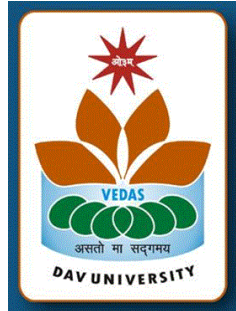**DAV UNIVERSITY, JALANDHAR**

DAV UNIVERSITY JALANDHAR

Course Scheme & Syllabus

For

**Scheme of Courses B.Tech
Computer Science & Engineering**

(Program ID-15)

1st TO 8th SEMESTER
Examinations 2013–2014 Session Onwards

Syllabi Applicable For Admissions in 2014

DAV UNIVERSITY, JALANDHAR

Scheme of Courses B.Tech
Computer Science & Engineering

Semester 1

S.No	Paper Code	Course Title	L	T	P	Cr	% Weightage				E
							A	B	C	D	
1	MTH151 / MTH152	Mathematics-I (For odd Sem)/ Mathematics -II For (even semester)	4	1	0	4	25	25	25	25	100
2	CHE151	Chemistry	3	0	0	3	25	25	25	25	75
3	CSE101	Computer fundamentals and programming	4	0	0	4	25	25	25	25	100
4	EVS101	Environment Education, Road Safety and Legal Awareness	4	0	0	4	25	25	25	25	100
5	SGS101	Human Values & Ethics	2	0	0	2	25	25	25	25	50
6	SGS 104	Stenography	3	0	0	1	25	25	25	25	25
7	MEC101	Engineering Drawing	2	0	4	4	25	25	25	25	100
8	CSE102	Computer fundamentals and programming -Lab	0	0	4	2	-	-	-	-	50
9	CHE152	Chemistry-Lab	0	0	2	1	-	-	-	-	25
10	SGS 105	Stenography Lab	0	0	1	1					25
			22	1	11	26					650

A: <u>Continuous Assessment:</u> Based on Objective Type Tests
B: <u>Mid-Term Test-1:</u>   Based on Objective Type & Subjective Type Test
C: <u>Mid-Term Test-2:</u>   Based on Objective Type & Subjective Type Test
D: <u>End-Term Exam (Final):</u> Based on Objective Type Tests
E: Total Marks
L: Lectures   T: Tutorial   P: Practical   Cr: Credits

DAV UNIVERSITY, JALANDHAR

Scheme of Courses B.Tech
Computer Science & Engineering

Semester 2

S.No	Paper Code	Course Title	L	T	P	Cr	% Weightage				E
							A	B	C	D	
1	MTH151/ MTH152	Mathematics-I (For odd Sem)/ Mathematics -II For (even semester)	4	1	0	4	25	25	25	25	100
2	PHY151	Physics	3	0	0	3	25	25	25	25	75
3	MEC102	Fundamentals of Mechanical Engineering	4	0	0	4	25	25	25	25	100
4	ELE101	Electrical & Electronics Technology	4	1	0	4	25	25	25	25	100
5	ENG151	Basic Communication Skills	3	0	0	3	25	25	25	25	75
6	SGS102	General knowledge & Current affairs	2	0	0	2	25	25	25	25	50
7	MGT151	Fundamentals of Management	2	0	0	2	25	25	25	25	50
8	MEC104	Manufacturing Practice	0	0	4	2	-	-	-	-	50
9	ELE102	Electrical & Electronics Technology -Lab	0	0	2	2	-	-	-	-	50
10	ENG152	Basic Communication Skills -Lab	0	0	2	1	-	-	-	-	25
11	PHY152	Physics-Lab	0	0	2	1	-	-	-	-	25
			22	2	10	28					700

A: <u>Continuous Assessment:</u> Based on Objective Type Tests

B: <u>Mid-Term Test-1:</u>   Based on Objective Type & Subjective Type Test

C: <u>Mid-Term Test-2:</u>   Based on Objective Type & Subjective Type Test

D: <u>End-Term Exam (Final):</u> Based on Objective Type Tests

E: Total Marks

L: Lectures   T: Tutorial   P: Practical   Cr: Credits

DAV UNIVERSITY, JALANDHAR

Scheme of Courses B.Tech
Computer Science & Engineering

Semester 3

S.No	Paper Code	Course Title	L	T	P	Cr	A	B	C	D	E
1	CSE201	Object Oriented Programming	4	-	-	4	25	25	25	25	100
2	CSE203	Data Structure Programming using C	4	-	-	4	25	25	25	25	100
3	ECE201	Digital Electronics	4	-	-	4	25	25	25	25	100
4	MTH254	Discrete Mathematics	4	1	-	4	25	25	25	25	100
5	ENG251	Advanced Communication Skills	4	1	-	4	25	25	25	25	100
6	CSE205	Object Oriented Programming Lab	-	-	4	2	-	-	-	-	50
7	CSE207	Data Structure Programming using C Lab	-	-	4	2	-	-	-	-	50
8	ECE204	Digital Electronics Lab	-	-	2	1	-	-	-	-	25
			20	2	10	25					625

Note: The header "% Weightage" spans columns A, B, C, D.

A: <u>Continuous Assessment:</u> Based on Objective Type Tests
B: <u>Mid-Term Test-1:</u> Based on Objective Type & Subjective Type Test
C: <u>Mid-Term Test-2:</u> Based on Objective Type & Subjective Type Test
D: <u>End-Term Exam (Final):</u> Based on Objective Type Tests
E: Total Marks
L: Lectures   T: Tutorial   P: Practical   Cr: Credits

Scheme of Courses B.Tech
Computer Science & Engineering

Semester 4

S.No	Paper Code	Course Title	L	T	P	Cr	% Weightage				E
							A	B	C	D	
1	CSE202	Computer Architecture & Organization	3	0	0	3	25	25	25	25	75
2	CSE204	System Programming	3	0	0	3	25	25	25	25	75
3	ECE350	Microprocessor & its Applications	4	0	0	4	25	25	25	25	100
4	CSE206	Data Communication	3	0	0	3	25	25	25	25	75
5	MTH252	Engineering Mathematics-III	4	1	0	4	25	25	25	25	100
6	CSE2xx	DE-I	3	0	0	3	25	25	25	25	75
7	CSE218	System Programming Laboratory	0	0	2	1	-	-	-	-	25
8	ECE351	Microprocessor & its Applications Laboratory	0	0	2	1	-	-	-	-	25
9	CSE220	Data Communication Laboratory	0	0	2	1	-	-	-	-	25
10	CSE222	Seminar	0	0	4	2	-	-	-	-	50
			20	**1**	**10**	**25**					**625**

DEPARTMENTAL ELECTIVE (DE)-I

1	CSE208	Web Technologies
2	CSE210	Multimedia Communication
3	CSE212	Principles of Programming Languages
4	CSE214	Management information system
5	CSE216	System Analysis & Design

A: <u>Continuous Assessment:</u> Based on Objective Type Tests
B: <u>Mid-Term Test-1:</u>   Based on Objective Type & Subjective Type Test
C: <u>Mid-Term Test-2:</u>   Based on Objective Type & Subjective Type Test
D: <u>End-Term Exam (Final):</u> Based on Objective Type Tests
E: Total Marks
L: Lectures   T: Tutorial   P: Practical   Cr: Credits

DAV UNIVERSITY, JALANDHAR

Scheme of Courses B.Tech
Computer Science & Engineering
Semester 5

S.No	Paper Code	Course Title	L	T	P	Cr	A	B	C	D	E
							% Weightage	
1	CSE301	Computer Networks	3	0	0	3	25	25	25	25	75
2	CSE303	Database Management System	3	1	0	3	25	25	25	25	75
3	CSE305	Operating Systems	3	0	0	3	25	25	25	25	75
4	CSE307	Algorithm Design & Analysis	4	0	0	4	25	25	25	25	100
5	CSE3xx	DE-II	3	0	0	3	25	25	25	25	75
6	CSE319	Computer Networks Laboratory	0	0	2	1	-	-	-	-	25
7	CSE321	Database Management System Laboratory	0	0	4	2	-	-	-	-	50
8	CSE323	Operating Systems Laboratory	0	0	4	2	-	-	-	-	50
9	CSE3xx	DE-II Laboratory	0	0	4	2	-	-	-	-	50
10	CSE300	Industrial Practical Training*	0	0	0	4	-	-	-	-	100
			16	1	14	27					675

DEPARTMENTAL ELECTIVE (DE)-II

S.No	Course Code	Course Title
1	CSE311	Java Programming
2	CSE313	Symbolic Logic and Logic Programming
3	CSE315	Computer Graphics & Animations
4	CSE317	Dot Net Programming

DEPARTMENTAL ELECTIVE (DE-II) LABORATORY

1	CSE325	Java Programming Lab.
2	CSE327	Symbolic Logic and Logic Programming Lab
3	CSE329	Computer Graphics & Animations Lab
4	CSE331	Dot Net Programming Lab

A: <u>Continuous Assessment:</u> Based on Objective Type Tests
B: <u>Mid-Term Test-1:</u>   Based on Objective Type & Subjective Type Test
C: <u>Mid-Term Test-2:</u>   Based on Objective Type & Subjective Type Test
D: <u>End-Term Exam (Final):</u> Based on Objective Type Tests
E: Total Marks
L: Lectures T: Tutorial P: Practical Cr: Credits

* Industrial practical Training for one month will be held during summer vacation after 4th semester.

DAV UNIVERSITY, JALANDHAR

Scheme of Courses B.Tech
Computer Science & Engineering

Semester 6

S.No	Paper Code	Course Title	L	T	P	Cr	A	B	C	D	E
							% Weightage				
1	CSE302	Theory of Computation	4	0	0	4	25	25	25	25	100
2	CSE304	Relational Database Management System	3	1	0	3	25	25	25	25	75
3	CSE306	Software Engineering & Project Management	3	0	0	3	25	25	25	25	75
4	CSE308	Peripheral Devices & Interface	3	0	0	3	25	25	25	25	75
5	CSE3xx	DE- III	3	0	0	3	25	25	25	25	75
6	CSE310	Distributed Systems	3	0	0	3	25	25	25	25	75
7	CSE320	Relational Database Management System-Lab	0	0	4	2	-	-	-	-	50
8	CSE322	Software Engineering & Project Management Lab.	0	0	2	1	-	-	-	-	25
9	CSE3xx	DE-III Lab.	0	0	2	1	-	-	-	-	25
10	CSE332	Seminar	0	0	4	2	-	-	-	-	50
			19	**1**	**12**	**25**					**625**

Departmental Elective (de)-III

S. No	Course Code	Course Title
1	CSE312	Data Mining
2	CSE314	Wireless Networks
3	CSE316	High Performance Communication Networks
4	CSE318	C Shell Programming

Departmental Elective (DE-III) lab

1	CSE324	Data Mining Lab.
2	CSE326	Wireless Networks Lab.
3	CSE328	High Performance Communication Networks Lab.
4	CSE330	C Shell Programming Lab.

A: <u>Continuous Assessment:</u> Based on Objective Type Tests
B: <u>Mid-Term Test-1:</u>   Based on Objective Type & Subjective Type Test
C: <u>Mid-Term Test-2:</u>   Based on Objective Type & Subjective Type Test
D: <u>End-Term Exam (Final):</u> Based on Objective Type Tests
E: Total Marks   L: Lectures   T: Tutorial   P: Practical   Cr: Credits

DAV UNIVERSITY, JALANDHAR

Scheme of Courses B.Tech
Computer Science & Engineering
Semester 7

S.No	Paper Code	Course Title	L	T	P	Cr	A	B	C	D	E
							\% Weightage				
1	CSE401	System Simulation & Modeling	4	1	0	4	25	25	25	25	100
2	CSE403	Compiler Design	4	1	0	4	25	25	25	25	100
3	CSE4xx	DE-IV	3	1	0	3	25	25	25	25	75
4	CSE4xx	DE-V	4	0	0	4	25	25	25	25	100
5	CSE4xx	DE-VI	3	1	0	3	25	25	25	25	75
6	CSE431	System Simulation & Modeling Laboratory	0	0	4	2	-	-	-	-	50
7	CSE433	Minor Project	0	0	4	2	-	-	-	-	50
8	CSE400	Industrial Practical Training*	0	0	0	4	-	-	-	-	100
			18	4	8	26					650

DEPARTMENTAL ELECTIVE (DE)-IV

S. No	Paper Code	Course Title
1	CSE407	Mobile Computing
2	CSE409	Internetworking Technologies
3	CSE411	Soft Computing
4	CSE413	High Speed & Broadband Networks

DEPARTMENTAL ELECTIVE (DE)-V

S. No	Paper Code	Course Title
1	CSE415	Natural language processing
2	CSE417	Information Retrieval Systems
3	CSE419	Data Compression
4	CSE421	Neural Network & Fuzzy Logic

DEPARTMENTAL ELECTIVE (DE)-VI

S. No	Paper Code	Course Title
1	CSE423	Virtual Reality
2	CSE425	Optical Network Design and Implementation
3	CSE427	Grid Computing
4	CSE429	Unified Modelling Language

A: <u>Continuous Assessment:</u> Based on Objective Type Tests
B: <u>Mid-Term Test-1:</u>   Based on Objective Type & Subjective Type Test
C: <u>Mid-Term Test-2:</u>   Based on Objective Type & Subjective Type Test
D: <u>End-Term Exam (Final):</u> Based on Objective Type Tests
E: Total Marks
L: Lectures   T: Tutorial   P: Practical   Cr: Credits
* Industrial practical Training for six weeks will be held during summer vacation after 6th semester.

DAV UNIVERSITY, JALANDHAR

Scheme of Courses B.Tech
Computer Science & Engineering

Semester 8

S.No	Paper Code	Course Title	L	T	P	Cr	% Weightage				E
							A	B	C	D	
1	CSE402	Information Security Systems	3	0	0	3	25	25	25	25	75
2	CSE404	Image Processing and Pattern Recognition	4	0	0	4	25	25	25	25	100
3	CSE406	Parallel Computing	3	0	0	3	25	25	25	25	75
4	CSE4xx	DE-VII	3	0	0	3	25	25	25	25	75
5	Xxxxxx	OE-1	3	0	0	3	25	25	25	25	75
6	CSE416	Information Security Systems Laboratory	0	0	4	2	-	-	-	-	50
7	CSE418	Major Project	0	0	8	6	-	-	-	-	150
8	CSE420	Seminar	0	0	4	2	-	-	-	-	50
			16	**0**	**16**	**26**					**650**

DEPARTMENTAL ELECTIVE (DE)-VI

S. No	Paper Code	Course Title
1	CSE408	Cyber Laws & IPR
2	CSE410	Modeling and Simulation of Networks
3	CSE412	Database Administration
4	CSE414	Network Management System

OPEN ELECTIVE (OE)-I

S.No	Paper Code	Course Title
1	ELE455	Matlab Programming
2	MGT452	Organisational Behaviour
3	MEC401	Robotics & Automation
4	ICE430	Bio-Medical Engineering

A: <u>Continuous Assessment:</u> Based on Objective Type Tests
B: <u>Mid-Term Test-1:</u>   Based on Objective Type & Subjective Type Test
C: <u>Mid-Term Test-2:</u>   Based on Objective Type & Subjective Type Test
D: <u>End-Term Exam (Final):</u> Based on Objective Type Tests
E: Total Marks
L: Lectures   T: Tutorial   P: Practical   Cr: Credits

DAV UNIVERSITY, JALANDHAR

Instruction for candidates (Theory Paper)

- The question paper for end-semester examination will have a weightage of 25%. It will consist of 100 objective questions of equal marks. All questions will be compulsory.
- Two preannounced test will be conducted having a weightage of 25% each. Each preannounced test will consist of 20 objective type, 5 short questions/problems on the UGC-NET (objective type) pattern as well as one long answer type question. The student is expected to provide reasoning/solution/working for the answer. The candidates will attempt all question. Choice will be given only in long answer type. The question paper is expected to contain problems to the extent of 40% of total marks.
- Four objective/MCQ type surprise test will be taken. Two best out of four objective/MCQ type surprise test will be considered towards final each of 12.5% weightage to the final. Each surprise test will include 20-25 questions.
- The books indicated as text-book(s) are suggestive However, any other book may be followed.

* Wherever specific instructions are required these are given at the starting of that particular subject/paper

DAV UNIVERSITY, JALANDHAR

Instruction for candidates (Practical Paper)

- Total marks of practical will include 20% weightage of Continuous Assessment and 80% end semester exam including Notebook / Viva / Performance/ written test.

DAV UNIVERSITY, JALANDHAR

Course Title: Engineering Mathematics-I
Paper Code: MTH 151

L	T	P	Credits	Marks
4	1	0	4	100

Objective: The aim of this course is to familiarize the
students with the theory of matrices which are used in solving equations in mechanics and the other streams. This course also provides a comprehensive understanding of the origin and development of ideas to exhibit the techniques origin and development of ideas to exhibit the techniques of solving ordinary differential equations.

UNIT-A   15 HOURS

Rank of matrices, Inverse of Matrices, Gauss Jordan Method, reduction to normal form, Consistency and solution of linear algebraic system of equations, Gauss Elimination Method Eigen values and Eigen vectors, Diagonalisation of Matrix, Cayley Hamilton theorem. Orthogonal, Hermit ion and unitary matrices.

UNIT-B   14 HOURS

Concept of limit and continuity of a function of two variables, Partial derivatives, Homogenous Function , Euler's Theorem, Total Derivative, Differentiation of an implicit function, chain rule, Change of variables,Jacobian, Taylor's and McLaurin's series. Maxima and minima of a function of two and three variables: Lagrange's method of multipliers.

UNIT-C   14 HOURS

Formation of ordinary differential equations, solution of first order differential equations by separation of variables, Homogeneous equations, Reduce to Homogenous, exact differential equations, equations reducible to exact form by integrating factors, equations of the first order and higher degree, clairaut's equation.

UNIT-D   13 HOURS

Solution of differential equations with constant coefficients: method of differential operators. Non – homogeneous equations of second order with constant coefficients: Solution by method of variation of parameters, Simultaneously Linear differential equation.

Recommended Books

1. Jain, R K and Iyengar, S R K. *Advanced Engineering Mathematics*, Narosa Publishing House, New Delhi (2003). 2nd Ed.
2. Thomas, G. B. R. L. Finney *: Calculus and Analytic Geometry*, Pearson Education. 11th Ed.
3. Kreyszig, Erwin. *Advanced Engineering Mathematics*,Wiley Eastern Ltd. N.Delhi. 2003. Revised Edition.
4. Grewal,B.S. *Higher Engineering Mathematics*, Khanna Publication, Edition 40th Edition.

DAV UNIVERSITY, JALANDHAR

Course Title: Engineering Mathematics-II
Course Code: MTH-152

L	T	P	Credits	Marks
4	1	0	4	100

Objective:
The objective of the course is to equip the students with the knowledge of concepts of vectors and geometry and their applications. A flavour of pure mathematics is also given to the readers.

Unit-A   **14 hours**
Infinite Series: Convergence and divergence of series, Tests of convergence (without proofs): Comparison test, Integral test, Ratio test, Raabe's test, Logarithmic test, Cauchy's root test and Gauss test. Convergence and absolute convergence of alternating series, Uniform Convergence and Power Series.

Unit-B   **15 hours**
Differential Calculus: Curve tracing: Tracing of Standard Cartesian; Parametric and Polar curves.
Integral Calculus: Rectification of standard curves; Areas bounded by standard curves; Volumes and surfaces of revolution of curves; Applications of integral calculus to find Centre of gravity and moment of inertia.
Multiple Integrals: Double and triple integral and their evaluation, change of order of integration, change of variable, Application of double and triple integration to find areas and volumes.

Unit-C   **13 hours**
Functions of Complex Variables: Complex Numbers and elementary functions of complex variable De-Moivre's theorem and its applications. Real and imaginary parts of exponential, logarithmic, circular, inverse circular, hyperbolic, inverse hyperbolic functions of complex variables. Summation of trigonometric series. (C+iS method).

Unit-D   **15 hours**
Vector Calculus: Scalar and vector fields, differentiation of vectors, velocity and acceleration.
Vector differential operators: Del, Gradient, Divergence and Curl, their physical interpretations. Line, surface and volume integrals.
Application of Vector Calculus: Flux, Solenoidal and Irrotational vectors. Gauss Divergence theorem. Green's theorem in plane, Stoke's theorem (without proofs) and their applications.

Reference Books:

1. Jain, R K and Iyengar, S R K. *Advanced Engineering Mathematics*, Narosa Publishing House, New Delhi (2003). 2nd Ed.
2. Singh, Ravish R. and Bhatt, M. *Engineering Mathematics a Tutorial Approach*, McGraw Hill.
3. Grewal,B.S. *Higher Engineering Mathematics*, Khanna Publication, Edition 40th Edition
4. Kreyszig, Erwin. *Advanced Engineering Mathematics*, Wiley Eastern Ltd. N.Delhi. 2003. Revised Edition

DAV UNIVERSITY, JALANDHAR

Course Title: Chemistry
Course Code: CHE151
Time: 03 Hours

L	T	P	Credits	Marks
3	0	0	3	75

Course Objectives:
The objective of the Engineering Chemistry is to acquaint the student with the basic phenomenon/concepts of chemistry for the development of the right attitudes by the engineering students to cope up with the continuous flow of new technology. The student will able to understand the new developments and breakthroughs efficiently in engineering and technology.

Expected Prospective:
This course will equip students with the necessary chemical knowledge concerning the fundamentals as well as new technology in the field of chemistry.

PART A

Spectroscopy and its Applications (12 Hours)
General Introduction: Introduction, electromagnetic spectrum, absorption and emission spectrum, atomic and molecular spectroscopy, types of molecular spectra, experimental techniques, selection rules, width and intensities of spectral lines.

UV/Visible Spectroscopy: types of electronic Transitions, Chromophores, Auxochromes, Effect of conjugation on Chromophores, Factors affecting λmax and intensity of spectral lines, effect of solvent on λmax, isobestic point, applications.

IR Spectroscopy: Infrared region, fundamental modes of vibrations and types, theory of infrared spectra, vibrational frequency and energy levels, anharmonic oscillator, modes of vibrations of polyatomic molecules, characteristic signals of IR spectrum, finger print region, factors affecting vibrational frequency; applications.

NMR Spectroscopy: Principle and instrumentation, relaxation processes, proton magnetic resonance spectroscopy, number of signals, Chemical shift, Spin-Spin Splitting, coupling constant, applications.

PART B

Water and its treatment (7 Hours)
Introduction, hardness of water, degree of hardness, units of hardness, boiler feed water: specification, scales and sludge formation; priming & foaming, boiler corrosion, caustic embrittlement, treatment of boiler feed water, internal treatment of water; softening of water by lime-soda, zeolite and ion exchange methods, desalination of water; Water for domestic use: purification of water for domestic use.

Corrosion and its Prevention (7 Hours)
Introduction; different types of corrosion - wet and dry corrosion; mechanism of wet corrosion; comparison of dry and wet corrosion, Types of electrochemical corrosion: galvanic corrosion, concentration cell corrosion or differential aeration corrosion, waterline corrosion, pitting corrosion, crevice corrosion, stress corrosion, intergranular corrosion; other forms of corrosion: atmospheric corrosion, soil corrosion, microbiological corrosion, erosion corrosion, filiform corrosion, stray current corrosion, passivity, galvanic series, factors influencing corrosion, various methods of corrosion control.

PART C

Chemistry in Nanoscience and Technology (7 Hours)
Introduction, Materials self-assembly, molecular vs. material self-assembly, hierarchical assembly, self-assembling materials, two dimensional assemblies, mesoscale self assembly,

coercing colloids, nanocrystals, supramolecular structures, nanoscale materials, future perspectives applications, nanocomposities and its applications.

Part D
Polymers and polymerization (7 Hours)
Introduction, monomer and repeating unit, degree of polymerization, functionality, classification of polymers: based on origin, monomers, structure, method of synthesis, tactility or configuration, action of heat, chemical composition, ultimate form; types of polymerization, specific features of polymers, regularity and irregularity, facticity of polymers, average molecular weights and size, determination of molecular weight by number average methods, effect of molecular weight on the properties of polymers, introduction to polymer reinforced composites.

Suggested Books:

1. William, Kemp. *Organic Spectroscopy*, Palgrave Foundations, 1991.
2. Skoog, D. A. F. Holler,J. and Timothy, A. N. *Principle of Instrumental Analysis*, *5th Edition*., Saunders College Publishing, Philadelphia, 1998.
3. Poole, C. P. Jr., Owens, F. J., *Introduction to Nanotechnology*, Wiley Interscience, 2003.
4. Foster, L.E. *Nanotechnology, Science Innovation & Opportunity*, Pearson Education, 2007.
5. Ghosh, P. *Polymer Science and technology (2nd Edition),* Tata McGraw Hill, 2008. Wiley Engineering Chemistry, Second Edition, 2013.

DAV UNIVERSITY, JALANDHAR

Course Title: Chemistry Lab
Course Code: CHE152

L	T	P	Credits	Marks
0	0	1	2	50

Time: 02 Hours
Course Objectives:
This course is intended to learn the basic concepts of Engineering Chemistry Laboratory. The present syllabus has been framed as per the recent research trends in the subject. The various experiments have been designed to enhance laboratory skills of the undergraduate students.

Expected Prospective:
The students will be able to understand the basic objective of experiments in Engineering chemistry, properly carry out the experiments, and appropriately record and analyze the results through effective writing and oral communication skills. They will know and follow the proper procedures and regulations for safe handling and use of chemicals.

List of Practicals:
1. Verify Lambert Beer's law using spectrophotometer and $CoCl_2$ or $K_2Cr_2O_7$ solution.
2. Determine the strength of HCl solution by titrating against NaOH solution conductometerically.
3. Determination of the strength of HCl solution by titrating against NaOH using pH meter.
4. Determination of total hardness of water (tap) using standard EDTA solution and Eriochrome black T indicator.
5. Determination of alkalinity of water.
6. Determination of surface tension of given liquid by using Stalagmometer.
7. Determination of residual chlorine in a water sample.
8. Determination of Flash & Fire point of given a given lubricating oil by Pensky-Marten's apparatus.
9. Determination of the viscosity of given lubricating oil by using Redwood Viscometer.
10. Preparation of a polymer phenol/urea formaldehyde resin.
11. Determination of moisture, volatile matter and ash content in a given sample of coal by proximate analysis.
12. Determination of dissolved oxygen present in given sample of water.

Suggested Books:

1. Levitt, B.P. *Findlay's Practical Physical Chemistry, 9th edition*, Longman Group Ltd., 1973.
2. Yadav, J.B. *Advanced Practical Physical Chemistry*.
3. Vogel, A. I. *A textbook of Quantitative Inorganic Analysis,* Longman Gp. Ltd, 4th edition (2000).

DAV UNIVERSITY, JALANDHAR

Course Title: Computer Fundamentals and Programming
Course Code: CSE-101

L	T	P	Credits	Marks
4	0	0	4	100

Course Objective: To get basic knowledge of computers (hardware and software), its components and Operating systems. To acquire programming skills in C, basic knowledge of Internet.

Expected Outcome: Students will feel comfortable working with computers and will have practical knowledge about Internet and procedural programming language (C Language).

PART-A
Introduction to Computers (8)
Define a Computer System, Block diagram of a Computer System and its working, memories, Volatile and non-volatile memory, cache, virtual, secondary storage devices-Magnetic Tape, Hard Disk, CD-DVD, Magnetic Disk, Various input devices including keyboard. Mouse, Joystick, Scanners and Various output devices including Monitors, Printers, Plotters.

Operating Systems (7)
Computer Software and its types and Hardware, Operating Systems, their types and functions.

PART-B
Working Knowledge of Computer System (6)
Introduction to word processors and its features, creating, editing, printing and saving documents, spell check, mail merge, creating power point presentations, creating spreadsheets and simple graphs.

Fundamentals of Internet Technology (8)
Local area networks, MAN and wide area network, Internet, WWW, E-mail, Browsing and Search engines, Internet Connectivity, Network Topology, Hub, Switches, Router, Gateway.

PART-C
Basic Constructs of C (8)
Keywords, Identifiers, Variables, Data Types and their storage, Arithmetic Operators, Relational Operators, Logical Operators, Bitwise Operators, Increment & Decrement Operators, Expressions, Conditional Expressions, Assignment Operators and Expressions, External Variables and Scope of Variables, Structure of C Program.

Control Structures (8)
Decision making statements: if, nested if, if – else ladder, switch, Loops and iteration: while loop, for loop, do – while loop, break statement, continue statement, goto statement.

PART D
Functions (6)
Advantages of using functions, structure of a function, declaring and definingfunctions, return statement, call by value and call by reference, recursion, and storage classes.
Arrays and Strings (7)

Declaration of arrays, initialization of array, accessing elements of array, I/O of arrays, passing arrays as arguments to a function, strings, I / O of strings, string manipulation functions (strlen, strcat, strcpy, strcmp).

Reference Books:

1. Jain,V.K. *Fundamentals of Information Technology and Computer Programming*. PHI. Latest Edition.
2. Goel, Anita. *Computers Fundamentals.* Pearson Publications
3. Kernighan, Brian. and Ritchie,Dennis M. *The C Programming Language.,* Prentice Hall, 2nd Edition 2007.
4. King, K.N. *C Programming: A Modern Approach.* W.W. Norton Company: 2nd edition. 2008.
5. Schildt, Herbert. *C: The Complete Reference,* Tata Mcgraw Hill Publications 4th edition.
6. Gottfired and Series, Schaum. *Programming in ANSI C.* TMH publications, 2nd Edition.1996.

DAV UNIVERSITY, JALANDHAR

Course Title: Computer Fundamentals and Programming Lab
Course Code: CSE-102

L	T	P	Credits	Marks
0	0	4	2	50

Instruction for Students: The students will be attending a laboratory session of 2 hours weekly and they have to perform the practical related to the following list.

1. Practical know-how of various internal and external Hardware components of a computer (including basic working of peripheral devices).
2. Introduction to Operating Systems; installing Windows; basics of windows.
3. Working knowledge of Internet.
4. Introduction to word processor and mail merge.
5. Introduction to MS-Excel.
6. Working on MS-PowerPoint.
7. Introduction to basic structure of C program, utility of header and library files.
8. Implementation of program related to the basic constructs in C
9. Programs using different data types in C
10. Programs using Loops and Conditional Statements in C
11. Programs using arrays single dimension in C.
12. Programs using functions by passing values using call by value method.
13. Programs using functions by passing values using call by reference method.
14. Program to implement array using pointers
15. Programs related to string handling in C

DAV UNIVERSITY, JALANDHAR

Course Title: Environment Education, Road Safety and Legal Awareness
Paper Code: EVS101

L	T	P	Credits	Marks
4	0	0	4	100

Course Objective: This course aims at understanding the students in aspects of environmental problems, its potential impacts on global ecosystem and its inhabitants, solutions for these problems as well as environmental ethics which they should adopt to attain sustainable development.

Unit 1

The multidisciplinary nature of environmental studies   **(2 Hours)**

Definition, scope and importance, Need for public awareness

Natural Resources: Renewable and non-renewable resources: **(8 Hours)**

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, case 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 induced landslides, soil erosion and desertification.

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

Ecosystem: **(4 Hours)**

- 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 function of the following ecosystem:

a. Forest ecosystem
b. Grassland ecosystem
c. Desert ecosystem
d. Aquatic ecosystems (ponds, streams, lakes, rivers, ocean estuaries)

Unit II

Biodiversity and its conservation   **4 hours**

- Introduction – Definition: Genetic, Species and Ecosystem Diversity
- Bio-geographical classification of India
- Value of biodiversity: Consumptive use, Productive use, 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, global and national efforts.
- Genetically modified crops
- Cartagena Protocol
- Biodiversity Act

Environmental Pollution   **8Hours**

- Definition,causes, effects and control measures of:

a. Air pollution
b. Water pollution
c. Soil pollution
d. Marine pollution
e. Noise pollution
f. Thermal pollution
g. Nuclear pollution

- Solid waste management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution
- Pollution case studies
- Disaster management: floods, earthquake, cyclone and landslides

Indoor Pollution: **2 Hours**

- Practical tips on how to save the self from self-inflicted pollution.
- Basics of toxicity.
- Problems of lifestyle based diseases.

- Solutions needed for safety.

Unit III

Social Issues and the Environment   **7 Hours**

- Population growth, variation among nations, Population explosion – Family Welfare Programmes.
- Environment and human health,
- From unsustainable to sustainable development
- Urban problems and 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 warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
- Wasteland reclamation
- Consumerism and waste products
- Environmental Laws: The Environment Protection Act, 1986; The Air (Prevention and Control of Pollution) Act, 1981; The Water (Prevention and control of Pollution) Act 1974; The Wildlife Protection Act, 1972; Forest Conservation Act, 1980.
- Issues involved in enforcement of environmental legislation
- Public Awareness

Human Population and Environment5 Hours

- Population Growth and Variations among Nations
- Population Explosion
- Human Rights
- Value Education
- HIV / AIDS
- Women and Child Welfare
- Role of Information Technology in Environment and Human Health
- Case Studies

Global environmental issues   **5 Hours**
- Stockholm Conference
- Brundtland Commission
- Montreal Protocol
- Kyoto protocol
- Earth Summit
- World Summit

Unit IV

Road Safety   **6 Hours**

- Road safety: Concept and its importance.
- Attitude of people towards road safety
- Role of traffic police in road safety
- Traffic rules, Traffic signs, How to obtain driving license, Traffic offences, penalties and procedures,
- Common driving mistakes, Significance of first-aid in road safety
- Role of civil society in road safety and Traffic police-public relationship
- Motor Vehicle Act 1998 (2010)

Legal Awareness   **4 Hours**

- Legal literacy
- Child labour
- Domestic Violence
- Right to Education

Field Work   **5 Hours**

- Visit to a local area to document environmental assets river/ forest/ grassland/hill/mountain
- Visit to a local polluted site – Urban / Rural / Industrial / Agricultural
- Study of common plants, insects, birds
- Study of simple ecosystems-Pond, river, hill slopes, etc (Field work equal to 5 lecture hours)

Suggested Readings:
1. Odum, E.P. *Basic Ecology.* Japan: Halt Saundurs. (1983).
2. Botkin, D.B. and Kodler, E.A.*Environmental Studies: The Earth as a living planet.* New York: John Wiley and Sons Inc. (2000)
3. Singh, J.S., Singh, S.P and Gupta S.R.,*Ecology, Environment and Resource Conservation,* New Delhi: Anamaya Publishers. (2006).
4. De, A.K. *Environmental Chemistry*. New Delhi: Wiley Eastern Ltd. (1990).
5. Sharma, P.D.. *Ecology and Environment*. Meerut: Rastogi Publications, (2004)
6. Uberoi, N.K.: *Environmental Management.* New Delhi: Excel Books, 2nd Edition,

DAV UNIVERSITY, JALANDHAR

Course Title: Human Values and Ethics
Course Code: SGS - 101

L	T	P	Credits	Marks
2	0	0	2	50

Course Objectives

➢ To sensitize students about the role and importance of human values and ethics in personal, social and professional life.
➢ To encourage students to read and realize the values of enlightened human beings.
➢ To enable students to understand and appreciate ethical concerns relevant to modern lives.

Learning Outcomes:

Students becoming responsible citizens and better professionals who practise Values and Ethics in every sphere of life.

Unit - A

Human Values

1.	**Concept of Human Values:** Meaning, Types and Importance of Values.	**2 hours**
2.	**Human Values :** Lessons from the lives and teachings of great thinkers.	**3 hours**
3.	**Value Education :** The content of value education	**2 hour**
4.	**Value crisis and its redressal.**	**1 hour**

Unit - B

Being Good and Responsible

1.	Self Exploration and Self Evaluation	**2 hour**
2.	Acquiring Core Values for Self Development	**2 hour**
3.	Living in Harmony with Self, Family, Society and Nature	**3 hours**
4.	Values enshrined in the Constitution : Liberty, Equality Fraternity and Fundamental Duties.	3 **hours**

Unit - C

Value – based living

1.	Vedic values of life	**2 hour**
2.	Karma Yoga and Jnana Yoga	**2 hours**
3.	Ashta Marga and Tri-Ratna	**2 hours**
4.	Truth, Contentment and Wisdom	**2 hours**

Unit - D

Ethical Living:

Ethics: Difference between Ethics and Values

1.	Personal Ethics	**2 hours**
2.	Professional Ethics	**3 hours**

3.	Ethics in Governance	**2 hours**
4.	Ethics in Education	**2 hours**
		Total = 35 hours

Reference Books:

1. Sreedharan,E. and Wakhlu,Bharat. Ed. *Restoring Values*. New Delhi: Sage Publications Ltd., 2010.

2. Nagarajan, K. *Indian Ethos and Values*.New Delhi: Tata McGraw Hill, 2011

3. Tripathi, A N. *Human Values*. New Delhi: New Age International Publishers, 2009

4. Sankar. *Indian Ethos and Values in Management*. New Delhi: Tata McGraw Hill Education Pvt. Ltd.

5. Osula.*Values and Ethics*. New Delhi: Asian Books, 2001.

6. Surbiramanian, R. *Professional Ethics*. New Delhi: Oxford University Press, 2013.

7. Anand, Rishabh. *Human Values and Professional Ethics,* New Delhi: Satya Prakashan, 2012

8. Bhalla, Sanjeev. *Human Values and Professional Ethics*.New Delhi: Satya Prakashan, 2012.

9. Soryan, Ritu. *Human Values and Professional Ethics*. New Delhi: Dhanpat Rai & Co. Pvt. Ltd., 2010.

10. Jayshree, Suresh, and B S, Raghavan. *Human Values and Professional Ethics*. New Delhi: S Chand & Co. Ltd.,2007.

11. Shukla, Dr. R K, Misra, Anuranjan. *Human Values and Professional Ethics*, A B Publication, 2010.

12. Sharma,Vayu. *Human Values and Professional Ethics*. New Delhi: Education of India Language publishers, 2012.

13. Kannan,S, and Srilakshmi,K. *Human Values and Professional Ethics*.New Delhi: Taxmann Publication, Pvt. Ltd., 2009

14. Srivastava, Smriti. *Human Values and Professional Ethics*. New Delhi: S K Kataria & Sons, 2001

15. Singh, Yogendra, and Garg, Ankur. *Human Values and Professional Ethics*. New Delhi: Aitbs publishers, 2011.

16. Kumar, Vrinder. *Human Values and Professional Ethics*. Ludhiana: Kalyani Publishers, 2013.

17. Gaur,R R, Sangal, R. Bagaria, GP. *Human Values and Professional Ethics*. New Delhi: Excel Books, 2010.

18. Osula, Dr. Bramwell and Upadhyay, Dr. Saroj. *Values and Ethics*, New Delhi : Asian Books Pvt. Ltd., 2011.

19. *Complete works of Swami Vivekanand*, Calcutta: Advaita Ashram, 1931.

20. Radhakrishnan, S. *Indian Philosophy*, George Allen & Unwin Ltd., New York: Humanities Press INC, 1929.

21. Dwivedi, A N. *Essentials of Hinduism, Jainism and Buddhism,* New Delhi: Books Today– 1979

22. Saraswati, Maharishi Dayanand. *Light of Truth: Satyarth Parkash*. New Delhi: Arya Swadhyay Kendra, 1975.

23. Bhan, Suraj. *Dayanand : His life and work*. New Delhi : DAVCMC, 2001.

24. Raghavan, V, and Iyer, N. *Moral and Political Thoughts of Mahatma Gandhi.* New Delhi : Oxford University Press India, 2000.

25. Singh, Narain. *Guru Nanak Dev's view of life*. Amritsar: Bhagat Puran Singh All India Pingalwara Society, 2010.

26. Dwivedi, Kapil Dev. *Esence of Vedas*. Hoshiarpur : Katyayan Vedic Sahitya Prakashan,1990.

27. Chaubey,B B. *Vedic* Concepts. Hoshiarpur : Katyayan Vedic Sahitya Prakashan, 1990.

28. Radhakrishnan, Saravapalli. *Mahatma Gandhi : Essays and Reflections on his life*. Mumbai: Zaico Publication, 1977.

29. Hardayal, Lala. *Hints for Self Culture*, Mumbai:Jaico Publishing House, 1961.

30. Saraswati Dayanand, *The Light of Truth (The Satyartha Prakashan)*.New Delhi:

31. Krishnamurti J. *The First and Last Freedom*

32. Maharishi, Sri Raman. *Who Am I.*

33. Balsekar, Ramesh S. *Peace and Harmony in Daily Living*. New Delhi: Yogi Impressions.

DAV UNIVERSITY, JALANDHAR

L	T	P	Credits	Marks
2	0	0	2	50

Course Title: Fundamentals of Management
Course Code: MGT151

Course Objective: The course aims at developing an appreciation about the principles, functions of management and functioning of professional organizations.

Learning Outcomes: After completion of course students will be able to work professionally in organizations. They should be able to apply the principles and theories of management in the work context.

Unit – A

- Introduction to business management- Definition of management, characteristics of management, management as an art, science and profession, universality of management, levels of management, management process, managerial roles and skills, functional areas of management.   4 hours

- Planning- Introduction, planning and plan, strategy and strategic planning, main components of plan, vision, mission, purpose, objectives, goals and targets, Management by Objectives (MBO),   3 hours

Unit – B

- Forecasting: Meaning, process and importance, Decision-Making Process and types of decisions.   3 hours

- Organizing- Definition, characteristics, organizing process, authority, responsibility, power, delegation, decentralization, departmentation, span of control, organization chart and manuals. Forms of Organization Structure   4 hours

Unit – C

- Staffing- Introduction, factors affecting and qualities of good staffing, manpower planning, recruitment and selection.   *3 hours*

- Leadership- Characteristics, importance, style, role, quality and skills of leader.   *2 hours*

- Directing and Co-ordination- meaning, Fundamentals of motivation, motivation theories : Maslow's need hierarchy, Herzberg's Two-Factor Theory of Motivation, McGregor's Theory X and Theory Y.   *4 hours*

Unit – D

- Communicating- Definition, Characteristics, Communication process, importance and types of communication, barriers to communication.   4 hours

- Controlling- Meaning, characteristics, scope, control process, types of control, designing effective control systems.   3 hours

                                                                  30 hours

Text Book:
1. Rudani Ramesh, Principles of Management, Tata, McGraw-Hill Education, 1st Edition

Reference Books:

1. Koontz H & Weihrich. *Essentials of Management*, 9th Edition 2013
2. Prasad L M, *Principles and Practices of Management*. New Delhi: Sultan Chand & Sons.
3. Stoner J A F, Freeman R E and Gilbert D R. *Management*, Pearson Education, 6th Edition

DAV UNIVERSITY, JALANDHAR

Course Title: Engineering Drawing
Course Code: MEC-101
Total Lectures: 90

L	T	P	CREDITS	Marks
2	0	4	4	100

Course Objectives: Students will get knowledge of various lines and dimension system, knowledge the concepts of orthographic projections, knowledge of developing the surfaces.

Part - A

Drawing Techniques   **(12)**

Introduction to drawing instruments, various types of lines, principles of dimensioning, size and location dimensions, symbols, lettering in single stroke as per SP-46 code

Scales   **(6)**

Concept of Reduced and Enlarge scale, Construction of plane and diagonal scales

Part - B

Projection of Points   **(6)**

Concept of horizontal and vertical planes (Principle planes). First and third angle projections; projection of points in all four quadrants, shortest distance from reference line

Projection of Lines and Planes   **(18)**

Projection of line perpendicular to one plane, inclined to one and both the reference planes and their traces. Plane perpendicular to one plane inclined to one and both the reference planes. Profile plane. Auxiliary planes

Part - C

Projection of Solids   **(12)**

Right and oblique solids; solids of revolution and polyhedrons etc. and projection of solid with axis perpendicular to one plane and parallel to one or both reference planes. Projection of solid with axis inclined to one or both reference axis.

Sectioning of Solids   **(9)**

Theory of sectioning, types of sectioning, and their practice on projection of solids, sectioning by auxiliary planes

Part - D

Interpretation of Views   **(9)**

Draw orthographic views from isometric view, Missing line and missing view

Development of Surfaces   **(18)**

Method of Development, Development of surfaces (pyramids, prisms, cylinders and cones). Development of oblique solids

Reference:

1. Jolhe, A.J., *"Engineering Drawing"*. New Delhi: Tata McGraw-Hill.
2. Gill, P.S., *"Engineering Drawing"*. Ludhiana: S.K. Kataria and Sons.
3. French, T.E. and Vierck, C.J., **"***Graphic Science***"**. New York: McGraw-Hill.
4. Zozzora, F, *"Engineering Drawing"* New York: McGraw Hill.

DAV UNIVERSITY, JALANDHAR

Course Title: Engineering Physics

Course Code: PHY-151

L	T	P	Credits	Marks
3	1	0	3	75

Unit-1

Physical Optics: (14)

Interference: Division of wave front, Fresnel's biprism, division of amplitude, Newton's rings and applications.

Diffraction: Difference between Fraunhofer and Fresnel diffraction, Fraunhofer diffraction through a slit, plane transmission diffraction grating, its dispersive and resolving power.

Polarization: Polarised and unpolarised light, double refraction, Nicol prism, quarter and half wave plates.

Unit-2   (12)

Laser: **Spontaneous and stimulated emission, Laser action, Characteristics of laser beam, concept of coherence, He-Ne laser, Semiconductor lasers and applications**

Fibre optics: Propagation of light in fibres, numerical aperture, single mode and multimode fibres, applications

Unit-3   (9)

Dielectrics: Molecular Theory, polarization, displacement, susceptibility, dielectric coefficient, permittivity, relations between electric vectors, Gauss's law in the presence of a dielectric, energy stored in an electric field, behaviour of dielectric in alternating field and Clausius Mosotti equation.

Unit-4   (10)

Quantum Mechanics: Difficulties with Classical physics, Introduction to quantum mechanics-simple concepts, Black Body radiation, Planck's Law of radiation and its limitations, Group velocity and phase velocity, Schrodinger's wave equations and their applications.

Super conductivity: Introduction (experimental survey), Meissner effect, Type I and type II superconductors, London equation, Elements of BCS theory, Applications of superconductors.

Reference Books:

1. F.W. Sear (Narosa).*Electricity and Magnetism*
2. Resnick & Halliday (Wiley Eastern). Physics Vol. 1 & 2
3. Lal, Brij and Subramanyam. *A Text Book of Optics*
4. Jenkin's and White. *Physical Optics*
5. Griffiths, David J. *Electromagnetism*
6. Beiser, Arthur (TMH). *Perspective of Modern Physics*

DAV UNIVERSITY, JALANDHAR

Course Code: PHY152: Engineering Physics Laboratory

(60hrs)   **Max Marks: 50**

Objective: The laboratory exercises have been so designed that the students learn to verify some of the concepts learnt in the theory courses. They are trained in carrying out precise measurements and handling sensitive equipment.

List of Experiments:

Experimental skills: General Precautions for measurements and handling of equipment, representation of measurements, Fitting of given data to a straight line, and Error analysis, Significant figures and interpretation of results

1. To determine the Refractive Index of the Material of a given Prism using Sodium Light.
2. To determine the Dispersive Power and resolving power of the Material of a given Prism using Mercury Light.
2. To determine wavelength of sodium light using Fresnel Biprism.
3. To determine wavelength of sodium light using Newton's Rings.
4. To determination Wavelength of Sodium Light using Michelson's Interferometer.
5. To determine the wavelength of Laser light using Diffraction of Single Slit.
6. To determine the wavelength of (1) Sodium and (2) Mercury Light using Plane Diffraction Grating.
7. To determine the (1) Wavelength and (2) Angular Spread of HeNe Laser using Plane Diffraction Grating.
8. To study the wavelength of spectral lines of sodium light using plane transmission grating.
9. To study the specific rotation of sugar solution Laurent's half shade polarimeter method
10. To study the numerical aperture and propagation losses using HeNe laser Optical fibre set up .
11. To compare the focal length of two lenses by Nodal slide method.
12. To find the unknown low resistance by Carey Foster bridge.
13. To determine the beam divergence of the HeNe laser.
14. To study the Meissner's effect insuperconducting sample.
15. To study the Faraday law of electromagnetic induction.
16. To study the capacitance by flashing/quenching of Neon bulb kit
17. To compare the two unknown capacitances of two capacitors by using DeSauty's bridge.
18. To find our out the unknown inductance by using the Anderson's bridge method.
19. To study the numerical aperture and propagation losses for HeNelaserby using the optical fiber set up for
20. To study the Planck's constant by using photoelectric cell method.

Course Title: Electrical and Electronics Technology	L	T	P	Credits	Marks
Course Code: ELE-101	4	0	0	4	100

UNIT 1: D.C Circuit Analysis
Voltage source, current source, dependent and independent sources, analysis of D.C circuit by KCL and KVL , Nodal and Mesh analysis, The venin theorem , Norton theorem, superposition theorem, Maximum Power Transfer Theorem

UNIT 2: A.C Circuit Analysis
Review of single phase A.C. circuit under sinusoidal steady state, solution of R.L.C. Series circuit, the j operator, complex representation of impedance, solution of series and parallel circuit, series and parallel resonance, 3 phase A.C. Circuit, star and delta connections, line and phase quantities solution of 3 phase circuits, balance supply voltage and balanced supply voltage and balance load, phasor diagram, measurement of power and power factor by two wattmeter method.

UNIT 3: Magnetic Circuit:
Review of laws of electromagnetism, Flux, MMF and their relation. Comparison of electrical   and magnetic circuit, B-H Curve, saturation leakage and fringing. Analysis of series and parallel magnetic circuit, AC Excitation in magnetic circuits, Hysteresis and eddy currents.

UNIT 4: Transformers
 Single phase transformer, basic concepts constructional detail, type, voltage current and impedance Transformation, phasor diagram, equivalent circuit, voltage regulation, oc/sc test, losses and efficiency concept of All day efficiency , autotransformer.

UNIT 5: Rotating Electrical Machines
Basic concepts, working principle and general construction of DC machines (motor/generators), torque and EMF expression.

UNIT 6: Basic Electronics:
P-Type and N-Type semiconductor, concept of diode, transistor and their application, introduction to OPAMP, application of op amp as a subtractor , summer, differentiator, integrator, logic gates AND ,OR, NOT, NOR, NAND etc.

Suggested Books:
1. Sukhija, M.S and Nagsarkar, T.K. *Basic Electrical and Electronics Engineering*. Oxford University Press, 2012.
2. Husain, Ashfaq and Harsoo, Ashfaq.*Fundamentals of Electrical Engineering*. Dhanpat Rai and Co., 2013,4th Edition
3. Mittle,V.N. *Basic Electrical Engineering*.Tata McGraw Hill Publication. 2nd Edition
4. Theraja, B.L. and Theraja, A.K. *A Text Book of Electrical Technology,* Volume-1.New Delhi: S. Chand Publication.
5. Jena, Debashisha. *Basic Electrical Engineering*. Wiley India Publication, 2012. 1st edition.
6. Theraja,B.L. and Sedha, R.S. *Principles of Electric Devices and Circuits.* S. Chand Publication, 1st edition, 2006

DAV UNIVERSITY, JALANDHAR

Course Title: Electrical and Electronics Technology Laboratory
Course Code: ELE-102

L	T	P	Credits	Marks
0	0	2	2	50

List of Experiments

1. To verify Ohm's Law, Kirchhoff's Current Law and Kirchhoff's Voltage Law.

2. To verify Thevenin's and Norton's theorems.

3. To verify Superposition theorem.

4. To verify Maximum Power Transfer theorem.

5. To study frequency response of a series R-L-C circuit and determine resonant frequency and Q-factor for various values of R, L and C

6. To study frequency response of a parallel R-L-C circuit and determine resonant frequency and Q-factor for various values of R, L and C.

7. To perform direct load test of a transformer and plot efficiency versus load characteristics.

8. To perform open circuit and short circuit test on transformer.

9. To perform speed control of DC motor.

10. Measurement of power in a three phase system by two wattmeter method.

11. To plot the V-I characterics of PN-junction diode.

12. To verify the truth table of logic gates.

DAV UNIVERSITY, JALANDHAR

	L	T	P	CREDITS	Marks
Course Title: Fundamentals of Mechanical Engineering **Course Code: MEC-102**	4	0	0	4	100

Course Objectives: To impart the basic knowledge of thermodynamic principles, various power producing and power absorbs devices. To impart the knowledge of mechanical devices and manufacturing processes.
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Part - A
Fundamental Concepts of Thermodynamics (6hours)

Introduction, Thermodynamic System and its types, Boundary and its types, Surroundings, Thermodynamic properties, processes and cycles, Working Substance, Units and Dimensions, Mechanical and Thermodynamic work, Equations for work done in various processes, Heat, Pressure, Pressure measurement, Pressure exerted due to a column of fluid, Barometer, Mechanical gauges for pressure measurement: Bourdon tube pressure gauge, Diaphragm pressure gauge, Dead weight pressure gauge, Manometer: Piezometer, Single tube manometer(Numerical), Double tube manometer, Differential manometers

Laws of Thermodynamics (6hours)

Zero law of Thermodynamics, Thermodynamic property and Thermometers, Principle of temperature measurement, Scale of temperature, Microscopic and Macroscopic point of view, Quasi Static Process, Reversible and Irreversible processes, Energy and Forms of Energy i.e. store and transient, Law of conservation of energy, Joule's Experiment, First law of thermodynamics, Work is a path function and properties are point function, Internal energy, Enthalpy, Specific heat at constant volume, Specific heat at constant pressure, Adiabatic Index, Limitations of first law of thermodynamics

Part - B
Heat Transfer (5hours)

Introduction, Modes of heat transfer, Thermal Conductivity, Thermal Resistance, Fourier law, Newton's law of cooling, Stefan Boltsmann's Law, Heat Exchangers, Insulation, Properties of insulation, Types of Insulations

Power Producing Devices (6hours)

Forms of matter, Steam boiler, Classification of boilers, Types of boilers, Advantages of superheating the steam, Essentials of a good boiler, Comparison between Water tube and Fire tube boilers, Steam Turbines, Classification, Advantage, Working of common type of turbines, Hydraulic Turbines, Internal combustion engines, Two and Four stroke SI engines

Part - C
Power Absorbing Devices (5hours)

Power Absorbing Devices, Difference between Hydraulic pump, Air compressor, Fan, Blower, Classification, Positive displacement and Dynamic, Reciprocating, Rotary, Centrifugal, Axial along with their types, Uses of compressed air.

Principles of Design (5hours)

Need of design, Stress and Strain and its types, Hooke's law, Poisson's ratio, Stress- Strain Curve, Factor of Safety, Material properties and selection, Factors affecting material selection, Aesthetics.

Part - D
Mechanical Devices (5hours)

Individual and group drive system, Belt drive, Ropes, Chain drive, Gear drive, Clutches, Brakes

Machine Elements (5hours)

Power transmission shafts, Types of shafts, Shaft material, Application of shafts, Axle, Keys, Coupling and their types, Flanged coupling, Oldham's coupling, Universal coupling, Bearings and their types, Flywheel construction and types, Governor

Reference Books:
1. Rajan, T.S. *Basic Mechanical Engineering.* New Age Publishers.
2. Singh, Sadhu. *Principles of Mechanical Engineering.* S Chand Publishers.
3. Shankar V.P. *Basic Mechanical Engineering.* Laxmi Publishers.
4. Phthak, G. K. *Basic Mechanical Engineering.* Rajsons Publications.
5. Kumar, Parveen. *Basic Mechanical Engineering.* Pearson Education

DAV UNIVERSITY, JALANDHAR

Course Title: Basic Communication Skills
Course Code: ENG151
No. of Lectures: 45

L	T	P	Credits	Marks
3	1	0	3	70

Course Objective:
- To enhance students' vocabulary and comprehensive skills through prescribed texts.
- To hone students' writing skills.

Learning Outcomes:

Unit – A Applied Grammar (Socio-Cultural Context)	
• Parts of Speech: Noun, Pronoun, Adjective, Verb, Adverb, Preposition, Conjunction, Interjection	4 hours
• Tenses (Rules and Usages in Socio-cultural contexts)	5 hour
• Modals: Can, Could, May, Might, Will, Would, Shall, Should, Must, Ought to	4 hours
• Passives	3 hours
• Reported/Reporting Speech	3 hour
Unit – B Reading (Communicative Approach to be Followed)	
• J M Synge: Riders to the Sea (One Act Play)	5 hours
• Anton Chekhov : Joy (Short Story)	4 hours
• Swami Vivekanand : The Secret of Work (Prose)	5 hours
Unit – C Writing	
• Paragraph and Essay Writing	4 Hours
• Letter Writing: Formal and Informal	4 hours
• Notice and Email	4 hours

Refernce Books:
  a. Books
  1. Kumar, Sanjay. and Lat, Pushp. *Communication Skills*. India: OUP, 2012.
  2. Vandana, R. Singh. *The Written Word* by. New Delhi: Oxford University Press, 2008.
  b. Websites

  1. www.youtube.com (to download videos for panel discussions)
  2. www.letterwritingguide.com
  3. www.teach-nology.com
  4. www.englishforeveryone.org
  5. www.dailywritingtips.com
  6. www.englishwsheets.com
  7. www.mindtools.com

DAV UNIVERSITY, JALANDHAR

Course Title: General Knowledge and Current Affairs
Course Code: SGS-102

L	T	P	Credits	Marks
2	0	0	2	50

Course Objectives

The study of General Knowledge and Current Affairs has become even more important today. It is not only a major constituent of most competitive examinations but also aids in acquiring general awareness.

The objectives of this course are :

- To introduce students with the course and contents of various competitive examinations

- To prepare a foundation for appearing in various competitive examinations

- To sensitize the students about the current issues and events of national and international importance

- To provide opportunity to the students to study inter disciplinary subjects like Geography, Science, Economy, Polity, History, International Relations etc.

Learning Outcomes:

- Students would get an opportunity to aspire, plan and prepare for various competitive examinations in advance.

- It would polish their personalities and sharpen the skills of debates, group discussions, communication, interview etc.

- Students would acquire general awareness of National and International Events.

Unit — A

General Geography
World Geography :   **3hours**
The Universe, The Solar System, The Earth, Atmosphere, The World we live in, Countries rich in Minerals, Wonders of the World, Biggest and Smallest.

Indian Geography :   **3hours**
Location, Area and Dimensions, Physical Presence, Indian States and Union Territories, Important sites and Monuments, Largest-Longest and Highest in India.

General History   **3hours**
Glimpses of India History, Ancient Indian, Medieval India, Modern India, Various Phases of Indian National Movement, Prominent Personalities. Glimpses of Punjab history with special reference to period of Sikh Gurus.

Glimpses of World History   **3hours**
Important Events of World History, Revolutions and Wars of Independence, Political Philosophies like Nazism, Fascism, Communism, Capitalism, Liberalism etc.

Unit — B
General Polity   **3hours**
World Politics – Major Actors and their political relations,UNO and other organizations viz: WTO, EU, SAARC, ASEAN, BRICS, WTO, OIC, OAU, OPEC, GCC etc.

Indian Polity : Constitution of India :   **3hours**
Important Provisions, Basic Structure, Union Government, Union Legislature and Executive, State Government: State Legislature and Executive,Indian Judiciary, The Election Commission, Panachayati Raj System, RTI etc.

General Economy :   **3hours**
The process of liberalization, privatization, globalization and Major World Issues. Indian Economy, Indian Financial System, Major Economic Issues, Economic Terminology.

Unit — C
General Science :   **3hours**
General appreciation and understandings of science including the matters of everyday observation and experience. Inventions and Discoveries.

Sports and Recreation :   **3hours**
The World of Sports and recreation. Who's Who is sports, Major Events,Awards and Honours. Famous personalities, Festivals. Arts and Artists.

Current Affairs :   **3hours**
National and International Issues and Events in News. Governments Schemes and Policy Decisions.

India and Neighbours:
Current phase relations with China, Pakistan, Bangladesh, Nepal, Sri Lanka and Afghanistan

Unit — D
Miscellaneous Information   **2hours**
Who is who
Books and Authors, Persons in News, Awards and Honours, Abbreviations and Sports
                                                                 Total : 35 Hours

Refernce Books :
- Aggarwal, R. S. *Advance Objective General Knowledge.* New Delhi: S. Chand Publisher (2013)
- Sen,S.*Concise General Knowledge Manual.*New Delhi: Unique Publishers,2013
- Verma, R P. *Encyclopedia of General Knowledge and General Awareness* Penguin Books Ltd (2010)
- Thorpe, Edgar. and Thorpe,Showick. *General Knowledge Manual.* Delhi: The Pearson. 2013-14
- Mohanty, Muktikanta. *General Knowledge Manual.* Delhi: Macmillan Publishers India Ltd. 2013-14
- India. *Government of India (Ministry of Information Broadcasting). New Delhi:* Publication Division, 2013.
- Methew, Mammen. *Manorama Year Book*, Kottayam: Malayalam Manorama Publishers, 2013.
- *Spectrum's Handbook of General Studies*. New Delhi: Spectrum Books (P) Ltd. 2013-14.
- *Unique Quintessence of General Studies*. Unique Publishers. 2013-14.

Current Affairs

Magazines

Economic and Political Weekly, Yojna, the Week, India Today, Frontline, Spectrum.
Competition Success Review, Competition Master, Civil Services Chronicle, Current Affairs,
World Atlas Book

Newspapers

The Hindu, Times of India, The Hindustan Times, The Tribune

Course Title: **Manufacturing Practice**
Course Code: MEC-104

L	T	P	Credits	Marks
0	0	4	2	50

Course Objectives:
1. Know basic workshop processes, Read and interpret job drawing.
2. Identify, select and use various marking, measuring, holding, striking and cutting tools & equipment's.
3. Operate and control different machines and equipment's.

Carpentry Shop

a) Preparation of half lap joint

b) Preparation of Mortise and Tenon Joint

c) Preparation of a Dove & Tail joint

d) To prepare a White board duster

Welding Shop:

a) Preparation of Joint by Arc Welding

b) Preparation of Joint by using Gas Welding

c) Preparation of Joint by MIG/ TIG Welding

d) Preparation of Joint by Spot/ Seam Welding

Smithy Shop

a) To Forge the L – Hook

b) To Forge a Chisel

c) To Forge a Cube from a M.S Round

d) To forge a screw driver

Fitting Shop

a) Filing a dimensioned rectangular or square piece and prepare a sq. fitting

b) Preparation of T fitting male part

c) Preparation of U fitting Female part

d) Internal thread Cutting in Square piece and external thread cutting on a rod and assembling as a paper weight

Foundry Shop:

a) To make a Mould of solid pattern

b) To prepare a mould of sleeve fitting using gating system

c) To make a Mould of Split Pattern using Cope & Drag

d) To check the Hardness of the Mould

To check the Moisture Content in the Molding Sand

To check the Compressive Strength of Molding Sand

Sheet-Metal Shop

a) Preparation of a funnel from G.I. sheet

b) Preparation of a book rack stand from G.I. Sheet

c) Preparation of a leak proof tray with inclined edges from G.I. Sheet

d) Preparation of a square pen stand from G.I. Sheet with riveting at corners

Machine Shop

a) To make a job using step turning and grooving

b) To make a job using knurling and threading

c) To make a multi operation job on a Lathe machine

d) To make V – slot by using shaper machine

Electrical Shop

a) Layout of electrical tube light wiring

b) Layout of stair case wiring using two way switch

c) Testing and rectification of simulated faults in electrical appliances such as 'Electric Iron' Ceiling Fan. Electric kettle

d) To fabricate a circuit for the electrical wiring of, Fan with regulator and Bulb through a main switch and its testing using a series lamp

Refernce Books:

1. Johl K. C. *"Mechanical Workshop Practice",* Prentice Hall India, 1st Edition.
2. Bawa H.S.*"Workshop Technology",* Tata McGraw Hill, 7th Edition.

DAV UNIVERSITY, JALANDHAR

Course Title: Stenography
Course Code: SGS104

L	T	P	Credits	Marks
3	0	0	1	25

Course Objective: The course is to inculcate writing and listening skills among the students. This would act as building blocks for the learner to begin the study of stenography. As the learners are from the senior secondary background the course has been created keeping in mind their requirements for the future.

Learning Outcome:

After going through this course the participant would have understood the basic concepts of shorthand language and would be able to apply them in daily life. Completion of the course will improve their speed of writing and typing. They would be able to pronounce the English words correctly and can use effective English communication.

Unit A I. The Consonants II. The Vowels III. Intervening Vowels and Position Grammalogues, Punctuation IV. Alternative Signs for r and h V. Diphthongs Abbreviated w. VI. Phaseography Tick the VII. Circle s and z—Left and Right Motion VIII. Stroke s and z IX. Large Circles sw and ss or sz X. Loops st and str.	12 hours
Unit B XI. Initial Hooks to Straight Strokes and Curves XII. Alternative Forms for fr, vr, etc. Intervening Vowels XIII. Circle or Loop Preceding Initial Hook XIV. n and f Hooks XV. Circles and Loops to Final Hooks.XVI The shun hook. XVII. The Aspirate. XVIII. Upward and Downward r.XIX. Upward and downward l and sh. XX. Compound consonants XXI. Vowel indication**.**	12 hours
Unit C XXII. The halving principle (section 1). XXIII. The halving principle (section 2). XXIV. The Doubling principle. XXV. Diphonic or two vowel signs. XXVI. Medial semicircle. XXVII. Prefixes negative words. XXVIII. Suffixes and terminations. XXIX. Contractions. XXX. Figures, etc .proper names.	11 hours
Unit D XXXI. Note taking, transcription, etc. XXXII. Essentials vowels. XXXIII. Special contractions. XXXIV. Advanced pharseography. XXXV. Intersections. XXXVI. Business phrases. XXXVIII. Banking and stockbroking phrases. XXXIX. Insurance and shipping phrases. XL. Technical and railway phrases. XLI. Legal phrases. XLIII. Special list of words. XLIV. Shorthand in practice.	10 hours
Total	**45 hours**

Text Book:
Pitman. *Pitman Shorthand Instructor and Key*, New Delhi: Pearson publisher. 2001.

DAV UNIVERSITY, JALANDHAR

Course Title: Stenography Lab
Course Code: SGS105

L	T	P	Credits	Marks
0	0	1	1	25

Course Objective: The course is to inculcate writing and listening skills among the students. This would act as building blocks for the learner to begin the study of stenography. As the learners are from the senior secondary background the course has been created keeping in mind their requirements for the future.

Learning Outcome:

After going through this course the participant would have understood the basic concepts of typing and would be able to apply them in daily life. Completion of the course will improve their speed of typing and typing skills.

Unit A Beginner : Basics-fjdk, sla;, ghty,vmbn,ruei,woqp,cx. .	04 hours
Unit B Shift keys, numeric pad, Digits and symbols	03 hours
Unit C Intermediate- Syllables and words.	04 hours
Unit D Expert- Paragraphs and Stories	04 hours
Total	**15 hours**

DAV UNIVERSITY, JALANDHAR

THIRD SEMESTER

Course Title: Object Oriented Programming
Course Code: CSE201

L	T	P	Credits	Marks
4	0	0	4	100

Course Objective: To understand the basic concepts of object oriented programming language.

Learning Outcomes: Students will feel comfortable working with computers and will have practical knowledge about Object-Oriented programming language (C++ Language).

PART-A

Object-Oriented Programming Concepts
Introduction, comparison between procedural programming paradigm and object-oriented programming paradigm, Basic concepts of object-oriented programming — concepts of an object and a class, interface and implementation of a class, abstraction, encapsulation, data hiding, inheritance, overloading, polymorphism, Declaring and initializing pointers, accessing data through pointers.

Standard Input/Output
Concept of streams, hierarchy of console stream classes, Input/output using overloaded operators >> and << of I/O stream classes, formatting output, Manipulators.

(15 Hours)

PART-B

Functions and Arrays
Defining a function, Actual and Formal Arguments, Local and global variables, Nested functions, recursive functions, Array declaration, character array, multidimensional array, arrays and pointers

Classes and Objects
Specifying a class, creating class objects, accessing class members, Access specifiers, static members, nested classes, local classes, abstract classes, Constructors and Destructors, copy constructor, dynamic constructors, explicit constructors, advantages and disadvantages of constructor and destructor.   **(15 Hours)**

PART-C

Operator Overloading and Type Conversion
Overloading operators, rules for overloading operators, Overloading of various operators, Type conversion.

Inheritance
Introduction, defining derived classes, Types of inheritance, virtual base class, Pure virtual functions, overriding member functions.

Polymorphism
Concept of binding - early binding and late binding, Virtual functions, abstract classes, Virtual destructors.

(14 Hours)

PART-D
Exception Handling
Review of traditional error handling, basics of exception handling, Exception handling mechanism, Throwing mechanism, catching mechanism.
Files
File streams, hierarchy of file stream classes, Error handling during file operations, Reading/writing of files, updating files.   **(14 Hours)**

Reference Books:-

1. Balagurusamy, E. *Object Oriented Programming with C++.* Tata McGraw Hill.
2. Ravichandran, D. *Programming in C++.*
3. Lafore R. *Object Oriented Programming in C++.* Waite Group.
4. Schildt, Herbert. *The Complete Reference to C++ Language.* Osborne: McGraw Hill.
5. Stroustrup, Bjarne. *The C++ Programming Language.* Addison Wesley.
6. Lippman, F. B. *C++ Primer.* Addison Wesley.

DAV UNIVERSITY, JALANDHAR

Course Title: Data Structure Programming using C
Paper Code: CSE203

L	T	P	Credits	Marks
4	0	0	4	100

Objective :-To impart knowledge of Data Structure and How to design algorithms to solve different types Of problems and to differentiate linear and nonlinear data structure.

Learning outcomes:-After reading data structure ,student will be able to explain data structure and its scope in computer science. After completion of data structure, students will be able to find the best solution about specific types logical and mathematical problems.

PART-A

Introduction
Basic terminology, Data structure and their types, Data structure operations Algorithm: Complexity, Time Space Trade off, Control structure and Complexity of algorithm, Big Oh Notation. Introduction
Array
Representation of Linear array in memory, traversing linear array, Searching Techniques: Linear search, Binary Search, Multi-dimensional array: 2D-array, representation of 2D-array in memory. Record, record structure and matrices.

(14Hours)

PART-B
Linked List
Representation of Linear Linked List , Traversing a linked list , operations on linked list , Memory Allocation , Garbage collection , overflow and underflow , Doubly linked list , circular Linked List , Header Linked List , application of linked list**.**

(14Hours)

PART-C
Stacks and Queues
Operation on stack : push , arithmatic expression , polish notation , quick sort : An application of stack , complexity of quick sort , Recursion , Tower of Honoi , representation of queue , Deques , priority queues.
Trees
Basic terminology, Binary tree, complete binary tree, extended binary tree 2-tree, traversing binary tree: Preorder, Inorder and Postorder. Binary search tree, Searching& Inserting in binary search tree.Heap; Heapsort, General tree.

(14Hours)

PART-D
Graphs
Basic terminology, Representation of Graph, Traversing of Graph; BFS, DFS. Applications of Graph.
Sorting
Bubble Sort, Insertion Sort, Selection Sort, Merging. Merge Sort, Hasing; Hash Functions**.**

(14Hours)

Reference Books:-

1. Langsam, Y. and Augenstein, M.J. Tanenbaum, A.M., Pearson Education. 2nd Edition
2. Kruse, R. Tondo. And C.L. B. Leung ,S. Mogalla. *Data Structures & Program Design in C*. Pearson Education. 2nd Edition.
3. Horowitz, E. and Sahni,S. Mehta, D. *Fundamentals of Data Structures in C++.* Universities Press 2. Donald E. Knuth. 2nd Edition.

DAV UNIVERSITY, JALANDHAR

Course Title: Digital Electronics
Paper Code: ECE201

L	T	P	Credits	Marks
4	0	0	4	100

Course Objectives: The purpose of this course is to develop a strong foundation in analysis and design of digital electronics.

Learning Outcomes: At the end of the course students should be able to:
- Understand concepts of combinational and sequential circuits.
- Analyze the synchronous and asynchronous logic circuits.
- Design Combinational and sequential systems.
- Understand concepts of memory, programmable logic and digital integrated circuits

PART-A
Number System and Binary Code
Introduction,Binary,Octal,Hexadecimal & some nonstandard Number:-Conversions, Addition, Subtractions, Multiplication, Division, Weighted- Non weighted codes, Signed - unsigned numbers, Binary Subtractions using 1's and 2's compliment, ASCII code, Excess 3 code, Grey code, BCD code and BCD additions & BCD Subtractions.
Minimization of logic function
Review of gates: - OR, AND, NOT, NOR, NAND, EX-OR, EX-NOR, Universal gates.

(14Hours)

PART-B

Minimization of logic function
Basic theorem of Boolean algebra, Sum of Products and Product of Sums, canonical form, Minimization using: - Boolean algebra, K-map and Q-M method.
Combinational Circuits
Introduction, Combinational circuit design, Encoders, decoders, Adders, Sub tractors and Code converters, Parity checker, seven segment display, Magnitude comparators. Multiplexers, De-multiplexer, Implementation of Combinational circuit using MUX & De-MUX.

(14Hours)

PART-C
Sequential Circuits
Introduction, flip flops, Clocked flip flops, SR, JK, D, T and edge triggered flip-flops, Conversions of Flip flops, Shift Registers, Type of Shift Registers, Ring Counter, Twisted Ring Counter, Counters, Counter types, counter design with state equation and state diagrams.
D/A and A/D Converters
Introduction, Weighted register D/A converter, binary ladder D/A converter, steady state accuracy test, monotonicity test, D/A accuracy and resolution, A/D converter:- Simultaneous, Counter type, Continuous, Successive approximation, Single and dual slope A/D converter, A/D accuracy and resolution.

(14Hours)

PART-D

Semiconductor Memories
Introduction, Memory organization, Classification and characteristics of memories, Sequential memories, ROMs, R/W memories, Content addressable memories, PLA and PAL.
Logic Families
RTL, DCTL, DTLTTL, ECL, CMOS and its various types, Comparison of logic families.

(14Hours)

Refernce Books Books:-

1. Mano, Morris. *Digital Design*. Prentice Hall of India Pvt. Ltd
2. Donald P.Leach and Malvino, Albert Paul. *Digital Principles and Applications, 5 ed.* New Delhi: Tata McGraw Hill Publishing Company Limited, 2003.
3. Jain, R.P. *Modern Digital Electronics, 3 ed.* New Delhi: Tata McGraw–Hill publishing Company limited. 2003.
4. Floyd, Thomas L. *Digital Fundamentals* New Delhi: Pearson Education. 2003
5. Tocci, Ronald J. and Widmer Neal S. and Moss,Gregory L. *Digital System -Principles and Applications.* Pearson Education.
6. Roth. *Fundamentals of Logic Design*. Cengage Learning

Course Title: Discrete Mathematics
Course Code: MTH 254

L	T	P	Credits	Marks
4	1	0	4	100

Course Objectives: The objective of this course is to acquaint the students with the basic concepts in Discrete Mathematics and Graph Theory. It includes the topic like Set Theory, Functions, Relations, Graph and Trees.

PART-A
Set Theory: Sets and Subsets, Set Operations and the Laws of Set Theory and Venn Diagrams. Relations and Functions: Cartesian Products and Relations, Introduction to Binary relations, equivalence relations and partitions, Partial order relations, Hasse diagram. Inclusion and exclusion principle. Mathematical Induction.

(14 hours)

PART-B

Mathematical Logic: Basic logical operations, conditional and bi-conditional statements, tautologies, contradiction, Quantifiers, prepositional calculus.Recursively Defined Sequences. Solving Recurrence Relations.The Characteristic Polynomial.Solving Recurrence Relations: Generating Functions.Basics of Counting and the Pigeon-hole Principle.

(14 hours)

PART-C
Graphs and Planar Graphs: Basic Terminology, Special types of Graphs. The Handshaking Theorem, Paths and Circuits Shortest paths.Connectivity of Graphs.Isomorphism of Graphs.Homeomorphic Graphs.Eulerian and Hamiltonian Graphs.Planar and Non Planar Graphs.Euler's formula. Graph Coloring.Travelling Salesman Problem.

(14 hours)

PART-D
Trees: Basic Terminology. Binary Trees. Tree Traversing: Preorder, Postorder and Inorder Traversals. Minimum Spanning Trees, Prim's and Kruskal'sAlogrithm. Boolean AIgebras: Boolean Functions, Logic Gates, Lattices and Algebraic Structures.

(14 hours)

Reference Books:-

1. Rosen, Kenneth H. *Discrete Mathematics and its Applications.* McGraw Hill, 2007. 6th Edition.
2. Malik,D.S. and Sen, M.K. *Discrete Mathematical Structures: Theory and Applications.* Thomson, 2004.
3. Liu, C. L. *Elements of Discrete Mathematics.* McGraw Hill, International Edition, Computer Science Series,

DAV UNIVERSITY, JALANDHAR

Course Title: Advanced Communication Skills
Course Code: ENG251

L	T	P	Credits	Marks
4	1	0	4	100

Course Objectives:

- To improve fluency in speaking English.
- To enhance students' vocabulary and comprehensive skills through prescribed texts.
- To promote interactive skills through GDs and role plays
- To hone students' writing skills

Learning Outcomes: The students will brush up their knowledge of grammar. Moreover, they will become proficient in business/formal writing.

PART–A

Applied Grammar
Phrase, Clause and Sentence, Conditional Sentences, Subject-Verb Agreement, Transformation of Sentences, Advanced Vocabulary

(14 hours)

PART–B

Reading
H.H. Munro: The Open Window (Short Story), Amrita Pritam: Today, I call Waris Shah, "Speak from your grave," (Poem), Dr. Ambedkar: 'Dr. Ambedkar's Speech at Mahad', in Poisoned Bread

(14 hours)

PART –C

Writing
Oral/PPT presentations, Letter Writing/Memos/E-mails, Report Writing/Job Application/C.V./Resume

(14 hours)

PART–D

Speaking/Listening
Interviews, Skit Enactment (Evaluative), Panel Discussions

(14 hours)

Refernce Books Books:-

3. Dangle, Aijun. *Poisoned Bread.* Hyderabad: Orient Longman, 1994.
4. Gangal, J. K. A *Practical Course In Spoken English*. India: Phi Private Limited,2012.
5. Kumar, Sanjay and Lata, Pushp. *Communication Skills*. India: OUP, 2012.
6. Singh, Vandana, R. *The Written Word* b. New Delhi: Oxford University Press, 2008.

DAV UNIVERSITY, JALANDHAR

Course Title: Object Oriented Programming Lab
Course Code: CSE205

L	T	P	Credits	Marks
0	0	4	2	50

Instruction for Students: The candidate will be attending a laboratory session of 4 hours weekly and students have to perform the practical related to the following list.

1. Introduction to basic structure of C++ program, utility of header and library files.
2. Implementation of program related to the basic constructs in C++
3. Programs using different data types in C++
4. Programs using Loops and Conditional Statements in C++
5. Programs using arrays single dimension in C++.
6. Programs using functions by passing values using call by value method and call by reference method.
7. Programs related to string handling in C++.
8. Program to demonstrate the objects of the class and their working.
9. Programs to implement the working of constructor & destructor.
10. Programs to implement the concept of operator overloading.
11. Programs to implement Inheritance and its types.
12. Programs using early and late binding.
13. Programs to show the working of abstract classes.
14. Programs to show the working of Exception Handling.
15. Program to illustrate the concept of file handling.

DAV UNIVERSITY, JALANDHAR

Course Title: Data Structure Programming using C Lab
Paper Code: CSE207

L	T	P	Credits	Marks
0	0	4	2	50

Algorithm development in all areas of data structures covered in the course. Emphasis should be given on the following matters. Development of recursive as well as non recursive a algorithms involving linked list trees and graphs. Use of pointers for dynamic allocations of storage. Development of classes for some of the data structures using the concept of abstract data types.

List of practical's:-

1. W.A.P. and algorithm to check whether number is greater or not.
2. W.A.P. and algorithm to print that given number is even or odd.
3. W.A.P. and algorithm to check whether numberis prime or not.
4. W.A.P. to perform various types of Arithmetic operations.
5. W.A.P. to store marks of a student in array and then print.
6. W.A.P. of traversing of an array.
7. W.A.P. to implement Linear Search.
8. W.A.P. to implement Binary Search.
9. W.A.P. to implement Bubble Sort.
10. W.A.P. to implement Selection sort.
11. W.A.P. to generate the Fibonacci series using Array.
12. W.A.P. to find the transpose of matrix.
13. W.A.P. to addition & subtraction of two matrix
14. W.A.P. to know length of given string.
15. W.A.P. to demonstrate the operation performed on stack.

DAV UNIVERSITY, JALANDHAR

Course Title: Digital Electronics Lab
Paper Code: ECE204

L	T	P	Credits	Marks
0	0	2	1	25

Course Objectives: To reinforce learning in the accompanying ECE-201 course through hands-on experience with digital electronic circuit analysis, design, construction, and testing. To provide the student with the capability to use simulation tools in digital electronic circuit analysis and design.

Learning Outcomes: To develop necessary skill in designing, analysing and constructing digital electronic circuits**.**

List of Experiments

1. Verification of the truth tables of TTL gates, e.g., 7400, 7402, 7404, 7408, 7432, 7486.
2. Verify the NAND and NOR gates as universal logic gates.
   a) Verification of the truth table of the Multiplexer 74150.
   b) Verification of the truth table of the De-Multiplexer 74154.
3. Design and verification of the truth tables of Half and Full adder circuits.
4. Design and verification of the truth tables of Half and Full subtractor circuits.
5. Design and test of an S-R flip-flop using NOR/NAND gates.
   a) Verify the truth table of a J-K flip-flop (7476)
   b) Verify the truth table of a D flip-flop (7474)
6. Operate the counters 7490, 7493 and 74194. Verify the frequency division at each stage and with a low frequency clock (say 1 Hz) display the count on LEDs.
7. Verify the truth table of decoder driver 7447/7448. Hence operate a 7 segment LED display through a counter using a low frequency clock.
8. Repeat the above with the BCD to Decimal decoder 7442 and an array of LEDs
9. Design and test D/A converter using R-2R Ladder Network
10. Study and test of A/D converter.

DAV UNIVERSITY, JALANDHAR

FOURTH SEMESTER

Course Title: Computer Architecture & Organization

Paper Code: CSE202

L	T	P	Credits	Marks
3	0	0	3	75

Course Objective: This course offers a good understanding of the various functional units of a computer system and prepares the student to be in a position to design a basic computer system.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of the working of the each functional and finally the student will be exposed to the recent trends in parallel and distributed computing and multithreaded application.

Part-A

Introduction

Basic organization of computers, Block level description of the functional units as related to the execution of a program; Fetch, decode and execute cycle.

Register Transfer and Micro operations

Register transfer language, Inter-Register Transfer, Arithmetic Micro-operations, Logic and Shift micro-operations Language, Control functions.

Arithmetic Logic Unit

Arithmetic, logic and shift micro operations. Constructing an arithmetic logic shift unit.

(10Hours)

Part-B

Basic Computer Architecture and Design

Computer registers, Computer Instructions-Instruction Set Completeness. Classifying Instruction Set Architecture. Basic steps of Instruction Execution. Hardwired Control. Micro programmed Control. Horizontal and Vertical Microprogramming. Interrupts.

Central Processing Unit

General Register Organization. Stack Organized CPU. Instruction Formats, Addressing Modes. Data Transfer and Manipulation.RISCVs CISC.

(11Hours)

Part-C

Pipelining

Parallel and pipeline Processing, Pipeline Control, Pipeline Implementations, Conflicts Resolution, and Pipeline Hazards. Vector Processing, and Array Processors.

Memory Organization

Memory Systems: principle of locality, principles of memory hierarchy Caches, associative memory, main memory, Virtual memory, Paging and Segmentation, Memory Interleaving.

(10Hours)

PART-D

Input Output Organization

I/O performance measures, types and characteristics of I/O devices, I/O Modes-Programmed I/O, Interrupt Initiated I/O and DMA. Buses: connecting I/O devices to processor and memory, interfacing I/O devices to memory, processor, and operating system.

Parallel Computers

Classification, SIMD, MIMD Organizations, Instruction and Arithmetic Pipeline, Parallel Processing.

(15Hours)

Refernce Books Books:-

1. Mano, M Mori. *Computer System Architecture,* Pearson Education, 3rd Edition 1993.
2. Patterson,David A. and Hennessy, John L. *Computer Organization & Design-The Hardware/Software Interface.* Morgan Kaufmann, 2nd Edition 1997.
3. Stallings, William. *Computer Organisation and Architecture, Designing for Performance.* Pearson Education Asia, 6th Edition 2003.
4. Jordan, Harry F. and Alaghband, Gita. *Fundamentals of Parallel Processing.* Pearson Education, 1st Edition 2003.
5. Hayes, J.P. *Computer System Architecture.* New Delhi: Prentice Hall of India.

DAV UNIVERSITY, JALANDHAR

Course Title: System Programming	**L**	**T**	**P**	**Credits**	**Marks**
Paper Code: CSE-204	3	0	0	3	75

Course Objective: The objective of this course is to provide the knowledge of one high level procedural language, assembly language and knowledge of data structures and computer organization.

Learning Outcomes: After the completion of this course the participants would gain the knowledge to design various system programs.

PART-A

Introduction to systems software
Definition, features of system Programming, System Programming vs. Application Programming, type of system programs.
Assemblers
Elements of Assembly Language Programming, Single pass assembler, two pass assembler and design procedure of an assembler.

(11Hours)

PART-B

Macros and Macro Processors
Macro Instructions, Features of a Macro facility, Implementation of Two pass Macro.
Compilers
Aspects of Compilation, Phases of compilation, Scanning and Parsing, Compilation of Expressions, Compilation of Control Structures Code Generation and Code optimization techniques,CompilerWritingTools,Compliervs.interpreter.

(12Hours)

PART-C
Loaders & Linkage Editors
Loading Linking and Relocation, Overview of Linkage Editing, Linking for Program Overlay.
Editors and debuggers
Introduction to editors, types of editor, design of an editor, debug monitors, introduction to various debugging techniques, turbo c++ debuggers.

(12Hours)

PART-D
Grammar and automation
Introduction to grammar, types of grammar, acceptability of grammar, introduction to automation, characteristics of automation, finite control, transition system, finite automation, Case study on LEX and YACC**.**
Introduction to Operating systems
Introduction, Operating System Structures, Process Management, Memory management, I/O systems, Distributed Operating Systems.

(13Hours)

Refernce Books Books:-

1. L L , Beck. *Systems Software: An Introduction to Systems Programming.* Addison-Wesley 2001.
2. J J ,Donovan. *Systems Programming.* New York, Mc-Graw Hill 1991.
3. Dhamdhere , D M. *Introduction to Systems Software.* Tata Mc-Graw Hill 2000.
4. Glingaert P. *Assembles Loaders and Compilers.* Prentice Hall 1972.
5. Aho A V and Ullman, J D. *Principles of compiler Design.* Addison Wesley/ Narosa 1985.

DAV UNIVERSITY, JALANDHAR

Course Title: Microprocessors and its Applications
Paper Code: ECE350

L	T	P	Credits	Marks
4	0	0	4	100

Course Objectives: The purpose of this course is to teach students the fundamentals, internal architectural details and functioning of microprocessors systems. The student will be able to incorporate these concepts into their electronic designs for other courses where control can be achieved via a microprocessor implementation.

Learning Outcomes: Through the use of assembly language, by the end of the course students will become thoroughly familiar with the elements of microprocessor software and hardware. They will be able to:
- Understand fundamental operating concepts behind microprocessors.
- Appreciate the advantages in using microprocessors in engineering applications.
- Design microprocessor based solutions to problems.

PART-A

Introduction
Introduction to Microprocessors, classification, recent microprocessors.
Microprocessor Architecture
8085 microprocessor Architecture. Bus structure, I/O, Memory &System buses, concept of address Bus, Data Bus & Control Bus, Synchronous & Asynchronous buses. Instruction execution sequence & Data Flow, Instruction cycle.

(14Hours)

PART-B

I/O memory interface
Data transfer modes: Programmable, interrupt initiated and DMA 8257, Serial & parallel interface, study of 8251 & 8255 programmable peripheral interfaces.

(14Hours)

PART-C
Instruction set & Assembly Languages Programming
Introduction, instruction & data formats, addressing modes, status flags, 8085 instructions, Data transfer operations, Arithmetic operations, Logical operations, Branch operations.

(14Hours)

Part-D
Case structure & Microprocessor application
Interfacing of keyboards and seven segment LED display, Microprocessor controlled temperature system (MCTS), Study of traffic light system, stepper motor controller.
Basic architecture of higher order microprocessor
Basic introduction to 8086, Architecture, Segmentation & addressing modes**.**

(14Hours)

Refernce Books Books:-

1. Gaonkar, Ramesh. *8085 Microprocessor.* New Delhi: PHI Publications.
2. Tabak, Daniel. *Advanced Microprocessors*. New Delhi: McGraw- Hill, Inc., Second Edition 1995.
3. Hall, Douglas V. *Microprocessors and Interfacing Programming and Hardware*. New Delhi: Tata McGraw Hill, Edition, 1986.
4. Gilmore, Charles M. *Microprocessors: Principles and Applications*. New Delhi: McGraw Hill.
5. Ram, B. *Microprocessor.* New Delhi: Dhanpat Rai Publications.

DAV UNIVERSITY, JALANDHAR

Course Title: Data Communication	L	T	P	Credits	Marks
Paper Code: CSE206	3	0	0	3	75

Course Objective: This course provides knowledge about various types of Network, Network Topologies, and protocols.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of how a network works during data communication.

PART-A

Introduction
Data Communication: Components, Data Flow; Network Categories: LAN, MAN, WAN (Wireless / Wired); Network Software: Concept of layers, protocols, interfaces and services; Reference Model: OSI, TCP/IP and their comparison.

Physical Layer
Concept of Analog & Digital Signal; Bit rate, Bit Length; Transmission Impairments: Attenuation, Distortion, Noise; Data rate limits: Nyquist formula, Shannon Formula; Multiplexing: Frequency Division, Time Division, Wavelength Division; Transmission media: Twisted pair, coaxial cable, fiber optics, wireless transmission (radio, microwave, infrared);Circuit Switching & Packet Switching.

(14Hours)

PART-B

Data Link Layer
Error correction & Detection; Flow & Error Control; Sliding window protocols: Stop & Wait ARQ, Go back n ARQ, Selective repeat ARQ; Examples of DLL Protocols-HDLC, PPP;Medium Access Sub layer: Channel Allocation; Random Access: ALOHA, CSMA protocols; Controlled Access: Polling, Reservation, Token Passing; Examples of IEEE 802.3, 802.11 standards.

(10Hours)

PART-C

Network Layer: Logical Addressing: IPv4 and IPv6; Packet Formats & their comparison: IPv4 and IPv6;Routing algorithms: Distance vector, Link State Routing, Hierarchical Routing, Broadcast & Multicast Routing; Congestion Control: Principles of Congestion Control, Congestion prevention policies, Leaky bucket &Token bucket algorithms.

(10Hours)

PART-D

Transport Layer
Addressing, flow control & buffering, multiplexing & de-multiplexing, crash recovery; Example transport protocols: TCP, SCTP and UDP.

Application Layer: Network Security; Domain Name System; Simple Network Management Protocol; Electronic Mail.

(14Hours)

Reference Books:-

1. Tanenbaum, Andrew S. *Computer Networks.* Ed Pearson Education 4th Edition, 2003.
2. Kurose, James F. and Ross, Keith W. *Computer Networking.* Pearson Education, 2002.
3. Stalling, William. *Data and Computer Communication.* Pearson Education, 7th Edition, 2nd Indian Reprint 2004.
4. Miller. *Data and Network Communication.* Ed Thomson Learning, 2001.
5. Comer, Douglas E. *Computer Networks and Internets,* Pearson Education 2nd Edition, 5th Indian Reprint 2001.

DAV UNIVERSITY, JALANDHAR

Course Title: Engineering Mathematics-III
Course Code: MTH252

L	T	P	Credits	Marks
4	1	0	4	100

Course Objective:
The objective of the course is to enable the students to understand the basic concepts related to Laplace transforms, Fourier series, ordinary differential and partial differential equations and their applications.

PART-A

Laplace Transforms
Laplace transforms of various standard functions, Linear property of Laplace transforms, Shifting property and change of scale, inverse Laplace transforms, transform of derivatives and integrals, Laplace transform of unit step function, impulse function, periodic functions, applications to solution of ordinary linear differential equations with constant coefficients, and simultaneous differential equations.

(14Hours)

PART-B

Fourier series
Periodic functions, Euler's formula. Dirichlet's conditions. Fourier series of discontinuous functions. Fourier series of Even and Odd functions, half range expansions, Fourier series of different wave forms, Complex form of Fourier series. Fourier Transformation.

(14Hours)

PART-C

Partial Differential Equations
Formulation of partial differential equations, Linear partial differential equations, homogeneous partial differential equations with constant coefficients. Wave equation and Heat conduction equation in one dimension. Two dimensional Laplace equation and their applications, solution by the method of separation of variables.

(14Hours)

PART-D

Functions of Complex Variable
Limits, continuity and derivative of the function of complex variable, Analytic function, Cauchy-Riemann equations, conjugate functions, and harmonic functions.
Conformal Mapping
Definition, standard transformations, translation, rotation, inversion, bilinear.
Complex Integration
Line integrals in the complex plane, Cauchy's theorem, Cauchy's integral formula and derivatives of analytic function. Taylor's and Laurent's expansions (without proofs), singular points, poles, residue, Integration of function of complex variables using the method of residues.

(14Hours)

Refernce Books Books:-

1. E, Kreyzig. *Advanced Engineering Mathematics.* John Wiley and Sons.
2. Ponnusamy S. *Foundations of Complex Analysis.* Narosa Publishers.
3. Sneedon I.N. *Elements of Partial Differential Equations.* McGraw-Hill.
4. Grewal B.S. *Higher Engineering Mathematics.* Khanna Publishers.

DAV UNIVERSITY, JALANDHAR

DEPARTMENTAL ELECTIVE-I

Course Title: Web Technologies
Paper Code: CSE208

L	T	P	Credits	Marks
3	0	0	3	75

Course Objective: Aim of this paper is to familiarize the students with current technologies used in Web development and maintenance.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of designing the web pages using different packages.

PART-A
Internet and World Wide Web
Introduction, Internet Addressing, ISP, types of Internet Connections, Introduction to WWW, WEB Browsers, WEB Servers, URLS, http, WEB applications, Tools for WEB site creation.
Html: Introduction to HTML, Lists, adding graphics to HTML page, creating tables, linking documents, frames, DHTML and Style sheets.

10Hours)

PART-B

Java Script
Introduction, programming constructs: variables, operators and expressions, conditional checking, functions and dialog boxes, JavaScript DOM, creating forms, introduction to Cookies

JAVA
Introduction to java objects and classes, control statements, arrays, inheritance, polymorphism, Exception handling.

(12Hours)

PART-C

XML
Why XML, XML syntax rules, XML elements, XML attributes, XML DTD displaying XML with CSS, Using XML Processors: DOM and SAX

AJAX
Introduction, HTTP request, HttpRequest, AJAX Server Script, AJAX Database. **(12Hours)**

PART-D
PHP
Introduction, syntax, statements, operators, sessions, E-mail, PHP and MySQL, PHP and AJAX.

Database Access
Database Programming using JDBC, Studying Javax.sql.* package, Accessing a Database from a JSP Page, Application – Specific Database Actions, Deploying JAVA Beans in a JSP Page, Introduction to struts framework.

(12Hours)

Refernce Books Books:-

1. Bergsten, Hans. *Java Server Pages*. SPD O'Reilly.
2. Dietel and Nieto. *Internet and World Wide Web – How to progra*. PHI/Pearson Education Asia.

DAV UNIVERSITY, JALANDHAR

Course Title: Multimedia Communication
Paper Code: CSE210

L	T	P	Credits	Marks
3	0	0	3	75

Course Objective: This Course introduces the multimedia systems and their applications to students. This course covers the different compression standards used in multimedia, some current technology and related issues.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of the various multimedia technologies and their uses.

PART-A

Introduction
Multimedia Elements; Multimedia Applications; Multimedia Systems Architecture; Evolving Technologies for Multimedia Systems; Defining Objects for Multimedia Systems; Multimedia Data Interface Standards; The need for Data Compression; Multimedia Databases

Media and Data Streams
Media : Perception Media, Representation Media, Presentation Media, Storage Media, Transmission Media, Information Exchange Media, Presentation spaces & Values, and Presentation Dimensions; Key Properties of a Multimedia System : Discrete & Continuous Media Independence Media, Computer Controlled Systems, Integration; Characterizing Data Streams: Asynchronous Transmission Mode, Synchronous Transmission Mode, Isochronous Transmission Mode; Characterizing Continuous Media Data Streams.

(10Hours)

PART-B

Audio Technology
Sound: Frequency, Amplitude, Sound Perception and Psychoacoustics; Audio Representation on Computers; Three Dimensional Sound Projection; Music and MIDI Standards; Speech Signals; Speech Output; Speech Input; Speech Transmission.

Graphics and Images
Capturing Graphics and Images Computer Assisted Graphics and Image Processing; Reconstructing Image; Graphics and Image Output Options.

Video Technology & Computer-Based Animation
Basics; Television Systems; Digitalization of Video Signals; Digital Television; Basic Concepts; Specification of Animations; Methods of Controlling Animation; Display of Animation; Transmission of Animation; Virtual Reality Modeling Language.

(13Hours)

PART-C

Data Compression
Storage Space; Coding Requirements; Source, Entropy, and Hybrid Coding; Basic Compression Techniques; JPEG: Image Preparation, Lossy Sequential DCT-based Mode, Expanded Lossy DCT-based Mode, Lossless Mode, Hierarchical Mode; H.261 (Px64) and H.263+ and H.263L; MPEG : Video Encoding, Audio Coding, Data Stream, MPEG-2, MPEG: Video Encoding, Audio Coding, Data Stream, MPEG-2, MPEG-4, MPEG-7; Fractal Compression.

Optical Storage Media

History of Optical Storage; Basic Technology; video Discs and other WORMs; Compact Disc Digital Audio; Compact Disc Read Only Memory; CD-ROM Extended Architecture; Further CD-ROM-Based Developments; compact Disc Recordable; Compact Disc Magneto-Optical; Compact Disc Read/Write; digital Versatile Disc.

(10Hours)

PART-D

Content Analysis

Simple vs. Complex Features; Analysis of Individual Images; Analysis of Image Sequences; Audio Analysis; Applications.

Data and File Format Standard

Rich-Text Format; TIFF file Format; Resource Interchange File Format (RIFF); MIDI File Format; JPEG DIB File Format for Still and Motion Images; AVI Indeo File Format; MPEG Standards; TWAIN.

Multimedia Application Design

Multimedia Application Classes; Types of Multimedia Systems; Virtual Reality Design; Components of Multimedia Systems; Organizing Multimedia Databases; Application Workflow Design Issues; Distributed Application Design Issues.

(10Hours)

Reference Books:-

1. Steinmetz, Ralf and Klara, Narstedt. *Multimedia Fundamentals: Vol 1- Media Coding and Content Processing.* PHI, 2ND Edition, 2003.(Chapters 2,3,4,5,6,7,8,9).
2. Andleigh, Prabhat K.and Thakrar, Kiran. *Multimedia Systems Design.* PHI, 2003..
3. Rao, K.R and Bojkovic, Zoran S. and Dragorad A. Milovanovi. *Multimedia Communication Systems: Techniques, Standards, and Networks.* Pearson 2002.
4. Sharad, Nalin K. *Multimedia information networking.* PHI, 2002.
5. Iain E.G. Richardson. *H.264 and MPEG-4 Video Compression.* John Wiley.

DAV UNIVERSITY, JALANDHAR

Course Title: Principles of Programming Languages
Paper Code: CSE212

L	T	P	Credits	Marks
3	0	0	3	75

Course Objective: This course should provide the students with a fairly good concept of fundamental concepts and design issues of programming languages and become familiar with major programming paradigms.

Learning Outcomes: After the completion of this course the participants understand similarities and differences between models and know when to use them and also learn programming techniques appropriate for each model.

PART-A

Introduction
Characteristics of programming Languages, Factors influencing the evolution of programming language, developments in programming methodologies, desirable features and design issues. Programming language processors: Structure and operations of translators, software simulated computer, syntax, semantics, structure, virtual computers, binding and binding time.
Elementary and Structured Data Types
Data object variables, constants, data types, elementary data types, declaration, assignment and initialization, enumeration, characters, strings. Structured data type and objects: Specification of data structured types, vectors and arrays, records, variable size data structure, pointers and programmer constructed data structure, Sets files. Sub Program and programmer defined data types: Evolution of data types, abstractions, encapsulations, information hiding, sub programme, abstract data types.

(12Hours)
PART-B
Sequence Control
Implicit and Explicit sequence control, sequence control with within expression and statements, recursive sub programmes, exception handling, co routines, Scheduled sub programmes, concurrent execution. Data control referencing environments, static and dynamic scope, local data local data referencing environment, shared data: Explicit common environment dynamic scope parameter passing mechanism.

(9Hours)
PART-C
Storage Management
Major run time requirements, storage management phases, static storage management, stack based, heap based storage management. Syntax and translation: General syntactic criteria, syntactic element of a language, stages in translation, formal syntax and semantics.

(10Hours)
Part-D
Operating and Programming Environment
Batch Processing Environments, Embedded system requirements, Theoretical models, Introduction to Functional Programming, Lambda calculus, Data flow language and Object

Oriented language, Comparison in various general and special purpose programming languages e.g. Fortran, C, Pascal, Lisp, etc.

(8Hours)

Reference Books:-

1. Pratt, Terrance W. *Programming Languages: Design and Implementation.* PHI.
2. Sebest. *Concept of Programming Language.* Addison Wesley.
3. Horowitz, E. *Programming Languages.* 2nd Edition, Addison Wesley.
4. Louden, *programming Languages-principles and practice.* Cengage Learning, New Delhi.

DAV UNIVERSITY, JALANDHAR

Course Title: Management Information System
Paper Code: CSE214

L	T	P	Credits	Marks
3	0	0	3	75

Course Objective: This course should provide understanding the planning of Information Systems.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of the various views of management and knowledge information systems.

Part-A

Management Information Systems A Framework
Importance of MIS; Management Information System: A Concept (Management, Information, And System); MIS: A Definition (Information Technology and MIS); Nature and Scope of MIS (MIS Characteristics, MIS Functions).

Structure and Classification of MIS
Structure of MIS (MIS Structure Bases on Physical Components, Information System Processing Functions, Decision Support, Levels of Management Activities, Organizational Functions); MIS Classification (Transaction Processing System, Management Information System (MIS), Decision Support System (DSS), Executive Support System, Office Automation Systems (OASs), Business Expert Systems (BESs); Functional Information System (Financial Information System, Marketing Information System, Production/Manufacturing Information System, Human Resource Information System.

Decision Making and MIS
Decision-Making, Simon's Model of Decision-Making, Types of Decisions (Purpose of Decision-Making, Level of Programmability, Knowledge of Outcomes); Methods for Choosing among Alternatives (Decision Theory or Decision Analysis, Utility, Decision Tree, Optimization Techniques); Decision Making and MIS.

(15Hours)

Part-B

Information and System Concepts
Information : A Definition; Types of Information (Strategic Information, Tactical Information, Operational Information); Information Quality; Dimensions of Information (Economic Dimension, Business Dimension, Technical Dimension); System : Definition (Multiple Meaning of the Word 'System'); Kinds of Systems (Abstract and Physical Systems, Deterministic and Probabilistic Systems, Open and Closed Systems, User-Machine Systems); System Related Concepts (Boundary, Interface and Black Box, System Decomposition, Integration of Sub-Systems); Elements of a System; Human as an Information Processing System (Information Filtering, Human Differences in Information Processing, Implications for Information Systems).

System Development Approaches
System Development Stages (System Investigation, System Analysis, System Design, Construction and Testing, Implementation, and Maintenance); System Development Approaches (Waterfall Model, Prototyping, Iterative Enhancement Model, Spiral Model.

(12Hours)

PART-C

System Analysis

Introduction; Requirement Determination (Understand the Process, Identify Data Used and Information Generated, Determine Frequency, Timing and Volume, Know the Performance Controls); Strategies for requirement Determination (Interview, Questionnaire, Record Review, Observation); Structured Analysis Tools (Data Flow Diagram, Data Dictionary, Decision Tree and Structured English, Decision Table).

System Design

Design objectives; Conceptual Design (Define Problem, Set System Objectives, Identify constraints, determine information needs, determine information sources, develop various designs, documentation of the conceptual design, report preparation); Design Methods; Detailed System Design (Project Planning and Control, Involve the user, detailed subsystem definition, output/input design, feedback from the user, database design, procedure design, design documentation).

Implementation and Evaluation of MIS

Implementation process (planning and implementation, acquisition of facilities and space planning, MIS Organization and procedure development, User training, acquisition of hardware and software, Creation of forms and database, Testing, Change Over); Hardware and Software Selection (Requirements analysis, Preparation of Tender Specifications, Inviting Tenders, Technical scrutiny and short-listing, Detailed Evaluation, Negotiations and Procurement Decisions, Delivery and Installation, Post Installation Review); Evaluation of MIS (Evaluation Approaches, Evaluation Classes, Product Based MIS Evaluation, Cost/Benefit Based Evaluation); System Maintenance (Corrective Maintenance, Adaptive Maintenance, Perfective Maintenance).

(10Hours)

PART-D

Information System Planning

Information System Planning; Planning Terminology (Mission, Objectives, Strategies, Policies); The Nolan Stage Model; The Four Stage Model of IS Planning (Strategic Planning, Information Requirement Analysis, Resource Allocation, Project Planning); Selecting a Methodology; Information Resource Management (IRM); Organization Structure and Location of MIS.

Information System as an Enabler : Introduction; Changing Concepts of IS (Information as a necessary Evil, Information for General Management Support, Information for decision making, Information as a Strategic Resource); IS as an Enabler (Competitive advantage, Organizational Change, Organizational Learning).

(12Hours)

Refernce Books:
1. Boddy, D. and Boonstra, A. and G. Kennedy. *Managing Information Systems: An Organizational Perspective.* 2nd Edition, Prentice Hall, 2004.
2. Laudon, K.C. and Laudon,J.P. *Management Information Systems: Managing the Digital Firm*, 8th Edition, Prentice Hall, 2004.
3. Turban E., McLean, E. and Wetherbe, J. *Information Technology for Management: Transforming Organizations in the Digital Economy.* 4th edition, Wiley, 2004.
4. Mudricm, R G , Ross J E , Clogget J R. *Information system for Modern Management.* Printce Hall
5. Effyoz. *Management Information System.* Cengage Learning, New Delhi.

DAV UNIVERSITY, JALANDHAR

	L	**T**	**P**	**Credits**	**Marks**
Course Title: System Analysis and Design **Paper Code: CSE216**	3	0	0	3	75

Course Objective: The objective of this course is to provide a solid foundation of systems principles and their working.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of business functions and designing of various systems.

PART-A
System definition and concepts
Characteristics and types of system, Manual and automated systems, Real-life Business sub-systems: Production, Marketing, Personal, Material, Finance**.**

Systems models & systems analyst
Systems environment and boundaries, Real-time and distributed systems, Basic principles of successful systems**,** Role and need of systems analyst, Qualifications and responsibilities ,Systems Analyst as an agent of change.

Phases of systems development life cycle
Analysis, Design, Development, Implementation, Maintenance.

(12Hours)

PART-B

Systems documentation considerations and planning
Principles of systems documentation, Types of documentation and their importance, enforcing documentation discipline in an organization, Data and fact gathering techniques: Interviews, Group communication, Presentations, Site visits. Feasibility study and its importance Types of feasibility reports System, Selection plan and proposal Prototyping, Cost-Benefit and analysis: Tools and techniques.

Systems Design and modeling
Process modeling, Logical and physical design, Design representation, Systems flowcharts and structured charts, Data flow diagrams, Common diagramming conventions and guidelines using DFD and ERD diagrams. Data Modeling and systems analysis, designing the internals: Program and Process design, Designing Distributed Systems.

(12Hours)

PART-C

Modular and structured design
Input/output forms design, User-interface design, Graphical interfaces, Module specifications, Module coupling and cohesion, Top-down and bottom-up design.

System Implementation and Maintenance
Planning considerations, Conversion methods, producers and controls, System acceptance Criteria, System evaluation and performance, Testing and validation, Systems qualify Control and assurance, Maintenance activities and issues. Computer system as an expensive resource: Data and Strong media Procedures and norms for utilization of computer equipment, Audit of computer system usage, Audit trails.

(12 Hours)

PART-D

Types of threats to computer system and control measures
Threat to computer system and control measures, Disaster recovery and contingency planning.
Object Oriented Analysis and design
Introduction to Object Oriented Analysis and design life cycle, object modeling: Class Diagrams, Dynamic modeling: state diagram, Dynamic modeling: sequence diagramming.
Case study of the following systems
(I) Inventory Control (II) Railway Reservation System (III) University Management System (IV) Hospital management System

(10Hours)

Refernce Books:

1. Edwards, Perry. *System Analysis and Design.* McGraw Hill 1993.
2. Awad , Elias M. *System Analysis and Design.* McGraw Hill 2002.
3. Kendall and Kendall. *System Analysis and Design.* Prentice Hall 6th Ed 2005.
4. Valacich, Joseph S. George, J F G Hoffer. *Modern System Analysis and Design.* Addison Wesley 1998.
5. Satzinger. *System Analysis and Design.* Cengage Learning, New Delhi

DAV UNIVERSITY, JALANDHAR

Course Title: System Programming Laboratory
Paper Code: CSE218

L	T	P	Credits	Marks
0	0	2	1	25

1. Design and Implementation of an Editor in any language.
2. Design and Implementation of One Pass Assembler in any language.
3. Design and Implementation of Two Pass Assembler in any language.
4. Implementation of various search techniques: Linear and Binary Search.
5. Implementation of various sorting techniques: Bucket sort, Merge Sort, Heap Sort
6. Implementation of Lexical Analyzer.
7. Implementation of Top down Parser.
8. Implementation of Bottom up Parser.
9. Design and Implementation of Two Pass Macro- Processor.
10. Study of LEX and YACC.

This is only the suggested list of practical's. Instructor may frame additional practical's relevant to the course contents

Course Title: Microprocessor & its Applications Laboratory
Paper Code: ECE351

L	T	P	Credits	Marks
0	0	2	1	25

Course Objective: This laboratory will provide the students a perfect introduction to the world of Microprocessors and to provide hands-on experience essential to the real understanding of microprocessors architecture and it's interfacing to the peripheral devices. The experiments are designed to provide the students with the design principles of microprocessor systems. The course accomplishes this by using microprocessor kits.

Learning Outcome: After successful completion of this course, student will be able:
- To demonstrate programming proficiency using the various addressing modes and data transfer instructions of the target microprocessor.
- To apply knowledge of the microprocessor's internal registers and operations by use of a PC based microprocessor simulator.
- To interface the processor to external devices.

List of Experiments:

1. Introduction to 8085 kit.
2. Addition of two 8 bit numbers, sum 8 bit.
3. Subtraction of two 8 bit numbers.
4. Find 1's complement of 8 bit number.
5. Find 2's complement of 8 bit number.
6. Shift an 8 bit no. by one bit.
7. Find Largest of two 8 bit numbers.
8. Find Largest among an array of ten numbers (8 bit).
9. Sum of series of 8 bit numbers.
10. 8255 PPI.
11. Seven segment display
12. Traffic light.
13. Stepper motor control

DAV UNIVERSITY, JALANDHAR

Course Title: Data Communication Laboratory
Paper Code: CSE220

L	T	P	Credits	Marks
0	0	2	1	25

1. Making Straight, Rollover and Cross-Over cables
2. Cable & RJ-45 Jack outlet installation
3. Installation of NIC Card & using TCP/IP
4. Design, build & test a simple communication system
5. Overview and basic Configuration of Router
6. Router show Command
7. Basic LAN Setup
8. Designing & Implementing LAN using sub netting
9. Study of Amplitude Modulation
10. Study of frequency Modulation
11. Study of ASK Modulation
12. Study of FSK Modulation
13. Simple point-to-point communication & error detection
14. Implementation of STOP and Wait protocol
15. Implementation of Sliding Window protocol

This is only the suggested list of practical's. Instructor may frame additional practical's relevant to the course contents

Course Title: SEMINAR
Paper Code: CSE222

L	T	P	Credits	Marks
0	0	4	2	50

The seminar is based on the research oriented topic. The evaluation of seminar is based upon the contents and presentation of a topic.

DAV UNIVERSITY, JALANDHAR

FIFTH SEMESTER

Course Title: Computer Networks
Paper Code: CSE301

L	T	P	Credits	Marks
3	0	0	3	75

Course Objective: This course should provide the knowledge of various networking components, protocols and their working.
Learning Outcomes: After the completion of this course the participants would gain the knowledge of how to implement a network and understand the functioning of the network.

PART-A

Introduction
Introduction to Computer Network and Physical Layer, Broadcast and Point-to-point- LAN-MAN-WAN- Wireless networks
Architecture and Reference Models
Layered architecture- OSI reference model, TCP/IP reference model –Internet Protocol Stack – Network Entities in Layers- Connection oriented and Connection less services
ATM
Protocol Architecture, ATM Logical Connections, ATM Cells, Transmission of ATM Cells, ATM Adaptation Layer, Traffic and Congestion Control, ATM LAN Emulation

(12Hours)

PART-B

Internetworking
Principles of Internetworking, Connectionless Internetworking, the Internet Protocol, Routing Protocol, IPv6 (IPng), ICMPv6
Distributed Applications
Abstract Syntax Notation One (ASN.l), Network Management-SNMPV2, Electronic Mail-SMTP and MIME, Uniform Resource Locators (URL) and Universal Resource Identifiers (URI), Hypertext Transfer Protocol (HTTP)

(8Hours)

PART-C

Network Layer and Routing
Network Service model – Datagram and Virtual circuit service-Routing principles-Link state routing-distant vector routing-hierarchical routing-multicast routing-IGMP Internet Protocol (IP): IPv4 addressing-routing and forwarding datagram-datagram format-datagram fragmentation- ICMP- DHCP- Network Address Translators (NATs)-IPv6 packet format-transition from IPv4 to IPv6-Mobile IP. Routing in the Internet: Intra Autonomous System Routing: RIP and OSPF-Inter Autonomous System Routing: BGP – Network layer in ATM.

(8Hours)

PART-D

Transport Layer
Transport Layer Services-Relationship between Transport Layer and Network Layer-Transport Layer in Internet-Multiplexing and De multiplexing. Connectionless Transport: UDP-Segment structure-Checksum Connection Oriented Transport: TCP-TCP connection-TCP Segment Structure-Round trip Time estimation and Time out-Reliable Data transfer-Flow control-TCP connection Management. Congestion Control: Causes and costs of congestion- Approaches to congestion control- TCP congestion control: Fairness-TCP delay modeling. ATM ABR congestion control.ATM AAL Layer protocols.

(8Hours)

Application Layer and Network Security: Application Layer Protocols - WWW and HTTP-File transfer Protocol: FTP Commands and Replies – Domain Name System (DNS)-SMTP - SNMP- multimedia. Remote Procedure Call. Security in Computer Networks: Principles of Cryptography-Symmetric key-Public key-authentication protocols -Digital Signatures – Firewalls. Security in different Layers: Secure E-mail- SSL – IP security.

(6Hours)

Refernce Books:

1. Kurose ,James F. and Ross, Keith W. *Computer Networking – A Top-Down Approach Featuring the Internet*. 2/e Pearson Education, 2003.
2. Keshav, S. *An Engineering Approach to Computer Networking*. Pearson education , 2002.
3. Halsall, F. *Data Communication, Computer Networks and Open Systems*. Addison Wesley, 1996.
4. Tanenbaum, Andrew S. *Computer Networks* , 4/e, Pearson education, 2003
5. Fourouzan, Behrouz A. *Data Communications and Networking*. 2/e TataMcGrawhill, 2000.

DAV UNIVERSITY, JALANDHAR

Course Title: Database Management System
Paper Code: CSE303

L	T	P	Credits	Marks
3	1	0	3	75

Course Objective: This course offers a good understanding of database systems concepts and prepares the student to be in apposition to use and design databases for different applications.
Learning Outcomes: After the completion of this course the participants would gain the knowledge of how to use a DBMS and how to build a DBMS.

PART-A
Introduction to Database Systems: File Systems Versus a DBMS, Advantages of a DBMS, Describing and Storing Data in a DBMS, Database System Architecture, DBMS Layers, Data independence.
Physical Data Organization: File Organization and Indexing, Index Data Structures, Hashing, B-trees, Clustered Index, Sparse Index, Dense Index, Fixed length and Variable Length Records.

(12Hours)
PART-B
Data Models
Relational Model, Network Model, Hierarchical Model, ER Model: Entities, Attributes and Entity Sets, Relationships and Relationship Sets, Constraints, Weak Entities, Class Hierarchies, Aggregation, Conceptual Database Design with the ER Model, Comparison of Models.
The Relational Model
Introduction to the Relational Model, ER to Relational Model Conversion, Integrity Constraints over Relations, Enforcing Integrity Constraints, Relational Algebra, Relational Calculus, Querying Relational Data.

(12Hours)
PART-C

Relational Query Languages
SQL: Basic SQL Query, Creating Table and Views, SQL as DML, DDL and DCL, SQL Algebraic Operations, Nested Queries, Aggregate Operations, Cursors, Dynamic SQL, Integrity Constraints in SQL, Triggers and Active Database, Relational Completeness, Basic Query Optimization Strategies, Algebraic Manipulation and Equivalences.
Database Design
Functional Dependencies, Reasoning about Functional Dependencies, Normal Forms, Schema Refinement, First, Second and Third Normal Forms, BCNF, Multi-valued Dependency, Join Dependency, Fourth and Fifth Normal Forms, Domain Key Normal Forms, Decompositions.

(14Hours)

PART-D

Transaction Management
ACID Properties, Serializability, Two-phase Commit Protocol, Concurrency Control, Lock Management, Lost Update Problem, Inconsistent Read Problem , Read-Write Locks, Deadlocks Handling, 2PL protocol.

Database Protection
Threats, Access Control Mechanisms, Discretionary Access Control, Grant and Revoke, Mandatory Access Control, Bell LaPadula Model, Role Based Security, Firewalls, Encryption and Digital Signatures.

(11Hours)

Reference Books:

1. C J, Date. *An Introduction To Database System.* Addision Wesley, Eighth Edition.
2. Korth, Silbertz, Sudarshan. *Database Concepts.* McGraw Hill.
3. Navathe, Elmasri. *Fundamentals of Database Systems.* Addision Wesley, Fifth Edition.
4. Desai, Bipin C. *An introduction to Database Systems.* Galgotia Publication.
5. Rob and Coronel. *Database Systems 5th Edition.* Cengage Learning, New Delhi.

DAV UNIVERSITY, JALANDHAR

Course Title: Operating Systems
Paper Code: CSE305

L	T	P	Credits	Marks
3	0	0	3	75

Course Objective: This course should provide the students with good understanding of Operating System including its architecture and all its components.

Learning Outcomes: After the completion of this course the participants would understand the overall architecture of the operating system and its main components, Functions of Kernel, file system architecture and implementation, concurrent programming and concurrency.

PART-A

Introduction
What is an O.S., O.S. Functions; Different types of O.S.: batch, multi-programmed, time sharing, real-time, distributed, parallel; General structure of operating system, O/S services, system calls.

Process Management
Introduction to processes - Concept of processes, process scheduling, operations on processes; Inter Process Communication, Critical Sections, Mutual Exclusion with Busy Waiting, Sleep and Wakeup, Semaphores, Message passing; CPU scheduling- scheduling criteria, preemptive & non-preemptive scheduling, Scheduling Algorithms: FCFS, SJF, RR and priority.

(14Hours)

PART-B
Memory Management
background, logical vs. physical address space, memory management without swapping; swapping; contiguous memory allocation, paging, segmentation, segmentation with paging; Virtual Memory, demand paging, performance, page replacement, page replacement algorithms (FIFO, Optimal ,LRU); Thrashing.

(6Hours)

PART-C
File Systems
Files - file concept, file structure, file types, access methods, File attributes, file operations; directory structure, allocation methods (contiguous, linked, indexed), free-space management (bit vector, linked list, grouping),Protection mechanisms.

Secondary Storage
Disk Structure, Disk Scheduling (FCFS, SSTF, SCAN, C-SCAN, and LOOK), Disk Management (Disk Formatting, Boot Blocks, and Bad Blocks), Swap Space Management (Swap Space use, Swap Space Location, Swap Space Management)

(12Hours)

PART-D
Deadlocks
Introduction to deadlocks, Conditions for deadlock, Resource allocation graphs, Deadlock Detection and Recovery, Deadlock Avoidance, Deadlock Prevention

Case Studies

Brief introduction of MS-DOS, Windows, UNIX and LINUX

(12Hours)

Refernce Books:

1. Peterson and Silberschatz. *Operating System Concepts.* Addison-Wesley 4th Edition 1994.
2. Milenkoviac. *Operating Systems Concepts and Design.* Tata McGraw-Hill 1992.
3. Crowley, Charles. *Operating Systems a Design Oriented Approach.* Tata McGraw-Hill 1996.
4. Tanenbaum, Andrews S. *Modern Operating Systems.* Pearson Education, 2nd edition 2001.
5. Stevens, W Richard. *Linux Network Programming.* PHI, Ist Edition 2003.

	L	T	P	Credits	Marks
Course Title: Algorithm Design & Analysis **Paper Code: CSE307**	4	0	0	4	100

Course Objective: The subject will give an insight into performance analysis, measurements and optimization of the various algorithm development techniques.

Learning Outcomes: After the completion of this course the participants will be able to choose one algorithm technique for any kind of problem.

PART-A
Introduction

Role of Algorithms in Computing; Growth of functions: Asymptotic Notation, Standard notation &common functions; Introduction to Recurrences: substitution method, recursion-tree method, master method; Randomizing Algorithms.

Divide and Conquer

Performance analysis of Binary Search, Merge sort, Quick sort, Selection sort.   **(14Hours)**

PART-B
Greedy Algorithms

Elements of Greedy strategy, Activity Selection Problem, Knapsack problem, Single source Shortcut paths problem, Minimum Spanning tree problem and analysis of these problems.

(10Hours)

PART-C
Dynamic Programming

Elements of dynamic programming, Assembly-line scheduling problem, Matrix-chain multiplication, Multistage Graph, All Pairs Shortest paths, Longest common subsequence, 0/1 Knap Sack.   **(10Hours)**

PART-D
Back Tracking

General method, 8 queen's problem, Graph coloring, 0/1 Knap Sack Problem

NP-Completeness

Polynomial Time, polynomial-time verification, NP-completeness & reducibility, NP-complete problems

(12Hours)

Refernce Books:

1. Sahni, Horowitz. *Fundamentals of Computer Algorithm*. Latest edition, Galgotia Publication.
2. Goodman. *Design & Analysis of Algorithm*. Latest Edition, McGraw hill Publication.
3. Rogers D. and Adams, J. *Mathematical Elements for Computer Graphics*. McGraw - Hill International Edition.
4. Rogers, David F. *Procedural Elements for Computer Graphics*. McGraw HillBook Company.
5. Watt, Alan. and Watt,Mark.*Advanced Animation and Rendering Techniques*. Addison-Wesley.
6. Young, X Window. *System Programming*. OSF/Motif Edition, Prentice Hall.

DAV UNIVERSITY, JALANDHAR

DEPARTMENTAL ELECTIVE (DE)-II

Course Title: Java Programming
Paper Code: CSE311

L	T	P	Credits	Marks
3	0	0	3	75

Course Objective: The course is an introduction to Computer Science that exposes students to the concept of computing and programming using JAVA. This course is for those with little or no programming experience. The exercises are designed to help the students get a solid grasp of declaring and using methods and also learn the fundamental concepts of object oriented programming. Students will learn to use Java technologies in the real world and write numerous programs throughout the semester to demonstrate mastery of the concepts discussed in the classroom.

Learning Outcomes: Upon successful completion of this course, students should be able to: Analyze and explain the behavior of programs involving the fundamental program, write programs that use the fundamental program constructs including standard conditional and iterative control structures, Identify and correct syntax and logic errors in short programs and they will be able to Design and implement program by using packages, interfaces, events, applets and swings. Students will also be able to handle exceptions in programs.

PART-A

Overview of Basic OO Concepts
Need for object-oriented paradigm: Agents, responsibility, messages, methods, classes and instances, class hierarchies (Inheritance), method binding, data types, variables, scope and life time of variables, arrays, operators, expressions, control statements, type conversion and casting.
Features of OOP language
classes and objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, string handling, inheritance, super keyword, polymorphism- method overriding, abstract classes.

(10Hours)

PART-B

Packages:
Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages, exploring packages – Java.io, Java.util.
Interfaces:
differences between classes and interfaces, defining an interface, implementing interface, applying interfaces, variables in interface and extending interface
Exception handling:
Concepts of exception handling, benefits of exception handling, Termination models, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes.
Multithreading
Differences between multi-threading and multitasking, thread life cycle, creating threads, synchronizing threads, daemon threads, thread groups.

(15Hours)

PART-C

Introduction to Event Handling
Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes, inner classes, The AWT class hierarchy.

User interface components
labels, button, canvas, scrollbars, text components, check box, check box groups, choices, lists panels – scroll pane, dialogs, menu bar, graphics, layout manager – layout manager types – boarder, grid, flow, card and grib bag.

Applets
Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets.

(10Hours)

PART-D

Swing
Introduction, limitations of AWT, MVC architecture, components, containers, exploring swing-JApplet, JFrame and JComponent, Icons and Labels, text fields, buttons – The JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes, Trees, and Tables.

Networking
Basics of network programming, addresses, ports, sockets, simple client server program, multiple clients, Java .net package Packages – java.util.

(12 Hours)

Refernce Books:-

1. Nino, J. and Hosch, F.A. *An Introduction to programming and OO design using Java.* John wiley& sons.
2. Budd, T. *An Introduction to OOP*. second edition, pearson education.
3. Liang Y, Daniel. *Introduction to Java programming.* 6th edition, Pearson education.
4. Johnson, R.A. *An introduction to Java programming and object oriented application development*. Thomson.
5. Horstmann Cay. S. and Cornell, Gary. *Core Java 2, Vol 1, Fundamentals.* seventh Edition, Pearson Education**.**

DAV UNIVERSITY, JALANDHAR

Course Title: Symbolic Logic and Logic Programming
Paper Code: CSE313

L	T	P	Credits	Marks
3	0	0	3	75

Course Objective: We will learn how software evolved from circuits and symbolic logic, and we will see how every computer program contains a "logical skeleton" (like a electronic circuit's schematic) that forecasts the program's computation. We can use the logical skeleton as a mathematical proof of the program's correctness, just like you do in algebra or circuit-theory class.

Learning Outcomes: This course is designed to help students acquire facility with logic, both as a formal system in its own right, and as a means to distinguish well from bad reasoning in informal argumentation. This course satisfies both the Quantitative Reasoning and Philosophical and Religious Inquiry and Ethics I pillars of the University Curriculum.

PART-A

Prepositional logic
Syntax and semantics, Validity and consequence. Normal forms. Representing world knowledge using prepositional logic. Proportional Logic, FOPL, Clausal Form, Resolution & Unification. Knowledge representation, acquisition, organization & Manipulation, Semantic nets, Frames, Conceptual Dependency, Scripts & CYC.

First order logic
World knowledge representation and the need for quantifiers. Syntax, semantics validity consequence clause normal from

(10Hours)

PART-B

Introduction to prolog
Syntax of prolog, structured data representation. Execution model Introduction to Programming in Prolog, Illustrative examples. The connection between logic and logic programming interpreting logic programs in terms of Horn clauses Deduction from clause form formulas resolution for prepositional logic Ground resolution. Unification and first order resolution SLD resolution; the computation and search rules. SLD trees and interpretation of non-declarative features of Prolog.

(15Hours)

PART-C

Introduction to Fuzzy logic
Fuzzy sets and Fuzzy reasoning - Fuzzy matrices - Fuzzy functions - Decomposition -Fuzzy automata and languages - Fuzzy control methods - Fuzzy decision making

Artificial Neural Networks
Basic concepts - Single layer perception - Multilayer Perception Supervised and Unsupervised learning – Back propagation networks - Kohen's self-organizing networks - Hopfield network

(10Hours)

PART-D

Advanced prolog features
Programming techniques: Structural Induction and Recursion, Extra Logical features.
Cut and Negation Case studies.

(10Hours)

Refernce Books:-

1. Stoll. *set Theory and logic*. Dover publishers, New York, 1963.
2. Clocksin, W.F. and Mellish, C.S. *Programming in Prolog* 2nd edition, Springer - Verlag, 1984.
3. Gries. *The Science of Programming*, Narosa Publishers, 1985.
4. O' Keefe, R. *The Craft of Prolog*. The MIT Press, 1991.
5. Lloyd, J. W. *Foundation of Logic Programming*, Springer, 1984.

DAV UNIVERSITY, JALANDHAR

Course Title: Computer Graphics and Animation
Paper Code: CSE315

L	T	P	Credits	Marks
3	0	0	3	75

Course Objective: To introduce students to the basics of computer graphics. To make students aware of the full range of techniques required to enable implementation of a graphics system capable of generating complex, realistic and animated images.

Learning Outcomes: Students will demonstrate an understanding of contemporary graphics concepts. Students will create interactive graphics applications in using one or more graphics application programming interfaces on basis of learned techniques geometrical transformations, visibility detection, computer graphics animation and rendering.

PART-A

Introduction
Introduction, Application areas of Computer Graphics, overview of graphics systems, video-display devices, and raster-scan systems, random scan systems, graphics monitors and work stations and input devices**.**
Output primitives
Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms
2-D geometrical transforms
Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems.

(15Hours)

PART-B

2-D viewing
The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland – Hodgeman polygon clipping algorithm
3-D object representation
Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces. Basic illumination models, polygon rendering methods.
3-D Geometric transformations
Translation, rotation, scaling, reflection and shear transformations, composite transformations. 3-D viewing: Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping.

(10Hours)

PART-C

Visible surface detection methods
Classification, back-face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, area sub-division and octree methods.
Rendering
Introduction to shading models- Flat and smooth shading – Adding texture to faces – Adding Shadow of object- Building a camera in a program- Creating shaded object- Rendering

texture- Drawing Shadows. **(10Hours)**

PART-D

Fractals

Fractals and Self similarity- Peano curves – Creating image by iterated function- Mandelbrot sets- Julia Sets- Random Fractals- Overview of Ray Tracing – Intersecting rays with other primitives- Adding Surface texture- Reflections and Transparency- Boolean operations on objects.

(10Hours)

Refernce Books:-

1. Hearn,Donald and Baker, M. Pauline. *Computer Graphics.* second Edition, PHI/Pearson Education.
2. Zhigandxiang, Plastock, Roy. *Computer Graphics Second edition.* Schaum's outlines, Tata Mc- Graw hill edition.
3. Rogers, David F. *Procedural elements for Computer Graphics.* Tata McGraw hill, 2nd edition.
4. Neuman and Sproul. *Principles of Interactive Computer Graphics.* TMH.
5. Foley, VanDam, Feiner and Hughes. *Computer Graphics Principles & practice.* second edition in C, Pearson Education.

DAV UNIVERSITY, JALANDHAR

Course Title: Dot NET Programming
Paper Code: CSE317

L	T	P	Credits	Marks
3	0	0	3	75

Course Objective:

- The ability to effectively use visual studio .NET.
- An understanding of the goals and objectives of the .NET Framework. .NET is a revolutionary concept on how software should be developed and deployed.
- A working knowledge of the C# programming language.

Learning Outcomes: Upon successful completion of this course, students should be able to: Analyze and explain the behavior of programs involving the fundamental program, write programs that use the fundamental program constructs including standard structures, Identify and correct syntax and logic errors in short programs and they will be able to Design and implement program by using NET Framework

PART-A

Introduction:
NET Framework - Common Language Runtime (CLR) - .NET Framework Class Library - .NET Windows Forms – Uses of Web Forms & Web Services - Common Language Runtime (CLR) – Common Type System - Microsoft Intermediate Language (MSIL) - Components of the CLR - Distinguish Between the .NET Compilers – Organizing and Executing Managed Code. NET Framework Class Library – Namespace – Input and Output - Serialization – Working with XML – Remoting – Enterprise Services –Interoperability – GUIs.

(15Hours)

PART-B

.NET Languages
C# Language Fundamentals – Classes and Objects – Methods – Fields and Properties - Inheritance and Polymorphism – Operator Overloading – Struts - Interfaces – Arrays – Indexers and Collections – Strings and Regular Expressions – Handling Exceptions – Delegates and Events.

VB .NET:
Language Fundamentals – Classes and Objects – Methods – Fields and Properties - Inheritance and Polymorphism – Operator Overloading– Interfaces – Arrays – Indexers and Collections – Strings and Regular Expressions.

(15Hours)

PART-C

VB .NET
Handling Exceptions – Delegates and Events - Accessing Data – ADO.NET Object Model- .NET Data Providers – Direct Access to Data – Accessing Data with Datasets.

(10Hours)

PART-D

J2EE: Enterprise Edition Overview - Multi-Tier Architecture - Best Practices-Comparison between J2EE and .NET

(5Hours)

Reference Books:-

1. David Chappell. *Understanding .NET – A Tutorial and Analysis.* Addison Wesley, 2002.   (UNIT I) .
2. Schildt, Herbert. *C# 3.0 the Complete Reference.* McGraw-Hill Professional, Third Edition, 2008. (UNIT II)
3. Harvey M. Deitel, Paul J. Deitel, Tem R. Nieto, Contributor Paul J. Deitel, and Tem R. Nieto. *Visual Basic .NET – How to Program.* Prentice Hall, Second edition, 2001. (UNITs III & IV).
4. Keogh. *J2EE the Complete Reference.* Tata McGraw-Hill, 2008. (UNIT V)

Course Title: Computer Networks Laboratory
Paper Code: CSE319

L	T	P	Credits	Marks
0	0	2	1	25

1. Introduction to Network Simulator OPNET/NS2.
2. Evaluate Ethernet Delay and Load Statics of Switched Ethernet
3. Evaluate the comparative investigations on the performance issues of switched Ethernet with VLAN based on Email and FTP applications.
4. Evaluate Internet connection choice for PC Network on different Data Rate for WAN based on Web Browsing and Email application
5. Implementation of Firewall; in a Network.
6. Simulation of Wireless data Network with different with physical characteristics.
7. Implementation of CSMA/CD Protocol and its comparative investigation with ALOHA Protocol.
8. Design and Implementation of Simple Transfer Protocol in C/ C++.
9. Design of substitution Cipher in C/ C++.
10. Design of Transposition Cipher in C/ C++.
11. Design of Public Key Algorithm in C/ C++.

DAV UNIVERSITY, JALANDHAR

Course Title: Database Management System Laboratory
Paper Code: CSE321

L	T	P	Credits	Marks
0	0	4	2	50

1. Introduction to SQL and installation of SQL Server / Oracle.

2. Data Types, Creating Tables, Retrieval of Rows using Select Statement, Conditional Retrieval of Rows, Alter and Drop Statements.

3. Working with Null Values, Matching a Pattern from a Table, Ordering the Result of a Query, Aggregate Functions,

4. Grouping the Result of a Query, Update and Delete Statements.

5. Set Operators, Nested Queries, Joins, Sequences.

6. Views, Indexes, Database Security and Privileges: Grant and Revoke Commands, Commit and Rollback Commands.

7. PL/SQL Architecture, Assignments and Expressions, Writing PL/SQL Code, Referencing Non-SQL parameters.

8. Stored Procedures and Exception Handling.

9. Triggers and Cursor Management in PL/SQL.

* Students are advised to use Developer 2000/Oracle-10i or higher version or other latest version for above listed experiments.

This is only the suggested list of Practicals. Instructor may frame additional Practicals relevant to the course contents.

DAV UNIVERSITY, JALANDHAR

Course Title: Operating Systems Laboratory
Paper Code: CSE323

L	T	P	Credits	Marks
0	0	4	2	50

1. Simulation of the CPU scheduling algorithms
   a) Round Robin   b) SJF   c) FCFS   d) Priority
2. Simulation of MUTEX and SEMAPHORES.
3. Simulation of Bankers Deadlock Avoidance and Prevention algorithms.
4. Implementation of Process Synchronization (Reader-Writer, Sleeping Barber and Dining Philosopher's Problem)
5. Simulation of page Replacement Algorithms a) FIFO b) LRU c) LFU
6. Simulation of paging techniques of memory management.
7. Simulation of file allocation Strategies a) Sequential b) Indexed c) Linked
8. Simulation of file organization techniques
   a) Single Level Directory   b) Two Level   c) Hierarchical   d) DAG
9. To automate the allocation of IP addresses i.e. to set and configure the DHCP server and DHCP client.
10. To share files and directories between RedHat Linux operating systems i.e. to set and configure the NFS server and NFS clients.
11. To share files and directories between Red Hat Linux and Windows operating systems i.e. to set and configure the samba server.
12. To set and configure the DNS (Domain Name Server).
13. To set and configure the print server and to share printers between Windows and Red Hat Linux operating systems.

This is only the suggested list of Practicals. Instructor may frame additional Practicals relevant to the course contents.

DAV UNIVERSITY, JALANDHAR

Course Title: JAVA Programming Laboratory
Paper Code: CSE325

L	T	P	Credits	Marks
0	0	4	2	50

Objective:

To make the student learn the application of advanced object oriented concepts for solving problems.

To teach the student to write programs using advanced Java features to solve the problems

List of practical:

1. a) Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.
   b) Write a Java program to multiply two given matrices.
2. a) Write a Java program that checks whether a given string is a palindrome or not. Ex: MADAM is a palindrome.
   b) Write a Java program for sorting a given list of names in ascending order.
3. Write a java program to create an abstract class named Shape that contains an empty method named number Of Sides ( ).Provide three classes named Trapezoid, Triangle and Hexagon such that each one of the classes extends the class Shape. Each one of the classes contains only the method number Of Sides ( ) that shows the number of sides in the given geometrical figures.
4. a) Develop an applet that displays a simple message.
   b) Develop an applet that receives an integer in one text field, and computes its factorial Value and returns it in another text field, when the button named "Compute" is clicked.
5. Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -,*, % operations. Add a text field to display the result.
6. Write a Java program for handling mouse events.
7. a) Write a Java program that creates three threads. First thread displays "Good Morning" every one second, the second thread displays "Hello" every two seconds and the third thread displays "Welcome" every three seconds.
   b) Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication.
8. Write a program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the program would throw a Number Format Exception. If Num2 were Zero, the program would throw an Arithmetic Exception Display the exception in a message dialog box.
9. Write a Java program that implements a simple client/server application. The client sends data to a server. The server receives the data, uses it to produce a result, and then sends the result back to the client. The client displays the result on the console. For ex: The data sent from the client is the radius of a circle, and the result produced by the server is the area of the circle. (Use java.net)
10. a) Write a java program that simulates a traffic light. The program lets the user select one of three lights: red, yellow, or green. When a radio button is selected, the light is turned on, and only one light can be on at a time No light is on when the program starts.
    b) Write a Java program that allows the user to draw lines, rectangles and ovals.

11. Suppose that a table named Table.txt is stored in a text file. The first line in the file is the header, and the remaining lines correspond to rows in the table. The elements are separated by commas. Write a java program to display the table using JTable component.

This is only the suggested list of Practical's. Instructor may frame additional Practical's relevant to the course contents*.*

DAV UNIVERSITY, JALANDHAR

Course Title: Symbolic Logic and Logic Programming Lab
Paper Code: CSE327

L	T	P	Credits	Marks
0	0	4	2	50

Study of Propositional Logic

1. Study of First Order Predicate Logic
2. Introduction to prolog programming by a simple prolog program
3. Program to check whether input is alphabet or not
4. Program to find if given number is positive or negative.
5. Write a program to check whether a given person is a member of Club
6. Program in prolog showing mapping that is constructing new structure similar to old one.
7. Program illustrating the use of recursion that is finding sum of first N integers.
8. Program to find the length of a list using 'Recursion' and then using "recursion and Accumulators';
9. Program to find the factorial of a number using recursion and accumulators and cut.
10. Program to calculate average tax illustrating cut-fail combination usage.
11. Program showing use of cut in terminating a 'generate and test'.
12. Program to play "Tic Tac Toe"
13. Write a program to generate fibonacci series upto the given no.
14. Write a program which accepts any number and checks whether it is prime or not.
15. To describe some basic predicates that are useful for manipulating lists.
16. .Program for Bubble Sort
17. Program for Insertion Sort

This is only the suggested list of Practical's. Instructor may frame additional Practicals relevant to the course contents

DAV UNIVERSITY, JALANDHAR

Course Title: COMPUTER GRAPHICS & ANIMATION LAB
Paper code: CSE329

L	T	P	Credits	Marks
0	0	4	2	50

Objective: To understand the logic used in drawing graphs and to implement it through the use of a programming language.

List of programs:

1. To draw a line using DDA Algorithm.
2. To draw a line using Bresenham's Algorithm.
3. To draw a circle using trigonometric Algorithm.
4. To draw a circle using Bresenham's Algorithm.
5. To draw a circle using Midpoint Algorithm.
6. To draw an ellipse using Trigonometric Algorithm.
7. To draw an ellipse using Midpoint Algorithm.
8. To translate an object with translation parameters in X and Y directions.
9. To scale an object with scaling factors along X and Y directions.
10. To rotate an object with a certain angle.
11. To perform composite transformations of an object.
12. To clip line segments against windows.
13. Demonstrate the properties of Bezier Curve.
14. Run a sample session on Microsoft Windows including the use of Paintbrush.
15. Generating Fractal images

This is only the suggested list of Practicals. Instructor may frame additional Practicals relevant to the course contents

DAV UNIVERSITY, JALANDHAR

Course Title: DOT NET PROGRAMMING LAB
Paper Code: CSE331

L	T	P	Credits	Marks
0	0	4	2	50

List of Practical:

1. Shopping cart project using ADO.NET: This sample project has all basic features required for a shopping cart web site including Login, Registration, Add to Cart, Checkout etc. A good ASP.NET learning project using C#, ASP.NET, SQL Server.

2. Personal Assistant: This is a small project for managing personal details. Current version of this project support AddressBook feature - Add, Edit andManage contacts and addresses using VB.NET.

3. Address Book: This is a small project for managing contact details. This is a C# version of the 'Personal Assistant' project.

4. School Management System: This is a project for managing education institutes using C#.

5. Library Management System: This is an academic project for students using Java.

6. Spider Alerts & Web services: This project communicates with web services and downloads Alerts from the web server using Java & XML.

7. Patient Information System: This software can be used to keep track of the patients' information andtreatment details in a hospital or clinic. Some of the advanced features include patient consulting, lab information, billing etc using JSP, Servlet & JDBC.

8. Web based Address Book: This application can be used to keep track of your contacts/addresses. N Tier architecture is used to separate data layer, business layer and UI layers.

DAV UNIVERSITY, JALANDHAR

SIX SEMESTER

	L	T	P	Credits	Marks
Course Title: Theory of Computation **Course Code: CSE302**	4	0	0	4	100

Course Objective: To understand the basic concepts of grammar, automata, languages and Expressions.

Learning Outcomes: Students will learn about all three theories of computer science – automata, formal languages and computation.

PART- A

Basics in Theory of Computations:
Basic concepts of strings, alphabets, languages, Principles of Mathematical Induction.

Languages and Grammars:
Construct of a language, Grammar, Chomsky Classification of Formal Languages.

Finite Automata:
Automata and Applications of Automata Theory, Deterministic and Non-Deterministic FA, Comparison and Equivalence of DFA and NFA.

(14 Hours)

PART- B

Regular Expressions:
Regular Expression, Equivalence of Regular Expression and Finite Automata, Equivalence of Regular Grammar and Finite Automata, Regular and Non- Regular Languages, Pumping Lemma for Regular Sets

Finite State Machines:
Moore and Mealy Machines, Equivalence of Moore and Mealy Machines.

(14 Hours)

PART-C

Context Free Language:
Context Free Grammar, Derivation trees, Context Free Grammar Simplification, Chomsky & Greibach Normal forms, Ambiguities.

Pushdown Automata:
Definition, Equivalence of PDA by Empty Store and PDA by Final State, Construction of PDA for CFLs.

(14 Hours)

PART- D

Turing Machines
Introduction and Turing Machine Model, Computable functions and languages, Techniques for construction of Turing machines, Church's Hypothesis.

Undecidability
Recursive and recursively enumerable languages, Rice theorem, Post's correspondence problem

(14Hours)

Reference Books:-

1. Hopcroft, J E, and Ullman, J D. *Introduction to Automata Theory, Languages and Computation.* Narosa Publishers, 2002.
2. Mishra, K L P, and Chandrasekaran, N. *Theory of Computer Science.* Prentice Hall Inc, 2002.
3. Lewis, Harry R, and Papadimitriou, Chritos H. *Elements of the Theory of Computation.* Pearson Education, 2001.
4. Linz, Peter. *An Introduction to Formal Languages and Automata.* Narosa Publishers, 2002.
5. Sipser, Michael. *Introduction to the theory of computation.* New Delhi: Cengage Learning.

	L	**T**	**P**	**Credits**	**Marks**

Course Title: Relational Database Management System

Paper Code: CSE304

L	**T**	**P**	**Credits**	**Marks**
3	1	0	3	75

Course Objectives: To learn how to use a RDBMS and how to build a RDBMS.

Learning outcome: It will help to make carrier in database administration & related data base designing & maintenance places.

PART-A

Data base system architecture, data independence, storage structures, data representation, indexing, relational data structure, relations, attributes, keys, embedded SQL, Relational Algebra, Query by example, relational calculus, normalization & normal forms, functional dependence, over view of security, integrity, recovery, backup, etc.

(12 Hours)

PART-B

 SQL, Transact-SQL, PL SQL, SQL *PLUS

Managing Database and Queries: Creating, defining and modifying Table structure

Transact-SQL PLUS and substitution of variables.

(12 Hours)

PART-C

- **Introduction to SQL Server and Oracle Server**
- **Indexes**
- **Views**
- **Packages**

(12 Hours)

PART-D

- **Triggers,**
- **Stored Procedures**
- **Cursors**
- **Control structure**

(12 Hours)

Reference Books:

1. Korth, Abraham, and Silberschatz. *Database System Concepts*. McGraw Hall, 1991.
2. Date, C.J. *An Introduction to Database Systems*. Addison Wesley, Vol.-1.
3. Elmasri, Ramez, Shamkant, B, and Navathe. *Fundamentals of Database System*. The Benjamin Cummings Publishing Co., 2nd Edition. 1994.
4. Bayross, Ivan. *PL/SQL the Programming Language of ORACLE*, BPB Publication.

DAV UNIVERSITY, JALANDHAR

Course Title: Software Engineering & Project Management
Course Code: CSE306

L	T	P	Credits	Marks
3	0	0	3	75

Course Objective: To understand the basic concepts of software engineering and software development life cycle.

Learning Outcomes: Students will learn about the different activities of software development and about the risk management. They will get aware about the different case tools.

PART – A

Introduction to Software Engineering:
Software Problem, Software Engineering, Approach, Software process, Characteristics of Software Engineering Process.

Process models:
The waterfall model, Incremental process models, Evolutionary process models, The Unified process.

Software Requirements:
Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document

(12Hours)

PART – B

Software Project Planning:
Cost estimation, cost estimation models, Project scheduling, Software Configuration management, Team Structure, Risk Management.

Requirements engineering process:
Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

System models:
Context Models, Behavioural models, Data models, Object models, structured methods

Design Engineering:
Design process and Design quality, Design concepts, the design model.

(12Hours)

PART – C

Creating an architectural design:
Software architecture, Data design, Architectural styles and patterns, Architectural Design

Object-Oriented Design:
Objects and object classes, An Object-Oriented design process, Design evolution.

Performing User interface design:
Golden rules, User interface analysis and design, interface analysis, interface design steps, Design evaluation

Testing Strategies:
A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging

Product metrics:
Software Quality, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.

Metrics for Process and Products:

Software Measurement, Metrics for software quality.

(12Hours)

PART – D

Risk management:
Reactive vs. Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan.
Quality Management:
Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, Software reliability, The ISO 9000 quality standards.
CASE Tools:
Types of CASE tools, advantages and components of CASE tools, Unified Modelling Language (UML)

(12Hours)

Reference Books:-
1. Agarwal, K.K, and Yogesh Singh.*Software Engineering*. New Age International Publishers,
2. Peters, James F. *Software Engineering, an Engineering approach.* Witold Pedrycz, John Wiely.
3. Jawadekar, Waman S. *Software Engineering principles and practice*. The McGraw-Hill Companies.
4. Pressman, R. S. *Software Engineering Approach*.
5. Pressman, Roger S. *Software Engineering, A practitioner's Approach.* McGraw Hill International Edition, 6th edition.
6. Sommerville. *Software Engineering.* Pearson education,7th edition.
7. Jalote, Pankaj. *An Integrated Approach to software Engineering*.

Course Title: Peripheral Devices & Interface	**L**	**T**	**P**	**Credits**	**Marks**
Course Code: CSE308	3	0	0	3	75

Course Objective: To understand the functional details of various peripheral devices.
Learning Outcomes: Students will learn about features and working of various peripheral devices and role of various device drivers.

PART- A
System Resources:
Interrupt, DMA Channel, I/O Port Addresses and resolving and resolving the conflict of resources. I/O buses-ISA, EISA, Local bus, VESA Local bus, PCI bus, PCI Express, Accelerated graphics port bus.
IDE & SCSI Interfaces:
IDE origin, IDE Interface ATA standards ATA1 to ATA7, ATA feature, ATA RAID and SCSI RAID, SCSI Cable and pin Connector pin outs SCSI V/s IDE Advantages and limitation.

(12Hours)

PART- B
Video Hardware:
Video display technologies, DVI Digital signals for CRT Monitor, LCD Panels, Video adapter types, Integrated Video/ Motherboard chipset, Video RAM, Video driver and multiple Monitor, Graphic accelerators. Advanced 3D Technologies, TV Tuner and Video Capture upgrades troubleshooting Video Cards and Drivers.

(12Hours)

PART- C
I/O Interfaces:
I/O Interfaces from USB and IEEE1394, I/O Interface from serial and Parallel to IEEE1394 and USB 961, Parallel to SCSI converter. Testing of serial and parallel port, USB Mouse/ Keyboard Interfaces

(10Hours)

PART- D
Input/ Output Driver software aspects:
Role of device driver DOS and UNIX/ LINUX device drivers, Design & Integration of Peripheral devices to a computer system as a Case Study
Future Trends:
Detailed Analysis of recent Progress in the Peripheral and Bus systems, Some aspects of cost Performance analysis while designing the system

(12Hours)

Reference Books:-
1. Chaudhary, P. Pal.*Computer Organization and design.* Prentice Hall of India Pvt. Ltd, 1994.
2. Corso, Del, Kirrman, H, and JD Nicond. *Microcomputer buses & links.* Academic Press, 1986.
3. Hall, Douglas V. *Microprocessor & Interfacing Programming & H/W*. McGraw Hill International, 2nd Edition, 1992.
4. Muller, Scott. *Upgrading and repairing PC*.

DAV UNIVERSITY, JALANDHAR

Course Title: DISTRIBUTED SYSTEMS
Paper Code: CSE310

L	T	P	Credits	Marks
3	0	0	3	75

Course Objective: The course is intended to provide basic foundation with fundamental concepts and mechanisms of distributed computing systems. Most of the issues discussed in this course material are the essence of advanced operating systems. Broad coverage as: Introduction to distributed computing systems (DCS) DCS design goals, Transparencies, Fundamental issues, Distributed Coordination, Process synchronization, Inter-process communication.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of the working of the each functional and finally the student will be exposed to the recent trends in distributed computing systems and multithreaded application.

Part-A
Characterization of Distributed Systems: Introduction, Examples of distributed Systems, Resource sharing and the Web Challenges.
System Models: Architectural models, Fundamental Models
Theoretical Foundation for Distributed System: Limitation of Distributed system, absence of global clock, shared memory, Logical clocks, Lamport's & vectors logical clocks, Causal ordering of messages, global state, and termination detection.

(10Hours)

Part-B
Distributed Mutual Exclusion: Classification of distributed mutual exclusion, requirement of mutual exclusion theorem, Token based and non-token based algorithms, performance metric for distributed mutual exclusion algorithms.
Distributed Deadlock Detection: system model, resource Vs communication deadlocks, deadlock prevention, avoidance, detection & resolution, centralized dead lock detection, distributed dead lock detection, path pushing algorithms, edge chasing algorithms.
Agreement Protocols: Introduction, System models, classification of Agreement Problem, Byzantine agreement problem, Consensus problem, Interactive consistency Problem, Solution to Byzantine Agreement problem, Application of Agreement problem, Atomic Commit in Distributed Database system.

(14Hours)

Part-C
Distributed Objects and Remote Invocation: Communication between distributed objects, Remote procedure call, Events and notifications, Java RMI case study.
Security: Overview of security techniques, Cryptographic algorithms, Digital signatures Cryptography pragmatics, Case studies: Needham Schroeder, Kerberos, SSL & Millicent.
Distributed File Systems: File service architecture, Sun Network File System, The Andrew File System, Recent advances.
Transactions and Concurrency Control: Transactions, Nested transactions, Locks, Optimistic Concurrency control, Timestamp ordering, Comparison of methods for concurrency control.

(12Hours)

Part-D
Distributed Transactions: Flat and nested distributed transactions, Atomic Commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery. Replication: System model and group communication, Fault -tolerant services, highly available services, Transactions with replicated data.
Distributed Algorithms: Introduction to communication protocols, Balanced sliding window protocol, Routing algorithms, Destination based routing, APP problem, Deadlock free Packet switching, Introduction to wave & traversal algorithms, Election algorithm.
CORBA Case Study: CORBA RMI, CORBA services.

(10Hours)

Reference Books:

1. Singhal and Shivaratri. *Advanced Concept in Operating Systems.* McGraw Hill.
2. Coulouris,Dollimore, and Kindberg. *Distributed System: Concepts and Design.* Pearson, Ed.
3. Tel, Gerald.*Distributed Algorithms.* Cambridge University Press.
4. Lynch, Nancy. *Distributed Algorithms.* Morgan Kaufmann.
5. Tanenbaum, Andrew S. *Distributed Operating Systems*. ACM Press.

DAV UNIVERSITY, JALANDHAR

DEPARTMENT ELECTIVE-III

Course Title: Data Mining
Paper Code: CSE312

L	T	P	Credits	Marks
3	0	0	3	75

Course Objective: This course will be an introduction to
data mining. Topics will range from statistics to database, with a focus on analysis of large data sets. Another objective is to study the methodology of engineering legacy databases for data warehousing and data mining to derive business rules for decision support systems.

Learning Outcomes: Upon completion of the course, students will be able to:
- Understand the nature and purpose of data mining
- Describe the theoretical constructs and core processes of data mining
- Understand the role of data mining in institutional research.
- Understand the basic statistical concepts related to data mining.
- Describe the predictive modelling functions of data mining.

PART-A

Introduction: Data Mining Concepts, Input, Instances, Attributes and Output, Knowledge Representation & Review of Graph Theory, Lattices, Probability & Statistics
Machine learning concepts and approaches: Supervised Learning Framework, concepts & hypothesis, Training & Learning, Boolean functions and formulae, Monomials, Disjunctive Normal Form & Conjunctive Normal Form, A learning algorithm for monomials

(12Hours)

PART-B

Data Preparation: Data Cleaning, Data Integration & Transformation, Data Reduction
Mining Association Rules: Associations, Maximal Frequent & Closed Frequent item sets, Covering Algorithms & Association Rules, Linear Models & Instance-Based Learning, Mining Association Rules from Transactional databases, Mining Association Rules from Relational databases & Warehouses, Correlation analysis & Constraint-based Association Mining.

(12Hours)

PART-C

Classification and Prediction: Issues regarding Classification & Prediction, Classification by Decision Tree induction, Bayesian classification, Classification by Back Propagation, k-Nearest Neighbor Classifiers, Genetic algorithms, Rough Set & Fuzzy Set approaches
Cluster Analysis: Types of data in Clustering Analysis, Categorization of Major Clustering methods, Hierarchical methods, Density-based methods, Grid-based methods, Model-based Clustering methods

(12Hours)

PART-D

Mining Complex Types of Data: Multidimensional analysis & Descriptive mining of Complex data objects, Mining Spatial Databases, Mining Multimedia Databases, Mining Time-series & Sequence data, Mining Text databases, Mining World -Wide Web
Data Mining Applications and Trends in Data Mining: Massive Datasets/Text mining, Agent-Based Mining

(10Hours)

Reference Books:-

1. Dunham, M.H. *Data Mining: Introductory and Advanced Topics*. Pearson Education.
2. Han, Jiawei, and Micheline Kamber. *Data Mining Concepts & Techniques*. Elsevier.
3. Bishop, C. M. *Pattern Recognition and Machine Learning*. Springer.
4. Theodoridis, S, and K Koutroumbas. *Pattern Recognition*, 4th Edition, Academic Press, 2009.
5. Pujari, Arun k. *Data Mining Techniques*. Universities Press Private Limited.

DAV UNIVERSITY, JALANDHAR

Course Tile: Wireless Networks
Paper Code: CSE314

L	T	P	Credits	Marks
3	0	0	3	75

Course Objective: This course is designed to provide the students with a basic understanding and experiential learning of wireless communications and networking.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of how a Wireless networks work during data communication between wireless end points and how to implement the Security on it.

PART-A
Introduction: Differences between wireless and fixed telephone networks, Evolution of wireless networks, Examples of Wireless Communication Systems: Paging Systems, Cordless Telephone Systems, Cellular Telephone Systems, Comparison of common Wireless Communication systems, Traffic routing in wireless networks: circuit switching and packet switching.

(12 Hours)

PART-B
Wireless Local Area Networks: Introduction, WLAN topologies, requirements, working and function of physical layer and MAC layer, IEEE standards for wireless networks, Wi-Fi, Bluetooth, WiMax.

(12 Hours)

PART-C
Wireless Internet: Mobile IP components, process of agent discovery, registration and de-registration, care-of-address, concept of tunnelling, Limitations of Mobile IP, introduction to micro-mobility protocols.

(12 Hours)

PART-D
Ad Hoc Wireless Networks: Introduction, Challenges in ad hoc networks: spectrum allocation, media access, routing, multicasting, energy efficiency, security and privacy; problems in ad hoc channel access, receiver-initiated MAC protocols, sender-initiated MAC protocols and existing ad hoc MAC protocols; Ad hoc routing protocols: Destination sequenced distance vector (DSDV), Ad hoc on demand distance vector routing (AODV), Dynamic source routing (DSR), Temporally ordered routing algorithm (TORA).

(10Hours)

Reference Books:-

1. Pahlavan and Krishnamurthy. *Principles of Wireless Networks.* Prentice Hall, 2002.
2. Schiller, J. *Mobile Communications.* Addison-Wesley, 2000.
3. Gibson, Jerry D.*The Mobile Communications Handbook.* CRC Press, 1999.
4. .Held, G. *Data over Wireless Networks.* McGraw-Hill, 2001.
5. Blake.*Wireless Communication Systems.* New Delhi : Cengage Learning.

DAV UNIVERSITY, JALANDHAR

Course Title: High Performance Communication Networks

Paper Code: CSE316

L	T	P	Credits	Marks
3	0	0	3	75

Course Objective: Speed is one of the demands put forth by the users. Hence it is required to focus the engineer's attention in developing high speed networks and applications. This syllabus is framed to satisfy the requirements of future telecommunication.

Learning Outcomes: To learn high performance protocols and learn requirements for high speed packet based Networks. How to apply QoS in large network's backbone for flow and congestion control.

PART -A

Basics of Networks: Telephone, computer, Cable television and Wireless network, networking principles, Digitalization: Service integration, network services and layered architecture, traffic characterization and QOS, networks services: network elements and network mechanisms.

Packet Switched Networks: OSI and IP models: Ethernet (IEEE 802.3); token ring (I EEE 802.5), FDDI, DQDB, frame relay, SMDS: Internetworking with SMDS.

(14Hours)

PART -B

Internet and TCP/IP Networks: Overview; internet protocol; TCP and VDP; performance of TCP/IP networks circuit switched networks: SONET; DWDM, Fibre to home, DSL. Intelligent networks, CATV.

(8 Hours)

PART –C

ATM and Wireless Networks: Main features-addressing, signalling and routing; ATM header structure-adaptation layer, management and control; BISDN, interworking with ATM ,Wireless channel, link level design, channel access; Network design and wireless networks.

(12Hours)

PART –D

Optical Networks and Switching: Optical links- WDM systems, cross-connects ,optical LAN's, optical paths and networks, TDS and SDS, modular switch designs-Packet switching, distributed, shared, input and output buffers.

(12Hours)

Reference Books

1. Warland, Jean, and Pravin Varaiya. *High Performance Communication Networks*. London: Harcourt and Morgan Kauffman, 2nd Edition, 2000.
2. Widjaja, Leon Gracia.*Communication networks.* New Delhi: Tata McGraw-Hill, 2000.
3. Kasera, Sethi,Sumit, and Pankaj Sethi. *ATM Networks.* New Delhi: Tata McGraw-Hill, 2000.

DAV UNIVERSITY, JALANDHAR

Course Title: C Shell Programming
Course Code: CSE318

L	T	P	Credits	Marks
3	0	0	3	75

Course Objective: To understand the basic concepts of shell programming.

Learning Outcomes: Students will learn about unix file system, C shell programming and file management.

PART- A
Introduction to UNIX: Architecture of Unix, Features of Unix , Unix Commands – PATH, man, echo, printf, script, passwd, uname, who, date, stty, pwd, cd, mkdir, rmdir, ls, cp, mv, rm, cat, more, wc, lp, od, tar, gzip.

UNIX Utilities: Introduction to unix file system, vi editor, filehandling utilities, security by file permissions, process utilities, disk utilities, networking commands, unlink, du, df, mount, umount, find, unmask, ulimit, ps, w, finger, arp, ftp, telnet, rlogin.Text processing utilities and backup utilities , detailed commands to be covered are tail, head , sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, awk, Cpio

Introduction to Shells: UNIX Session, Standard Streams, Redirection, Pipes, Tee Command, Command Execution, Command-Line Editing, Quotes, Command Substitution, Job Control, Aliases, Variables, Predefined Variables, Options, Shell/Environment Customization.

(13Hours)

PART- B

Filters: Filters and Pipes, Concatenating files, Display Beginning and End of files, Cut and Paste, Sorting, Translating Characters, Files with Duplicate Lines,
Count characters, Words or Lines, Comparing Files.
Grep: Operation, grep Family, Searching for File Content.
Sed: Scripts, Operation, Addresses, commands, Applications, grep and sed.
awk: Execution, Fields and Records, Scripts, Operations, Patterns, Actions, Associative Arrays, String Functions, String Functions, Mathematical Functions, User – Defined Functions, Using System commands in awk,
Applications, awk and grep, sed and awk.
Interactive Korn Shell: Korn Shell Features, Two Special Files, Variables, Output, Input, Exit Status of a Command, eval Command, Environmental Variables, Options, Startup Scripts, Command History, Command Execution Process.

(15Hours)

PART- C
Korn Shell Programming: Basic Script concepts, Expressions, Decisions: Making Selections, Repetition, special Parameters and Variables, changing Positional Parameters, Argument Validation, Debugging Scripts, Script Examples.

Interactive C Shell: C shell features, Two Special Files, Variables, Output, Input, Exit Status of a Command, eval Command, Environmental Variables, On-Off Variables, Startupand Shutdown Scripts, Command History, Command Execution Scripts.

(10 Hours)

PART- D

C Shell Programming: Basic Script concepts, Expressions, Decisions: Making Selections, Repetition, special Parameters and Variables, changing Positional Parameters, Argument Validation, Debugging Scripts, Script Examples.

File Management: File Structures, System Calls for File Management– create, open, close, read, write, lseek, link, symlink, unlink, stat, fstat, lstat, chmod, chown, Directory API – opendir, readdir, closedir, mkdir, rmdir, umask

(8 Hours)

Reference Books:-

1. Forouzan, Behrouz, Gilberg A, and Richard F. *Unix and shell Programming*. Thomson.
2. Das Sumitabha. *Your UNIX the ultimate guide*. TMH, 2nd Edition.
3. Graham, Glass, and King Ables. *UNIX for programmers and users*.Pearson Education, 3rd edition.
4. Kernighan and Pike. UNIX *programming environment*. PHI. / Pearson Education
5. Foster, E.Johnson & other *Beginning shell scripting*. Wile Y India.

Course Title: Relational Database Management System-Lab

Paper Code: CSE320

L	T	P	Credits	Marks
0	0	4	2	50

1) To run the various queries using commands of SQL.

2) To write programs using control structures of PL/SQL like

   If-else statements.

3) To write programs using loops of PL/SQL like For , Do-while , while

4) Implementation of Cursors, Procedures ,Packages Triggers

DAV UNIVERSITY, JALANDHAR

Course Title: Software Engineering & Project Management Lab

Course Code: CSE322

L	T	P	Credits	Marks
0	0	2	1	25

Instruction for Students: The students will be attending a laboratory session of 2 hours weekly and they have to perform the practical related to the following list.

- System Requirement Specification (SRS) and related analysis documents Design documents representing the complete design of the software system.

  Use of CASE Tools:

- Analysis and design for the same problem should be done using Object-Oriented approach.

- Simple exercises in effort and cost estimation in COCOMO model.

- Application of COCOMO and Function Point (FP) model for the actual project that has been chosen.

- Familiarization of SCM tools with some public domain software.

- Familiarization of some reverse engineering tools available in the public domain.

DAV UNIVERSITY, JALANDHAR

DEPARTMENTAL ELECTIVE (DE)-III LAB

Course Title: Data Mining Lab.
Paper Code: CSE324

L	T	P	Credits	Marks
0	0	2	1	25

Students are required to perform practical's in Oracle/MS SQL Server and STATISTICA Data Miner

1. Building a Database Design using ER Modeling and Normalization Techniques
2. Implementation of functions, Procedures, Triggers and Cursors
3. Load Data from heterogenous sources including text files into a predefined warehouse schema.
4. Feature Selection and Variable Filtering (for very large data sets)
5. Association mining in large data sets
6. Interactive Drill-Down, Roll up, Slice and Dice operations
7. Generalized EM & k-Means Cluster Analysis
8. General Classification

Course Title: Wireless Networks Lab
Paper Code: CSE326

L	T	P	Credits	Marks
0	0	2	1	25

1. Design an 802.11 network of mesh topology, using set of suitable inputs check the performance parameters like: Battery Energy consumed, Bit error Rate, Busy, Signal to Noise ratio, Throughput, Utilization.
2. Design Wireless network using Carrier Sensing Multiple Access Technique, Check the performance parameters like: Channel Throughput, Signal to Noise Ratio etc.
3. Design a Project having two scenarios: (a) Star Topology Wireless Network using rapid configuration method. (b) Ring Topology Wireless network also using rapid configuration method, Compare the performance parameters like: End to End Delay for data, Traffic Received, Queue size etc.
4. Design a Star shaped Wireless network, and suggest a way to configure a Physical layer of selected nodes.
5. Design a Project having two scenarios: (a) Bus Topology Wireless Network (b) Ring Topology Wireless network, make use of the Web Reporting to compare the result of two different scenarios.
6. Design a Wireless model having four networks which are ten meters apart from each other, connected to each other wirelessly and are susceptible to delays etc.
7. Create a radio network and observe variations in the quality of received signal that results from radio noise at the receiving node in a dynamic network topology.
8. Designs a Star shaped Wireless topology and suggest a suitable way to import traffic.
9. Performance analysis of wireless mesh backhaul network with 802.11 a/b/g technologies using OPNET.
10. Performance analysis of wireless mesh backhaul network with 802.11 a/p technologies using OPNET.
11. Development of a new CDMA based MAC on top of 802.11p Physical layer

DAV UNIVERSITY, JALANDHAR

	L	T	P	Credits	Marks

Course Title: High Performance Communication Networks Laboratory

L	T	P	Credits	Marks
0	0	2	1	25

Paper code: CSE328

1. Design an 802.3 network of mesh topology, using set of suitable inputs check the performance parameters like: Battery Energy consumed, Bit error Rate, Busy, Signal to Noise ratio, Throughput, Utilization.
2. Design 802.5 network using Carrier Sensing Multiple Access Technique, Check the performance parameters like: Channel Throughput, Signal to Noise Ratio etc.
3. Design a Project having two scenarios: (a) Star Topology 802.3 Network using rapid configuration method. (b) Ring Topology 802.3 network also using rapid configuration method, Compare the performance parameters like: End to End Delay for data, Traffic Received, Queue size etc.
4. Design a Star shaped ATM network, and suggest a way to configure a Physical layer of selected nodes.
5. Design a Project having two scenarios: (a) Bus Topology TCP/IP Network (b) Ring Topology TCP/IP network, make use of the Web Reporting to compare the result of two different scenarios.
6. Design a Wireless model having four networks, which are ten meters apart from each other, connected to each other wirelessly and are susceptible to delays etc.
7. Create a radio network and observe variations in the quality of received signal that results from radio noise at the receiving node in a dynamic network topology.
8. Designs a Frame Relay Network and suggest a suitable way to import traffic.
9. Performance analysis of FDDI networks using OPNET.
10. Performance analysis of Enterprise Network with ATM using OPNET.
11. Emulate LAN over ATM using OPNET.

DAV UNIVERSITY, JALANDHAR

Course Title: C Shell Programming Lab

L	T	P	Credits	Marks
0	0	2	1	25

Course Code: CSE330

Instruction for Students: The students will be attending a laboratory session of 2 hours weekly and they have to perform the practical related to the following list.

1. a) Login to the system
b) Use the appropriate command to determine your login shell
c) Use the /etc./password file to verify the result of step b.
d) Use the who command and redirect the result to a file called myfile1. Use the more command to see the contents of myfile1.
e) Use the date and who commands in sequence (in one line) such that the output of date will display on the screen and the output of who will be redirected to a file called myfile2. Use the more command to check the contents of myfile2.

2) a) Write a sed command that deletes the first character in each line in a file.
b) Write a sed command that deletes the character before the last character
in each line in a file.
c) Write a sed command that swaps the first and second words in each line in a file.

3. a) Pipe your /etc/passwd file to awk, and print out the home directory of each user.
b) Develop an interactive grep script that asks for a word and a file name and then tells how many lines contain that word.
c) Repeat
d) Part using awk

4. a) Write a shell script that takes a command –line argument and reports on whether it is directory, a file, or something else.
b) Write a shell script that accepts one or more file name as arguments and converts all of them to uppercase, provided they exist in the current directory.
c) Write a shell script that determines the period for which a specified user
is working on the system.

5. a) Write a shell script that accepts a file name starting and ending line numbers as arguments and displays all the lines between the given line numbers.
b) Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.

6. a) Write a shell script that computes the gross salary of a employee according to the following rules:
i) If basic salary is < 1500 then HRA =10% of the basic and DA =90% of the basic.
ii) If basic salary is >=1500 then HRA =Rs500 and DA=98% of the basic. The basic salary is entered interactively through the key board.
b) Write a shell script that accepts two integers as its arguments and computers the value of first number raised to the power of the second number.

7. a) Write an interactive file-handling shell program. Let it offer the user the choice of copying, removing, renaming, or linking files. Once the user has made a choice, have the program ask the user for the necessary information, such as the file name, new name and so on.

b) Write shell script that takes a login name as command – line argument and reports when that person logs in

c) Write a shell script which receives two file names as arguments. It should check whether the two file contents are same or not. If they are same then second file should be deleted.

8. a) Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.

b) Develop an interactive script that ask for a word and a file name and then tells how many times that word occurred in the file.

c) Write a shell script to perform the following string operations:

i) To extract a sub-string from a given string.

ii) To find the length of a given string.

9. Write a C program that takes one or more file or directory names as command line input and reports the following information on the file:

i) File type

ii) Number of links

iii) Read, write and execute permissions

iv) Time of last access

(Note: Use stat/fstat system calls)

10. Write C programs that simulate the following unix commands:

a) mv

b) cp (Use system calls)

11. Write a C program that simulates ls Command (Use system calls / directory API)

DAV UNIVERSITY, JALANDHAR

Course Title: Seminar
Paper Code: CSE332

L	T	P	Credits	Marks
0	0	4	2	50

The seminar is based on the research oriented topic. The evaluation of seminar is based upon the contents and presentation of a topic.

DAV UNIVERSITY, JALANDHAR

SEVENTH SEMESTER

Course Title: System Simulation & Modeling

Paper Code: CSE401

L	T	P	Credits	Marks
4	1	0	4	100

Course Objective: This Course introduces
the simulation systems and their modelling applications to students. This course covers the different techniques of Simulation, General Principles and related issues.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of the various simulation technologies and their uses.

Part-A

Introduction to Simulation: System & System Environment, Components of a System, Discrete and Continuous Systems, Model of a System and Types of Models, Discrete Event System Simulation, Advantages and Disadvantages of Simulation, Areas of Application

Techniques of Simulation: Monte Carlo Method, Types of System Simulations, Real Time Simulation, Stochastic Variables, Discrete Probability Functions.

(14 Hours)

Part-B

General Principles: Concepts in Discrete Event Simulation, Event Scheduling /Time Advance Algorithm, List Processing, Using Dynamic Allocation & Linked List

Simulation Software: History of Simulation Software, Selection of Simulation Software, Simulation in C++, GPSS, Simulations Packages, Trends in simulation Software.

Statistical Models in Simulation: Useful Statistical Models, Discrete Distribution s, Continuous Distributions, Poisson Process, Empirical Distributions.

(14 Hours)

Part-C

Queuing Models: Characteristics of Queuing systems, Queuing Notation, Long Run Measures of performance of Queuing Systems, Steady State Behavior of infinite Population Markovian Models, Steady State Behavior of finite Population Models, Networks of Queues.

Random Number Generation: Properties of Random Numbers, Generation of Pseudo-Random Numbers, Techniques for Generating Random Numbers, Tests for Random Numbers, Inverse transform Techniques, Convolution Methods, and Acceptance –Rejection Techniques.

(14 Hours)

Part-D

Input Modeling: Data Collection, Identifying the Distribution with Data, Parameter Estimation, Chi – Square Test, Selecting Input Models with Data.

Verification & Validation of simulation Modeling: Model Building, Verification & Validation, Verification of simulation Models, Calibration & Validation of Models.

(14 Hours)

Refernce Books:

1. Gordon G, *"System Simulation",* PHI 2nd Edition 1998.

2. Deo Narsingh, *"System Simulation with Digital Computers",* PHI, New Delhi 1993.

3. Trivedi, K S. *"Probability and Statistics with Reliability,* Queuing and Computer Science Application", PHI

4. Subranranian, K R V and Sudaresan R Kadayam, *"System simulation: Introduction to GPSS"*, CBS, New Delhi 1993.

5. Feller,W*"An introduction to Probability Theory and its Applications,"* Val 182, Wiley Eastern Ltd. ND.

DAV UNIVERSITY, JALANDHAR

	L	T	P	Credits	Marks
Course Title: Compiler Design	4	1	0	4	100

Paper Code: CSE403

Course Objective: This course should provide the students with a fairly good concept of fundamental concepts and compiler design issues of programming languages and become familiar with major programming paradigms.

Learning Outcomes: After the completion of this course the participants understand similarities and differences between models and know when to use them and also learn designing techniques appropriate for each model.

PART-A

Compiler structure: analysis-synthesis model of compilation, various phases of a compiler, tool based approach to compiler construction.

Lexical analysis: interface with input, parser and symbol table, token, lexeme and patterns. Difficulties in lexical analysis. Error reporting. Implementation. Regular definition, Transition diagrams, LEX.

(14Hours)

PART-B

Syntax analysis: CFGs, ambiguity, associativity, precedence, top down parsing, recursive descent parsing, transformation on the grammars, predictive parsing, bottom up parsing, operator precedence grammars, LR parsers (SLR, LALR, LR), YACC.

Syntax directed definitions: inherited and synthesized attributes, dependency graph, evaluation order, bottom up and top down evaluation of attributes, L- and S-attributed definitions.

(14Hours)

PART-C

Type checking: type system, type expressions, structural and name equivalence of types, type conversion, overloaded functions and operators, polymorphic functions.

Run time system: storage organization, activation tree, activation record, parameter passing, symbol table, dynamic storage allocation.

(14Hours)

PART-D

Intermediate code generation: intermediate representations, translation of declarations, assignments, control flow, boolean expressions and procedure calls. Implementation issues.

Code generation and instruction selection: issues, basic blocks and flow graphs, register allocation, code generation, dag representation of programs, code generation from dags, peep hole optimization, code generator generators, specifications of machine.

(14 Hours)

Reference Books:

1. Aho, V. Sethi, R. and Ullman. J. D. *Compilers: Principles, Techniques and Tools* , Addison-Wesley, 1988.
2. Fischer and LeBlanc, R. Crafting *a Compiler* , Benjamin Cummings, 1991..
3. . Holub, C. *Compiler Design in C* , Prentice-Hall Inc., 1993.
4. Appel. *Modern Compiler Implementation in C: Basic Design ,* Cambridge Press.
5. Fraser and Hanson. *A Retargetable C Compiler: Design and Implementation* , Addison-Wesley.

DAV UNIVERSITY, JALANDHAR

DEPARTMENTAL ELECTIVE-IV

Course Title: Mobile Computing
Paper Code: CSE407

L	T	P	Credits	Marks
3	1	0	3	75

Objectives: To impart knowledge of mobile and wireless computing systems and techniques.

Learning outcomes: - This course offers a good understanding of the concepts, methods and techniques of mobile computing and helps to make a good carrier in the field of telecommunication.

PART – A
Mobility: Issues, challenges, and benefits; Review of mobile and cellular communication technology; Review of distributed/network operating systems, ubiquitous computing. Global System for Mobile Communication (GSM) System Overview: GSM Architecture, Mobility Management, Network Signalling, GPRS.

(14Hours)

PART-B
Mobile IP Networks: Physical mobility, challenges, limits and connectivity, mobile IP and cellular IP in mobile computing. Mobile Transport Layer: Transport layer issues in wireless, Indirect TCP, Snoop TCP, Mobile TCP

(10Hours)

PART – C
Wireless LANs: Introduction to IEEE 802.11, Bluetooth technologies and standards. Mobile Adhoc Networks: Hidden and exposed terminal problems; Routing protocols: DSDV, DSR, AODV.

(10 Hours)

PART-D
Mobile Devices and OS: Various types of Devices, Operating System: PalmOS, WindowsCE, Windows Mobile. Application Development: WWW programming model, Development Environment for Mobile Devices.

(12 Hours)

Refernce Books:

1 Tanenbaum, A.S. *Computer Networks. 4th Ed.,* Pearson Education.
2 Milojicic, D., and Douglis, F. *Mobility Processes, Computers and Agents.* Addison Wesley.
3 Kamal, Raj. *Mobile Computing.* Oxford University Press.

DAV UNIVERSITY, JALANDHAR

Course Title: Internetworking Technologies

Paper Code: CSE409

L	T	P	Credits	Marks
3	1	0	3	75

Course Objective: The subject will give the knowledge of various internetworking components and techniques.

Learning Outcomes: After the completion of this course the participants are able to design the different networks.

Part-A

Introduction to Internetworking: Internetworking Basics, Ethernet Protocol, FDDI Protocol, Token Ring / IEEE 802.5 Protocol

(4Hours)

WAN Technologies: Frame Relay, High Speed Serial Interface, Point to Point Protocol, Switched Multimegabit Data Service, Asymmetric Digital Subscriber Line, Synchronous Data Link Control & Derivatives

(5Hours)

Part-B

Bridging and Switching: ATM Switching, Data-Link Switching, LAN Switching, Tag Switching, Mixed Media Bridging, Source- Route Bridging, Transparent Bridging

(5Hours)

Network Protocols: Apple Talk, DECNET, SNA, NETWARE, Banyan Vines, Xerox Network Systems

(5Hours)

Part-C

Routing Protocols: Border Gateway, IGRP & Enhanced IGRP, Internet Protocol Multicast, NLSP, OSPF, Resource Reservation Protocol, RIP, Simple Multicast Routing Protocol**Network Management Basics:** IBM Network Management, Remote Monitoring, Simple Network Management Protocol

(12Hours)

Part-D

Introduction to Troubleshooting: Symptoms, Problems and Solutions, General Problem Solving Models, Preparing for Network Failures, Use of Some Troubleshooting Tools

(6Hours)

Handling Troubleshooting for Some Important Components: Ethernet, FDDI and Token Ring, TCP/IP, Apple talk, DECNET, SNA & NETWARE, Banyan Vines & XNS, Serial lines & WAN Connections, Bridging and Switching.

(6Hours)

Reference Books:
1. Ford, Merilee. *Internetworking Technologies Handbook.* Ed Cisco Press, 2004.
2. Downes, Kevin. *Internetworking Troubleshooting Handbook.* Ed Cisco Press, 2004.
3. Tanenbaum, Andrew S. *Computer Networks.* Pearson Education 4th Edition, 2003.

4. Kurose, James F, and W Ross Keith. *Computer Networking.* Pearson Education, 2002.
5. Nance. *Introduction to Networking.* PHI 4th Edition, 2002.

Course Title: Soft Computing	**L**	**T**	**P**	**Credits**	**Marks**
	3	1	0	3	75

Paper Code: CSE411

Course Objective: This course should provide the basic knowledge of different soft computing techniques and different problem solving techniques.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of the soft computing techniques and their implementation. Also they learn intelligent systems and various learning techniques.

Part-A

Artificial Neural Networks: Basic concepts - Single layer perception - Multilayer Perception - Supervised and Unsupervised learning – Back propagation networks - Kohnen's self-organizing networks - Hopfield network.

(10 Hours)

Part-B

Fuzzy Systems: Fuzzy sets and Fuzzy reasoning - Fuzzy matrices - Fuzzy functions - Decomposition -Fuzzy automata and languages - Fuzzy control methods - Fuzzy decision making.

(10 Hours)

Part-C

Neuro - Fuzzy Modelling: Adaptive networks based Fuzzy interface systems - Classification and Regression Trees -Data clustering algorithms - Rule based structure identification - Neuro-Fuzzy controls -Simulated annealing – Evolutionary computation.

(10 Hours)

Part-D

Genetic Algorithms: Survival of the Fittest - Fitness Computations - Cross over - Mutation - Reproduction -Rank method - Rank space method.

(6Hours)

Soft computing and Conventional AI: AI search algorithm - Predicate calculus - Rules of interference – Semantic networks -Frames - Objects - Hybrid models - Applications.

(5Hours)

Reference Books:

1. Jang J.S.R., C.T. Sun, and Mizutani E. *Neuro-Fuzzy and Soft computing.* Prentice Hall, 1998.
2. Fausett, Laurene. *Fundamentals of Neural Networks.* Prentice Hall, 1994.
3. Klir, George J., and Bo Yuan. *Fuzzy sets and Fuzzy Logic.* Prentice Hall, USA 1995.
4. Nelsson, N. J. *Artificial Intelligence - A New Synthesis.* Harcourt Asia Ltd., 1998.
5. Goldberg, D.E. *Genetic Algorithms: Search, Optimization and Machine Learning.* Addison Wesley, 1989.

Course Title: High Speed & Broadband Network
Paper Code: CSE413

L	T	P	Credits	Marks
3	1	0	3	75

Objective: - To impart knowledge of High speed broadband network
Learning outcomes: -   It will help to enhance knowledge in the field of broadband network.
Part-A
Introduction: Introduction to modern networking trends Optical networking: principles and challenges; evolution of optical networks, wavelength routed network, wavelength division multiplexing (WDM) network technology, sub-carrier multiplexing optical networks.

(8 Hours)

Part-B
Enabling technologies: optical transmitter, optical fiber, optical receivers, optical amplifiers, optical switching elements, optical cross-connects (OXC), multiplexers/demultiplexers, wavelength routers, optical wavelength converters, WDM network test beds. Network architecture, IP over WDM. Broadcast optical networks: single and multiple hop networks, channel sharing and multi-casting, shared channel multicasting network-GEMNET, performance evaluation for unicast and multicast traffic, experimental WDM networks.

(15 Hours)

Part-C
Wavelength routed networks: virtual topology design, routing and wavelength assignment, circuit switched and packet switched approaches, performance evaluation. Reconfiguration in WDM network, network control and management, network optimization, design considerations. Multi wavelength star and ring networks

(10Hours)

Part-D
 Photonic switching, optical TDM (OTDM) and optical CDMA (O-CDMA) networks, next generation optical networks. Protection and Restoration on WDM networks Network Flow problem and Simulations Control and signaling schemes in WDM networks GMPLS Deeper Protection/Restoration issues on WDM networks Optical Network Security

(12 Hours)

Refernce Books:

1. Stern, Thomas E. *Multi wavelength Optical Networks: A Layered Approach.* Krishna Bala.
2. Cameron, Debra. *Optical Networking.* Wiley, December 2001.
3. Vivek Alwayn. *Optical Network Design and Implementation.* Cisco Press.
4. Gumaste, Ashwin, and Antony, Tony. *DWDM Network Designs and Engineering Solutions*, Pearson Education.
5. Gurusamy, Mohan C. Siva Murthy. *WDM Technology and Issues in WDM Optical Networks.* Prentice Hall Publications, 2002.

DEPARTMENTAL ELECTIVE-V

Course Title: Natural Language Processing
Paper Code: CSE415

L	T	P	Credits	Marks
4	0	0	4	100

Objective: - Introduction to the methods and techniques of Natural Processing- semantics, pragmatics, Applications of Natural Language Processing.

Learning outcomes: -   To learn how to make interface between human and machine & Semantics knowledge Representation approaches.

Part-A

Components of natural language processing: lexicography, syntax, semantics, and pragmatics: word level representation of natural languages prosody & natural languages. Formal languages and grammars: Shomsky Hierarchy; Left Associative Grammars. Ambiguous Grammars. Resolution of Ambiguities.

(14 Hours)

Part-B

Semantics knowledge Representation: Semantic Network Logic and inference. Pragmatics, Graph Models and Optimization. Prolog for natural semantic.

(14 Hours)

Part-C

Computation Linguistics: Recognition and parsing of natural language structures: ATN & RTN; General techniques of parsing: CKY, Earley& Tomita's Algorithm.

(14 Hours)

Part-D

Application of NLP: Intelligent Work Processors: Machine Translation; User Interfaces; Man-Machine Interfaces: Natural language Querying Tutoring and Authoring Systems. Speech Recognition Commercial use of NLP.

(13 Hours)

Reference Books:-

1. Arbib, Mdlj, and faury, K. *Introduction to formal language Theory*, Springer Verlag. 1988.
2. Allen, J. *Natural Language understanding*. Benjamin/Cunnings, 1987.
3. Gazder, G. *Natual Language processing in Prolog*. Addison Wesley, 1989.

DAV UNIVERSITY, JALANDHAR

Course Title: Information Retrieval System
Paper Code: CSE417

L	T	P	Credits	Marks
4	0	0	4	100

Objective: - To impart knowledge of information retrieval system
Learning outcomes: - To enhance knowledge in Information visualization technologies.

Part –A
Introduction: Definition, Objectives, Functional Overview, Relationship to DBMS, Digital libraries and Data Warehouses. Information Retrieval System Capabilities: Search, Browse, Miscellaneous Cataloguing and Indexing: Objectives, Indexing Process, Automatic Indexing, Information Extraction.

(12 Hours)

 Part-B
Data Structures: Introduction, Stemming Algorithms, Inverted file structures, N-gram data structure, PAT data structure, Signature file structure, Hypertext data structure. Automatic Indexing: Classes of automatic indexing, Statistical indexing, Natural language, Concept indexing, Hypertext linkages, Document and Term Clustering: Introduction, Thesaurus generation, Item clustering, Hierarchy of clusters.

(15 Hours)

Part-C
User Search Techniques: Search statements and binding, Similarity measures and ranking, Relevance feedback, Selective dissemination of information search, weighted searches of Boolean systems, Searching the Internet and hypertext.

(13 Hours)

Part-D
Information Visualization: Introduction, Cognition and perception, Information visualization technologies. Text Search Algorithms: Introduction, Software text search algorithms, Hardware text search systems. Information System Evaluation: Introduction, Measures used in system evaluation, Measurement example – TREC results.

(13 Hours)

Refernce Books:

1. Kowalski, Gerald, and Maybury, Mark T. *Information Retrieval Systems: Theory and Implementation,* Kluwer Academic Press, 1997.
2. Frakes, W.B., and Yates, Ricardo Baeza. *Information Retrieval Data Structures and Algorithms,* Prentice Hall, 1992.
3. Yates. *Modern Information Retrieval.* Pearson Education.
4. Korfhage, Robert. *Information Storage & Retrieval*. John Wiley & Sons.

Course Title: Data Compression	L	T	P	Credits	Marks
Paper Code: CSE419	4	0	0	4	100

Objective: - To impart knowledge of Data Compression
Learning outcomes: - To know different types of data compression techniques.

Part-A
Introduction: Compression Techniques: Loss less compression, Lossy Compression, Measures of prefonnance, Modeling and coding, Mathematical Preliminaries for Lossless compression: A brief introduction to information theory, Models: Physical models, Probability models, Markov models, composite source model, Coding: uniquely decodable codes, Prefix codes.

(12 Hours)

Part-B
Huffman coding: The Huffman coding algorithm: Minimum variance Huffman codes, Adaptive Huffman coding: Update procedure, encoding procedure, decoding procedure. Golomb codes, Rice codes, Tunstall codes, Applications of Hoffman coding: Loss less image compression, Text compression, Audio Compression. Arithmetic Coding: Coding a sequence, Generating a binary code, Comparison of Binary and Huffman coding, Applications: Bi-level image compression-The JBIG standard, JBIG2, Image compression. Dictionary Techniques: Introduction, Static Dictionary: Diagram Coding, Adaptive Dictionary.

(15 Hours)

Part-C .
The LZ77 Approach, The LZ78 Approach, Applications: File Compression-UNIX compress, Image Compression: The Graphics Interchange Format (GIF), Compression over Modems: V.42 bits, Predictive Coding: Prediction with Partial match (ppm): The basic algorithm, The ESCAPE SYMBOL, length of context, The Exclusion Principle, The Burrows-Wheeler Transform: Move-to- front coding, CALIC, JPEG-LS, Multi-resolution Approaches, Facsimile Encoding, Dynamic Markoy Compression.

(14 Hours)

Part-D
Mathematical Preliminaries for Lossy Coding: Distortion criteria, Models, Scalar Quantization: The Quantization problem, Uniform Quantizer, Adaptive Quantization, Non uniform Quantization. Vector Quantization: Advantages of Vector Quantization over Scalar Quantization, The Linde-Buzo-Gray Algorithm, and Tree structured Vector Quantizers. Structured Vector Quantizers. **(13 Hours)**

Reference Books:
1. Sayood, Khalid. *Introduction to Data Compression*. Morgan Kaufmann Publishers.
2. Nelson, Mark. *The data compression book: Featuring fast, efficient data compression Techniques in C*. M&T Books.
3. Nelson, Mark, and Gailly, Jean-loup. *The Data Compression Book 2nd edition*. M&T.
4. Hankerson, D. and Johnson, P. D. and Harris,G. A. *Introduction to Information Theory and Data Compression*. CRC Press, 1998.
5. Held, G., and Marshall, T. R. *Data and Image Compression*: *Tools and Techniques*. Wiley, 1996.

DAV UNIVERSITY, JALANDHAR

Course Title: Neural Networks & Fuzzy Logic Paper Code: CSE421	L	T	P	Credits	Marks
	4	0	0	4	100

Objective: - To impart knowledge of neural network and fuzzy logic
Learning outcomes: - After completion of this subject student will able to make various types of Projects and will help to make carrier in the field of artificial intelligence.

PART-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, out star, weights on connections, threshold function, application- Ada line and mada line Back propagation: feed forward back propagation network- mapping, layout, training, BPN applications

(15 Hours)

PART-B
Learning and training: objectives of learning, Hebb's rule, delta rule, supervised learning, unsupervised networks, learning vector quantize, associative memory models , one-shot learning, resonance, stability, training and convergence .

(14 Hours)

PART-C
Fuzzy Logic: Introduction, fuzzy sets, fuzzy operations, 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.

(14 Hours)

PART-D
Adaptive Resource theory- network for ART, processing in ART Kohen Self Organizing Map- Competitive learning, lateral inhibition, training law for Kohen network, implementation, applications to pattern recognition Application of fuzzy Logic: Fuzzy databases and quantification, fuzzy control, designing fuzzy logic controller.

(13 Hours)

Reference Books:

1. Rao, Vallinu B. and Rao, Hayagriva. *Neural networks and fuzzy Logic, second edition,* BPB Publication.
2. Riza, Berkan C. Trubatch L, Sheldon, *Fuzzy Systems design Principle*. IEEE Press: Standard publisher's distributers.
3. James, Freeman A. and David Skapura M. *Neural networks algorithms, applications and programming Techniques*. Pearson Education.
4. Anderson, James A. *Introduction to neural N/W.* PHI 5. Neural N/W Freeman Publisher: Addison Wesley.

DAV UNIVERSITY, JALANDHAR

DEPARTMENTAL ELECTIVE –VI

Course Title: Virtual Reality

L	T	P	Credits	Marks
3	1	0	3	75

Paper Code: CSE423

Course Objective: This course offers a good understanding of the various functional Trackers, Navigation, and Gesture Interfaces and knowledge of 3D Sprites, animated 3D sprites and particle systems.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of the working of the each functional of virtual reality and finally the student will be exposed to the recent trends in 3D Sprites, animated 3D sprites and application.

Part-A
Introduction: The three I's of virtual reality, commercial VR technology and the five classic components of a VR system.
Input Devices: (Trackers, Navigation, and Gesture Interfaces): Three-dimensional position trackers, navigation and manipulation, interfaces and gesture interfaces.
Output Devices: Graphics displays, sound displays & haptic feedback.

(14Hours)

Part-B
Modeling: Geometric modeling, kinematics modeling, physical modeling, behaviour modeling, model management.

(10Hours)

Part-C
Human Factors: Methodology and terminology, user performance studies, VR health and safety issues.
Applications: Medical applications, military applications, robotics applications.

(10Hours)

Part-D
VR Programming-I: Introducing Java 3D, loading and manipulating external models, using a lathe to make shapes.
VR Programming-II: 3D Sprites, animated 3D sprites, particle systems.

(11Hours)

Reference Books

1. Burdea, Gregory C., and Coiffet, Philippe. *Virtual Reality Technology, Second Edition*, John Wiley & Sons, Inc.
2. Sherman, William R. and Craig, Alan. *Understanding Virtual Reality, interface, Application and Design,* Elsevier: Morgan Kaufmann.
3. Fleming, Bill *3D. Modeling and surfacing,* Elsevier: Morgan Kauffman.
4. Eberly, H, David. *3D Game Engine Design,* Elsevier.
5. Vince, John. *Virtual Reality Systems,* Pearson Education.

DAV UNIVERSITY, JALANDHAR

Course Title: Optical Networks Design and Implementation

Paper Code: CSE425

L	T	P	Credits	Marks
3	1	0	3	75

Course Objective: The objective of this course is to gain an understanding of various issues in designing an optical network. Topics include SONET/SDH, wavelength division multiplexing, framing techniques, Parametric Process**,** protection and restoration, and optical packet switching.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of Various Optical topologies and designing stagey of Optical Communication Systems.

Part-A
Introduction: Historical perspective, Fibre Characteristics, Group Velocity Dispersion, Different propagation Regimes, Dispersion Induced pulse broadening, higher order Dispersion, Dispersion Slope, Growth of optical communication systems to its current scenario. (12 Hours)

Part-B
Fiber non linearties: Fiber nonlinearties: SPM and XPM Induced Nonlinear effects, Nonlinear Birefringence Effects, XPM induced Modulation Stability, spectral & temporal Effects, XPM induced Non reciprocity, Implications for Optical Communication Systems.
(12 Hours)
Part-C
Parametric Process: Four Wave Mixing, Second harmonic Generation Parametric Gain, Phase Matching Techniques, parametric Amplifications & its applications, Dispersion Management**.** (12 Hours)

Part-D
Optical Networks: Introduction to optical networks, LAN, WAN and MAN, Various Optical topologies, Wavelength Routers, wavelength Converters, Survivability and multicast in optical networks. (12 Hours)

Reference Books:

1. Alwayn. *Optical Network Design and Implementation.* Cisco Press.
2. Dutton. *Understanding Optical Communication.* IBM publications.
3. Myneav. *Optical Fibre Technology.* Pearson.
4. Agarwal, G.P. *Fiber optic communication systems 2nd Edition.* New York: John Wiley & Sons.
5. Keiser, G. *Optical fiber communication Systems.* New York: McGraw-Hill, 2000.

Course Title: Grid Computing	L	T	P	Credits	Marks
Paper Code: CSE427	3	1	0	3	75

Course Objective: This Course introduces the Grid Computing and their applications to students. This course covers the different compression standards used in business, some current technology and related issues.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of the various technical and management issues regarding Grid business.

Part-A

Introduction: Fundamentals of Grid Computing, Types of resources, Problems in Grid computing, Global Distribution System for Grid Computing, Ecosystem of the Grid, Early Grid Activities. **(12Hours)**

Part-B

Grid Architecture: Autonomic Computing, Service-Oriented Architecture and Grid, Semantic Grids, Merging the Grid Services Architecture with the Web Services Architecture. Open Grid Services Architecture (OGSA)

Grid Computing in Business: Grid-specializing vendors and niche vendors, Grid resource providers, Departmental grids, Enterprise grids, Partner grids, Open grids. **(11Hours)**

Part-C

Grid software components: Management components, Donor software, Submission software, Distributed grid management, Schedulers, Enrolling and installing grid software, Logging onto the grid, Logging onto the grid

Grid administration: Planning, Installation, Managing enrollment of donors and users, Certificate authority, Resource management, Data sharing. **(10Hours)**

Part-D

Technical and Management Issues: Building and selling Grid business case, transition period management, Role of consultants, Risk Mitigation, Organizational security requirements and firewalls, Authorization scalability and federations.

Case Study: The MCNC Enterprise Grid: Service, Customers, Financials, Resources, Location. **(12Hours)**

Reference Books:

1. Joseph, Joshy. and Fellenstein, Craig. *Grid Computing.* IBM Press.
2. Li, Maozhen. and Baker, Mark. *The Grid: Core Technologies.* John Wiley & Son's Publisher.
3. Ahmar Abbas. *Grid Computing: Practical guide to technology and applications.* Publisher: Charles River Media.
4. Pawel, Plaszczak, and Rich, Wellner. *Grid Computing: The Savvy Manager's Guide.* Morgan Kaufmann Publishers.
5. Marios, D. Dikaiakos. *Grid Computing"*, Spinger.

Course Title: Unified Modelling Language

Paper Code: CSE429

L	T	P	Credits	Marks
3	1	0	3	75

Course Objective: This Course introduces the object oriented design and modelling. It provides the various diagrams to represent and design the various systems.
Learning Outcomes: After the completion of this course the participants would gain the knowledge of the various models and diagrams to design the system blueprints.
Part-A

Object Oriented Design and Modelling: Object Oriented Fundamentals, Objects and object classes, object oriented design process, importance of modelling, principles of modelling, object oriented modelling.
Introduction to UML: Conceptual model of UML, building blocks of UML, Mechanisms in UML, architecture, software development life cycle.

(12Hours)

Part-B
Basic Structural Modelling: Classes, relationships, common mechanisms, class and object diagrams.
Advanced structural Modelling: Advanced classes, advanced relationships, Interfaces types and roles, packages, instances and object diagrams.

(12Hours)

Part-C
Collaboration Diagrams and Sequence Diagrams: Terms, concepts and depicting a message in collaboration diagrams. Terms and concepts in sequence diagrams. Difference between collaboration and sequence diagram. Depicting synchronous messages with/without priority call back mechanism.
Basic behavioral modelling: Interactions, use cases, Use Case Diagrams, Interaction Diagrams and activity diagrams.

(12Hours)

Part-D
Advanced behavioral modelling: Events and signals, state machines, process and threads, time and space, state chart diagrams.
Architectural Modelling: Terms, Concepts, examples, Modelling techniques for component diagrams and deployment diagrams.

(12Hours)

Reference Books:

1. Booch, Grandy, Rumbough, James, and Jacobson, Ivar. *The Unified Modelling Language User Guide*. Pearson Education, 2002.
2. Sommerville, Ian. *Software Engineering Sixth Edition.* Pearson education, 2003.
3. Jones, Meilir Page. *Fundamentals of Object Oriented Design in UML.* Addison Wesley, 2000.

DAV UNIVERSITY, JALANDHAR

Course Title: System Simulation and Modeling Laboratory

Paper Code: CSE431

L	T	P	Credits	Marks
0	0	4	2	50

Implementation of the followings Simulation problems in GPSS or any High Level Programming   Language

1. Computer Generation of Random Numbers.

2. Testing Random Number Generators.

3. Monte-Carlo Simulation.

4. Simulation of Single Server Queuing System.

5. Simulation of Two-Server Queuing System.

6. Simulation of Inventory System.

7. Simulation of Telephone System.

DAV UNIVERSITY, JALANDHAR

Course Title: Minor Project

Paper Code: CSE433

L	T	P	Credits	Marks
0	0	4	2	50

The minor project may be a

- Database
- Application software
- System software
- Multimedia
- Web Related

A complete project report must be submitted along with softcopy of project. Project report may include requirements of project, Flow Chart, DFDs, coding and test results.

EIGHTH SEMESTER

Course Title: Information Security Systems
Paper Code: CSE402

L	T	P	Credits	Marks
3	0	0	3	75

Course Objective: The aim of this course is to provide attendees with a thorough understanding of the issues associated with the design, provision and management of security services for modern communication and information systems. Students will learn the different aspects of information and network security and you will be able to speak about a multitude of security attacks and the defensive strategies used to combat them.

Learning Outcomes: After completing this course the student should be able to:
• Describe the fundamental concepts of information system security.
• Understand the following terms: security policy, host based security, firewall, and packet filtering and intrusion detection.

PART-A

Overview: Services, Mechanisms, and Attacks, the OSI Security Architecture, A Model for Network, Security.
Classical Encryption Techniques: Symmetric Cipher Model, Substitution Techniques, Transposition Techniques, Rotor Machines, Steganography.
Block Ciphers And The Data Encryption Standard: Simplified DES, Block Cipher Principles, The Data Encryption Standard, The Strength of DES, Differential and Linear Cryptanalysis, Block Cipher Design Principles, Block Cipher Modes of Operation.
Introduction To Finite Fields: Groups, Rings, and Fields, Modular Arithmetic, Euclid's Algorithm, Finite Fields of the Form GF(p), Polynomial Arithmetic, Finite Fields of the Form GF(2n).

(12Hours)

PART-B

Advanced Encryption Standard: Evaluation Criteria for AES, The AES Cipher.
Contemporary Symmetric Ciphers: Triple DES, Blowfish, RC5, Characteristics of Advanced Symmetric Block Ciphers, RC4 Stream Cipher.
Confidentiality Using Symmetric Encryption: Placement of Encryption Function, Traffic Confidentiality, Key Distribution, Random Number Generation.
Public-Key Encryption and Hash Functions: Introduction to Number Theory: Prime Numbers, Format's and Euler's Theorems, Testing for Primality, The Chinese Remainder Theorem, Discrete Logarithms.
Public-Key Cryptography and RSA: Principles of Public-Key Cryptosystems, the RSA Algorithm, Recommended Reading and Web Site, Key Terms, Review Questions, and Problems.
Key Management and Other Public-Key Cryptosystems: Key Management, Diffie-Hellman Key Exchange, Elliptic Curve Arithmetic, Elliptic Curve Cryptography.

(12Hours)

PART-C

Message Authentication and Hash Functions: Authentication Requirements, Authentication Functions, Message Authentication Codes, Hash Functions, Security of Hash Functions and MACs.

Hash Algorithms: MD5 Message Digest Algorithm, Secure Hash Algorithm, RIPEMD-160, and HMAC.

Digital Signatures and Authentication Protocols: Digital Signatures, Authentication Protocols, Digital Signature Standard.

(12Hours)

PART-D

Network Security Practice: Authentication Applications: Kerberos, X.509 Authentication Service, Electronic Mail Security: Pretty Good Privacy, S/MIME. IP Security: IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations, Key Management, Web Security: Web Security Considerations, Secure Sockets Layer and Transport Layer Security, Secure Electronic Transaction.

System Security: Intruders: Intruders, Intrusion Detection, Password Management, Malicious Software: Viruses and Related Threats, Virus Countermeasures, Firewalls: Firewall Design Principles, Trusted Systems.

(12Hours)

Reference books:

1. Stallings, William. *Cryptography and network Security.* Pearson Education, 2003.
2. Trappe, and Washington. *Introduction to Cryptography with Coding Theory.* Prentice-Hall 2001.
3. Stinson, D. *Cryptography: Theory and Practice.* Second Edition: Chapman & Hall, 2002.
4. Perlman, Kaufman, and Speciner. *Network Security.* Prentice-Hall Second Edition, 2001.
5. Whitman, Michael E. *Principles of information Security.* Cen gage Learning, New Delhi.

Course Title: Image Processing and Pattern Recognition
Paper Code: CSE404

L	T	P	Credits	Marks
4	0	0	4	100

Course Objective: The students develop understanding of use of statistical analysis for multidimensional data. It also give fundamentals to understand data analysis from raw measurement values to higher level decision making in colour and image context. The students develop basic understanding for difference between analysis with or without a priori data as well as ways to evaluate results.

Learning Outcomes: On completion of this course the students will be able to:
Understand principles how multidimensional statistical methods differ from one dimensional method. Program some basic clustering and classification methods and test their validity.

PART-A

- **Introduction:** Digital Image Processing and Applications – Image Representation and Modeling – Image Enhancement – Image Restoration – Image Analysis – Image Data Compression **5 hours**
- **Digital Image Fundamentals:** Elements of Visual perception – A simple Image Model – Sampling and Quantization – Some Basic Relationship between Pixels **5 hours**
- **Image Transforms:** Two Dimensional Orthogonal and Unitary Transforms – Properties of Unitary Transforms – One Dimensional DFT – Two Dimensional DFT – Cosine Transforms – Sine transforms – Hadamard Transforms – Haar Transforms – Slant transforms. **8 hours**

PART-B

- **Image Enhancement:** **4 hours**
  Point Operations – Histogram Modeling – Spatial Operations – Transform Operations.
- **Image Restoration and Compression:** Image observation models – Inverse and Wiener Filtering – Pixel Coding – Predictive techniques – Transform Coding of Images **4 hours**

PART-C

- **Statistical   and   Non – Parametric   Decision   Making:** Applications of Pattern Recognition – Baye's Theorem – Multiple Features – Conditionality Independent Features – Decision Boundaries – Unequal Costs of Error – Estimation of Error Rates – Kernel and Window Estimator – Nearest Neighborhood Classification Techniques – Adaptive Decision Boundaries – Adaptive Discriminant Functions **9 hours**
- **Clustering:**   Introduction – Hierarchical Clustering – Partitioned Clustering **4 hours**

PART-D

- **Artificial Neural Networks:** Introduction – Nets without Hidden Layers – Nets With Hidden Layers – The Back Propagation Algorithms – Hopfield Nets – Classifying Sex From Facial Images **5 hours**

Reference Books:

1. Jain, Anil K. *Fundamentals of Digital Image Processing*. PHI.
2. Gose, Earl, and Jost, Richard Johnson Baugh Steve. *Pattern Recognition and Image Analysis*, PHI.
3. Gonzalez, Rafael C, and Woods, Richard E. *Digital Image Processing,* Addison – Wesley.
4. AHMED, M. A. SID. *Image Processing Theory Algorithms and Architecture.* McGraw Hill Inc.

Course Title: Parallel Computing

Paper Code: CSE406

L	T	P	Credits	Marks
3	0	0	3	75

Objectives: To impart knowledge of parallel computing systems and techniques.
Learning outcome: -   Student will able to find parallelism approaches and use of parallel programming.

Part-A
Introduction: Paradigms of parallel computing: Synchronous - vector/array, SIMD, Systolic; Asynchronous- MIMD, reduction paradigm. Hardware taxonomy: Flynn's classifications, Handler's classifications. Software taxonomy: Kung's taxonomy, SPMD.

(8 Hours)

Part-B
Abstract parallel computational models: Sequential model, need of alternative model, parallel computational models such as PRAM, LMCC, Hypercube, Cube Connected Cycle, Butterfly, Perfect Shuffle Computers, Tree model, Pyramid model, Fully Connected model, PRAM-CREW, EREW models, simulation of one model from another one, Sorting network, Interconnection RAMs. Parallelism approaches - data parallelism, control parallelism.

(12 Hours)

Part-C
Performance Metrices: Laws governing performance measurements. Metrices - speedups, efficiency, utilization, communication overheads, single/multiple program performances, benchmarks. Parallel Processors: Taxonomy and topology - shared memory mutliprocessors, distributed memory networks. Processor organization - Static and dynamic interconnections. Embeddings and simulations

(12 Hours)

Part-D
 Parallel Programming: Shared memory programming, distributed memory programming, object oriented programming, data parallel programming, functional and dataflow programming. Scheduling and Parallelization: Scheduling parallel programs. Loop scheduling. Parallelization of sequential programs. Parallel programming support environments

(13 Hours)

Reference Books:
1. Quinn, M. J. *Parallel Computing: Theory and Practice*, New York: McGraw Hill, 1994.
2.   Lewis, T. G. and Rewini, H. El.   *Introduction to Parallel Computing.* New Jersey:Prentice Hall, 1992.
3. Lewis, T. G. *Parallel Programming: A Machine-Independent Approach*. Los Alamitos: IEEE Computer Society Press, 1994.
4. Akl, S.G. *Design and Analysis of Parallel Algorithms,* Prentice Hall, 1989.
5. Akl, S.G. *Parallel Sorting Algorithm.* New York: Academic Press, 1984.

DAV UNIVERSITY, JALANDHAR

DEPARTMENTAL ELECTIVE- VII

Course Title: Cyber Laws And IPR
Paper Code: CSE408

L	T	P	Credits	Marks
3	0	0	3	75

Course Objective: This syllabus presents the meaning and definition of cybercrime, the legislation in India dealing with offences relating to the use of or concerned with the abuse of computers or other electronic gadgets. The Information Technology Act 2000 and the I.T. Amendment Act 2008 have been dealt with in detail and other legislations dealing with electronic offences have been discussed in brief.

Learning Outcomes: Upon successful completion of this course, students will be aware of present cyber laws, Cyber Crimes, Cyber Security, Criminal Liability, Corporate policies.

PART-A

Cyber laws: Introduction to the Cyber World and Cyber Law, Information Technology Act, 2000 –Digital Signature; E-Governance; Regulation of Certifying Authorities; Duties of pub scribers; Penalties and Adjudications; Offences under the Act; Making of Rules and Regulations etc.

Cyber Crimes Introduction –computer crime and cybercrimes; Classification of cybercrimes. Cyber forensic, Cyber criminals and their objectives Kinds of cybercrimes – cyber stalking; cyber pornography; forgery and fraud; crime related to IPRs; Cyber terrorism; computer vandalism etc

(11Hours)

PART-B

Cyber Security: Cyber Security and its problem-Intervention Strategies: Redundancy, Diversity and Autarchy. Private ordering solutions, Regulation and Jurisdiction for global Cyber security, Copy Right-source of risks, Pirates, Internet Infringement, Fair Use, postings, criminal liability, First Amendments, Data Losing

(11Hours)

PART-C

Copy Right: Source of risks, Pirates, Internet Infringement, air Use, postings, Criminal Liability, First Amendments, Losing Data, Trademarks, Defamation, Privacy-Common Law Privacy, Constitutional law, Federal Statutes, Anonymity, Technology expanding privacy rights.

Duty of Care, Criminal Liability, Procedural issues, Electronic Contracts & Digital Signatures, Misappropriation of information, Civil Rights, Tax, Evidence. Information security policies and procedures: Corporate policies- Tier 1, Tier 2 and Tier3 policies -process management-planning and preparation-developing policies-asset classification policy developing standards**.**

(15Hours)

PART-D

Corporate policies- Tier 1, Tier 2 and Tier3 policies -process management-planning and preparation-developing policies-asset classification policy developing standards.

(8Hours)

Reference:

1. Rosenoer,Jonathan. *Cyber Law: The law of the Internet*. Springer, 1997.
2. Grady, Mark. And Peltier, F Fransesco Parisi Thomas R. *The Law and Economics of Cyber Security.* Cambridge University Press, 2005.
3. Knapp, Kenneth J. *Cyber Security and Global Information Assurance: Threat Analysis and Response Solutions.* IGI Global, 2009.
4. Peltier, Thomas R Justin Peltier, and blackley, John. *"Information Security Fundamentals"*, 2nd Edition, Prentice Hall, 1996.

DAV UNIVERSITY, JALANDHAR

Course Title: MODELING AND SIMULATION OF NETWORKS

Paper Code: CSE410

L	T	P	Credits	Marks
3	0	0	3	75

Course Objective: The subject will provide the knowledge of various networking techniques and routing mechanism of data networks.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of the various routing protocols used in networking and the working strategy of different components.

Part-A
Delay Models in Data Networks: Queuing Models, M/M/1, M/M/m, M/M/m/m and other Markov System, M/G/1 System, Networks of Transmission Lines, Time Reversibility, and Networks of Queues.

(10Hours)

Part-B
Multi-access Communication: Slotted Multi-access and the Aloha System, Splitting Algorithms, Carrier Sensing, Multi-access Reservations, Packet Radio Networks.

(11Hours)

Part-C
Routing in Data Networks: Introduction, Network Algorithms and Shortest Path Routing, Broadcasting Routing Information: Coping with Link Failures, Flow models, Optimal Routing, and Topological Design, Characterization of Optimal Routing, Feasible Direction Methods for Optimal Routing, Projection Methods for Optimum Routing, Routing in the Codex Network.

(12Hours)

Part-D
Flow Control: Introduction, Window Flow Control, Rate Control Schemes, Overview of Flow Control Practice, Rate Adjustment Algorithms.

(12Hours)

Reference Books:

1. Bertsekas, Dimitri, and Gallager, Robert. *Data Networks, 2nd edition*. Prentice Hall of India, 2003.
2. Stallings, William. *High-Speed Networks and Internets.* Pearson Education (Asia) Pte. Ltd, 2004.
3. Walrand, J. and Varaya, P. *High Performance Communication Networks.* 2nd edition, Harcourt India Pte. Ltd. & Morgan Kaufman, 2000.
4. Walrand, Jean, and Bagchi, Kallol. Zobrist, George W. *Network performance modeling and simulation.* Gordon and Breach Science Publishers, Inc. Newark, NJ, USA.
5. Mir, Nader F. *Computer and Communication.* Prentice hall.

Course Title: Database Administration
Paper Code: CSE412

L	T	P	Credits	Marks
3	0	0	3	75

Course Objective: This course uses the latest database tools and techniques to prepare the student to understand, develop, and manage more advanced database applications. Students gain considerable hands-on experience with the Oracle family of databases, and define, design, and implement databases. Students learn how to use object-oriented technologies to design relational databases, and how to design relational databases to support object-oriented applications.

Learning Outcomes: Upon completion of this course the student will be able to: • properly install, configure and tune a database • properly administer servers and server groups • properly manage and optimize schemas, tables, indexes, and views •

PART-A

- **Introduction to Database**: Client/Server Concept, Types of Databases, Relational Vs. Flat File Database. Background of SQL Server, Versions of SQL Server and Clients Supported by SQL Server **5 hours**
- **SQL Server 2000:** Installation & Configuring SQL Server: Installing SQL Server 2000, Unattended Installations, SQL Server Services. Configuring SQL Server Network Protocol Settings. Installing SQL Server Clients. **5 hours**

PART-B

- **SQL Server Tools and Utilities**: Managing SQL Server with Enterprise Manager, Query Analyzer, SQL Server Groups. Tools Menu, Action Menu. Introduction to Transact – SQL (T-SQL) **5 hours**
- **Managing Database**: Creating Database, Database File Placement (RAID 0, RAID 1 RAID 5), Creating Database using T-SQL and Enterprise Manager. Altering, Renaming, Dropping Database. Creating Objects in Database: Tables, Views, Constraints, Indexes. **6 hours**

PART-C

- **Managing Security:** Understanding Security Modes, Windows Authentication Modes, Mixed Mode, SQL Server Logins, Windows Logins, Fixed Server Logins, Creating Users, Database Roles, (Grant, Revoke ,Deny) N-Tier Security.. **6 Hours**
- **Database Backups and Restore:** Copying Database with Copy Database Wizard. SQL Database Backup Modes (Full, Differential, Transactional Log Backup). Backing Up of the Database. Restoring Database. DTS: Its meaning, DTS Packages. DTS Storage and Designer. **6 hours**

PART-D

- **SQL Server Agent:** Configuring Understanding Alerts, Jobs and Events. Creating Jobs: Multi Server Jobs, Creating, Editing and Deleting of Jobs. SQL Server and IIS. Understanding the Static Page and Dynamic Pages of the Internet. Internet Database Connector **6 hours**
- **Replication and Performance Optimization**: Overview of Replication. Installing. Types of Replication: Merge Replication, Snapshot Replication, Transactional Replication. Using Windows System Monitor: Monitor with SQL Profiler and Query Analyzer. Optimization Techniques: Queries and Stored Procedure, Proper Indexing, Locks and Defragmentation **6 hours**

Reference Books:

1. Kreines, David ,. and Laskey, Brian. *Oracle Database Administration.* Oreilly Media.
2. Mullins, Craig S. *Database Administration: The Complete Guide to Practices and Procedures.* Powell's books.
3. Rajan, Claire. *Oracle 10g Database Administrator II: Backup/recovery & Network Administration.* Thomson.
4. Alapati, Sam R. *Expert Oracle9i Database Administration.* Apress,2003.
5. Wood, Dan. *Begininig SQL Server 2005 Administration.* Wrox publication,2009.

Course Title: Network Management Systems	**L**	**T**	**P**	**Credits**	**Marks**

Course Title: Network Management Systems
Paper Code: CSE414

L	**T**	**P**	**Credits**	**Marks**
3	0	0	3	75

Course Objective: Appreciate the need for inter operable network management. Understand general concepts and architecture behind standards based network management. Understand concepts and terminology associated with SNMP and TMN

Learning Outcomes: Critically analyses evaluate and explain the concepts, architectures and operation of Network Management systems. Critically reflect on the changing needs and requirements of Network Management in Industrial contexts.

PART-A

- Data communications and Network Management Overview : Analogy of Telephone Network Management, Communications protocols and Standards, Case Histories of Networking and Management, Challenges of Information Technology Managers, Network Management: Goals, Organization, and Functions, Network and System Management, Network Management System Platform, Current Status and future of Network Management **9 hours**
- **SNMPV1 Network Management**: Organization and Information and Information Models.. **3 hours**
- **Managed network** : Case Histories and Examples, The History of SNMP Management, The SNMP Model, The Organization Model, System Overview, The Information Model **3 hours**
- **SNMPv1 Network Management**: Communication and Functional Models. The SNMP Communication Model, Functional model. **3 hours**

PART-B

- **SNMP Management:** SNMPv2 : Major Changes in SNMPv2, SNMPv2 System Architecture, SNMPv2 Structure of Management Information, The SNMPv2 Management Information Base, SNMPv2 Protocol, Compatibility With SNMPv1. **5 hours**
- RMON : What is Remote Monitoring? , RMON SMI and MIB, RMON1, RMON2, ATM Remote Monitoring, A Case Study of Internet Traffic Using RMON **5 hours**
- Telecommunications Management Network: Why TMN? , Operations Systems, TMN Conceptual Model, TMN Standards, TMN Architecture, TMN Management Service Architecture, An Integrated View of TMN, mplementation Issues. **5 hours**

PART-D

- Network Management Tools and Systems:Network Management Tools, Network Statistics Measurement Systems, History of Enterprise Management, Network Management systems, Commercial Network management Systems, System Management, Enterprise Management Solutions.. **7 hours**
- Web-Based Management:NMS with Web Interface and Web-Based Management, Web Interface to SNMP Management, Embedded Web-Based Management, Desktop management Interface, Web-Based Enterprise Management. **8 hours**

References Books:

1. Morris. *Network management*. Pearson Education.
2. Burges, Mark. *Principles of Network System Administration*, Wiley Dreamtech.
3. Paul. *Distributed Network Management.* John Wiley.

DAV UNIVERSITY, JALANDHAR

OPEN ELECTIVE (OE)-I

Course Title: Organisational Behaviour

Paper Code: MGT452

L	T	P	Credits	Marks
3	0	0	3	75

Course Objective: The course aims at studying the individual and group behavior in the context of organization.

Learning Outcomes: After the completion of the course the participant will be able to better comprehend the personalities of others. The participant will also learn about designing the structure of organizations, how to handle situations of conflict as well as learn about his/her own self. It will make the participant more empathetic towards others.

UNIT-A

- Introduction to human behavior, perception, attitudes and job satisfaction. 2 hours

- Concepts of Personality, Self-awareness, Perception and Attribution, Learning, Values and Attitudes and their determinants, theories 2 hours

- MBIT and big five model, Hofstede's cultural dimensions theory 2 hours

- Concept of teams, Foundations of Team Dynamics, types of teams, teams in modern workplace 2 hours

- Group process: group and intergroup behavior, group decision making 3 hours

- Interpersonal group dynamics 2 hours

- Skills for Managing Teams: Communication, Conflicts and negotiation, Power & Influence, Group Development and Cohesiveness, Team Performance and Decision Making. 2 hours

UNIT-B

- Concept of Leadership Theories and Perspectives on Effective Leadership-Power and Influence, Charismatic and Transformational Leadership power distribution in organization, organizational politics: concept, consequences, reasons and management of political behavior, 3 hours

- Work stress: causes, organizational and extra organizational stressor, individual and group stressor, effect of stress, stress coping strategies. 2 hours

- Conflict and inter-group behavior: sources of conflict, types of conflict, functional and dysfunctional aspects of conflict, approaches to conflict management 2 hours

UNIT-C

- Organizational culture: functions of OC, creating and sustaining of OC, development and implications of OC 4 hours

- Organizational effectiveness: concept and approaches to OE, factors in OE, effectiveness through adaptive coping cycle 2 hours

- 0rganizational health development 2 hours

• Emotional intelligence.	2 hours

UNIT-D

• Organization Design, Determinants of Organizational Design, Parameters of Organizational Design	3 hours
• Organizational Failure and Pathology	2 hours
• Organizational Change and Development, Organizational Learning and Transformation.	2 hours
• Do "Organizations" Have a Future? Designing Organizations' for Uncertain Environment.	2 hours
• Building Learning Organizations	2 hours
• Transactional Analysis	2 hours
	45 hours

Text Book:
1. Robbins, S.P., and Judge, T, and Sanghi, S. *Organizational Behavior.* Pearson Education.

Reference Books:
1. Luthans, F. *Organizational Behavior*. McGraw –Hill Inc.
2. Newstrom, J.W. and Davis, K. *Organizational Behavior - Human Behavior at Work.* McGraw Hill.
3. Weiss, P. *Organizational Behaviour and Change.* West Group Publication.
4. Koontz, Harold. and Koontz, Weihrich. *Essentials of management*

Course Title: Robotic and Automation

Course Code: MEC401

L	T	P	Credits	Marks
3	0	0	3	75

Course Objectives: Students will learn about the basic concepts of automation, about the fluid power, about the robotic, about the robotic sensors, end effectors and its programming.

Part – A

Introduction to Robotic

(4)

Introduction, terminology, laws of robotics, classification based on geometry, machine vision, robot components, degree of freedom, coordinators, reference frames,

Robot Sensors and End Effectors

(5)

Types of Sensors in robots, exteroceptors, proprioceptors, tactile, proximity, range, velocity and machine vision sensors, robot end-effectors, classification, gripper, gripper mechanism, type of gripper.

Part – B

Robot Programming

(5)

Robot programming, techniques of programming, robot languages, requirement for a standard robot language, types of languages.

Industrial applications

(4)

Applications of robots in welding, machine loading, fabrication, spray painting, assembly and unusual applications.

Part – C

Industrial Automation

(3)

Basic principles of automation; Hard Automation, Flexible Automation, Low Cost Automation Elements of Automation

Fluid Power

(6)

Fluid power control elements, Construction and performance of fluid power generators; Hydraulic and pneumatic cylinders - construction, design and mounting; Hydraulic and pneumatic valves for pressure, flow and direction control.

Part – D

Logic Circuits

(5)

Design of pneumatic logic circuits for a given time displacement diagram or sequence of operations

Fluidics

(4)

Boolean algebra; Truth tables; Conda effect; Fluidic elements – their construction working and performance characteristics

Reference Books:
1. SR, Deb. *Robotics and Flexible Automation.* Tata McGraw-Hill Publishing Company Ltd., New Delhi.
2. SR, Majumdar. *Pneumatic Control.* Tata McGraw-Hill Publishing Company Ltd., New Delhi.
3. CR, Asfahl. *Robotics and Manufacturing Automation.* Wiley India.
4. SB, Niku. *Introduction to Robotic.* Wiley India.

Course: MATLAB Programming

Course Code: ELE455

L	T	P	Credits	Marks
3	0	0	3	75

Unit-A

Introduction to MATLAB Programming and Environment
MATLAB Windows, Expressions, Constants, Variables and assignment statement, Arrays
Basic plotting, Built in functions, Generating waveforms, Sound replay, load and save

(12hrs)

Unit-B
Procedures and Functions and Control Statements
Arguments and return values, M-files, Formatted console input-output, String   handling,
,Manipulating Text, Writing to a text file, Reading from a text file, Randomising and sorting
a list, Searching a list, Attaching buttons to actions, Getting Input, Setting Output, Variables,
Data Types, Control Statements: Conditional program flow, Iteration / Looping,Conditional
statements.

(12hrs)

Unit-C
Spectral Analysis and Speech Signal Analysis
Filterbank analysis, Fourier analysis, Spectrograms, Filterbank synthesis, Fundamental of
Speech Signal, frequency estimation – frequency domain, Fundamental frequency estimation,
time domain, Formant frequency estimation

(12hrs)

Unit-D

MATLAB Applications

Math and computation – Algorithm development – Modeling, simulation, and prototyping –
Data analysis, exploration, and visualization – Scientific and engineering graphics –
Application development, including graphical user interface building, Working with Sound
and Images, Reading and Writing files, Recursion, Compression.

(12hrs)

Reference Books:
1. Agam Kumar Tyagi. *MATLAB and Simulink for Engineers,* Oxford University Press,
   USA, 2012.
2. Chapman, Stephen J. *MATLAB Programming for Engineers.* Cengage Learning, 2008.

DAV UNIVERSITY, JALANDHAR

Course: Bio-Medical Engineering

L	T	P	Credits	Marks
3	0	0	3	75

Paper Code: ICE430

Course Objective: To teach students that medical field is based on instrumentation and to enhance their skills in different biomedical instruments.

Learning Objective:
- Origin of bio-electric signals
- Physiological parameters adaptable to bio-telemetry
- security in medical methods

UNIT-I

Physiological Transducers: Introduction to physiological systems, Pressure transducers, Transducer for body temperature measurement. Pulse sensors, Respiration sensors.

Bio-Electric Signals and Electrodes: Origin of bio-electric signals, Recording electrodes, Polarization Skin contact impendence, Electrodes for ECG, EEG, Electrical conductivity of electrode jellies and creams, Microelectrodes.

12 Hr

UNIT-II

Measurement And Analysis Techniques: Blood flow meters, Cardiac Output measurement, Pulmonary function analyzers, Spiro-meter, Respiratory gas analyzers, Blood gas analyzers Blood pH, PCO_2, PO_2 measurement, Blood cell counters, Audio meter, Pure tone audio meters, Speech audiometers Evoked response audio-metric systems, Oxy-meters.

X-Ray And Ultrasonic Diagnosis: Soft & Hard X-Rays. X-Ray generators for diagnosis. Radiography, Angiography, Fluoroscopy, X-Ray computed tomography, Ultrasonic principles, Application of ultrasonic for diagnosis.

12 Hr

UNIT-III

Physical Medicine And Assist Devices: Diathermy-Short wave, ultrasonic and Microwave, Range and area of irritation of each type, Nerve and muscle simulators, Pace makers external and implantable pacemakers, DC defibrillators, Defibrillator with synchronizer, Implantable defibrillators.

Radiotherapy: X-Raytherapy, Radio nuclide therapy, Units for radiation and radiation dose.

12 Hr

UNIT-IV

Bio-Telemetry: Physiological parameters adaptable to bio-telemetry, Components of a biotelemetry system, Implantable units, Application of telemetry in patient care.

Introduction to Telemedicine: Telemedicine System's classification, input and output peripherals, Characteristic of available transmission media, introduction to communication system for telemedicine. Medical image format standards, introduction to DICOM and PACs technologies various image compression

techniques, loss less and lossy image compression for biomedical application. Telemedicine and law, confidentiality of telemedicine records, security in medical methods.

12 Hr

Reference Books:
1. Khandpur, R. S. *Handbook of Biomedical Instrumentation.* TMH.
2. Pratt, Cromwell. *Biomedical Instrumentation.* Prentice Hall.
3. Webster, John G. *Medical Instrumentation, Applications &Design.* John Wiley.
4. Geddes. *Baker Principles of Applied Biomedical Instrumentation.* John Wiley.

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Course Title: Information Security Systems Laboratory

Paper Code: CSE416

L	T	P	Credits	Marks
0	0	4	2	50

Implementation of the followings in any High Level Programming Language:
1. Transposition Techniques, Steganography.
2. Block Ciphers and The Data Encryption Standard
3. Random Number Generation.
4. Testing for Primarily, the Chinese Remainder Theorem
5. The RSA Algorithm.
6. Elliptic Curve Cryptography.
7. Hash Algorithms: MD5 Message Digest Algorithm, Authentication Protocols.
8. System Security: Firewalls: Firewall Design Principles

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L	T	P	Credits	Marks
0	0	8	6	150

Course Title: Major Project

Paper Code: CSE418

1. Project should include following phases

- System analysis and design

- Coding - Implementation

- Testing

2. Should be a working project

3. Must have a future perspective

4. It may be a

- Database

- Application software

- System software

- Multimedia

- Web Related

5. A complete project report must be submitted along with soft copy of project. Project report

may include requirements of project, Flow Chart, DFDs, coding and test results.

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Course Title: SEMINAR
Paper Code: CSE420

L	T	P	Credits	Marks
0	0	4	2	50

The seminar is based on the research oriented topic. The evaluation of seminar is based upon the contents and presentation of a topic.