Bennet, “Introduction to Compiler Techniques”, Second Edition, Tata McGraw-Hill, 2003.
5. Henk Alblas and Albert Nymeyer, “Practice and Principles of Compiler Building with C”, PHI, 2001.
6. Kenneth C. Louden, “Compiler Construction: Principles and Practice”, Thompson Learning, 2003

CPE – 315 NETWORK SECURITY

L	T	P	Cr
3	1	0	3.5

Section A

Basic Encryption And Decryption: Attackers and Types of threats, challenges for information security, Encryption Techniques, Classical Cryptographic Algorithms: Monoalphabetic Substitutions such as the Caesar Cipher, Cryptanalysis of Monoalphabetic ciphers, Polyalphabetic Ciphers such as Vigenere, Vernam Cipher, Stream and Block Ciphers.
Secret Key Systems: The Data encryption Standard (DES), Analyzing and Strengthening of DES, Introduction to Advance Encryption Standard (AES)
Public Key Encryption Systems: Concept and Characteristics of Public Key Encryption system, Introduction to Merkle-Hellman Knapsacks, Rivets – Shamir-Adlman (RSA) Encryption.

Section B

Hash Algorithms: Hash Algorithms, Message Digest Algorithms such as MD4 and MD5, Secure Hash Algorithms such as SH1 and SHA2.
Network Security: Network Security Issues such as Impersonation, Message Confidentiality, Message Integrity, Code Integrity, Denial of Service, Firewalls, DMZs, Virtual Private Networks, Network Monitoring and Diagnostic Devices.
Web Security: Web Servers, Secure Electronic Mail, Enhanced Email, Pretty Good Privacy, Public Key Cryptography Standards
Ethical Hacking: Introduction to Ethical Hacking, Terminology, Hackers, Crackers, and Other Related Terms, Hactivism, Threats, Hacking History ,Ethical Hacking Objectives and Motivations.
.

Recommended Books:

1. Principles of Cryptography, William Stallings, Pearson Education
2. “Security in Computing (Second Edition)’, Charles P.Pfleeger, 1996, Prentice Hall International, Inc.
3. Cryptography & Network Security, Atul Kahate, TMH

CPE 319 JAVA PROGRAMMING

L	T	P	CR
3	1	0	3.5

Section A

Introduction to Java : Features of Java, difference between Java and C++, JVM, Bytecode, data types, Wrapper types, variables, arrays, operators-arithmetic, bit-wise, relational, Boolean, various control statements.

Introduction to Classes: Class fundamentals, declaring objects, methods, constructors, garbage collection, passing parameters to methods, recursion.

Inheritance: types of inheritance, Access Modifiers (Private, Public, Protected, Default), Polymorphism (Overloading, Overriding, Super & This Keyword), Final Variable, Final Classes & Methods, Static variable Static method, Abstract methods and classes , Packages and interfaces, importing packages.

Exception Handling: Exception types, try, catch, finally, throw and throws, creating exception subclasses.

Section B

Multithreading: Multithread programming, thread priorities, synchronisation, interthread communication, Thread class methods, runnable interface,

I/O: Input/Output, streams, reading and writing console input/output, reading and writing files,

Applets and Graphics: Applet fundamentals; Applet class; Applet initialization and termination; event handling; keyboard and mouse events; AWT class; Layout managers; panels; canvases; Frame windows; drawing lines, rectangles, ellipses.

JDBC programming: Commonly used classes and interfaces of java.sql package, connecting java application to a database, prepared statements.

Advance Concepts: Introduction to Java Beans, Java Swings, Java Server Pages.

Recommended Books :

1.Dietel and Dietal, Java: How to Program, 6th Edition, Pearson Education
2.Herbert Schildt The Complete Reference Java2, TMH
3.James Edward Keogh, Jim Keogh J2EE: The complete Reference, McGraw-Hill

CPE-357 RDBMS USING PL/SQLLAB

L	T	P	Cr
0	0	2	1.0

OBJECTIVE

1. The students are required to do exercises / projects in database design
2. Implementation of SQL queries DDL, DML, DCL
3. Implementation of PL/SQL
    a. Block Structure, Variables
    b. Control Structure
    c. Cursors
    d. Procedures
    e. Functions
    f. Packages
    g. Triggers

CPE-361 NETWORK SECURITY LAB

L	T	P	Cr
0	0	2	1.0

List of Experiment

1. Implementation of DES algorithm in C.
2. Implementation of triple DES algorithm in C.
3. Implementation of Deffie Hellman algorithm in C.
4. Implementation of Blow fish algorithm in C.
5. Implementation of concepts of Ethical Hacking.
6. Foot printing.
7. Concept of WHOIS SERVER
8. Study of IT act.
9. Port Scanner: nmap software.
10. Case Study of social networking with respect to security.

CPE-362 JAVA PROGRAMMING LAB

L	T	P	Cr
0	0	2	1.0

List of Experiments

1. WAP to implement constructors and overloading.
2. WAP to implement recursion, functions and arrays.
3. WAP to implement Inheritance, interfaces and packages.
4. WAP which will explain the concept of try, catch and throw.
5. WAP to demonstrate threads and animations.
6. WAP to explain I/O streams and files and socket programming.
7. WAP to implements Applets and use of it on internet.
8. WAP to describe AWT Class, Frames, Panels and Drawing.
9. WAP to demonstrate JDBC and build an application.
10. WAP to implements use of JSP.

CPE - 311 PARALLEL COMPUTING

L	T	P	Cr
3	1	0	3.5

Section-A

Overview of Parallel Processing and Pipelining Processing. Necessity of high performance, Constraints of conventional architecture, Parallelism in uniprocessor system, Evolution of parallel processors, future trends, Architectural Classification, Applications of parallel processing, Classification of Computers on the basis of instructions, memory access and grain size.
Instruction level Parallelism and Thread Level Parallelism, Explicitly Parallel Instruction Computing (EPIC) Architecture. Principles of scalable performance: Performance Metrics and Measures, Speedup Performance Laws PRAM algorithms of suffix summation, parallel reduction tree and list ranking.

Section-B

Vector and Array Processor: Basic vector architecture, Issues in Vector Processing, Vector performance modeling, vectorizers and optimizers. SIMD Computer Organization Masking and Data network mechanism, Inter PE Communication, Interconnection networks of SIMD, Static V s Dynamic network, cube hyper cube and Mesh Interconnection network. Parallel Algorithms for Array Processors

Multiprocessor Architecture: Loosely and Tightly coupled multiprocessors, Processor characteristics of multiprocessors, Inter Processor communication network, Time shared bus, Crossbar switch, Multiport Memory Model, Memory contention and arbitration techniques, Cache coherency and bus snooping, Massively Parallel Processors (MPP), COW's and NOW's Cluster and Network of Work Stations, Chip Multiprocessing (CMP), Case Study of IBM Power4 Processor.Inter Processor Communication and Synchronization

Recommended Books :

1. V.Rajaraman, L Sivaram Murthy, "Parallel Computers", PID.
2. William Stallings, "Computer Organization and Architecture, Designing for performance" Prentice Hall, Sixth edition
3. Kai Hwang, Scalable Parallel Computing
4. Harrold Stone, High performance computer Architectures
5. Richard Y. Kain , Advanced Computer Architecture
6. Parallel Computing in C and OpenMPI , M. J. Quinn, McGraw-Hill (2004) ISBN 0072822562
7. Parallel Processing with Communicating Process Architecture, I East, UCL Press (1995).
8. Designing and Building Parallel Programs, I Foster, Addison Wesley (1996) ISBN 0201575949
9. Programming with Threads, S Kleiman et al., Prentice Hall (1996) ISBN 0131723898
10. Kai Hwang, Faye A. Briggs, "Computer Architecture and Parallel Processing" McGrawhill international Edition
11. Kai Hwang, "Advanced Computer Architecture", Tata McGrawhill Edition

CPE - 312 MULTIMEDIA SYSTEMS

L	T	P	Cr
3	1	0	3.5

SECTION – A

Introduction: Introduction to Multimedia, Introduction to Hypermedia and Hyper Text, Multimedia Systems and Desirable Features, Applications of Multimedia

Multimedia Technology: Multimedia software development tools, Multimedia Authoring Tools, Multimedia Standards for Document Architecture: SGML and ODA.

Multimedia Storage Media : Magnetic and Optical Media, RAID and its levels, Compact Disc and its standards, DVD and its standards, other optical storage devices

Text, Image, Graphics and Video: Types of text, ASCII codes, Unicode standards, Font, Insertion of text, OCR, Graphic/Image File Formats, Graphic/Image Data, Colour in Image, introduction to Video ,Types of Video Signals: Analog Video, Digital Video, TV standards.

SECTION – B

Compression: Basics of Information theory, Classifying Compression Algorithms: Lossless, Lossless/Perceptual Compression Algorithms: Entropy Encoding: Run-length Encoding, Huffman Coding. Differential Encoding, Definitions of Scalar Quantization and Vector Quantization, Frequency Domain Methods: JPEG Compression, Video Compression; MPEG Video Compression, MPEG Video Bit stream.

Audio Compression: Brief introduction to: Decibels, Microphone, Amplifier, Speakers, Digital audio specifications, Sound card, Synthesizers, Purpose of Musical Instrument Digital Interface (MIDI), Psychoacoustics, Perceptual Audio Coder, Simple Audio Compression Methods; PCM, DPCM, MPEG-1 Audio Compression, MP3, ADPCM speech coder, Multimedia System architecture**,** Components, Quality of service.

Reference Books

1. Li, Drew , Multimedia Computing, Pearson Education, Latest Edition ,
2. Ralf Steinmetz and Klara Nahrstedt, Multimedia Computing Communications and Applications By Pearson Educations
3. Prabhat K. Andleigh, Kran Thakkar, Multimedia System Design, PHI, Latest Edition
4. Fred Halsall Multimedia Communications, Pearson Education, Latest Edition

CPE – 313 SOFTWARE PROJECT MANAGEMENT

L	T	P	Cr
3	1	0	3.5

Section A

Introduction to Software Project Management: Introduction, Software, Difference between software and Program, Characteristics of Software, What is a Project? Why Software Project Management? Activities Covered by Software Project Manager, Structure of Software Project Management Document, Software Project Management Life Cycle, Role of Metrics and Measurement.
Project Size Measurement using KLOC and Function Point Metric, Cost Estimation Analysis, COCOMO Model, PERT, Gantt chart and Critical Math Management for Project Scheduling.
Software Project Development Models: Waterfall Model, Prototype Model, Spiral Model and RAD Model, Merits and Demerits of different models.

Section B

Managing and Evaluating the Project**:** Managing the task: Project Monitoring and control, managing the plan, reviews, feedback and reporting mechanisms, configuration management, quality control and quality assurance, managing change, readjusting goals and milestones, risk management, testing phases, formalized support activities;
Managing the team: Team organizations, recruiting and staffing-picking the right people, technical leadership, avoiding obsolescence-training etc.

Risk Management : What is risk management and why it is important Risk Management Cycle, Risk Identification; Common Tools and Techniques, Risk quantification, Risk Monitoring, Risk mitigation.

Recommended Books :

1. Tom Demarco, Controlling Software Project Management, Measurement, Prentice Hall, New Jersey.
2. Tom Glib, Finzi Susannah, Principles of Software Engineering Management, Addison Wesley, England.
3. Bob Hughes and Mike Cotterell; Software Project Management, third edition, Tata McGraw Hill Publishing Company Ltd., New Delhi.
4. Pankaj Jalote; Software Project Management in Practice, Pearson Education Asia.
5. Watts S. Humphrey; Winning with Software ? An Executive Strategy, Pearson Education Asia.
6.Software Project Management, Walker Royce: Pearson Education, 2005.
7.Software Project Management, Joel Henry, Pearson Education.

CPE – 314 DISTRIBUTED COMPUTING

L	T	P	Cr
3	1	0	3.5

Section A

Introduction: Motivation, objectives, characterization & classification of distributed systems. Distributed system architecture. **Hardware & software issues, Communication:** Layered protocols, Client server protocols, RPC, group communication.
Coordination, synchronization & consistency: Logical clocks, Physical clocks, mutual exclusion, election algorithms, atomic broadcast, sequential consistency transaction distributed consensus, **Threads:** Thread synchronization, implementation issues, and threads vs. RPC.
Models of distributed computing: Client - Server Architectures : Challenges, Design, Methodology, Intranets and Groupware. Group models and peer to peer: Groups for service replication/ reliability, groups for parallelism / performance, client/ server vs. peer-to-peer, multicast.

Section B

Distributed file system: Security, Naming/ location transparency, R/W semantics, cache coherence, replication. Load Balancing Distributed shared memory.
Distributed multimedia system: Introduction, characteristics, and resource management stream adaptation
Fault tolerant distributed systems: Introduction, dependability, faults vs. errors vs. failure, space time and value redundancy, fault tolerant architecture, failure detection algorithms, partitioning, FT consensus.
Security techniques, cryptographic algorithms, authentication and access control.

Recommended Books :

1. Distributed systems, concepts and design, 3rd Edition, Addison Wesley by George Colouris, Jean Dollimore and Tim Kinder berg.
2. Distributed system, 2nd Edition, Addison Wesley by Sape Mull ender.
3. Distributed Computing, Principles and applications, M.L.Liu, Pearson Education

MBA 5011 FOUNDATIONS OF FINANCIAL ACCOUNTING

L	T	P	Cr
3	1	0	3.5

Introduction to Financial Accounting

Financial Statements: Balance Sheet, Income Statement, Statement of cash flows. Mechanics of Accounting: Transaction Analysis, Journal Entries, Trial of Balance. **Completing the Accounting Cycle:** Accrual Accounting, Adjusting Entries, Preparing Financial Statements. **Ensuring the Integrity of Financial Information:** Problems, Safeguards. Selling a Product or a Service: Revenue Recognition, Cash Collection, Accounts Receivable. Inventories: Nature of Inventories, Valuation Methods.

Recommended Books:

1. Khan and Jain, Financial Management, Tata McGraw-Hill Publishing Co. Ltd., New Delhi, 4th Edition.
2. Robert Anthony, David F. Hawkins and Kenneth A. Merchant, Accounting-Text and Cases, Tata McGraw-Hill Publishing Co. Ltd., New Delhi, 12th Edition, 2007.

CPE– 316 ATM NETWORKS

L	T	P	Cr
3	1	0	3.5

Section-A

Brief History of B-ISDN and ATM. Principles and building blocks of B-ISDN - B-ISDN principles, B-ISDN network concept - Networking Techniques - Network layering, Switching of virtual channels and virtual paths, Applications of virtual channel/path connections. Traffic management aspects

B-ISDN user-network interfaces and protocols - B-ISDN protocol reference model - General aspects Layered architecture, relationship between the B-ISDN PRM and the OSI reference model, B-ISDN PRM description, Layer Functions, Relationship between OAM functions and the B-ISDN PRM. General aspects of the user-network interface - Transfer mode, Bit rates Interface structure. ATM Layer - Cell structure, Cell Header, ATM Reference Model, ATM adaptations Layer

Section-B

Implementation issues - Physical layer, ATM Layer. Traffic management: Traffic control procedures and their impact on resource management. Mechanisms to achieve a specified QoS - Use of virtual paths, Connections admission control, Usage parameter control and network parameter control, Priority control, Traffic shaping.
The Internet and ATM : IP over ATM - Encapsulation, addressing and routing, Address resolution, , Multicast and broadcast support for IP and ATM - Multicast address resolution server operations. IP Version 6 over ATM.. IP switching, Tag switching, Carrier scale internetworking - IP switching, tag switching, Carrier scale internetworking.

Interworking with other networks and services: Interworking principles, Circuit emulation service (CES). ATM local area networks, Local Area network emulation - The basic LANE principles, the building blocks, advantages and disadvantages of LANE, overview of LANE version 2. Multiprotocol over ATM - The basic principles, Principles of data flow, MPOA control flows. ATM switching - Switching elements - Matrix-type switching elements, Central memory switching element, Bus type switching element, Ring- type switching element, Performance aspect, Technological aspects, Single stage networks, Multi - stage networks, Cell header processing in switch fabrics, Multicast functionality. Switches and corss connects - Generic system structure, System building blocks.

Recommended Books :

1. ATM Network: 3rd Edition, Rain Handel, Handel & Schroder
2. ATM - Theory and Application by David E. McDysan & Darren L. Spohn, Mc Graw Hill 1994
3. IEEE Networks Magazine Sep '92 onwards

CPE - 317 GRID COMPUTING

L	T	P	Cr
3	1	0	3.5

Section A

Overview and Motivation: The history and evolution of Grid computing, Basic concepts of Grid computing and Requirements. Problems, Trends and Directions in Grid Computing. Applications of Grid Computing.

Grid Architectures and Technologies: Nature of Grid architecture, Components of Grid, Layered Grid Architecture: Key Components: Grid Resource Allocation Management (GRAM), Grid FTP protocol, Grid Resource Information Service (GRIS). Resource infrastructure, Open Grid Services Architecture (OGSA), Globus Toolkit and Web Services, gLite, and UNICORE etc.

Section B

Grid Computing Environments, Resource allocation, sharing and discovery. Peer-to-peer systems: Purpose, definition, characteristics, Types of P2P systems, Security issues in Grid environment

Advanced Applications of Grid in New Biology and the Grid, Data Intensive Grids applications for high-energy physics, Semantic Grid.
Case Study: VECC (National Project), World Community Grid (Global Project), BOINC & F@H

Recommended Books:

1. Bart Jacob, Michael Brown, Kentarofukui, Nihar Trivedi – Introduction to Grid Computing (IBM Red Book) 2005
2. Ananth Grama, Anshul Gupta, George Karypis, Vipin Kumar – Introduction to Parallel Computing (Pearson Edu), 2004 II Ed.
3. V. Rajaraman, C. Siva Ram Murthy – Parallel Computers – Architecture and Programming (PHI), 2000
4. Joshy Joseph & Craig Fellenstein, “Grid Computing”, Pearson/PHI PTR-2003.
5. Fran Berman, Geoffrey Fox, and Tony Hey – “Grid Computing: Making The Global Infrastructure a Reality”, 2003

CPE - 318 BUSINESS INTELLIGENCE

L	T	P	Cr
3	1	0	3.5

Section A

Introduction to Business Intelligence

Introduction to digital data and its types – structured, semi-structured and unstructured, Introduction to OLTP and OLAP (MOLAP, ROLAP, HOLAP), BI Definitions & Concepts, BI Framework, Data Warehousing concepts and its role in BI, BI Infrastructure Components – BI Process, BI Technology, BI Roles & Responsibilities, Business Applications of BI, BI best practices.

Basics of Data Integration (**E**xtraction **T**ransformation **L**oading)

Concepts of data integration, needs and advantages of using data integration, introduction to common data integration approaches, Meta data - types and sources, Introduction to data quality, data profiling concepts and applications, introduction to ETL using Kettle.

Section B

Introduction to Multi-Dimensional Data Modeling

Introduction to data and dimension modeling, multidimensional data model, ER Modeling vs. multi dimensional modeling, concepts of dimensions, facts, cubes, attribute, hierarchies, star and snowflake schema, introduction to business metrics and KPIs, creating cubes using Microsoft Excel.

Basics of Enterprise Reporting

A typical enterprise, Malcolm Baldrige - quality performance framework, balanced scorecard, enterprise dashboard, balanced scorecard vs. enterprise dashboard, enterprise reporting using MS Access / MS Excel, best practices in the design of enterprise dashboards.

RECOMMENDED BOOKS:

1 R.N. Prasad and Seema Acharya, Fundamentals of Business Analytics, Wiley India Ltd.
2 Mike Biere, Business Intelligence for the Enterprise, Prentice Hall Professional.
3 Teo Lachev, Applied Microsoft Analysis Services 2005: And Microsoft Business Intelligence Platform, Prologika Press.
4 David Taniar, Progressive methods in data warehousing and business intelligence: concepts and competitive analytics, Idea Group Inc (IGI).
5 Data warehousing: the ultimate guide to building corporate business intelligence, Birkhäuser.
6 Mark Humphries, Michael W. Hawkins, Michelle C. Dy, Data warehousing: architecture and implementation, Prentice Hall Professional.

CPE-320 CLOUD COMPUTING

L	T	P	Cr
3	1	0	3.5

Section A

Introduction: Definition of Cloud, Basics of Cloud Computing,Characteristics of Cloud, Benefits of Cloud, Driving factors towards the use of Cloud Computing, Comparing Cloud with GridComputing Systems, Workload Patterns for the Cloud, Selection criteria for migrating into Cloud, Application of Cloud Computing.

Basic Concepts and Virtualization: Cloud Computing Evolution, Big Data Concept, Elasticity and scalability, Virtualization: characteristics of virtualization, Benefits of virtualization, Forms of CPU virtualization, Hypervisors, VMWare,Multitenancy, Application programming interfaces (API), Billing and metering of Cloud services, Economies of scale, Management, Tooling, and automation in Cloud Computing, SLA in Cloud Computing.

Cloud Computing Service Delivery Models: Cloud service delivery models, Cloud Reference Model, Infrastructure as a service (IaaS) architecture, details, examples and applications,Platform as a service (PaaS) architecture, details, examples and applications, Software as a service (SaaS) architecture, details, examples and applications, NIST architecture.

Section B

Cloud Deployment Models: Cloud deployment models, Private Clouds, Public Clouds, Hybrid Clouds, Community, Virtual private Clouds,Heterogeneous and Homogenous Clouds, Vertical and special purpose Clouds, Migration paths for Cloud, Selection criteria for Cloud deployment.

Cloud Security: Cloud Security challenges and risks, Principal Characteristics of Cloud Computing security, Cloud Computing Security Reference Model, How security gets integrated, Principal security dangers to Cloud Computing, Virtualization and Multitenancy, Internal security breaches, Data corruption or loss, User account and service hijacking, Steps to reduce Cloud Security breaches, Identity and access management, Cloud forensics, Digital signature, SSL.

Case Studies: Google Cloud platform, Windows Azure platform.

RECOMMENDED BOOKS

1. Raj Kumar Buyya, James Broberg, AndrezeiM.Goscinski, Cloud Computing: Principles and paradigms, 2011
2. Barrie Sosinsky, Cloud Computing Bible, Wiley, 2011.
3.Michael Miller, Cloud Computing, 2008.
4 Judith Hurwitz, Robin Bllor, Marcia Kaufman, Fern Halper, Cloud Computing for dummies, 2009.
5.Anthony T. Velte, Toby J. Velte and Robert Elsenpeter, Cloud Computing: A practical Approach, McGraw Hill, 2010. BorkoFurht, Armando Escalante (Editors), Handbook of Cloud Computing, Springer 2010.

MBA 5012 FOUNDATIONS OF MANAGERIAL ACCOUNTING

L	T	P	Cr
3	1	0	3.5

Management Accounting and Cost Concepts. Investing Activities: Nature of Long-Lived Assets, Depreciation methods. Long-term Liabilities. Equity Financing: Nature of equities, Accounting for Equities, Retained Earnings. Investments in Debt and Equity Securities: Trading Securities, Available-for-sale Securities, Held-to-maturity securities. Statement of Cash Flows: Purpose, Classification. Financial Statement Analysis: Ratios, Common-Size Financial Statements. Activity-Based Costing. Cost Behavior and Decisions using C-V-P analysis: Importance of C-V-P, Analysis of Mixed costs, Methods of C-V-P analysis. Capital Investment Decisions: Nondiscounted Capital Budgeting Techniques, Discounted Capital Budgeting Techniques.

Recommended Books:

1. Charles T. Horngren, George Foster and Srikant M. Datra, *Cost Accounting: A Managerial Emphasis*, Prentice-Hall of India, New Delhi, 12th Edition.
2. Charles T. Horngren, *Introduction to Management Accounting*, Prentice-Hall of India, New Delhi, 12th Edition, 2007.

B. TECH FOURTH YEAR
COMPUTER SCIENCE & ENGINEERING

(Batch 2015)
Session (2018-19)
SCHEME OF PAPERS

SEVENTH SEMESTER (COMPUTER SCIENCE & ENGINEERING)

S. No.	Subject Code	Subject Name	L	T	P	Cr.
1	CPE-403	System Modeling & Simulation	3	1	0	3.5
2	CPE-404	Artificial Intelligence	3	1	0	3.5
3	CPE-407	Data Mining & Warehousing	3	1	0	3.5
4	CPE-412	Computer Graphics	3	1	0	3.5
5	CPE-454	Artificial Intelligence Lab	0	0	2	1.0
6	CPE-455	Data Mining & Warehousing Lab	0	0	2	1.0
7	CPE-456	Computer Graphics Lab	0	0	2	1.0
8		Elective- IV *	3	1	0	3.5
9		Elective – V **	3	1	0	3.5
Total			18	6	6	24
Total Contact Hours = 30						

ELECTIVE – IV FOR SEVENTH SEMESTER (COMPUTER SCIENCE & ENGINEERING)*

S. No.	Subject Code	Subject Name	L	T	P	Cr.
1.	CPE-405	Neural Computing	3	1	0	3.5
2.	CPE-408	Digital Image Processing	3	1	0	3.5
3.	CPE-409	Advanced Computer Architecture	3	1	0	3.5
4.	CPE-410	Object Oriented Analysis & Design Using UML	3	1	0	3.5
5.	CPE-411	Cyber Security	3	1	0	3.5
6.	MBA-5033	Foundation of International Business	3	1	0	3.5

*CHOOSE ANY ONE FROM THE LIST

ELECTIVE – V FOR SEVENTH SEMESTER (COMPUTER SCIENCE & ENGINEERING)**

S. No.	Subject Code	Subject Name	L	T	P	Cr.
1	ECE-403	Wireless & Mobile Communication	3	1	0	3.5
2	ECE-407	Nano Electronics	3	1	0	3.5
3	ECE-408	Biomedical Instrumentation	3	1	0	3.5
4	ECE-409	Optical Networks	3	1	0	3.5
5	MBA-5013	Foundations of Finance	3	1	0	3.5

*CHOOSE ANY ONE FROM THE LIST

CPE-454, CPE-455 and CPE-456 are practical papers only. There will not be any theory examination for these papers.

Department of Computer Engineering
Punjabi University, Patiala.
General Instructions to the Paper Setters
(Common for B.Tech. in COMPUTER SCIENCE & ENGINEERING, Electronics and communication Engineering, Mechanical Engineering, Civil Engineering and Integrated BTech/MBA Branches)

Applicable to 2014 Batches onward

The B. Tech question paper structure will be as shown below:

Pattern of Question Paper

TITLE OF SUBJECT (CODE----)
Bachelor of Technology (Branch) Section: ……..
End Semester Exam

TIME ALLOWED: 3 Hour

Roll. No…….

Maximum Marks: 50

Note:- Section C is compulsory. Attempt any six questions selection three questions from each section A & B.

Section-A (From Section A of the syllabus)

Q1. .....
Q2. .....
Q3. .....
Q4. ..... 3x5
Q5……..

Section-B (From Section B of the syllabus)

Q6. .....
Q7. .....
Q8. .....
Q9. ..... 3x5
Q10…….

Section-C (From whole syllabus)

Q11
a).....
b).....
c).....
d).....
e).....
f).....
g).....
h).....
i).....
j)……. 10x2=20

Note for the paper setter:

1. Total numbers of questions to be set are Eleven (11) as per the above format.
2. There will be five questions in each of the Sections A and B. Each question will be of five (05) marks. However, a question may be segregated into subparts.
3. Section C is compulsory and contains ten (10) sub-parts each of two (2) marks.
4. The maximum limit on numerical problems to be set in the paper is 35% while minimum limit is 20%.
5. The paper setter shall provide detailed marking instructions and solutions to numerical problems for evaluation purpose in the separate white envelopes provided for solutions.
6. The paper setters should seal the internal & external envelope properly with signatures & cello tape at proper place.
7. Log tables, charts, graphs, Design data tables etc. should be specified, whenever needed.
8. Use of Scientific calculator should be clearly specified.

CPE 403 SYSTEM MODELING & SIMULATION

L	T	P	CR
3	1	0	3.5

Section – A

Introduction: Systems, modeling, general systems theory, Concept of simulation, Simulation as a decision making tool, types of simulation. Simulation Terminologies- Application areas – Model Classification –Types of Simulation- Steps in a Simulation study- Concepts in Discrete Event Simulation - Simulation Examples.

Statistical Models – Concepts: – Discrete Distribution- Continuous Distribution – Poisson Process- Empirical Distributions- Queueing Models – Characteristics- Notation – Queueing Systems – Markovian Models- Properties of random numbers- Generation of Pseudo Random numbers- Techniques for generating random numbers-Testing random number generators- Generating Random-Variates- Inverse Transform technique – Acceptance- Rejection technique – Composition & Convolution Method.

Section-B

Design of Simulation Experiments: Problem formulation, data collection and reduction, time flow mechanism, key variables, logic flow chart, starting condition, run size, experimental design consideration, output analysis and interpretation validation, input modeling, Data collection, Assessing sample independence, Hypothesizing distribution family with data, Parameter Estimation, Goodness-of-fit tests, Selecting input models in absence of data, Output analysis for a Single system, Terminating Simulations, Steady state simulations.

Development of simulation models using simulation language studied for systems like queuing systems, Production systems, Inventory systems, maintenance and replacement systems and Investment analysis. Simulation Tools – Model Input, High level computer system simulation, CPU –Memory Simulation, Comparison of systems via simulation – Simulation Programming techniques - Development of Simulation models. Simulation programming languages – simulation suitability with characteristics, Comparison and selection of simulation languages, study of any one simulation language.

Recommended Books:

1. Jerry Banks and John Carson, " Discrete Event System Simulation", Fourth Edition, PHI, 2005.
2. Geoffrey Gordon, "System Simulation", Second Edition, PHI, 2006.
3. Narsingh Deo, "System Simulation with Digital Computer, "Prentice Hall, India, 2001.
4. Frank L. Severance, " System Modeling and Simulation", Wiley, 2001.
5. Jerry Banks, "Handbook of Simulation: Principles, Methodology, Advances, Applications and Practice", Wiley, 1998.

CPE-404 ARTIFICIAL INTELLIGENCE

L	T	P	CR
3	1	0	3.5

Section A

Artificial Intelligence Techniques, levels of models, understand the importance, functions, advantages, as well as the limitations of artificial intelligence. Use of Artificial Intelligence and intelligent agents
State, space, search, control strategies, heuristic search, problem characteristics, production system characteristics. Mapping between facts and representations, approaches to knowledge representation, semantic sets, frame, conceptual depending, scripts, predictive logic, resolution in predicate logic

Section B

Procedural Vs declarative knowledge, matching, conflict resolution, Non-monotonic reasoning, default reasoning, statistical reasoning, knowledge extraction. Investigate the roles and development methods of artificial intelligence in decision making processes. Neural network resources, cognitive science, role of neural network in computer science.

Characteristics of AI language, LISP-symbol manipulation- basic lisp function, predicated, condition, recursion, iteration, Array-lambda functions, input-output statements. AI problems : pattern recognition, voice recognition, Feature Extraction

Recommended Books :

1. Artificial Intelligence by Rich and Kinght, TMH
2. Introduction to Artificial Intelligence by Charniak and Mcdermott. Addison-Wesley, 1985.
3. Essentials of Artificial Intelligence by Ginsburg. Morgan Kaufmann, 1993.
4. Artificial Intelligence by Winston 3rd Edition, Addison Wesley, 1992.
5. Artificial Intelligence by Padhy, Oxford Press

Architecture of EJB, creating a stateless-session EJB, statefull-session bean, Life Cycle of session beans, Entity beans, life cycle of entity beans

Recommended Books :

1.Dietel and Dietal, Java: How to Program, 6th Edition, Pearson Education
2.Herbert Schildt The Complete Reference Java2, TMH
3.James Edward Keogh, Jim Keogh J2EE: The complete Reference, McGraw-Hill

CPE-407 DATA MINING WAREHOUSING

L	T	P	CR
3	1	0	3.5

Section A

Introduction: Introduction to RDBMS, data warehouse, transactional databases, data mining functionalities, classification of data mining system, major issues in data mining

Data Preprocessing: Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation

Data Warehouse And OLAP: Need for Data Warehousing, Difference from Traditional Databases, Data Warehouse Architecture, Multidimensional Data Model, Schemas for Multi-Dimensional Model: Star, Snowflake & Fact Constellation, OLAP Operations, Types Of OLAP Servers: ROLAP Versus MOLAP Versus HOLAP.

Introduction to Data Mining: Basics of data mining, Data mining techniques, KDP (Knowledge Discovery Process), Application and Challenges of Data Mining, Security Issue, Privacy Issue.

Section B

Mining Association Rules in Large Databases: Association Rule Mining, Apriori Algorithm, Fp-Growth Algorithm, latest trends in association rules mining.

Classification and Clustering: classification and prediction, issues regarding classification and prediction, decision tree induction algorithm, rule based classification: using if-then rules for classification, prediction: linear &non linear regression, cluster analysis, type of data for cluster analysis, introduction to Categorization of Major Clustering Methods, Classical Partitioning Method: k-Means.

Introduction to Mining Complex Types of Data: Complex data objects, Mining spatial databases, Multimedia databases, Time Series and sequence databases, Text databases and World Wide Web.

BOOKS RECOMMENDED

1. Jiawei Han and MichelineKamber, “Data Mining: Concepts and Techniques”, Morgan Kaufmann Publishers, 2000 (ISBN: 1-55860-489-8).
2. Ian H. Witten and Eibe Frank, “Data Mining: Practical Machine Learning Tools and Techniques with Java implementations”, Morgan Kaufmann Publishers, San Fransisco, CA (2000).
3. Dorian Pyle, “Data Preparation for Data Mining”, Morgan Kaufmann, (1999)
4. Korth, Silbertz, Sudarshan, “Database Concepts”, McGraw Hill
5. Elmasri, Navathe, “Fundamentals Of Database Systems”, Addision Wesley

CPE-412 COMPUTER GRAPHICS

L	T	P	Cr
3	1	0	3.5

Section-A

Graphics Hardware: Raster CRTs, Raster and Random Scan Displays, Display Controllers and Processors, Graphics Input Devices, Applications of Computer Graphics.
Raster Scan Conversion Algorithms: Line Drawing Algorithms (DDA & Bresenham's), Circle Drawing Algorithms (Mid Point and Bresenham's).

Two-Dimensional Geometric Transformations: Basic Transformations, (Translation, Rotation and Scaling) Matrix Representation and Homogenous Coordinates, Shear and Reflection Transformations, Composite Transformations.
Filling: Region filling Algorithms (Boundary Fill and Flood Fill).

Section-B

Windowing And Clipping: Viewing pipeline, viewing transformations. 2-D Clipping algorithms-Line clipping algorithms (Cohen Sutherland, Liang Barsky algorithm) Polygon clipping (Sutherland Hodgeman polygon clipping, Weiler and Atherton polygon clipping).
Three-Dimensional Geometric Transformations: Basic Transformations: (Translation, Scaling, Rotation) Composite transformations.
Projections: Parallel and Perspective.
Visible Surface Detection Methods: Depth Buffer Method, A-Buffer Method, Scan Line Method, Area Subdivision Method.
Shading: Gouraud and Phong Shading Algorithms, Properties of Bezier and B-Spline Curves.

Recommended Books:

1. Computer Graphics: By Donald Hearn, M. Pauline Baker
2. Computer Graphics (Schaum Series) by Lipschutz (MC Graw Hill)
3. Principles of Interactive Computer graphics: By W.M. Newman, R.Sproull
4. Fundamentals of Interactive Computer Graphics: By J.D. Foley, A. Van Dam
5. Computer Graphics Using OPEN GL: By F.S. Hill Jr.
6. Computer Graphics: Roy A. Plastock, Gordon Kalley.

CPE 454 **ARTIFICIAL INTELLIGENCE LAB**

L	T	P	Cr
0	**0**	**2**	**1.0**

(Using PROLOG)

1. To show the relation of a person named John and his likings.

2. To check whether a person named Marry is bachelor or not.

3. To confirm whether a given entity is a bird or not.

4. To authenticate about the relation of sisters among different entities.

5. To check about the different entities whether they are club members or not.

6. To pass multiple arguments in facts and queries .

7. To generate a family tree.

8. To calculate the density of any given area.

9. To find the length of a given list.

10. To check whether a given element is a member of list of not.

11. To find the factorial of a given number.

12. To apply the use of cut operators.

CPE-455 DATA WAREHOUSING &DATA MINING LAB

L	T	P	Cr
0	0	2	1.0

1. Introduction to Data Mining Tool and its installation.
2. Exploring Data Mining Tool.
3. Understanding file formats supported by the tool.
4. Demonstration of preprocessing.
5. Demonstration of Association rule process on dataset using apriori algorithm.
6. Demonstration of classification rule process on dataset using id3 algorithm.
7. Demonstration of clustering rule process on dataset using simple k-means.

CPE-456 COMPUTER GRAPHICS LAB

L	T	P	Cr
0	0	2	1.0

OBJECTIVE

The students are required to do exercises on various computer graphics algorithms in either C/C++ Language. Implement following using various algorithms:

1. Line drawing
2. Line clipping
3. circle drawing
4. area clipping
5. drawing of some 2-D pictures
6. 2-D transformations: rotation, translation etc
7. Shading
8. Line Hidding

Finally design some Ads., Game etc using all the above or built in commands.

CPE-405 NEURAL COMPUTING

L	T	P	CR
3	1	0	3.5

Section A

Neural networks: introduction, neural networks, supervised or unsupervised learning, feed forward network, Hopfield network.
Neural network models: neural network models, layers in neural network and their connections. Instar, outstar, weights on connections, threshold function.

Backpropagation: Forward back propagation network- mapping, layout, training, BPN applications.
Learning and training: objectives of learning, Hebb's rule, delta rule, supervised learning, unsupervised networks, learning vector quantizer, associative memory models, one-shot learning, resonance, stability, training and convergence.

Section B

Fuzzy Logic: Introduction, fuzzy sets, fuzzy operations, and fuzziness in neural networks, neural trained fuzzy system, BAM- bidirectional associative memory, inputs and outputs, weights and training. FAM-fuzzy
Associative memory, association, FAM neural networks, encoding
Application of fuzzy Logic: Fuzzy inference system, defuzzification.
Introduction to Neuro Fuzzy Systems Architecture of a Neuro Fuzzy Network.
Genetic Algorithm: An overview, GA in problem solving Implementation of GA and GP

Recommended Books :

1. Rao, Vallinu B.,and Rao, Hayagriva . Neural networks and fuzzy Logic, second edition, BPB Publication
2. Berkan C. Riza, Trubatch L, Sheldon, Fuzzy Systems design Principlea. IEEE Press , standard publishers
3. Freeman A. James, Skapura M. David- neural networks algorithms, applications and programming.
4. Soft Computing by Fred Aminzadel & Jamshich, Prentice Hall

CPE 408 DIGITAL IMAGE PROCESSING

L	T	P	CR
3	1	0	3.5

Section-A

Introduction and Digital Image Fundamentals: Digital Image representation, Fundamental steps in Image processing, Elements of digital Image processing, Sampling and quantization, some basic relationships like neighbor's connectivity, distance measure between pixels, Image geometry.
Image Transforms: Discrete Fourier transform, Some properties of two-dimensional Fourier transform, Fast Fourier transform, Inverse FFT.

Image Enhancement: Point Operations, Histograms, Spatial Domain methods, Frequency domain methods, Enhancement by point processing, Spatial filtering, low pass filtering, High pass filtering, Homomorphic filtering, Colour image processing.
Image Restoration Degradation model, Algebraic approach to Restoration, Inverse filtering, Wiener filter, Constrained least square restoration, Interactive restoration, Restoration in spatial domain.

Section-B

Image Compression: Coding Inter-pixel and Psycho visual redundancy, Image Compression models, Error free compression, Lossy Compression, Image Compression standards.
Image Segmentation: Detection of discontinuities, Edge linking and boundary detection, Thresholding, Region Orientation Segmentation, Motion based segmentation.

Representation and Description: Representation schemes like chain coding, Polygonal approximation, Signatures, Boundary Segments, Skeleton of region, Boundary Description, Regional descriptors, Morphology.
Recognition and Interpretation: Elements of Image Analysis, Pattern and pattern classes, Decision Theoretic methods, Structural methods, Interpretation.

Recommended Books:

1. A.K. Jain," Fundamentals of Digital Image Processing", Pearson Education.
2. Rafael C. Gonzalez & Richard E. Woods, "Digital Image Processing", AWL.
3. W. K. Pratt," Digital Image Processing".
4. Ramesh Jain, Brian G. Schunck, "Machine Vision", TMH.

CPE-409 ADVANCED COMPUTER ACRHITECTURE

L	T	P	CR
3	1	0	3.5

Section A

Introduction to Parallel Processing: Evolution of Computer Architecture, Parallelism in Uniprocessor System, Parallel Computer Structures, Architectural Classifications Schemes, Multiprocessors and Multicomputers, Multivector and SIMD Computers, Parallel processing application.
Memory and input ouput subsystems: Hierarchical Memory structure, Virtual memory system, Memory Allocation and Management, Cache Memories and Management, Input-Output Subsystem.

Pipelining and Vector Processing: Pipelining, Instruction and Arithmetic Pipelines, Principles of Designing Pipelined Processors, Vector Processing Requirements , Vector Super Computers, Pipeline Chaining and Vector Loops, Vectorization and Optimization Methods.

Section B

Structures and Algorithms for Array Processors: SIMD Array Processors, SIMD Interconnection Networks: Static & Dynamic Networks, Mesh Connected Network, Cube interconnection Networks, Parallel Algorithms for array processors, Associative Array Processing.
Multiprocessor Architecture and Programming: Functional Structures, Interconnection Networks: Multi stage networks For multiprocessors, Parallel Memory Organization, Multiprocessor Operating System, Exploiting Concurrency for Multiprocessing.

Recommended Books :

1. Hawang kai, Briggs F.A., Computer Architectures and Parallel Processing, McGraw-Hill
2. Kain Richard Y., Advanced Computer Architecture, PHI
3. Hwang Kai, Advanced Computer Architecture, McGraw-Hill
4. Mano M., Computer System Architecture, PHI

CPE-410 OBJECT ORIENTED ANALYASIS & DESIGN Using UML

L	T	P	CR
3	1	0	3.5

Section A

Introduction to Object: Object Orientation, Development, Modeling, Object Modeling technique. Object modeling: Objects and classes, Links and Association, Generalization and inheritance, Grouping constructs, Aggregation, Abstract Classes, Generalization as extension and restriction, Multiple inheritance, **Polymorphism, Encapsulation**, Meta data, Candidate keys, Constraints.
Dynamic modeling: Events and states, Nesting, Concurrency, Advanced Dynamic Modeling concepts
Functional modeling: Functional Models, Data flow diagrams, Specifying operations, Constraints, Relation of Functional model to Object and Dynamic Models.
Design Methodology, Analysis: Object modeling, Dynamic modeling, Functional modeling, Adding operations, Iterating Analysis.
System design: Subsystems Concurrency, Allocation to processor and tasks, Management of data stores, Handling Global Resources, Handling boundary Conditions, Setting Trade-off priorities.
Object Design: Overview, Combining the three models, Designing Algorithms, Design Optimization, Implementation of Control, Adjustment of Inheritance, Design of Associations, Object Representation, Physical Packaging, and Document Design Decision.

Section B

UML: Basics, Emergence of UML, **Architecture**, **Importance of Modeling**, **Principles of Modeling**, **Conceptual Model of UML**, Types of Diagrams.
Use Case: Actors, Use Case Diagram, and Relationships between Use Cases.
Classes: Class Diagram, Classes, Objects, Attributes Operations, Methods, Interfaces, Constraints, Generalization, Specialization, Association, and Aggregation.

Advanced Structural modeling: Advanced classes, advanced relationships, Interfaces types and roles packages, instances and object diagrams.
Basic behavioral modeling: Interactions use cases; Use case Diagrams, Interaction Diagrams, **Sequence Diagrams**, **Event State Diagram, Collaboration Diagram** and activity diagrams.
Architectural Modeling: Terms, Concepts, examples, modeling techniques for component diagrams, **Deployment Diagarms**.
Case Studies: Library Applications,

Recommended Books:

1. BOOCH, “Object Oriented Analysis and Design”, Addison Wesley
2. Pierre-Alain Muller, “Instant UML”, Shroff Publishers, 2000
3. Booch, Rumbaugh, Jacobson, “The Unified Modeling Language User Guide”, Addison Wesley, 1999
4. Booch, Rumbaugh, Jacobson, “The Unified Modeling Language Reference Manual”, Addison Wesley, 1999
5. Rebecca Wirfs-Brock, “Design Object Oriented Software”, PHI
6. Rambough, “Object Oriented Modeling and Design”, Pearson Education, 2002
7. Bernd Oestereich, “Developing Software With UML”, Pearson Education.

CPE -411 CYBER SECURITY

L	T	P	Cr
3	1	0	3.5

Section A

Introduction to Internet, Cyber Space and threats, Computer Storage, Cell Phone / Mobile Forensics, Computer Ethics and Application Programs.

Electronic and Digital Signatures -Intellectual Property – Data Protection and Privacy. Need for cyber law and forensics, Jurisprudence of Indian Cyber Law.

Footprinting, WHOIS and DNS enumeration, network reconnaissance, Email spoofing, Email bombing, Data diddling, Denial of service attack, Virus / worm attacks- trojans and keyloggers, Internet time theft, Web jacking, Phishing-Smishing-Vishing-Identity theft, Cyber terrorism- use of encryption by terrorists, Human trafficking.

Section B

The Legal Perspective – The IT Act, Challenges faced by IT Act and its amendments, Sections Under IT Act- Section 43,65,66,67,68,69,70. Section relevant to cyber crime under IPC(Indian Penal Code).

Ehical hacking: Need, penetration testing: Information gathering tools like nmap, vulnearibility detection scanners like nessus, nexpose, information analysis and planning, attack and penetration tools like metasploit, results analysis and reporting.

Recommended Books

1. Cyber Security - Understanding cyber crimes,computer forensics and legal perspectives by Nina Godbole and Sunit Belapure.
2. System Forensics by Ankit Fadia.
3. hacking Exposed: network security secrets and solutions by Stuart mcclaure, Scambray and Kurtz. Tata Mc Graw hill.

MBA 5033 FOUNDATIONS OF INTERNATIONAL BUSINESS

L	T	P	CR
3	1	0	3.5

Understand the nature and language of International business / international trade, Origin of International trade. International economic environment, International Culture and its impact on global trade, Managing Diversities. Analyzing World Conditions and their impact on International trade, Global perspective on world events and contemporary issues. Balance of Payments & Foreign Exchange Management

Recommended Books:

1. International Business – A Strategic Management Approach by Alan N Rugman, R.M. Hodgetts, McGraw Hill.
2. Simai, Mihaly, The Future of Global Governance, Washington, D.C., United States Institute of Peace Process, 1994.

ECE 403 WIRELESS & MOBILE COMMUNICATION

L	T	P	CR
3	1	0	3.5

Section A

Introduction: History of wireless communication. Future trends in cellular radio and personal communications. Second generation (2G) cellular networks, evolution to 2.5G wireless networks (HSCSD, GPRS and EDGE for 2.5G GSM and IS-136, IS-95B for 2.5G CDMA). 3g Wireless Networks: 3G W-CDMA (UMTS), 3G CDMA 2000, 3G TD-SCDMA. Wireless local loop (WLL) and LMDS, WLANs, Bluetooth and PANs.

Cellular Concepts: Introduction, frequency reuse, channel alignment strategies, hand off strategies, interference and system capacity, Trunking and grade of service, improving coverage and capacity in cellular systems using cell splitting, sectoring, cellular system design considerations.
Mobile Radio Propagation: Large scale path loss: Introduction to radio wave propagation, Free space propagation model, Three basic propagation mechanism, reflection, ground reflection (two-ray) model. Diffraction, scattering, shadow fading, combined path loss and shadowing.

Section B

Small Scale Fading And Mutipath: Introduction, small scale multipath propagation, Impulse response of a multipath channel. Factors influencing small scale fading, parameters of mobile multipath channels (time dispersion, coherence bandwidth, doppler spread and coherence time). Types of smaal scale fading, Rayleigh, Rician and Nakagami fading distributions.

Multiple Access Techniques: Introduction, FDMA, TDMA, SSMA, CDMA, SDMA, pure ALOHA & slotted ALOHA.

Functional block diagram of modulation and demodulation for GSM.
Spread Spectrum Modulation Techniques: Pseudo- noise (PN) sequences, DS-SS, FH-SS. Block diagram of IS-95 forward link, block diagram of IS-95 reverse link. Functional block diagram of modulator & demodulator for GSM.
Wireless Signal Detection and Estimation: Diversity Techniques, Combiner analysis, Detection and estimation algorithms.
Current and upcoming Wireless Systems: 3G, 4G, 802.11a/b/g, 802.16, Adhoc networks.

Multiple Access Techniques: Introduction, FDMA, TDMA, SSMA,FHMA, CDMA, Hybrid spread spectrum techniques, SDMA, packet radio protocols- pure ALOHA & slotted ALOHA, CSMA.

Recommended Books :

1. Wireless Communications- Andrea Goldsmith, Cambridge University Press.
2. Wireless Communications: Principles & Practice – Theodore S. Rappaport, Pearson Education.
3. Digital Communications- John G. Proakis, Mcgraw Hill

ECE 407 NANO ELECTRONICS

L	T	P	CR
3	1	0	3.5

Section-A

Introduction: Introduction to Nano-scale Science and Nano-scale Technology. Why nano science and nano technology? Length, energy, and time scales. Nano structure types and properties, electronic and optical properties of materials, sensors.
Quantum wires and dots, single electron effects and single electron transistors, coulomb blockade effects in ultra small metallic tunnel junctions, Quantum confinement of electrons in semiconductor nanostructures: two dimensional confinement(quantum wells), Band gap engineering, Epitaxy.

Fabrication: Nanomagnets and spintronics, non-ideal interfaces and defects, nano fabrication(Lithography, Self assembly, Contact imprinting), molecular electronics, Organic Electronics(Carbon Fullerness and nanotubes, polymers) .
Bio Electronics: Introduction, Binding of Organic semiconductors, DNA computing.

Section-B

Nano-Photonics: Emitters, Wave Guides, Detectors, Photonic Crystals.
Surface Analytical Insrumentation Techniques For Nanotechnology: Atomic scale characterization techniques: scanning tunneling microscopy, atomic force microscopy. Low Energy Electron Diffraction (LEED), Scanning Probe Microscopy, UV Photo electron spectroscopy (UPS).

Mems And Nems: MicroElectro mechanical systems (MEMS) and Nano electro mechanical systems(NEMS), size dependent electronic, magnetic and optical behavior of nano materials .
Application: Introduction to quantum methods of information processing, Nano Particles and Environmental Hazardness , Industrial applications of Nano Sized materials.

Recommended Books :

1. Transport in Nanostructures- David Ferry, Cambridge University Press,2000
2. Introduction to Mesoscopic Physics -Y.Imry, Oxford University Press,1997
3. Electron Transport in Mesoscopic Systems ,S.Datta, Cambridge University Press,1995
4. Single Charge Tunneling, H.Grabert and M.Devoret, Plenum Press,1992
5. Handbook of Microlithography, Micromachining and Microfabrication -P.Rai Choudhary, SPIE,1997

ECE 408 BIOMEDICAL INSTRUMENTATION

L	T	P	CR
3	1	0	3.5

Section-A

Human Body Subsystems: Brief description of neuronal, Muscular, Cardiovascular and respiratory systems; their electrical, Mechanical and chemical activities.
Transducers And Electrodes: Principles and classification of transducers for bio-medical applications; Electrode theory, Different types of electrodes; Selection criteria for transducers and electrodes.
Cardiovascular System Measurements: Measurement of blood pressure, Blood flow, Measurement of pH value of blood, Cardiac rate, Heart sounds; Electrocardiograph, Plethysmograph.

Respiratory System Measurements: Measurement of gas volume, Flow rate, Carbon-dioxide and oxygen concentration in exhaled air.
Measurement Of Electrical Activity In Neuromuscular System And Brain: Neuron potential, Muscle potential, Electromyograph, Brain potentials, Electroencephalograph.

Section-B

Medical Imaging: Diagnostic X-rays, CAT, MRI, Ultrasonography, Medical use of isotopes, Endoscopy.
Patient Care, Monitoring And Safety Measures: Elements of intensive care monitoring; Basic hospital systems and components; Physiological effect of electric currents, Shock hazards from electrical equipment, Safety measures.
Assisting And Therapeutic Devices: Introduction to cardiac pacemakers, Defibrillators, Ventilators, Diathermy.
Bio-Telemetry And Lasers: Physiological parameters adaptable to Bio-telemetry, components of a bio telemetry system, Application of telemetry in patient care, Application of lasers to biomedical sciences.

Recommended Books :

1. L. Biomedical Instrumentation and Measurement -Chromwell, F.J.Weibell, E.A.Pfeiffer Prentice Hall of India, New Delhi.
2. Introduction to biomedical Equipment technology- Carr JJ and Brown JM, Pearson Publishers, Delhi.
3. Medical Instrumentation applications and design -J.G Webster, John Wiley Sons, New York.
4. Handbook of Biomedical Instrumentation- R.S Khandpur, Tata Mc Graw Hill, New Delhi
5. Principles of applied Biomedical Instrumentation -L.G.Geddes, L.E. Baker, John Wiley Sons, New York.

ECE 409 OPTICAL NETWORKS

L	T	P	CR
3	1	0	3.5

Section A

Generation of Transport networks, WDM, TDM, wireless optical systems, key optical nodes, evolution of optical systems, key attributes of optical fiber. Telecommunication Infrastructure, digital multiplexing techniques, digital signaling hierarchy, T1, DS1, T3 or DS3, layered protocol model. Timing & Synchronization in digital networks, Timing error, clocking signal, Timing types, variation, clock exchange methods, SONET and DS1 timing, Downstream devices timing, BITS, SSMs.

SONET & SDH evolution, multiplexing structure, frame structure, envelopes, functional components, problem detection, payload, pointers, VTs overhead bytes, SONET & SDH concatenation. Architecture of optical transport networks, Digital wrappers, O/O/O, hierarchy, OTN layer models. WDM DWDM, operation, its components.

Section B

Network topologies, protection schemes, robustness, diversity, 1:N protection, optical channel, types BLSR, passive optical networks and Metro. MPLS and optical networks, Label switching, Lamba switching, traffic engineering, Link management protocol (LMP), Link up, LMP messages, connectivity, Fault management. Optical Routers switching, preferences, OSP, LSP, load increasing, technologies, MEMS, Thermo, bubble, Granularity of Labels.

ATM vs. IP in optical internets: IP over ATM & SONET, OSI internet layered model, Encapsulation & its methods, PPP packet, ATM vs. IP debate, Optical Internets Evolution to 3G architecture, Migration to IP networking, IP subnets, non-optical nodes, routing tables, stack alternatives, digital wrapper, internetworking, internet service providers.

Recommended Books:

1. Optical Networks-Third Generation Transport Systems – Uyless Black, Pearson Education.
2. Optical Network Design and Implementation - Vivek Alwayn, Pearson Education
3. Understanding SONET/SDH and ATM-communications networks for the next millennium by Stamatious V. Kartalopoulos, Prentice - Hall India.

MBA 5013 FOUNDATIONS OF FINANCE

L	T	P	CR
3	1	0	3.5

An Overview of Financial Management: Shareholder Wealth Maximization, Valuation Models, Agency Relationships. Risk and Return: Investment Return, Stand-alone risk and Portfolio risk, Bata Coefficient and CAPM. Bond Valuation: Bond characteristics, Valuation. Stock Valuation: Types of Common Stock, Common Stock Valuation Models.

Recommended Books:

1. J.J. Hamton, Financial Decision Making: Concepts, Problems and Cases, Prentice-Hall of India, New Delhi, 4th Edition.
2. Khan and Jain, Financial Management, Tata McGraw-Hill Publishing Co. Ltd., New Delhi, 4th Edition.
3. Stephan A. Ross, Randolph W. Waterfield and Jeffery Jaffe, Corporate Finance, Tata McGraw-Hill Publishing Co. Ltd., New Delhi, 7th Edition.

B. TECH FOURTH YEAR
COMPUTER SCIENCE & ENGINEERING

(Batch 2015)
Session (2018-19)

SCHEME OF PAPERS

EIGHTH SEMESTER (COMPUTER SCIENCE & ENGINEERING)

Code	Title of Paper	Total Credits
PRJ-451	Project Semester (One Semester Training in Industry)	20

Breakup of Marks:

Industrial Visit by Faculty Coordinator (150 Marks)
(Within 10—12 weeks of commencement of Training)

Presentation : 60 Marks
Viva Voce : 60 Marks
Report (Hard Copy) : 30 Marks

Evaluation by Faculty Coordinator is consolation with Industrial Coordinator during industrial visit.

Evaluation by a Team of Faculty Members in the Institute (250 Marks)
(Within One Week of completion of Training)

Presentation : 100 Marks
Viva Voce : 100 Marks
Report (Hard Copy) : 50 Marks

The Final Presentation and viva – voce will be conducted jointly by the faculty coordinator, external examiner and nominee of the Head to be appointed by the Head of the Department.

The Letter grade will be awarded to the students according to marks obtained by him/her out of total 400 marks.