H.P. TECHNICAL UNIVERSITY
HAMIRPUR (HP)

Syllabus
[Effective from the Session: 2012-13]
B. Tech. (Computer Science & Engg)

Group A contain: **Civil Engineering (CE)**
Information Technology (IT)
Electronics and Communication Engg. (ECE)
Computer Science and Engg. (CSE)

Group A

1st Semester – Scheme and Distribution of Marks

Course No.	Subject	L	T	P/D	Hrs	Theory		Practical		Total
						End Semester	Sessional	End Semester	Sessional	
NS-101	Engineering Mathematics – I	3	1	0	4	100	50			150
NS-102	Engineering Physics-I	3	1	0	4	100	50			150
NS-103	Engineering Chemistry	3	1	0	4	100	50			150
HS-102	Communication and Professional Skills in English	3	1	0	4	100	50			150
BE-102	Basic Mechanical Engineering	3	1	0	4	100	50			150
BE-104	Principles of Computer Programming & C^{++}	3	1	0	4	100	50			150
(Practicals / Drawing / Design)										
NS-103 (P)	Engineering Chemistry Laboratory	0	0	2	2			25	25	50
HS-102 (P)	Communication and Professional Skills Lab-I	0	0	2	2			25	25	50
BE-104 (P)	Computer Programming Laboratory	0	0	2	2			25	25	50
WS-101	Workshop Practice-I	0	0	3	3			25	25	50
Total					**33**	**600**	**300**	**100**	**100**	**1100**

2nd Semester– Scheme and Distribution of Marks

Course No.	Subject	L	T	P/D	Hours	Theory		Practical		Total
						End Semester	Sessional	End Semester	Sessional	
NS-104	Engineering Mathematics-II	3	1	0	4	100	50			150
NS-105	Engineering Physics-II	3	1	0	4	100	50			150
HS-101	Disaster Management and Environmental Science	3	1	0	4	100	50			150
BE-101	Basic Electrical and Electronics Engineering	3	1	0	4	100	50			150
BE-103	Engineering Drawing and Graphics	1	0	5	6	100	50			150
BE-105	Engineering Mechanics	3	1	0	4	100	50			150
(Practicals / Drawing / Design)										
NS-105 (P)	Engineering Physics Lab	0	0	2	2			25	25	50
BE-101a (P)	Basic Electrical Engineering Lab	0	0	2	2			25	25	50
BE-101b (P)	Basic Electronics Engineering Lab	0	0	2	2			25	25	50
WS-102	Workshop Practice-II	0	0	3	3			25	25	50
Total					**35**	**600**	**300**	**100**	**100**	**1100**

Computer Science and Engineering

3rd Semester– Scheme and Distribution of Marks

Course No.	Subject	L	T	P/D	Hours	Theory		Practical		Total
						End Semester	Sessional	End Semester	Sessional	
HS-201	Engineering Economics	3	0	0	3	100	50			150
CS-211	Data Structures and Algorit	3	1	0	4	100	50			150
CS-212	Computer Organization & Computer Architecture	3	1	0	4	100	50			150
CS-213	Internet Fundamentals	3	1	0	4	100	50			150
EC-214	Digital electronics	3	1	0	4	100	50			150
NS-206A	Discrete Mathematics & Logic Design	3	1	0	4	100	50			150
(Practical's / Drawing / Design)										
CS-211 (P)	Data Structures Lab	0	0	2	2			25	25	50
CS-215(P)	Hardware/PC Lab	0	0	2	2			25	25	50
EC-214 (P)	Digital electronics Lab	0	0	2	2			25	25	50
HS-202 (P)	Communication Skill Lab II	0	0	2	2			25	25	50
Total					**31**	**600**	**300**	**100**	**100**	**1100**

4th Semester

Course No.	Subject	L	T	P/D	Hours	Theory		Practical		Total
						End Semester	Sessional	End Semester	Sessional	
HS-203	Human Values and Professio Ethics	2	0	2	4	100	50			150
NS-207	Numerical methods for Engir	3	1	0	4	100	50			150
CS-221	System Software	3	1	0	4	100	50			150
CS-222	Theory of Computation	3	1	0	4	100	50			150
CS-223	Internet Technology (JAVA)	3	1	0	4	100	50			150
CS-224	Computer Graphics	3	1	0	4	100	50			150
(Practical's / Drawing / Design)										
CS-220 (P)	Numerical Method Lab	0	0	2	2			25	25	50
CS-223(P)	Internet Technology Lab	0	0	2	2			25	25	50
CS-224 (P)	Computer Graphics Lab	0	0	2	2			25	25	50
ECA-201	Extra Curricular Activity	0	0	2	2			25	25	50
Total					**32**	**600**	**300**	**100**	**100**	**1100**

Field Visit shall be compulsory to all students of 2nd year once in a year during or after 4th semester. Survey camp of minimum four (4) weeks duration shall be conducted after 4th Semester for Civil Engineering students. For students of other branches community project at this level will be conducted be included. The Evaluation of same shall be done during 5th Semester.

5th Semester

Course No.	Subject	L	T	P/D	Hours	Theory		Practical		Total
						End Semester	Sessional	End Semester	Sessional	
HS-301	Principals of Management Critical Thinking	3	0	2	5	100	50			150
CS-311	Operating system	3	1	0	4	100	50			150
CS-312	Modeling and Simulation	3	1	0	4	100	50			150
CS-313	Analysis and Design of Algorithms	3	1	0	4	100	50			150
CS-314	Computer Networks	3	1	0	4	100	50			150
EC-311	Microprocessor Theory & Applications	3	1	0	4	100	50			150
(Practical's / Drawing / Design)										
CS-311(P)	Operating System Lab	0	0	2	2			25	25	50
CS-314(P)	Computer Networks Lab	0	0	2	2			25	25	50
EC-311(P)	Microprocessor Lab	0	0	2	2			25	25	50
HS-300	Community Project/Survey Camp	0	0	0	0			50	50	100
Total					**31**	**600**	**300**	**125**	**125**	**1150**

6th Semester

Course No.	Subject	L	T	P/D	Hours	Theory		Practical		Total
						End Semester	Sessional	End Semester	Sessional	
**-300	Open Elective	3	1	0	3	100	50			150
CS-321	Database Management System	3	1	0	4	100	50			150
CS-322	Compiler Design	3	1	0	4	100	50			150
CS-323	Software Engineering	3	1	0	4	100	50			150
CS-324	Artificial Intelligence	3	1	0	4	100	50			150
CS-325	Information Storage Management	3	1	0	4	100	50			150
(Practical's / Drawing / Design)										
CS-320(P)	System and Network Administration Lab.	0	0	2	2			25	25	50
CS-321(P)	DBMS Lab	0	0	2	2			25	25	50
CS-324(P)	Artificial Intelligence Lab	0	0	2	2			25	25	50
CS-326(P)	C#/.NET Lab	0	0	2	2			25	25	50
Total					**31**	**600**	**300**	**100**	**100**	**1100**

$$ - Industrial Training of 8 weeks duration after 6th Semester

Open Elective to be opted from list below but one which is not offered by his Department

Sr. No.	Open Elective	Sub. Code
1.	Energy Assessment and Auditing	EE-300
2.	Total Quality Management	ME-300
3.	Optimization methods for Engineering System	NS-300
4.	Remote Sensing & GIS	CE-300
5.	Operating Systems	CS-300

7th Semester

Course No.	Subject	L	T	P/D	Hours	Theory		Practical		Total
						End Semester	Sessional	End Semester	Sessional	
CS-411	Elective -I	3	1	0	4	100	50			150
CS-412	Advanced Computer Architecture	3	1	0	4	100	50			150
CS-413	Web Technology	3	1	0	4	100	50			150
CS-414	Wireless Communication and Mobile Computing	3	1	0	4	100	50			150
CS-415	Soft Computing	3	1	0	4	100	50			150
(Practical's / Drawing / Design)										
CS-413(P)	Web Technology Lab	0	0	2	2			25	25	50
CS-416(P)	Multimedia Application Lab	0	0	2	2			25	25	50
CS-496	Industrial Training Viva	0	0	0	0			50	50	50
CS-497	Seminar	0	0	2	2			-	50	50
CS-498	Project-I	0	0	6	6			100	50	150
Total					**32**	**500**	**250**	**200**	**200**	**1150**

During winter break there shall be a field visit compulsory to all students of 7th semester, 4th year.

Elective-I

CS-411(a)- Multimedia Technology

CS-411(b)- Management Information System

CS-411(c)- Digital Image Processing

8th Semester

Course No.	Subject	L	T	P/D	Hours	Theory		Practical		Total
						End Semester	Sessional	End Semester	Sessional	
CS-421	Elective-II	3	1	0	4	100	50			150
CS-422	Information System Security	3	1	0	4	100	50			150
CS-423	Data Mining and Data Ware Housing	3	1	0	4	100	50			150
CS-424	Fundamentals of Cloud Computing	3	1	0	4	100	50			150
(Practical's / Drawing / Design)										
CS-423(P)	Data Mining Lab	0	0	2	2			25	25	50
CS-499	Project -II	0	0	6	6			100	50	150
GP-400	General Proficiency	0	0	0	0			100	0	100
Total					**24**	**400**	**200**	**225**	**75**	**900**

Elective-II

CS-421(a)- E-Commerce & ERP

CS-421(b)- Internet and Internet Technology

CS-421(c)- Advanced Computer Networks

Engineering Mathematics-I (NS-101)

Course Code	**NS-101**	**Credits- 04**	**L - 3, T- 1, P - 0**
Name of Course	**Engineering mathematics-I**		
Lectures to be delivered	**52 (L-39, T-13 for each semester)**		
Semester End Examination	**MM: 100**	**Min. Marks; 40**	**Time Allowed: 3 Hrs.**
Continue Assessment (based on sessional tests 50%) Tutorial/ Assignment: 30%, Quiz/ Seminar: 10 %, Attendance: 10 %.			**MM: 50.**

INSTRUCTIONS

1. The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.

2. Candidates are required to attempt five questions in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators are allowed.

SECTION-A

1. MATRICES

Matrices, Related matrices, Complex matrices (Hermitian and skew-Hermitian matrices, Unitary matrix), Consistency of linear system of equations, Rank of a matrix, Normal form of a matrix, Vectors, Linear dependence, Consistency of a linear system of equations, System of linear homogeneous equations, Linear and orthogonal transformations, Characteristic equation, Eigen values, Eigen vectors, Properties of Eigen values, Cayley-Hamilton theorem, Quadratic forms and its reduction to canonical form.

SECTION-B

2. DIFFERENTIAL CALCULUS

Indeterminate forms, Taylor's and Maclaurin's series, Partial Differentiation and its geometrical interpretation, Homogeneous functions, Euler's theorem and its extension, Total differentials, Composite function, Jacobian, Maxima and minima of functions of two variables, Method of undetermined multipliers.

SECTION-C

3. INTEGRAL CALCULUS

Reduction formulas, Quadrature, Rectification, Surface and Volume of revolution for simple curves, Double integrals and their applications, Change of order of integration, Change of variables, Triple integrals and their applications, Change of variable, Beta and Gamma functions and their relationship.

SECTION-D

4. COMPLEX NUMBERS

Applications of De Moivre's theorem, Root of a complex number, Exponential, Circular, Hyperbolic and Logarithmic functions of a complex variable, Inverse Hyperbolic functions, Real and imaginary parts of Circular and Hyperbolic functions, Summation of the series-'C+iS' method.

TEXT BOOKS

1. Advanced Engineering Mathematics: by Erwin Kreyszig, John Wiley and Sons, NC, New York.
2. Advanced Engineering Mathematics: by R. K. Jain & S. R. K Iyengar, Narosa Pub. House.

REFERENCE BOOKS

1. Advanced Engineering Mathematics: by C. R. Wylie & L. C. Barrett, McGraw Hill
2. Differential & Integral Calculus: by N. Piskunov, MIR Publications.
3. Calculus and Analytic Geometry, by Thomes, G.B, Finney, R.L. Ninth Edition, Peason Education.
4. Advanced Engineering Mathematics, by Peter. V. O‟ Nil, Wordsworth Publishing Company.
5. Advanced Engineering Mathematics, by Jain, R.K and Lyengar, S.R.K., Narosa Publishing Company.
6. Higher Engineering Mathematics, by Grewal, B.S., Khanna Publishers, New Delhi.
7. Engineering Mathematics, by Taneja, H.C., Volume-I & Volume-II, I.K. Publisher.

Engineering Physics-I (NS-102)

Course Code	**NS-102**	**Credits-4**	**L-3, T-1, P-0**
Name of the Course	**Engineering Physics-I**		
Lectures to be Delivered	**52 (1 Hr Each) (L=39, T=13 for each semester)**		
Semester End Examination	**Max Marks: 100**	**Min Pass Marks: 40**	**Maximum Time: 3 hrs**
Continuous Assessment (based on sessional test (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			**Max Marks: 50**

INSTRUCTIONS

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For Candidates:** Candidates are required to attempt five question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

SECTION A

INTERFERENCE-Coherent Sources, Two Beam Interference by Division of Wavefront- Fresnel Biprism Interference by Division of Amplitude - Newton's Rings, Michelson Interferometer.

DIFFRACTION-Fraunhoffer Diffraction, Diffraction Through Single Slit, Plane Transmission Grating, Fresnel Diffraction, Fresnel Half Period Zone, The Zone Plate.

POLARIZATION- Production of Polarized Light, Malus's Law, Double Refraction, Interference of polarized Light: Quarter Wave Plate And Half Wave Plate.

SECTION B

Particle Properties of Waves: Electromagnetic Waves, Maxwell Equations, Blackbody radiations, Photoelectric Effect, Compton Effect, Pair Production,

Waves Properties of Particles: De Broglie waves, Phase velocity, group velocity and Particle velocity. Relation between phase velocity and group velocity. Relation between group velocity and particle velocity. Particle Diffraction, Heisenberg's uncertainty principle and its physical significance (no derivation). Application of uncertainty principle (Non-existence of electron in the nucleus).

SECTION C

Quantum Mechanics: Postulates of quantum mechanics, The Wave Euation. Properties and Physical significance of a wave function. Probability density and Normalisation of wave function. , Schrodinger's equation: Time- Dependent form, Expectation Values, Operators, Schrodinger's equation: Steady- Stateform Eigen values and eigen function, Application of Schrödinger wave equation –Particle in a box, FinitePotential well, Tunnel Effect, Harmonic oscillator.

SECTION D

Nuclear Structure: Composition of nucleus, Nuclear Properties, Stable Nuclei, binding energy, Liquid Drop Model, Nuclear Forces.
Nuclear Reactions: Cross-section, Nuclear fission, moderators, nuclear reactors, Nuclear fusion in Stars, Fusion Reactors
Elementary Particles: Leptons,Hadrons, Elementary particle quantum numbers, Quarks, Field Bosons,
Cosmology: The Big Bang Theory, Evolution of Stars.

TEXT BOOKS:

1. A.Ghatak: Optics,Tata Mcgraw Hill, 3rd edition.
2. Arthur Beiser, Concepts of Modern Physics ,6th Edition, Tata Mcgraw Hill-2009

REFERENCE BOOKS:

1. David J Griffith , Introduction to Electrodynamics, Pearson Prentice Hall.
2. Halliday, Resnick and Walker- Principles of Physics, Wiley India 9th Edition-2012

ENGINEERING CHEMISTRY (NS – 103)

Course Code	**NS-103**	**Credits- 04**	**L-03, T-01, P-0**
Name of Course	**Engineering Chemistry**		
Lectures to be delivered	**55 (L-42, T-13 for each semester)**		
Semester End Examination	**MM: 100**	**Min. Marks; 40**	**Time Allowed: 3 Hrs.**
Continue Assessment (based on sessional tests 50%) Tutorial/ Assignment: 30%, Quiz/ Seminar: 10 %, Attendance: 10 %)			**MM: 50.**

INSTRUCTIONS

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E.

SECTION –A

Electrochemistry: Electrical Conductance, Types of Electrolyte, Specific Conductance, Equivalent Conductance, Molar Conductance, Ionic Conductance (Kohlrausch Law), Factors Affecting Conductance, Transport Number, Interionic Attraction Theory of Conductance, Hydration of ions, Electrochemical Cell ,Electrode Potential, Standard Electrode Potential, Galvanic Cells, EMF of the Cell & Free Energy Change, Nernst Equation, Reference Electrodes (S.H.E,Calomel Electrode, Silver-Silver Electrode, Eletrochemical Series, Glass Electrode, Concentration Cell, types & applications of Concentration Cell, Batteries(primary cell, Secondary storage cell, Metal- Air Batteries), Fuel cell, hydrogen-oxygen fuel cell.

Phase Rule: Introduction, One Component System (water system, sulpher system) Two components System (lead-silver & Zinc- magnesium system), thermal Analysis.

SECTION – B

Water Treatment: Introduction, Sources of water, Impurities, Hardness Analysis, Oxidations, (BOD & COD), Boiler Corrosion Sewage & Treatment.

Corrosion and its Controls: Introduction, Types of corrosions, Electrochemical Theory, Pitting, Water Line, Differential Aerations corrosions, Stress Corrosions, Factors affecting Corrosions, Preventive measures.

SECTION – C

Instrumental Methods of Analysis

Introduction to spectroscopy; UV-Visible spectroscopy- Absorption laws ,Instrumentation, formation of absorption bands, Theory of electronic spectroscopy, Chromophore and auxochrome concept, fluorescence & phosphorescence, application of UV-Visible spectroscopy ; IR spectroscopy- Principle, theory of molecular vibrations, important features of IR spectroscopy and applications; NMR-Principle, relaxation processes, Instrumentation, Shielding-desheilding effects, spin coupling, coupling constant, applications of NMR.

Fuel and Combustion: Introduction, class of fuels (Solid, Liquid and Gases) Coal and its origin, Analysis of Coals, Petroleum fuels, Cracking, Reforming, Octane no, Cetane no, Gaseseous fuel – Water gas, producer gas, bio gas, coal gas and oil gases

SECTION – D

Polymers Classification of polymers, types of polymerizations, plastics, some important commercial thermoplastics (polythene, polypropylene, polystyrene, polyvinylchloride, Teflon, plexiglass, polyurethanes), thermosetting (Bakelite, epoxy resin, Urea formaldehyde) Elastomers- synthetic rubbers, synthetic fibers.

Composite Materials

Introduction, Classification, Constituents of composites, Fiber reinforced composites, unidirectional fibre reinforced composites, short fibre reinforced composites, particle reinforced composites, important types of particulate composites, Failures of fiber reinforced composites, Advantages and applications of composites.

TEXT BOOKS:

1. Engineering Chemistry by Dr Ramesh Thakur and Dr.Subba Ramesh, Wiley India publisher
2. A Text Book of Engineering Chemistry by ShashiChawla, DhanpatRai& Sons.

REFERENCE BOOKS:

1. Engineering Chemistry by P C Jain & Monika Jain
2. Fundamental of organic spectroscopy by Y. R. Sharma
3. Spectroscopic methods by Williams and Fleming

Communication & Professional Skills in English (HS-102)

Course Code	**HS-102**	**Credits-3**	**L-3, T-1, P-0**
Name of the Course	**Communication & Professional Skills in English**		
Semester End Examination	**Max Marks: 100**	**Min Pass Marks: 40**	**Maximum Time: 3 hrs**
Continuous Assessment (based on Sessional test (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			**Max Marks: 50**

INSTRUCTIONS

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For Candidates:** Candidates are required to attempt five question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E.

SECTION A

Essentials of communication:

The process of communication: communication competence, types and channels of communication – verbal and non-verbal, Importance of listening skills in communication: types of listening, barriers to listening, Barriers to communication and removal of these barriers, personal SWOT Analysis, Analyzing audience, role of emotions and body language in communication.

SECTION B

Written communication:

Enriching vocabulary, using vocabulary in different context, Essentials of strong writing skills, language and style of writing, characteristics of a good technical style, logical reasoning, Paragraph writing, Developing perspective: goals, objectives and principles of critical thinking.

SECTION C

Reading Comprehension:

Importance of reading: Eye movement, fixations, regression, visual wandering, right approach to reading, SQ3R method of reading, Precis writing, Comprehension, Essay writing.

SECTION D

Technical Communication:

Report writing: Importance, structure, drafting of reports, Business Writing: Sales letters, claim and adjustment letters, inviting/sending quotations, Tenders, Memorandum, Job Application letter, Preparing a personal resume, notices, agenda and minutes of meeting.

TEXT BOOKS:

1. An Introduction to Professional English and Soft Skills: by Bikram K. Das, Kalyani Samantray, Cambridge Press.
2. Business correspondence and Report Writing: by R. C. Sharma & Krishna Mohan

REFERENCE BOOKS:

1. Communication Skills, Sanjay Kumar and PushpLata, Oxford University Press.
2. Chrissie Wright (Ed.); Handbook of Practical Communication Skills; JAICO Books
3. Effective Communication and soft Skills, NitinBhatnagar and MamtaBhatnagar, Pearson Publication.
4. Communicative English for Engineers and professionals, NitinBhatnagar and MamtaBhatnagar, Pearson Publication.
5. Communication Skills and soft skills- An integrated approach, Kumar, Pearson Publication
6. Communication Skills for Engineers, Mishra, Pearson Publication
7. K.K.Sinha, Business Communication, Galgotia Publishing Company, New Delhi, 1999.
8. R.K.Bansal& J.B. Harrison, spoken English for India, Orient Longman.

Recommended Readings:

1. Business @ The Speed of thought, Bill Gates.
2. My Experiments with Truth, M.K.Ghandhi
3. Wings of Fire, A.P.J. Kalam
4. An Autobiography, JwaharLal Nehru.

BASIC MECHANICAL ENGINEERING (BE-102)

Course Code	**BE-102**	L-3, T-1, P-0	
Name of the Course	**Basic Mechanical Engineering**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	Max. Time = 3 hrs.	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			**Max. Marks: 50**

INSTRUCTIONS

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus, and each question will carry 20% of the total marks of the semester end examination for the course.
   Note: The paper setter will be required to mention a note in the question paper that use of steam table, graphical plots are permitted.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION-A

Basic concept: Dimensions and units, thermodynamic systems, thermodynamic properties and process, thermodynamic equilibrium, energy-kinetic, potential and internal, heat and work, zeroth law, concept of temperature, definition of ideal gas, laws and properties of ideal gas.
First law of Thermodynamics: First law for control mass (closed system), internal energy as a property, enthalpy, specific heats, non-flow processes of ideal gases, cyclic process, first law for control volume (open system), applications of steady flow energy equation to engineering devices.

SECTION-B

Second law of Thermodynamics: Limitations of first law of thermodynamics, Kelvin- Planck and Clausius statements, their equivalence, application of statements of second law to heat engine, heat pump and refrigerator, reversible processes, reversible cycles, and carnot cycle, corollaries of the second law, thermodynamics temperature scale, Clausius inequality, entropy, principle of increase of entropy, availability and irreversibility.
Properties of Steam: Phase transformation, phase diagram, condition of steam- saturated steam, dry-saturated steam, wet steam, superheated steam, dryness fraction, property of steam, steam tables, use of Mollier charts , process of vapors and various process.

SECTION-C

Gas Power Cycles: Carnot, Diesel, Otto, Dual combustion, working of 2-stroke and 4-stroke engine, Air standard thermal efficiency, Concepts of mean effective pressure, indicated power and brake powerfor reciprocating engines.

SECTION-D

Introduction of Psychometry: The Gibbs Dalton law, Psychometric terms, Introduction of Psychometry Chart.

Introduction to Heat Transfer: Mechanisms – Conduction, Convection and Radiation, Introduction to Fourier's Law of heat conduction, Newton's law of cooling, Stefan-Boltzmann law.

Introduction to Fluid Mechanics: Fluid, properties of fluid, viscosity, Newton's law of viscosity, surface tension, types of fluid, buoyancy.

TEXT BOOKS:

1. Basic Mechanical Engineering by Basant Aggarwal and CM Aggarwal Wiley India.
2. Fundamentals of Mechanical Sciences: Engineering Thermodynamics and Fluid Mechanics by Mukherjee and Paul, PHI Learning.

REFERENCE BOOKS:

1. Thermodynamics – An Engineering Approach (SI Units) – Yunus. A. Cengel, Michael A. Boles, TMH New Delhi
2. Fundamentals of Thermodynamics –Sonntag, Borgnakke Van Wylen – Wiley India.
3. Engineering Thermodynamics by P.K. Nag, TMH, New Delhi
4. Thermodynamics by C.P. Arora, TMH, New Delhi
5. Fundamentals of Mechanical Engineering, 2nd Edition by G.S. Sawhney, PHI Learning Private Limited.

Principle of Computer Programming & C++ (BE-104)

Course Code	**BE-104**	**Credits-4**	**L-3, T-1, P-0**
Name of the Course	**Principle of Computer Programming & C++**		
Lectures to be Delivered	**52 (1 Hr Each) (L=39, T=13 for each semester)**		
Semester End Examination	**Max Marks: 100**	**Min Pass Marks: 40**	**Maximum Time: 3 hrs**
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			**Max Marks: 50**

INSTRUCTIONS

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus, and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION-A

Introduction to Computer:-Definition, Characteristics..Generation of Computers, Capabilities and Limitations. Introduction to Operating System. Basic Components of a Computer System-Control Unit, ALU, Input/output functions and characteristics. Memory Introduction, Classifications- Volatile Memory and Non- Volatile , Memory, ROM, RAM.

Input, Output and storage Units:-Computer Keyboard, Pointing Devices: Mouse, Trackball, Touch Panel, and Joystick, Light Pen, Scanners, Various types of Monitors.

Hard Copy Devices:- Impact and Non- Impact Printers- Daisy Wheel, Dot Matrix, Line Printer, Chain Printer. Non Impact Printers- DeskJet, Laser Printer, Virus : General introduction of virus and anti-virus .

SECTION-B

High Level Language and Low Level Language, Software and its different types- System Software, Application software. Compiler, Interpreter and Assembler. Introduction to algorithm and Flow chart: - Representation of an algorithm, flowchart symbols and flow chart, rules, advantage and limitations of flowchart and pseudo code. Testing and Debugging:-Definition of testing and debugging , types of program errors.

DOS : Internal and External Commands , Difference between External and Internal Commands.

SECTION-C

Introduction to C++ : Starting with C++, Features of C++ Procedure-oriented programming OOP vs. procedure-oriented programming Compiling, linking and running a C++ program.

Object-Oriented Programming Concepts: Abstraction , Inheritance, Polymorphism, Data Binding , Encapsulation., Classes and Objects Concept of a class ,Defining a class, Creating an object , Object Scope.

The Basics of C++ : Basic Data Types, User-defined Data Types, Variable Declarations, Variable Names Constants and its types , Character Constants , String Constants, Standard input and standard output Formatted input –cin and Formatted output – cout.

Working with Operators and Expressions: Operators, Arithmetic Operators, Relational Operators, Assignment Operator, Logical Operators, Increment and Decrement Operators (++ and --), 'Operate-Assign' Operators (+=, =, ...).

SECTION-D

Controlling the Program Flow: Decision control : if, if – else, if - else if . Loop Control : while, do – while, for, break, continue Case Control switch, goto.

Functions/Procedures: function, Returning values from functions, Arguments Passed by Value Passing Addresses of Arguments, Concept of variable scope and scope rules, Global variables

Pointers and Arrays: Pointers, Pointer Initialization, Pointer Operators ,The & (and) Operator Understanding Arrays, Initializing Arrays.

Files: reading, writing text and binary files, pointers, character pointers, pointers to arrays, arrays ofpointer to structures.

TEXT BOOKS:

1.Fundamentals of Computers by Rajaraman, V, PHI Publication

2.Object oriented programming in C^{++} by Rajesh K. Shukla, Wiley India.

REFERENCE BOOKS

1. The C++ programming language ,Bjarne Stroustrup ,Addison Wesley , 2000.
2. Object Oriented Programming with C++, By Sourav Sahay, Oxford University Press.
3. Basic Computer Engineering, Kogent learning solution Inc. Dreamtech Press.
4. Object oriented programming Principles and Fundamental, Gim Keogh and Mario Giannini, John Wiley.
5. Object oriented programming in turbo C^{++} ,Robbet Lofre, 4 Ed Pearson Publication.
6. Programming with C^{++}, D. Ravichandern, Tata Mcgraw Hill 1996.
7. Object oriented programming in C++, Nicolai M Josuetis, John Wiley.

Engineering Chemistry Lab (NS-103(P))

Course Code	**NS-103(P)**	**Credits-2**	**L-0, T-0, P-2**
Name of the Course	**Engineering Chemistry Lab**		
Lectures to be Delivered	**26 hours of Lab. work (2 hrs. per week)**		
Semester End Examination	**Max Marks: 25**	**Min Pass Marks: 10**	**Maximum Time: 3 hrs**
Continuous Assessment	Lab work 30% Lab Record 25% Viva/ Hands on 25% Attendance 20%		Max Marks: 25

Instructions for paper setter / candidates

Laboratory examination will consist of two parts:

Performing a practical exercises assigned by the examiner.

Viva-voce examination

Viva-voce examination will be related to the practicals performed / project executed by the candidate related to the paper during the course of the semester.

NOTE: At least 10 to 12 experiments to be performed.

List of Experiments

1. To determine the surface tension of the given liquid by drop number method by using stalgmometer and identify the given liquid.
2. To determine the insoluble, soluble and total solids in given sample of sewage.
3. To determine the solid carbon, volatile matter, ash content and percentage of moisture in given sample of coal by proximate analysis method and classify the coal.
4. To determine the total alkalinity in a given sample of water using a standard acid.
5. To determine the percentage of Chlorine in a given sample of $CaOCl_2$ which has been dissolved in one litre of solution..
6. To determine the surface tension of the two given unknown liquids by using Stalgmometer and identify the given liquid.
7. To determine the coefficient of viscosity of the given unknown liquids by using Ostwald's Viscometer and identify the given liquid.
8. To determine the coefficient of viscosity of the given lubricating oil using Red Wood Viscometer
9. To determine the coefficient of viscosity of the given lubricating oil using Seybolt Viscometer.
10. To determine the flash point and fire point of given sample of oil using Pens key Marten's apparatus.
11. To determine the amount of Chlorine in given sample of water approximate N/20 sodium Thiosulphate solution.
12. To determine the maximum wavelength of solution of cobalt chloride
13. To determine the Beer's Law and apply it to find the concentration of given unknown solution by spectra-photometer.
14. To determine the chemical oxygen demand of waste water.
15. To determine the half-life period of given radioactive sample using GM counter.

Communication & Professional Skills Lab-I (HS-102(P))

Course Code	**HS-102 (P)**	**Credits-2**	**L-0, T-0, P-2**	
Lectures to be Delivered	**26 hours of Lab. work (2 hrs. per week)**			
Semester End Examination	**Max Marks: 25**	**Min Pass Marks: 10**	**Maximum Time: 3 hrs**	
Continuous Assessment	**Lab work 30%** **Lab Record 25%** **Viva/ Hands on 25%** **Attendance 20%**			**Max Marks: 25**

Instructions for paper setter / candidates:

Laboratory examination will consist of two parts:

(i) Performing a practical exercises assigned by the examiner .

(ii) Viva-voce examination

Note: Each practical should be performed twice for effectiveness.

List of Practicals:

1. Word processing a document.
2. Power point presentations.
3. Resume / Biodata preparation
4. Report writing.
5. Preparing notice, agenda and minutes of meeting.
6. Preparation of Quotation and tender document
7. Note making based reading comprehension
8. Précis Writing

Recommended books:

1. English Conversation Practice by Grant Taylor
2. Business correspondence and Report Writing: by R. C. Sharma & Krishna Mohan
3. Chrissie Wright (Ed.); Handbook of Practical Communication Skills; JAICO Books.
4. Veena Kumar, The Sounds of English, Makaav Educational Software, New Delhi.

Computer Programming Laboratory (BE-104(P))

Course Code	**BE-104 (P)**		**L-0, T-0, P-2**
Name of the Course	**Computer Programming Laboratory**		
Lectures to be Delivered	**26 Hrs. of Lab work (2hrs. each per week)**		
Semester End Examination	**Max Marks: 25**	**Min Pass Marks: 10**	**Maximum Time: 3 hrs**
Continuous Assessment	**Lab work 30%** **Lab Record 25%,** **Viva 25%** **Attendance 20%**		**Max Marks: 25**

Instructions for paper setter / candidates

Laboratory examination will consist of two parts:

Performing a practical exercises assigned by the examiner.

Viva-voce examination

Viva-voce examination will be related to the practicals performed / project executed by the candidate related to the paper during the course of the semester.

NOTE: At least 10 to 12 experiments to be performed.

List of Experiments

1. Write a Program to find the sum, difference, product and quotient of two integers.
2. Write a program C++ Program to output an integer, a floating point number and a character.
3. Write a program to switch between different cases.
4. Write a program to count the number of words and characters in a sentence.
5. Program to find the roots of a quadratic equation.
6.
   - Create a class rational which represent a numerical value by two double values numerator and Denominator include the following public members functions
   - Constructor with no argument(default)
   - Constructor with two arguments
   - Void reduce ()that reduce the rational number by eliminating the highest common factor between the numerator and the denominator
   - Overload + operator to add two rational numbers
   - Overload >> operator to enable input through cin.
   - Overload << operator to enable input through cout.

7. Write a program to convert days into years and weeks.
8. Write a program to convert temperatures from Celsius to Fahrenheit and vice versa.
9. Write a program to find the sum of either of the diagonals of a 4 x 4 matrix.
10. Write a program to enter a sentence and output the number of uppercase & lowercase consonants, uppercase & lowercase vowels in sentence.
11. Write a program to enter 10 integers in a single-dimension array and then print out the array in ascending order.
12. Write a program to find the sum of each row & column of a matrix of size n x m and if matrix is square, find the sum of the diagonals also.
13. Write a program to display fibonacci series upto n terms.
14. Write a program for payroll system using inheritance.
15. To calculate the total mark of a student using the concept of virtual base class.
16.

17. Program for Write File Operation Using C++ Programming.
18. Write a program that creates a binary file by reading the data for the student for the terminal .The data of each student consist of roll number, name (a string of thirty or lesser number of characters) and marks.
19. Write a program to read a number and display its square, square root, cube and cube root. Use a virtual function to display any one of the above.
20. Write a program to read two matrix and find their product use operator overloading so that the statement for multiplying the matrix may be written as Z=x*y where x,y,z are matrices.

WORKSHOP PRACTICE-I (WS-101)

Course Code	**WS– 101**	**L-0, T-0, P-3**	
Name of the Course	**Workshop Practice –I**		
Lectures to be delivered	**39 hours of Lab sessions in each semester**		
Semester End Examination	**Max. Marks: 25**		**Min. Pass Marks: 10**
Continuous Assessment	**Lab work 30%, Viva 25%,**	**Lab record 25%, Attendance 20%**	**Max. Marks: 25**

INSTRUCTIONS:

Laboratory examination will consist of two parts:
(i) Performing a practical exercises assigned by the examiner .
(ii) Viva-voce examination
Viva-voce examination will be related to the practicals performed / project executed by the candidate related to the paper during the course of the semester.

LIST OF EXPERIMENTS: -

Fitting Shop: -
Introduction to the tools used in Fitting Shop and various processes in Fitting shop.
1. To make a square piece of mild steel.
2. To make V-matching joint of mild steel.
3. To make a V-notch.

Machine Shop: -
Introduction to various machine tools and machine parts, such as Lathes, drilling machine, grinders etc. Cutting tools and operations.
1. Facing and turning on mild steel rod on Lathe Machine.
2. To make a groove on lathe machine.
3. Taper turning operation on Lathe Machine.

Carpentry and Pattern making Shop: -
Carpentry and Pattern Making Various types of timber and practice boards, defects in timber, seasoning of wood, tools, operations and joints. Introduction to the tools used in carpentry shop.
1. To make the 'T' lap joint.
2. To make 'T' Dove-tail joint.
3. To make Mortise &Tennon joint.

Welding Shop: -
Introduction to different welding methods, welding equipment, electrodes, welding joints, awareness of welding defects.

1. To make a lap joint.
2. To make a T joint.
3. To make a V-butt joint.

Smithy and Forging: -
Introduction to forging tools, equipments, and operations, Forgability of metals.

1. To make a ring of mild steel by cold forging process.
2. To make S-hook by hot forging process.
3. To make chisel by hot forging process.

Foundry Shop: -

Introduction to moulding materials, moulds, use of cores, melting furnaces, tools and equipment used in Foundry.

1. Make a single piece pattern mould.
2. To make spilt pattern mould.
3. To make mould and core and assemble it.

Electrical and Electronics Shop: -

Demonstration of tools, Introduction to electric wiring, Exercises preparation of PCBs, involving soldering of electrical & electronic application.

1. Fault rectification, disassembly and assembly of (any two) electrical appliances viz. electric iron, electric mixer, ceiling and table fan, tube light, blower and water heater.
2. Demonstration and use of flowing electronic instruments: multimeter, voltmeter, ammeter, energy meter, CRO.

Suggested Reading: -

1. Workshop Technology by Chapman.
2. Manufacturing Processes by Begman.
3. Manufacturing Materials and processes by JS Campbell.
4. Workshop Practice-I, Mechanical Workshop Practice, 2nd Edition by John, PHI Learning Private Limited.

Semester-II
Engineering Mathematics-II (NS-104)

Course Code	**NS-104**		**L - 3, T- 1, P - 0**
Name of Course	**Engineering mathematics-II**		
Lectures to be delivered	**52 (L-39, T-13 for each semester)**		
Semester End Examination	**MM: 100**	**Min. Marks; 40**	**Time Allowed: 3 Hrs.**
Continue Assessment (based on sessional tests 50%) Tutorial/ Assignment: 30%, Quiz/ Seminar: 10 %, Attendance: 10 %.			**MM: 50.**

INSTRUCTIONS

1. The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. Candidates are required to attempt five questions in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators are allowed.

SECTION-A

INFINITE SERIES: Convergence and divergence of infinite series, Geometric series test, Positive term series, p-series test, [Comparison test, D'Alembert's ratio test, Cauchy's root test (Radical test), Integral test, Raabe's test, Logarithmic test, Gauss's test] (without proofs), Alternating series and Leibnitz's rule, Power series, Radius and interval of convergence, absolute convergence and Conditional convergence.

SECTION-B

FOURIER SERIES: Euler's formula, Conditions for a Fourier expansion, Dirichlet's conditions, Functions having points of discontinuity, Change of interval, Odd and even periodic functions, Expansion of odd and even periodic functions, Half-range series, Typical wave-forms, Parseval's formula.

SECTION-C

LINEAR DIFFERENTIAL EQUATIONS: Brief review of first order ordinary differential equations, Exact equations, Equations reducible to exact equations, Equations of the first order and higher degree, Clairaut's equation, Linear differential equations with constant co-efficients, Complimentary functions and particular integral, Method of variation of parameters, Equations reducible to linear equations with constant co-efficients (Cauchy's and Legendre's linear equations).

SECTION-D

VECTOR CALCULUS: Curves in space, curvature and torsion, Scalar and vector point functions, Differentiation of vectors, Vector operator Del, gradient, divergence and curl with their physical interpretations, Formulae involving gradient, divergence and curl, Line, surface and volume integrals, Green's Theorems, Stokes and GaussTheorems and their verifications and applications. Scalar potential, solenoidal and irrotational fields.

TEXT BOOKS

1. Advanced Engineering Mathematics by ErwinKreyszig, John Wiley and Sons, N.C., New York.
2. Advanced Engineering Mathematics by R. K. Jain & S. R. K Iyengar, Narosa Publishing House.

REFERENCE BOOKS

1. Advanced Engineering Mathematics: by C. R. Wylie & L. C. Barrett, McGraw Hill
2. Higher Engineering Mathematics byB S Grewal,Khanna Publishers, New Delhi.
3. Differential & Integral Calculus: by N. Piskunov, MIR Publications.
4. Calculus and Analytic Geometry by Thomes, G.B, Finney, R.L. Ninth Edition, Pearson Education.
5. Advanced Engineering Mathematics byPeter. V. ONil, Wordsworth Publishing Company.
6. Vector Calculus by C. E. Weatherburn. John Wiley and Sons, NC, New York.
7. Differential Equations by Shepley L. Ross, John Wiley & Sons, New York.

Engineering Physics– II(NS – 105)

Course Code	**NS-105**		**L-3, T-1, P-0**
Name of the Course	**Engineering Physics– II**		
Lectures to be delivered	**52 (1Hr.each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max. Marks: 50

INSTRUCTIONS

1. The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. Candidates are required to attempt five questions in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators are allowed.

SECTION – A

Crystal Structure: Space lattice, Bravais lattice - unit cell, primitive cell. Lattice parameters. Crystal systems. Direction and planes in a crystal.Miller indices. Expression for inter-planar spacing.Co-ordination number. Atomic packing factor. Bragg's Law.Determination of crystal structure by Bragg's x-ray spectrometer. Crystal structures of NaCl, and diamond.

Free electron theory: Elements of classical free electron theory and its limitations. Quantum theory of free electrons, Fermi level, density of states, fermidirac distribution function, Thermionic emission, Richardson's equation.

(10 Lectures) & (Text Book-1)

SECTION – B

Band Theory of Solids: Origin of energy bands, Periodic Potential in a crystal, Wave function in a periodic potential, kronig, Penney Model (qualitative), E-K diagrams, Brillouin Zones, Effective mass of electron, Concept of negative effective mass and holes, Classification into metals, semiconductors and insulators, fermi energy and its variation with temperature.

(9 Lectures) & (Text Book-1)

SECTION – C

Dielectric and Magnetic Properties of Materials: Dielectric polarization, dielectric constant, types of polarization, electric field, electric displacement and dielectric polarization vector & relation between them, Gauss;s law in the presence of dielectric, Behavior of dielectric in alternating field- simple concepts, Atomic Magnetic Moments, Classification of magnetic materials, Dia, para, and ferromagnetic materials, domains, B-H graph in ferromagnetic materials Anti-ferromagnetism &ferrimagnetisms, . Soft and Hard magnetic materials. Ferrite and their applications.

Superconductivity: Temperature dependence of resistivity in superconducting materials. Effect of magnetic field (Meissner effect). Type I and Type II superconductors. BCS theory (qualitative), High temperature superconductors, Applications of superconductivity.

(12 Lectures) & (Text Book-1)

SECTION – D

Lasers: Spontaneous and stimulated emission, Einstein's Coefficients, Characteristics of Laser beam, Population inversion, Pumping Techniques, Components of a laser system, Ruby Laser and He-Ne Lasers

Fiber Optics: Basics of fiber optics, Total Internal Reflection, Acceptance angle, Numerical aperture, Single mode & Multimode fibres, Step index and Graded index fiber, pulse Dispersion in optical fibres, Attenuation in Optical Fibres, applications of optical fibres.

(8 Lectures) & (Text Book-2)

TEXT BOOKS:

1. Rajnikant: Applied Solid State Physics, Wiley India Pvt Ltd.
2. A. Ghatak: Optics,Tata Mcgraw Hill, 3rd edition.

REFERENCE BOOKS:

1. Charles Kittel: Introduction to Solid State Physics, John Wiley & sons Inc.
2. S. O. Kasap, Principle of Electronic materials and Devices.

DISASTER MANAGEMENT AND ENVIRONMENTAL SCIENCE (HS-101)

Course Code	**Hs-101**	L-3, T-1, P-0	
Name of the Course	**Disaster Management and Environmental Science**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, P = 13 for each semester)**		
Semester End Examination	Max. Time = 3 hrs.	Max. Marks: 100	Min. Pass Marks: 40
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			**Max. Marks: 50**

INSTRUCTIONS

1. The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. Candidates are required to attempt five questions in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators are allowed.

SECTION-A

Principles of Disaster Management. Natural Disasters such as Earthquake, Floods, Fire, Landslides, Tornado, Cyclones, Tsunamis, Nuclear, Chemical, Terrorism, Extra Terrestrial and other natural calamities. Hazards, Risks and Vulnerabilities. Assessment of Disaster Vulnerability of a location and vulnerable groups, National policy on disaster Management,

SECTION-B

Prevention, Preparedness and Mitigation measures for various Disasters, Post Disaster Relief & Logistics Management, Emergency Support Functions and their coordination mechanism, Resource & Material Management, Management of Relief Camp, Information systems & decision making tools, Voluntary Agencies & Community Participation at various stages of disaster, management, Integration of Rural Development Programmes with disaster reduction and mitigation activities.

SECTION-C

Renewable and non-renewable resources, Role of individual in conservation of natural resources for sustainable life styles. Use and over exploitation of Forest resources, Deforestation, Timber extraction, Mining, Dams and their effects on forest and tribal people. Use and over exploitation of surface and ground water resources, Floods, Drought, Conflicts over water, Dams- benefits and problems. Causes, effects and control measures of Air pollution, Water pollution, soil pollution, Noise pollution, Thermal pollution, Nuclear hazards.

SECTION-D

Global Environmental crisis, Current global environment issues, Global Warming, Greenhouse Effect, role of Carbon Dioxide and Methane, Ozone Problem, CFC's and Alternatives, Causes of Climate Change Energy Use: past, present and future, Role of Engineers.

TEXT BOOKS:

1. Disaster Management By G. K. Ghosh A.P.H. Publishing Corporation
2. Environmental Studies, R Rajgopalan, Oxford University Press

REFERENCE BOOKS:

1. Modern Encyclopaedia of Disaster and Hazard Management By B C Bose Rajat publications.
2. Disaster Management By R.B. Singh Rawat Publications.
3. Disaster Management By B Narayan A.P.H. Publishing Corporation.
4. Environmental Studies, Daniels, Wiley Publication
5. Environmental Studies, Basak, Pearson Publication

Basic Electrical & Electronics Engineering (BE-101)

Course Code	**BE-101**	**L-3, T-1, P-0**	
Name of the Course	**Basic Electrical & Electronics Engineering**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	Max. Marks: 100	Min. Pass Marks:40
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max. Marks: 50

INSTRUCTIONS

1. The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. Candidates are required to attempt five questions in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators are allowed.

SECTION A

DC circuits:. Ohm's law , resistance, receptivity, series & parallel connections, star delta transformation, power dissipation in resistance, effect of temperature on resistance. Kirchhoff's laws Mesh laws; Mesh & Nodal analysis.

AC circuits: Generation of alternating voltage &currents, Sinusoidal signals, instantaneous and peak values, R.M.S. &Average value, phase angle, polar and rectangular, exponential and trigonometric representations of RL and C components,

Electrical Instruments and Devices: Voltmeter, Ammeter, Wattmeter, Energy meter, Inverters. Introduction to Domestic Electric Wiring

SECTION – B

Series and Parallel Circuits: A.C.Through resistance; inductance & capacitance. R-L; R-C & R-L-C series & parallel circuits, phasor diagrams. Power & power factor, series & parallel resonance. Problems by analytical as well as physical methods.

Three phase circuits: Three phase voltage & current generation, star & delta connections (balanced load), relationship between phase &line currents and voltages, phasor diagrams, measurement of power by two wattmeter methods.

A.C. And D.C. Machines: Principle, construction and working of transformer. Introduction to D.C and A.C. machines.

SECTION – C

Semiconductor Devices & Circuit: Classification of material; Energy band structure of conductors, insulators & semiconductor ;Classification of Semiconductor Mobility and conductivity, Intrinsic and extrinsic semiconductors and charge densities in semiconductors, current components insemiconductors, continuity equation. ; PN junction Characteristics& Analysis ;diode rating ; Types of diodes – Zener diodes, Photodiodes, Light emitting diodes (LED's), Varactor diodes and tunnel diodes. Rectifiers and filter circuit: Half wave, full wave

and Bridge rectifier circuits and their analysis, L, C and Pi filters, Basic regulator supply using zener diode.

Transistors: Construction and characteristics of bipolar junction, transistors (BJT's)-Comm. Base, Comm. emitter, Comm. Collector configuration.

SECTION – D

Field Effect Transistor: Construction and characteristics of JFET.MOSFET construction and characteristics.

Integrated Circuits: Classification Of ICs; Monolithic ICs; OP Amp: Characterstics of Ideal OPAmp& application

Electronic Instruments: Role and importance of general purpose test Instruments, Electronic Millimeter, Cathode Ray Oscilloscope, Measurement of amplitude, Frequency and phase using CRO.

TEXT BOOKS:

1. Basic Electrical & Electronics Engineering –V Jegathesan , K Vinoth Kumar & R Saravanakumar, Wiley India
2. Basic Electrical & Electronics Engineering- B.L.Thereja

REFERENCE BOOKS:

1. Electronics devices and circuit theory by Robert Boylestad.
2. Electronics Devices and circuits by Millman&Halkias, TMH.
3. Basic Electronics by Debashis De, Pearson Education, 2010.
4. Electronics devices and circuit by Bhargava and Kulshtreshta, TTTI Series
5. Fundamentals of Electrical & Electronics Engg., 2nd Edition by Smarajit Ghosh, PHI Learning Private Limited.

ENGINEERING MECHANICS (BE-105)

Course Code	BE – 105	L-3, T-1, P-0	
Name of the Course	Engineering Mechanics		
Lectures to be delivered	52 (1 Hr Each) (L = 39, T = 13, P=0 for each semester)		
Semester End Examination	Max. Time = 3 hrs.	Max. Marks: 100	Min. Pass Marks: 40
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max. Marks: 50

INSTRUCTIONS:

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus, and each question will carry 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION-A

Force, Moment, Center of gravity & Moment of Inertia: Idealization of Mechanics, Concept of Rigid Body and Elastic Body, Laws of Mechanics, Forces & System of Forces, Composition, Resolution & resultant of Forces, Laws of Forces, Lami's Theorem, Moment & Couples, Varignon's Theorem, Free Body Diagram, Centre of Gravity of a Lamina, Centroids of various Geometric Shapes, Moment of Inertia, Radius of Gyration, Parallel and Perpendicular Axis Theorem.

Frames and Trusses: Introduction, Perfect Frame, Redundant Frame, Reactions of Supports, Plane Trusses, Space Trusses, Method of Joints, Method of Section, Graphical Method- Maxwell Diagram.

SECTION-B

Simple Stresses and Strains: Stress & strain; Types of stresses and strains Elastic limit; Hooks law; Stress – strain diagram for ductile and brittle material, Factor of safety; Poisson's ratio; Elastic constants; Young's modulus, Shear modulus & Bulk modulus. Relationship between elastic constants. Thermal Stress & Strain.

Shear Force and Bending Moment: Concept of beams - statically determinate and indeterminate beams, Concept and definition of shear force and bending moment, Sign conventions, Types of load – concentrated, uniformly distributed, uniformly varying, Types of beams: Cantilever beam, simply supported beam, overhanging beam; Shear force and bending moment diagrams for the above beams subjected to different loadings and couples. Point of contra flexure, Relationship between load, Shear force and bending moment.

SECTION-C

Bending Stresses in Beams: Bending Stresses in Beams with derivation of Bending equation and its application to beams of circular, rectangular I & T Section, Composite beams.

Shearing Stresses in Beams: Shearing stress at a section in a loaded beam, Shear stress distribution over different sections.

SECTION-D

Torsion of Circular Shaft: Introduction, Theory of Pure torsion - Derivation of torsion equation, assumptions made in theory of pure torsion, Maximum torque transmitted by Solid and hollow shafts, Polar modulus, Torsion rigidity, Power transmitted by a shaft, Comparison of hollow and solid shaft subjected to pure torsion,Close coiled helical spring subjected to axial load and torque.

Introduction to Friction: Definition, Principles of friction, Friction between solid bodies, Coefficient of friction, Kinetic friction force, Definition & Determination of angle of friction, Laws of friction , Procedure for friction analysis, Equilibrium of rigid bodies subjected to frictional force of resistance, Friction at the ends of ladder, Wedge friction, Remedial measures in overcoming friction.

TEXT BOOKS:

1. Engineering Mechanics-Nelson, McGraw Hill
2. Engineering Mechanics: Statics, Meriam, JohnWiley

REFERENCE BOOKS:

1. Mechanics of Materials-E.J. Hearn, Elsevier
2. Engineering Mechanics-Bhavikatti, New Age International
3. Engineering Mechanics- JagatBabu, Pearson
4. Engineering Mechanics, P.N. Chandramouli, PHI Learning Private Limited.
5. Engineering Mechanics, V. Jayakumar & M. Kumar, PHI Learning Private Limited.

ENGINEERING DRAWING AND GRAPHICS (BE-103)

Course Code	**BE-103**	L-1, T-0, P-5	
Name of the Course	**Engineering Drawing and Graphics**		
Lectures to be delivered	**78 (1 Hr Each) (L = 13, P = 65 for each semester)**		
Semester End Examination	Max. Time = 3 hrs.	Max. Marks: 100	Min. Pass Marks: 40
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			**Max. Marks: 50**

INSTRUCTIONS:

1. **For Institutes:** There will be two sessions per week. 1st session will consist of one lecture and two hours of practice session. 2nd session will consist of three hours of practice session.

2. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.

3. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION-A

Drawing Techniques and Scales: Various type of lines, principal of dimensioning, size and location as per IS code of practice (SP-46) for general Engg. Drawing. Practice of drawing, various types of lines and dimensioning exercises. Drawing exercises pertaining to symbols. Conventions and Exercise of lettering techniques. Free hand printing of letters and numerals in 3, 5, 8 and 12 mm sizes, vertical and inclined at 75 degree. Instrumental lettering in single stroke. Linear scale, Diagonal scale &vernier scale.

Points, Lines and Planes: Projection of Points, Lines and Planes: Concept of horizontal and vertical planes. First and third angle projections: projections of point and lines, true length of lines and their horizontal and vertical traces, projection of planes and their traces. Auxiliary planes.

SECTION-B

Projections of Solids: Right regular solids of revolution and polyhedrons etc. and their auxiliary views.

Sectioning of Solids: Principal of sanctioning, types of sanctioning and their practice on projection of solids, sectioning by auxiliary planes.

SECTION-C

Development of Surfaces: Development of surfaces of cylinders, cones, pyramid, prism etc. exercises involving development of unique surfaces like Y-piece, hopper, tray, truncated pieces etc.

Intersection of Surfaces: Intersection of cylinders, cones and prisms with their axes being vertical, horizontal or inclines. Exercise on intersection of solids-cylinder and cylinder, cylinder and cone, prism and prism.

SECTION-D

Isometric Projection: Concept of isometric views: isometric scale and exercise on isometric views. Practice of Orthographic projections.

Simple Trusses: Graphical Method.

TEXT BOOKS:

1. Engineering Drawing & Engg. Graphics byP. S. Gill, Kataria and Sons Millennium Edition.
2. Engineering Drawing Plane and Solid Geometry byN.D. Bhatt and V. M. Panchal, 44th Edition, 2002, Charotar Publishing House.

REFERENCE BOOKS:

1. Engineering Drawing by Dhananjay A. Jolhe, Tata McGraw Hill.

Engineering Physics Lab (NS-105(P))

Course Code	**NS-105(P)**		**L-0, T-0, P-2**
Name of the Course	**Engineering Physics Lab**		
Lectures to be Delivered	**26 hours of Lab. work (2 hrs. per week)**		
Semester End Examination	**Max Marks: 25**	**Min Pass Marks: 10**	**Maximum Time: 3 hrs**
Continuous Assessment	**Lab work 30%, Lab Record 25% Viva/ Hands on 25%, Attendance 20%**		**Max Marks: 25**

Instructions for paper setter / candidates

Laboratory examination will consist of two parts:

Performing a practical exercises assigned by the examiner.

Viva-voce examination

Viva-voce examination will be related to the practicals performed / project executed by the candidate related to the paper during the course of the semester.

LIST OF EXPERIMENTS:

1. To find the refractive index of a prism by using spectrometer.
2. To find the wavelength of sodium light by Newton's rings experiment.
3. To find the wavelength of sodium light by Michelson interferometer.
4. To study the laser beam characterstics like, wavelength using diffraction grating aperture & divergence.
5. To study the variation of magnetic field with distance and to find the radius of coil by Stewart and Gee's apparatus.
6. To find the value of e/m for electrons by Helical method.
7. To compare the capacitances of two capacitors by De'sauty Bridge.
8. To find the value of Planck's constant by using a photoelectric cell.
9. To calculate the hysteresis loss by tracing a B-H curve for a given sample
10. To determine the Hall co-efficient
11. To determine the band gap of an intrinsic semiconductor by four probe method.
12. To find the velocity of ultrasound in liquid.
13. To find out polarizability of a dielectric substance.
14. To determine the numerical Aperture of an optical fibre.
15. To determine the attenuation & propagation losses in optical fibres.

Note: Each student is required to perform at least ten experiments.

Books:

1.Practical Physics-S.L.Gupta&V.Kumar.

2.Advanced Practical Physics Vol. I & II – S.P. Singh

BASIC ELECTRICAL ENGINEERING LAB (BE– 101a(P))

Course Code	**BE– 101a(P)**		L-0, T-0, P-2
Name of the Course	**Basic Electrical Engineering Lab**		
Lectures to be Delivered	26 hours of Lab. work (2 hrs. per week)		
Semester End Examination	Max Marks: 25	Min Pass Marks: 10	Maximum Time: 3 hrs
Continuous Assessment	Lab work30%, Lab Record 25% Viva/ Hands on 25%, Attendance 20%		Max Marks: 25

Instructions for Paper setter/ Candidates

Laboratory examination will consist of two parts:
1. Performing a practical examination assigned by the examiner
2. Viva-voce examination

Viva-voce examination will be related to the practical's performed/projects executed by the candidate related to the paper during the course of the semester.

LIST OF EXPERIMENTS

1. To verify KCL and KVL.
2. To study various types of Electrical Meters.
3. To perform open circuit and short circuit test of Transformer.
4. Measurement of power by Three Voltmeter/Three Ammeter method.
5. Measurement of power in 3-phase system by two wattmeter method.
6. To perform direct load test of transformer and plot efficiency v/s load characteristics.
7. To perform direct load test of the DC shunt generator and plot load v/s current curve.
8. To study frequency response of series RLC circuit and determine resonance frequency and Q factor for various values of R,L,C.
9. To study frequency response of parallel RLC circuit and determine resonance frequency and Q factor for various values of R,L,C.

Note: All the practical's of Electrical should also be performed on breadboard.

BASIC ELECTRONICS ENGINEERING LAB (BE– 101b(P)

Course Code	**BE– 101b(P)**	Credits-2	L-0, T-0, P-2
Name of the Course	**Basic Electronics Engineering Lab.**		
Lectures to be Delivered	26 hours of Lab. work (2 hrs. per week)		
Semester End Examination	Max Marks: 25	Min Pass Marks: 10	Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25% Viva/ Hands on 25% Attendance 20%		Max Marks: 25

Instructions for Paper setter/ Candidates

Laboratory examination will consist of two parts:

1. Performing a practical examination assigned by the examiner
2. Viva-voce examination

Viva-voce examination will be related to the practical's performed/projects executed by the candidate related to the paper during the course of the semester.

LIST OF EXPERIMENTS

1. Familiarization with electronic components, and general purpose Laboratory equipment.
2. Use of CRO and function generator and calculation of amplitude, frequency, time period of different types of ac signals.
3. Verification of Junction Diode and Zener Diode characteristic and determination of static and dynamic resistance at the operating point
4. Verification of input and output characteristics of a Bipolar Junction Transistor and determination of the operating point on load line.
5. Verification of input and output characteristics of a Field Effect Transistor and determination of the operating point on load line.
6. Verification of Series and Parallel Resonance theory.
7. Operation of diode as different form of rectifier and effect of different types of passive filters on the output.
8. Determination of frequency response of a RC coupled amplifier and determination of bandwidth and signal handling capacity.
9. Use of OP-AMP as an inverting and non-inverting amplifier for different gains.
10. Verification of Uni-junction Transistor characteristics and relaxation oscillator
11. Rectifiers- Half wave , Full wave & Bridge rectifiers

Note: All the practical's should be performed on breadboard.

WORKSHOP PRACTICE-II (WS-102)

Course Code	**WS– 102**	**L-0, T-0, P-3**	
Name of the Course	**Workshop Practice -II**		
Lectures to be delivered	**39 hours of Lab sessions in each semester**		
Semester End Examination	**Max. Marks: 25**		**Min. Pass Marks: 10**
Continuous Assessment	**Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%**		**Max. Marks: 25**

INSTRUCTIONS:

Laboratory examination will consist of two parts:

(i) Performing a practical exercises assigned by the examiner .

(ii) Viva-voce examination

Viva-voce examination will be related to the practical's performed / project executed by the candidate related to the paper during the course of the semester.

List of Experiments: -

Fitting Shop: -

1. Drilling and Tapping in a M.S. piece.
2. To make a male-female joint (Taper type) of mild steel.

Machine Shop: -

1. To perform boring operation on lathe machine.
2. To perform knurling and threading operation on lathe machine.
3. Step turning operation on a lathe machine.

Carpentry and Pattern making Shop: -

1. To make a single piece pattern of connecting rod.
2. To make a self-cod pattern.
3. To make a split pattern.

Welding Shop: -

1. To make a V butt joint in horizontal position.
2. To make a V butt joint in vertical position.
3. To perform Gas welding operation.

Smithy and Forging: -

1. To make a cube from a circular bar.
2. To make a tong using hot forging operations.
3. To perform drawing down operation.

Foundry Shop: -

1. To make a mould and perform casting operation.
2. Study of casting defects and its remedies.

Sheet Metal Working Shop: -

Blanking and piercing die construction, press work materials, strip layout, bending dies, forming dies, drawing operations, single and double action draw dies.

1. To make a Ring by Piercing.
2. To make a square shaped object by Bending and Forming Operation.
3. To Draw a Wire.

Suggested Reading: -

1. Workshop Technology by Chapman
2. Manufacturing Processes by Begman
3. Manufacturing Materials and Processes by J. S. Campbell

SEMESTER-3RD

ENGINEERING ECONOMICS (HS-201)

Course Code	**HS-201**	L-3, T-0, P-0	
Name of the Course	**Engineering Economics**		
Lectures to be delivered	**39 (1 Hr Each) (L = 39 for each semester)**		
Semester End Examination	Max. Time = 3 hrs.	Max. Marks: 100	Min. Pass Marks: 40
Continuous Assessment (based on Sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			**Max. Marks: 50**

INSTRUCTIONS

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weight age of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E.

SECTION-A

Economics: Definition, nature and scope of economics, need &significance of economics in Engineering, Economic Systems- Meaning of capitalism, socialism and mixed economy

Demand: Meaning, determinants of demand, demand curve, law of demand, exception to the law of demand, increase &decrease in demand, contraction &extension of demand, Elasticity of demand, Methods of measuring Elasticity of demand

Supply: Law of supply, extension &contraction of supply, increase & decrease in Supply, Elasticity of supply

SECTION-B

Cost of Production: Concept, types, Relation between average & marginal cost.

Theory of Production: Laws of returns- Law of variable proportions and law of returns to Scale, Break Even Analysis.

Price & Output Determination: Price determination under perfect competition, monopoly, monopolistic competition &oligopoly.

SECTION-C

Monetary policy- Meaning, objectives, methods, Fiscal policy- Meaning &Objectives of fiscal policy In a developing country like India, Functions of Reserve Bank of India and commercial banks.

Economics & Business Environment- Business/Trade Cycles- Meaning, Characteristics & classification, Inflation Effect, Foreign capital &economic development, Engineering Economics Analysis, Economics Analysis in the public and regulated sectors.

SECTION D

Indian Economy: - Characteristics of Indian economy, Planning in India, Development &Growth in India. Overall Economic policy since independence, Input & output analysis, Problem of unemployment in India. Concept of sustainable development &inclusive growth in India. Policy of globalizations, liberisation & privatization. Analysis of state &union budgets.

TEXT BOOKS:

1. Modern Micro Economics by Koutsoyannisa, MC Millen
2. Principles of Engineering Economics Analysis by John A. White, Kenneth E. Case and David B. Pratt Wiley India

REFERENCE BOOKS:

1. Business Economics by K. P. M. Sundharam, Sultan Chand &Sons
2. Elementary Economics Theory by K.K Dewett & J. D. Verma, S.Chand Publication.

DATA STRUCTURE & ALGORITHMS (CS-211)

Course Code	CS-211	L-3, T-1, P-0	
Name of the Course	Data Structure & Algorithms		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTIONS

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weight age of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E.

SECTION A

Introduction : Data types, data structures, abstract data types, the running time of a program, the running time and storage cost of algorithms, complexity, asymptotic complexity, big O notation, obtaining the complexity of an algorithm. Development of Algorithms

Notations and Analysis, Storage structures for arrays - sparse matrices - structures and arrays of structures, Stacks and Queues: Representations, implementations and applications.

SECTION – B

Trees – The tree abstract data type, Basic algorithm on tree, Data structure for representing tree, Storage, binary trees, binary tree traversal, searching insertion and deletion in binary trees, heap trees, heap sort algorithm, height balanced trees and AVL trees.
Transverse, Insert, Delete, Sorting of data in these data structures; Prefix, Infix, Postfix Notations;

SECTION – C

Linked list: Representation of linked list, multi- linked structures, Storage Allocation & Garbage Collection, sparse matrix representation.
Graphs and their application , sequential and linked representation of graph , adjacency matrix , operation on graph, traversing a graph , Dijkstra's algorithm for shortest distance.
Tables, searching sequential tables Hash tables and symbol tables.

SECTION – D

Searching and sorting: Use of various data structure for searching and sorting, linear and binary search, insertion sort, selection sort, Merge sort, Radix sort and bubble sort.
Introduction to file handling, Data and Information, File concepts, File organization, files and streams.

Note:

1. Programs are implemented in C/C++.
2. Insertion, deletion, Search and transversal operation are to be performed on all the data structures.

TEXT BOOKS:

1. Seymour Lipschutg : Theory and practice of Data structure , Tata Mc. Graw Hill 1998
2. Tenebaum , A. Lanhgsam Y and Augensatein , A. J: Data structures using C++ , Prentice Hall of India.

REFERENCE BOOKS:

1. Data structure and Algorithms in C++ by Micheal T. Goodrich, Wiley India publication.
2. Data Structure using C++ By Patil , Oxford University press.
3. Data Structure , Algorithm and Object-Oriented programming , Gregory L. Heileman, Tata Mc-Graw Hills.
3. S. Sahni , " Data structure Algorithms ad Applications in C++", WCB/McGraw Hill.
4. J.P. Tremblay and P.G. Sorenson, "An Introduction to Data Structures with applications", Tata McGraw Hill.

COMPUTER ORGANIZATION & COMPUTER ARCHITECTURE (CS-212)

Course Code	**CS-212**	**L-3, T-1, P-0**	
Name of the Course	**Computer Organization & Computer Architecture**		
Lectures to be Delivered	**52 (1 Hr Each) (L=39, T=13 for each semester)**		
Semester End Examination	**Max Marks: 100**	**Min Pass Marks: 40**	**Maximum Time: 3 hrs**
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTIONS:

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weight-age of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E.

SECTION-A

Introduction: Von Neumann Model, System Model, Level of Machines, Typical Computer System, Role of Network.
Computer Arithmetic: Addition & Subtraction, Multiplication Algorithms (Booth's Multiplication
Algorithm), Division Algorithm, Floating point arithmetic operations,
LOGIC DESIGN TECHNIQUES: Designing combinations logic, basic gates, Multiplexers, de multiplexer, decoders and encoders. Instruction codes Computers registers and instructions, timing and control, instruction cycle memory reference instruction, Design of basic computer, Design of accumulator logic.

SECTIONS-B

Processing Unit Design : CPU Basics, Hardware component of the instruction set architecture, Register Set, Data path, CPU Instruction Cycle, Control Unit. Instruction Set Architecture and Design: Memory Locations and Operations, General register organization, stack origination, Instruction formats, and address instructions, addressing modes, data transfer and manipulations, programmed control RISC instruction set design, three address instructions. Parallel processing, RISC pipeline, Vector Processing ,

SECTION-C

Basic of Micro- architecture, The data path , the control section, case study : the VHDL,
Internal communication methodologies , architecture Parallel bus , Serial bus architecture, Mass storage, RAID
Memory Organization : Memory device characteristics, random access memory, serial access memory, virtual memory, associative memory, associative memory in Router,
The Intel Pentium 4, 5 memory , cache memory

SECTION –D

Pipelining Design Techniques: General Concepts, Instruction Pipeline, Example Pipeline Processors, Instruction-Level Parallelism, Arithmetic Pipeline
Introduction to Multiprocessors: Introduction, Characteristic, Interconnection structure, Classification of Computer Architectures, Parallel Architecture, Flynn Taxonomy, Superscalar Machines, SIMD Schemes, MIMD Schemes, Interconnection Networks

TEXT BOOKS:

1. Computer Architecture and Organization: An Integrated Approach by Miles Murdocca and Vincent Heuring , Wiley India Edition
2. M. Moris Mano , Computer System &Architecture PHI.

REFERENCE BOOKS:

1.Computer organization and Architecture By V.Rajaraman, PHI Publication.
2.Hayes J. P "Computer Architecture & Organization" By Tata McGrew Hills 2nd edition .

INTERNET FUNDAMENTALS (CS-213)

Course Code	CS-213	L-3, T-1, P-0	
Name of the Course	Internet Fundamentals		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTIONS

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weight age of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E.

SECTION A

The Internet: Introduction to networks and internet, history, Internet, advantage of internet, major internet services, Evolution and growth of the internet (Introduction and computer generations), Intranet & Extranet, Internet Congestion, internet culture, business culture on internet. Modes of Connecting to Internet, The internet architecture: Client server computing, TCP/IP protocol of internet, IPv4 and IPv6 protocols, Bandwidth and bandwidth management Internet Service Providers(ISPs), Internet address, standard address, Type of internet account.

SECTION B

Electronic Mail: Type of electronic mail, mail transfer protocols, using outlook express, using Mozilla thunderbird, Etiquettes on the internet , Getting Free E-mail address.

World Wide Web : Origin and growth of the world wide web, Domain name system , WEB 2.0 and WEB 3.0,

Building Website : Introduction, Creating HTML Files.

SECTION C

Making Dynamic Web pages: Web programming Language, Creation of client side programs, creation of server side programs, Web service and AJAX.

Hosting and Promoting Website: Structure of website , hosting website.

Electronic commerce: E-bussiness and e-commerce, Type of business in the internet.

Newsgroup and news feeds: Introduction and Origin of newsgroups.

SECTION D

Internet Telephony and web conferring: Introduction, voice and data convergence in networks.
Blogs and social networking: Introduction, blogs
File transfer , Gopher , Remote working: Introduction, File sharing and file transfer.
Internet Security: Introduction, Importance of network security.
The internet and the society, Super Tool for better computing.

TEXT BOOK:

1. The internet A user Guide By K.L James PHI publication.
2. Fundamentals of the Internet and the World Wide Web, Raymond Greenlaw and Ellen Hepp – 2001, Tata McGraw-Hill Education.

REFERENCE BOOKS:

1. Internet & World Wide Programming, Deitel, Deitel & Nieto, 2000, Pearson Education.

DIGITAL ELECTRONICS (EC-214)

Course Code :	**EC-214**	**L-3, T-1, P-0**	
Name of the Course	**Digital Electronics Engineering**		
Lectures to be Delivered	**52 (1 Hr Each) (L=39, T=13 for each semester)**		
Semester End Examination	**Max Marks: 100**	**Min Pass Marks: 40**	**Maximum Time: 3 hrs**
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTIONS

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weight age of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E.

SECTION A

NUMBER SYSTEM & CODES:

Introduction to Number system: Binary, Octal, Hexadecimal number systems and their inter-conversion, Binary Arithmetic (Addition, Subtraction, Multiplication and Division),Floating Point numbers & Arithmetic Diminished radix and radix compliments, BCD codes, 8421 code, Excess-3 code, Gray code, Error detection and correction: Parity code Hamming code.

LOGIC GATES, BOOLEAN ALGEBRA& SIMPLIFICATION TECHNIQUES :

Positive & negative Logic; Logic Gates Tristate Logic gates Schmitt gates ; special output gates; Fan out of logic gates; buffer & transceivers ; IEEE/ANSI standards symbols, Introduction to Boolean algebra ; Postulates of Boolean Algebra; Theorems of Boolean algebra ;

SECTION – B

BOOLEAN ALGEBRA SIMPLIFICATION TECHNIQUES:

Sum of products and Product of Sums Simplification, NAND and NOR implementation, incompletely specified functions, Ex-OR functions, The map method, Two, Three, Four and Five variable maps,

The tabulation method, Determination of Prime implicants, Selection of Essential Prime implicants,

LOGIC FAMILIES:

Classification of digital IC's ; Significance & types ; Characteristics Parameters ; TTL Logic ;ECL CMOS Logic Family; NMOS & PMOS Logic; Interfacing of different logic families ;

SECTION – C

Combinational Logic Circuits:

Implementing combinational logic ;Arithmetic circuits: half Adder ,full adder ,half subtractor , full subtract; BCD Adder; Multiplexer ;Encoder ; Demultiplexer& Decoder

Flip Flops:
Introduction, S-R Flip -flops, Level & edge Triggered flip flops; JK flip-flop, D flip-flop, T flip-flop, master slave flip-flop , Flip Flop timing parameters & application ;
Counters:
Ripple counter ; Synchronous Counter; Modulus of a counter; Binary ripple counter ;UP & down ; Decade & binary counter ; Shift register ; shift register counter,:

SECTION – D

Data conversions Circuits:
Digital to analogue Converter(Simple Resistive divider network ; binary lader network); D/A converter: specification &Types ;A/D Converter: Specification & Types
SEMICONDUCTOR MEMORIES: Introduction, Memory organization, Classification and characteristics of memories, Sequential memories, ROMs, R/W memories. Content addressable memories, Programmable logic arrays, Charged-Coupled device memory

TEXT BOOK:
1 Digital electronics (Principle & Integrated circuits)- Anil K Maini- Wiley India edition
2 M. Morris Mano, Digital Design, Prentice Hall of India.

REFERENCE BOOKS:
1 Thomas Downs and Mark F Schulz, Logic Design with Pascal, Van Nostrand Reinhold.
2 Digital principle and applications Malvino and Leach- (TMH)

DISCRETE MATHEMATICS & LOGIC DESIGN (NS-206A)

Course Code	**NS-206A**	**L-3, T-1, P-0**	
Name of the Course	**Discrete Mathematics & logic design**		
Lectures to be Delivered	**52 (1 Hr Each) (L=39, T=13 for each semester)**		
Semester End Examination	**Max Marks: 100**	**Min Pass Marks: 40**	**Maximum Time: 3 hrs**
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTIONS

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weight age of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators are allowed**.**

SECTION-A

SET THEORY, RELATIONS AND FUNCTIONS

Definition of sets, countable and uncountable sets, Venn Diagrams, proofs of some general identities on sets, Set Theory.

Functions and Relations: Subsets, Power Set, Null Set, Singleton, Finite Set, Infinite Set, Universal Set, Disjoint Sets, Operation on Sets, Venn Diagrams, Cartesian Product of Sets, Partition of Sets, Concept of Relation & Properties of Relations, Different types of Relations, Equivalence relation, Partition and partial order relation Composition of Relations, Functions and their different mappings, Composition of Function.

POSETS, HASSE DIAGRAM AND LATTICES:

Introduction, ordered set, Hasse diagram of partially ordered set, isomorphic ordered set, well ordered set, properties of Lattices, bounded and complemented lattices.

SECTION-B

PROPOSITIONAL LOGIC, COMBINATORICS AND LOGIC GATES:

Proposition, First order logic, Basic logical operation, truth tables, tautologies, Contradictions, Algebra of Proposition, logical implications, logical equivalence, predicates, Universal and existential quantifiers.

COMBINATORICS:

Permutation and Combination, Recurrence Relations, Generating functions, linear recurrence relations with constant coefficients, Homogeneous solutions, particular solutions and total solutions of recurrence relations using generating functions.

PROPOSITIONAL LOGIC:

Proposition, First order logic, Basic logical operation, truth tables, tautologies, Contradictions, Algebra of Proposition, logical implications, logical equivalence, predicates, Universal and existential quantifiers.

SECTION-C

ALGEBRAIC STRUCTURES:

Definition of Algebraic structures, Properties, types: Semi Groups, Monoid, Groups, Abelian group, properties of groups, Subgroup, cyclic groups, Order of group, Lagrange's theorem, Cosets, factor group, Permutation groups, Normal subgroup, Homomorphism and isomorphism of Groups, example and standard results, Rings and Fields: definition, standard results, Integral domain, sub ring, Homomorphism and isomorphism of Rings.

SECTION-D

GRAPHS AND TREES:

Simple graph, multi graph, graph terminology, representation of graphs, Bipartite, Regular, Planar and connected graphs, connected components in a graph, Eulerian graphs, Hamiltonian path and circuits, Graph coloring, chromatic number, isomorphism and Homomorphism of graphs, Shortest path.

TREES:

Definition of trees, rooted tree, Properties of trees, Binary search tree and Tree traversal.

TEXT BOOKS :

1. Trembley, J.P & R. Manohar, "Discrete Mathematical Structure with Application to Computer Science", McGraw Hill.
2. Raman Kumar & Dr D.G Mahto, "Discrete Mathematics and Logic Design " Axis Publication
3. Kenneth H. Rosen, "Discrete Mathematics and its applications", McGraw Hill.

REFERENCE BOOKS:

1. Deo, Narsingh, "Graph Theory With application to Engineering and Computer. Science.", PHI.

DATA STRUCTURE LAB (CS-211 (P))

Course Code	**CS-211 (P)**	L-0, T-0, P-2	
Name of the Course	Data Structure Lab		
Lectures to be Delivered	26 Hrs. of Lab work (2hrs. each per week)		
Semester End Examination	Max Marks: 25	Min Pass Marks: 10	Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25%, Viva 25% & Attendance 20%	Max Marks: 25	

Instructions for paper setter / Candidates

Laboratory examination will consist of two parts:

1. Performing a practical examination assigned by the examiner.
2. Viva-voce examination.

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

LIST OF PROGRAMS:

1. Write a program to search an element in a one-dimensional array using linear search.
2. Write a program to search an element in a two-dimensional array using linear search.
3. Using iteration & recursion concept write programs for finding the element in the array using Binary Search Method.
4. Write a program to perform following operations on tables using functions only
   a) Addition b) Subtraction c) Multiplication d) Transpose
5. Using iteration & recursion concept write the program for Quick Sort Technique.
6. Write a program to implement the various operations on string such as length of string , string concatenation, reverse of a string & copy of a string to another.
7. Write a program for swapping of two numbers using 'call by value' and 'call by reference' strategies.
8. Write a program to implement Binary search tree. (Insertion & deletion in binary search tree)
9. Write a program for implementation of a file and performing operations such as insert, delete and update a record in a file.
10. Write a program to create a linked list & perform operations such as insert, delete, update, reverse in the link list.
11. Create a linked list and perform the following operation on it
    a) Add a node b) Delete a node c) Count no. of nodes d) Sum of nodes
12. Write a program to simulate the various searching & sorting algorithms and compare their timings for a list of 1000 elements.
13. Write a program to simulate the various graph traversing algorithms.
14. Write a program, which simulates the various tree traversal algorithms.
15. Circular double linked list
16. Sorting
    a).Bubble sort
    b).Merge sort
    c).Insertion sort
    d).Selection sort
16. Write down a program to implement polynomial equation addition in single linked list
17. Stack implementation using
    a)Array b) Linked list
18. Queue implementation using
    a)Array b) Linked list

HARDWARE/PC LAB (CS-215(P))

Course Code	**CS-215(P)**	L-0, T-0, P-2	
Name of the Course	**Hardware/PC Lab**		
Lectures to be Delivered	26 Hrs. of Lab work (2hrs. each per week)		
Semester End Examination	Max Marks: 25	Min Pass Marks: 10	Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25%, Viva 25% & Attendance 20%	Max Marks: 25	

Instructions for paper setter / Candidates

Laboratory examination will consist of two parts:

1. Performing a practical examination assigned by the examiner.
2. Viva-voce examination.

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

LIST OF PRACTICALS

PC Hardware:

1) To check and measure various supply voltages of PC.
2) To make comparative study of motherboards.
3) To observe and study various cables, connections and parts used in computer communication.
4) To study various cards used in a system viz. display card, LAN card etc.
5) To remove, study and replace floppy disk drive.
6) To remove, study and replace hard disk.
7) To remove, study and replace CD ROM drive.
8) To study monitor, its circuitry and various presents and some elementary fault detection.
9) To study printer assembly and elementary fault detection of DMP and laser printers. .
10) To study parts of keyboard and mouse.
11) To assemble a PC.
12) Troubleshooting exercises related to various components of computer like monitor, drives, memory and printers etc.

REFERENCE BOOKS:

1) Complete PC upgrade & maintenance guide, Mark Mines, BPB publ.
2) PC Hardware: The complete reference, Craig Zacker& John Rouske, TMH
3) Upgrading and Repairing PCs, Scott Mueller, 1999, PHI,

DIGITAL ELECTRONICS LAB (EC-214(P))

Course Code	**EC – 214 (P)**	L-0, T-0, P-2	
Name of the Course	Digital Electronics lab		
Lectures to be Delivered	26 hours of Lab sessions		
Semester End Examination	Max Marks: 25	Min Pass Marks: 10	Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25% Viva/ Hands on 25% Attendance 20%		Max Marks: 25

Instructions for paper setter/Candidates
Laboratory examination will consist of two parts:
i) Performing a practical examination assigned by the examiner
ii) Viva-voice examination
Viva-voice examination will be related to the practical's performed/projects executed by the candidate related to the paper during the course of the semester

PRACTICAL LIST:

1. To verify the truth table of logic gates realize AND, OR, NOT gates

2. To realize AND, OR gates using diodes and resistors

3. Implementation of X-OR and X-NOR using NAND and NOR

4. Design of adder, subtractor, BCD adder using IC 7483

5. Implementation of logic equations using MUX, DEMUX

6. Design of encoders and decoders

7. Conversion of flip flops

8. Design of counters and registers

9. Application of logic design- sequence detector

10Design a half/full adder circuit using FF for 2 bits

11. Design a half/full sub tractor circuit using FF for 2 bits

12 Design BCD to seven-segment display using 7447 IC

Note: All the practical's should be performed on breadboard & Simulator

COMMUNICATION & PROFESSIONAL SKILLS LAB-II (HS-202(P))

Course Code	HS-202 (P)	L-0, T-0, P-2	
Lectures to be Delivered	26 hours of Lab. work (2 hrs. per week)		
Semester End Examination	Max Marks: 25	Min Pass Marks: 10	Maximum Time: 3 hrs
Continuous Assessment	Lab work 30% Lab Record 25% Viva/ Hands on 25% Attendance 20%		Max Marks: 25

Instructions for paper setter / candidates:

Laboratory examination will consist of two parts:

(iii) Performing a practical exercises assigned by the examiner

(iv) Viva-voce examination

Note: Each practical should be performed twice for effectiveness.

List of Practicals:

1. Phonetics: Organs of speech, speech sounds, symbols, articulation of speech sounds- stress and intonation.
2. SWOT analysis (Personal / Organization)
3. Group discussion
4. Debate
5. Vocabulary improvement programs
6. Technical write up based on critical thinking (On subject allocated by coordinator)
7. Telephonic etiquettes: Preparing, Controlling and Follow up.

RECOMMENDED BOOKS:

1. Developing Communication Skills: by Krishan Mohan & Meera Bannerji
2. Group Discussions by Sudha Publications And Ramesh Publishing House, New Delhi
3. Vocabulary Improvement: Words Made Easy: by Diana Bonet
4. Word Power Made Easy: by Norman Lewis

4TH SEMESTER SYLLABUS

HUMAN VALUES AND PROFESSIONAL ETHICS (HS-203)

Course Code	**HS-203**	**L-02, T-00, P-02**	
Name of Course	**Human Values and Professional Ethics**		
Lectures to be delivered	**52 (L-26, P-26 for each semester)**		
Semester End Examination	**MM: 100**	**Min. Marks; 40**	**Time Allowed: 3 Hrs.**
Continuous Assessment (based on Sessional tests 50%) Tutorial/ Assignment: 30%, Quiz/ Seminar: 10 %, Attendance: 10 %.			**MM: 50.**

INSTRUCTIONS

1. **For Paper Setters:** The question paper will consist of six sections A, B, C, D, E & F. Section F will be compulsory, it will consist of a single question with 10-15 subparts of short answer type, which will cover the entire syllabus. Section A, B, C, D & E will have two questions from the respective sections of the syllabus. Each section will have a weight age of 15% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt six questions in all selecting one question from each of the sections A, B, C, D & E of the question paper and all the subparts of the questions in Section E.

OBJECTIVES:

a. To help the students appreciate the essential complementarily between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.
b. To facilitate the development of a Holistic perspective among students towards life, profession and happiness, based on a correct understanding of the Human reality and the rest of Existence. Such a holistic perspective forms the basis of Value based living in a natural way.
c. To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually satisfying human behavior and mutually enriching interaction with Nature.

Thus, this course is intended to provide a much needed orientation input in Value Education to the young enquiring minds.

COURSE METHODOLOGY:

- The methodology of this course is universally adaptable, involving a systematic and rational study of the human being vis-à-vis the rest of existence.
- It is free from any dogma or value prescriptions.
- It is a process of self-investigation and self-exploration, and not of giving sermons.
- Whatever is found as truth or reality is stated as proposal and the students are facilitated to verify it in their own right based on their Natural Acceptance and Experiential Validation.
- This process of self-exploration takes the form of a dialogue between the teacher and the students to begin with, and within the student himself/herself finally.
- This self-exploration also enables them to evaluate their pre-conditionings and present beliefs.

Content

SECTION A

Course Introduction - Need, Basic Guidelines, Content and Process for Value Education

1. Understanding the need, basic guidelines, content and process for Value Education
2. Self Exploration–what is it? - its content and process; 'Natural Acceptance' and Experiential Validation- as the mechanism for self exploration
3. Continuous Happiness and Prosperity- A look at basic Human Aspirations
4. Right understanding, Relationship and Physical Facilities- the basic requirements for fulfillment of aspirations of every human being with their correct priority
5. Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario
6. Method to fulfill the above human aspirations: understanding and living in **harmony** at various levels

SECTION B

Understanding Harmony in the Human Being - Harmony in Myself!

7. Understanding human being as a co-existence of the sentient 'I' and the material 'Body'
8. Understanding the needs of Self ('I') and 'Body' - *Sukh* and *Suvidha*
9. Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer)
10. Understanding the characteristics and activities of 'I' and harmony in 'I'
11. Understanding the harmony of I with the Body: *Sanyam* and *Swasthya*; correct appraisal of Physical needs, meaning of Prosperity in detail
12. Programs to ensure *Sanyam* and *Swasthya*

- Practice Exercises and Case Studies will be taken up in Practice Sessions.

SECTION C

Understanding Harmony in the Family and Society- Harmony in Human- Human Relationship

13. Understanding harmony in the Family- the basic unit of human interaction
14. Understanding values in human-human relationship; meaning of *Nyaya* and program for its fulfillment to ensure *Ubhay-tripti*;
    Trust (*Vishwas)* and Respect (*Samman)* as the foundational values of relationship
15. Understanding the meaning of *Vishwas*; Difference between intention and competence
16. Understanding the meaning of *Samman*, Difference between respect and differentiation; the other salient values in relationship
17. Understanding the harmony in the society (society being an extension of family): *Samadhan, Samridhi, Abhay, Sah-astitva* as comprehensive Human Goals
18. Visualizing a universal harmonious order in society- Undivided Society (*Akhand Samaj),* Universal Order (*Sarvabhaum Vyawastha)*- from family to world family!

- Practice Exercises and Case Studies will be taken up in Practice Sessions.

SECTION D

Understanding Harmony in the Nature and Existence - Whole existence as Co-existence

19. Understanding the harmony in the Nature
20. Interconnectedness and mutual fulfillment among the four orders of nature-recyclability and self-regulation in nature
21. Understanding Existence as Co-existence (*Sah-astitva*) of mutually interacting units in all-pervasive space
22. Holistic perception of harmony at all levels of existence

- Practice Exercises and Case Studies will be taken up in Practice Sessions.

SECTION E

Implications of the above Holistic Understanding of Harmony on Professional Ethics

23. Natural acceptance of human values
24. Definitiveness of Ethical Human Conduct
25. Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order
26. Competence in professional ethics:

a) Ability to utilize the professional competence for augmenting universal human order,
b) Ability to identify the scope and characteristics of people-friendly and ecofriendly production systems,
c) Ability to identify and develop appropriate technologies and management patterns for above production systems.

27. Case studies of typical holistic technologies, management models and production systems
28. Strategy for transition from the present state to Universal Human Order:

a) At the level of individual: as socially and ecologically responsible engineers, technologists and managers
b) At the level of society: as mutually enriching institutions and organizations

TEXT BOOK:

1. R R Gaur, R Sangal, G P Bhagaria, 2009, *A Foundation Course in Value Education*.

REFERENCE BOOKS:

1. Ivan Illich, 1974, *Energy & Equity*, The Trinity Press, Worcester, and HarperCollins, USA
2. E.F. Schumacher, 1973, *Small is Beautiful: a study of economics as if people mattered*, Blond & Briggs, Britain.
3. A Nagraj, 1998, *Jeevan Vidya ek Parichay*, Divya Path Sansthan, Amarkantak.
4. Sussan George, 1976, *How the Other Half Dies*, Penguin Press. Reprinted 1986, 1991
5. PL Dhar, RR Gaur, 1990, *Science and Humanism*, Commonwealth Purblishers.
6. A.N. Tripathy, 2003, *Human Values*, New Age International Publishers.
7. Subhas Palekar, 2000, *How to practice Natural Farming*, Pracheen (Vaidik) Krishi Tantra Shodh, Amravati.
8. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 1972, *Limits to Growth – Club of Rome's report*, Universe Books.
9. E G Seebauer & Robert L. Berry, 2000, *Fundamentals of Ethics for Scientists & Engineers ,* Oxford University Press
10. M Govindrajran, S Natrajan & V.S. Senthil Kumar, *Engineering Ethics (including Human Values)*, Eastern Economy Edition, Prentice Hall of India Ltd.
11. Values and Ethics in Business & Professional, Samita Manna & Suparna Chakraborti, PHI Learning Private Limited.

RELEVANT CDS, MOVIES, DOCUMENTARIES & OTHER LITERATURE:

1. Value Education website, *http://www.uptu.ac.in*
2. Story of Stuff, *http://www.storyofstuff.com*
3. Al Gore, *An Inconvenient Truth*, Paramount Classics, USA
4. Charlie Chaplin, *Modern Times*, United Artists, USA
5. IIT Delhi, *Modern Technology – the Untold Story*

NUMERICAL METHODS FOR ENGINEERS (NS-207)

Course Code	NS-207	L-3, T-1, P-0	
Name of the Course	**Numerical Methods for Engineers**		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTIONS:

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weight-age of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed

SECTION –A

SOLUTION OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS: Bisection method, Method of false position, secant method, Iteration method, Newton-Raphson method and Generalized Newton-Raphson method, Rate of convergence and condition of convergence, solution of simultaneous equations by Iteration method and Newton-Raphson method

SOLUTION OF SIMULTANEOUS ALGEBRAIC EQUATIONS: Partial and Complete Pivoting, Gauss Elimination method, Gauss Jordan method, Jacobi's method, Gauss-Seidal method, Relaxation method and LU-decomposition method.

SECTION-B

FINITE DIFFERENCE AND INTERPOLATION: Errors and approximation analysis, Interpolation, Various difference operators and relation between them, Newton's forward and backward interpolation formulae, Central difference Interpolation formula, Gauss's forward and backward interpolation formulae, Stirling formula, Bessel formula, Lagrange's interpolation formula of unequal intervals, Newton's divided difference formulae.

SECTION-C

NUMERICAL DIFFERENTIATION AND INTEGRATION: Numerical differentiation: Derivatives using Newton forward, backward and central difference formulas, Derivatives using Gauss forward and backward formulas, Derivatives using Bessel formula, Derivatives using Newton divided difference formulas, Maxima and minima of tabulated functions.

NUMERICAL INTEGRATION: Newton-Cotes Quadrature formula, Trapezoidal rule, Simpson's $1/3^{rd}$ and $3/8^{th}$ rules, Boole's and Weddle's rules, Errors and accuracy of these formulae (Trapezoidal rule, Simpson's $1/3^{rd}$ rule) Romberg's integration.

SECTION-D

NUMERICAL SOLUTIONS OF ORDINARY EQUATIONS: Picard method, Taylor's series method, Euler's method, Runge's method, Runge-Kutta method, Predictor- Corrector Methods: Milne's method and Adams-Bashforth method.

NUMERICAL SOLUTIONS OF PARTIAL DIFFERENTIAL: Finite difference approximations of partial derivatives, solution of Laplace equation (Standard five-point formula and Diagonal five-point formula), Solution of Poisson equation.

TEXT BOOKS:

1. Numerical methods for Scientific &Engg. Computations: M. K. Jain, S. R. K. Iyengar& R. K. Jain; Wiley Eastern Ltd.
2. Introductory Methods of Numerical Analysis Engineers & Sciences: S. S. Sastry, PHI Learning Private Limited New Delhi, (2009).

REFERENCE BOOKS:

1. Numerical Methods in Engineers &Sciences : J.N Sharma : Narosa Publishers.
2. Numerical Methods in Engg. &Sciences :B.S.Grewal : Khanna Publishers.
3. Computer Oriented Numerical methods: U. RajaramanOrebtuce; Hall of India.
4. Introduction to Numerical Analysis: C. E. Froberg; Addison Wesley.

SYSTEMS SOFTWARE (CS-221)

Course Code	CS-221	L-3, T-1, P-0	
Name of the Course	**Systems Software**		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTION

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weight age of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E.

SECTION A

System Software : Distinction between system software and application software, Components of System Software, Evolution of System Software, H/W Independent features of System Software, General features of a System Software, Layered Organization of System Software, Overview of Compilers and Interpreters, Machine structure of 360/370 , Instruction set,
System File and Library Structure: Library file organization, Design a record, data file structure, executable file , image file structure.

SECTION B

Assembler: Classification of assembler, General problem in assembler, , General design Procedure, Design of Two-Pass Assembler, Data Structures Format of Databases, Algorithm, One pass and multipass assembler, Advance assembly process, Varient of assembler

Machine Language and Microprocessor
Macro processor: Definitions, nested macro – definitions, Advantage using macro, macro expansion, conditional macro-expansion, implementation.

SECTION C

Loaders: Principle of loading operation, sequential and direct loader, Location, Linking, Static and dynamic linking, Loader Schemes: Compile and go Loaders, General Loader schema , Absolute Loaders, Subroutine linkages , relocating loader , Direct linking loader , other loader schema , design of an absolute and direct linking loader , complexity, Graphic loader.

SECTION D

System Software Tools

Searching and Sorting: Linear search, Binary search, sorting (interchange sort, shell Sort, Bucket Sort, radix exchange sort)
Elements of System software Tools, Text Editor: Line and Stream Editor, Screen Editor, Structure Editor, Word Processor, Editor Structure, sound editor, Debug Monitor, Programming Environment, DOS functions,
Debuggers: Type of error, classification of debuggers, debugging using hardware.
System administrator: System administrator, system configuration, System administrator for DOS, window, UNIX

TEXT BOOKS:

1. John J. Donovan, “System Programming”, By Tata McGraw Hills.
2. D. M. Dhamdhere, “System Software and Operating System”, By Tata McGraw Hills.

REFERENCE BOOKS:

1. Rajesh Kumar Maurya “System Programming” Dreamtech press
2. System Programming by Srimanta Pal oxford university press.
3. Leland L. Black, “System Software-An Introduction to System Programming”, Addison Wesley.

THEORY OF COMPUTATION (CS-222)

Course Code	CS-222	L-3, T-1, P-0	
Name of the Course	**Theory of Computation**		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTIONS:

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weight-age of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E.

SECTION A

Finite Automata and Regular Expressions:

Automata definition, constructing simple and complex automata, Limitation of finite automata. Finite State Systems, Basic Definitions Non-Deterministic finite automata (NDFA), Deterministic finite automata (DFA), Equivalence of DFA and NDFA Finite automata with E-moves, Concept of basic Machine, Properties and limitations of FSM. Moore and mealy Machines, Equivalence of Moore and Mealy machines

SECTION B

Regular Expressions, Constructing Regular Expression, Equivalence of finite automata and Regular Expressions, Regular expression conversion and vice versa. Method to constructing regular expression

Properties of Regular Sets:

The Pumping Lemma for Regular Sets, Applications of the pumping lemma, Closure properties of regular sets, Myhill-Nerode Theorem and minimization of finite Automata, Minimization Algorithm.

SECTION C

Grammars:

Definition, Context free and Context sensitive grammar, nature of context free grammar, Ambiguity regular grammar, Eliminating Ambiguity, Chomsky Normal Form (CNF), Converting to Chomsky normal Form, Parsing with Chomsky Normal form , Griebach Normal Form (GNF).

Pushdown Automata:

Introduction to Pushdown Machines, Application of Pushdown Machines

SECTION D

Turing Machines:

Basic model of Turing machine, Representation of Turing machine Constructing simple and Complex Turing Machine , Variation of Turing machine, universal Turing Machine

Chomsky Hierarchies:

Chomsky hierarchies of grammars, unrestricted grammars, Context sensitive languages, Relation between languages of classes.

Computability and Undesirability:

Basic concepts, The post correspondence problem, Primitive Recursive Functions, Understanding the halting problem of Turing machine

TEXT BOOKS:

1. Theory Of Computation by Dr Kavi Mahesh , Wiley India publication.
2. Theory of Computer Sc.(Automata, Languages and computation):K.L.P.Mishr &N. Chandrasekaran, 2000, PHI.
3. Introduction to automata theory, language & computations Hopcroaft &O.D.Ullman, R Mothwani, Pearson publication, 2001.

REFERENCE BOOK:

1 Formal Language and Automata Theory By Basavaraj S . Anami , Wiley India publication.
2 Formal language and automata theory by C.K. Nagpal Oxford University Press
3 Introduction to languages and the Theory of Computation by John C. Martin 2003, Tata McGrew Hills.

INTERNET TECHNOLOGY (CS-223)

Course Code	**CS-223**	**L-3, T-1, P-0**	
Name of the Course	**Internet Technology**		
Lectures to be Delivered	**52 (1 Hr Each) (L=39, T=13 for each semester)**		
Semester End Examination	**Max Marks: 100**	**Min Pass Marks: 40**	**Maximum Time: 3 hrs**
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTIONS:

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weight age of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION A

An overview of Java: Object oriented programming, Two paradigms, abstraction, the, OOP principles, Java class libraries

Data types, variables and arrays: Integers, floating point types, characters, Boolean, Variable, Type casting, Array Declaration, Multidimensional array.

Operators: Arithmetic operators, bitwise operators, relational operators, Boolean logical assignment operators, '?' Operator, operator precedence

Control statements: Java's selection statements, iteration statements, jump statements

Introduction to classes: Class fundamentals, declaring object reference variable, object, classes and methods, constructors, the this key word, garbage collection, the finalize () method.

Methods and Classes: Overloading methods, using objects as parameters, recursion, constructor.

SECTION B

Inheritance: Inheritance basics and Types of inheritance, using super, method overriding, dynamic method dispatch, abstract Classes, Using final with inheritance.

Package and Interfaces: Package asses protection, importing packages, interfaces.

Exception handling: Exception handling fundamentals., Exception types, Uncaught Exceptions Using try and catch, multiple catch clauses, nested try statements throw, finally Java built in exception creating your own exception sub classes, using exceptions.

SECTION C

Multithreaded Programming:

The Java thread model, Thread priorities, thread Vs processes, Synchronization, Inter thread communications, suspending resuming and stopping thread using multithreading.

Event Handling and java input/output: Event Handling Models, Event Classes, Event Listener Interfaces-action listener, focus listener, Adapter Classes, console input, integer input, console outputs, streams.

AWT Classes and AWT control's: Window fundamentals, working with frames windows, panels, working with colour's, fonts, AWT Controls, Layout Manager & Menus, AWT controls-buttons, check box, choice, label, list, scroll bar, Text field, Text area, Layout manager-border layout, grid layout, flow layout.

SECTION D

Java Beans, Swing and Applets: Java Beans Architecture, Features of java beans, Swing components, java foundation classes, features, relationship to AWT, relationship to SWT, handling components with swings. Introduction, Brief summary of Applet life cycle, Handling event's.

JDBC: Java as a database front end, Database Client/Server methodology, Creating and executing JDBC statements, Two-and three-tier database design, JDBC drivers, The JDBC API.

TEXT BOOKS:

1. Core Java .An Integrated Approach, Dr. R Nageswara Rao, Dream Tech Publication .
2. Programming with Java, E. Balagurusamy, Tata McGraw Hill, New Delhi, 2002.
3. Programming in java by Malhotra Oxford university press

REFERENCE BOOKS:

1. Advance Java Technology, Prof. M.T. Savaliya, Dream Tech Publication .
2. Core java by Mathu , PHI publication.
3. The Complete Reference, Java 2, 3rd Edition, Patrick Naughton, Herbert Schildt, Tata McGraw Hill.

COMPUTER GRAPHICS (CS-224)

Course Code	CS-224	L-3, T-1, P-0	
Name of the Course	Computer Graphics		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTIONS

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weight age of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed

SECTION A

Introduction: Use and need for Graphics, Image and object , Image representation. Pixel graphic V/s Vector graphics
Input Devices: Text input device, Pointing device, Image and video input device.
Hard Copy Devices: Impact and non-impact printers, such as line printer, dot matrix, laser, ink-jet, electrostatics, flatbed and drum plotters.

Video Display Devices: Refresh cathode- ray tube, raster scan displays, random scan displays, color CRT-monitors, direct view storage tube, flat-panel display, 3D viewing devices, virtual reality, raster scan systems, random scan systems, graphics monitors and workstations.

SECTION B

Scan conversion algorithms: Point, Line, Line drawing algorithms: VECGAN algorithm , Bresenham's algorithm's, Cicle generating algorithm: parametric circle drawing algorithm, Bresenham's Circle drawing ,DDA, Different line style.
Solid area scans conversion: Polygon inside tests: Inside and outside test, even odd method, winding number method. Polygon area filling technique, scan conversion of character, Aliasing , antialiasing , half toning
2-D Transformation: Transformation matrix, Type of transformation in 2-D graphic, combined transformation, Homogenous coordinate, Inverse transformation, affine transformation.
.

SECTION C

3-D Transformation: Object in homogenous coordinates, three dimensional transformational, world coordinate and viewing coordinate, Projection.

Viewing and clipping: window and viewport, introducing to clipping (Point and line), Polygon clipping, text clipping.
Curve design: Curve continuity , Conic curves, Piecewise curve design, LeGrange interpolated curves, Spline curve representation,.

SECTION D

Visibility and Hidden surface : Coherence for visibility , Extents and bounding volumes, back face culling , Painter algorithm , Z-buffer algorithm , Newell's algorithm , Appel's alogrithm's, Floating Horizon algorithm, Robert algorithm, Warnock's algorithm.
Surface Shading Methods: Constant intensity method, Gauraud Shading, Phong Shading, Colur models, Illumination model
Computer Animation: Key frame animation, construction of an animated sequence, Motion control method, Procedural animation, Key frame animation vs procedural animation, Introduction to morphing, warping techniques, three dimensional morphing,

TEXT BOOKS:

1.Foley, van Dam et al: Computer Graphics: principles and Practice In C, 2nd Ed., Addison Wesley.
2.Rajesh K . Maurya "Computer Graphic ",Wiley India Publication.
3. Computer Graphic By Apurva A. desai by PHI Publication.
4. Hearn and Baker: Computer Graphics, 2nd Ed., Prentice Hall of India, 1999.

REFERENCE BOOKS:

1. Steven Harrington: Computer Graphics: A programming approach, Tata McGraw Hills.
2. Alavala, Chennakesava R "Computer graphic" by PHI publication .
3. D.F. Rogers: Procedural Elements of Computer Graphics, 2nd Ed., McGraw Hill International Editions.

NUMERICAL METHOD LAB (CS-220 (P))

Course Code	CS-220 (Lab)	L-0, T-0, P-2	
Name of the Course	Numerical Method Lab		
Lectures to be Delivered	26 Hrs. of Lab work (2hrs. each per week)		
Semester End Examination	Max Marks: 25	Min Pass Marks: 10	Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25%, Viva 25% & Attendance 20%		Max Marks: 25

Instructions for paper setter / Candidates

Laboratory examination will consist of two parts:

1. Performing a practical examination assigned by the examiner.
2. Viva-voce examination.

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

WRITE DOWN AND EXECUTE FOLLOWING PROGRAMS USING C/C++ LANGUAGE

1. To find the roots of non-linear equation using Bisection method.
2. To find the roots of non-linear equation using Newton's method.
3. Curve fitting by least-squares approximations.
4. To solve the system of linear equations using Gauss-Elimination method.
5. To solve the system of linear equations using Gauss-Seidal iteration method.
6. To solve the system of linear equations using Gauss-Jordan method.
7. To solve integral equation numerically using Trapezoidal rule.
8. To solve integral equation numerically using Simpson's rule.
9. Find the largest Eigen value of a matrix by power – method.
10. To find numerical solution of ordinary differential equations by Euler's method.
11. To find numerical solution of ordinary differential equations by Runga-Kutta method.
13. To find numerical solution of ordinary differential equations by Milne's method.
14. To solve a given problem using Newton's forward interpolation formula.
15. To solve a given problem using Lagrange's forward interpolation formula.

NOTE: Minimum 10 experiments are to be performed.

INTERNET TECHNOLOGY LAB (CS-223 (P))

Course Code	**CS-223 (P)**	L-0, T-0, P-2	
Name of the Course	**Internet Technology Lab**		
Lectures to be Delivered	26 Hrs. of Lab work (2hrs. each per week)		
Semester End Examination	Max Marks: 25	Min Pass Marks: 10	Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25%, Viva 25% & Attendance 20%	Max Marks: 25	

Instructions for paper setter / Candidates

Laboratory examination will consist of two parts:

Performing a practical examination assigned by the examiner.

Viva-voce examination.

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

LIST OF PRACTICAL'S:

1. Write a program to develop a swing application with different layouts.
2. Write a program to create a menu-based application using Swing which opens a File Dialog box and allows user to select a file from local hard drives. Display name of a file selected into textbox and create an executable jar file for this application.
3. Write a program to create the User Interface for the Text Editor Application and implement some functions. (using SWING classes)22
4. Write an application that finds out all the loaded JDBC compliant drivers and their details.
5. Write a database application that is JDBC driver and data source independent.
6. Write an application that finds out number of records, No. of columns and types of the columns within a table.
7 Write a program to develop an application that calls Stored Procedure from Oracle Server.
8. Write a database application that allows users to insert values in a table from command prompt and manages appropriate Exception handling when wrong values are entered. Don't load database driver from application.43
9. WAP that implements a simple client/server application. The client sends data to a server. The server receives the data, uses it to produce a result and then sends the result back to the client. The client displays the result on the console. For ex: The data sent from the client is the radius of a circle and the result produced by the server is the area of the circle.
10. Write a program to create a Time client-server application using connectionless and connection-oriented socket.
11. Write a Program to Implement an RMI application. Invoke the Remote method having signature int add(int,int) and display the result.
12. Write an RMI application where client supplies a string and server responds with no. of characters and digits within string. Provide your custom security policy for this application.
13. Write a Program to implement a Servlet which counts the number of active session, no of requests for each session and no of hits.
14. Write a Program to create a form processing Servlet which demonstrates use of cookies and session.
15. Write a Program to develop web application using Servlet having following pages in system.
16. Write a Program to create a JSP page with a form which takes information about a contact and stores in database. (Address book)

COMPUTER GRAPHICS LAB (CS-224(P))

Course Code	CS-224(P)	L-0, T-0, P-2	
Name of the Course	Computer Graphics Lab		
Lectures to be Delivered	26 Hrs. of Lab work (2hrs. each per week)		
Semester End Examination	Max Marks: 25	Min Pass Marks: 10	Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25%, Viva 25% & Attendance 20%	Max Marks: 25	

Instructions for paper setter / Candidates

Laboratory examination will consist of two parts:

1. Performing a practical examination assigned by the examiner.
2. Viva-voce examination.

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

LIST OF PROGRAMS:

1. Introduction to Computer Graphics.
2. Familiarize yourself with creating and storing digital images using scanner and digital camera (compute the size of image when stored in different formats) and convert the stored images from one format to another (BMP, GIF, JPEG, TIFF, PNG, etc.) and analyze them.
3. Implement bresenham's line algorithm. Also provide Provision to change attributes of graph primitives such as stippling (Dotted and Dashed pattern), colors.
4. Implement bresenham's circle algorithm. Also provide to change attributes of graph primitives such as stippling (Dotted and Dashed pattern) and colors.
5. Implement 2-D transformation with translation, scaling, rotation, reflection, Shearing and scaling
6. Implement tweening procedure for animation with key frames having equal or different no. of edges.
7. Write a program for 2D line drawing as Raster Graphics Display.
8. Write a program for 2D circle drawing as Raster Graphics Display.
9. Write a program for 2D polygon filling as Raster Graphics Display.
10. Write a program for line clipping.
11. Write a program for polygon clipping.
12. Implement Flood Fill Method to fill interior and exterior of a polygon.
13. Write a program for displaying 3D objects as 2D display using perspectives transformation.
14. Write a program for rotation of a 3D object about arbitrary axis.
15. Write a program to draw different shapes and fill them with various pattern.

5TH SEMESTER
PRINCIPLES OF MANAGEMENT AND CRITICAL THINKING (HS-301)

Course Code	**HS-301**	**L - 3, T- 0, P - 2**	
Name of Course	**Principles of Management and Critical Thinking**		
Lectures to be delivered	**65 (L-39, P-26 for each semester)**		
Semester End Examination	**MM: 100**	**Min. Marks; 40**	**Time Allowed: 3 Hrs.**
Continue Assessment (based on Sessional tests 50%) Tutorial/ Assignment: 30%, Quiz/ Seminar: 10 %, Attendance: 10 %.			**MM: 50.**

INSTRUCTIONS:

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weight age of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E.

Course Objectives:

- To understand the roles and functions of managers at various (entry, middle and the top) levels
- To explain the relationships between organizational mission, goals, and objectives
- To comprehend the significance and necessity of managing stakeholders
- To conceptualize how internal and external environment shape organizations and their responses
- To demonstrate empirical understanding of various organizational processes and behaviours and the theories associated with them
- To demonstrate critical thinking skills in identifying ethical, global, and diversity issues in planning, organizing, controlling and leading functions of management
- To understand organizational design and structural issues

Learning Outcomes: On completion of this course the students should be able to:

- Describe the functions of management.
- Outline the historical theories relating to modern management.
- Explain the role of management within a business setting.
- Describe human resource planning and staffing processes needed to achieve optimal performance
- Prepare a business forecast and budget.
- Illustrate how business ethics and social responsibility apply to organizations.
- Describe formal and informal organizational communication processes and how to influence employees

SECTION A

Historical Perspectives of Management: **(6 Hours)**

- The behavioural approach to management
- The management science approach
- The contingency approach
- The system approach

Principles of Planning **(5 Hours)**

- Defining planning, Purposes of planning,
- Advantages and potential disadvantages of planning,
- Management by objectives, Planning tools,
- Strategic planning, Forecasting and budgeting

SECTION B

The Management Task **(4 Hours)**

- The Role of management,
- Defining management,
- The management process, management functions,
- Management goal attainment,
- Management and organizational resources

Fundamentals of Organizing **(5 Hours)**

- The definition of organizing
- The organizing process
- The organizing subsystem
- Classical organizing theory

SECTION C

Leadership and Effective Communication **(3 Hours)**

- Defining leadership; leader vs. manager,
- Leadership behaviours, Transformational Leadership,
- Coaching, Entrepreneurial leadership

Controlling for Productivity (**4 Hours)**

- Defining production and productivity,
- Quality and productivity, Operations management,
- Operations control, Using control tools to control organizations

SECTION D

Managerial Ethics and Social Responsibility **(6 Hours)**

- Fundamentals of social responsibility,
- Areas of corporate social responsibility,
- Social responsiveness and decision making,
- Influencing individuals performing social responsibility activities,
- A definition of ethics, Creating an ethical workplace

Making Good Business Decision **(6 Hours)**

- Types of decisions, Elements of the decision situation,
- The decision making process, Decision making conditions,
- Decision making tools, Processes for making group decisions

TEXT BOOKS:

1. Charles W. L. Hill and Steven McShane (2006) Principles of Management. McGraw-Hill/Irwin; 1st Edition. ISBN-10: 0073530123, ISBN-13: 978-0073530123.
2. A practical guide to critical thinking: deciding what to do and believe, david a. hunter wiley India
3. Moore & Parker, Critical Thinking, 9th ed. (McGraw-Hill, 2008) ISBN-13: 9780073386676

REFERENCE BOOKS:

1. Gary Dessler (2003). Management: Principles and Practices for Tomorrow's Leaders, Prentice Hall; 3rd Edition. ISBN-10: 0131009923, ISBN-13: 978-0131009929
2. Ellen A. Benowitz (2001). Principles of Management. Cliffs Notes. ISBN-10: 076456384X, ISBN-13: 978-0764563843
3. Griffin, Ricky W., Management seventh edition, Houghton Mifflin Company
4. Fisher, Alec. The Logic of Real Arguments (Second Edition). Cambridge: Cambridge University Press, 2004.

PRACTICAL CLASS DISCUSSION TOPICS

Some Basics: Issues, Claims, Arguments- Types & Structures, Clarity- Vagueness, Ambiguity, Credibility, Rhetoric, & Fallacies, Formal Deductive Logic, Deductive Arguments: Truth-Functional Logic
(a) Symbolization; (b) Truth Tables; (c) Long Truth Table Test; (d) Short Truth Table Test;
(e) Deductions w/Inference Rules; (f) Deductions w/Equivalence Rules
Left brain /right brain exercise, Truth and Knowledge, Good and Bad Reasoning, Inductive and Deductive Reasoning, Fallacious Reasoning, Psychological Impediments to Cogent Reasoning Truth, Belief, and the Leader/Follower Relationship.

OPERATING SYSTEMS- CS-311

Course Code	**CS-311**	**L - 3, T- 1, P – 0**		
Name of Course	**Operating Systems**			
Lectures to be delivered	52 (1 Hr Each) (L=39, T=13 for each semester)			
Semester End Examination	**MM: 100**	**Min. Marks; 40**	**Time Allowed: 3 Hrs.**	
Continue Assessment (based on sessional tests 50%) Tutorial/ Assignment: 30%, Quiz/ Seminar: 10 %, Attendance: 10 %.				**MM: 50.**

INSTRUCTIONS:

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weightage of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E.

SECTION A

Introduction to System Software: Overview of all system software's: Compiler, Assembler, Linker, Loader, Operating system, I/O manager

Fundamentals of Operating System: OS services and Components, Multitasking, Multiprogramming, Multiprocessing, Time Sharing, Buffering, Spooling, Distributed OS

SECTION B

Process and Thread Management: Concept of process and threads, Process states, Process management, Context switching, Interaction between processes and OS Multithreading
Example OS : Linux

Concurrency Control: Concurrency and Race Conditions, Mutual exclusion requirements, Software and hardware solutions, Semaphores, Monitors, Classical IPC problems and solutions, Deadlock, Characterization, Detection, Recovery, Avoidance and Prevention

SECTION C

Memory Management: Memory partitioning, Swapping, Paging, Segmentation, Virtual, memory, Overlays, Demand paging, Performance of Demand paging, Virtual memory concepts, Page replacement algorithms, Allocation algorithms, Example OS : Linux

I/O Systems: Secondary-Storage Structure, Disk structure, Disk scheduling, Disk management, Swap-space management, Disk reliability, Stable storage implementation, Introduction to clock, Clock hardware, Clock software

SECTION D

File systems: File concept, File support, Access methods, Allocation methods, Directory Systems, File protection, Free space management, Example OS : Linux

Protection & Security: Protection, Goals of protection, Domain of protection, Access matrix, Implementation of access matrix, Revocation of access rights, Security, The security problem, Authentication, One-Time passwords, Threats, Example OS: Linux **Case Study:** Android OS

TEXT BOOKS:

1. Operating System Concepts by Silberschatz and Galvin, Wiley.
2. Operating Systems Achyut S. Godbole Tata McGraw Hill.
3. Operating system By Doeppnar, Wiley India .

REFERENCE BOOKS:

1. Operating Systems – Internals and Design Principles, by William Stallings, Prentice Hall.
2. Modern Operating Systems by Andrew S Tanenbaum, Prentice Hall India.
3. Operating Systems by Gary Nutt, Nabendu Chaki, Sarmishtha Neogy, Pearson
4. Operating Systems Design & Implementation Andrew S. Tanenbam, Albert S. Woodhull Pearson
5. Operating Systems D. M. Dhardhere Tata McGraw Hill

MODELING AND SIMULATION (CS-312)

Course Code	CS-312	L-3, T-1, P-0	
Name of the Course	Modeling And Simulation		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTIONS:

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weight age of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION A

Definition of systems: Concept of system, continuous and discrete system. Type of Models, , System
Simulation , Computer simulation , Real time simulation, Comparison of simulation and analytical
method, Steps in simulation study, advantage and limitation of simulation technique, Area of
application , Simulation in design, Simulation in computer Training, medical and education. Mathematical models, Computer Models, Cobweb Models, Monto carlo Simulation.

SECTION B

Simulation Process: Discrete and continuous simulation procedures. Random number generation and its testing discrete and continuous random variables, density and distributive functions, Measure of probability function , Uniform and Binomial distribution function, Poisson, Norma.

SECTION C

Simulation of Queuing System: Rudiments of queuing theory , components of waiting line system, stationary and time dependent queues, transient and steady state of the system, Measure of system performance, Kendall's notation, Queuing Arrival service model, Simulation of single –server queue, two server queue, two servers in parallel queuing system , Simulation of PERT network,

Simulation of inventory system: Introduction, Classification, cost, Infinite delivery rate with no backordering, Infinite delivery rate with backordering

SECTION D

Verification & Validation: Design of simulation experiments and validation of simulation experiments comparing model data units and real system data.

Simulation Language: Merits of Simulation language , simulation language and simulations, Discreate Event simulation tools , Classification of simulation tools, SIM SCRIPT, Introduction to GPSS , GPSS output information , GPSS block diagram , characteristics of Blocks, Block Type , Merits of GPSS,

TEXT BOOKS:

1. Deo, Narsing: System Simulation with Digital Computers PHI.
2. System simulation by D.S Hira ,2nd edition S.Chand publication
3. Gorden G: System Simulation, Prentice Hall

REFERENCE BOOKS:

1. Simulation and Modeling "New age International publication " by V.P singh.
2. Payer, T.A., Introduction to System Simulation, McGraw Hill.
3. Reitman, J., Modeling and performance measurement of Computer System. Spriet, WI A., Computer Aided Modeling and Simulation (Academic Press).

ANALYSIS & DESIGN OF ALGORITHMS (CS-313)

Course Code	**CS-313**	L-3, T-1, P-0	
Name of the Course	Analysis & Design Of Algorithms		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTION

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weight age of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E.

SECTION A

Introductory Concepts: The role of algorithm in computing, fundamentals of algorithmic problem solving, Methodologies for analyzing algorithms, A review of fundamental data structures.

Fundamentals of analysis of algorithms efficiency: Amortization, data analysis and visualization, Asymptotic notation and standard efficiency classes, mathematical analysis of recursive and non-recursive algorithms.

SECTION B

Divide and Conquer: quick sort, binary search,

Sorting in Linear Time, Search : Binary trees, Red black tree, breadth first search , depth first search, topological Sort. Text Processing.

Dynamic Programming: Assembly line scheduling, Element of dynamic programming, Optimal binary search tree, knapsack problem, The travelling sales person problem; Flow shop scheduling.

Backtracking: The 8 queens problem, graph coloring, Hamiltonian cycles.

SECTION C

All pair shortest path (Shortest path and matrix multiplication, Floyd – Warshall algorithm, Johnson,s algorithm for sparse graphs)

Greedy Method: prim's algorithm, kruskal's algorithm, , Minimum cost spanning trees.

Single source Shortest path: Bellman ford algorithm, Single source shortest path in directed acyclic graph , Difference constraints and shortest path , Proof of shortest path properties .

Lower Bound Theory: comparison trees, oracles and adversary arguments, techniques for algebraic problems, lower bounds on parallel computing.

Approximation Algorithms: Vertes cover problem, set covering problem , the subset sum problem.

SECTION D

Flow networks, Ford-fulkerson, maximum bipartite matching, Sorting Networks, Cryptographic, Computations, Multicast routing, BIN Packing,
Computational Complexity: Complexity measures, Polynomial Vs non-polynomial time complexity; NP-hard and NP-complete classes, Important NP complete Problem, Parallel algorithm , online algorithms , Cook's theorem,

TEXT BOOKS:

1. T. H. Cormen, Leiserson, Revest and Stein, "Introduction of Computer algorithm," PHI.
2. E. Horowitz, S. Sahni, and S. Rajsekran, " Fundamental of Computer Algorithms," Galgotia Publication
3. Sara Basse, A. V. Gelder, " Computer Algorithms," Addison Wesley.

REFERENCE BOOKS:

1 . Algorithm design by Michal T . Goodrich , Wiley India publication

COMPUTER NETWORKS (CS-314)

Course Code	**CS-314**	L-3, T-1, P-0	
Name of the Course	Computer Networks		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTION

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weight age of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E.

SECTION A

Introduction: Layered Network Architecture; ISO-OSI Model; TCP/IP, Example Networks.
Data Communication Techniques: Pulse Code Modulation (PCM); Differential Pulse Code Modulation (DPCM), Delta Modulation (DM), Data Modems, Multiplexing Techniques – Frequency – Division, Statistical time – Division Multiplexing, Multiplexing Hierarchies, Transmission Media – Wires, Cables, Radio Links, Satellite Links, Fibre-optic Links, Error Detection: Parity Check Codes, Cyclic Redundancy Codes.

SECTION B

Data Link Protocols: Stop and Wait protocols: Noise free and Noisy Channels, Performance and Efficiency; Sliding Window protocols: Go Back N and Selective Repeat ARQs, performance and Efficiency, HDLC.

MAC Sublayer: The Channel Allocation Problem, Carrier Sense multiple Access Protocols, Collision Free Protocols, IEEE 802.3, 802.4 and 802.5 Protocols; performance of Ethernet and Token ring Protocols; FDDI protocol; Distributed Queue Dual Bus (DQDB) protocol, Virtual LAN.

SECTION C

Network Layer protocols: Design Issues: Virtual Circuits and Datagrams; Routing Algorithms; Optimality principle, Shortest path routing – Dijkstra, Bellman-Ford and Floyd-Warshall Algorithms, Flooding and Broadcasting, Distance Vector Routing, Link State Routing, Flow Based Routing, Multicast Routing; Flow and Congestion Control: General Principles, Congestion control in datagram subnets: Choke Packets, Load Shedding, Jitter Control, RSVP.

Interworking: Bridges, Routers and Gateways; Internet Architecture and Addressing.

IP packet, addressing , subnet addressing , IP routing

SECTION D

Transport Layer Protocols: Design Issues: Quality of Services, Primitives; Introduction to Sockets, Connection Management: Addressing, Connection Establishment and Releases, Use of Timers, Flow Control and Buffering, Multiplexing, Crash Recovery; The internet Transport Protocols: User Datagram protocol UDP/TCP Layering, Segment Format, Checks Sum, Timeout Connection Management.

Session Layer protocol: Dialog Management; Synchronization; OSI Session primitives; Connection Establishment.

Introduction to network management: Remote Monitoring Techniques: polling, traps performance management, class of service, quality of service, security management, firewalls, proxy servers

TEXT BOOKS:

1. A. S. Tanenbaum, " Computer Networks", Second Ed., Prentice Hall, India.
2. J. F. Hayes, "Modelling and analysis of Computer Communication Networks", Plenum Press (Reprinted in India by Khana Publishers).
3. W. Stalling, "Data & Computer Communication", Maxwell Macmillan International Edition.

REFERENCE BOOKS:

1 . Computer Network by Natalia Olifer , Wiley India Publication.
2. Computer Network by Trivadi , Oxford university press..
3. D. Bertsekas and R. Gallager, " Data Networks", Second Ed., Prentice Hall, India.
4. G. E. Keiser, " Local Area Networks", McGraw Hill, International Edition

SEMESTER-V

MICROPROCESSOR THEORY & APPLICATIONS EC-311

Course Code	**EC-311**	L-3, T-1, P-0	
Name of the Course	MICROPROCESSOR THEORY & APPLICATIONS		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

Instructions

1. The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. Candidates are required to attempt five question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

SECTION – A

Introduction:

Evolution of microprocessor, General Architecture Basic 8085 microprocessor architecture and its functional blocks, 8085 microprocessor IC pin outs and signals, address, data and control buses, 8085features Addressing Modes:- Direct addressing, indirect addressing, indexed, register direct, register indirect, implicit addressing mode, Timing diagrams. Typical instruction set of 8085, data manipulation, data transfer, status management instructions.

SECTION – B

Programming: Development of Assembly language program. Interrupts & data transfer: Interrupt system of 8085 Stack and subroutine Types of memory and memory interfacing Decoding techniques – absolute and partial

Mapping techniques – I / O mapped I /O and memory mapped I / O ,Serial I/O lines of 8085 and the implementation asynchronous serial data communication using SOD and SID..

SECTION – C

Peripheral devices & applications of microprocessor: Description of 8251, 8255, 8253, 8257, 8259, 8279. Cycle stealing and burst mode of DMA controller. Synchronous and asynchronous data transfer using 8251

SECTION – D

8086 and 8088 Microprocessors:

Architecture and organization of 8086/8088 microprocessors family, bus interface unit, 8086/8088 hardware pin signals, timing diagram of 8086 family microprocessors, simplified read/ write bus cycles, 8086 minimum and maximum modes of operation, 8086/8088 memory addressing, address decoding, memory system design of 8086 family, timing considerations for memory interfacing, input/output port addressing and decoding, introduction to 8087 floating point coprocessor and its connection to host 8086. Introduction to Modern Microprocessor.

Text Books -

1. Microprocessor & Architecture, programming and application by Gaonkar.
2. Microprocessors and Digital Systems, D.V.HALL, McGraw Hill
3. Microprocessor and Microcontrollers, Senthil, Saravanam (Oxford University Press)

Reference Books:

1 An introduction to microprocessor – A.P. Mathur.
2 The 8086 Microprocessor –Kenneth J Ayala
3. Fundamentals of microprocessor & microcomputers – B.Ram

OPERATING SYSTEM LAB (CS-311(P))

Course Code	CS-311(P)	L-0, T-0, P-2	
Name of the Course	Operating System Lab		
Lectures to be Delivered	26 Hrs. of Lab work (2hrs. each per week)		
Semester End Examination	Max Marks: 25	Min Pass Marks: 10	Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25%, Viva 25% & Attendance 20%		Max Marks: 25

Instructions for paper setter / Candidates

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester

LIST OF PRACTICAL:

1. Installation Linux operating system.
2. To study basic Linux Commands.
3. Study Shell scripting in Linux.
4. To study arithmetic and relational operators.
5. To study various filters in Linux.
6. Administration of LINUX Operating System.
7. Introduction to variables in shell scripting.
8. Introduction of various constructs in shell scripting.
9. Write the program to mount the various devices (i.e. floppy, CD-Rom etc).
10. To study Process synchronization.
11. Implement various programs for virus and vaccine.
12. Case study of various operating systems.
13. Case study of Android and different servers .

COMPUTER NETWORK LAB (CS-314(P))

Course Code	CS-314(Lab)	L-0, T-0, P-2	
Name of the Course	Computer Network Lab		
Lectures to be Delivered	26 Hrs. of Lab work (2hrs. each per week)		
Semester End Examination	Max Marks: 25	Min Pass Marks: 10	Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25%, Viva 25% & Attendance 20%		Max Marks: 25

Instructions for paper setter / Candidates

Laboratory examination will consist of two parts:

1. Performing a practical examination assigned by the examiner.
2. Viva-voce examination.

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

LIST OF PRACTICALS:

1. Write a program to encrypt and decrypt data of ASCII character.
2. Study various Type of topology
3. Construct a network of 2 or 3 system.
4. Write a program to Obtain The Information About The (A) Host (B) Network (C) Protocols (D) Domains
5. Write a program to Manipulate The IP Address.
6. To study and install NS-2.
7. Study different type of connector and its circuit diagram
8. Asure cables, connections, crimping tools.
9. Study different type of classes and Bridges, Routers, Hubs, gateway etc.
10. Configuration a switch , router
11. Experimentation with protocol like RIP, IGRP
12. Experimentation with protocol like EIGRP, OSPF

Note: - Record to be maintained in the laboratory record book for evaluation.

MICROPROCESSOR LAB (EC – 311(P))

Course Code	**EC – 311(P)**	L-0, T-0, P-3	
Name of the Course	**MICROPROCESSOR LAB**		
Lectures to be Delivered	26 hours of Lab sessions (2 hrs. per week)		
Semester End Examination	Max Marks:25	Min Pass Marks: 10	Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25% Viva/ Hands on 25% Attendance 20%		Max Marks:25

Instructions for Paper setter/ Candidates

Laboratory examination will consist of two parts:
1. Performing a practical examination assigned by the examiner
2. Viva-voce examination

Viva-voce examination will be related to the practicals performed/projects executed by the candidate related to the paper during the course of the semester.

LIST OF EXPERIMENTS

8085 Based

1 Addition and subtraction of two 8-bit numbers with programs based on different addressing modes of 8085A.
2 Addition and subtraction of two 16-bit numbers. (Using 2's complement method, also programs which access numbers from specified memory locations.)
3 Addition and subtraction of two 16-bit BCD numbers. (using DAA instruction.)
4 Multiplication of two 8-bit numbers using the method of successive addition and Shift & add.
5 Division of two 8-bit numbers using the method of successive subtraction and shift & subtract.
6 Block transfer and block exchange of data bytes.
7 Finding the smallest and largest element in a block of data.
8 Arranging the elements of a block of data in ascending and descending order.
9 Converting 2 digit numbers to their equivalents.
a) BCD to HEX and b) HEX to BCD
10 Generating delays of different time intervals using delay subroutines and measurement of delay period on CRO using SOD pin of 8085A.
11 Generation of Fibonacci Series.

Application Based (Max 2)

1 Program controlled data transfer using 8255 PPI.
A) To INPUT data bytes from peripheral port and to store them in memory.
B) To OUTPUT data bytes from memory to peripheral port.
2 Study of interrupts by enabling them in main line program and then executing different subroutines when TRAP, RST 7.5, RST 6.5 & RST 5.5 are activated.
3 Interfacing 7 segment LED display using 8255A – in static and dynamic mode.
4 Interfacing ADC 0808/0809.
5 Interfacing DAC 0808.
6 Interfacing stepper motor with microprocessor using 8255A – in Half and Full excitation.
7 Interfacing of 8253 / 8254.

Semester –VI

Open Elective

ENERGY ASSESSMENT AND AUDITING - EE-300

Course Code	**EE-300**	**L - 3, T- 0, P – 0**		
Name of Course	**Energy Assessment and Auditing**			
Lectures to be delivered	**39 (L-39 for each semester)**			
Semester End Examination	**MM: 100**	**Min. Marks; 40**	**Time Allowed: 3 Hrs.**	
Continue Assessment (based on sessional tests 50%) Tutorial/ Assignment: 30%, Quiz/ Seminar: 10 %, Attendance: 10 %.				**MM: 50.**

INSTRUCTIONS:

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weightage of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E.

SECTION A

Energy Scenario: Commercial and Non-commercial energy, primary energy resources, commercial energy production, final energy consumption, energy needs of growing economy, long term energy scenario, energy pricing, energy sector reforms, energy and environment, energy security, energy conservation and its importance, re-structuring of the energy supply sector, energy strategy for the future, air pollution, climate change. Energy Conservation Act-2001 and its features.

Basics of Energy and its various forms: Electricity basics- DC & AC currents, electricity tariff, load management and maximum demand control, power factor improvement, selection & location of capacitors, Thermal Basics-fuels, thermal energy contents of fuel, temperature & pressure, heat capacity, sensible and latent heat, evaporation, condensation, steam, moist air and humidity & heat transfer, units and conversion.

SECTION B

Energy Management & Audit: Definition, energy audit, need, types of energy audit. Energy management (audit) approach-understanding energy costs, bench marking, energy performance, matching energy use to requirement, maximizing system efficiencies, optimizing the input energy requirements, fuel & energy substitution, energy audit instruments.

Material and Energy balance: Facility as an energy system, methods for preparing process flow, material and energy balance diagrams.

SECTION C

Energy Action Planning: Key elements, force field analysis, Energy policy purpose, perspective, contents, formulation, ratification, Organizing - location of energy management, top management support, managerial function, roles and responsibilities of energy manager, accountability. Motivating-motivation of employees: Information system-designing barriers, strategies; Marketing and communicating-training and planning.

Financial Management: Investment-need, appraisal and criteria, financial analysis techniques-simple pay back period, return on investment, net present value, internal rate of return, cash

flows, risk and sensitivity analysis; financing options, energy performance contracts and role of ESCOs.

SECTION D

Project Management: Definition and scope of project, technical design, financing, contracting, implementation and performance monitoring. Implementation plan for top management, Planning Budget, Procurement Procedures, Construction, Measurement & Verification.

Energy Monitoring, Targeting and Global environmental concerns: Defining monitoring & targeting, elements of monitoring & targeting, data and information-analysis, techniques -energy consumption, production, cumulative sum of differences (CUSUM). United Nations Framework Convention on Climate Change (UNFCC), sustainable development, Kyoto Protocol, Conference of Parties (COP), Clean Development Mechanism (CDM), Prototype Carbon fund (PCF).

TEXT BOOKS:

1. L.C. Witte, P.S. Schmidt, D.R. Brown, "Industrial Energy Management and Utilisation" Hemisphere Publ, Washington, 1988.
2. O. Callaghn, P.W. "Design and Management for Energy Conservation", Pergamon Press, Oxford.

REFERENCE BOOKS:

1. I.G.C. Dryden, "The Efficient Use of Energy" Butterworths, London.
2. W.C. turner, "Energy Management Hand book" Wiley, New York.
3. W.R. Murphy and G. Mc KAY "Energy Management" Butterworths, London.
4. Handbook of Energy Audits by Albert Thuman – Fairman Press Inc.
5. Energy basis for man and nature by Howard T.Odum & Elisbeth. C. Odum.

TOTAL QUALITY MANAGEMENT - ME-300

Course Code	**ME-300**	**L - 3, T- 0, P – 0**		
Name of Course	**Total Quality Management**			
Lectures to be delivered	**39 (L-39 for each semester)**			
Semester End Examination	**MM: 100**	**Min. Marks; 40**	**Time Allowed: 3 Hrs.**	
Continue Assessment (based on sessional tests 50%) Tutorial/ Assignment: 30%, Quiz/ Seminar: 10 %, Attendance: 10 %.				**MM: 50.**

INSTRUCTIONS:

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weightage of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E.

SECTION A

Introduction - Need for quality - Evolution of quality - Definition of quality - Dimensions of manufacturing and service quality - Basic concepts of TQM - Definition of TQM – TQM Framework - Contributions of Deming, Juran and Crosby – Barriers to TQM.

Quality Control and Improvement Tools: Check Sheet, Histogram, Pareto Chart, Cause and Effect diagram, Scatter diagram, Control chart, Graph, Affinity diagram, Tree diagram, Matrix diagram, Process decision program chart, Arrow diagram, Acceptance Sampling, Process capability studies, Zero defect program (POKA-YOKE).

SECTION B

TQM PRINCIPLES: Leadership – Strategic quality planning, Quality statements - Customer focus – Customer orientation, Customer satisfaction, Customer complaints, Customer retention - Employee involvement – Motivation, Empowerment, Team and Teamwork, Recognition and Reward, Performance appraisal – Continuous process improvement – PDSA cycle, 5s, Kaizen - Supplier partnership – Partnering, Supplier selection, Supplier Rating.

SECTION C

TQM TOOLS & TECHNIQUES: The seven traditional tools of quality – New management tools – Six-sigma: Concepts, methodology, applications to manufacturing, service sector including IT – Bench marking – Reason to bench mark, Bench marking process – FMEA – Stages, Types. Quality circles – Quality Function Deployment (QFD) – Taguchi quality loss function – TPM – Concepts, improvement needs – Cost of Quality – Performance measures.

SECTION D

Quality Management System & Quality Audit: Quality Systems, Quality management principles, ISO-9000:2000, ISO 9001 : 2000, ISO 14000, Future of quality system audit, Audit objectives, types of quality audit, Quality Auditor, Audit performance. Case studies of TQM implementation in manufacturing and service sectors including IT.

TEXT BOOKS:

1. Dale H. Besterfiled, et at., "Total Quality Management", Pearson Education Asia, 3rd Edition, Indian Reprint.
2. Ross, J.E.: Total Quality Management, Vanity Books International.

REFERENCE BOOKS:

1. James R. Evans and William M. Lindsay, "The Management and Control of Quality", South-Western (Thomson Learning).
2. Oakland, J.S., "TQM – Text with Cases", Butterworth – Heinemann Ltd., Oxford.
3. Suganthi,L and Anand Samuel, "Total Quality Management", Prentice Hall (India)Pvt. Ltd.
4. Janakiraman, B and Gopal, R.K, "Total Quality Management – Text and Cases", Prentice Hall (India) Pvt. Ltd.
5. Goetsch, D.L. & Davis,S. : Introduction to Total Quality, Prentice Hall.
6. Juran, J.M. & Gryna, F.M. : Quality Planning and Analysis, Tata McGraw Hill Publishing Co. Ltd., New Delhi
7. Charantimath, P.M. : Total Quality Management, Pearson Education.

OPTIMIZATION METHODS FOR ENGINEERING SYSTEMS - NS-300

Course Code	**NS-300**	**L - 3, T- 0, P – 0**		
Name of Course	**Optimization Methods For Engineering Systems**			
Lectures to be delivered	**39 (L-39 for each semester)**			
Semester End Examination	**MM: 100**	**Min. Marks; 40**	**Time Allowed: 3 Hrs.**	
Continue Assessment (based on sessional tests 50%) Tutorial/ Assignment: 30%, Quiz/ Seminar: 10 %, Attendance: 10 %.				**MM: 50.**

INSTRUCTIONS:

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weightage of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E.

SECTION A

Introduction: Engineering Application; Statement of the Optimal Problem; Classification; Optimization Techniques;
Classical Method: Single Variable Optimization; Multivariable Optimization Without any Constraints with Equality and Inequality Constraints.

SECTION B

One-Dimensional Minimization Method: Unimodal Function; Elimination Method – Dichotomous Search, Fibonocci and Golden Method; Interpolation Method – Quadratic and Cubic Interpolation Method.
Unconstrained Minimization Method: Univariate, Conjugate Directions, Gradient And Variable Metric Method.

SECTION C

Constrained Minimization Method: Characteristics of a constrained problem; Direct Method of feasible directions; Indirect Method of interior and exterior penalty functions.
Geometric Programming: Formulation and Solutions of Unconstrained and Constrained geometric programming problem.

SECTION D

Dynamic Programming: Concept of Sub-optimization and the principal of optimality: Calculus, Tabular and Computational Method in Dynamic Programming: An Introduction to Continuous Dynamic Programming.
Integer Programming: Gomory's Cutting Plane Method for Integer Linear Programming; Formulation & Solution of Integer Polynomial and Non- Linear problems.

TEXT BOOKS:

1. Optimization (Theory & Application)- S.S. Rao, Wiley Eastern Ltd, New Delhi.

2. Optimization Concepts and Applications in Engineering – Ashok D.Belegundu and Tirupathi R Chandrupatla – Pearson Education 1999, First India Reprint 2002.

REFERENCE BOOKS:

1. Optimization: Theory and Practice, C.S.G. Beveridge and R.S. Schechter, McGraw Hill, New York.
2. Kalyanamoy Deb, "Optimization for Engineering design algorithms and Examples", Prentice Hall of India Pvt. Ltd. 2006.
3. Rao, Singaresu, S., "Engineering Optimization – Theory & Practice", New Age International (P) Limited, New Delhi, 2000.
4. Johnson Ray, C., "Optimum design of mechanical elements", Wiley, John & Sons, 1990.
5. Goldberg, D.E., "Genetic algorithms in search, optimization and machine", Barnen, Addison-Wesley, New York, 1989.

REMOTE SENSING AND GIS- CE-300

Course Code	**CE-300**	**L - 3, T- 0, P – 0**	
Name of Course	**Remote Sensing and GIS**		
Lectures to be delivered	**39 (L-39 for each semester)**		
Semester End Examination	**MM: 100**	**Min. Marks; 40**	**Time Allowed: 3 Hrs.**
Continue Assessment (based on sessional tests 50%) Tutorial/ Assignment: 30%, Quiz/ Seminar: 10 %, Attendance: 10 %.			**MM: 50.**

INSTRUCTIONS:

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weightage of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E.

SECTION A

EMR AND ITS INTERACTION WITH ATMOSPHERE & EARTH MATERIAL: Definition of remote sensing and its components – Electromagnetic spectrum – wavelength regions important to remote sensing – Wave theory, Particle theory, Stefan-Boltzman and Wein's Displacement Law – Atmospheric scattering, absorption – Atmospheric windows – spectral signature concepts – typical spectral reflective characteristics of water, vegetation and soil.

PLATFORMS AND SENSORS: Types of platforms – orbit types, Sun-synchronous and Geosynchronous – Passive and Active sensors – resolution concept – Pay load description of important Earth Resources and Meteorological satellites – Airborne and spaceborne TIR and microwave sensors.

SECTION B

IMAGE INTERPRETATION AND ANALYSIS: Types of Data Products – types of image interpretation – basic elements of image interpretation - visual interpretation keys – Digital Image Processing – Pre-processing – image enhancement techniques – multispectral image Classification – Supervised and unsupervised.

SECTION C

GEOGRAPHIC INFORMATION SYSTEM: Introduction – Maps – Definitions – Map Projections – types of map projections – map analysis – GIS definition – basic components of GIS – standard GIS softwares – Data type – Spatial and non-spatial (attribute) data – measurement scales – Data Base Management Systems (DBMS).

SECTION D

DATA ENTRY, STORAGE AND ANALYSIS: Data models – vector and raster data – data compression – data input by digitization and scanning – attribute data analysis – integrated data Analysis – Modeling in GIS Highway alignment studies – Land Information System.

TEXT BOOKS:

1. Lillesand, T.M., Kiefer, R.W. and J.W. Chipman. (2004). Remote Sensing and Image Interpretation. V Edn. John Willey and Sons (Asia) Pvt. Ltd., New Delhi.
2. Anji Reddy, M. (2001). Textbook of Remote Sensing and Geographical Information System. Second edn. BS Publications, Hyderabad.

REFERENCE BOOKS:

1. Lo. C.P. and A.K.W. Yeung (2002). Concepts and Techniques of Geographic Information Systems. Prentice-Hall of India Pvt. Ltd., New Delhi.
2. Peter A. Burrough, Rachael A. McDonnell (2000), Principles of GIS. Oxford University Press.
3. Ian Heywood (2000), An Introduction to GIS, Pearson Education Asia.

OPERATING SYSTEMS- CS-300

Course Code	**CS-300**	**L - 3, T- 0, P – 0**	
Name of Course	**Operating Systems**		
Lectures to be delivered	**39 (L-39 for each semester)**		
Semester End Examination	**MM: 100**	**Min. Marks; 40**	**Time Allowed: 3 Hrs.**
Continue Assessment (based on sessional tests 50%) Tutorial/ Assignment: 30%, Quiz/ Seminar: 10 %, Attendance: 10 %.			**MM: 50.**

INSTRUCTIONS:

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weightage of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E.

SECTION A

Introduction to System Software: Overview of all system software's: Compiler, Assembler, Linker, Loader, Operating system, I/O manager

Fundamentals of Operating System: OS services and Components, Multitasking, Multiprogramming, Multiprocessing, Time Sharing, Buffering, Spooling, Distributed OS

SECTION B

Process and Thread Management: Concept of process and threads, Process states, Process management, Context switching, Interaction between processes and OS Multithreading
Example OS : Linux

Concurrency Control: Concurrency and Race Conditions, Mutual exclusion requirements, Software and hardware solutions, Semaphores, Monitors, Classical IPC problems and solutions, Deadlock, Characterization, Detection, Recovery, Avoidance and Prevention

SECTION C

Memory Management: Memory partitioning, Swapping, Paging, Segmentation, Virtual, memory, Overlays, Demand paging, Performance of Demand paging, Virtual memory concepts, Page replacement algorithms, Allocation algorithms, Example OS : Linux

I/O Systems: Secondary-Storage Structure, Disk structure, Disk scheduling, Disk management, Swap-space management, Disk reliability, Stable storage implementation, Introduction to clock, Clock hardware, Clock software

SECTION D

File systems: File concept, File support, Access methods, Allocation methods, Directory Systems, File protection, Free space management, Example OS : Linux

Protection & Security: Protection, Goals of protection, Domain of protection, Access matrix, Implementation of access matrix, Revocation of access rights, Security, The security problem, Authentication, One-Time passwords, Threats, Example OS: Linux **Case Study:** Android OS

TEXT BOOKS:

1. Operating System Concepts by Silberschatz and Galvin, Wiley.
2. Operating Systems Achyut S. Godbole Tata McGraw Hill

REFERENCE BOOKS:

1. Operating Systems – Internals and Design Principles, by William Stallings, Prentice Hall.
2. Modern Operating Systems by Andrew S Tanenbaum, Prentice Hall India.
3. Operating Systems by Gary Nutt, Nabendu Chaki, Sarmishtha Neogy, Pearson
4. Operating Systems Design & Implementation Andrew S. Tanenbam, Albert S. Woodhull Pearson
5. Operating Systems D. M. Dhardhere Tata McGraw Hill

DATABASE MANAGEMENT SYSTEM (CS-321)

Course Code	**CS-321**	L-3, T-1, P-0	
Name of the Course	Database Management System		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTION

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weight age of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E.

SECTION A

Overview of DBMS: Basic Terminology of Database: Data and information, Problems in Manual Database, Components of DBMS: users, language, structure, data-dictionary, data manager, DBA, Characteristics of a database. File processing versus Data Management, File Oriented approach versus Database Oriented approach. SPARC 3-level architecture: A brief overview of three traditional models (hierarchical mode, network model and relational model). Types of Database Systems, Database Languages: DDL, DML, DCL.

SECTION B

Relational Database Model: Components, Properties of relational model {Codd's 12 rules (integrity rules (concept of keys))}, Relational algebra (select, project, Rename, cross product, joins (theta-join, equi-join, natural-join, outer join)), Relational Calculus, Entity-Relationship model: Basic Constructs, ER Notation, Designing ER Diagram, Design Issues, Converting ER-Model into relational schema. Functional Dependencies, Fully Functional Dependency, Other Dependencies: Candidate FD, Primary FD, Multi-valued Dependencies, Join Dependency, Normalization (up to 5th level)

SECTION C

File Organization: Sequential file, index sequential files, direct files, Hashing, B-trees, index files, Operations on Files.

Structured Query language: DDL and DML commands, Nested Queries, Integrity constraints, Views, Triggers, Joins operations, Grouping data.

Backup and Recovery: Types of Database Failures, Types of Database Recovery, Recovery Techniques: Deferred Update, Immediate Update, Shadow Paging, Checkpoints, Buffer Management.

SECTION D

Query processing (Introduction, steps in Query processing, General Processing Strategies, Query Optimization), Introduction to Object-Oriented Database, C/S Database, Knowledge Based Database and Distributed Database Management System.

Transaction Processing Concepts: Introduction, Properties of Transactions, Recoverability, Serializability, Concurrency control Techniques: Two phase locking, Timestamp Ordering.

TEXT BOOKS:

1. C.J. Date, " An Introduction To Data Base System", 7th ed. Pearson Publication , 2000.
2. Abraham Silberschatz, Henry F. Korth, S. Sudershan, Database System Concepts, 3rd edition, The McGraw Hill Companies, Inc., 1997
3. E. Ramez, Navathe B. Shamakant, Fundamentals of Database Systems, Fifth Edition, Pearson Education.

REFERENCE BOOKS:

1. Introduction to Database Management by Gillenson , Wiley India
2. Naveen Prakash ,"Introduction to Database management ", Tata McGraw Hill Publishing Company Ltd., New Delhi.
3. Advance Database Management System; Rini Chakrabarti , Shilbhdra Dasgupta ; Dream Tech Press.
4. A simplified approach to DBMS ; Prateek Bhatia; Kalyani Publication

COMPILER DESIGN (CS-322)

Course Code	CS-322	L-3, T-1, P-0	
Name of the Course	Compiler Design		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTIONS:

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weight age of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

Introduction: Introduction to compliers, a simple traditional modular compiler, Compiler architecture, properties of good compiler, translators; Types of Compilers, bookkeeping, error handling, regular expressions, finite automata, Clouser algorithm, Phases of a Compiler: Lexical & Syntax analysis, Intermediate code generation, code optimization, Code Generation, Frontend and backend of compiler, compiler writing tools

SECTION – B

Parsing: Context free grammar, Derivation & Parse Trees, Bottom-up parsers: shift reduce, operator precedence, top-down parsers: Prediction and Backtracking, Recursive Decent and Predictive Parser, efficient parsers; LR parsers: LR(0), SLR, LALR, implementation of parsers

Syntax Directed Translation: Syntax Directed Program Evaluation, Different schemes & implementation, immediate code generation, syntax-trees, three address code generation, quadruples triple, translation of assignment statements, Boolean expressions, postfix notation any parser.

SECTION – C

Code Optimization: Sources of optimization, Optimizing Transformations: Compile time evaluation, Common sub expression elimination, code movement, dead code elimination, loop optimization, strength reduction, DAG representation of basic blocks, Value number & algebraic laws, Global data-flow analysis, Dominators, Reducible flow graphs, loop invariant computations, Induction variables eliminations, Backward flow problems.

SECTION – D

Code Generation: Major tasks, Issues in designing code generators, Object programs, Basic Blocks and flow Graphs, A simple code generator, Register allocation & assignment code generation from DAG's., Peephole optimization, Dynamic Programming Code-generation algorithm, Code-generator generators.

Error Detection & Recovery: Types of Errors, Lexical-phase errors, syntactic-phase errors, semantic errors.

TEXT BOOKS:

1. Principles of Compiler Alfred V. Aho, J.D. Ullman Narosa Publishing Design.
2. Compiler Design by Rajesh K. Maurya, Dreamtech Press, 2011.
3. Compiler Principles A.V. AHO, Ravi Sethi Addison Wesley Techniques Tools J.D. Ulliman

REFERENCE BOOKS:

1. Modern Compiler Design By Dick Grune & Henri E.Bal , Wiley India Publication.
2. Compiler Construction D.M. Dhamdhere Macmillan India Ltd.

SOFTWARE ENGINEERING (CS-323)

Course Code	**CS-323**	L-3, T-1, P-0	
Name of the Course	Software Engineering		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTIONS:

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weight age of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION A

Software Evolution: Expanding role for computers, Software Engineering discipline, Computer based system , Generic vs customer made software product , Distinctive characteristics of software product, The software problem **,** Emerging of software engineering.
Need for software engineering, Evolving role of software, software crisis, S/W engineering-a Layered Technology, Process and project, Component software processes, Software Development process models (SDLC), Comparison of different life cycle mode

Software Requirement Analysis and Specification- Value of Good SRS, Requiring process, Requirements specification, Formal system specification, Crucial process step, Classification of requirements, Requirement engineering task, Data dictionaries, E-R diagram , Data models, Functional Models, Object oriented models, Structured requirements definition, structured analysis & design technique, Software prototyping, Software requirements specification, Nature of the SRS, characteristics of a good SRS. Organization of the SRS.

SECTION B

Software Architecture: Role of software architecture, Architecture view, component and connector view, Architecture style for C&C view, Documenting architecture design.
System Models: Domain analysis and modeling, data models, functional models, object oriented models.
Software Project Management: Software project, Project feasible study, project planning , project organization, Estimate of project effort(COCOMO), staffing level estimation, Staffing , Risk management, Project scheduling , Project monitoring and control.
S/W Design: Design Concepts, Function oriented and OO Design, Detailed Design, Verification.

SECTION C

Software Quality Management :Quality Dimension , Process quality and product quality, quality assurance planning , Quality measurement, Software Configuration Management , software Process Improvement, ISO 9000 Quality standards, ISO approach to quality assurance systems, SEI capability maturity model, PSP.

Coding and unit Testing: Incrementally developing code , managing evolving code, unit testing, Non execution based testing, code inspection, testing process, Black box testing, white box testing, Metric, debugging, program analysis tool, integration testing, system testing, Testing distributed implementation, testing of real time system, accepting testing some general issue associated with testing, , recovery testing, security testing, stress testing, performance testing

SECTION D

Software maintenance: Planning for maintenance, Maintenance activities , reengineering, Characteristics, potential solution to maintenance problems ,s/w maintenance process models.

Software Reuse: s/w reverse engineering, S/w reuse concepts, Basic issues in reuse program. A reuse approach, Reuse at organization level.

Emerging Trends: Client server software , SOA, Software as services.

Computer aided Software engineering: case and its scope, case environment, case support in software life cycle, architecture of case environment.

TEXT BOOKS:

1.Software Engineering: Pankaj Jalote A Precise Approach, Wiley India Publications.
2.Essentials Of Software Engineering: S.Thangasamy , Wiley India Publications.

REFERENCE BOOKS :

1.Fundamental of Software Engineering By Rajib Mall PHI Publication
2. Software Engineering-K.K. Aggarwal &Yogesh by New Age International Publishers

ARTIFICIAL INTELLIGENCE (CS-324)

Course Code	CS-324	L-3, T-1, P-0	
Name of the Course	Artificial Intelligence		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTIONS:

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weight age of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION A

Introduction: Definition of AI, Growth of AI, Application of AI, History of AI, Intelligent system.

Heuristic Search Techniques: Search as a problem solving technique, Blind search technique, Generate Test, Hill climbing, Best first search, A * algorithm: Admissibility, AND/OR graph AO *, constraint satisfaction, Means-end Analysis, Game playing, Minimax search, Alpha-Beta pruning.

Knowledge Representation: Definition and importance of knowledge, Propositional calculus, Predicate logic, well-formed formulas, quantifiers, Rule based system, Procedural vs Declarative Knowledge, Forward reasoning: Conflict resolution, backward reasoning, structured knowledge representation.

SECTION B

A.I. programming language

PROLOG: Syntax, procedural and declarative meaning, Prolog unification mechanism, Converting English to PROLOG facts and rules, Goals, Anonymous variable, Lists, Use of fail, CUT, not.

LISP: Basic concepts, Function and variable, List manipulation functions, Program control in LISP,LISP as a problem solving tool , Programming method in LISP, iteration and recursion, Comparison of LISP and PROLOG.

Introduction to Neural Network: Hopfield network, single and multilayer networks, perceptions, back-propagations learning, Boltzman machine.

SECTION C

Introduction to Genetic algorithm: The Genetic algorithm, Genetic operators, working of Genetic algorithm, problem with Genetic algorithm.

Expert System: introduction, skill v/s knowledge, characteristics of expert system, knowledge engineering, inferencing , forward chaining and backward chaining expert system tools, Applications and future scope.

SECTION D

SWARM: Introduction, importance ANT colony, Paradigm, ANT colony system, development, application, working of ANT colony system, PSO algorithm, algorithm parameters

Natural language processing: Introduction, language parsing, Syntactic and semantic analysis, top down and bottom up parsing, chart parsing, knowledge representation languages, ELIZA, speech recognition

TEXT BOOKS:

1. AI – E. Rich & K Knight Tata McGraw Hill (2nd edition).
2.Artificial intelligence and intelligent system by N.P.Padhy, Oxford publication.

REFERENCE BOOKS :

1. Artificial Intelligence Application Programming By M. Tim Jones , Dreamtech publication.
2. Artificial intelligence by Rajendra Akerkar, PHI publication.
3. AI an engineering Approan –R.J Schalkoff, McGraw Hill international Edition
4. Principles of AI Nilsson Narosa publishing Narosa publishing house.
5. Programming in PROLOG – Clocksm 7 Mellish, Narosa Publishing House
6. Artificial Intelligence – P.H. Wisnston, 2nd edition, Addison Wesley .
7. Introduction to Expert system – D.W. Paterson, Prentice Hall of India .
8. Introduction to expert system –Peter Jackson, Addison Wesley publishing company

INFORMATION STORAGE & MANAGEMENT (CS-325)

Course Code	CS-325	L-3, T-1, P-0	
Name of the Course	Information Storage Management.		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTIONS:

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weight age of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION A

Storage System

- Introduction to information storage, virtualization and cloud computing
- Compute, Application and storage virtualization.
- Disk drive & flash drive components and performance.
- RAID
- Intelligent storage system and storage provisioning (including virtual provisioning).

SECTION B

Storage Networking Technologies and Virtualization

- Fibre Channel SAN components, FC protocol and operations.
- Block level storage virtualization.
- iSCSI and FCIP as IP-SAN solutions.
- Converged networking option-FcoE.
- Network Attached Storage (NAS)-components, protocol and operations.
- File level storage virtualization.
- Object based storage and unified storage platform.

SECTION C

Backup, Archive, and Replication

- Business continuity terminologies, planning and solutions.
- Clustering and multipathing architecture to avoid single points of failure
- Backup and recovery – methods, targets and topologies.
- Data deduplication and backup in virtualized environment.
- Fixed content and data archive.
- Local replication in classic and virtual environments.

- Remote replication in classic and virtual environments.
- Three- site remote replication and continuous data protection

SECTION D

Cloud Computing Characteristics benefits

- Services and deployment models
- Cloud infrastructure components
- Cloud migration considerations

Securing and Managing Storage Infrastructure

- Security threats, and countermeasures in various domains.
- Security solutions for FC-SAN, IP-SAN and NAS environments.
- Security in virtualized and cloud environments.
- Monitoring and managing various information infrastructure components in classic and virtual environments.
- Information lifecycle management (ILM) and storage tiering

TEXT BOOK :

1. (EMC)Information Storage and Management : Storage , managing and protecting Digital Information in Classic , Virtualized and Cloud environment, 2nd Edition , Wiley India publication

SYSTEM AND NETWORK ADMINISTRATION LAB(CS-320)(P)

Course Code	**CS-320(P)**	L-0, T-0, P-2	
Name of the Course	System and Network Administration lab		
Lectures to be Delivered	26 Hrs. of Lab work (2hrs. each per week)		
Semester End Examination	Max Marks: 25	Min Pass Marks: 10	Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25%, Viva 25% & Attendance 20%	Max Marks: 25	

Instructions for paper setter / Candidates

Laboratory examination will consist of two parts:

1. Performing a practical examination assigned by the examiner.
2. Viva-voce examination.

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

LIST OF EXPERIMENTS

1. Management of the users & the domain.
2. Configuring DHCP.
3. Configuring of server 2008.
4. Start and stop services from user window and command prompt.
5. Configrration FTP.
6. Install SUSE Linux server .
7. Management of the IIS and FJP server.
8. Study and install Proxy servers.
9. Setting up of local area network.
10. Setting up of router in Window 2000 server.
11. Use of utilities (a) Ping (b) Trocert (c) netstat (d) net (e) Path ping (f) IP configuration
12. Configuring of Firewalls .
13. Setting up of a DNS.
14. Setting up and use TELNET".

Data Base Management System LAB (CS-321(P))

Course Code	**CS-321(P)**	L-0, T-0, P-2	
Name of the Course	DBMS Lab		
Lectures to be Delivered	26 Hrs. of Lab work (2hrs. each per week)		
Semester End Examination	Max Marks: 25	Min Pass Marks: 10	Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25%, Viva 25% & Attendance 20%	Max Marks: 25	

Instructions for paper setter / Candidates

Laboratory examination will consist of two parts:

1. Performing a practical examination assigned by the examiner.
2. Viva-voce examination.

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

LIST OF EXPERIMENTS:

1. Introduction to SQL and installation of SQL Server / Oracle.
2. Data Types and Create a database and write the programs to carry out the following operation:
    a. Add a record in the database.
    b. Delete a record in the database.
    c. Modify the record in the database.
    d. List all the records of database in ascending order.
    e. Alter and Drop Statements.
3. Working with Null Values, Matching a Pattern from a Table, Ordering the Result of a Query.
4. Aggregate Functions,: Grouping the Result of a Query
5. Set Operators, Nested Queries, Joins, Sequences.
6. Views, Indexes, Database Security and Privileges: Grant and Revoke Commands, Commit and Rollback Commands.
7. PL/SQL Architecture, Assignments and Expressions, Writing PL/SQL Code, Referencing Non-SQL parameters.
8. Stored Procedures and Exception Handling.
9. Triggers and Cursor Management in PL/SQL.
10. Develop a menu driven project management of database system:
11. Library information system
    a. Engineering
    b. MCA
12. Inventory control system
    1. Computer Lab
    2. College Store
       Student Information System
    3. Academic
    4. Finance
       Time Table development system
    5. CSE, IT & MCA Departments.
    6. Electrical & Mechanical Departments.

Usage of S/W:

1. VB, ORACLE and/or DB2
2. VB, MSACCESS
3. VB, MS SQL SERVER 2002

Note: At least 5 or 10 more exercises to be given by the teacher concerned.

ARTIFICIAL INTELLIGENCE LAB (CS-324(P))

Course Code	**CS-324(P)**	L-0, T-0, P-2	
Name of the Course	Artificial Intelligence lab		
Lectures to be Delivered	26 Hrs. of Lab work (2hrs. each per week)		
Semester End Examination	Max Marks: 25	Min Pass Marks: 10	Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25%, Viva 25% & Attendance 20%	Max Marks: 25	

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i. Performing a practical examination assigned by the examiner
ii. Viva-voce examination

Viva-voce examination will be related to the practical performed/project executed by the candidate related to the paper during the course of the semester.

LIST OF EXPERIMENTS

1. Study of PROLOG.
2. Write the following programs using PROLOG:
3. Write a program to solve 8-queens problem.
4. Solve any problem using depth first search.
5. Solve any problem using best first search.
6. Solve 8- puzzle problem using best first search.
7. Solve Robot (traversal) problem using means End Analysis.
8. Solve Traveling Salesman problem.

Note: At least 5 to 10 more exercises to be given by the teacher concerned.

1. To check the various relationships using PROLOG,
2. Using operators in prolog.
3. To find cube of number using prolog.
4. To find factorial of a number.
5. To solve monkey-banana problem in prolog.
6. To find population density of given country.
7. To find the union & intersection of two lists using LISP.
8. Program for flattening a list.
9. Program to find largest of two numbers.
10. Program to perform various operations on List.
    a) Membership
    b) Concatenation
    c) Addition
    d) Deletion

C#/.NET LAB (CS-326(P))

Course Code	CS -326(P)	L-0, T-0, P-2	
Name of the Course	**C#/.NET** Lab		
Lectures to be Delivered	26 Hrs. of Lab work (2hrs. each per week)		
Semester End Examination	Max Marks: 25	Min Pass Marks: 10	Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25%,Viva 25% & Attendance 20%		Max Marks: 25

Instructions for paper setter / Candidates
Laboratory examination will consist of two parts:
1. Performing a practical examination assigned by the examiner.
2. Viva-voce examination.
Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

LIST OF PRACTICAL'S:

1) Write a program to design a class for employee (detail of Employee) using C#.
2) Write a program to implement Hybrid inheritance using C#.
3) Write a program to implement operator overloading using C#.
4) Write a program for to design a calculator using exception handling in C#
   USING .NET Framework
5) Installation and Configuration of the IDE
6) Database Programming Using ADO
7) Working With Common Controls
8) Design of a calculator.
9) Creating A web Page Using ASP
10) Designing & Generating Reports
11) Working With Multiple Document Interfaces (MDI)
12) Design of a web Browser.
13) File Handling – Reading/ Writing From/To Files
14) ActiveX Controls
15) Image Slideshow with Background Music.

Projects:

1) Text to Speech Converter using C#
2) Library Management System using .Net framework.
3) Hotel Management System using C#
4) File Based Record Maintenance Application using C#

7TH SEMESTER

ADVANCED COMPUTER ARCHITECTURE (CS-412)

Course Code	**CS-412**	Credits-4	L-3, T-1, P-0
Name of the Course	ADVANCED COMPUTER ARCHITECTURE		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTIONS

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For Candidates:** Candidates are required to attempt five question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

SECTION A

Review of Computer Architecture: Taxonomy of MIMD Computers, Multi-vector and SIMD, Computers, Vector Supercomputers SIMD Supercomputers.

PRAM and VLSI Models: Parallel Random Access Machines, VLSI Complexity Model.

Architectural Development Tracks: Multiple-Processor Tracks, Multi-vector and SIMD Tracks, Multithreaded and Dataflow Tracks.

Conditions and Parallelism: Data and Resource Dependences, Hardware and Software Parallelism, The role of compilers.

Program partitioning and scheduling: grain Sizes and Latency, Grain Packing and scheduling, static Multiprocessor Scheduling.

Program Flow Mechanisms: control flow Mechanism, Demand-Driven Mechanism, Comparison of Flow Mechanisms, System Interconnect Architectures: Network properties and Routing, Static Connection networks, Dynamic Connection Networks.

SECTION B

Performance Metrics and Measures: Parallelism Profile in Programs, Harmonic mean Performance, Efficiency, Utilization and Quality, Standard Performance Measures.

Speedup performance Law: Amdahl's law for a fixed workload, Gustafron's Law for sealed problems.

Scalability Analysis and Approaches: Scalability metrics and Goals, Evolution of Scalable Computers.

Advance Processor Technology: Instruction set architecture, CISC and RISC Scalar processors.

Superscalar and Vector Processors: Superscalar Processors, The VLIW Architecture, Vector and Symbolic Processors.

Memory Hierarchy Technology: Hierarchical Memory Technology Inclusion, Coherence and Locality, Memory Capacity Planning.

SECTION C

Multiprocessor System Interconnects: Hierarchical Bus system, Crossbar Switch and Multiport Memory, Multistage and Combining networks.

Cache Coherence and Synchronization Mechanism: The Cache coherence problem, Snoopy bus protocol, Hardware Synchronization Mechanisms.

Vector Processing principles: Vector Instruction Types, Vector Access Memory Schemes.

Multivector Multiprocessors: Performance Directed Design rules, Cray Y – MP, C-90 and NTP

SIMD Computer Organization: Implementation Models, The CM-2 Architecture.

Introduction to Multicore architecture

SECTION D

Software for parallel Programming: Shared variable Model, Message Passing Model, Data parallel Model, Function and Logic Models.

Parallel Language and Compilers: Language feature for parallelism, Parallel language Constructs, Optimizing Compiler for parallelism.

Parallel Programming Environment: Software tools and environment, Y-MP, Pargon and CM-5 Environment, Visualization and Performance Testing.

Synchronization and Multiprocessing Modes: Principles of synchronization, Multiprocessor execution Models, Shared-Variable Program Structures, Locks for protected access, Semaphores and Applications, Monitors and Application, Message-passing program Development, Distributing the Computation, Synchronous Message passing, Asynchronous message passing.

Mapping Programs on to Multicomputer: Domain Decomposition Techniques, Control Decomposition techniques, Heterogeneous Processing.

TEXT BOOKS:

1. Kai Hawang: Advance Computer Architecture – Parallelism, Scalability and Programmability, McGraw Hill International Edition, Computer Series 1993.
2. Michael J. Quinn: Parallel Computing – Theory and Practice, McGraw Hill International Edition, Computer Science Series, 2nd Edition, 1994.

REFERENCE BOOKS:

1. Advance Computer Architecture : A Design Space Approach By Sima , Pearson Publication.
2. Advance computer architecture by Kain , PHI publication.
3. S. G. Akl: Design and Analysis of parallel algorithms, Prentice Hall, Englewood Cliff NJ.
4. A practical approach to parallel Computing by S.K. Ghosal, University press (India) Ltd.

WEB TECHNOLOGY (CS-413)

Course Code	**CS-413**	L-3, T-1, P-0	
Name of the Course	Web Technology		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTIONS:

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weight age of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION –A

Information Architecture: The role of Information Architect, Collaboration and communication, Organizing information, organizational challenges, Organizing web sites and Intranets, Creating cohesive organization systems, designing navigation systems, types of navigation systems, Integrated navigation elements, designing elegant navigation systems, Searching systems, Searching your web site, designing the search interface, Indexing the right stuff, To search or not to search grouping content, conceptual design, High level Architecture Blueprint. Architectural Page Mockups, Design Sketches.

SECTION B

Dynamic HTML and Web Designing: HTML Basic concepts, Good web design, process of web publishing phases of web site development, STRUCTURE OF HTML documents, HTML elements- Core attributes, Language attributes, Core events, Block level events, Text level events, Linking basics, Linking in HTML, Images and Anchors, Anchor Attributes, Image maps, Semantic linking meta information, image preliminaries, Image download issues, Images and buttons, introduction to layout: Backgrounds, color and text, fonts, layout with tables. Advanced layout: Frames and layers, HTML and other media types. Audio support in browsers, video support, other binary formats. Style sheets, positioning with style sheets. Basic Interactivity and HTML: FORMS, form control, new and emerging form elements.

SECTION C

Java Server Pages: Basics, Integrating Scripts in JSPs, JSP Objects and Components, configuring and troubleshooting, JSP: request and response objects, retrieving the contents of an HTML format, retrieving a query string, Working with Beans, Cookies, creating and Reading Cookies. Using Application Objects and Events.

XML: Relationship between HTML, SGML and XML, Basic XML, Valid documents, ways to use XML, XML for data files, embedding XML into HTML documents. Converting XML to HTML for Display, Displaying XML using CSS and XSL, rewriting HTML as XML, the future of XML.

SECTION D

Php Mysql Introduction: What is PHP, History, Why choose PHP

Installation: Installation overview, Configuration**,** Advantage of PHP over other scripting language, creating a PHP script, Handel error in PHP script**.**

Data Types: Variables, Strings, String functions, Numbers, Arrays, Array functions, Booleans and NULL, Type switching and casting, Constants

Control Structures: if, else, else-if, and switch statements, Logical operators, while, for, for each loops, continue and Break statements

Functions: Defining & Using functions, Returning values from a function, Setting global variables, Setting default values

Building Web Pages: Links and URLs, Using GET values, Encoding GET values, Encoding for HTML, Building forms, Setting cookies, Establishing sessions, Headers and page redirection, Including and requiring pages

My SQL Basics :

Introduction to web form , My SQL introduction, Creating a database in My SQL, Populating a My SQL database, Php My Admin, Connecting to My SQL with PHP, Accessing data in My SQL with PHP.

TEXT BOOKS:

1. Web technology, Black Book by Kogent learning Inc , Dreamtech publication
2. Thomas A Powell, HTML The Complete Reference, Tata McGraw Hill Publications
3. HTML 5, Black Book, Wiley India Publication

REFERENCE BOOKS:

1. Joseph L.Weber," Using Java 2 platform " Prentice Hall of India Pvt Ltd, 2000
2. John R Hubbard, Programming with Java, Schaum's Outline Series, McGraw Hill International edition 1999.
3. Ian S. Graham, XHTML 1.0 Language and design sourcebook, John Wiley & sons inc. 2000.
4 .Peter Rossbach, Hendrik Schreiber Java Server & services Pearson education Ltd. 2000
5.The Java developer tool kit JoshuMarketos, John Wiley and Sons, 1997.

WIRELESS COMMUNICATION AND MOBILE COMPUTING (CS-414)

Course Code	CS-414	L-3, T-1, P-0	
Name of the Course	Wireless Communication And Mobile Computing		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on Sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTIONS:

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weight age of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION A

Mobile Communication, Mobile Computing, Mobile Computing architecture , Mobile devices, Mobile system network , Mobility management.
GSM : GSM services and architecture, Radio interfaces of GSM, Protocols of GSM, 2G,3G,4G

SECTION B

Cellular network and frequency reuse, handheld device, Limitation of mobile device.
Wireless switching Technology, Wireless communication problem, Wireless Network reference model, wireless networking issue, wireless network standards, wireless body area network architecture and component , Design issue , network protocols, WBAN technologies .
Mobile IP network Layer : IP and mobile IP network layer , Packet delivery and handover management , tunneling and encapsulation, routing optimization, VOIP, IPsec

SECTION C

Network components, Design Requirements of WLAN, Network architecture, WLAN standards ,WLAN protocols, IEEE 802.11p, WLAN applications. Wireless metropolitan area networks, WMAN network architecture, network protocols, Broadband Wireless networks, WMAN applications. WAP

SECTION - D

Data base and mobile computing, Cellular Networks, satellite Network, WLAN versus WWAN, Internetworking of WLAN and WWAN,WWAN applications. Wireless Ad Hoc Networks, mobiles Ad Hoc Networks, wireless sensor networks, wireless mesh networks, Vehicular Ad Hoc Networks (VANETs).

TEXT BOOKS:

1. Wireless and Mobile networks by Manvi&Kakkasageri , Wiley India Publication.
2. Mobile Computing by Raj Kamal , Oxford university press

REFERENCE BOOKS :

1. Wireless Communication: Theodore S. Rappaport: Pearsons.
2. Mobile Cellular Telecommunication: W.C.Y.Lee: McGraw Hill.
3. W. Stallings, “Wireless Communications and Network”, Pearson Education

SOFT COMPUTING (CS-415)

Course Code	**CS-415**	L-3, T-1, P-0	
Name of the Course	Soft Computing		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTIONS:

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weight age of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

Neural Networks:

Basic concepts, Human brain, Neural Network architecture ,Characteristic of neural network, scope of neural network , Hybrid System , Evolution of Neural Network , Basic models of Artifical Neural Network , Important Terminologies of ANNs, Mcculloch-Pitts Neuron , Liner Separability , Hebb Network , Perceptron Network , Adapative Linear Neuron, Back propagation Network , Radital Basis Function Network , Tree Neural Network

SECTION – B

Associative Memory: Training algorithm for pattern association, Auto associative memory network, Hetrocorrelation , Exponential BAM, Associative memory for real coded pattern pairs, Iterative auto associative memory network.

Unsupervised Learning networks: Fixed weight competitive nets, Kohonen self organizing features maps, Learning vector quantization.

Adaptive Resonance theory network: Introduction, ARTI1, ART2, Application

SECTION – C

Probabilistic Reasoning Fuzzy Logic:

Introduction to Fuzzy Logic, Fuzzy v/s Crisp , Fuzzy sets, Crisp set, Properties of fuzzy sets, Crisp relation, Cartesian product of relation, Classical Relation, Fuzzy Relation, Tolerance and equivalence relation , Crisp logic, predicate logic, fuzzy rule base system, Fuzzification, Method of membership value assignments, Defuzzification method, application, Fuzzy arithmetic and fuzzy measure , FIS.

SECTION – D

Genetic Algorithms:
Introduction, Traditional optimization and search technique, Genetic algorithm and search space, Genetic algorithm v/s traditional algorithm, working principle, Encoding, Evolutionary computation. - Fitness Computations - Cross over – Mutation, Reproduction - Rank method - Rank space method.
Genetic Modeling: Inversion and deletion, Mutation operator, bitwise operator, Generational cycle, Converge of genetic algorithm, application, Multilevel optimization, real life problem, Difference and similarities b/w GA and other traditional method, Introduction to Hybrid system.

TEXT BOOKS:

1. Principle Of Soft Computing by S.N Sivanandam & Deep , Wiley India Publication.
2. Neural network , Fuzzy logic and Genetic alogritham By S. rajasekaran PHI.
3. AI A Modern Approach , by Stuart J . Russel ,Norvig , Pearson Education.
4. Michael Negnevitsky Artificial Intelligence: A Guide to Intelligent Systems, 2/E, Addison-Wesley, 2005

REFERENCE BOOK:

1. James Freeman A. and David Skapura M Neural Networks - Algorithms, Applications & Programming Techniques Addison Wesley,
2. Artificial Neural Networks, by Yegnanarayana B Prentice Hall of IndiaPrivate Ltd., New Delhi, 1999.
3. Genetic algorithms in search, optimization and machine learning by Goldberg, David E, Latest Edition, Addison Wesley

WEB TECHNOLOGY LAB (CS-413(P))

Course Code	**CS-413(P)**	L-0, T-0, P-2	
Name of the Course	Web Technology Lab		
Lectures to be Delivered	26 Hrs. of Lab work (2hrs. each per week)		
Semester End Examination	Max Marks: 25	Min Pass Marks: 10	Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25%, Viva 25% & Attendance 20%	Max Marks: 25	

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i. Performing a practical examination assigned by the examiner

ii. Viva-voce examination

Viva-voce examination will be related to the practical performed/project executed by the candidate related to the paper during the course of the semester.

LIST OF PRACTICALS

1. Create your own page with your favorite hobbies.
2. Create a frameset that is divided into three sections. The frameset should have three zones.
    a. The Topmost section of the frameset should take up about just 15% of the browser window. Name this frame title.
    b. The middle section should be 70% of the browser window. Name this frame title.
    c. The lower section should be 15% of the browser window. Name this frame menu.
3. Create pages for each section. For the lowermost section, create page that loads the content into the middle section. The topmost section should contain a page describing the web page itself.
4. Create a web page, which displays the map of your country Link, each city /state on the image map, such that the respective HTML page of the city/state is displayed when the user selects an area.
5. Design a Web Template Using Adobe Photoshop.
6. Embed an animation in web Page using Flash.
7. Use Style sheet to modify the following:
    a. Change background to modify the following.
    b. Change font type, face and color.
    c. Align Text.
    d. Remove underlines from hyperlinks
8. Introduction and Installation Of WAMP Server.
9. Write a simple program ” Hello” world Using Php.
10. Introduction to the data Types Used in Php.
11. Using Control statements in Php.
12. Printing various patterns Using loops.
13. Creating and securing database using MySql.
14. Use of Php My admin in php.
15. Creating login page using php and Mysql.
16. Create Your College Website

MULTIMEDIA APPLICATION LAB (CS-416(P))

Course Code	**CS-416(P)**	L-0, T-0, P-2	
Name of the Course	Multimedia Application Lab		
Lectures to be Delivered	26 Hrs. of Lab work (2hrs. each per week)		
Semester End Examination	Max Marks: 25	Min Pass Marks: 10	Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25%, Viva 25% & Attendance 20%	Max Marks: 25	

Instructions for paper setter/Candidates
Laboratory examination will consist of two parts:

i. Performing a practical examination assigned by the examiner
ii. Viva-voce examination

Viva-voce examination will be related to the practical performed/project executed by the candidate related to the paper during the course of the semester.

LIST OF EXPERIMENTS:

1. Using available Multimedia software like Photoshop, Macromedia, Generator, Flash to create
    a. Backgrounds.
    b. Titling.
    c. Icons.
    d. Pulls.
    e. Buttons & Bullets.
    f. Menu Bars.
    g. Animation (Rotate, fade, Marquee, Twirl, Morphing etc. and submit a project in consultation with instruction tutor incharge.
2. Overview of Flash 5.
    a) Menu. b) Lasso Tool. c) Arrow Tool. d) Pen Tool.
3. Working with Drawing and Painting Tool.
4. Working with Bitmap and Raster Graphics.
5. Sound and Movie.
6. Understand of Action scripts.
7. 3-D graphics.
8. Animation.
9. Write a program to read a paragraph and store it in suggested format.
10. Study the pions notes and stimulate them using key board and store them in file.
11. Write a program to play wave, mid file.

Projects:

1. Create a HTML based static website.
2. Create a Animated movie in flash.
3. Create a full motion video movie in flash.
4. Create a post table game in flash.

ELECTIVE-I

MULTIMEDIA TECHNOLOGY (CS-411(A))

Course Code	CS-411(A)	L-3, T-1, P-0	
Name of the Course	Multimedia Technology		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTIONS:

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weight age of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION A

Introduction: Multimedia and its types, Use of multimedia, Introduction to Multimedia Systems and their Characteristics, Challenges, Desirable Features, Components and Applications, Trends in Multimedia, Structure and components of Multimedia. Application Domains, Internet and Multimedia.

Technology: Architecture of a sound card, MIDI interface, protocol and data format , digitization of audio signal - sampling and coding, digital audio signal processing, architecture of a sound card, elementary concept of music, pitch and voice, staff notation and scoring, electronic music and synthesizer , Multimedia Hardware devices/Software's, Multimedia software development tools.

SECTION B

Image & Graphics: Basic concept, Digital image Representation and formats, Graphic drafting Tools, Image processing and enhancement, Color printer principles, Image scanner principle, File formats, Digital still Camera and photography.

Animation and special effects: animation principles, Survey of animation tools, Special Visual Effects wiping, morphing using Dream viewer.

Video Technology: Analog Video, Principles Broadcast standards, CCD Camera, Recording formats and standard, Digital Video, Principles, PC video and Videoconference standards, TV Cards Frame Grabber Principles, IDTV and HDTV principles, Motion Picture to Video Conversion, video performance measurement .

SECTION C

Compression and decompression: Type of compression, Need of data compression, Binary image compression schema, Color and gray schema, and still video image compression, video image compression, Audio compression.

Multimedia Document and Interchange formats: Media preparation, media composition, Hypertext, HTML, MHEG and Hypermedia, SGML, TIFF, TWAIN, Open document Architecture (ODA), Quick Time Movie film format, Open Media framework (OMFI)

SECTION D

Synchronization: Temporal Dependence in Multimedia presentation. Inter-object and Intra-object Synchronization , Time Abstraction for authoring and visualization, Reference Modle and Specification.

Hypermedia Messaging: Mobile messaging, Hypermedia message component, Hypermedia linking and embedding, creating hypermedia message, Integrated multimedia message standards, integrated document management.

Distributed Multimedia system: Component of distributed Multimedia system, Client server operation , Multimedia object servers, Multi-server network topologies , Distributed multimedia data bases, Managing distributed object

TEXT BOOKS:

1.Multimedia Systems Design, P.K.Andleigh and K.Thakrar, Prentice Hall PTR, 1996.
2. Multimedia system Ed by John f.K Buford , Addison Weslay Publication.
3. Multimedia Computing, Communications and Applications, Ralf Steinmetz and Klara Nashtedt, Prentice Hall 1995

REFERENCE BOOKS:

1. Multimedia and web design by Vikas Gupta , Dreamtech publication
2. Multimedia Technology & Applications, David Hillman, Galgotia Publications

MANAGEMENT INFORMATION SYSTEM (CS-411)(b)

Course Code	CS-411(b)	L-3, T-1, P-0	
Name of the Course	Management Information System		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTIONS:

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weight age of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION –A

Introduction to MIS: Meaning and role of MIS. Definition of MIS, System approach to MIS, MIS organization within a company. Importance of MIS, Modern organization, role of internet, managing internet era, challenge for manager

Concepts of Management Information Systems: Data and Information, Information as a Resource, Information in Organizational Functions, Types of Information Systems, Decision Making with MIS, Communication in organizations.

SECTION – B

MIS Planning: General business planning, Appropriate MIS response, MIS Planning: General, MIS Planning: Details .

Conceptual Design of MIS: Definition of the problem, System objective and system constraints, Analysis of information source, Conceptual system design document.

Information system and Managing Strategy.

SECTION –C

Management Information Systems: Challenges of Managing the IT Function, Vendor Management, IT Governance.

Information Technology Infrastructure and Choices: What is the IT Infrastructure, Infrastructure Components: Hardware, software, Networks, Solutions: Cloud Computing, Virtualization, Enterprise Systems, IT Outsourcing.

Managing data resources, Business process integration and enterprise system.

SECTION - D

Managing Data Resources: The need for Data Management, Challenge of Data Management , Database Concepts ,Database Design , Elements of Database, Data Warehouses.

ICT for development, Type of ICT interventions, Example of ICT for development project, E-governance concept, E-participation, The society of the internet, Open source software .

TEXT BOOKS :

1. Management Information Systems in Business by RAHUL DE , Wiley India Publications.
2. Murdick, Ross & Claggett “Information system for modem management”, Prentice-Hall of India.

REFERENCE BOOK:

1. S.Sadagopan”Management Information Systems”, Prentice-Hall of India.

DIGITAL IMAGE PROCESSING (CS-411(C))

Course Code	**CS-411(C)**	L-3, T-1, P-0	
Name of the Course	Digital Image Processing		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTIONS

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For Candidates:** Candidates are required to attempt five question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

SECTION A

Digital image Processing: Problem and application, Image representation and modeling **,**
Continuous image characterization: Continuos image mathematical characterization: Image Representation, Two-Dimensional Systems, TWO-DIMENSIONAL Fourier Transform, Image Stochastic Characterization.
The Z-transformation, Optical and modulation transfer function, Matrix theory, Block matrices and kronecker products, Random sigmals.
Psychophysical vision properties: Light , Luminance , brightness and contrast , Perception, Eye-Physiology, Visual Phenomena, Monochrome Vision Model, Color vision model
Digital image characterization: Image sampling and recognisation: image sampling and reconstruction concepts, monochrome image sampling systems, monochrome image reconstruction systems, color image sampling systems.
Image quantization: scalar quantization, processing quantized variables, monochrome and color image quantization.

SECTION B

Discrete two – dimensional processing: Discreate random field, The spectral density function, Discrete image mathematical characterization: vector-space image representation, generalized two-dimensional linear operator, image statistical characterization, image probability density models, linear operator statistical representation
Superposition and convolution: finite-area superposition and convolution, sampled image superposition and convolution, superposition and convolution operator relationships.
Unitary transforms: general unitary transforms, fourier transform, cosine, sine and hartley tranforms, hadamard, haar and daubechies tranforms, karhunen-loeve tranform .
Linear processing techniques: transform domain processing, transform domain superposition, fast Fourier transform convolution, fourier transform filtering, small generating kernel convolution

SECTION C

Image improvement: Image enhancement: Point operation , histogram modification, noise cleaning, edge crispening, color image enhancement, multispectral image enhancement.
Image restoration models: Image observation model, Inverse and wiener filtering, Image Restoration Models: General Image Restoration models, Optical Systems models, Photographic Process Models, Discrete Image Restoration Models.
Image Restoration Techniques: Sensor and Display Point Nonlinearity Correction, Continuous Image Spatial Image Restoration, Pseudoinverse Spatial image restoration, SVD Pseudoinverse Spatial image restoration, Statistical Estimation Spatial image restoration, Constrained Image restoration, Blind Image Restoration, Multiplan Image Restoration.

SECTION D

Morphological Image Processing: binary image connectivity, binary image hit or miss transformations, binary image shrinking thinning, skeletonising and thickening, binary image generalized dilation and erosion, binary image close and open operations, gray scale image morphological operations.
Edge Detection: Gradient and compass operators, Laplace operators and zero crossing, stochastic gradients', performance of edge detection. Line and spot detection.
Image Feature Detection: Image Feature Evaluation, Amplitude Features, Transform Coefficient features, texture definition, Visual texture discrimination, texture Feature.
Image Segmentation: Amplitude segmentation, Clustering segmentation, region segmentation, Boundary segmentation, Texture segmentation, Segment Labeling.

TEXT BOOKS:

1. Pratt, K. William, "Digital Image Processing", Fourth Edition, Wiley India Edition.
2. Fundamental of Digital Image Processing By Jain , PHI publication.

REFERENCE BOOKS:

1. Digital image processing by SRIDHAR Oxford University Press
2. R. Gonzalez and R. E. Wood, "Digital Image Processing", Prentice Hall of India.
3. Andrian Low, "Introductory Computer Vision and Image Procession", McGraw Hill CO.

8TH SEMESTER

INFORMATION SYSTEM SECURITY (CS-422)

Course Code	**CS-422**	L-3, T-1, P-0	
Name of the Course	Information System Security		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTIONS:

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weight age of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION A

Importance of information system, Basic of information system, Security consideration in mobile and wireless computing,

Basic Encryption and Decryption: Role of cryptography in information security, Terminology and Background: Encryption, Decryption and Cryptosystems, Plain Text and Cipher Text, Encryption algorithms, Cryptanalysis.

Introduction to Ciphers: Monoalphabetic substitutions such as the Caesar Cipher, Cryptanalysis of Monoalphabetic ciphers such as Vigenere Tableaux, Cryptanalysis of Polyalphabetic Ciphers, Perfect substitution Cipher such as the Vernam Cipher, Stream and Block Cipher, Characteristics of 'Good' Ciphers: Shannon Characteristics, Confusion and Diffusion, Information Theoretic Tests, Unicity Distance.

SECTION B

Properties of Arithmetic Operations: Inverses, Primes, Greatest Common Divisor, Euclidean algorithm, Modular Arithmetic, Properties of Modular Arithmetic, Computing the inverse, Fermat's Theorem, algorithm for computing inverses, random number generation

Public key(Asymmetric key) Encryption Systems: Concept and Characteristics of Public Key Encryption system, Introduction to Merkle-Hellman Knapsacks, rivest – Shamir-Adlman (RSA) Encryption in detail, introduction to Digital Signature Algorithms, The Digital Signature Standard (DSA).

Hash Algorithms; Hash concept, description of Hash Algorithms, Message Digest Algorithms such as MD4 and MD5, Secure Hash Algorithms such as SH1 and SHA2.

SECTION C

Secure Secret Key (Symmetric) Systems: The Data Encryption Standard (DES), Analyzing and Strengthening of DES, Key Escrow and Clipper, Introduction to Advance Encryption Standard (AES)

Law and legal Framework : Information security and law, understanding the law for information security, The Indian IT act, Patent law, copyright law, Indian copyright law, Privacy issues and law in HONG KONG, Japan and Australia , Data protection Act in Europe, GLBA, SOX, Legal issue in data mining security.

Firewall for network protection: Firewalls, DMZ, Proxy servers, Topology for different type of firewalls, Firewall v/s routers, policy for firewall , using firewall effectively, firewall configuration.

SECTION D

Operating System Security: Role of operating system in information system application, operating system type, operating system security, Host security and OS hardening, Patched operating system

Database Security: data base security challenge in modern world, nature of data base security issue, Federated database, securing the contents of mobile databases, securing connectivity with enterprise database, data base security policies.

Security in electronic Mail: Today electronic mail usage scenario, electronic mail system mechanism, growing power of electronic mail system, security threat posed by electronic mails, countermeasure to protection from threat posed e-mails, Governance for electronic mail system.

Web service and Privacy: Privacy on internet, Privacy consideration in web services, Privacy in semantic web, Privacy consideration in use of context sensitive technology.

Ethical issue and intellectual: Information system- Threat from within, Characteristics of insider attack on organization information system , Ethical issue owing to information warfare,

Cryptographic tools and ethical issues, Understanding ethical hacking, social engineering issue, Ethical domain for information security

TEXT BOOKS:

1.Security in Computing (Second Edition) , Charles P.Pfleeger, 1996, Prentice Hall International, Inc.

2.Information System security by Nina Godbole , Wiley India Publication

3.Cryptography and N/W Security by Behrouz A Farouzan , McGraw Hill.

REFERENCE BOOKS:

1. Network Security bible by Eric Cole & Ronald Krutz , Wiley India Publication.
2. Information security By Patel , PHI publication .
3. Cryptography and Security by C K Shyamala& N Harini , Wiley India publication
4. Cryptography and N/W Security 4th edition by William Stallings , Pearson.

DATA MINING AND DATA WAREHOUSING (CS-423)

Course Code	**CS-423**	L-3, T-1, P-0	
Name of the Course	Data Mining and Data Warehousing		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on Sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTIONS:

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weight age of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION A

Data ware housing: Definition, Data warehouse users, 3 – Tier data warehouse architecture, DBMS vs. Data warehouse, Data warehouse features: Subject oriented data, integrated data, time variant data, nonvolatile data, data granularity.
Data warehouse process & architecture: Introduction, characteristics of data warehouse architecture, Goals, Architecture, OLTP vs. OLAP, OLAP in the Data Warehouse, types of OLAP servers (MOLAP, ROLAP and HOLAP), distributed and virtual data warehouses, infrastructure as the foundation for data warehousing. , data ware house security , backup and recovery.

SECTION B

DW tools and technologies: Reporting and Query tools, the need for applications, Extraction, cleansing and transformation tools, DW admin and management tools, data marts – reasons and issues.
Data warehouse schema: Dimensional modeling, The star schema, The snowflake schema, Aggregate tables, Data warehouse and the data model.
Data Warehousing Design: Designing, Dimensionality modeling, Design methodology, data warehousing and web, DW design using Oracle, data ware house development, Testing , Growth , and Maintenance .

SECTION C

Data mining: Basics & tasks, Data mining user's perspective, other issue, Foundation of data mining, measuring data mining effectiveness, Data mining Architecture, The knowledge Discovery Process, Integrating data mining with data warehousing, KDD vs. Data Mining, DBMS vs. Data Mining.

Frequent Pattern mining: Mining associate rule, Application, variation, interestingness, FIM, Optimal FIM algorithm, incremental mining, sequential rule.
Data mining techniques: Association rules, Clustering techniques, Decision tree, Clustering Analysis, Case-Based reasoning, Genetic Algorithms, knowledge discovery through neural Networks & Generic Algorithm, Rough Sets, Support Victor Machines and Fuzzy techniques.

SECTION D

Moving into Data mining: Relational data, transactional data, and multi-dimensional data , data stream, Application of data mining, web mining, text mining, temporal Data Mining, sequence mining, time series analysis, Spatial Data Mining, Issue and challenges in data mining, Current trends in Data Mining.

Mining Complex data objects: Multimedia databases, Time series and sequence data; mining text Databases and mining World Wide Web.

TEXT BOOKS:

1. Data warehousing Fundamentals; Paulraj Ponniah; 2001,Wiley India Edition
2. Data warehousing by Reema Thareja , Oxford University press.
3. Data Mining concepts & Techniques; Jiawei Han &Micheline Kamber 2001, Morgan kaufmann.

REFERENCE BOOKS:

1.Data Mining By Pudi, Oxford University press.
2.Data Mining Techniques; Arun Pujari; 2001, University Press; Hyderabad
3.Data Warehousing, Data Mining and OLAP; Alex Berson, 1997, McGraw Hill
4. Data Warehousing System; Mallach;2000, McGraw Hill
5. Managing the Data Warehouses; W.H. Longhman, C.Klelly, John Wiley & Sons.
6. Data Mining using SAS Enterprise Miner;RandallMatignon,Willey India Edition
7. Decision support Systems & Data Warehouses, Ravindernath, B., New Age International Publishers, New Delhi.

FUNDAMENTALS OF CLOUD COMPUTING (CS-424)

Course Code	**CS-424**	L-3, T-1, P-0	
Name of the Course	Fundamentals of Cloud Computing		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTIONS:

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weight age of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed

SECTION A

Journey to the cloud

Business driver for cloud computing, Definition of cloud computing, Characteristics of cloud computing as per NIST, Steps involve in transitioning from classic data center to cloud computing environment, Disadvantage of cloud computing , Cloud Models.

Classic data center (CDC)

Application, DBMS, compute, storage and networking, Object based and unified storage technologies, Business continuity overview and backup, Replication technologies, CDC management

SECTION B

Cloud as a Service : Gamut of Cloud Solutions , Principal Technologies ,Cloud Strategy , Cloud Design and Implementation Using SOA Conceptual Cloud Model , Cloud Service Defined .

Cloud Solution: Cloud Ecosystem , Cloud Business Process Management , Cloud Service Management , On-Premise Cloud Orchestration and Provisioning Engine , Computing on Demand (CoD) Cloud sourcing .

Cloud Offerings : Introduction , Information Storage, Retrieval, Archive, and Protection , Cloud Analytics , Testing Under Cloud Information Security , Virtual Desktop Infrastructure , Storage Cloud , Cloud architecture.

SECTION C

Cloud Management : Resiliency , Provisioning , Asset Management , Cloud Governance , High Availability and Disaster Recovery Charging Models, Usage Reporting, Billing, and Metering

Cloud Virtualization Technology : Introduction , Virtualization Defined , Virtualization Benefits , Server Virtualization , Virtualization for x86 Architecture , Hypervisor Management Software, Virtual Infrastructure Requirements , Virtualized data center (VDC),

Cloud Infrastructure: Storage Virtualization , Storage Area Networks , Network-Attached Storage, Cloud Server Virtualization Networking Essential to Cloud, Virtual LAN(VLAN) and virtual SAN (VSAN)and their benefits, and considerations, Backup and recovery of virtual machines(VMs)

SECTION D

Cloud and SOA : SOA Journey to Infrastructure , SOA and Cloud , SOA Defined , SOA and IAAS , SOA-Based Cloud Infrastructure Steps , SOA Business and IT Services Cloud Mobility : Introduction , The Business Problem , Mobile Enterprise Application Platforms Mobile Application Architecture

Cloud security and migration to cloud

Security concerns and counter measures in a VDC and cloud environment, Governance, risk, and compliance aspects in cloud, Cloud models suitable for different categories of users, Consideration for choosing applications suitable for cloud, Different phases to adopt the cloud.

TEXT BOOKS:

1. Cloud Computing By DR. KUMAR SAURABH, Wiley India Pvt Ltd.
2. Cloud Computing By BARRIE SOSINSKY Wiley India Pvt Ltd
3. Cloud Computing : A practical approach by Anthony T. Velte- Tata McGraw Hill Education Private Limited (2009) ISBN: 0070683514.

REFERENCE BOOKS :

1. Cloud Computing For Duminies by Halper Fern, Kaufman Marica, Bloor Robin, Hurwit Judith, - Wiley India Pvt Ltd (2009) ISBN: 8126524871.
2. Grid and cluster computing by Prabhu , PHI publication.

DATA MINING LAB (CS-423(P))

Course Code	**CS-423(P)**	L-0, T-0, P-2	
Name of the Course	Data Mining Lab		
Lectures to be Delivered	26 Hrs. of Lab work (2hrs. each per week)		
Semester End Examination	Max Marks: 25	Min Pass Marks: 10	Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25%, Viva 25% & Attendance 20%		Max Marks: 25

LIST OF EXPERIMENTS:

1. Create student relation with all data types and execute sql, pl/sql commands?
2. Create a table using various

a. constraints(primary key, foreign key, not NULL ,Unique)
b. Aggreate functions (Sum, Max, Min ,Ciel, Floor etc.)
c. Using Conversion functions(To_ Char, To_ Num, To _Date)
d. String functions (Concatenation ,lpad ,rpad, ltrim, initcap, length etc.)

3. Write a query to list all the fields from the table and list the rows after eliminating duplicate data?
4. Create a view which shows the detail of salesman with his salary. (Sales man name, salary)
5. Create a Pl/SQL programme using cursors to retrieve first tuple from department relation(use table deptt (dno., dname, loc))?
6. Code a program to calculate tax for any employe whose number is input from the keyboard. Display appropriate error message if data does not exist in the table?
7. Create a simple PL/SQL programme which includes declaration section executable section and exception handling section?
8. Develop a programme using creation of procedures passing parameters IN and OUT Procedures?
9. Develop a programme using features of parameters in a CURSOR FOR UPDATE CURSOR using CURRENT CLAUSE?
10. Develop a programme that includes the features NESTED IF, CASE and CASE expression?
11. Write a trigger to restrict the user from using the particular table?
12. Create a database for storing and retrieving student information for your college?
13. Create a table called Area which contains two attributes radius and area. Write a program which will calculate the area of circle for different radius. Take value of radius from user, calculate it and then insert those values in the Area table through the program.
14. Create user defined Exceptions. Write a program in which the ACCT table records the current balance for an account, which is updated whenever, any deposits or withdrawals takes place. If the withdrawal attempted is more than the current balance held in the account, a user defined exception is raised displaying an appropriate error message otherwise perform the appropriate task.
15. Develop a project showing the use of oracle?

Note : 5 to 10 practical's can be executed by concerned teacher in his/her lab.

ELECTIVE-II

E-COMMERCE& ERP (CS-421)(a)

Course Code	**CS-421(a)**	L-3, T-1, P-0	
Name of the Course	E-Commerce& ERP		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTIONS:

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. Each section will have a weight age of 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION A

Introduction and Concepts: Electronic commerce and Physical commerce, The digital phenomenon e-comm from different perspective, different type of e-commerce , example of the type of e-commerce, e-commerce scenario , Change bought by e-commerce, advantage of e-commerce, e-commerce development and implementation.

Networks and Commercial Transactions – Internet and other novelties: networks and electronic transactions today, Model for commercial transactions; Internet environment – Internet advantage, worlds wide web and other Internet Sales venues; online commerce solutions, HTTP

SECTION B

Internet Payment System : Characteristics of Payment system , 4C payment method , Protocol for credit card payment, E-cash, E-check, Micro payment system , Overview of Smart card and Mondex

Customer –oriented e-commerce : Traditional retailing and e-retailing , Benefit of e-retailing , Key success factors, Model of e-retailing, Features of e-retailing , consumer –oriented e-commerce system, PASS model

SECTION C

Business –oriented e-commerce : Features of B2B e-commerce, business models, integration

E-service : Categories of e-service , web enable service , Match making service, information selling on the web, Auction .

Web advertising and web publishing : Traditional and internet advertising, Internet advertising technique , business model for advertising , Pricing model , web publishing , web site development methodologies, Usability testing

SECTION D

ERP – an Enterprise Perspective: Information System Perspective: Functional to OLAP (Online Analysis and Processing), TP, OAS, KBS, MRP, BPR, SCM, REP, CRM, and Information Communication Technology.

ERP – Key Managerial Issues: Concept Selling, IT Infrastructure, Implication, of ERP System on business Organization, Critical success factors in ERP System, ERP Culture Implementation Issues, resistance to change, ERP Selection issues, return on Investment, pre and post Implementation Issues.

TEXT BOOKS:

1. E-Commerece (Fundamentals and Application) by Henery Chan, Raymond Lee, Wiley India Publication
2. V.K. Garg and N.K. Venkita Krishna: Enterprise Resource Planning – Concepts and practice, 1998,PHI.

REFERENCE BOOKS

1. Ravi lalakota, Andrew Whinston: Frontiers of Electronics Commerce, 1996, Addison Wesley.
2. E-Commerce – Jaffrey F. Rayport, Bernard J. Jaworski, 2002, TMH.

INTERNET AND INTERNET TECHNOLOGY (CS-421(B))

Course Code	**CS-421(B)**	L-3, T-1, P-0	
Name of the Course	Internet and Internet Technology		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTIONS

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For Candidates:** Candidates are required to attempt five question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

SECTION A

THE INTERNET AND WWW:

Evolution of the Internet and the Growth of the World Wide Web. Client-Server model. Architecture of the Intranet/ Internet /Extranet.

Access methods: dialup, ISDN, ADSL/2+, cable, LAN, WIFI, Mobile & Satellite.

Proxy servers.

APPLICATION AREAS:

E-commerce, Education, Entertainment such as games and gambling. Portals, discussion forums, Weblogs, Podcasting, RSS / ATOM, Wiki, VoIP, video on demand. Search Engines, webbots, integrity of information, databases online.

SECTION B

PROCESS, STANDARDS AND PROTOCOLS URL

TCP/IP fixed and dynamic IP addressing. Role of DNS. Email: email clients, server and gateways; SMTP, POP3, IMAP & Webmail. File transfer – FTP. Remote login – telnet.

WWW – HTTP and HTTPS:

Role of W3C. Accessibility. Mobile computing, wireless, 3G, GPS.

SECTION C

WEBSITE DEVELOPMENT

Static and dynamic HTML. Fluency in at least one of the following client-side scripting languages: JavaScript or VB script. DOM model, style sheets, CSS and XSL. Development tools: page and site authoring, delivery and maintenance tools. Multimedia Content: text, graphics, sound, animation and video -performance and quality issues; streaming. Hosting choices and issues. Usability issues.

SECTION D

SECURITY AND PERFORMANCE

Security policies/Privacy/Identification/Authentication/Access control. Hardware and software, Risk assessment, Vulnerabilities. Threats and attack methods such as Viruses, Spam, Root kits, "phishing", Firewalls – spyware plug-ins. Performance: speed, reliability, downtime, bandwidth.

TEXT BOOKS:

1. Preston Gralla and Michael Troller., How the Internet Works (November 21, 2006), Publisher: Que, Print ISBN-10: 0-7897-3626-8, Print ISBN-13: 978-0-7897-3626-0
2. Perry J. et al, The Internet – Illustrated Introductory, Course Technology (3rd Ed), ISBN: 0619109580

REFERENCE BOOKS:

1. Bates, C., Web Programming: Building Internet Applications, John Wiley and Sons (3rd Ed), 2006, ISBN: 0470017759 .
2. K. Roy, "Web Technology" Oxford University Press.
3. Berners-Lee, T. et al, Weaving the Web, Harper Business, 2000, ISBN: 006251587X
4. Hofstetter, F.T., Internet Literacy, McGraw Hill (3rd Ed), 2002, ISBN: 0071124241
5. McGloughlin, S., Multimedia: Concepts and Practice, Prentice Hall, 2001, ISBN: 0130575062
6. Niederst, J., Web Design in a Nutshell, O'Reilly (2nd Ed), 2001, ISBN: 0596001967

ADVANCED COMPUTER NETWORKS (CS-421(C))

Course Code	**CS-421(C)**	L-3, T-1, P-0	
Name of the Course	Advanced Computer Networks		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

INSTRUCTIONS

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For Candidates:** Candidates are required to attempt five question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

SECTION A

Internetworking

Introduction, History and Context, Packet switching. Internetworking: Architectural Principles, Names, Addresses. Interdomain Routing

SECTION B

Resource Management

End-to-End Congestion Control, Fair Queuing –WFQ, CSFQ, Router congestion control – RED,XCP. Quality of Service – Future requirements and IntServ, Router Design

SECTION C

Wireless Networks

Wireless Networks Overview and Architectures (MACAW, WTCP), Wireless Networks in the Real World - roofnet, Routing in ad-hoc Networks, Sensor networks, topology

SECTION D

Applications, Naming, and Overlays

Overlay Networks, Distributed Hash Tables, DNS and the Web, Names, Identifiers, and Network architecture

Measurement and Tracing , Internet Measurement, X Trace, Data-oriented networking and DTNs, Multicast, Datacenter Networking

TEXT BOOKS:

1. Computer Networks: A Systems Approach, 4th Ed. (2007), by Larry Peterson and Bruce Davie.
2. Computer Networks, Fourth Edition, A. Tanenbaum, Prentice-Hall, 2002.
3. Computer Networking: A Top-Down Approach Featuring the Internet, 4th Ed. (2007), by James F. Kurose and Keith W. Ross.
4. UNIX Network Programming: Networking APIs: Sockets and XTI (Volume 1) by W. Richard Stevens.
5. Advanced Programming in the UNIX Environment by W. Richard Stevens, Addison-Wesley, 1993.

REFERENCE BOOKS:

1. Computer Networks and Internets with Internet Applications, Third Edition, D.E. Comer, Prentice-Hall, 2001.
2. Communication Networks, Fundamental Concepts and Key Architecture, A. Leon-Garcia and I. Wadjaja, McGraw-Hill, 2000.
3. Data and Computer Communications, Sixth Edition, W.S. Stallings, Prentice-Hall, 1999.
4. Data Communications, Computer Networks and Open Systems, Fourth Edition, F. Halsall, Addison-Wesley, 1995.
5. Data Networks, Second Edition, D. Bertsekas and R. Gallager, Prentice- Hall, 1992