DAV UNIVERSITY JALANDHAR

Course Scheme & Syllabus

For

B.Tech. in Computer Science Engineering (Honour/Pass)

1st TO 8thSEMESTER Examinations2015–2016 Session

Syllabi Applicable For Admissions in 2015

DAV UNIVERSITY, JALANDHAR

Scheme of Courses
B.Tech. in Computer Science Engineering
Semester-1

S.NO.	Paper Code	Course Title	L	T	P	Cr	Nature of Course
1	MTH151A	Engineering Mathematics-I	4	0	0	4	Core
2	CHE151A	Chemistry	4	0	0	4	Core
3	CSE101A	Computer Fundamentals and Programming	4	0	0	4	Core
4	EVS100	Environmental Studies	4	0	0	4	AECC
5	MEC101A	Engineering Drawing	2	0	4	4	Core
6	ENG151A	Basic Communication Skills	3	0	0	3	AECC
7	CHE152	Chemistry Laboratory	0	0	2	1	Core
8	CSE103	Computer Fundamentals and Programming Laboratory	0	0	2	1	Core
9	ENG152	Basic Communication Skills Laboratory	0	0	2	1	AECC

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

Scheme of Courses
B. Tech. in Computer Science Engineering
Semester-2

S.NO.	Paper Code	Course Title	L	T	P	Cr	Nature of Course
1	MTH152A	Engineering Mathematics-II	4	0	0	4	Core
2	PHY151A	Engineering Physics	4	0	0	4	Core
3	MEC103	Mechanical Engineering Fundamentals	4	0	0	4	Core
4	ELE101	Electrical and Electronics Technology	4	0	0	4	Core
5	SGS107	Human Values and General Studies	4	0	0	4	AECC
6	MEC104	Manufacturing Practice	0	0	4	2	Core
7	PHY152A	Engineering Physics Laboratory	0	0	2	1	Core
8	ELE102A	Electrical and Electronics Technology Laboratory	0	0	2	1	Core

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

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Scheme of Courses
B. Tech. in Computer Science Engineering
Semester-3

S.NO.	Paper Code	Course Title	L	T	P	Cr	Nature of Course
1	CSE201	Object Oriented Programming	4	0	0	4	Core
2	CSE209	Computer Organization & Architecture	4	0	0	4	Core
3	CSE211	Data Structures	3	1	0	3	Core
4	ECE201	Digital Electronics	4	0	0	4	Core
5	MTH254A	Discrete Mathematics	4	0	0	4	Core
6	CSE205	Object Oriented Programming Laboratory	0	0	4	2	Core
7	CSE213	Data Structures Laboratory	0	0	4	2	Core
8	ECE204	Digital Electronics Laboratory	0	0	2	1	Core

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

Scheme of Courses
B. Tech. in Computer Science Engineering
Semester-4

S.NO.	Paper Code	Course Title	L	T	P	Cr	Nature of Course
1	CSE204	System Programming	3	1	0	3	Core
2	CSE206	Data Communication	3	1	0	3	Core
3	CSE224	Operating System Concepts	4	0	0	4	Core
4	ECE350	Microprocessor & its Applications	4	0	0	4	Core
5	MTH252A	Engineering Mathematics-III	4	0	0	4	Core
6	CSE218	System Programming Laboratory	0	0	2	1	Core
7	CSE226	Operating System Concepts Laboratory	0	0	4	2	Core
8	ECE351	Microprocessor & its Applications Laboratory	0	0	2	1	Core
9	CSE220	Data Communication Laboratory	0	0	2	1	Core

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

Note: *At the end of the examination of 4th Semester the students will undergo compulsory industrial training for a period of 4 weeks duration in reputed industries. Every student will submit the Training Report within two weeks from the start of teaching for 5thSemester. The marks for this will be included in the 5th Semester.*

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Scheme of Courses
B. Tech. in Computer Science Engineering
Semester-5

S.NO.	Paper Code	Course Title	L	T	P	Cr	Nature of Course
1	CSE301	Computer Networks	3	0	0	3	Core
2	CSE303B	Database Management System	4	0	0	4	Core
3	CSE333	Software Engineering	3	0	0	3	Core
4	CSE307	Algorithm Design & Analysis	4	0	0	4	Core
5	CSE335	Computer Graphics	3	1	0	3	Core
6	CSE319	Computer Networks Laboratory	0	0	2	1	Core
7	CSE321	Database Management System Laboratory	0	0	4	2	Core
8	CSE337	Computer Graphics Laboratory	0	0	4	2	Core
9	CSE300A	Industrial Training	0	0	0	2	Training, D & P

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

Scheme of Courses
B. Tech. in Computer Science Engineering
Semester-6

S.NO.	Paper Code	Course Title	L	T	P	Cr	Nature of Course
1	CSE302	Theory of Computation	4	0	0	4	Core
2	CSE312A	Data Mining	3	1	0	3	Core
3	CSE334	Mobile Computing and Communication	4	0	0	4	Core
4	CSE310	Distributed Systems	3	0	0	3	Core
5	CSE336	Object Oriented Analysis and Design	3	0	0	3	Core
6	CSEXXX	Department Specific Elective-I	3	0	0	3	DSE-I
7	CSE338	Object Oriented Analysis and Design Laboratory	0	0	2	1	Core
8	CSEXXX	Department Specific Elective-I Laboratory	0	0	2	1	DSE-I
9	CSE324A	Data Mining- Laboratory	0	0	4	2	Core

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

Note:

- *Department specific elective-I should be from the basket of "Department Specific Elective-I".*
- *At the end of the examination of 6th Semester the students will undergo compulsory industrial training for a period of 6 weeks duration in reputed industries. Every student will submit the training report within two weeks from the start of teaching of 7th Semester. The marks for this will be included in the 7th semester.*

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Scheme of Courses
B. Tech. in Computer Science Engineering
Semester-7

S.NO.	Paper Code	Course Title	L	T	P	Cr	Nature of Course
1	CSE401A	System Simulation and Modelling	3	1	0	3	Core
2	CSE403	Compiler Design	4	1	0	4	Core
3	CSE405	Information Security	3	0	0	3	Core
4	CSEXXX	Discipline Specific Elective-II	4	0	0	4	DSE-II
5		Generic Elective-I	4	0	0	4	GE-I
6	CSE435	Information Security Laboratory	0	0	2	1	Core
7	CSE400A	Training	0	0	0	2	Training, D & P
8	CSE450	Project	0	0	8	4	T,D&P

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

Note:

- *Department specific elective-II should be from the basket of "Department Specific Elective-II".*
- *Generic elective-I should be from the "Generic Elective Basket"*

Scheme of Courses
B. Tech. in Computer Science Engineering
Semester-8

S.NO.	Paper Code	Course Title	L	T	P	Cr	Nature of Course
1	CSE404A	Image Processing & Pattern Recognition	3	1	0	3	Core
2	CSE406	Parallel Computing	3	1	0	3	Core
3	CSEXXX	Discipline Specific Elective-III	4	0	0	4	DSE-III
4	CSEXXX	Discipline Specific Elective-IV	4	0	0	4	DSE-IV
5		Generic Elective-II	4	0	0	4	GE-II
6	CSE424	Image Processing & Pattern Recognition Laboratory	0	0	4	2	Core
7	CSE420	Seminar	0	0	4	2	Training, D & P
8	ENG352	Professional Communication	3	0	0	3	AECC

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

Note:

- *Department specific elective-III & IV should be from the basket of "Department Specific Elective-III & IV" respectively.*
- *Generic elective-II should be from the "Generic Elective Basket"*

Discipline Specific Elective-I

S.NO.	Paper Code	Course Title	L	T	P	Cr	Nature of Course
1	CSE342	Introduction to JAVA Programming	3	0	0	3	DSE-I
2	CSE344	C# Programming	3	0	0	3	DSE-I
3	CSE346	Network Programming	3	0	0	3	DSE-I
4	CSE348	Optimization Techniques	3	0	0	3	DSE-I

Discipline Specific Elective-I Laboratory

S.NO.	Paper Code	Course Title	L	T	P	Cr	Nature of Course
1	CSE362	Introduction to JAVA Programming Laboratory	0	0	2	1	DSE-I
2	CSE364	C# Programming Laboratory	0	0	2	1	DSE-I
3	CSE366	Network Programming Laboratory	0	0	2	1	DSE-I
4	CSE368	Optimization Techniques Laboratory	0	0	2	1	DSE-I

Discipline Specific Elective-II

S.NO.	Paper Code	Course Title	L	T	P	Cr	Nature of Course
1	CSE427A	Grid Computing	4	0	0	4	DSE-II
2	CSE437	Operational Research	4	0	0	4	DSE-II
3	CSE439	Wireless Network Communication	4	0	0	4	DSE-II
4	CSE441	Expert System	4	0	0	4	DSE-II

Discipline Specific Elective-III

S.NO.	Paper Code	Course Title	L	T	P	Cr	Nature of Course
1	CSE426	Real Time System	4	0	0	4	DSE-III
2	CSE428	Cloud Computing	4	0	0	4	DSE-III
3	CSE430	Computer Peripheral Devices & Interface	4	0	0	4	DSE-III
4	CSE432	Optical Network Design	4	0	0	4	DSE-III

Discipline Specific Elective-IV

S.NO.	Paper Code	Course Title	L	T	P	Cr	Nature of Course
1	CSE422	Fuzzy Logic and Neural Network	4	0	0	4	DSE-IV
2	CSE412	Database Administration	4	0	0	4	DSE-IV
3	CSE446	Network Management System	4	0	0	4	DSE-IV
4	CSE434	Network Security	4	0	0	4	DSE-IV

Generic Elective-I Basket

S.NO.	Paper Code	Course Title	L	T	P	Cr
1	CSE801	Software Engineering & Project Management	4	0	0	4

Generic Elective-II Basket

S.NO.	Paper Code	Course Title	L	T	P	Cr
1	CSE802	Computer Networks	4	0	0	4

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B Tech Course Structure

CBCS	Nature of Courses	Core	Elective Courses			Ability Enhancement Courses		Total Credits
Year	Course Structure	Core	Dissertation/ Project	Generic Elective	Discipline Specific Elective	Ability Enhancement Compulsory Courses	Skill Enhancement Courses	
2015	CSE	146	6	8	16	15	4	195

Core	Basic Sciences (BS) including Mathematics, Physics, Chemistry, Biology	Engineering Sciences (ES) including Materials, WS, ED, Basics of EE/ME/CSE	Interdisciplinary Core	Discipline Core	Total Credits
146	26	15	10	95	146

Detailed Syllabus

DAV UNIVERSITY, JALANDHAR

Course Title: Engineering Mathematics-I
Paper Code: MTH151A

L	T	P	Credits
4	0	0	4

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

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, Hermition and unitary matrices.

Unit-B

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'sseries. Maxima and minima of a function of two and three variables: Lagrange's method of multipliers.

Unit-C

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

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.

REFERENCES:

1. Grewal, B.S. *Higher Engineering Mathematics*. New Delhi: Khanna Publication, 2009.
2. Kreyszig, Erwin. *Advanced Engineering Mathematics*. New Delhi: Wiley Eastern Ltd., 2003.
3. Jain, R K, and K Iyengar S R. *Advanced Engineering Mathematics*, New Delhi: Narosa Publishing House, 2003.
4. Thomas, George B. and Finney Ross L. *Calculus and Analytic Geometry*. New Delhi Addison Wesley, 1995.

DAV UNIVERSITY, JALANDHAR

Course Title: Chemistry

Course Code: CHE151A

L	T	P	Credits
4	0	0	4

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.

Unit- A

Spectroscopy and its Applications

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 onλmax, 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.

Unit- B

Water and its treatment

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

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, Filliform corrosion, stray current corrosion, passivity, galvanic series, factors influencing corrosion, various methods of corrosion control.

Unit-C

Chemistry in Nanoscience and Technology

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.

Unit-D

Polymers and polymerization

Introduction, monomer and repeating unit, degree of polymerization, functionality, classification of polymers: based on origin, monomers, structure, method of synthesis, tacticity or configuration, action of heat, chemical composition, ultimate form; types of polymerization, specific features of polymers, regularity and irregularity, tacticity 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.

REFERENCES:

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

DAV UNIVERSITY, JALANDHAR

Course Title: Computer Fundamentals and Programming
Course Code: CSE101A

L	T	P	Credits
4	0	0	4

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

Unit-A

Introduction to Computers

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

Computer Software and its types and Hardware, Operating Systems, their types and functions

Unit-B

Working Knowledge of Computer System

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

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

Unit-C

Basic Constructs of C

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

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.

Unit-D

Functions

Advantages of functions, function prototype, declaring and defining functions, return statement, call by value and call by reference, recursion, and storage classes.

Arrays and Strings

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)

REFERENCES:

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

DAV UNIVERSITY, JALANDHAR

Course Title: Environmental Studies
Paper Code: EVS100

L	T	P	Credits
4	0	0	4

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- A

The multidisciplinary nature of environmental studies

Definition, scope and importance, Need for public awareness

Natural Resources: Renewable and non-renewable resources:

Natural resources and associated problems

(a) **Forest resources:** Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.

(b) **Water resources:** Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.

(c) **Mineral resources:** Use and exploitation, environmental effects of extracting and using mineral resources, 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:

- 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 -B

Biodiversity and its conservation

- 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.

Environmental Pollution

- 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

Unit-C

Social Issues and the Environment

- 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

Unit-D

Human Population and Environment

- 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

Field Work

- 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)

REFERENCES:

1. Odum, EP. *Basic Ecology*. Japan: Halt Saundurs, 1983.
2. Botkin, DB, and Kodler EA. *Environmental Studies: The Earth as a living planet.* New York: John Wiley and Sons Inc., 2000.
3. Singh, JS, Singh, SP, and Gupta SR. Ecology, *Environment and Resource Conservation.* New Delhi: Anamaya Publishers, 2006.
4. De, AK. *Environmental Chemistry*. New Delhi: Wiley Eastern Ltd., 1990
5. Sharma, PD. *Ecology and Environment*. Meerut Rastogi Publications, 2004

DAV UNIVERSITY, JALANDHAR

Course Title: Engineering Drawing
Course Code: MEC101A

L	T	P	Credits
2	0	4	4

Course Objectives: Students will be able to use the techniques to interpret the drawings and to use it in the field work of engineering. They will learn various lines, planes, solids and their sectioning and to develop their lateral surfaces. Concepts of orthographic and isometric projections

Unit-A

Drawing Techniques

Introduction to drawing instruments, various types of lines and their convention, principles of dimensioning, Engineering symbols, Gothic lettering in single stroke as per SP-46 code (Vertical and inclined)

Scales

Concept of scaling, construction of plane and diagonal scales

Unit-B

Projection of Points

Concept of plane of projections (Principle planes), First and third angle projections; projection of points in all four quadrants, shortest distance problems

Projection of Lines and Planes

Projection of line parallel to both planes, 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 and their traces. Concept of profile plane and auxiliary planes,Tofind the true length, α, β, θ and Φ.

Unit-C

Projection of Solids

Right and oblique solids; solids of revolution and polyhedrons, 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 planes.

Sectioning of Solids

Theory of sectioning, types of section planes, their practice on projection of solids, Sectioning by auxiliary planes,to find true section of truncated solids.

Unit-D

Development of Surfaces

Method of Development, Development of surfaces: Parallel line and Radial line method. Development of oblique solids, Development of curved surfaces.

Orthographic and Isometric Views

Draw orthographic views from isometric view or vice-a-versa, Missing line and missing view

REFERENCES:

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

DAV UNIVERSITY, JALANDHAR

Course Title: Basic Communication Skills
Course Code: ENG151A

L	T	P	Credits
3	0	0	3

Course Objective:

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

Learning Outcomes: Students will be able to improve their writing skills as well as will enrich their word power.

Unit – A

Applied Grammar (Socio-Cultural Context)

1. Parts of Speech: Noun, Pronoun, Adjective, Verb, Adverb, Preposition, Conjunction, Interjection
2. Tenses (Rules and Usages in Socio-cultural contexts)
3. Modals: Can, Could, May, Might, Will, Would, Shall, Should, Must, Ought to
4. Passive/Active
5. Reported/Reporting Speech

Unit – B

Reading (Communicative Approach to be followed)

1. J M Synge: Riders to the Sea (One Act Play)
2. Anton Chekhov : Joy (Short Story)
3. Swami Vivekanand : The Secret of Work (Prose)

Unit – C

Writing

1. Essay Writing and Letter Writing
2. Report Writing
3. Group Discussion & Facing an Interview

REFERENCES:

a. Books

1. Kumar, Sanjay and PushpLata. *Communication Skills*. India: OUP, 2012. Print.

2. Vandana, R. Singh. *The Written Word* by. New Delhi: Oxford University Press, 2008. Print.

b. Websites

1. www.youtube.com (to download videos for panel discussions). Web.

2. www.letterwritingguide.com. Web.

3. www.teach-nology.com.Web.

4. www.englishforeveryone.org.Web.

5. www.dailywritingtips.com.Web.

6. www.englishwsheets.com.Web.

7. www.mindtools.com.Web.

DAV UNIVERSITY, JALANDHAR

Course Title: Chemistry Laboratory
Course Code: CHE152

L	T	P	Credits
0	0	2	1

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 Experiments

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.

REFERENCES:

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, 4^{th} edition (2000).

DAV UNIVERSITY, JALANDHAR

Course Title: Computer Fundamentals and Programming Laboratory
Course Code: CSE103

L	T	P	Credits
0	0	2	1

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.

List of Experiments

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 functions by passing values using call by value method.
12. Programs using functions by passing values using call by reference method.
13. Programs using arrays single dimension in C.
14. Program to implement array using pointers
15. Programs related to string handling in C

Course Title: Basic Communication Skills Laboratory
Course Code: ENG152

L	T	P	Credits
0	0	2	1

Course Objective:

- To improve fluency in speaking English.
- To promote interactive skills through Group Discussions and role plays.

Learning Outcome: Students will get exposure to speaking through the above mentioned interactive exercises. In addition, they will develop a technical understanding of language learning software, which will further improve their communicative skills.

Unit – A Speaking/Listening

1. Movie-Clippings (10 Hrs)
2. Role Plays (10 Hrs)
3. Group Discussions (10 Hrs)

REFERENCES:

1. Gangal, J. K. *A Practical Course in Spoken English.* India: Phi Private Limited, 2012. Print.
2. Kumar, Sanjay and PushpLata. *Communication Skills*. India: OUP, 2012. Print.

WEBSITES

1. www.youtube.com (to download videos for panel discussions).Web.
2. www.englishforeveryone.org.Web.
3. www.talkenglish.com.Web.
4. www.mindtools.com.Web.

Course Title: Engineering Mathematics-II
Course Code: MTH152A

L	T	P	Credits
4	0	0	4

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

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-B

Integral Calculus: Rectification of standard curves; Areas bounded by standard curves; Volumes and surfaces of revolution of curves;
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. Centre of gravity and Moment of inertia

Unit-C

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

Unit-D

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

REFERENCES:

1. Grewal, B.S., *Higher Engineering Mathematics*. New Delhi: Khanna Publication, 2009
2. Kreyszig, Erwin, *Advanced Engineering Mathematics*. New Delhi: Wiley Eastern Ltd., 2003.
3. Jain, R K, and K Iyengar S R., *Advanced Engineering Mathematics*, New Delhi: Narosa Publishing House, 2003.
4. Thomas, George B. and Finney Ross L., *Calculus and Analytic Geometry*. New Delhi Addison Wesley, 1995

DAV UNIVERSITY, JALANDHAR

Course Title: Engineering Physics
Course Code: PHY151A
Total Lecture: 60

L	T	P	Credits
4	0	0	4

Course Objective: The aim of this course on physics is to make the student of engineering understand the basic concepts of physics which will form the basis of certain concept in their respective fields.

Unit-A

PHYSICAL OPTICS:

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-B

LASER: Spontaneous and stimulated emission, Laser action, Characteristics of laser beam, concept of coherence, HeNe laser, Semiconductor lasers and applications

FIBRE OPTICS: Propagation of light in fibres, numerical aperture, single mode and multimode fibres, applications

Unit-C

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 ClausiusMossotti equation.

Unit-D

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.

REFERENCES:

1. Sear, F.W. *Electricity and Magnetism.* London: Addison-Wesley, 1962.
2. Resnick and Halliday. *Physics.*New York: Wiley, 2002.
3. Lal,B. and Subramanyam, N.*A Text Book of Optics.* New Delhi: S. Chand and Company Limited, 1982.
4. Jenkins, and White. *Fundamental of Physical Optics*. New York: Tata McGraw-Hill, 1937.
5. Griffiths,D*. Introduction to Electrodynamics,* New Delhi: Prentice Hall, 1998.
6. Beiser, A. *Perspective of Modern Physics.* New Delhi: McGraw Hill Ltd., 2002.

DAV UNIVERSITY, JALANDHAR

Course Title: **Mechanical Engineering Fundamentals**
Course Code: MEC103

L	T	P	Credits
4	0	0	4

Course Objectives:
To impart the basic knowledge of thermodynamic principles, design principles, power transmission devices, power producing and power absorbing devices.

Unit-A

Fundamental Concepts of Thermodynamics
Introduction, Thermodynamic System and its types, Boundary and its types, Surroundings, Thermodynamic properties, State, Path, process and cycles, Thermodynamic Equilibrium, Working Substance, Microscopic and Macroscopic Analysis, Units and Dimensions, Quasi Static Process, Reversible and Irreversible processes, Point Function and Path Function, Mechanical and Thermodynamic work, P-dv Work (Displacement Work), Work is a Path Function, Equations for work done in various processes

Laws of Thermodynamics
Zeroth law of Thermodynamics, Temperature, Thermometry (Measurement of temperature), Temperature Scales, Energy, Potential and Kinetic Energies at Micro and Macro Level, Internal Energy, Law of conservation of energy, Joule's Experiment, First law of thermodynamics (Open and Closed System), Energy – A property of system, Enthalpy, Entropy, Heat, Heat vs Temperature, specific heat, Heat Capacity, Specific heat at constant volume, Specific heat at constant pressure, Adiabatic Index, Limitations of first law of thermodynamics

Unit-B

Pressure
Pressure Concept and Definition, Pressure conversion Table, Atmospheric pressure, Standard Atmospheric Pressure, Gauge Pressure, Vacuum Pressure, Absolute pressure, Properties of fluid, Pressure head of a Liquid, Pascal's Law, Pressure measurement: Mechanical Gauges and Manometers, Mechanical Gauges: (Bourdon tube pressure gauge, Diaphragm pressure gauge, Dead weight), Manometers: (Principle/Advantage/Limitation/ Classification), Piezometer, Single U tube manometer (Numerical for Vacuum and Gauge pressure), [Simple problems on above topics]

Heat Transfer
Introduction, Heat Transfer vs Thermodynamics, Applications, Thermal Conductivity, Thermal Resistance, Modes of heat transfer, Spectrum of electromagnetic radiation, Surface emission properties, Absorptivity, Reflectivity and Transmissivity, Fourier law, Newton's law of cooling, Stefan Boltzmann's Law, Heat Exchangers (Applications, Selection, Classification), Thermal Insulation (Properties of insulation, Types of Insulations, Thermal Insulating Materials)

Power Absorbing Devices
Power Absorbing Devices, Difference between Hydraulic pump, Air compressor, Fan, Blower, Pump (Function, Selection, Applications), Classification of Pump, Positive displacement and Dynamic Pumps, Reciprocating Pumps and its types, Rotary Pumps and its types, Centrifugal Pump, Axial Pump

Unit-C

Power Producing Devices Boiler
States of matter, Changing State of Matter, Sublimation, Effect of temperature during change of Phase, Steam boiler, Application, Classification of boilers, Types of boilers (Brief Description),

Essentials of a good boiler, Advantages of superheating the steam, Comparison between Water tube and Fire tube boilers, Function of boiler Mountings and Accessories

Turbines

Turbine, Classification based on working fluid, Classification of hydraulic turbines, Selection of hydraulic turbines, Impulse Turbines (Pelton Wheel/ Turgo/ Cross Flow), Reaction Turbines (Francis/ Kaplan/ Propeller)

Internal Combustion Engines

Heat Engine, Types of Heat Engine, Advantages, Disadvantages and Applications, Classification of IC Engine, Engine Components (Location, Function and Material), Basic Terminology used in IC engine, Four stroke Cycle Engines (SI and CI), Two stroke Cycle Engines (SI and CI)

Unit-D

Principles of Design

Need of design, Product Life Cycle, Material properties and selection, Factors affecting material selection, Stress and Strain and its types, Hooke's law, Modulus of Elasticity, Longitudinal and Lateral Strain, Poisson's ratio, Stress- Strain Curve for ductile material and brittle material, Factor of Safety, Centre of Gravity, Centroid, Centroid of areas of plain, Figures (Without Derivation), Centroid of areas of composite sections (Without Derivation), Moment of Inertia, Radius of gyration, Theorem of perpendicular axis, Theorem of parallel axis, MI of L, I and T sections, [Simple problems on above topics]

Power Transmission Devices and Machine Elements

Individual and group drive system (advantages and Disadvantages), Belt drive (Types: V and Flat Belts and their Applications, Advantages and Disadvantages), Ropes drive (Types: Fiber and Wire Ropes and their Applications, Advantages and Disadvantages), Chain drive (Applications, advantages and Disadvantages, Sprockets), Gear drive (Types of Gears), Power transmission shafts, Types of shafts, Application of shafts, Axle, Keys (Function, Classification), Coupling (Function, Classification: Rigid and Flexible), Flanged coupling, Oldham's coupling, Universal coupling, Bearings and their types, Flywheel construction and types

REFERENCES:

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

DAV UNIVERSITY, JALANDHAR

Course Title: Electrical and Electronics Technology
Course Code: ELE101

L	T	P	Credits
4	0	0	4

Unit-A

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-B

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-C

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.

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-D

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

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.

REFERENCES:

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

DAV UNIVERSITY, JALANDHAR

Course Title: Human Values and General Studies
Course Code: SGS107

L	T	P	Credits
4	0	0	4

Course Objectives

a) To sensitize students about the role and importance of human values and ethics in personal, social and professional life.
b) To enable students to understand and appreciate ethical concerns relevant to modern lives.
c) To prepare a foundation for appearing in various competitive examinations
d) To sensitize the students about the current issues and events of national and international importance
e) To provide opportunity to the students to study inter disciplinary subjects like Geography, Science, Economy, Polity, History, International Relations etc.

Unit-A

Human Values

1. **Concept of Human Values:** Meaning, Types and Importance of Values.
2. **Value Education :** Basic guidelines for value education
3. **Value crisis and its redressal**

Being Good and Responsible

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

Unit-B

Value – based living

1. Vedic values of life
2. *Karma Yoga* and *Jnana Yoga*
3. *AshtaMarga* and *Tri-Ratna*

Ethical Living:

1. Personal Ethics
2. Professional Ethics
3. Ethics in Education

Unit-C

General Geography

World Geography

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

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

General History

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

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

Indian Polity: Constitution of India

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

The process of liberalization, privatization, globalization and Major World Issues, Indian Economy, Indian Financial System, Major Economic Issues, Economic Terminology.

Unit-D

General Science

General appreciation and understandings of science including the matters of everyday observation and experience, Inventions and Discoveries

Sports and Recreation

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

Current Affairs

National and International Issues and Events in News, Governments Schemes and Policy Decisions

Miscellaneous Information

Who is who?

Books and Authors, Persons in News, Awards and Honours, Abbreviations and Sports

REFERENCES:

1. Human Values, A N Tripathi, New Age International Publishers, New Delhi, Third Edition, 2009
2. Professional Ethics, R. Surbiramanian, Oxford University Press, New Delhi, 2013.
3. Human Values and Professional Ethics, RishabhAnand, SatyaPrakashan, New Delhi, 2012
4. Human Values and Professional Ethics, SanjeevBhalla, SatyaPrakashan, New Delhi, 2012.
5. Human Values and Professional Ethics, RituSoryanDhanpatRai& Co. Pvt. Ltd., First Edition, 2010.
6. Human Values and Professional Ethics by Suresh Jayshree, Raghavan B S, S Chand & Co. Ltd. , 2007.
7. Human Values and Professional Ethics, Yogendra Singh, AnkurGarg, Aitbs publishers, 2011.
8. Human Values and Professional Ethics, Vrinder Kumar, Kalyani Publishers, Ludhiana, 2013.
9. Human Values and Professional Ethics, R R Gaur, R. Sangal, GP Bagaria, Excel Books, New Delhi 2010.
10. Values and Ethics, Dr.BramwellOsula, Dr.SarojUpadhyay, Asian Books Pvt. Ltd., 2011.
11. Indian Philosophy, S. Radhakrishnan, George Allen &Unwin Ltd., New York: Humanities Press INC, 1929.
12. Essentials of Hinduism, Jainism and Buddhism, A N Dwivedi, Books Today, New Delhi – 1979
13. Dayanand : His life and work, SurajBhan, DAVCMC, New Delhi – 2001.

14. Esence of Vedas, KapilDevDwivedi, Katyayan Vedic SahityaPrakashan, Hoshiarpur, 1990.
15. Vedic Concepts, Prof. B BChaubey, Katyayan Vedic SahityaPrakashan, Hoshiarpur, 1990.
16. Advance Objective General Knowledge, R. S. Aggarwal, S. Chand Publisher (2013)
17. Concise General Knowledge Manual 2013, S. Sen, Unique Publishers,2013
18. Encyclopedia of General Knowledge and General Awareness by R P Verma, Penguin Books Ltd (2010)
19. General Knowledge Manual 2013-14, Edgar Thorpe and Showick Thorpe, The Pearson, Delhi.
20. General Knowledge Manual 2013-14, MuktikantaMohanty, Macmillan Publishers India Ltd., Delhi.
21. India 2013, Government of India (Ministry of Information Broadcasting), Publication Division, 2013.
22. Manorama Year Book 2013-14, MammenMethew, Malayalam Manorama Publishers, Kottayam, 2013.
23. Spectrum's Handbook of General Studies – 2013-14, Spectrum Books (P) Ltd., New Delhi

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

DAV UNIVERSITY, JALANDHAR

Course Title: **Manufacturing Practice**
Course Code: MEC104

L	T	P	Credits
0	0	4	2

Course Objective:

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

REFERENCES:

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: Engineering Physics Laboratory
Course Code: PHY152A

L	T	P	Credits
0	0	2	1

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 equipments.

Note:

- Students are expected to perform at least eight-ten experiments out of following list. The experiments performed in first semester cannot be repeated in second Semester.
- The examination for both the courses will be of 3 hours duration

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

DAV UNIVERSITY, JALANDHAR

Course Title: Electrical and Electronics Technology Laboratory
Course Code: ELE102A

L	T	P	Credits
0	0	2	1

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 characteristics of PN-junction diode.
12. To verify the truth table of logic gates.

DAV UNIVERSITY, JALANDHAR

Course Title: **Object Oriented Programming**
Course Code: CSE201

L	T	P	Credits
4	0	0	4

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++/Java 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.

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

(12 Hours)

PART-B

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,

Operator Overloading and Type Conversion

Overloading operators, rules for overloading operators, Overloading of various operators, Type conversion.

(12 Hours)

PART-C

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.

Standard Input/Output Operations

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-D

Working with Files

File streams, hierarchy of file stream classes, Error handling during file operations, Reading/writing of files, updating files.

Exception Handling

Review of traditional error handling, basics of exception handling, Exception handling mechanism, throwing mechanism, catching mechanism

(8 Hours)

REFERENCES:-

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

DAV UNIVERSITY, JALANDHAR

Course Title: **Computer Organization & Architecture**
Course Code: CSE209

L	T	P	Credits
4	0	0	4

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)

REFERENCES:

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

DAV UNIVERSITY, JALANDHAR

Course Title: **Data Structures**
Course Code: CSE211

L	T	P	Credits
3	1	0	3

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.

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.

(10 Hours)

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**.**

(11 Hours)

PART-C

Stacks and Queues

Operation on Stack : Push , Arithmetic Expression , Polish Notation , Quick Sort : An Application of Stack , Complexity of Quick Sort , Recursion , Tower of Hanoi , Representation of Queue , Deques , Priority Queues.

Trees

Basic terminology, Binary Tree, Complete Binary Tree, Extended Binary Tree 2-tree, Traversing Binary Tree: Preorder, In order and Post order. Binary Search Tree, Searching& Inserting in Binary Search Tree, General tree.

(12 Hours)

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, Hashing and Hash Functions**.**

(10 Hours)

REFERENCES:

1. LipschutzSchaumseries: TataMcGrawHill.
2. Y.Langsam, M.J.Augenstein, A.M.Tanenbaum,Data Structures using C and C++,2nd Edition, Pearson Education

3. R.Kruse, C.L.Tondo,B.Leung,S.Mogalla,Data Structures & Program Design in C.2nd Edition, Pearson Education
4. E.Horowitz, S.Sahni,D.Mehta:Fundamentals of Data Structures in C++, 2nd Edition, Universities Press 2. Donald E. Knuth.

DAV UNIVERSITY, JALANDHAR

Course Title: **Digital Electronics**
Course Code: ECE201

L	T	P	Credits
4	0	0	4

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.
- 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)

REFERENCES:

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

DAV UNIVERSITY, JALANDHAR

Course Title: **Discrete Mathematics**
Course Code: MTH254A

L	T	P	Credits
4	0	0	4

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)

REFERENCES:

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

DAV UNIVERSITY, JALANDHAR

Course Title: **Object Oriented Programming Laboratory**
Course Code: CSE205

L	T	P	Credits
0	0	4	2

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.

List of Experiments

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 Structures Laboratory**
Course Code: CSE213

L	T	P	Credits
0	0	4	2

Course Objectives:-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 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 Experiments

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 numbers 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 Laboratory**
Course Code: ECE204

L	T	P	Credits
0	0	2	1

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

Course Title: **System Programming**
Course Code: CSE204

L	T	P	Credits
3	1	0	3

Course Objective: The objective of this course is to provide the knowledge of one high level procedural language, assembly language 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 System Programming
Definition of System Programming, Features of System Programming, System Programming v/s Application Programming, Types of System softwares.
Assemblers
Elements of Assembly Language Programming, Single pass assembler, two pass assembler and design procedure of an assembler.

(10 Hours)

PART-B
Macros and Macro Processors
Macro Instructions, Features of a Macro facility, Implementation of Two pass Macro.
Compilers
Aspects of Compilation, Complier v/s Interpreter. Phases of compilation, Scanning and Parsing, Compilation of Expressions, Compilation of Control Structures Code Generation and Code Optimization Techniques, CompilerWritingTools (Case study on LEX and YACC.**)**

(13 Hours)

PART-C
Loaders & Linkage Editors
Loading, Linking and Relocation, Types of loaders, Detailed Linking and Loading process in memory.
Editors and debuggers
Introduction to Editors, Types of Editors, Structure of an Editor, Debug monitors, Introduction to various debugging techniques, Turbo C++ Debuggers.

(12 Hours)

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.

(10 Hours)

REFERENCES:-

1. Beck L L, "Systems Software: An Introduction to Systems Programming", Addison-Wesley 2001.
2. Donovan J J, "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 J D Ullman, "Principles of compiler Design", Addison Wesley/ Narosa 1985.

DAV UNIVERSITY, JALANDHAR

Course Title: **Data Communication**
Course Code: CSE206

L	T	P	Credits
3	1	0	3

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)

REFERENCES:-

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

DAV UNIVERSITY, JALANDHAR

Course Title: **Operating System Concepts**
Course Code: CSE224

L	T	P	Credits
4	0	0	4

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, Process Control Block, operations on processes; Inter Process Communication, Critical Sections, Semaphores, Message passing; CPU scheduling**-** scheduling criteria, preemptive & non-preemptive scheduling, Scheduling Algorithms(FCFS, SJF, RR and priority).

(15Hours)

PART-B
Memory Management
Background, logical vs. physical address space, swapping; contiguous memory allocation, internal & external fragmentation, memory compaction, paging, segmentation, Virtual Memory, demand paging, 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).

(13Hours)

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(9x,XP,2000), UNIX and LINUX

(14Hours)

REFERENCES:

1. Silberchatz/Galvin/Gagne, "Operating System Concepts", John Wiley 6th Edition2001
2. Peterson and Silberschatz, "Operating System Concepts", Addison-Wesley 4th Edition 1994.
3. Milenkoviac, "Operating Systems Concepts and Design", Tata McGraw-Hill 1992.

4. Charles Crowley, "Operating Systems a Design Oriented Approach", Tata McGraw-Hill 1996.
5. Andrews S. Tanenbaum, "Modern Operating Systems", Pearson Education, 2nd edition 2001.
6. W Richard Stevens, "Linux Network Programming" PHI, Ist Edition 2003

DAV UNIVERSITY, JALANDHAR

Course Title: **Microprocessor & its Applications**
Course Code: ECE350

L	T	P	Credits
4	0	0	4

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)

REFERENCES:

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

DAV UNIVERSITY, JALANDHAR

Course Title: **Engineering Mathematics-III**
Course Code: MTH252A

L	T	P	Credits
4	0	0	4

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)

REFERENCES:

1. Kreyzig E.: 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

Course Title: **System Programming Laboratory**
Course Code: CSE218

L	T	P	Credits
0	0	2	1

List of Experiments

1. Design and Implementation of an Editor in any language.
2. Design and Implementation of Pass1 of Two Pass Assembler in any language.
3. Design and Implementation of Pass2 of Two Pass Assembler in any language.
4. Design and Implementation of One Pass Assembler in any language.
5. Design and implementation of Symbol Table(create, insert, delete, search, modify functions)
6. Implementation of Lexical Analyzer.
7. Implementation of Parser in any language.
8. Design and Implementation of Two Pass Macro- Processor.
9. Programming using LEX and YACC.
10. Design and Implementation of a Loader.

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

DAV UNIVERSITY, JALANDHAR

Course Title: **Operating Systems Concepts Laboratory**
Course Code: CSE226

L	T	P	Credits
0	0	4	2

List of Experiments

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. Basic Introduction to Linux Operating System and Shell scripting.
11. To share files and directories between RedHat Linux operating systems i.e. to set and configure the NFS server and NFS clients.

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

DAV UNIVERSITY, JALANDHAR

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

L	T	P	Credits
0	0	2	1

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**
Course Code: CSE220

L	T	P	Credits
0	0	2	1

List of Experiments

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 practicals. Instructor may frame additional practicals relevant to the course contents

DAV UNIVERSITY, JALANDHAR

Course Title: **Computer Networks**
Course Code: CSE301

L	T	P	Credits
3	0	0	3

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)

REFERENCES:

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

DAV UNIVERSITY, JALANDHAR

Course Title: **Database Management System**
Course Code: CSE303B

L	T	P	Credits
4	0	0	4

Course Objective: This course offers a good understanding of database systems concepts and prepares the student to be in a position 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: Introduction and applications of DBMS, Purpose of database, Data Independence, Database System architecture- levels, Mappings, Database users and DBA, File Systems Versus a DBMS, Advantages of a DBMS,DBMS Layers, Data independence.

(10 Hours)

PART-B
Data Models
Relational Model, Network Model, Hierarchical Model, ER Model: Entities, Attributes and Entity Sets, Relationships and Relationship Sets, Constraints, Weak Entities, Comparison of Models, Database Design with the ER Model, Keys.

(12 Hours)

PART-C
Database Design
Normalization and Normal Forms, Various dependencies in database (i.e. Functional dependencies, Multi-valued Dependency, Join Dependency, etc) First, Second and Third Normal Forms, BCNF, Fourth and Fifth Normal Forms
Transaction Management
ACID Properties, Serializibility, Two-phase Commit Protocol, Concurrency Control, Lock Management, Lost Update Problem, Inconsistent Read Problem , Read-Write Locks, Deadlocks Handling, 2PL protocol and Introduction to Database Recovery and its techniques.

(14 Hours)

PART-D
Database Protection
Database Threats, Access Control Mechanisms, Grant and Revoke, Firewalls, Encryption and Digital Signatures.
PL/SQL-Concepts:
Cursors, Stored Procedures, Database Triggers

(12 Hours)

REFERENCES:

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

DAV UNIVERSITY, JALANDHAR

Course Title: **Software Engineering**
Course Code: CSE333

L	T	P	Credits
3	0	0	3

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, Software Applications, Software Crisis: Problem and Causes.

Software Development Life Cycle:
The waterfall model, Incremental process models, Evolutionary process models, Spiral Model.

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

(10Hours)

PART – B

Software Requirements:
Functional and non-functional requirements, User requirements, System requirements, Interface specification, documenting Software Requirement Specification (SRS).

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

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

Design Engineering:
Design Concepts, design models for architecture, component, data and user interfaces; Problem Partitioning, Abstraction, Cohesiveness, Coupling, Top Down and Bottom Up design approaches; Functional Versus Object Oriented Approach, Design Specification, 4GL.

(10Hours)

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

Coding and Testing Strategies:
Code reviews, 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.

(10Hours)

PART – D

Risk Management:
Reactive vs. Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement.

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)

(10Hours)

REFERENCES:

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

DAV UNIVERSITY, JALANDHAR

Course Title: **Algorithm Design & Analysis**
Course Code: CSE307

L	T	P	Credits
4	0	0	4

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
Concept of Algorithm, Role of Algorithms in Computing, Algorithm Specification, Performance Analysis (Time and space complexities), and Growth of functions: Asymptotic Notation, Standard notation & common functions; Introduction to Recurrences: substitution method, recursion-tree method, master method; Randomizing Algorithms.
Divide and Conquer
General Method, Binary Search, Merge sort, Quick sort, Selection sort.

(14Hours)

PART-B
Greedy Algorithms
Elements of Greedy strategy, Activity Selection Problem, Knapsack problem, Minimum Cost Spanning Trees (Prim's Algorithm, Kruskal's Algorithm), Single source Shortcut paths problem and analysis of these problems.

(12 Hours)

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 and Travelling Salesman Problem.

(12 Hours)

PART-D
Back Tracking
General method, 8 queen's problem, Graph coloring and Hamiltonian Cycles, 0/1 Knap Sack Problem
NP-Completeness
Polynomial Time, polynomial-time verification, NP-completeness & reducibility, NP-complete problems

(12 Hours)

REFERENCES:

1. Fundamentals of Computer Algorithm, Latest edition, By Horowitz Sahni, Galgotia Publication.
2. Introduction to Algorithms, By Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest,
3. Algorithms, Latest Edition, By knuth.
4. Design & Analysis of Algorithm, Latest Edition, By Goodman, and McGraw hill Publication.
5. D.Rogers and J. Adams, Mathematical Elements for Computer Graphics,McGraw -Hill International Edition.

6. David F. Rogers, Procedural Elements for Computer Graphics, McGraw HillBook Company.
7. Alan Watt and Mark Watt, Advanced Animation and Rendering Techniques,Addison-Wesley.
8. Young, X Window. System Programming, OSF/Motif Edition, Prentice Hall.

DAV UNIVERSITY, JALANDHAR

Course Title: **Computer Graphics**
Course Code: CSE335

L	T	P	Credits
3	1	0	3

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**.**

Scan Conversion

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

(10 Hours)

PART- B

Two dimensional transformations

Translation, rotation, scaling, reflection and shear transformations, composite transformations

Two dimensional viewing and Clipping

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

Three dimensional transformations

Geometric transformations, shear transformations, composite transformations.

Projections: Perspective Projection and Parallel projection

Three dimensional Viewing: Three dimensional Viewing, clipping, Viewing transformations.

(15 Hours)

Part C

Curve and Surface design

Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces

Hidden Surfaces

Z-Buffer algorithm, back-face detection, scan-line, The Painter's algorithm, area sub-division Rendering of mathematical surfaces

(10 Hours)

Part D

Color and Shading models

Introduction to shading models- Light and Color, The Phong model, Interpolative shading models, Texture, Ray tracing

(5 Hours)

REFERNCES:

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.
6. David F. Rogers, Procedural Elements for Computer Graphics, McGraw HillBook

Company.
7. Alan Watt and Mark Watt, Advanced Animation and Rendering Techniques, Addison-Wesley.
8. Young, X Window. System Programming, OSF/Motif Edition, Prentice Hall.

DAV UNIVERSITY, JALANDHAR

Course Title: Computer Networks Laboratory
Course Code: CSE319

L	T	P	Credits
0	0	2	1

List of Experiments

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
Course Code: CSE321

L	T	P	Credits
0	0	4	2

List of Experiments

1. Introduction to SQL and its Data Types.
2. Write the queries for Data Definition and Data Manipulation language.
3. Write SQL queries using Logical operators (=, <,>, etc.).
4. Write SQL queries using SQL operators (Between, AND, IN (List), Like, ISNULL and also with negating expressions).
5. Write SQL query using character, number and group functions.
6. Write SQL queries for Relational Algebra (UNION, INTERSECT, and MINUS, etc.).
7. Write SQL queries for extracting data from more than one table (Equi-Join, Non-Equi-Join , Outer Join)
8. Write SQL queries for sub queries, nested queries(using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET)
9. Concepts for ROLL BACK, COMMIT & CHECK POINTS.
10. Creation, altering and dropping of tables and inserting rows into a table (use constraints while creating tables) examples using SELECT command.
11. Queries (along with sub Queries) Constraints. Example: - Select the roll number and name of the student who secured fourth rank in the class.
12. Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING clauses.
13. Queries using Conversion functions (to_char, to_number and to_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, and substr), date functions (Sysdate, next_day, add_months, last_day, months_between, least, greatest, trunc, round, to_char, to_date)
14. Create Views, Cursors, And Triggers and Stored Procedures 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: Computer graphics Laboratory
Course Code: CSE337

L	T	P	Credits
0	0	4	2

List of Experiments

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.

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

DAV UNIVERSITY, JALANDHAR

Course Title: Theory of Computation
Course Code: CSE302

L	T	P	Credits
4	0	0	4

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

(12 Hours)

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

(14 Hours)

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

(12 Hours)

PART- D
Pushdown Automata: Pushdown Automata: Deterministic Push down Automata, Equivalence of Push Down automata and Context free Grammar.
Turing Machines: Definition of Turing Machine, Application of Turing Machine in language accepting and computing.

(12 Hours)

REFERENCES:-

1. J E Hopcroft and J D Ullman, "Introduction to Automata Theory, Languages and Computation", Narosa Publishers 2002.
2. K L P Mishra and N Chandrasekaran, "Theory of Computer Science", Prentice Hall Inc, .2002
3. Harry R Lewis and Chritos H Papadimitriou, "Elements of the Theory of Computation", Pearson Education 2001.
4. Adesh K. Pandey, "Automata Theory & Formal Language", S. K. Kataria & Sons
5. Hopcroft, "Introduction to Automata Theory, Languages, and Computation", Pearson Education India
6. MichaelSipser, "Introduction to the theory of computation ", Cengage Learning, New Delhi

DAV UNIVERSITY, JALANDHAR

Course Title: Data Mining `
Course Code: CSE312A

L	T	P	Credits
3	1	0	3

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:

- 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 Neighbour 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)

REFERENCES:-

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

DAV UNIVERSITY, JALANDHAR

Course Title: Mobile Computing and Communication
Course Code: CSE334

L	T	P	Credits
4	0	0	4

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, Windows CE, Windows Mobile. Application Development: WWW programming model, Development Environment for Mobile Devices.

(12 Hours)

REFERENCES:

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

DAV UNIVERSITY, JALANDHAR

Course Title: DISTRIBUTED SYSTEMS
Course Code: CSE310

L	T	P	Credits
3	0	0	3

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 distributed system 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.

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.

(11Hours)

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, Case studies: Needham Schroeder, Kerberos.

Distributed File Systems: File service architecture, Sun Network File System, The Andrew File System.

(10Hours)

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.

CORBA Case Study: CORBA RMI, CORBA services.

(10Hours)

REFERENCES:

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

DAV UNIVERSITY, JALANDHAR

Course Title: Object Oriented Analysis and Design
Course Code: CSE336

L	T	P	Credits
3	0	0	3

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.

(10 Hours)

REFERNECES:

1. GrandyBooch, James Rumbough, Ivar Jacobson. ' The Unified Modelling Language User Guide.PearsonEdutaion 2002.
2. Ian Sommerville, ' Software Engineering Sixth Edition' 2003.
3. Meilir Page Jones, 'Fundamentals of Object Oriented Design in UML' , Addison Wesley, 2000

DAV UNIVERSITY, JALANDHAR

Course Title: Object Oriented Analysis and Design Laboratory
Course Code: CSE338

L	T	P	Credits
0	0	2	1

OBJECTIVES:

- To learn basic OO analysis and design skills through an elaborate practical applications.
- To use the UML design diagrams
- To apply the appropriate design patterns

List of Experiments

1. Develop an IEEE standard SRS document.
2. Develop risk management and project plan (Gantt chart).
3. Identify Use Cases and develop the Use Case model.
4. Identify the business activities and develop an UML Activity diagram.
5. Identity the conceptual classes and develop a domain model with UML Class diagram.
6. Using the identified scenarios find the interaction between objects and represent them using UML Interaction diagrams.
7. Draw the State Chart diagram.
8. Draw Component and Deployment diagrams
9. Draw a scenario making use of Sequence diagram, Package diagram, and State Chart diagram.

DAV UNIVERSITY, JALANDHAR

Course Title: **DATA MINING Laboratory**
Course Code: **CSE324A**

L	T	P	Credits
0	0	4	2

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

List of Experiments

1. Building a Database Design using ER Modelling and Normalization Techniques
2. Implementation of functions, Procedures, Triggers and Cursors
3. Load Data from heterogeneous 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

DAV UNIVERSITY, JALANDHAR

Course Title: System Simulation and Modelling
Course Code: CSE401A

L	T	P	Credits
3	1	0	3

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.

(10 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 Distributions, Continuous Distributions, Poisson Process, Empirical Distributions.

(10 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.

(9 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.

(10 Hours)

REFERENCES:

1. Gordon G, "System Simulation", PHI 2nd Edition 1998.
2. DeoNarsingh, "System Simulation with Digital Computers", PHI, New Delhi 1993.
3. K S Trivedi, "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. W Feller, "An introduction to Probability Theory and its Applications," Val 182, Wiley Eastern Ltd. ND.

DAV UNIVERSITY, JALANDHAR

Course Title: COMPILER DESIGN
Course Code: CSE403

L	T	P	Credits
4	1	0	4

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: At the end of the course the student will be able to design and implement a Simple Compiler

PART-A
Introduction and Lexical Analysis
Introduction to Compilers, Analysis of the source program, the phases of a compiler, grouping of phases, The role of the lexical analyzer, Specification of tokens, Recognition of tokens, A language for specifying lexical analyzer, Scanning Process, Regular Expressions, Finite Automaton (NFA and DFA),LEX.

(14Hours)

PART-B
Syntax analysis: CFG's, Ambiguity, 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, Bottom up & Top down evaluation of attributes, L- and S-attributed definitions.

(14 Hours)

PART-C
Type Checking -Type Systems, Specification of a simple type checker.
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.
Code Generation and Optimization: issues, basic blocks and flow graphs, register allocation, code generation, DAG representation of programs, code generation from DAG, Peep-hole optimization, code generator generators.

(14 Hours)

REFERENCES:

1. V. Aho, R. Sethi, and J. D. Ullman. Compilers: Principles, Techniques and Tools, Addison-Wesley, 1988.
2. Fischer and R. LeBlanc. Crafting a Compiler , Benjamin Cummings, 1991..
3. C. Holub. 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

Course Title: Information Security
Course Code: CSE405

L	T	P	Credits
3	0	0	3

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).

(10Hours)

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.

Public-Key Encryption: Introduction to Number Theory: Prime Numbers, Format's and Euler's Theorems, Testing for Primarily, 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.

(10Hours)

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.

(10Hours)

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.

(9Hours)

REFERENCES:

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

DAV UNIVERSITY, JALANDHAR

Course Title: Information Security Laboratory
Course Code: CSE435

L	T	P	Credits
0	0	2	1

List of Experiments

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

DAV UNIVERSITY, JALANDHAR

Course Title: Project
Course Code: CSE450

L	T	P	Credits
0	0	8	4

Project should include following phases:

- System Analysis and Design
- Coding - Implementation
- Testing

a. It should be a working project
b. Must have a future perspective
c. The Domain of project can be from:

- **Databases**
- **Application software**
- **System software**
- **Multimedia**
- **Web Applications, etc**

d. A complete project report must be submitted along with softcopy of project. Project report may include Requirements of Project, Flow Chart, DFD's, Coding and Test Results.

DAV UNIVERSITY, JALANDHAR

Course Title: Image Processing & Pattern Recognition
Course Code: CSE404A

L	T	P	Credits
3	1	0	3

PART A

Introduction: Digital Image- Steps of Digital Image Processing Systems-Elements of Visual Perception -Connectivity and Relations between Pixels. Simple Operations- Arithmetic, Logical, Geometric Operations. 2D Linear Space Invariant Systems - 2D Convolution - Correlation 2D Random Sequence - 2D Spectrum.

Image Transforms: 2D Orthogonal and Unitary Transforms-Properties and Examples. 2D DFT- FFT – DCT, Histogram Equalization Technique- Point Processing-Spatial Filtering-In Space and Frequency -Nonlinear Filtering-Use of Different Masks.

(14 Hours)

PART B

Image Restoration: Image Observation And Degradation Model, Circulant And Block Circulant Matrices and Its Application In Degradation Model - Algebraic Approach to Restoration-Inverse By Wiener Filtering – Generalized Inverse-SVD And Interactive Methods - Blind Deconvolution-Image Reconstruction From Projections.

Image Compression: Redundancy and Compression Models -Loss Less and Lossy. Loss Less-Variable-Length, Huffman, Arithmetic Coding - Bit-Plane Coding, Loss Less Predictive Coding Lossy Transform (DCT) Based Coding, JPEG Standard - Sub Band Coding.

(14 Hours)

PART C

Image Segmentation: Edge Detection - Line Detection - Curve Detection - Edge Linking and Boundary Extraction,

Boundary Representation, Region Representation and Segmentation, Morphology-Dilation, Erosion, Opening and Closing. Hit and Miss Algorithms Feature Analysis

(12 Hours)

PART D

Color and multispectral image processing: Color Image-Processing Fundamentals, RGB Models, HSI Models, Relationship Between Different Models.

Pattern Recognition Representation Feature extraction and Pattern Representation, Concept of Supervised and Unsupervised Classification Introduction to Application Areas

Statistical methods for Pattern Recognition Bayes Decision Theory, Minimum Error and Minimum Risk Classifiers, Discriminant Function and Decision Boundary ,Normal Density, Discriminant Function for Discrete Features ,Parameter Estimation

(12 Hours)

REFERENCES:

1. Digital Image Processing By Rafael C.Gonzales, Richard E. Woods, Pearson Education.
2. Digital Image Processing and Computer Vision by Sonka, Hlavac, Boyle Cengage Learning
3. Fundamentals of Digital Image Processing By Jain, Pearson Education
4. Digital Image Processing and Analysis by Chanda&Majmuder, PHI
5. Digital Image Processing by W. K. Pratt, John Wiley
6. Pattern Classification, Duda, R.D. and Hart, P.E., Stork, D. G.
7. Richard O. Duda, Peter E. Hart and David G. Stork, "Pattern Classification", JohnWiley& Sons, 2001.
8. Earl Gose, Richard Johsonbaugh and Steve Jost, "Pattern Recognition and ImageAnalysis", Prentice Hall, 1999

DAV UNIVERSITY, JALANDHAR

Course Title: Parallel Computing
Course Code: CSE406

L	T	P	Credits
3	1	0	3

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 Metrics: Laws governing performance measurements. Metrics - speedups, efficiency, utilization, communication overheads, single/multiple program performances, benchmarks. Parallel Processors: Taxonomy and topology - shared memory multiprocessors, 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)

REFERENCES:

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

DAV UNIVERSITY, JALANDHAR

Course Title: Image Processing & Pattern Recognition Laboratory
Course Code: CSE424

L	T	P	Credits
0	0	4	2

List of Experiments

1. Implement the spatial image enhancement functions on a bitmap image – Mirroring (Inversion)
2. Implement the spatial image enhancement functions on a bitmap image – Rotation (Clockwise)
3. Implement the spatial image enhancement functions on a bitmap image – Enlargement (Double Size)
4. Implement (a) Low Pass Filter (b) High Pass Filter 5 Implement (a) Arithmetic Mean Filter (b) Geometric Mean Filter
5. Implement Smoothing and Sharpening of an eight bit color image.
6. Implement (a) Boundary Extraction Algorithm (b) Graham's Scan Algorithm
7. Implement (a) Edge Detection (b) Line Detection
8. Display an image and its histogram, perform shrinking, zooming and cropping of an image, and perform blurring and de-blurring on an image and removal of Salt and Pepper noise.

DAV UNIVERSITY, JALANDHAR

Course Title: Professional Communication
Course Code: ENG352

L	T	P	Credits
3	0	0	3

Course Objective: This paper, with a practice-oriented approach, aims to hone students' skills in the major dimensions of professional communication.
Learning Outcome: Students will show adequate understanding of professional communication skills.

Unit-1

Professional Communication: Technical Communication and Business Communication
Verbal and Non-Verbal Communication
Barriers to Communication

(N.B. As the topics are largely theoretical, teacher shall introduce the topics in classroom in the form of lectures and encourage students to read on their own from the reference books. All these topics will be supported by examples from real life situations.)

Unit-2

Reading Skills: Active & Passive Reading, Reading strategies, and Developing a Good Reading Speed
Listening Skills: Types of Listening & Effective Listening Strategies
Speaking Skills: Basics in Phonetics
Writing Skills: Topic Sentence and Paragraph (descriptive, narrative, expository, and persuasive)

(N.B. Teacher will encourage students to apply the theoretical knowledge while practicing the four skills. Opportunities to practice the language skills should be created for students in the classroom.)

Unit-3

Conversation: Formal and Informal
Panel Discussion and Group Discussion
Oral Presentation

(N.B. Teacher will give supporting examples from the industry and encourage students to do relevant exercises.)

Unit-4

C.V. and Cover Letter
Interview Skills
Professional Letters
Report Writing and Memo

(N.B. Teacher will give supporting examples from the industry and encourage students to do relevant exercises.)

Testing: The examinations will be conducted as per the norm of the university.

References:

Crystal, David. The Gift of the Gab – How Eloquence Works. Connecticut: Yale University, 2016. Print.
Gangal, J. K. A Practical Course in Spoken English. India: Phi Private Limited, 2012. Print.
Hosler, Mary Margaret. English Made Easy. Delhi: McGraw, 2013. Print.
Koneru, Aruna. Professional Communication. Delhi: McGraw, 2008. Print.
Mahanand, Anand. English for Academic and Professional Skills. Delhi: McGraw, 2013. Print.
Rani, D Sudha, TVS Reddy, D Ravi, and AS Jyotsna. A Workbook on English Grammar and Composition. Delhi: McGraw, 2016. Print.
Rizvi, M. Ashraf. Effective Technical Communication. Delhi: McGraw, 2018. Print.
Sharma, R.C. and Krishna Mohan. Business Correspondence and Report Writing. Delhi: McGraw, 2013. Print.
Suzana, Roopa. A Practical Course in English Pronunciation. Delhi: McGraw Hill Education, 2017. Print.
Tyagi, Kavita and Padma Misra. Basic Technical Communication. Delhi: PHI Learning, 2013. Print.

Websites

www.youtube.com (to watch standard videos)
http://learnenglish.britishcouncil.org/en
https://owl.english.purdue.edu/

DISCIPLINE SPECIFIC ELECTIVE-I

DAV UNIVERSITY, JALANDHAR

Course Title: Introduction to Java Programming
Course Code: CSE342

L	T	P	Credits
3	0	0	3

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

String Handling

The string constructors, string length, special string operations, character extraction, string comparison, searching string, modifying string, data conversion, changing the case of characters, string buffer.

I/O and Applets

I/O Basics, Reading Console Input, Writing Console Output, Reading and Writing Files, Applet Fundamentals, Applet Architecture, The HTML Applet tag, passing parameters to Applets.

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.

(10Hours)

PART-D

Introduction to Event Handling

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.

Networking

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

(12 Hours)

REFERENCES:

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

DAV UNIVERSITY, JALANDHAR

Course Title: C# Programming
Course Code: CSE344

L	T	P	Credits
3	0	0	3

Objectives: This course offers a good understanding of Visual Programming concepts and prepares students to be in a position to write GUI applications.

Part – A
Introduction to Programming: Variables, Functions, Visual Programming, and Object Oriented Concepts: Abstraction, Inheritance, Polymorphism, Classes, Collections, Debugging.
Graphical User Interface Concepts - I: Windows Forms, Control Properties and Layout, Using Common Dialogs, Event Handling: Mouse and Keyboard, Labels, Textboxes, Buttons, Group Boxes, Panels, Check Boxes and Radio Buttons, Picture Boxes, ToolTips.

(14 hours)

Part B
Graphical User Interface Concepts - II: Menus, Controls: Month Calendar, DateTimePicker, Link Label, List Box, CheckedListBox, Combo Box, Tree View, List View, Data grid, Grid view, Tab Control, Multiple Document Interface (MDI) Windows.

(12 hours)

Part C
Multithreading and Exception Handling: Thread States, Lifecycle of a Thread, Thread Priorities and Scheduling, Creating and Executing Threads, Thread Synchronization and Class Monitor, Exception Handling.
Graphics and Multimedia: Drawing Classes and the Coordinate System, Graphics Contexts and Graphics Objects, Color and Font Control, Drawing Lines, Rectangles, Ovals, Arcs, Loading, Displaying and Scaling Images, Animating a Series of Images.

(12 hours)

Part D
File Processing and Streams: Data Hierarchy, Files and Streams, Classes File and Directory, Reading and Writing Sequential Access Files, Serialization.
Data Access: Data Access Techniques, XML, LINQ, SQL, ADO.NET Object Model, LINQ to SQL, ADO.NET and LINQ, LINQ to XML.
Additional Techniques: XML Documentation, Networking, Security, Web Services.

(12 hours)

REFERENCES:

1. Karli Watson, Christian Nagel, Jacob Hammer, et al., “Beginning Microsoft Visual C#”, Wrox.
2. C# Unleashed, Pearson Education
3. Watson, Skinner, “Beginning C#” , Wiley
4. Samuel J. Leffler Marshall Kirk McKusick Michael J. Karels John S. Quarterman, “The programming with C#”, Addison Wesley
5. “C# Black Book”, Wiley
6. Deitel, “Visual C#: How to Program”.
7. Christian Nagel, Bill Evjen, Jay Glynn, Morgan Skinner, Karli Watson, “Professional C#”, Wrox.

DAV UNIVERSITY, JALANDHAR

Course Title: Network Programming
Course Code: CSE346

L	T	P	Credits
3	0	0	3

PART A

Introduction – Overview of UNIX OS – Environment of a UNIX process – Process control – Process relationships Signals – Interprocess Communication – overview of tcp/ip protocols
Introduction to Socket Programming –Introduction to Sockets – Socket address Structures – Byte ordering functions – address conversion functions – Elementary TCP Sockets – socket, connect, bind, listen, accept, read, write , close functions – Iterative Server – Concurrent Server.

PART B
Application development TCP Echo Server – TCP Echo Client – Posix Signal handling – Server with multiple clients – boundary conditions: Server process Crashes, Server host Crashes, Server Crashes and reboots, Server Shutdown – I/O multiplexing – I/O Models – select function – shutdown function – TCP echo Server (with multiplexing) – poll function – TCP echo Client (with Multiplexing)

PART C
Socket options, elementary udp sockets: Socket options – getsocket and setsocket functions – generic socket options – IP socket options – ICMP socket options – TCP socket options – Elementary UDP sockets – UDP echo Server – UDP echo Client – Multiplexing TCP and UDP sockets – Domain name system – gethostbyname function – Ipv6 support in DNS – gethostbyadr function – getservbyname and getservbyport functions.

PART D
Advanced sockets : Ipv4 and Ipv6 interoperability – threaded servers – thread creation and termination – TCP echo server using threads – Mutexes – condition variables – raw sockets – raw socket creation – raw socket output – raw socket input – ping program – trace route program.

REFERENCES:
1. W. Richard Stevens, “Advanced Programming in The UNIX Environment”, Addison Wesley, 1999.
2. W. Richard Stevens, “UNIX Network Programming - Volume 1”, Prentice Hall International, 1998.

DAV UNIVERSITY, JALANDHAR

Course Title: Optimization Techniques
Course Code: CSE348

L	T	P	Credits
3	0	0	3

PART A

Introduction and Classical Optimization Techniques:
Statement of an Optimization problem - design vector - design constraints - constraint surface - objective function - objective function surfaces - classification of Optimization problems.
Classical Optimization Techniques-Single variable Optimization - multi variable Optimization without constraints - necessary and sufficient conditions for minimum/maximum multivariable Optimization with equality constraints.

PART B

Linear Programming: Standard form of a linear programming problem - geometry of linear programming problems - definitions and theorems - solution of a system of linear simultaneous equations - pivotal reduction of a general system of equations - motivation to the simplex method - simplex algorithm.
Transportation Problem-Finding initial basic feasible solution by north - west corner rule, least cost method and Vogel's approximation method - testing for optimality of balanced transportation problems.

PART C

Unconstrained Nonlinear Programming :One - dimensional minimization methods: Classification, Fibonacci method and Quadratic interpolation method
Unconstrained Optimization Techniques: Univariate method, Powell's method and steepest descent method.

PART D

Constrained Nonlinear Programming: Characteristics of a constrained problem, Classification, Basic approach of Penalty Function method; Basic approaches of Interior and Exterior penalty function methods. Introduction to convex Programming Problem.
Dynamic Programming: Dynamic programming multistage decision processes - types - concept of sub optimization and the principle of optimality - computational procedure in dynamic programming - examples illustrating the calculus method of solution - examples illustrating the tabular method of solution.

REFERENCE BOOKS:

1 " Optimization Methods in Operations Research and systems Analysis" - by K.V. Mital and C. Mohan, New Age International (P) Limited, Publishers, 3rd edition, 1996.
2. Operations Research - by Dr. S.D.Sharma.
3. "Operations Research : An Introduction" - by H.A. Taha, PHI Pvt. Ltd., 6th edition
4. Linear Programming - by G. Hadley

DAV UNIVERSITY, JALANDHAR

Course Title: Introduction to Java Pprogramming Laboratory
Course Code: CSE362

L	T	P	Credits
0	0	2	1

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 Experiments

1. Write a simple java program to generate Fibonacci series.
2. Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.
3. Write a Java program that checks whether a given string is a palindrome or not.
4. Write a Java program for sorting a given list of names in ascending order.
5. Write a simple program to implement the concept of classes, inheritance, packages and interfaces.
6. Write a java program to implement the concept of super, this keyword, method overloading and overriding and dynamic method dispatch.
7. Write a program to implement the concept of exception handling using try, catch, and throw, throws.
8. Write a simple program to create your own exception subclass.
9. 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.
10. 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.
11. Write a Java program for handling mouse events.
12. 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.
13. Write a Java program to implement the concept of multithreading using runnable interface and extending thread class.
14. Write a simple program to implement the concept of socket programming in java.
15. Write a simple program to connect the Database using JDBC.

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

DAV UNIVERSITY, JALANDHAR

Course Title: C# Programming Laboratory
Course Code: CSE364

L	T	P	Credits
0	0	2	1

List of Experiments

1. Writing basic C# programs demonstrating the concepts of functions, arrays, classes, inheritance, polymorphism etc.
2. Writing graphical programs demonstrating the concepts of event handling, Labels, Textboxes, Buttons, Group Boxes, Panels, Checkboxes and Radio Buttons, Picture Boxes, ToolTips.
3. Writing MDI Applications and demonstration of controls like: Month Calendar, DateTimePicker, Link Label, List Box, CheckedListBox, Combo Box, Tree View, List View, and Tab Control.
4. Writing programs demonstrating the concepts of Multithreading and Exception Handling.
5. Writing programs demonstrating Graphics and Multimedia concepts.
6. Writing programs for reading and writing text files.
7. Writing programs demonstrating Database Access, Networking and Security.
8. Writing Web Services.

DAV UNIVERSITY, JALANDHAR

Course Title: Network Programming Laboratory
Course Code: CSE366

L	T	P	Credits
0	0	2	1

Objectives:

- To teach students various forms of IPC through Unix and socket Programming

Recommended Systems/Software Requirements:

- Intel based desktop PC with minimum of 166 MHZ or faster processor with at least 64 MB RAM and 100 MB free disk space LAN Connected
- Any flavour of Unix / Linux

1. Implement the following forms of IPC.
a. Pipes
b. FIFO
2. Implement file transfer using Message Queue form of IPC
3. Write a programme to create an integer variable using shared memory concept and increment the variable simultaneously by two processes. Use senphores to avoid race conditions
4. Design TCP iterative Client and server application to reverse the given input sentence
5. Design TCP iterative Client and server application to reverse the given input sentence
6. Design TCP client and server application to transfer file
7. Design a TCP concurrent server to convert a given text into upper case using multiplexing system call “select”
8. Design a TCP concurrent server to echo given set of sentences using poll functions
9. Design UDP Client and server application to reverse the given input sentence
10 .Design UDP Client server to transfer a file
11 .Design using poll client server application to multiplex TCP and UDP requests for converting a given text into upper case.
12 . Design a RPC application to add and subtract a given pair of integers

DAV UNIVERSITY, JALANDHAR

Course Title: Optimization Techniques Laboratory
Course Code: CSE368

L	T	P	Credits
0	0	2	1

To develop computer programs for the following and to test with suitable numerical examples

1. Graphical method to solve two dimensional Linear Programming Problem.
2. Revised Simplex method to solve n-dimensional Linear Programming Problem
3. Dual Simplex method to solve n-dimensional Linear Programming Problem.
4. Solution of Transportation problem.
5. Gomory cutting plane methods for Integer Programming Problems.
6. Branch and Bound method to solve Integer Programming Problem.
7. M/M/1/N AND M/M/C queuing problems.
8. Single item deterministic inventory model problems with/without shortage and finite/infinite production rate.
9. To draw the PERT/CPM networks.
10. Calculations of PERT analysis
11. Calculation of CPM analysis.

DISCIPLINE SPECIFIC ELECTIVE-II

DAV UNIVERSITY, JALANDHAR

L	T	P	Credits
4	0	0	4

Course Title: GRID COMPUTING
Course Code: CSE427A

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)

REFERENCES:

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.

DAV UNIVERSITY, JALANDHAR

Course Title: OPERATIONAL RESEARCH
Course Code: CSE437

L	T	P	Credits
4	0	0	4

PART-A

Introduction to Operations Research: Basics definition, scope, objectives, phases, models and limitations of Operations Research. Linear Programming Problem – Formulation of LPP, Graphical solution of LPP. Simplex Method, Artificial variables, Big-M method, two-phase method, degeneracy and unbound solutions.

Transportation Problem. Formulation, solution, unbalanced Transportation problem. Finding basic feasible solutions – Northwest corner rule, least cost method and Vogel's approximation method. Optimality test: the stepping stone method and MODI method.

Assignment model. Formulation. Hungarian method for optimal solution. Solving unbalanced problem. Traveling salesman problem and assignment problem

(14 Hours)

PART-B

Sequencing models. Solution of Sequencing Problem – Processing n Jobs through 2 Machines – Processing n Jobs through 3 Machines – Processing 2 Jobs through m machines – Processing n Jobs through m Machines.

Dynamic programming-Characteristics of dynamic programming. Dynamic programming approach for Priority Management employment smoothening, capital budgeting, Stage Coach/Shortest Path, cargo loading and Reliability problems

(12 Hours)

PART-C

Games Theory-Competitive games, rectangular game, saddle point, minimax (maximin) method of optimal strategies, and value of the game. Solution of games with saddle points, dominance principle. Rectangular games without saddle point – mixed strategy for 2 X 2 games.

Replacement Models- Replacement of Items that deteriorate whose maintenance costs increase with time without change in the money value. Replacement of items that fail suddenly: individual replacement policy, group replacement policy.

(14 Hours)

PART-D

Inventory models-Inventory costs. Models with deterministic demand – model (a) demand rate uniform and production rate infinite, model (b) demand rate non-uniform and production rate infinite, model (c) demand rate uniform and production rate finite.

(10 Hours)

REFERENCES:

1. P. Sankara Iyer, "Operations Research", Tata McGraw-Hill, 2008.
2. A.M. Natarajan, P. Balasubramani, A. Tamilarasi, "Operations Research", Pearson Education, 2005.
3. J K Sharma., "Operations Research Theory & Applications , 3e", Macmillan India Ltd, 2007.
4. P. K. Gupta and D. S. Hira, "Operations Research", S. Chand & co., 2007.
5. J K Sharma., "Operations Research, Problems and Solutions, 3e", Macmillan India Ltd.
6. N.V.S. Raju, "Operations Research", HI-TECH, 2002.

DAV UNIVERSITY, JALANDHAR

Course Title: Wireless Networks Communication
Course Code: CSE439

L	T	P	Credits
4	0	0	4

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 tunneling, 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)

REFERENCES:

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: Expert System
Course Code: CSE441

L	T	P	Credits
4	0	0	4

Objectives:
The major objectives of this course is to provide students with a view of various models of expert systems, its design, Implementation methods for Knowledge extraction and representation, Fuzzy and connectionist systems.

PART-A
Expert Systems, Definitions types, components, Expert System Development Process Knowledge Representation Techniques-Logic Frames, Semantic Nets

(10 Hours)

PART-B
Domain Exploration, Knowledge elicitation, Conceptualization, Bathering, Formalizations, Methods of Knowledge Acquisition; Interviewing Sensor Data Capturing.

(12 Hours)

PART-C
Learning, Planning and Explanation in Expert System: Neural Expert System, Fuzzy Expert System, Real Time Expert Systems.

(12 Hours)

PART-D
Implementation Tools : Prolog, Expert System Shell Expert System, Study of existing expert systems- TIERES, As Mycin & AM.

(10 Hours)

REFERENCES:

1. Patterson, Introduction to AI Expert System, PHI, 1993
2. Jackson, Building Expert System, John-Wiley 1991.

DISCIPLINE SPECIFIC ELECTIVE-III

DAV UNIVERSITY, JALANDHAR

Course Title: Real Time System
Course Code: CSE426

L	T	P	Credits
4	0	0	4

PART-A

Introduction – Issues in Real Time Computing, Structure of a Real Time System, Task Classes, Performance Measures for Real Time Systems, Estimating Program Run Times.

Task Assignment and Scheduling – Classical Uniprocessor scheduling algorithms, Uniprocessor scheduling of IRIS tasks, Task assignment, Mode changes, and Fault Tolerant Scheduling.

(11 Hours)

PART-B

Programming Languages and Tools – Desired language characteristics, Data typing, Control structures, Facilitating Hierarchical Decomposition, Packages, Run – time (Exception) Error handling, Overloading and Generics, Multitasking, Low level programming, Task Scheduling, Timing Specifications, Programming Environments, Run – time support.

(11 Hours)

PART-C

Real time Databases – Basic Definition, Real time Vs General Purpose Databases, Main Memory Databases, Transaction priorities, Transaction Aborts, Concurrency control issues, Disk Scheduling Algorithms, Two – phase Approach to improve Predictability, Maintaining Serialization Consistency, and Databases for Hard Real Time Systems.

(11 Hours)

PART-D

Real – Time Communication – Communications media, Network Topologies Protocols, Fault Tolerant Routing. Fault Tolerance Techniques – Fault Types, Fault Detection. Fault Error containment Redundancy, Data Diversity, Reversal Checks, Integrated Failure handling.

Reliability Evaluation Techniques – Obtaining parameter values, Reliability models For Hardware Redundancy, Software error models. Clock Synchronization – Clock, A Non-fault Tolerant Synchronization Algorithm, Impact of faults, Fault Tolerant Synchronization in Hardware, Fault Tolerant Synchronization in software.

(14 Hours)

REFERENCES:

1. C.M. Krishna, Kang G. Shin, "Real Time Systems", McGraw - Hill International Editions, 1997
2. By Albert M. K. Cheng , “Real-time systems: scheduling, analysis, and verification” Wiley

DAV UNIVERSITY, JALANDHAR

Course Title: Cloud Computing
Course Code: CSE428

L	T	P	Credits
4	0	0	4

Course Objective: Analyse the components of cloud computing showing how business agility in an organization can be created. Compare and contrast the economic benefits delivered by various cloud models based on application requirements, economic constraints and business requirements.
Learning Outcomes: This module gives students the skills and knowledge to understand how Cloud Computing Architecture can enable transformation, business development and agility in an organization. .

PART-A
Cloud Computing : Overview, Applications, Intranet and the Cloud, First Movers on the cloud, the need for Cloud Computing, Benefits of cloud Computing, Limitations of the Cloud Computing, security concerns and regulatory issues, Business case for implementing a Cloud

(14 Hours)

PART-B
Cloud Computing Technologies: Hardware and Infrastructure: Clients, Security, Network, services
Accessing the Clouds: Platforms, WEB APIS, WB Browsers
Cloud Storage: Overview, Storage provides, Cloud Standards: Applications, Client, Infrastructure, Services.

(13 Hours)

PART-C
Cloud Computing Mechanisms: Software as a service: Overview, Driving Forces, Company offerings,
Industries, Software + services: Overview, Mobile Device Integration, Providers, Microsoft Online
Application development: Google, Microsoft, Intuit Quick base, Cast Iron Cloud, Bungee Connect

(14 Hours)

PART-D
Local Clouds: Virtualization, server solutions, Thin Client
Migrating to the clouds: Cloud services for individuals, Mid-market and Enterprise wide, Migration.

(15 Hours)

REFERENCES:

1. Velte, Anthony. Toby, T. Velte, J. and Elsenpeter, Robert. *Cloud Computing a practical approach.* Tata McGraw-HILL. 2010.
2. Miller, Michael. *Cloud Computing-web Based application that change the way you work and collaborate online*. Pearson Eduction. 2009.
3. Hurwitz, Judith. Robin, Bloor. Kaufman, Marcia & Halper, Fern. *Cloud Computing for Dummie.* November 2009.

DAV UNIVERSITY, JALANDHAR

Course Title: Computer Peripheral Devices & Interface
Course Code: CSE430

L	T	P	Credits
4	0	0	4

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)

REFERENCES:-

1. P. Pal Chaudhary, "Computer Organization and design" Prentice Hall of India Pvt. Ltd, 1994.
2. Del Corso, H.Kirrman, JD Nicond "Microcomputer buses & links" AcademicPress 1986.
3. Douglas V Hall "Microprocessor & Interfacing Programming & H/W" McGraw Hill International 2ndEdition 1992.
4. Scott Muller, "Upgrading and repairing PC"

DAV UNIVERSITY, JALANDHAR

Course Title: Optical Network Design
Course Code: CSE432

L	T	P	Credits
4	0	0	4

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

Introduction to optical networking: Introduction to SONET/SDH, Legacy SONET/SDH Multiservice Provisioning Platforms, Improving SONET/SDH Bandwidth Efficiency, QoS, SONET/SDH Encapsulation of Ethernet, Packet Ring Technologies, Provisioning, Signaling, Dense Wavelength-Division Multiplexing.

(10 Hours)

PART-B

Time Division Multiplexing : An Introduction to Time-Division Multiplexing, Analog Signal Processing, Analog Signal Generation and Reception, Analog To Digital Conversion - Filtering, Sampling, Quantization, M-law and A-Law coding, Echo Cancellation ; Circuit-Switched Networks - TDM Signaling, Channel –Associated Signaling(CAS), Common Channel Signaling(CCS) ; The T-carrier - DS Framing, DS Multiframing, D4 Super frame, D5 extended Super frame, SF and ESF Alarms ; The E-carrier - E1 Frame Alignment Signal, E1 Multiframe Alignment Signal, E1 CRC Error Checking, E1 Errors and Alarms ; ISDN, TDM networks Elements - Repeaters, CSU/DSU, Digital Access and Cross-Connect Systems, Channel Bank.

(12 Hours)

PART-C

Fiber –Optic Technologies : A brief history of Fiber Optics Communications; Fiber Optic Applications; Performance Considerations; Optical –Power Measurement ,Glass fiber-optic cable, Plastic fiber optic cable, Plastic clad Silica Fiber-optic cable, Multifiber cable systems; Propagation Modes , Fiber-optic Characteristics :- Interference, Linear Characteristics - Attenuation, Chromatic Dispersion, Polarization Mode Dispersion, Optical Signal to noise Ratio Non-linear characteristics - Self –phase Modulation, Cross- phase Modulation, Four- Wave Mixing, Stimulating Raman Scattering, Stimulating brillouin Scattering

(14 Hours)

PART-D

Wavelength Division Multiplexing : Wavelength-Division Multiplexing; Unidirectional WDM; Bidirectional WDM :- Band-Separation Method, Interleaving –Filter Method, Circulator Method, Channel spacing; Coarse Wavelength-Division Multiplexing; Dense wavelength-Division Multiplexing; The ITU Grid; Wavelength- Division Multiplexing Systems; Transmitter :- Distributed Feedback Lasers, Distributed Bragg Reflector, Tunable Lasers, Vertical Cavity Surface Emitting Lasers; Chirp; Modulators; Optical Multiplexers and Multiplexers :- Thin film Filter, Fiber Bragg Grating, Arrayed Waveguide, Fabry Perot Cavity Filter, Acousto Optical Tunable Filter, Mach-Zehnder Interferometers, Couplers, circulators and Isolators, Periodic Filters, Frequency Slicers and Interleavers; Amplifiers :- Erbium-Doped Fiber Amplifiers, Raman fiber Amplifiers, Hybrid and Distributed Amplifiers; Optical-fiber Media; Receivers

WDM characteristics and Impairments to transmission: Forward Error Correction, Signal-to-noise ratio: - OSNR Calculations; Dispersion and Compensation in WDM: - Chromatic Dispersion, Chromatic Dispersion Compensation, Polarization Mode Dispersion, Polarization Mode Dispersion Compensation

(16 Hours)

REFERENCES

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

DISCIPLINE SPECIFIC ELECTIVE-IV

DAV UNIVERSITY, JALANDHAR

Course Title: Fuzzy Logic and Neural Networks
Course Code: CSE422

L	T	P	Credits
4	0	0	4

PART -A

Neural networks characteristics, History of development in neural networks principles, Artificial neural net terminology, Model of a neuron, Topology, Learning, types of learning, Supervised, Unsupervised, Re-inforcement learning. Knowledge representation and acquisition.

(12 Hours)

PART -B

Basic Hop field model, Basic learning laws, unsupervised learning, Competitive learning, K-means clustering algorithm, Kohonen's feature maps.

(12 Hours)

PART -C

Radial basis function neural networks, Basic learning laws in RBF nets, Recurrent back propagation, Introduction to counter propagation networks, CMAC network, and ART networks.

Fuzzy Logic I: Basic concepts of fuzzy logic, Fuzzy Vs Crisp set, Linguistic variables, Membership functions, Operations of fuzzy sets.

(14 Hours)

PART- D

Fuzzy Logic II: Fuzzy IF-THEN rules, Variable inference techniques, De-Fuzzification, Basic fuzzy inference algorithm, Fuzzy system design, PID control, Antilock Breaking system (ABS)

(12 Hours)

REFERENCES:

1. S. N. Sivanandam, S. N Deepa,"Introduction To Neural Net With Matlab 6.0", Tata McGraw-Hill Education
2. George k klir ,"Fuzzy Sets and Fuzzy Logic Theory and Applications".
3. Yegnanarayana B, "Artificial Neural Networks", Prentice Hall of India Private Ltd., New Delhi
4. S.N Sivanandam, SN Deepa : Principles of Soft Computing, Wiley India, 2nd Edition
5. S. Rajasekaran, G.A. VijayalakshmiPai : Neural Networks, Fuzzy Logic and Genetic Algorithms: Synthesis and Applications, 15th Edition, PHI Learning.
6. James Freeman A. and David Skapura : Neural Networks - Algorithms, Applications & Programming Techniques, Addison Wesley
7. Simon Haykin,"Neural Networks".
8. ROSS J.T,"Fuzzy logic with engineering application", Tata Mc.
9. Bart Kosko,"Neural Networks & Fuzzy Logic".

DAV UNIVERSITY, JALANDHAR

Course Title: DATABASE ADMINISTRATION
Course Code: CSE412

L	T	P	Credits
4	0	0	4

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

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.

(10 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) 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.

(11 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.

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

(12 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

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

(12 Hours)

REFERENCES:

1. David C. Kreines, Brian Laskey,"Oracle Database Administration ", Oreilly Media
2. Craig S Mullins," Database Administration: The Complete Guide to Practices and Procedures",Powell's books
3. Claire Rajan," Oracle 10g Database Administrator II: Backup/recovery & Network Administration",by Thomson
4. Sam R. Alapati," Expert Oracle9*i* Database Administration", Apress
5. Dan wood, "Begininig SQL Server 2005 Administration", Wroxpubliction

DAV UNIVERSITY, JALANDHAR

Course Title: NETWORK MANAGEMENT SYSTEMS
Course Code: CSE446

L	T	P	Credits
4	0	0	4

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

(11 Hours)

PART-B

SNMPV1 Network Management: Organization and Information and Information Models.

Managed network : Case Histories and Examples, The History of SNMP Management, The SNMP Model, The Organization Model, System Overview, The Information Model

SNMPv1 Network Management: Communication and Functional Models. The SNMP Communication Model, Functional model

(11 Hours)

PART-C

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.

RMON: What is Remote Monitoring? , RMON SMI and MIB, RMON1, RMON2, ATM Remote Monitoring, A Case Study of Internet Traffic Using RMON

Telecommunications Management Network: Why TMN? , Operations Systems, TMN Conceptual Model, TMN Standards, TMN Architecture, TMN Management Service Architecture, An Integrated View of TMN, Implementation Issues.

(15 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.

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.

(14 Hours)

REFERENCES:

1. Network management, Morris, Pearson Education.
2. Principles of Network System Administration, Mark Burges, Wiley Dreamtech.
3. Distributed Network Management, Paul, John Wiley.

DAV UNIVERSITY, JALANDHAR

L	T	P	Credits
4	0	0	4

Course Title: NETWORK SECURITY
Course Code: CSE434

Course Objective: The objective of this course is to gain an understanding of various methods, and protocols used in network security.
Learning Outcomes: After the completion of this course the participants would gain the knowledge of various protocols of networking, security issues and password authentication protocols.

PART-A
Overview of computer networks, seven-layer architecture, TCP/IP suite of protocols. Introduction to information Security, Types of information security controls, need of Information Security, Allocation of information security responsibilities, Security mechanisms, Identification of Security threats and their effects on security, Technologies and Security policies, real time Communication security. An introduction to LAN/WAN Security and internet Security, Security Management for the World Wide Web and Internet firewalls and how to get past the firewall, Steganography, Layers and Cryptography.

(11 Hours)

PART-B
Overview of Authentication schemes: Password and address based Authentication, Cryptographic Authentication protocols, Trusted Intermediaries and session key establishment. **Authentication of people:** Passwords, Online and offline password guessing, eavesdropping, password and careless users, authentication tokens and biometrics.

(12 Hours)

PART-C
Security handshake pitfalls: Mutual authentication, Integrity for data, Mediated Authentication, Strong password protocols: EKE, SRP, SPEKE and PDM.
Public key infrastructure (PKI): Terminology, PKI trust models, Revocation and Authorization futures.
IPsec: Overview of IPsec, IP and IPv6, AH and ESP, IKE, SSL/TLS.

(12 Hours)

PART-D
Overview of IT Security, Hacking, Hackers and Types of Hackers, Attacks, Denial of Service Attacks(DoS), types of DOS attacks, Viruses and their characteristics, impact they can have on operations and business, Detection and Prevention Mechanisms, types of virus, The self-Hack Audit, VPN.
Intrusion: Intruders, Audit records, Intrusion detection, distributed intrusion detection, honeypots.
Electronic Mail Security: PEM, Structure of PEM Message and S/MIME, PGP etc.

(14 Hours)

REFERENCES:

1. Charlie Kaufman, Radia Perlman, Mike Speciner," Network Security", Pearson Education, 2006
2. S. Cimato and C. Galdi, "Security in Communication Networks", Springer, 2003.
3. H. Chan and V. Gligor, "Information Security", Springer, 2002.
4. UPTEC Computer Consultancy Limited, "Information Technology Tools and Applications", ELSEVIER2005.
5. Rajaraman, "Introduction to Information technology", Prentice Hall of India, Ed., 2005.

6. Thomas II, "Network Security", Pearson Education, 2005.

GENERIC ELECTIVE-I

DAV UNIVERSITY, JALANDHAR

Course Title: Software Engineering & Project Management
Course Code: CSE801

L	T	P	Credits
4	0	0	4

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

(15 Hours)

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.
Testing Strategies: A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing.
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.

(12 Hours)

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)

(11 Hours)

REFERENCES:

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

GENERIC ELECTIVE-II

DAV UNIVERSITY, JALANDHAR

Course Title: Computer Networks
Course Code: CSE802

L	T	P	Credits
4	0	0	4

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)

REFERENCES:

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