SCHEME FOR SYLLABUS

OF

B.TECH.
(INFORMATION TECHNOLOGY)

**HIMACHAL PRADESH UNIVERSITY
SUMMER HILL
SHIMLA-5**

First Semester		L	T	P	Total	Exam Schedule		Practical Schedule			Credits
Course No.	Subjects	L	T	P	Total	Theory	Sess.	Pract.	Sess.	Total	
AS – 1001	Applied Mathematics – I	3	1	-	4	100	50	-	-	150	4
AS – 1002	Applied Physics – I	3	1	-	4	100	50	-	-	150	4
ME – 1001	Engineering Graphics	3	1	-	4	100	50	-	-	150	4
HU – 1003	Communication & Professional Skills in English	3	1	-	4	100	50	-	-	150	4
EC – 1001	Basic Electronics	3	1	-	4	100	50	-	-	150	4
CS – 1001	Introduction to Computers & Programming in C	3	1	-	4	100	50	-	-	150	4
(Practicals/ Drawing/Design)											
AS – 1003	Applied Physics Lab	-	-	2	2	-	-	50	50	100	2
EC – 1002	Basic Electronics Lab	-	-	2	2	-	-	50	50	100	2
ME – 1002	Engineering Graphics Lab	-	-	3	3	-	-	50	50	100	3
CS – 1002	Computer Programming Lab	-	-	2	2	-	-	50	50	100	2
TOTAL		18	6	9	33	600	300	200	200	1300	33	35

L: Lecture (Theory)/per week   T: Tutorial/per week   P: Practical/per week
Sess.: Sessionals   Pract.: Practicals

Scheme of Examination (Common to all branches)											
Second Semester						Exam Schedule		Practical Schedule			Credits
Course No.	Subjects	L	T	P	Total	Theory	Sess.	Pract.	Sess.	Total	
AS – 2001	Applied Mathematics – II	3	1	-	4	100	50	-	-	150	4
AS – 2002	Applied Physics – II	3	1	-	4	100	50	-	-	150	4
CS - 2002	Fundamentals of Computer Science and Technology	3	1	-	4	100	50	-	-	150	4
HU – 2002	Science, Technology & Society	3	1	-	4	100	50	-	-	150	4
EE – 2001	Basic Electrical Engineering	3	1	-	4	100	50	-	-	150	4
ME – 2001	Basic Mechanical Engineering	3	1	-	4	100	50	-	-	150	4
(Practicals/Drawing/Design)											
EE – 2002	Basic Electrical Engineering Lab	-	-	2	2	-	-	50	50	100	2
CS – 2003	Computer Science Trainer Workshop	-	-	4	4	-	-	50	50	100	4
ME – 2002	Basic Mechanical Engineering Lab	-	-	2	2	-	-	50	50	100	2
IT-1003	Matlab	-	-	2	2	-	-	50	50	100	2
TOTAL		18	6	10	34	600	300	200	200	1300	34

L: Lecture (Theory)/per week   T: Tutorial/per week   P: Practical/per week
Sess.: Sessionals   Pract.: Practicals

Scheme of Examination (Information Technology										
Third Semester (Information Technology)					**Exam Schedule (Marks)**		**cal Schedule Marks)**		**Total**	**Credits**
Course No.	Subjects	L	T	P	Total	Theory	Sess.	Pract.	Sess.		
IT – 3001	Computer Organization	3	1	-	4	100	50	-	-	150	4
IT – 3002	Object Oriented Programming	3	1	-	4	100	50	-	-	150	4
IT – 3003	Data Structures & Algorithms	3	1	-	4	100	50	-	-	150	4
IT – 3004	Database Management System	3	1	-	4	100	50	-	-	150	4
EC – 3001	Digital Electronics	3	1	-	4	100	50	-	-	150	4
AS - 3002	Principles of Engineering Economics & Management	3	1	-	4	100	50	-	-	150	4
(Practicals / Drawing / Design)											
EC – 3004	Digital Electronics Laboratory	-	-	2	2	-	-	50	50	100	2
IT – 3005	Data Structure Laboratory	-	-	2	2	-	-	50	50	100	2
IT – 3006	Object Oriented Programming Lab	-	-	2	2	-	-	50	50	100	2
IT - 3007	RDBMS Laboratory	-	-	2	2	-	-	50	50	100	2
TOTAL		18	6	8	32	600	300	200	200	1300	32

L: Lecture (Theory)/per week   **T: Tutorial/per week**   **P: Practical/per week**
           Sess.: Sessionals   **Pract.: Practicals**

Scheme of Examination (Information Technology											
Fourth Semester (Information Technology)						*Exam Schedule (Marks)*		*al Schedule Marks)*		Total	Credits
Course No.	Subjects	L	T	P	Total	Theory	Sess.	Pract.	Sess.		
IT - 4001	Management Information System	3	1	-	4	100	50	-	-	150	4
IT - 4002	Operating System	3	1	-	4	100	50	-	-	150	4
IT - 4003	Computer Networks	3	1	-	4	100	50	-	-	150	4
EC – 4010	Digital and Data Communication	3	1	-	4	100	50	-	-	150	4
IT - 4004	System Analysis and Design	3	1	-	4	100	50	-	-	150	4
IT - 4005	Human Computer Interaction	3	1	-	4	100	50	-	-	150	4
(Practicals / Drawing / Design)											
IT - 4006	Operating System Lab	-	-	2	2	-	-	50	50	100	2
EC –4011	Digital and Data Communication Lab	-	-	2	2	-	-	50	50	100	2
IT – 4007	SAD Project	-	-	2	2	-	-	50	50	100	2
IT - 4008	Computer Networks Lab	-	-	2	2	-	-	50	50	100	2
TOTAL		18	6	8	32	600	300	200	200	1300	32

L: Lecture (Theory)/per week   T: Tutorial/per week   P: Practical/per week
Sess.: Sessionals   Pract.: Practicals

Scheme of Examination (Information Technology										
fth Semester (Information Technology)						*Exam Schedule (Marks)*	*al Schedule Marks)*		Total	Credits
Course No.	Subjects	L	T	P	Total	Theory	Sess.	Pract.	Sess.		
IT - 5001	Software Engineering	3	1	-	4	100	50	-	-	150	4
IT - 5002	Computer Graphics	3	1	-	4	100	50	-	-	150	4
IT - 5003	Analysis & Design of Algorithms	3	1	-	4	100	50	-	-	150	4
IT - 5004	Visual Programming	3	1	-	4	100	50	-	-	150	4
EC - 5001	Microprocessor, Micro computers and Interfaces	3	1	-	4	100	50	-	-	150	4
IT-5005	Discrete Structures	3	1	-	4	100	50	-	-	150	4
(Practicals / Drawing / Design)											
EC - 5005	Microprocessor Lab	-	-	2	2	-	-	50	50	100	2
IT - 5006	Visual Programming Laboratory	-	-	2	2	-	-	50	50	100	2
IT – 5007	Computer Graphics Lab	-	-	2	2	-	-	50	50	100	2
IT - 5009	Vocational Training *	-	-	2	2	-	-	50	50	100	2
TOTAL		18	6	8	32	600	300	200	200	1300	32

L: Lecture (Theory)/per week   **T: Tutorial/per week**   **P: Practical/per week**
Sess.: Sessionals   **Pract.: Practicals**

*Note: -
  1.   6 Weeks Vocational Training

Scheme of Examination (Information Technology										
Sixth Semester (Information Technology)						*Exam Schedule (Marks)*	*al Schedule Marks)*		**Total**	**Credits**
Course No.	**Subjects**	**L**	**T**	**P**	**Total**	**Theory**	**Sess.**	**Pract.**	**Sess.**		
IT - 6001	Object Oriented Software Engineering	3	1	-	4	100	50	-	-	150	4
IT - 6002	Web Technology	3	1	-	4	100	50	-	-	150	4
IT - 6003	Artificial Intelligence	3	1	-	4	100	50	-	-	150	4
IT - 6004	Computer Network Management	3	1	-	4	100	50	-	-	150	4
IT - 6005	Parallel Computing	3	1	-	4	100	50	-	-	150	4
IT - 6006	Core Java	3	1	-	4	100	50	-	-	150	4
(Practicals / Drawing / Design)											
IT - 6007	Artificial Intelligence Laboratory	-	-	2	2	-	-	50	50	100	2
IT - 6008	Web Technology Laboratory	-	-	2	2	-	-	50	50	100	2
IT - 6009	Parallel Computing Laboratory	-	-	2	2	-	-	50	50	100	2
IT - 6010	Core Java Lab	-	-	2	2	-	-	50	50	100	2
TOTAL		18	6	8	32	600	300	200	200	1300	32

L: Lecture (Theory)/per week **T: Tutorial/per week** **P: Practical/per week**
Sess.: Sessionals **Pract.: Practicals**

Scheme of Examination (Information Technology										
Seventh Semester (Information Technology)					**Exam Schedule (Marks)**		**cal Schedule Marks)**		**Total**	**Credits**
Course No.	**Subjects**	**L**	**T**	**P**	**Total**	**Theory**	**Sess.**	**Pract.**	**Sess.**		
IT - 7001	Natural Language Processing	3	1	-	4	100	50	-	-	150	4
IT - 7002	Modeling & Simulations	3	1	-	4	100	50	-	-	150	4
IT - 7003	e-Commerce & ERP	3	1	-	4	100	50	-	-	150	4
IT - 7004	Advance Java	3	1	-	4	100	50	-	-	150	4
EC - 7012	Wireless communication	3	1	-	4	100	50	-	-	150	4
XX - XXXX	Professional Elective-I	3	1	-	4	100	50	-	-	150	4
(Practicals / Drawing / Design)											
IT - 7005	Advance Java Lab	-	-	2	2	-	-	50	50	100	2
IT - 7006	Modeling and Simulation Laboratory	-	-	2	2	-	-	50	50	100	2
IT - 7007	E-Commerce Laboratory	-	-	2	2	-	-	50	50	100	2
IT - 7008	Project – I	-	-	3	3	-	-	50	50	100	3
IT - 7016	Vocational Training *	-	-	1	1	-	-	50	50	100	1
TOTAL		18	6	10	34	600	300	250	250	1400	34

L: Lecture (Theory)/per week   **T: Tutorial/per week**   **P: Practical/per week**
Sess.: Sessionals   **Pract.: Practicals**

*Note: -
   1.   6 Weeks Vocational Training

Scheme of Examination (Information Technology)											
ighth Semester (Information Technology)					Exam Schedule (Marks)		Practical Schedule (Marks)		Total	Credits	
Course No.	Subjects	L	T	P	Total	Theory	Sess.	Pract.	Sess.		
IT - 8001	Multimedia Technology	3	1	-	4	100	50	-	-	150	4
IT - 8002	Information Systems Security	3	1	-	4	100	50	-	-	150	4
IT - 8003	Data Warehouse and Data Mining	3	1	-	4	100	50	-	-	150	4
XX - XXXX	Open Elective	3	1	-	4	100	50	-	-	150	4
XX - XXXX	Professional Elective-II	3	1	-	4	100	50	-	-	150	4
(Practicals / Drawing / Design)											
IT - 8004	Project-II	-	-	10	10	-	-	150	100	250	10
IT - 8005	Multimedia Technology Lab	-	-	2	2	-	-	50	50	100	2
IT - 8016	General Proficiency	-	-	1	1	-	-	50	50	100	1
TOTAL		15	5	13	33	500	250	250	200	1200	33

L: Lecture (Theory)/per week   **T: Tutorial/per week**   **P: Practical/per week**

Sess.: Sessionals   **Pract.: Practicals**

ELECTIVES (Information and Technology)

Professional Elective - I				Open Elective	
1.	Software Maintenance	IT-7010	1.	Communication System	EC-8020
2.	Corba / XML	IT-7011	2.	Reliability of electronics Communication system	EC-8021
3.	Design of Embedded Systems	IT-7013	3	Non Conventional Electrical Power Generation	EE-8008
4.	GIS/Remote Sensing	IT-7015	4.	Energy Assessment and Auditing	EE-8009
			5.	Computer software Testing	CS-8020
	Professional Elective - II		6.	Computer Network and security	CS-8021
			7	Entrepreneurship Development & New Enterprise Managements	HU-8020
1	GPS and Application	IT-8006	8	Accounts & Financial Management	HU-8021
2	Mobile Computing*	IT-8007	9	Total Quality Management	HU-8022
3	Neural Networks	ES-8001	10.	Advanced Operations Research	ME-8019
4	Multilingual Applications*	IT-8008	11.	Industrial Management	ME-8020
5	Speech Image & Coding*	IT-8009	12.	Optimisation methods for Engineering System	ME-8021
7	Digital Image Processing	IT-8011	13	Disaster Management	CS-8022
8	Bio-Informatics	IT-8015	14	Environmental Pollution & Management	CE-8023
			15	Remote Sensing & GIS	CE-8024

Note :

For 7th & 8th semesters any of the core courses offered in B. Tech. (CSE) which are not being taught in B. Tech. (IT) can also be offered as elective course.

SYLLABUS

OF

B.TECH.
(INFORMATION TECHNOLOGY)

SEMESTER - I

Applied Mathematics - I (AS-1001)

Course Code	AS-1001	Credits-4	L-3, T-1, P-0
Name of the Course	Applied Mathematics - I		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End	Max Marks: 100	Min Pass Marks:	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials / Assignments		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
   Function of several variables, limits and continuity, partial derivatives, higher order partial derivatives, Euler's theorem, Jacobians, maxima of functions of two variables. Lagrange's method of multipliers, double and triple integrals, change of variables, applications of double and triple integrals, beta and gamma functions.

Section B
   Reduction formulae, definite integral as limit of a sum, area under a curve, length of an arc of a curve. Linear differential equations of second order with constant coefficients: complementary functions, particular integrals, Euler homogeneous form, and variation of parameters. Convergence of series, Taylor's theorem with remainder, power series expansion of functions, Taylor's and Maclaurin's series.

Section C
   Matrices: review of properties of determinants. Elementary operations on matrices.
   Homogeneous and nonhomogeneous system of linear equations and their properties, bilinear, quadratic, hermitian and skew-hermeitian forms. Eigenvalues of hermitian, skew-hermitian and unitary matrices.

Section D
   Complex analytic functions: brief review of complex numbers, complex variable, concept of limit, continuity and derivatives of analytical function, cauchy-Riemann equations, harmonic function, complex series, some elementary functions, logarithm.

Books:
1. Kryszig, Thomas-Finny, Advanced Engineering Mathematics.
2. S.S. Shastri, "Engineering Mathematics (2nd edition) Vol-I and Vol-II.
3. B.S. Grewal, Higher Engineering Mathematics.
4. Piskunov, Differential and Integral Calculus.
5. R.K.Jain and S.R. K. Iyengar, Advanced Engineering, Mathematics.

6.   Michael D. Greenberg, Advanced Engg. Mathematics.

Semester - I
Applied Physics - I (AS-1002)

Course Code	AS-1002	Credits-4	L-3, T-1, P-0
Name of the Course	Applied Physics - I		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Max Marks: 100		Min Pass Marks:	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/ Assignments, 30%, Quiz/Seminar 10%, Attendance		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

Physical Optics: Interference-division of wavefront-fresnel's biprism, division of multitude,
interference by Newton's rings, Michelson's interferometer and its applications.
Diffraction- Difference between fraunhofer and fresnel diffraction through slit, plane transmission grating, its dispersal and resolving powers Polarization- polarized and unpolarised light, double refraction, nicol prism, quarter and half wave plates, polarimetry, biquartz and laurents half shade polarimeters, simple concepts of photoelasticity.
Special theory of Relativity: Michelson-Moreley experiments, Relativistic transformations, Variation of mass with velocity, mass energy equivalence.

Section B

Wave and oscillations: Simple harmonic oscillations, simple concept of harmonic oscillator,
resonance, quality factor, E.M wave theory, Review of basic ideas, Maxwell's equations and their experimental basis. Simple plane wave equations, simple concepts of wave-guides and co- axial cables, Poynting vector.
Dielelectrics: Molecular Theory, polarization, displacement susceptibility, dielectric coefficient, permitivity and various relations between these Gauss's law in the presence of dielectric, energy stored in an electric field. Behavior of dielectric in field –simple concepts, dielectric losses.

Section C

Quantum Physics: Difficulties with classical physics, Introduction to quantum mechanics-
simple concepts, discovery of Planck's constant. De Broglie Waves, Phase and Group Velocities, Particle diffraction, Uncertainty Principle, the wave equation,

Postulates of quantum mechanics, Time dependent and independent Schrodinger equation, Expectation Values, Eigen Values and Eigen functions, Particle in a box, Finite Potential Well, Tunnel Effect, Harmonic oscillator. Statistical distributions, Maxwell Boltzmann Statistics, Quantum statistics.

Section D

Nuclear Physics: Neutron cross-section, nuclear fission, moderators, nuclear reactors, reactor

criticality, interaction of radiation with matter-basic concepts, Radiation Detectors-ionization chamber, G.M counter, scintillations & solid state detectors, cloud Chamber & bubble chamber.

Books:
1. Arthur Beiser, Concepts of Modern Physics, 5th International edition Tata McGraw Hill
2. Wehr, Richards & Adair, Physics of the Atom.
3. A.S.Vasudeva, Modern Engg. Physics.

Engineering Graphics (ME-1001)

Course Code	ME-1001	Credits-6	L-3, T-1, P-0
Name of the Course	Engineering Graphics		
Lectures to be Delivered	78 Hrs. of Lab. Work (6 hrs. per week)		
Semester End	Max Marks: 100	Min Pass Marks:	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2), 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%,		Max Marks: 50 Min. Pass Marks: 25	

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

Plane Curves And Free Hand Sketching:
Basic Geometrical constructions, Curves used in engineering practices: Conics – Construction of ellipse, parabola and hyperbola by eccentricity method – Construction of cycloid – construction of involutes of square and circle – Drawing of tangents and normal to the above curves, Scales: Construction of Diagonal and Vernier scales. Visualization concepts and Free Hand sketching: Visualization principles –Representation of Three Dimensional objects – Layout of views- Free hand sketching of multiple views from pictorial views of objects

SECTION – B

Projection Of Points, Lines And Plane Surfaces:
Orthographic projection- principles-Principal planes-First angle projection-projection of points. Projection of straight lines (only First angle projections) inclined to both the principal planes - Determination of true lengths and true inclinations by rotating line method and traces Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method.

SECTION – C
Projection of Spolids
Projection of simple solids like prisms, pyramids, cylinder, cone and truncated solids when the axis is inclined to one of the principal planes by rotating object method and auxiliary plane method.

SECTION – D
Projection of Sectioned Solids and Development of Surfaces
Sectioning of above solids in simple vertical position when the cutting plane is inclined to the one of the principal planes and perpendicular to the other – obtaining true shape of

section. Development of lateral surfaces of simple and sectioned solids – Prisms, pyramids cylinders and cones. Development of lateral surfaces of solids with cut-outs and holes

Principles of isometric projection

isometric scale –Isometric projections of simple solids and truncated solids - Prisms, pyramids, cylinders, cones- combination of two solid objects in simple vertical positions and miscellaneous problems. Perspective projection of simple solids-Prisms, pyramids and cylinders by visual ray method .

Introduction: Starting, User Interface, Working with Commands, Cartesian Workspace, Opening an Existing Drawing File ,Viewing Your Drawing ,Saving Your Work,

Basic Drawing & Editing Commands : Drawing Lines , Erasing Objects , Drawing Lines with Polar Tracking , Drawing Rectangles, Drawing Circles , Undo and Redo Actions.

Drawing Precision: Using Running Object Snaps , Using Object Snap Overrides , Polar Tracking at Angles, Object Snap Tracking , Drawing with Snap and Grid (Optional).

Books:

1. Bhatt N.D. and Panchal V.M., "Engineering Drawing", Charotar Publishing House, 50th Edition, 2010.
2. AUTOCAD for Engineers and Designers BY Prof.Sham Tickoo, Published by Dreamtech Press
3. Autocad 2014 for Engineers and Designers by Prof. Sham Tickoo , Amit Bhatt (Author), T. Kishore , Gaurav Verma, Published by Dreamtech Press
4. AutoCAD 2013 and AutoCAD LT 2013 Bible: The Comprehensive Tutorial Resource by Ellen Finkelstein, Published by Wiley India Private Limited

Semester - I
Communication & Professional Skills in English (HU-1003)

Course Code	HU-1003	Credits-4	L-3, T-1, P-0
Name of the Course	Communication & Professional Skills in English		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments		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

Reading Skills: The skill of effective reading – eye movements, fixations, regression and visual
wandering, the right approach to reading; Factors affecting the style of reading – reader related material related and environmental; Memory, retention, association of read material.

Kinds of Reading: Introduction to phonetics – familiarization with speech sound and their symbols – articulation of speech sounds – stress and intonation.

Grammar: Word building use of punctuation marks, articles, tenses, abbreviations, prepositions, idioms & phrases transformation of sentences, incorrect to correct English, single word for a group of words.

Section B

Writing Skills: Business letters: principles, structure and style of writing business i.e., sales
letters, claim and adjustment letters, inviting quotations/tenders, writing a memo, job application letters, preparing a personal resume; Effective Meetings: Qualities i.e. planning, processing the discussion, conducting a meeting use of different type of questions, summaries, handling problem situations and problem people, writing notices, agenda and minutes of meetings; Report writing: Characteristics, types of reports, structure of technical/research reports, preparatory steps to report writing; Elements of style: Definition of style, characteristics of a good technical style – practical hints to improve the style of writing ; précis writing; Comprehension of passages (May be picked up from the books recommended for reading).

Section C

Listening Skills: Barriers to listening, effective listening and feedback skills, Telephone
techniques. Considerations of listening and voice, developing telephone skills –

preparing for the call, controlling the call follow up action. Handling difficult calls and difficult callers.

Section D

Speaking And Discussion Skills: Effective speaking: Preparation i.e., deciding the objective,

preparing the environments, organizing the material selection of words, voice modulation, speed, expression, body language, dealing with questions, dealing with nervousness, presentation of

audio-visual aids; Group Discussions: The art of participating in group discussion i.e., initiative, cooperation with group members, analysis of the issue, putting one's views effectively, establishing leadership.

Assignments / Seminars / discussions may be given for following skill

development. a)   Word processing a document
b)   Report writing
c)   Preparing agenda for meeting
d)   Preparing minutes of the meeting /
seminars. e)   Press Releases
f)   Preparing a Brochure
g)   Advertisements
h)   Preparing a power point slide show on a PC / OHP
i)   Any other exercise decided by the course Professor.

Books:
1. Sheila HA Smith, M and Thomas, L., Methuen, Reading to Learn; London, 1982.
2. McGraw, SJ;Basic Managerial Skills for all, Prentice Hall of India, New Delhi 1991
3. Technical Reporting Writing British Association for commercial and Industrial Education, BACIE, 1992
4. Chrissie Wright (Ed.); Handbook of Practical Communication Skills; JAICO Books
5. K.K.Sinha, Business Communication, Galgotia Publishing Company, New Delhi, 1999.
6. English Grammar
7. David Cameron, Mastering Modern English.
8. Robert L. Shuster, Written Communication in Business.
9. Ron Ludlow & Ferous panton. The Essence of Effective Communication.
10. Ragmond & Petit, business Communication.
11. Common Errors in English, by Sudha Publication (P) Ltd., B-5, Prabhat Kiran Building, Rajendra Place, New Delhi – 110008.
12. Abul Hashem, Common Errors in English, Ramesh Publishing House, Daryagang New
      Delhi.
13. Objective English by Tata McGraw Hill Publishing Co. Ltd., New Delhi.
14. R.K.Bansal & J.B. Harrison, spoken English for India, Orient Longman.
15. Veena Kumar, The Sounds of English, Makaav Educational Software, New Delhi.
16. R.C.Sharma & Krishna Mohan, Business Correspondence and Report writing, Tat McGraw
      Hill Publishing Co. Ltd., New Delhi
17. Group Discussion by Sudha Publications and Ramesh Publishing House, New Delhi.

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, Jwahar Lal Nehru.

Course Code	EC -1001	Credits-4	L-3, T-1, P-0
Name of the Course	Basic Electronics		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/ Assignments		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
Brief review of Band Theory, transport phenomenon in semiconductors, Electrons and holes in
Intrinsic semiconductor, Donor and acceptor Impurities, charge densities in semiconductor.
PN Junction, Reverse and Forward bias conditions, Diode Characteristic and parameter, Ideal vs. Practical diode.equivalent circuits and frequency response. rectification-half and   full wave,
Zener and Avalanche diode, its role as regulator, photodiode.

Section B
Bipolar junction transistor (BJT) and their characteristics as circuit and gain elements.
Two port network analysis, h-parameters and trans-conductance. Equivalent circuits for JFET
and MOSFET, enhancement mode and depletion mode MOSFETS.
Unijunction transistor (UJT), UJT characteristics, parameters and circuit operation.

Section C
Bias for transistor amplifier: fixed bias, emitter feed back bias. Feedback principles. Types of
feedback, Stabilization of gain, reduction of non-linear distortion, change of inputs and output resistance by negative feedback in amplifier. Amplifiers coupling, types of coupling, Amplifier pass band, Eq circuits for BJT at high frequency response of CE, RC-Coupled amplifiers at mid, low and high frequencies.

Section D
Semi conductor processing, active and passive elements, Integrated circuits, bias for

integrated

circuits. Basic operational amplifier, applications of operational amplifier – adder, subtractor, Integrator, differentiator and comparator, Photo transistor: its characteristics and applications.

Reference Books:-
1. A.P.Malvino.Electronic Principles.
2. J.D. Ryder Electronic Fundamentals and Applications.
3. J.Millman and C.C.Halkias Electronic Circuits & Devices.
4. J.Millman & C.C.Halkias Integrated Circuits & Devices.
5. N.N.Bhargava & Kulshrestha, Electronic Devices.

Introduction to Computer & Programming in C (CS-1001)

Course Code	CS-1001	Credits-4	L-3, T-1, P-0
Name of the Course	Introduction to Computer & Programming in C		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/ Assignments		Max Marks: 50 Min. Pass Marks: 25	

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

Fundamental Computer Concept: Operating system fundamentals, disk basics, VDU Basics,
Keyboard basics, introduction to compiler, interpreter, assembler, linker and loader and their inter relationship, Introduction to basics of Information Technology.

Section B

Problem solving with Computers: Algorithms, pseudo codes and Flowcharts, Debugging, testing
and documentation, structure-programming concepts, top down and bottom-up
design approaches. Data types, Constants, variables, arithmetic and logical expressions, data inputs and output, assignments statements, conditional statements.

Section C

Iteration, arrays processing, use-defined data types, functions, recursion, parameter passing by
reference and by
value.

Section D

Structure, Multiple structures, Arrays of structure,
Unions,
Files: reading, writing text and binary files, pointers, character pointers, pointers to arrays, arrays of pointer to structures.
(The programming language C is to be taught along with the course in
detail.)

Books:

1. Kanitkar, "Let us C", BPB Publications
2. Richie and Kerningham, "C Programming"

3. V Rajaraman "Fundamentals of computers"
4. D.Dromey, "How to solve it by computers" (Prentice Hall)
5. E. Balaguruswamy, "Programming in C", Tata McGraw Hill.

Semester - I
Applied Physics Lab (AS-1003)

Course Code	AS-1003	Credits-2	L-0, T-0, P-2
Name of the Course	Applied Physics Lab		
Lectures to be	26 hours of Lab. work (2 hrs. per week)		
Semester End	Max Marks: 50	Min Pass Marks: 20	Maximum Time: 3
Continuous Assessment	Lab work 30% Lab Record 25%		Max Marks: 50 Min Pass Marks: 25

Instructions for paper setter / candidates
Laboratory examination will consist of two parts:
- (i) Performing a practical exercises assigned by the examiner (25 marks).
- (ii) Viva-voce examination (25 marks)

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
Note: (Two experiments to be done from each section, total number of experiments required to be
performed 10 to be decided by the teacher concerned and availability of equipment.)

Section A
1. To find the wavelength of sodium light by Newton's rings experiment.
2. To find the wavelength of sodium light by Fresnel's Biprism experiment.
3. To find the wavelength of sodium light by using the phenomenon of diffraction of light at a straight edge.
4. To find the wavelength of various colors of white light with the help of a plane transmission diffraction grating.
5. To find the wavelength of sodium light by Michelson interferometer.

Section B
1. To find the refractive index and Cauchy's constant of a prism by using spectrometer.
2. To find the resolving power of a telescope.
3. To study the beam parameters of a helium-neon laser.
4. To find the specific rotation of sugar solution by using a polarimeter.
5. To find the velocity of Ultrasonic Waves in a given liquid.
6. To find the specific rotation of sugar using polarimeter

Electricity and Magnetism
Section C
1. To compare the capacitances of two capacitors by De'sauty Bridge.
2. To find the flashing & quenching potentials of argon & also to find the capacitance of unknown capacitor.
3. To find the temperature coefficient of resistance by using platinum resistance thermometer and Callender & Griffith bridge.

Section D

1. To find the frequency of AC mains by using sonometer.
2. To find the low resistance by carrey – Foster's bridge.
3. To find the resistance of a galvanometer by Thomson's constant deflection method using a post office box.
4. To find the value of high resistance by Substitution method.
5. To find the value of high resistance by Leakage method.
6. To convert a galvanometer into an ammeter of a given range.
7. To study the variation of magnetic field with distance and to find the radius of coil by Stewart and Gee's apparatus.
8. To find the reduction factor of two turn coil of tangent galvanometer by using a copper voltammeter.

Modern Physics: Section E
1. To find the value of e/m for electrons by Helical method.
2. To determine the charge of an electron by Millikan's oil drop method.
3. To find the ionization potential of Argon. Mercury using a thyratron tube.
4. To find the value of Planck's constant by using a photoelectric cell.

Section F
1. To study the various crystal structures using Beed Model.
2. To calculate the hysteresis loss by tracing a B-H curve for a given sample.
3. To determine the band gap of an intrinsic semiconductor by four probe method.
4. To determine the resisitivity of a semi-conductor by four probe method at different temperatures.
5. To determine the Hall co-efficient.
6. To study the photovoltaic cell & hence to verify the inverse square law.

Books:
1. Practical Physics-S.L.Gupta & V.Kumar.
2. Advanced Practical Physics Vol. I & II – S.P. Singh
3. Practical Physics for B.Sc I, II and III - C.L.Arora.

Basic Electronics Lab (EC-1002)

Course Code	EC-1002	Credits-2	L-0, T-0, P-2
Name of the Course	Basic Electronics Lab		
Lectures to be	26 hours of Lab. work (2 hrs. per week)		
Semester End	Max Marks: 50	Min Pass Marks: 20	Maximum Time: 3
Laboratory Continuous	Lab work 30%	Lab Record 25%	Max Marks: 50 Min Pass Marks: 25

Instructions for paper setter / candidates

Laboratory examination will consist of two parts:
   (i)   Performing a practical exercises assigned by the examiner (25 marks).
   (ii)   Viva-voce examination (25 marks)

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.   (a) To study the use and scope of using an oscilloscope as a measuring device in an electronic laboratory.
        (b) To study the use and scope of using a millimeter (digital and analog) as a measuring device in an electronics laboratory.
        (c) To study the use and scope of function generator as a signal source in an electronics laboratory.

Set up an experiment to:
   2.   Draw forward bias and reverse bias characteristics of a p-n junction diode and use it as a half wave and full wave rectifier.
   3.   Draw the characteristics of a zener diode and use it as a voltage regulator.
   4.   Draw characteristics of common base configuration of p-n-p transistor.
   5.   Draw characteristics of common emitter configuration of an npn transistor.
   6.   Draw characteristics of common drain configuration of a MOSFET.
   7.   Find the voltage and current gain of single stage common emitter amplifier.
   8.   Draw the characteristics curve of UJT.
   9.   Find the voltage gain of single stage voltage series feedback amplifier.
   10. Use operational amplifier as
        I)   Inverting amplifier
        II)   Non-inverting amplifier
        III) Comparator
   11. Use operational amplifier as
        I)   Integrator
        II)   Differentiator
   12. Use operational amplifier as
        I)   Adder
        II)   Precision amplifier
   13. Find the overall voltage gain and current gain of a two stage RC coupled amplifier.

Basic electronics should stress on interfacing with real life devices and general-purpose linear

units. Emphasis is on system design and not on discrete components, some of the components around which exercises can be built are

1. SCR as triacs and power control.
2. Power supplies starting with zener.
3. Op to compliers and isolations where photo diode, transistors, leds are used.
4. Laser diode (laser pointer)
5. Op amps
6. Op amps for instrument amplifiers.

Note: - Record to be maintained in the laboratory record book for evaluation. Usage of breadboard approach to be encouraged

Engineering Graphics Lab (ME-1002)

Course Code	ME-1002	Credits-3	L-0, T-0, P-3
Name of the Course	Engineering Graphics Lab		
Lectures to be	39hrs. (Lab Session=13(3 hrs. each))		
Semester End	Max Marks: 50	Min Pass Marks:	Maximum Time: 3
Laboratory	Lab work 30%	Lab Record	Max Marks: 50
Continuous	25%		Min Pass Marks:

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

    (i)   Performing a practical exercises assigned by the examiner (25 marks).

    (ii)   Viva-voce examination (25 marks)

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.

Introduction:
Starting AutoCAD, User Interface, Working with Commands, AutoCAD's Cartesian Workspace, Opening an Existing Drawing File ,Viewing Your Drawing ,Saving Your Work, Basic Drawing & Editing Commands : Drawing Lines , Erasing Objects , Drawing Lines with Polar Tracking , Drawing Rectangles, Drawing Circles , Undo and Redo Actions.
Drawing Precision in AutoCAD : Using Running Object Snaps , Using Object Snap Overrides , Polar Tracking at Angles, Object Snap Tracking , Drawing with Snap and Grid (Optional).
Making Changes in Your Drawing : Selecting Objects for Editing , Moving Objects , Copying Objects , Rotating Objects , Scaling Objects , Mirroring Objects , Editing with Grips.
Advanced Object Types: Drawing Arcs ,Drawing Polylines, Editing Polylines, Drawing Polygons , Drawing Ellipses.

Getting Information from Your Drawing:
Working with Object Properties , Measuring Objects , Advanced Editing Commands, Trimming and Extending Objects , Stretching Objects , Creating Fillets and Chamfers , Offsetting Objects , Creating Arrays of Objects.
Inserting Blocks: What are Blocks? Inserting Blocks ,Working with Dynamic Blocks , Inserting Blocks with DesignCenter

Setting Up a Layout : Printing Concepts , Working in Layouts , Copying Layouts , Creating Viewports , Guidelines for Layouts.

Text : Working with Annotations , Adding Text in a Drawing , Modifying Multiline Text , Formatting Multiline Text , Adding Notes with Leaders to Your, Drawing , Creating Tables , Modifying Tables, Hatching, Editing Hatches , Adding Dimensions, Dimensioning Concepts , Adding Linear Dimensions , Adding Radial & Angular Dimensions , Editing Dimensions, Model Space and Paper Space, Creating Tiled View ports, Making a View port Current, Joining Two Adjacent View, Paper Space Viewports(Floating Viewports), Editing Viewports, Manipulating the visibility of Viewport Layers

Printing Your Drawing :Printing Layouts , Printing from the Model Tab

Understanding External References:
External References, Dependent Symbols, Managing External Refernces in a drawing, The Overlay option, , Working with the ATTACH Command, The User Coordinate System: The World Coordinate System, Controlling the Visibility of UCS Icon, Defining the New UCS, Managing the UCS

Books:

    1. AUTOCAD for Engineers and Designers BY Prof.Sham Tickoo, Published by

Dreamtech Press

Autocad 2014 for Engineers and Designers by Prof. Sham Tickoo , Amit Bhatt (Author), T.   Kishore , Gaurav Verma, Published by Dreamtech Press

2. AutoCAD 2013 and AutoCAD LT 2013 Bible: The Comprehensive Tutorial Resource by Ellen Finkelstein, Published by Wiley India Private Limited

Semester - I
Computer Programming Lab. (CS -1002)

Course Code	CS -1002	Credits-2	L-0, T-0, P-2
Name of the Course	Computer Programming Lab.		
Lectures to be	26 Hrs. of Lab. Work (2 hrs. per week)		
Semester End	Max Marks: 50	Min Pass Marks: 20	Maximum Time:
Laboratory Continuous Assessment	Lab work 30% Record 25% Viva/ Hands on 25%	Lab Max Marks: 50	Min Pass Marks: 25

Instructions for paper setter / candidates

Laboratory examination will consist of two parts:

 (i) Performing a practical exercises assigned by the examiner (25 marks).

 (ii) Viva-voce examination (25 marks)

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.

 A. Dos 6.2 (through MS-DOS prompt, usage of basic commands, idea of .bat, .sys, .com, .exe etc.and usage of an editor to be done in consultation with the faculty incharge for the course).

 B. Windows (usage of GUI for working effectively in laboratory to be done in consultation with the faculty incharge for the course).

 C. Microsoft office (projects based on word, excel, power point, access, to prepare reports, presentations and databases to be done in consultation with the faculty incharge for the course).

 D. Programming of fundamental algorithms in C in the form of projects in groups of two (based on how to solve it, Dromey and let us C by Kanitkar and in consultation with the faculty incharge for the course).List of Lab. exercises to be displayed in advance covering whole of the course. Tentative list is given below to be developed in the form of projects. 10 more exercises to be added by the faculty incharge.

1. Write a program to find the largest of three numbers (if-then-else).

2. Write a program to find the largest number out of ten numbers (for statement).

3. Write a program to find the average male height & average female heights in the class(input is in form of sex code, height).

4. Write a program to find roots of quadratic equation using functions and switch statement.

5. Write a program using arrays to find the largest and second largest no.

6. Write a program to multiply two matrices.

7. Write a program to read a string and write it in reverse order.

8. Write a program to concatenate two strings.

9. Write a program to sort numbers using the Quick sort Algorithm.

10. Represent a deck of playing cards using arrays.

Note: - Record to be maintained both electronically and hard copy for evaluation.

SECOND SEMESTER

APPLIED MATHEMATICS – II(AS – 2001)

Course Code	AS – 2001	Credits : 4	L-3, T-1, P-0
Name of the Course	APPLIED MATHEMATICS-II		
Lectures to be	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 50%, Tutorials/ Assignments 30%,		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

Vector Calculus: Curves, arc length, tangent, curvature and torsion, Directional derivative, Gradient

of a scalar field, divergence and curl of a vector field. Line, surface and volume integrals, theorem of gauss, Stoke's and Green's (proofs not needed), consequences and applications.

SECTION – B

Integral Transforms: Fourier series, Euler's formula, even and odd functions, half range expansions. Fourier integral. Fourier and Laplace transform, Inverse transform of derivatives and integrals, shifting theorem,

application to periodic functions, unit step function, impulse function.

SECTION – C

Second order Differential Equations: Solution by: Power series method and its basis, Solution of Bessel and

Legendre differential equations, properties of Bessel and Legendre functions.

SECTION – D

Partial Differential Equations (PDE): Formulation and classification. Solution of wave equation heat

equation in one dimension and Laplace equation in two dimesion by the method of separation of variables.

Books:
1. E.Kreyszig, Advanced Engineering Mathematics (Wiley Eastern Pvt. Ltd.).
2. S.S.Sastri, Engineering Mathematics (2nd edition) Vol-I and Vol-II.
3. B.S.Grewal, Higher Engineering Mathematics.
4. Piskunov, Differential and Integral Calculus.

5.   R.K.Jain and S.R.K.Iyengar, Advanced Engineering, Mathematics.
6.   Michael d.Greenberg, Advanced Engg. Mathematics.

APPLIED PHYSICS– II(AS –2002)

Course Code	AS –2002	Credits : 4	L-3, T-1, P-0
Name of the Course	APPLIED PHYSICS – II		
Lectures to be	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 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

Crystal Structure: Space lattice, unit cell and translation vector, miller indices, Simple crystal

structure, bonding in solids, Experimental x-ray diffraction method, laue method, powder method.

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

SECTION – B

Band Theory of Solids: Origin of energy bands, kronig, Penney Model (qualitative), E-K diagrams,

Brillouin Zones, Concept of effective mass and holes, Classification into metals, semiconductors and insulators, fermi energy and its variation with temperature.

SECTION – C

Photoconductivity & Photovoltaic: Photoconductivity in insulating crystals, variation with

illumination, Effect of traps, application of photoconductivity, Photovoltaic cell and their characteristics.

Properties of Solids: Atomic Magnetic Moments, Orbital Diamagnetism, Classical Theory of Para magnetism, Ferromagnetism Molecular Field theory and domains, Magnetic circuit. Its comparison with Electric circuit and its applications, Super Conductor (Introduction,

Types and Applications) Hall Effect.

SECTION – D

Laser: Spontaneous and stimulated emission, Laser action, Characteristics of Laser Beam – Concept

of coherence, Types of lasers based on pumping techniques, He-Ne Laser, Semiconductor Laser

(simple Ideas) with applications.

Fiber Optics: Optical communication: Communication through open space, optical wave guides with special reference to Propagation of light in Fibres, Numerical Aperture, single mode and multi mode Fibers, applications.

Books:
1.   Charles Kittel: Introduction to Solid State Physics.
2.   B.S.Saxena, R.C.Gupta & P.N.Saena: Solid state Physics.
3.   M.B.Avadhanulu & P.G.Kshirsagar, A text book of Engineering Physics.
4.   Arthur Beiser, concepts of Modern Physics, 5th International edition Tata McGraw Hill.
5.   A.J.Dekkar, Introduction to solid state Physics.

FUNDAMENTALS OF COMPUTER SCIENCE AND TECHNOLOGY(CS – 2002)

Course Code	CS – 2002	Credits : 4	L-3, T-1, P-0
Name of the Course	FUNDAMENTALS OF COMPUTER SCIENCE AND TECHNOLOGY		
Lectures to be	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 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

Computer Appreciation: Definition of an Electronic Digital Computer, history, Generations, Characteristics and applications of Computers, classification of Computers.

Fundamentals of Computer & Internet:
Introduction to Computer and Problem Solving: Information and Data Hardware: CPU, Primary and Secondary
storage, I/O devices, Bus structure, Computer Peripherals - VDU, Keyboard, Mouse, Printer. Software: System
and Application. Different System Software.

Programming Languages: Machine Language, Assembly Language, High Level Language, Object Oriented
Language.

SECTION – B

Programming Language Classification: Computer Languages, Generation of Languages, Translators – Interpreters, Compilers, Assembles, Introduction to 4GLS.

Problem solving: Algorithm, Flow charts, Decision tables & Pseudo codes.

Number systems and Codes: Number representation: Weighted codes, Non-weighted codes, Positional,

Binary, Octal, Hexadecimal, Binary Coded Decimal (BCD), Conversion of bases. Complement notations, Binary
Arithmetic, Binary Codes: Gray, Alphanumeric, ASCII, EBCDIC, Single Error-Detecting and Correcting Codes,
Hamming Codes.

Basic Computer Organization: IAS Computer, Von Neumann Computer, System Bus. Instruction Cycle, Data
Representation, Machine instruction and Assembly Language, CPU Organization, Arithmetic and Logic Unit,
Control Unit, CPU Registers, Instruction Registers, Program Counter, Stack Pointer.

SECTION – C
Introduction to Networking & Advantages of Networking: Basic Features, LAN, MAN and WAN; simple PC
Based Network: Example, block diagram. Mode of operation and characteristic features. Types of LAN,
Basic ISO-OSI model of LAN, client – Sever Architecture's.

Intranet and Internet: Servers and Clients; Ports; Domain Name Server (DNS); WWW, Browsers Connections:
Guided and Unguided media - Dial up, ISDN, ADSN; Cable, Modem; E-mail, Voice and Video Conferencing.

SECTION – D
Information Technology Applications: Multimedia introduction, tools graphics, sound, video and
animations. Artificial intelligence (AI) – Basic concepts of AI and Expert
systems.

Latest Computer enabled business applications: Basic concepts with definitions and short introduction of Enterprise Resource Planning (ERP), Customer relationship Management (CRM) Supply Chain Management (SCM), E-Commerce. Awareness of Ongoing IT Projects in India such as NICNET, ERNET, INFLIBNET etc.

**Book
s:**
1.   Rajaram,V.:   Introduction   to
Computer.
2.   Morris: Computer
Organisation.
3.   Hamacher: Computer
Organisation.
4.   Kanter: Managing   Information
System.
5.   Vital   N: Information   Technology   India
Tomorrow.
6.   Murthy   C.S.V: Fundamentals   &   Information
Technology.

Semester - II

SCIENCE, TECHNOLOGY AND SOCIETY (HU – 2002)

Course Code	HU – 2002	Credits : 4	L-3, T-1, P-0
Name of the Course	SCIENCE, TECHNOLOGY AND SOCIETY		
Lectures to be	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 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		Max. Marks: 50	

Instruction

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.

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

1. Science, Technology and Engineering, as knowledge and as social and professional activities.
2. Inter-relationship of technology growth and social, economic and cultural growth: historical perspective.
3. Ancient, medieval and modern technology/Industrial revolution and its impact. The Indian Science and
   Technology.

SECTION – B

1. Social and Human critiques of technology: Mumford and Ellul.
2. Rapid technological growth and depletion of resources. Reports of the club of Rome.
3. Energy crisis; renewable energy resources.
Environmental degradation and pollution. Eco-friendly technologies. Environmental regulations. Environmental ethics.

SECTION – C

1. Technology and the arms race. The nuclear threat.
2. Appropriate technology movement Schumacher; later developments.
3. Technology and the developing nations. Problems of technology transfer. Technology assessment/impact analysis.
4. Human operator in Engineering projects and industries Problems of man machine

interaction. Impact of assembly line and automation. Human centered technology.

SECTION – D

1. Industrial hazards and safety. Safety regulations. Safety Engineering.
2. Politics and technology. Authoritarian versus democratic control of technology. Social and ethical audit of industrial organizations.
3. Engineering profession. Ethical issues in Engineering practice, Conflicts between business demands and professional ideals. Social and Ethical responsibilities of the engineer. Codes of professional ethics. Whistle blowing and beyond. Case studies.

BOOKS:
1. Appleyard, R.ed. 1989. the impact of international migration on developing countries paris: OECD.
2. Barger, Bernard 1952 science and the social order New York: Free Press.
3. Gaillard, J 1991. Scientists in the third world Lexington: Kentucky University Press.
4. Gaillard, J., V.V.Krishna and R.Waast, eds. 1997. Scientific communities in the developing world New Delhi: Sage.
5. Kamala Cahubey ed. 1974. Science policy and national development New Delhi: Macmillan.
6. Krishna, V.V.1993. S.S.Bhatnagar on science, technology and development 1938-54 New Delhi: Wiley Eastern.
7. Kornhauser, William, 1962 Scientists in industry, Berkley; University of California Press, price, Derek J.dSolla,
1963 little science, big science New York Columbia University Press.
8. Rahman, A.1972 Trimurti: Science, Technology and society – A collection of essays New Delhi: Peoples Publishing House.
9. Storer, Norman W.1966. The social system of science New York: Holt Rinehart and Winston.
10. UNCTAD/CSIR Case study in reverse transfer of technology: A survey of problems and policy in India Doc.
TD/B/C.6AC.4/6 and Corr.1, Geneva.
11. Crane, Diana. 1965. "scientists at major and minor universities: A study of productivity and recognition'" American sociological review, 30 (5) , Pp. 699-714.
12. Coler, Myron A.ed 1963 Essays on the creativity in the sciences New York: New York University Press.
13. Debroy, Bibek. 1996. Beyond the Uruguay round: The Indian perspective on GATT New Delhi: Sage.
14. Gilpin, Robert, and Christopher Wright eds. 1964. Scientists and national policy making New York: Columbia University Press.
15. Kumar, Nagesh and N.S.Siddharthan. 1997. Technology, market structures and internationalization: Issues and policies for developing countries London: Routlege and the united National University.
16. MacLeod, Roy and Deepak Kumar, 1995. Technology and the raj: Western technology and technical transfers to India,
1700-1947 New Delhi: Saga.
17. Merton, Robert K.1938. "Science, technology and society in seventeenth – century

England" Osiris (Bruges, Belgium),
14 Pp.360-632.

BASIC ELECTRICAL ENGINEERING (EE – 2001)

Course Code	EE –2001	Credits: 4	L-3, T-1, P-0
Name of the Course	**BASIC ELECTRICAL ENGINEERING**		
Lectures to be	52 (1 Hr Each) (L = 39, T = 13 for each semester)		
Semester End Examination	Max. Time: 3 hrs.	Max. Marks: 100	Min. Pass Marks:
Continuous Assessment (based on sessional tests 50%, Tutorials/ Assignments 30%, Quiz/Seminar	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:

D.C. circuits: Ohm's law, Kirchoff's Laws, Thevenin's, Norton's, superposition theorem, Maximum
power transfer theorem, Reciprocity, Compensation, Millman and Tellegan's Theorem . D.C. circuits, Nodal and Mesh analysis.

A.C. circuits: Sinusoidal signal, instantaneous and peak values, RMS and average values, phase angle, polar and rectangular, exponential and trigonometric representations RL and C components, behavior of these components in A.C. circuits, concept of complex power, power factor.

Transient Response: transient response RL, RC and RLC circuits with
step input.

Section B:

Series and Parallel A.C. circuits: Series and Parallel A.C. circuit, Series and Parallel resonance. Q
factor, cut off frequency and
bandwidth.

Three phase circuits: Phase and line voltages and currents, balanced star and delta circuits, power equation, measurement of power by 2-wattmeter method, importance of earthling.

Section C:

Transformers: Principle, construction and working of transformer, Efficiency and
regulation.

Electrical Machines: Introduction to D.C. Machines, induction motor, Synchronous machines.

Section D:

Measuring Instruments: Voltmeter, Ammeter, Wattmeter, Energy meter.

Batteries: Storage batteries:- Types, construction, charging and discharging, capacity and efficiency.

Books :

1. Kothari & Nagarath: Basic Electrical Engg. (2nd Edition), TMH.
2. B.L. Theraja & A.K. Theraja, S.Chand: Electrical Technology(Vol-1).
3. Deltoro: Electrical Engg Fundamentals, PHI.

BASIC MECHANICAL ENGINEERING(ME – 2001)

Course Code	ME - 2001	Credits: 4	L-3, T-1, P-0
Name of the Course	Basic Mechanical Engineering		
Lectures to be	65 (1 Hr Each) (L =52, T = 13 for each semester)		
Semester End Examination	Maximum Time: 3 hrs.	Max. Marks: 100	Min. Pass Marks: 40
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%,	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
First Law of Thermodynamics

Essence and corollaries of the first law, analytical expressions applicable to a process and cycle,
internal energy, enthalpy and specific heats, first law analysis of steady flow, applications of steady flow energy equation to engineering devices.

Applications of first law of Thermodynamics

Closed and open systems, analysis of non-flow and flow processes for an ideal gas under constant
volume (Isochoric), constant pressure (Isobaric), constant temperature (Isothermal), adiabatic and polytropic conditions. Analysis of free expansion and throttling processes. Representation of these processes on P-V charts and analysis of property changes and energy exchange (work and heat) during these processes.

SECTION – B
Second Law of Thermodynamics

Limitations of first law, various statements of second law and their equivalence, application of
statements of second law to heat engine, heat pump and refrigerator. Philosophy of Carnot cycle and its consequences. Carnot theorem for heat engines and heat pump. Classius inequality, concept and philosophy of entropy and entropy changes during various processes. Temperature – entropy chart and representation of various processes on it. Third law of thermodynamics.

SECTION – C

Simple Stresses & Strains

Concept & types of Stresses and strains, Poisson's ratio, stresses and strain in simple and compound
bars under axial loading, stress strain diagrams, Hooks law, Elastic constants and their relationships. Temperature stress and strain in simple and compound bars under axial loading, Numerical problems.

Shear Force and Bending Moments

Definitions, SF & BM diagrams for cantilevers, simply supported beams with or without over-hang
and calculation of maximum BM and SF and the point of contraflexture under (i) concentrated loads, (ii) uniformly distributed loads over whole span or a part of it, (iii) combination of concentrated loads and uniformly distributed loads. Relation between the rate of loading, the shear force and the bending moments, Numerical Problems.

SECTION – D
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, stress in beam with derivation, Combined
Bending , Torsion & Arial loading of beams ,
Numerically .

Torsion of Circular Members

Design of thin Circular Tubes, Torsion of Solid and hollow circular shafts, Combined bending and
torsion, Equivalent torque, Numerical
Problems.

Text Books

1. Nag, P.K., "Engineering Thermodynamics", Tata McGraw – Hill, New Delhi.
2. Yadav, R., Thermal Science and Engineering, Central Publishing House, Allahabad.
3. Strength of Materials – G.H.Ryder – Third Edition in S I units 1969 Macmillan India.
4. Mechanics of Materials – Dr. Kirpal Singh, Standard Publishers Distributors, New Delhi.

Reference Books

1. Strength of Materials – Popoy, PHI, New Delhi.
2. Strength of Materials – Sadhu Singh, Khanna Publications.
3. Strength of Materials – A Rudimentary Approach – M.A.Jayaram, Revised Ed. 2001, Sapna

Book House, Bangalore.

4. Strength   of   Materials   –
U.C.Jindal
5. Moran, M.J. and Shapiro, H.N., Fundamentals of Engineering Thermodynamics, John Wiley, New York.
6. Van Wylen, G.J., Fundamental of Classic Thermodynamics, John Wiley, New York.
7. Spalding, D.B. and Cole, E.H., Engineering Thermodynamics, ELBS, New Delhi.
8. Hibbeler, R.C. Engineering Mechanics – Statics, Addison Wesley Longman, New Delhi.

BASIC ELECTRICAL ENGINEERING LAB (EE–2002)

Course Code	EE – 2002		Credits : 2	L-0, T-0, P-2
Name of the	BASIC ELECTRICAL ENGINEERING LAB			
Lectures to be Delivered	26 hours of Lab sessions			
Semester End Examination	Max. Time : 3 hrs		Max. Marks : 50	Min. Pas
Laboratory	Continuous Assessment (based on Lab work 30%, Lab record 30%, Viva		Max. Marks: 50	Min. Pas

Instructions for paper setter / candidates
Laboratory examination will consist of two parts:
- (i) Performing a practical exercises assigned by the examiner (25 marks).
- (ii) Viva-voce examination (25 marks)

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 verify KCL and KVL.

2. TO study frequency response of series RLC circuit and determine resonance frequency and Q factor for various
   values of R,L,C

3. TO study frequency response of parallel RLC circuit and determine resonance frequency and Q

   factor for various values of R,L,C

4. To perform direct load test of transformer and plot efficiency v/s load characteristics.

5. To perform direct load test of the DC shunt generator and plot load v/s current curve.

6. To study and verify Thevenins, Norton's, superposition, Milliman's, maximum

   power, reciprocity theorems

7. To perform O.C and S.C test of transformer.

8. To study various types of meters

9. Measurement of power by 3 voltmeter/ 3 ammeter method.

10. Measurement of power in 3-phase system by 2-wattmeter method.

Computer Science Trainer Workshop (CS –2003)

Course Code	CS –2003	Credits : 4	L-1, T-0, P-3
Name of the	Computer Science Trainer Workshop		
Lectures to be delivered	52 hours		
Semester End Examination	Max. Time : 3 hrs	Max. Marks : 50	Min. Pas
Laboratory	Continuous Assessment (based on Lab work 30%, Lab record 30%, Viva	Max. Marks: 50	Min. Pas

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

(i) Performing a practical exercises assigned by the examiner (25 marks).
(ii) Viva-voce examination (25 marks)

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

This workshop will provide training of different types of operating systems (Windows98,LINUX) with hands on experiments on the following:

1. Installation of operating system.

2. Configuration of Hard Disk.

3. Configuration of Display Cards.

4. Configuration of sound cards.

5. Configuration of CDROM.

6. Configuration of Mouse.

7. Configuration of Printer.

8. Configuration of Display Cards.

9. Configuration of Network Cards.

10. Configuration of Modems.

11. Understanding Boot up process.

12. Creating and using emergency Disk.

13. Troubleshooting exercises related to various components of computer like Monitor drives, memory, printers etc.

14. Assembling a PC.

BASIC MECHANICAL ENGENEERING LAB (ME – 2002)

Course Code	ME – 2002		Credits : 2	L-0, T-0, P-2
Name of the	BASIC MECHANICAL ENGENEERING LAB			
Lectures to be delivered	26 hours of Lab sessions			
Semester End Examination	Max. Time : 3 hrs		Max. Marks : 50	Min. Pas
Laboratory	Continuous Assessment (based on Lab work 30%, Lab record 30%, Viva		Max. Marks: 50	Min. Pas

Instructions for paper setter / candidates

Laboratory examination will consist of two parts:
- (i) Performing a practical exercises assigned by the examiner (25 marks).
- (ii) Viva-voce examination (25 marks)

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 study low-pressure boilers.

2. To study High-pressure boilers.

3. Calibration of thermometers.

4. Calibration of pressure gauges.

5. Study of discharge measuring devices.

6. To determine co-efficient of discharge of orifice meter.

7. To verify the Bernoulli's Theorem.

8. To find Young's Modulus of Elasticity using Searl's apparatus.

9. To find Young's Modulus of Elasticity of a beam with deflection beam apparatus.

10. To find Modulus of rigidity with the help of torsion apparatus.

MAT LAB   **(IT– 1003)**

Course Code	**IT– 1003**	Credits : 2	L-0, T-0, P-2
Name of the Course	*MAT LAB*		
Lectures to be delivered	**26 hours of Lab sessions**		
Semester End Examination	**Max. Time : 3 hrs**	**Max. Marks : 50**	**Min. Pass Marks : 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 30%, Viva 30%, Attendance 10%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:
  i) Performing a practical examination assigned by the examiner (25 marks).
  ii) Viva-voce examination (25 marks).

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.

The aim of this laboratory is to help students get an idea about a programming environment very widely used by engineer to solve the problem in their respective disciplines.

Exercises on computer
  i. Roots of a quadratic equation.
  ii. Guessing a number
  iii. Units conversion
  iv. Factorial program
  v. Simulation of RC circuit
  vi. V-I characteristics of a MOSFET.
  vii. Finding average with dynamic array.
  viii. Writing a binary file
  ix. Reading a binary file
  x. Plotting one dimensional and two dimensional graph using MAT LAB 2-D plot types.
  xi. Using functions in MAT LAB Environment
To teacher concerned will give at least 10 exercises to solve non trivial problems using MAT LAB environment.

Reference books
1   Programming in MAT LAB by Marc E.Herniter   Thomson ASIA Ptd.
                                                         Ltd Singapore(2001)

2   MAT LAB the languages of computing.   The maths work inc.

SEMESTER - III

Computer Organization   **(IT -3001)**

Course Code	**IT – 3001**	Credits : 4	L-3, T-1, P-0
Name of the Course	**Computer Organization**		
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.

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

BASICS: An introduction to computers with block diagram, Computers generation, Impact of technology. Flynn's Classification of computers (SIMD, MISD, MIMD).

LOGIC DESIGN TECHNIQUES : Designing combinations logic using Karnaugh-Maps with building blocks of basic gates , Multiplexers, de-multiplexer, decoders and encoders, arithmetic, logics units .Instruction codes Computers registers and instructions, timing and control, instruction cycle memory reference instruction, I –O interruption

Basic sequential logic blocks flip-flops, registers, shift registers and counters,

SECTIONS-B

COMPUTER ARITHMETIC: Adder and Subtraction circuits, Booth Multiplication algorithm Performance bench marks, Division Algorithm, Floating Point Arithmetic operations.

CONTROL PATH DESIGN: Sequence counter method, Micro programmed controllers address sequencing Control Option.

SECTION-C:

CENTRAL PROCESSING UNIT: Registers general register origination, stack origination, Instruction formats, address instructions, addressing modes, data transfer and manipulations,CISC,programmed control RISC instruction set

design, applications of CISC &RISC three address instructions and arithmetic pipelines with example of floating point adder, instruction pipe lines, advanced pipe lining using instruction level parallelism,

SECTION –D
MEMORY ORGANISATION: Memory device characteristics, random access memory, serial access memory virtual memory associative memory cache memory, memory management hardware.
I/O ORGANISATION: I/O interface asynchronous data transfer DMA interrupt, I/O processor

BOOKS:
1. M. Moris Mano , Computer System &Architecture PHI
2. Hayes J. P Computer Architecture & Organization .
3. M. Morris & Charles R . Kire , Logic and Computer Design Fundamental – PHI 1995

Object Oriented Programming (IT – 3002)

Course Code	**IT – 3002**	Credits : 4	L-3, T-1, P-0
Name of the Course	**Object Oriented Programming**		
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.
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 object oriented concepts : Overview, Abstract data type :Object , Modularization , classes, creating and destroying objects, garbage collection strategies , overloading , dynamic binding, polymorphism , constants.
Inheritance: class inheritance, inheriting instance variable inheriting methods, meta classes , object inheritance , multiple and multilevel inheritance

SECTION B
C++ programming language: overview: programming paradigm support for data abstraction and object oriented programming , declaration and constant , expression and statements , functions and files
Classes and objects : Definitions of class declaration , data numbers class function definition , member function definition scope resolution operator , private and public member function, nesting of member function , creating objects , accessing class data member functions , array of objects, objects as function arguments
Operator overloading :Operator function, user defined typed conversion large objects, assignment and initialization and subscripting and functions call, referencing, increment and decrement, a string class, friends and members.

SECTION –C

Inheritance thorough extending classes: Base and drive classes, visibility modes, single inheritance , protect member and inheritance , multilevel inheritance , nesting of classes .

Streams templates and design of libraries .output, input, formatting files and streams, C-I/O , Design of libraries.

SECTION –D

Objected oriented analysis and design: Object oriented analysis and system design , objected design , semantic and entity relationship modeling , contrasting design for data bases and OOA,OOD.

Books:
1. The C++ programming language , Bjarne Stroustrup ,Addison Wesley , 2000.
2. Obejcting Moudling and design, James ,Rumbaugh, Michel Blha , William Premerlani,Fredetrick Eddy and William Lorence , PHI-1998
3. Object oriented programming in turbo C++ , Robbet Lofre, Galgotia Publication Pvt Ltd. 1994.
4. Object oriented Programming with C++ , Balaguruswamy, Tata Mcgraw Hill Publication Co. Ltd 2000.
5. Programming with C++, D. Ravichandern, Tata Mcgraw Hill 1996..

Data Structures & Algorithms   **(IT – 3003)**

Course Code	IT – 3003	Credits: 4	L-3, T-1, P-0
Name of the Course	**Data Structures & Algorithms**		
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.

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: Basic concepts and notions, data structures and data structure operation, mathematical notation and functions algorithm complexity, running time of program.

Development of Algorithms: Storage Structure of Array, Stack and Queues.

Linked List: Singly Linked List, Linked Stacks and Queues, doubly linked list, circularly Linked list*.*

SECTION – B

TREES: Definitions and basic concept, linked tree representation, representations in contiguous storage, binary trees, binary tree traversal, searching insertion and deletion in binary trees, heap trees, heap sort algorithm, height balanced trees and AVL trees.

SECTION – C

GRAPHS: Graphs and 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, Heap Sort, Comparing the Complexities of Different searching and sorting Algorithm.

Note:

1.   Programs are implemented in C.

2. Insertion, deletion, Search and transversal operation are to be performed on all the data structures.

Books:

1. Tenebaum , A. Lanhgsam Y and Augensatein , A. J: Data structures using C , Prentice Hall of India.

2.Seymour Lipschutg : Theory an practice of Data structure , Mc. Graw Hill 1998.

3.Horowitz E and Sahni S: Data structure with Pascal 3rd edition , Galgotia 1991.

DATABASE MANAGEMENT SYSTEM   (IT - 3004)

Course Code	IT– 3004	Credits: 4	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. Time: 3 hrs.**	**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

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.

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 :
Overview of DBMS, Components of DBMS: (users, language, structure, data-dictionary, data manager, DBA, etc.). File Oriented approach versus Database Oriented approach, SPARC 3-level architecture. A brief overview of data models (hierarchical mode, network model, relational model, E-R model, Object Oriented Model), Overview of types of databases (Centralized, Parallel, Client-Server, Distributed).

Section B:
Entity-Relationalship model as a tool for conceptual design, Converting ER-Model into relational schema. Properties of relational model { Codd's 12 rules (integrity rules (concept of keys))}Relational algebra (select, project, cross product, joins (theta-join, equi-join, natural-join, outer join)),

Section C:
Functional Dependencies, Multi-valued Dependencies, Normalization (up to 5th level), Structured Query language (DDL, DML), INSERT, DELETE, UPDATE, VIEW definitions, Select Statement, integrity constraints: (not null, unique check, primary key, foreign key references),
file organization: (Sequential file, index sequential files, Direct files, Hashing, B-trees, index files).

Section D:

Transaction Processing & Concurrency Control: Transaction Concepts, Recovery in centralized DBMS, Serializability, Locking schemes (two phase locking, tree-locking protocol), granularity of locking.

Query processing (Introduction, steps in Query processing, General Processing Strategies, Query Optimisation). and security.

Books :

1. C.J. Date, " An introduction to data base System", 7th ed. Addison Wesly, 2000.

    Abraham Silberschataz, Henry F. Korth S. Sudershan ,The McGraw Hill Companies, Inc., 1997.

2. Naveen prakash ,"Introduction to Database management systems",Tata McGraw hill .

    Bipin C desai ,An introduction to database management system.

3. Database Systems Cocept, design and applications, S.K Singh, Pearson education

Digital Electronics   **(EC – 3001)**

Course Code	**EC – 3001**	Credits : 4	L-3, T-1, P-0
Name of the Course	**Digital Electronics**		
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.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one section 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

Binary, octal & Hexadecimal number systems and their inter conversion. Binary arithmetic (Addition & Subtraction, Multiplication & Division), 1's & 2's complements, 9's & 10's complement, BCD code, BCD Addition, Gray Code, Error Detection and Correction , Hamming code.

.

SECTION – B

Logic functions (OR, AND, NOT, NAND, NOR, XOR), Elements of Boolean Algebra (Theorems truth tables and relation's) Negative & Positive logic, Saturated & non saturated logic , fan in, fan-out, Logic IC's, de Morgan's Theorem, minterms and maxterms.

Karnaugh mapping, K-map representation of logical function for 2, 4 variable, simplification of Boolean equations with the help of K-map, Various minimization techniques, Quine's method and Quines Mc-Cluskey method, Half adder, full adder, half subtractor, full subtractor, serial and parallel binary adder

SECTION – C

Introduction and performance criteria for logic families, various logic families - DCTL, RTL, DTL, TTL & EC working and their characteristics in brief, MOS Gates and GMOS Gates, comparison of various logic families.

SECTION – D

Various kinds of Flip-Flop: RS Flip-Flop, Clocked RS Flip-Flop, Edge triggered D Flip-Flop, Flip-Flop Switching time, J/K Flip-Flop, JK Master Slave Flip flop. Shift registers: serial in serial out, parallel in parallel out, Ring counters, asynchronous counters, synchronous counters.

D/A Converter, A/D Converter, Multiplexer and Demultiplexer, Encoder and Decoder.

BOOKS:

1. Digital Principles & Applications   Malvino and Leach   : TMH
2. Digital Integrated Electronics   Taub and Schilling   : TMH
3. Digital Circuits and Logic Design   Samuel C Lee   : PHI
4. Pulse, Digital and Switching Waveforms   Millman and Taub.   :TMH
5. Modern Digital Electronics   R.P.Jain   :TMH
6. Digital Fundamentals   Floydd   :Pearson Edu.

Principles of Engineering Economics and Management   (AS – 3002)

Course Code	AS – 3002	Credits : 4	L-3, T-1, P-0
Name of the Course	**Principles of Engineering Economics and Management**		
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.
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

ECONOMICS   : Definitions, Nature & scope of Economics, Economics Systems-meaning of Capitalism, Socialism & mixed economy.
DEMAND AND SUPPLIES ANALYSIS: Law of demand and supply, exception to the law of demand, Elasticity of demand and supply and their types, Methods of measuring elasticity of demand and supply.

SECTION – B

THEORY OF PRODUCTION: Scales of production, Law of returns, Break even analysis.
MONETARY SYSTEM: 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: Privatization –Growth of private capitalism in India, Business/Trade Cycles – Meaning, Characteristics & classification, Foreign capital & economic development.

SECTION – C

MANAGEMENT PRINCIPLES: Meaning & types of Management, Concept of Scientific Management, Management by Objectives, System Approach to Management.

FINANCIAL MANAGEMENT: Meaning, functional areas of financial management, Sources of Finance, Meaning of financial accounting, accounting principles-concepts & conventions, Importance of final accounts – profit & loss a/c and balance sheet, Need and importance of capital budgeting.

MARKETING MANAGEMENT: Introduction to marketing management, Market segmentation, Developing & managing advertising programs, Deciding on media & measuring effectiveness.

SECTION – D

PRODUCTION MANAGEMENT: Procedure for production planning & Control, Plant Location & Lay-out, Routing, Scheduling, CPM & PERT

QUALITY MANAGEMENT: Statistical Quality Control, introduction Control Charts, X Charts, R Charts, Control Charts for C (N. of defects per unit), Control chart for P(Fraction defective), Advantages & Limitations of SQC

QUALITY CIRCLES: Structure, functions & Limitations.

Text Books:-
1. Business Organisation & Management – B.P.Singh – T.N.Chabra – Dhanpat Rai & Sons.
2. Modern Economic Theory – K .K. Dewett – S.Chand & Co.

Reference Books :-
1. Marketing Management – Philip Kotler – Prentice Hall of India Pvt. Ltd.
2. Financial Management - I.M. Pandey - Vikas Publishing House Pvt. Ltd.
3. Indian Economic – Ruddar Dutt, K.P.M.Sundaram – S.Chand & Co.
4. Advanced Economic Theory – H.L.Ahuja – S.Chand & Co.
5. Production Operation Management.- Dr. B.S. Goel – Pragati Prakashan.
6. Statistical Quality Control – Grant, Leaven worth – Tata Mc. Graw Hill.
7. Personnel Management – Edwin B.Flippo – Tata Mc. Graw Hill.
8. Management – A Global Perespective – Harold Krontz – Tata Mc. Graw Hill.

DIGITAL ELECTRONICS LAB   **(EC – 3004)**

Course Code	EC – 3004		Credits : 2	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. Time = 3 hrs.**	**Max. Marks: 50**		**Min. Pass Marks: 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%)**	**Max. Marks: 50**		**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i)   Performing a practical examination assigned by the examiner (25 marks).

ii)   Viva-voice examination (25 marks).

Viva-voice 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

1.   Verify truth tables of AND, OR, NOT, NAND, NOR and XOR gates.
2.   Implement (i) half adder (ii) full adder using AND – OR gates.
3.   Implement full adder using NAND gates as two level realization.
4.   Implement full subtractor using 8 to 1 multiplexer.
5.   Verify truth tables of RS & JK flip flops and convert JK flip flops into D type & T type flip flops.
6.   Realization of Gates (AND, OR, NOT) with discrete components.
7.   (a) Use of 4-bit shift register for shift left and shift right operations.
            (b) Use 4-bit shift register as a ring counter.
8.   Implement mod – 10 counter and draw its output wave forms.
9.   Implement 4-bit DAC using binary weighted resistance technique/R-2R ladder network technique.
10.   Implement 8 – bit ADC using IC (ADC 0800/0801).

ADDITIONAL EXERCISES

1.   Construct bounce less switch.
2.   Construct a pulser of 1 Hz and 10 Hz, 1k/Hz and manual.
3.   Construct logic state detector.
4.   Construct opto – sensor based.
5.   Measurement rotational speed of motor.
6.   Measurement time elapse between two events.
7.   Measurement of linear velocity.

8.   Measurement of acceleration.

9.   Construct a memory using TTL Circuits. Read and write data onto a memory from bus.

10.   Construct a security latch that can be operated by an identity card.

NOTE:-Record to be maintained both electronically and hard copy for evaluation

Data Structure Laboratory   **(IT-3005)**

Course Code	IT – 3005		Credits : 2	L-0, T-0, P-2
Name of the Course	**Data Structures Laboratory**			
Lectures to be delivered	**26 hours of Lab sessions**			
Semester End Examination	**Max. Time = 3 hrs.**		**Max. Marks: 50**	**Min. Pass Marks: 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%)**		**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i)   Performing a practical examination assigned by the examiner (25 marks).

ii)   Viva-voce examination (25 marks).

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.

1. Write a program to search an element in a two-dimensional array using linear search.
2. Using iteration & recursion concept write programs for finding the element in the array using Binary Search Method.
3. Write a program to perform following operations on tables using functions only

    a) Addition b) Subtraction c) Multiplication d) Transpose
4. Using iteration & recursion concept write the program for Quick Sort Technique.
5. 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.
6. Write a program for swapping of two numbers using 'call by value' and 'call by reference' strategies.
7. Write a program to implement Binary search tree. (Insertion & deletion in binary search tree)
8. Write a program for implementation of a file and performing operations such as insert, delete and update a record in a file.
9. Write a program to create a linked list & perform operations such as insert, delete, update, reverse in the link list.
10. 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
11. Write a program to simulate the various searching & sorting algorithms and compare their timings for a list of 1000 elements.
12. Write a program to simulate the various graph traversing algorithms.

13. Write a program, which simulates the various tree traversal algorithms.
14. Circular double linked list
15. 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

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

Object Oriented Programming Lab   (IT-3006)

Course Code	IT-3006	**Credits-2**	**L-0, T-0, P-2**
Name of the Course	**Object Oriented Programming Lab**		
Lectures to be delivered	**26 hours of Lab Work**		
Semester End Examination	Max. Time: 3 hrs.	**Max. Marks: 50**	**Min. Pass Marks: 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:
1. Performing a practical examination assigned by the examiner (25 marks).
2. Viva-voce examination (25 marks).

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.

 Laboratory Exercise:
1.   Raising a number n to a power of p is the same as multiplying n by itself p times. Write a function called power( ) that takes a double value for an int value for p and returns the result as double value . Use a default argument of 2 of p, so that if this argument is omitted, the number will be squared. Write a main( ) function that gets values from the user to test this function .
2.   A point on the two dimensional plane can be represented by two numbers: an X coordinate and a Y coordinate. For example   (4,5) represents point   4 unit to the right of origin along the X axis and 5 units up the y-axis . The sum of the two points can be defined as new point whose X and Y coordinates.

   Write a program that uses a structure called point to model a point . Define three points and have the user input values to two of them. Than set the third point equal to the sum of the other two. And display the value of new points. Interaction with the program might look like this.

        Enter Coordinate of P1:   3   4
        Enter Coordinate of P2:   5   7
        Coordinates of P1+P2 are :   8   11
3.   Create the equivalent of four function calculator . The program should request the to user to enter a number , an operator and another number . It should carry out the specified arithmetical operation: adding, subtracting, multiplying ,or dividing the two numbers. (it should use a switch statement to select the operation) finally it should be display the result.

        When it finishes the calculation , the program should ask if the user want to do another calculation. The   response can be 'Y' or 'N' . Some sample interaction with the program might look like this.
         Enter first   number ,operators and second number 12+100

Answer =112
Do another (Y/N)?N
4. A phone no. such as (212)767-8900 , can be thought of as having three parts area code(212), the exchange (767) and the number (8900). Write a program that uses a structure to store these three parts of phone both no. separately . Call the structure phone . create two structure Enter your area code Exchange and number : 415 555 1212
My number is (415)555-1212
5. Create two classes DM and DB which stores the value of distances DM stores distance in meters and centimeters and DB in feet and inches . Write a program that can read value for the classes objects and add one object of DM with another object DB.
Use a friend function to carry out the addition operation .The object that stores the result may be a Dm object or DB object depending on the units in which result are required .
The display should be in the format of feet and inches or meters and centimeters depending on the object on display.
6. Create a class rational which represents numerical value by two double value NUMERATOR & DENOMENATOR . Include the following public member functions:
- Constructor with no arguments.(defaults)
- Constructor with two arguments.
- Void reduce( ) that reduce the rational number by eliminating the highest common factor between the numerator and denominator .
- Overload +operator to add two rational number
- Overload operator >> operator to be enabled input through cin
- Overload <<operator to be enabled input through count.
Write a main ( ) to test all the functions in the class
7. Consider the following class definition class father {
Protected : int age;
Public:
Father (int x){age = x;}
Virtual void iam ()
{
{cout <<"I AM THE FATHER , my age is ",<<age<<endl;}
};
Derive the two classes son and daughter from the above classes and for each define iam() to write our similar but appropriate message .You should also define suitable constructors for these classes
Now write a main ( ) that creates objects of three classes and then call iam( ) them .Declare pointer to father , successively assign addresses of object of the two derived classes to this pointer and in each case , call iam( ) through the pointer to demonstrate polymorphism in action.
8. Write a program that create a binary files by reading the data from the students from the terminal. The data of each student consist of roll no, name(a string of 30 or lesser no. of character) and marks.

9. A hospital wants to create a database regarding its indoor patients. The information to store include.
    a)   Name of the patient
    b)   Date of admission
    c)   Disease
    d)   Date of discharge
    Create a structure to store the data (year, month, date as its members). Create a base class to store the above information. The member function should include function to enter information and display a list of all the patients in database Create a drive class to store the age of patients. List the information about all to store the age of the patients. List the information about all the pediatric (less then twelve years in age)

10. Makes a class Employee with the name and salary . Makes a class manager inherit from the Employee Add an instance variable named :department, type : string. Supply a method to String that print the manager's name, department and salary. Make a class Executive inherit from information store in the manager super class object . Supply a test program that test these classes and methods.

11. Imagine a tollbooth with a class called Toll booth . The two data item are a type unsigned into to hold the total number of cars and type double to hold the total amount of money collected . A constructor initializes both these to 0. A member function called nopaycar( ). Increments the car total and adds 0.50 to the cash total. Another function, called nopaycar( ), increment the car total but adds nothing to the cash total. Finally , a member function called display the two totals . Include a program to test this class . This program should allow the user to push one key to count paying a car ,and another to count a non paying car . Pushing the ESC key should cause the program to print out the total cars and total cash and than exit

12. Write a function called reverse it ( ) that reverses a string(an array of char) use a for loop that swap the first and last characters, then the second and next to last character and so on .
     the string should be passed to reversesit ( ), and print out the result. Use an input method that allows   embedded blanks. Test the program with Napoleon's famous phrase , "Able was ere I saw Elba".

13. Create some objects of the string class, and put them in a Deque – some at the head of the Deque and some at the tail. Display the contents of the Deque using the for Each( ) function and a user written display function . Then search the Deque for a particular strings, using the first That ( ) Function and display any string that match, finally remove all the item from the date using the get left( ) Function and display each item. Not ice is the order in which the item are displayed: Using Get Left ( ), Those inserted on the left (head),of the Deque are removed in "last and first out" order while those put on the right side are removed in "first in first out" order. The opposite would be true if Get right ( ) were used

14. Assume that a blank maintain two kinds of accounts for customer. One called as saving accounts and another is current account . The saving account provides compound interest and withdrawal facility but no cheque book facility, The current account provides cheque book facility but no interest Current account holders should also maintain a minimum balance and if the balance false below this level , a service charge is imposed.

   Create a class account that store customer name, account number and type of account. From this drive the classes   cur_acct and sav_account to make them more specific to their requirement. Include necessary member function in order to   achieve the following task
   a)   Accept deposit from a customer and update the balance
   b)   Display the balance
   c)   Compute and deposit interest
   d)   Permit withdrawal and update the balance
   e)   Check for the minimum balance, impose penalty ,necessary and update the balance.
   f)   Do not use any constructor , use member function to initialize the class members

15.   Create a base class called shape .Use this class to store two double type values that could be used to compute the area of figure, Derive to specific classes called triangle and rectangle from the base shape . Add to the base class, a member function get data ( ) to initialize base class data member and another member function display area ( ), To compute and display the area of figures make display area ( ) as virtual function and redefine this function in the derived classes to suit the requirements.

   Using this three classes design a program that will accept dimension of triangle or rectangle interactively and display the area

   Remember the two value given as input will be treated as length of two sides in the case of rectangle and as base and height in the case of triangle and used as follows
   Area of rectangle   = x   *   y
   Area of triangle   =1/2   *   x   *   y

   Programming of exercise in C++ in the form of project (based on "object oriented programming in TURBO C++") , Robert lafore , Galgotia Publication Pvt. Ltd.1994 to be done in consultation with the faculty incharge for the course

   Note: Record to be maintained both electronically and hard copy of evaluation

RDBMS LABORATORY (IT – 3007)

Course Code	IT – 3007		Credits: 2	L-0, T-0, P-2
Name of the Course	**RDBMS LABORATORY**			
Lectures to be delivered	**26 hours of Lab sessions**			
Semester End Examination	**Max. Time = 3 hrs.**		**Max. Marks : 50**	**Min. Pass Marks: 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%)**		**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

Performing a practical examination assigned by the examiner (25 marks).

Viva-voce examination (25 marks).

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:

Familiarization with any RDBMS engine (Mysql/ORACLE/SQL Server) using PHP/VISUAL BASIC as front end) & developing a small application.

Create a database and write the programs to carry out the following operation:

Add a record in the database.

Delete a record in the database.

Modify the record in the database.

Generate queries.

Generate the report.

List all records of database in ascending order.

Develop a menu driven project management of database system:

Library information system

Engineering

MCA

Inventory control system

(c) Computer Lab

(d) College Store

(iii) Student Information System

(e) Academic

(f) Finance

(iv) Time Table development system

(g) CSE, IT & MCA Departments.

(h) Electrical & Mechanical Departments.

Usage of S/W:
    PHP, VB, Mysql/ORACLE/ SQL server

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

Semester IV

Management Information System   **(IT-4001)**

Course Code	IT-4001	Credits-4	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 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

Introduction to MIS: Meaning and role of MIS. Definition of MIS, System approach to MIS, MIS organization within a company.

MIS Planning: General business planning derivation of MIS plan, Prioratisation and development strategies.

Section B

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

Section C

Detail System Design and Implementation: Application of basis system design concept to MIS, Involvement of end-user and role of MIS department and system Analyst Role of top management during design and implementation. System evaluation, review and update.

Section D

Discussion of the following MIS in a standard layout given in the note below.

    1. MIS for personal system (See note at end)
    2. MIS for Accounting and Finance Function (See note at end)
    3. MIS for marketing system (See note at end)

Note: -

Key information needs
Transaction processing and management control
Reports design and data collection methods: routing frequency etc
Input
Output

Control reports

Books: -

1. Information system for modem management Murdick, Ross & Claggett, Prentice-Hall of India.
2. Management Information System, S Sadgopan, Prentice Hall of India
3. Introduction to computer Information System for Business, Mark G. Simkin, S. Chand & Co. 1996.
4. Management Information System James A. O'Brien, Galgotia Publication 1994.
5. John Dearden & F Warrah MC Farlan " MANAGEMENT INFORMATION SYSTEM TEXT AND CASES"

OPERATING SYSTEM **(IT-4002)**

Course Code	IT-4002	Credits-4	L-3, T-1, P-0
Name of the Course	OPERATING 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 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
What is an Operation System? Simple Batch Systems; Multiprogrammed Batched Systems; Time-Sharing System; Personal-Computer systems; Parallel System; Distributed System; Real-Time Operating Systems. System Components System Calls, System Programs; System Structure; Virtual Machines.
Process concept: Process Scheduling; Operation on processes, Interprocess Communication
CPU Scheduling fundamental concepts, Scheduling criteria; Scheduling Algorithms; Multi-processor Scheduling; Real Time Scheduling.
Threads: Overview; Multithreading
Process Synchronization, Critical section problem, synchronization hardware, Critical reasons, Automatic Transactions

Section B
Deadlock: System Model; Deadlock Characterization, Methods of Handling Deadlock, deadlock Prevention; Deadlock Avoidance; Deadlock Detection, Recovery from deadlock; Combined approach to deadlock handling
Protection: Goals of protection; Domain of protection; Access matrix and its implementation; Revocation of Access Right; Capability- Based Systems; Language Based Protection.
Security: The Security Problem; Authentication; One Time passwords program Threats, System Threats; Threat Monitoring; Encryption and decryption; Computer-Security Classification; An example Security Model: windows NT

Section C

Memory Management: Logical Versus Physical Address Space, Swapping, Contiguous Allocation; Paging; Segmentation; Segmentation with paging.

Virtual Memory: Demand Paging Performance of Demand Paging page Replacement Page Replacement Algorithms; Allocation of Frames Thrashing; Demand Segmentation;

Cache memory and implementation.

Secondary Storage Structure: Disk Structure; Disk Scheduling; Disk Management; Swap-space management; Disk Reliability; Stable-Storage Implementation.

Section D

File System Interface: File Concept; Access Methods; Directory Structure; Protection; Consistency Semantics;

File System Implementation: File System Structure; Allocation Methods, Free Space Management Directory Implementation; Efficiency and Performance; Recovery.

Books:
1. Abrahanm Silberschatz, Peter Baer Galvin, " Operating System Concepts " John Wiley & Sons, Inc., Vth Eduction, 2000.
2. Detail H. M. "An Introduction to Operating System" Addison Wesley Publising Co., 1984

Computer Networks   **(IT-4003)**

Course Code	IT-4003	Credits-4	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

Instructions

3. **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.
4. **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

Introduction: Layered Network Architecture; ISO-OSI Model;
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 and Selective Repeat ARQs, performance and Efficiency; Verification of Protocols using Finite State Machine; HDLC Data Link Protocol; Integrated Services Digital network; Interfaces, Devices; Channel Structure; Asynchronous Transfer Mode (ATM); ATM Cells, Header and Cell Formats, Layers in ATM, Class 1,2,3,4 Traffic.
Local Area Networks (LANs): IEEE 802.3, 802.4 and 802.5 Protocols; performance of Ethernet and Token ring Protocols; FDDI protocol; Distributed Queue Dual Bus (DQDB) protocol.

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 Stat Routing, Flow Based Routing, Multicasting Routing; Flow and Congestion Control; General Principles, Window Flow Control, Packet Discarding, Isarithmic Control, Traffic Shaping, Choke packets, RSVP; Dead Locks and their Avoidance; Network Layer in ATM; Interworking: Bridges, Routers and Gateways; Internet Architecture and Addressing.

Transport Layer Protocols: Design Issues: Quality of Services, Primitives; Connection Management: Addressing, Connection Establishment and Releases, Use of Timers, Flow Control and Bufferings, Multiplexing, Crash Recovery; Elements of TCP/IP Protocol: User Datagram protocol (UDP/TCP Layering, Segment Format, Checks Sum, Timeout, Connection Management, Finite State Machine.

Section D

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

Presentation and Application Layer protocols: Presentation Concepts; SNMP-abstract Syntax notation.1 (ASN. 1), Structure of Management, Management Information Base; Cryptography: substitution and Transposition Ciphers; Data Encryption Standards (DES), DES Chaining, Breaking DAS, Public Key Cryptography, Authentication Protocols; Electronic Mail; World Wide Web.

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. D. Bertsekas and R. Gallager, " Data Networks", Second Ed., Prentice Hall, India.
4. D.E.Comer, " Internetworking with TCP/Ip", Vol. 1, Prentice Hall, India.
5. G. E. Keiser, " Local Area Networks", McGraw Hill, International Edition.
6. W. Stalling, "Data & Computer Communication", Maxwell Macmillan International Edition.

Digital and Data Communication   **(EC – 4010)**

Course Code	EC – 4010	Credits-4	L-3, T-1, P-0	
Name of the Course	Digital and Data Communication			
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
Introduction: A communications model, data communication networking –
Standards – Making organizations – Data Transmission:Concepts and
terminology – Analog and Digital Transmission –
Transmission impairments – Transmission media.
Data Encoding:
Digital data,Digital signals:Encoding schemes:NRZ-L,NRZ-I,Manchester-Diff-
Manchester-Encoding,Pseudoternary-Bipolar-AMI,B8ZS- HDB3 – Evaluation
factors-Digital data, analog signals: Encoding
Techniques –ASK-FSK-PSK-QPSK-Performance comparision-Analog
data,digital signals:Quantization- Sampling theorm-PCM-Delta modulation-
Errors- comparision- Analog Data, analog signals:Need for
modulation -Modulation methods – Amplitude modulation- Angle modulation
Section B
Digital data communication techniques:
Asynchronous and synchronous transmission –Error Detection techniques :
Parity checks – Cycle redundancy checks-Checksum-Error Correcting codes:
Forwards and backward error corrections
DTE & DCE interface:
Characterstics of DTE-DCE interface.Interfaces: Rs-232-C , Rs-449/422,A/423-
A.
Section C
Data link control

Need for data link control – Line configurations: Topology,duplexity and line discipline – flow control : effect of propagation delay and transmission rate – sliding window protocol-Error Control; Error detection –
ARQ – Bit oriented link control- Necessity – Protocols – HDLC,ADCC,LAP-B,SDLC – Character-oriented link control- Binary synchronous communications – Their categories-Limitations,serial Controller 85C30.
Multiplexing
Advantages – Types of Multiplexing – FDM – Synchronous TDM – Statistical TDM or Asynchronous TDM,Study of their characteristics and carrier systems.

Section D
Satellite Communication Systems:
Satellite parameters and configurations – Capacity allocation , Frequency Division FDMA ; Time Division TDMA- Fixed assigned multiple access(FAMA), Demand assign multiple access(DAMA) – The concept of spread spectrum : FHSS, DSSS – CDMA – Transmission and reception.
Books Recommended:

Proakin, "Digital Communications",Mc Graw Hill.
W.Stalling, "Wireless Communication And Networks" Pearson.
Stallings, "Data & computer Communications",PHI.
Forouzen, "Data Communication & Networking",Tata Mcgraw Hill.
Pratt, "Satellite Communication", John Wiuley.

SYSTEM ANALYSIS & DESIGN (IT – 4004)

Course Code	**IT – 4004**	Credits : 4	L-3, T-1, P-0
Name of the Course	**System Analysis & Design**		
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

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.

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 System (Overview): Concept of System, Common types of systems (Natural systems, Man made system, Automated systems), General systems principles

Participants to system development: Users, Management, Auditors, System analysts, System designers, Programmers, Operations, Personnel.

System Development Life Cycle: phase 1: System Planning, phase 2: System Analysis, phase 3: Systems Design, phase 4: Systems Implementation, phase 5: Systems operation and support

PHASE 1: System Planning

Preliminary Investigation: Problem Identification, problem selection, Evaluation of system request, Evaluation of projects, Overview of Feasibility (Operational Feasibility, Economic Feasibility)

Cost Analysis Tools: Classification of Costs and Benefits, Cost Benefit Analysis (Payback analysis, ROI & Present value analysis)

SECTION-B

PHASE2: Systems Analysis

Determining Requirements: Traditional Methods of requirement determination (Interviews, onsite observation etc), Contemporary Methods of requirement determination (Joint Application Design (JAD), Prototyping),
Analyzing Requirements: Data Flow Diagrams, Conceptual Data Modeling, Entity relationship diagrams, Data Dictionary.

SECTION-C

PHASE 3: Form & Report Design: Designing printed reports, Designing Forms, Formatting forms and reports.
Input Design: Introduction to input design, Source document design, Interface Designing, input record designing, automated design tools.

SECTION-D
PHASE 4: System Implementation
Application Development: Documentation review and application design, coding and testing the application.
Documentation: Program documentation, System documentation, Operations documentation and user documentation.
Phase 5: System Operation and Support
Overview: Systems support and maintenance activities
Support Activities: User training and assistance, maintenance activities, Corrective maintenance, Adaptive maintenance, Perfective maintenance.

Books
1. Modern System Analysis & Design , Jeffrey A. Hoffer, Joey F. George, Joseph S. Valacich, Pearson education
2. Element of System Analysis, Marvin Gore, John Stubbe. Galgotia Book Source. 1994
3. Systems Analysis and design Methods. Whitten, Bently and Barlow. Galgotia Publication,1995
4. System Analysis and Design, Elias M. Awad. Galgotia publication, 1995.
5. System analysis and Design, P.S.Grover, BPB Publication, 1994
6. System analysis and Design, Harry Edwards. McGraw Hill International Ed., 1995
7. Introduction to System analysis and Design I.T. Hawryszkiewyez, Prentice Hill of India, 1994

Human Computer Interaction   **(IT – 4005)**

Course Code	IT – 4005	Credits-4	L-3, T-1, P-0
Name of the Course	*Human Computer Interaction*		
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

5.　**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.

6.　**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

Introduction & development in HCI

What is HCI, Need of HCI,Rules and Heuristics for good HCI design,Applications of HCI,Workstation environment e.g. Screens,Keyboard,Pointing devices,other I/O devices, related processing and storage requirements,Types of user Interface,Menu selection and methods of selection,concept of look and feel

Section B

Development in the concept of user

Range of users(Hypertext,event driven systems,use of multimedia),modeling techniques,Design methodologies,selection of HCI for specific applications,Interaction styles,interaction paradigms

Psychological consideration

Memory(long and short term), reasoning, perception,,congnition and use of metaphors

Section C

Health and safety Considreation

Ergonomics as the surrounding environment, types of ergonomics , use of ergonomics in HCI,RSI,

Information Consideration

Necessity of information rich environment,virtual machine,interaction using virtual environments, real time simulations(flight simulators),high speed interactive interfaces(games),

Section D
Analysis & design
Task analysis ,UID life cycle,Audience analysis,,Difference between task analysis and other techniques, good and bad interface design,,Knowledge based analysis, importance of task analysis in HCI,Dialog box,dialog principles

Usability
Usability Engineering,How to achieve high level usability, usability goals

Books:-
HCI:Alex Dix,Janet Ginlay,Rusell Beale,LPE
HCI:- Rajender Prasad<Laxmi Publication>
Human Computer Interaction in the New Millennium; John M. Carrol, Editor, Addison Wesley
Human Computer Interaction: Issues and Challenges; Qiyang Chen, Montclair State University, USA; Idea Group Publishing

Operating System Lab   **(IT-4006)**

Course Code	IT-4006		Credits-2		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: 50	Min Pass Marks: 20		Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25%, Viva 25% & Attendance 20%			Max Marks: 50	Min Pass Marks: 25

Instructions for paper setter / Candidates

Laboratory examination will consist of two parts:
1. Performing a practical examination assigned by the examiner. (25 marks)
2. Viva-voce examination. (25 marks)

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.

CASE STUDIES on the following operating system to be done in consultation with the faculty incharge for the course:

1. Singal User System :MS-DOS and Windows98

2. Network Operating System: Windows 2000/Windows NT

3. Multiuser System :Unix/Linux
4. Study the Linux operating system and implement various commands and shell scripting.
5. Implement the process synchronization using semaphores.
6. Write the program to mount the various devices (i.e. floppy, CD-Rom etc)
7. Write a program do the following thing…
   a. Find the attribute of file.
   b. To change the attribute of file.
   c. Create the directory.
   d. Delete the directory.
   e. Create the file.
   f. Delete the file.

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Digital and Data Communication Lab   **(EC-4011)**

Course Code	EC -4011	Credits-2	L-0, T-0, P-2
Name of the Course	Digital and Data Communication Lab		
Lectures to be Delivered	26 Hrs. of Lab work (2hrs. each per week)		
Semester End Examination	Max Marks: 50	Min Pass Marks: 20	Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25%, Viva 25% & Attendance 20%	Max Marks: 50	Min Pass Marks: 25

Instructions for paper setter / Candidates

Laboratory examination will consist of two parts:

1. Performing a practical examination assigned by the examiner. (25 marks)
2. Viva-voce examination. (25 marks)

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

1. To perform Amplitude modulation/demodulation and calculate modulation index and percentage (%age) modulation.

2. Perform frequency modulation for calculating frequency deviation (DF) and modulation index.

3. Prove and perform sampling theorem for various bit rates (eg. 8kbps, 16kbps, 32kbps, 64kbps).

4. Convert analog signal into digital using delta modulation/demodulation.

5. Prove and perform "adaptive delta modulation/demodulation" to reduce the quantization voice.

6. Analyze the pulse code modulation (PCM) system and perform A/D conversion using PCM.

7. Prove and perform multiplexing using time division multiplexing technique.

8. Analyze and establish a PC TO PC Communication using RS-332 DTE-DCE interface.

9. Establish a transmitter and receiver link using optical fiber.

SAD Project   **(IT – 4007)**

Course Code	**IT – 4007**	Credits-2	**L-0, T-0, P-2**
Name of the Course	**SAD Project**		
Lectures to be delivered	**26 hours of Lab sessions**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 50**	**Min. Pass Marks: 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

    i. Performing a practical examination assigned by the examiner (25 marks).
    ii. Viva-voce examination (25 marks).

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.

Aim of this Project

Aim of this Project is to equip students in the methodology of System Analysis and Design of a Live Project in the institute in which he is studying or in a place of work such as Bank, School, College and office in the vicinity of the institute.
This will be a guide Project under the Close supervision of the faculty of the institute.
Project should be presented in the form of a project report giving a candidate system for solving a life problem.

Computer Networks Lab   **(IT-4008)**

Course Code	IT-5003	Credits-4	L-, T-, P-2
Name of the Course	Computer Networks Lab		
Lectures to be Delivered	26(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 Implement the data link layer framing methods such as character, character stuffing and bit stuffing.
2 Implement on a data set of characters the three CRC polynomials – CRC 12, CRC 16 and CRC CCIP
3 Implement Dijkstra's algorithm to compute the Shortest path thru a graph.
4 Take an example subnet graph with weights indicating delay between nodes. Now obtain Routing table art each node using distance vector routing algorithm
5 Take an example subnet of hosts. Obtain broadcast tree for it.

6 Take a 64 bit playing text and encrypt the same using DES algorithm.
7 Write a program to break the above DES coding
8 Using RSA algorithm Encrypt a text data and Decrypt the same

Semester V

SOFTWARE ENGINEERING (IT - 5001)

Course Code	IT – 5001	Credits: 4	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. Time: 3 hrs.**	**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

4. **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.

5. **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: Need for software engineering, issue in the design of large software, software life cycle models, overview of software development process.

SECTION-B

Software Requirement Analysis and Specification- Requirements Engineering, Crucial process step, State of the practice, problem analysis, Data dictionaries, Entity relationship diagram, code object diagram, approaches to problem analysis, Structured requirements definition, structured analysis & design techniques, Software prototyping, Software requirements specification, Nature of SRS, characteristics of good SRS. Organization of the SRS, Specifying behavioral requirements, finite state machines, decision tables & tree, PDL

SECTION-C

Software Matrics: What and why: Definition, areas of applications, problems during implementation, size matrics, The basic information Flow Model, the more sophisticated information Flow Model, Metrics analysis using statistics for

Assessment, problems with metric data, The common of pool of data. A pattern for successful applications

SECTION-D

Software Project Planning: Cost estimation: Models , Static ,single variable model, Static multivariable model, The constructive cost model: Basic model, International model, Detailed COCOMO Model, The Putnam resource allocation model: The trade off- -of-time versus cost, development sub cycle,

Software Risk Management : what is Risk, typical software risks , Risk management Activities, Risk identification, Risk projection, Risk management activity

Books:
1. Software Engineering- A practitioner's Approach, RogerS. Pressmen
2. Software Engineering-K.K. Aggarwal&Yogesh
3. Software Engineering- A Systematic Approach by J.S. Dilawari, Paragon Publishers New Delhi

Computer Graphics   (IT-5002)

Course Code	IT-5002	Credits-4	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 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

Graphic Hardware: The functional characteristics of systems are emphasized

Input Devices: Keyboards, Touch Panel, Light Pens, Graphics Tablets, Joysticks, Trackball, Data glove, Digitizer, Image scanner, Mouse, Voice Systems.

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 for line, circle and ellipse, Bresenham's algorithms area filling techniques, character generation.

2-dimensional Graphics: Cartesian and Homogeneous co-ordinate system, Geometric transformations, (Translation, Scaling, Rotation, Shearing), Composite transformation, Affine transformation, Two dimensional viewing transformation and clipping (line, polygon and text)

Section C

3-dimensional graphics: Geometric transformation (Translation, Scaling, Rotation, Reflection, Shearing), Composite transformation, Mathematics of projections (parallel and perspective) , 3-D viewing transformation and clipping.

Hidden line and surface elimination algorithms, z-buffer, scan line, sub-division, and Painter's algorithm.

Section D

Shading: Modeling Light intensities: Diffuse reflection, Specular reflection, refracted light, texture surface patterns, halftoning.

Surface Shading Methods: Constant intensity method, Gauraud Shading, Phong Shading.

Animation: Principles of animation, animation techniques- draw – erase, animation with lookup table, Storyboards for animation, key frame system, basic requirements in animation, animation softwares.

Books:
1. Foley, van Dam et al: Computer Graphics: principles and Practice In C, 2nd Ed., Addison Wesley, 1997.
2. Hearn and Baker: Computer Graphics, 2nd Ed., Prentice Hall of India, 1999.
3. Woo, Neider, Davis, and Shreiner: Open GL Programming Guide, 3rd Addison Wesley, 2000.
4. Steven Harrington: Computer Graphics: A programming approach, 2nd Addison Wesley, 1997.
5. A. Watt: Three-dimensional Computer Graphics, 3rd Ed. Addison Wesley, 2000.
6. D.F. Rogers: Procedural Elements of Computer Graphics, 2nd Ed., McGraw Hill International Editions.
7. Edward Angel: Intractive Computer Graphics; a top-down Approach with Open GL, 2nd ED., Addison Wesley
8. Yeshwant Kanetkar: Graphics under C.
9. Stevens: Graphics Programmong in C.
10. Plastock R.A. and Kalley G., computer Graphics, McGraw Hill 1986.

ANALYSIS & DESIGN OF ALGORITHMS   **(IT–5003)**

Course Code	IT – 5003	Credits : 4	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. Time: 3 hrs.**	**Max. Marks:**	**M in. Pass M ark s: 40**
Continuous Assessment (based on sessional 50%, Tutorials/Assignments 30%, Quiz/Seminar		*Max. Marks: 50*	

I nstructions

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

Introductory Concepts: The notation of algorithm, fundamentals of algorithmic problem solving, analysing algorithms, A review of fundamental data structures.

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

Section B

Divide and Conquer : merge sort, quick sort, binary search, Selection sort.

Search : Binary trees, breadth first search , depth first search.

Dynamic Programming: All pair shortest path, Optimal binary search tree, knapsack problem, the travelling sales person problem;Flow shop scheduling.

Section C

Back tracking:the 8 queens problem, graph coloring, hamiltonian cycles.

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

Branch and Bound: least cost search(LC), the 15 puzzle, bounding, fifo branch and bound, LC branch and bound.

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

Section D

N P hard and N P complete problems: Basic concepts, Cook's theorem, examples of NP hard problems and approximation algorithms. deterministic and non deterministic polynomial time algorithms.
Space and time tradeoff in algorithms.
Texts/References:
1. Horowitz Ellis And Sartaj Sahni: Fundamentals of Computer Algorithms.
2. Anany V. Levitin: Introduction to Design and analysis of algorithms
3. D.E. Kunth:The art of computer programming Vols 1 and 3
4. Aho-Hopcroft and Ullman: The Design and Analysis of computer algorithms.

Visual Programming   **(IT - 5004)**

Course Code	IT -5004	Credits-4	L-3, T-1, P-0
Name of the Course	**_Visual Programming_**		
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

INTRODUCTION TO .NET : Introduction to .NET, The origin of .NET; The .Net Framework: Key design goals; Common Language runtime; Simpler Faster development; Tool Support; Scalability; metadata; Namespaces; Deployment and Execution;

.NET FRAMEWORK BASE CLASSES : Inside the .NET Class Framework; System Namespaces; the System Types; System.object class; System.Exception Class; System.Collections;

USER AND PROGRAM INTERFACES : User interfaces; Windows forms; Web forms; Console Applications; Program interfaces Web services.XML as the .NET "meta language".

INTRODUCTION TO CLR : Common Runtime and Type System; The Anatomy of .NET Applications: Assembly; Module; Type; Common type System; Custom types

Introduction to Visual Basic.Net : Viusal Basic.NET Defined; Visual Basic.NET as a programming language; Visual Basic.NET used for writing Windows Applications; Event driven Programming; VB.NET as a object oriented programming language.

Section -B

Understanding the development Environment : The .NET Framework; The Visual Studio Start Page; Creating and Opening Projects; Understanding Solutions; Visual Studio.Net work area ; Understanding Window Behaviour; Designing Visual Componenets; Using the task list; Customising the IDE

Event procedures, properties and controls : Event Procedure-Using the IDE to create an Event procedure; Writing code inside the Event Procedure;Viewing and changing properties; Adding controls to the form;The Toolbox ; Changing the Control's properties, size , location using Form Designer

Section-C

Visual Basic Programming Fundamentals : Declaring and naming variables; Naming Conventions; Changes to the Dim statement; Understanding Data types; Working with numeric data types; Data type Conversion; Assignment and Arthmetic Operators :Division operators; Operator precedence;Comparision and Logical operators; Assignment Operator; The Location of the Assignment Statement; The Left

Controlling the flow of your program : Understanding the if statements; Using multiple Commands with an If Block; Working with false Condition; Working with Multiple if statements; Using Boolean logic in If condition; Using Select case statement; Working with loops; for loops; Do loops; Arrays: Declaring an array; Useful array functions; Resizing an array;

Section – D

Managing program tasks with procedures : Types of procedures; Working with sub procedure; Executing a procedure; passing data to a procedure with arguments; Working with function procedures; Understanding scope and Accessibilty

User Interface : Message boxes; Dialog boxes; Menus and Toolbars; Creating menu;Context Menu; Adding Toolbars and buttons;Defining an icon for a toolbar button;Adding Functionality to the Toolbar;

Error Handling : System Exception Handling and debugging; Structred Exception Handling; The Try – Catch – Finally Statement.

Text Books:
1**.** A Programmer's Introduction to Visual Basic.Net by Craig Utley, SAMS Publications
Books:
      a. Visual Basic .NET How to Program (2nd Edition) by Dietel & Dietel
      b.   Programming Visual Basic .NET by Dave Grundgeiger
2.   Visual basic Shell Programming by Hamilton pub. O' Reilly.
6.   Visual basic Oracle 8 Programmer's reference by Tretsch pub. O' Reilly

Microprocessor, Micro Computers and Interfaces   **(EC-5001)**

Course Code	EC-5001	Credits-4	L-3, T-1, P-0
Name of the Course	Microprocessor, Micro Computers and Interfaces		
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

Evolution of microprocessors,The 8085 Microprocessor:Architecture,instruction set,interrupt structure and assembly language programming.

Section B

The 8086 Architecture: Architecture,block diagram of 8086,memory segmentation and physical address calculations,program relocation,addressing modes,instruction formats,pin diagrams and description of various signals.

Section C

Instruction set of 8086: instruction execution timing,assembler instruction format,data transfer instructions,arithmetic instructions,branch instructions,looping instructions,NOP and HLT instructions,flag manipulation instruction,logical instructions, shift and rotate instructions,directives and operators,programming examples.

Section D

Interfacing devices: The 8255 A Programmable Peripheral Interface chip,DMA,8237DMA controller,8259 and programmable interval timer.

Books:

• **Microprocessor Architecture, Programming & Applications with 8085 : Ramesh S Gaonkar; Wiley Eastern Ltd.**

- **The Intel Microprocessors 8086- Pentium processor : Brey; PHI**

- **Microprocessors and interfacing : Hall; TMH**
- **The 8088 & 8086 Microprocessors-Programming, interfacing,Hardware & Applications :Triebel & Singh; PHI**

Discrete Structures   **(IT – 5005)**

Course Code	IT – 5005	Credits-4	L-3, T-1, P-0	
Name of the Course	Discrete Structures			
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

Mathematical Logic: Introduction; Statements and Notation; Connectives- negation, conjunction, disjunction, statement formulas and truth tables; Tautologies and contradiction; Laws of equivalence; rules of substitution and transitivity; normal forms, principal disjunctive normal forms; principal conjunctive normal forms Ordering and uniqueness of normal forms.

The Predicate Calculus: Predicates; the statement function, variables and quantifiers; Predicate formulas; Free and bound variables; the universe of discourse.

Section B

Permutations, Combinations, and Discrete Probability: Introduction, The Rules of Sum and product; permutations; Combinations; Generation of permutations and combinations, Discrete probability, Information and Mutual Information.

Set Theory: Basic concepts, venn diagrams, set operations, Algebra of set, Duality , Finite and Infinite sets, Classes of sets, Power sets, Multisets, Cartesian Product.

Relations and Functions:

Introduction, properties of Binary Relations; Equivalence Relations and partitions; Partial Ordering Relations and Lattices; Chains and Antichains; Functions- definitions and notation, one to one, onto, one to one and onto, composition, related results and the Pigeonhole principle.

Section C

Graphs and Planner Graphs: Introduction, Basic Terminology, Multigraphs and Weighted Graphs, Paths and Circuits; Warshall' algorithm, Dijkstra's Shortest path algorithm in Weighted Graphs, Eulerian paths and circuits; Hamiltonian paths and circuits, The Traveling Salesperson problem; Factors of Graph; planar Graph.

Trees and cut-sets: Trees, Rooted Trees, path, Lengths in Rooted trees; prefix codes; Binary search trees; Spanning Trees and cut-sets; Minimum Spanning Trees.

Section D

Groups and Rings: Introduction, Algebraic structures, semi-group, Group and Subgroup- examples and standard results; Generators and evaluation of Powers; Cosets and Lagrange's Theorem; permutation groups; Codes and Group codes; Isomorphisms and Automorphisms; Homomorphisms; Rings, Integral Domains, and Fields.

Recurrence Relations: Introduction, recurrence relations, linear recurrence relations with constant coefficients- homogeneous solutions, particular solutions and solution by the method of generating functions.

Books:

1. J.P. Trembley and R. Manohar, "Discrete mathematics Structures with Applications to Computer Science", (TaTa McGraw-Hill, 1997)
2. C.L.Liu, " Elements of Discrete Mathematics", 2nd Edition (TaTa McGraw-Hill, 1985)

Microprocessor Laboratory   **(EC-5005)**

Course Code	EC-5005	Credits-2	L-0, T-0, P-2
Name of the Course	Microprocessor & Computer Network Laboratory		
Lectures to be Delivered	26 Hrs. of Lab work (2hrs. each per week)		
Semester End Examination	Max Marks: 50	Min Pass Marks: 20	Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25%, Viva 25% & Attendance 20%	Max Marks: 50	Min Pass Marks: 25

Instructions for paper setter / Candidates

Laboratory examination will consist of two parts:

1. Performing a practical examination assigned by the examiner. (25 marks)
2. Viva-voce examination. (25 marks)

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.

1. Study of 8085 Microprocessor kit.
2. Write a program using 8085 and verify for :a. addition of two 8-bit numbers.

b. addition of two 8-bit numbers (with carry).

3. Write a program using 8085 and verify for :

substraction of two 8-bit numbers.

4. Write a program using 8085 for multiplication of two 8- bit numbers by repeated addition method. Check for minimum number of additions and test for typical dat

5. Write a program using 8085 for dividing two 8- bit numbers by bit rotation method and test for typical data.

6. Study of 8086 microprocessor kit

7. Write a program using 8086 for division of a defined double word (stored in a data segment) by another double word division and verify.

8. Write a program using 8086 for finding the square root of a given number and verify.

9. Write a program using 8086 for copying 12 bytes of data from source to destination and verify.

10. Write a program using 8086 and verify for:

a. Finding the largest number from an array.

b. Finding the smallest number from an array.

11. Write a program using 8086 for arranging an array of numbers in descending order.

Visual Programming Laboratory   (IT – 5006)

Course Code	IT – 5006	Credits-2	L-0, T-0, P-2
Name of the Course	Visual Programming Laboratory		
Lectures to be Delivered	26 Hrs. of Lab work (2hrs. each per week)		
Semester End Examination	Max Marks: 50	Min Pass Marks: 20	Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25%, Viva 25% & Attendance 20%	Max Marks: 50	Min Pass Marks: 25

Instructions for paper setter / Candidates

Laboratory examination will consist of two parts:
1. Performing a practical examination assigned by the examiner. (25 marks)
2. Viva-voce examination. (25 marks)

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. To print the factorial of a number entered by the user in the Textbox at the button's click.
2. To create a user account by getting input for his Name , Father's name, Mother's name, email-ID, city, phone number, password, confirm password, validating it such that user is directed to the page which reads "Thank you for sharing your details. You are registered."
3. To use link button to redirect to the page corresponding to the link.
4. To use image control to display the image file using browse template.
5. To display the usage of Select-Case statement.
6. To demonstrate the working of loops For-Next, For-Each-Next, Do-Until .
7. To add/edit/delete master details in form using SQL server.
8. To demonstrate the name and roll no. of those students from the table who obtained above 75% marks using Data Connection, DataRepeater.
9. To generate a master page which spans over 3 other pages- College website having other links having same menubar.
10. To create the stored procedure to calculate total amount payable by the customer after deducting the discount on the various commodities.

Computer Graphics Lab   **(IT-5007)**

Course Code	IT-5007	Credits-2	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: 50	Min Pass Marks: 20	Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25%, Viva 25% & Attendance 20%	Max Marks: 50	Min Pass Marks: 25

Instructions for paper setter / Candidates
Laboratory examination will consist of two parts:
1. Performing a practical examination assigned by the examiner. (25 marks)
2. Viva-voce examination. (25 marks)

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 to be developed:
1. 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.
2. Implement bresenham's line algorithm. Also provide Provision to change attributes of graph primitives such as stippling (Dotted and Dashed pattern), colors and Butt & round Caps.
3. Implement bresenham's circle algorithm. Also provide to change attributes of graph primitives such as stippling (Dotted and Dashed pattern) and colors.
4. Implement 2-D transformation with translation, scaling, rotation, reflection, Shearing and scaling
5. Construct Bezier curves and Spline curves with 6 or more control points entered through mouse.
6. Construct fractal geometric shapes using linear or non-linear procedures.
7. Consider a scene with two or more three dimensional polygonal object. Generate Different perspective views of scene by changing various 3D viewing parameters interactively.
8. Implement tweening procedure for animation with key frames having equal or different no. of edges.
9. Write a program for 2D line drawing as Raster Graphics Display.
10. Write a program for 2D circle drawing as Raster Graphics Display.
11. Write a program for 2D polygon filling as Raster Graphics Display.
12. Write a program for line clipping.
13. Write a program for polygon clipping.
14. Write a program for displaying 3D objects as 2D display using perspectives transformation.

15. Write a program for rotation of a 3D object about arbitrary axis.
16. Write a program for hidden surface removal from a 3D object.

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

Vocational Training   **(IT-5008)**

Course Code	IT-5008		Credits-0		L-0, T-0, P-0
Name of the Course	Vocational Training				
Semester End Examination	Max Marks: 50		Min Pass Marks: 20		Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25%, Viva 25% & Attendance 20%			Max Marks: 50	Min Pass Marks: 25

Instructions for paper Setter / Candidates

This six weeks training will be related to Industrial Projects to be undertaken under the guidance of Faculty preferably at Industry / Software Park / Incubation Centre or related areas. This may also be undertaken with in the Institute. This training will be undertaken during vacation. Student is supposed to submit the project report at the end of the training.

Evaluation will be based on Project Report, presentation and comprehensive Viva-voce examination related to the project.

Project should be made only on any technology (Training to be done only in CSE and IT Company)

Semester VI

Object Oriented Software Engineering   (IT-6001)

Course Code	IT-6001	Credits-4	L – 3, T- 1, P-0
Name of the Course	Object Oriented 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: 3hrs		
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 section will carry 15% 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 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 object oriented systems: Design object, class hierarchy, inheritance, polymorphism, object relationships and associations, aggregations and object containment, object persistence, meta class, object oriented systems development life cycle, software development process object oriented systems development : a use case driven approach.

Section – B

Methodology for object oriented design: Object modelling techniques as software engineering methodology, Rumbaugh methodology, Jacobson methodology, Booch Methodology, Patterns, Frameworks, the unified approach, unified modelling language(UML).

Section – C

Object Oriented Analysis : analysis process, use case driven object oriented analysis, use-case model, object classification, theory, different approaches for identifying classes, classes, responsibilities and collaborators, identifying object relationship, attributes and

methods, super sub class relationships, A – part of relationships aggregation class responsibilities, object responsibilities.

Section – D

Object oriented design process, corollaries, design axioms, design patterns, object oriented design philosophy, UML object constraint language, designing classes: The process, class visibility, refining attributes, designing methods ad protocols, packages and managing classes, designing interface objects, view layer interface design, Macro and Micro level Interface design, Macro and Micro level interface design process.

Text Books:

- Object Oriented systems development, Ali Baharmi, 1999, MGH.
- Object Oriented Modeling and Design, Rumbaugh et.al. 1997, PHI.
- Object Oriented analysis and design, Grady Booch, 1995, Addison Wesley.
- Object Oriented software Engineering by Subhash Mehta, Suresh K. Basandra, Galgotia Publication.

Web Technology   **(IT-6002)**

Course Code	**IT – 6002**	Credits : 4	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. Time = 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%,	**Max. Marks: 50**		

Instructions

1.ForPaperSetters: The question paperwill consist of   five sections A, B, C, D, and E. Section Ewill be Compulsory, itwill consist of a single question with 10-20subparts of short answer type, which will cover the entire syllabus andwill carry 20 of the total marks of the semester endexamination for t h e course. Section A, B,C and D will have two questions from the respective sections of the syllabus and each question will carry 15% 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 and D of the question paper and all the subparts of the questions in section E. Use of nonprogrammable calculators is allowed.

Section –A

Internet: Its Architecture / Structure, modes of connecting to internet, ISP, Internet addressing DNS, FTP, telnet, HTTP, basics of web page designing,Structure of Web pages, Basic principle of web page design,

Section B

Introduction to Web:

HTML: HTML Elements with attributes (Heading , Paragraph, text formatting, hyper-link, image map, tables, lists, forms, frames)

CSS : Introduction to CSS, CSS styling (Backgrounds, Text, Fonts, Links, Lists, Tables),

CSS Box Model : Border, Outline, Margin, Padding

Section C

Web-servers: (IIS , Apache) Accessing & using these servers.

PHP : Intro, Syntax, Variables, String, Operators, If...Else, Switch, Arrays, While Loops, For Loops, Functions, PHP $_GET, PHP $_POST, session handling. Database connectivity

Javascript: Introduction to scripting languages, basics of java script (variable, operators, control statements,popup boxes,functions,events (onLoad, onFocus,onBlur,onSubmit,onMouseOver, onMouseOut, OonUnload), javascript form validations

Section D
Brief Introduction of JSP/ASP. Brief introduction to XML documents, different searching method adopted by search engine. Brief introduction of Middleware technologies like CORBA

Books:

John R Hubbard, Programming with Java, Schaum's Outline Series, McGraw Hill International edition 1999.
Joseph L.Weber," Using Java 2 platform " prentice Hall of India Pvt Ltd, 2000.

Chuck Musciano 7 Bill Kennedy, HTML & XHTML: The Definitive Guide, O Reilly & Associate i nc,
4th edition Aug. 2000
Ian S. Graham, XHTML 1.0 Language and design sourcebook, John Wiley & sons inc. 2000.
Peter Rossbach, Hendrik Schreiber Java Server & services Pearson education Ltd. 2000.
The Java developer tool kit Joshu Marketos, John Wiley and Sons, 1997.
Java Scripts Peercell Mara
ABC of java scripts BPB publications
Network firewall, Kironjeet Syan, New Ridden publication.
www.seeinf.com
www.hackers.com
Web Strategies
www.unleashed
Web Technology & Design, C. Xavier, New International Publishers, New Delhi.

Artificial Intelligence   **(IT-6003)**

Course Code	IT-6003	Credits-4	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 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

Scope of AI: Games, theorem Proving, Natural Language Processing, Vision and speech processing, Robotics, Expert system AI techniques search knowledge, abstraction, problem solving, State space search, Control strategies, depth first search, breadth first search, production system, problem characteristics, Decomposable, ignorable, recoverable, predictable.

Use of Heuristics: Hill climbing, Best first search, A * algorithm: Admissibility, AND/OR graph 0 AO *, constraint, satisfaction, crypto arithmetic, Waltz line labeling

Game playing, Minimax search, Alpha-Beta pruning.

Knowledge Representation: Predicate logic, well-formed formulas, quantifiers, prenex normal form skolemization, unification, modus pones, resolution refutation various strategies

Rule based system, Forward reasoning: Conflict resolution Backward reasoning: Use for no back track.

Structured knowledge representation.

Semantic net: Slots inheritance, frames – exceptions and default attached predicates; conceptual dependency form formalism, object oriented representation

Section B

A.I. programming language

PROLOG: Syntax, procedural and declarative meaning, Prolog unification mechanism, Anonymous variable, Lists, Use of fail, CUT, not.

LISP: Basic concepts, Eval function, Function and variable, scooping of LISP variable, iteration and recursion.

Section C

Headlong uncertainty: Probabilistic reasoning, Byes net, Dumpster Shafer theory: use of certainty factors Fuzzy logic, no monotonic reasoning, Dependencdirectedbackt, Truth maintenance systems.

Learning: Concept of learning, learning automation, the genetic algorithm, learning by induction, Neural Networks: Hop field Networks, perceptions learning algorithm, back propagation network, Boltzman Machine.

Section D

Planning: Components of planning system, Plan generation algorithm: Forward state propagation, backward state propagation, non-linear planning using constraint posting.

Expert System: Need & justification for expert system – Cognitive problems, Expert system architecture: Rule based system, Non-production system, knowledge acquisition, case studies: MYCIN, RI.

Natural language processing: syntactic analysis, top down and bottom up parsing, Augmented transition networks Semantic analysis case grammars.

Books: -

1. AI – E. Rich & K Knight Tata McGraw Hill (2nd edition)
2. Introduction to Expert system – D.W. Paterson, Prentice Hall of India (1992)
3. Introduction to expert system –Peter Jackson, Addison Wesley publishing company.
4. AI an engineering Approan –R.J Schalkoff, McGraw Hill international Edition
5. Principles of AI Nilsson Narosa publishing Narosa publishing house.
6. Programming in PROLOG – Clocksm 7 Mellish, Narosa Publishing House
7. Rule Based Expert System- M. Sasikumar, S, Ramani
8. Artificial Intelligence – P.H. Wisnston, 2nd edition, Addison Wesley 1884.

Computer Network Management   **(IT-6004)**

Course Code	IT-6004	Credits-4	L-3, T-1, P-0
Name of the Course	*Computer Network 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: 20	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
System Design: Introduction, Resource Constraints and their metrics, Common design techniques, Performance Analysis And Tuning.
Network Management Tools: Network management Tools, Tool catalog, Bit error rate tester, Basic software tools, SNMP MIB tools, The Protocol Analyzer.
Network statistics Measurement System: Traffic load monitoring, Protocol Statistics, data and error statistics, Using MRTG to collect traffic statistics.
Section B
Network Management System: History of Enterprise Management.
Network Management System: Functional components, Multiple NMS configuration Network management, System requirements.
Commercial Network Management System: Hewlett-Packard's Open View Network Node Manager, Cabeltrons's spectrum platform, Sun network management system family.
System Management: High-End system management, Low end system management, Enterprise management solutions, Computer associates Unicenter TNG, Tivoli enterprise manager.
Network Management Application: Configuration Management, Network Provisioning, Inventory Management, Network topology, Fault management, Fault detection, Fault location and isolation techniques.
Performance Management: Performance Metrics, Data Monitoring, Problem isolation, Performance statistics.
Event Correlation Techniques: Rule Based Reasoning, Model Based Reasoning, Case Based reasoning, Codebook Correlation Model, State Transition Graph Model, Finite State Machine Model.

Security Management: Policies and Procedure, Security Breaches and the Resources needed to prevent them, Firewalls, Cryptography, Authentication and Authorization, Client/Server Authentication system, Message Transfer Security, Protection of Network from Virus Attacks.

Accounting Management, Report management, Policy-Based management.

Section C

Web-Based Management: NMS with Web Interface and Web-Based Management, Web interface to SNMP management, Embedded Web- Based management, Desktop Management Interface, Web-Based Enterprise Management.

WBEM: Windows Management Instrumentation.

Java Management Extension: Service Driven Network, Java Dynamic Management, Kit, JMX **Architecture Management of a Storage Area Network:** The Jiro Platform, Future Direction.

Section D

Flow Control: Model, Classification, Open-loop flow control, Closed-loop flow control,hybrid flow control

Traffic Management: Introduction, An economic framework for traffic management, Traffic models, Traffic classes, Time scale of traffic management, Scheduling, Renegotiation, Signaling, Admission control, Peak-load pricing, Capacity planning.

Books: -

1. Network Mangement (Principles and Practice), Subramanian, Person Education Asia, 2nd edition.
2. An engineering approach to computer Networking, S. Keshav, Pearson Education Asia, 4th edition.
   Computer Networks and Internets, Douglas E. Comer, Pearson Education, 2nd Edition

Parallel Computing   **(IT-6005)**

Course Code	IT-6005	Credits-4	L-3, T-1, P-0
Name of the Course	*Parallel 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 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.

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

Scalability Analysis and Approaches: Scalability metrics. 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

SIMD Computer Organization: The CM-2 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.

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

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.
3. S. G. Akl: Design and Analysis of parallel algorithms, Prentice Hall, Englewood Cliff NJ.
4. S. Lakshmivarahan and S. K. Dhail: Analysis and Design of Parallel Algorithms-arithmetic and Matrix Problems, McGraw Hill International Edition, Computer Science Series.1990.
5. A practical approach to parallel Computing by S.K. Ghosal, University press (India) Ltd.

Core Java   **(IT-6006)**

Course Code	**IT-6006**	Credits : 4	L-3, T-1, P-0
Name of the Course	**Core Java**		
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%,	**Max. Marks: 50**		

Instructions

1. **ForPaperSetters:** The question paperwill consist of   five sections A, B, C, D, and E. Section Ewill be Compulsory, itwill consist of a single question with 10-20subparts of short answer type, which will cover the entire syllabus andwill carry 20 of the total marks of the semester endexamination for t h e course. Section A, B,C and D will have two questions from the respective sections of the syllabus and each question will carry 15% 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 and D of the question paper and all the subparts of the questions in section E. Use of nonprogrammable calculators is allowed.

Section A

Introduction to Java, Difference between C/C++ and Java, Applets and Applications, Java Development Kit, Advantages of Java, (Data types, modifiers, expressions, operators in Java), Control Statements in Java, Classes statements in Java

Section B

Classes, Inheritance (single, multilevel, hierarchical), Multiple Inheritance using Interfaces, Arrays, Strings and Vectors, Java packages.
Event Handling: Event Handling Models, Event classes, Event Listener Interfaces, Adapter Classes.

Section C

Multithreading: Java Thread Model, Thread Priorities, Creating Multiple Threads, Synchronization, Inter thread communication, Exception handling.

Section D

Applets: Applet Basic, Applet Architecture, Display Methods, HTML APPLET tag.

AWT Classes: Window fundamentals, working with frames windows, Panels, working woth color, fonts, AWT Controls, layout Manager & Menus. Applets, Graphics and AWT

Books Suggested:

1. Programming w ith JAVA, John R . H ubbard, Schaum 's Outline Series, Tata M cG raw M cG raw H ill , New York.

2. Java Script, Don G osselin, Thomson L earning, Cam bridge,

3. P rogram m ing w ith Java, E B alagurusam y, T ata M cG raw H ill, New Delhi, 2002

Artificial Intelligence Laboratory   **(IT-6007)**

Course Code	IT-6007	Credits-2	L-0, T-0, P-2
Name of the Course	Artificial Intelligence Laboratory		
Lectures to be Delivered	26 Hrs. of Lab work (2hrs. each per week)		
Semester End Examination	Max Marks: 50	Min Pass Marks: 20	Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25%, Viva 25% & Attendance 20%	Max Marks: 50	Min Pass Marks: 25

Instructions for paper setter / Candidates

Laboratory examination will consist of three parts:
1. Performing a practical examination assigned by the examiner. (25 marks)
2. Viva-voce examination. (25 marks)

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. Implement these practical in LISP or Prolog in which you feel comfortable.

   a) Depth –bounded depth first search.
   b) Iterative Deepening Search.
   c) Best first search.
   d) A * Search.
   e) AO* Search.
   f) Minmax Search.
   g) Alpha Beta Pruning.

2. Solve the water jug problem using AI technique.
3. Solve the Missionaries problem using AI technique.
4. Design the following expert system using LISP or Prolog in which you feel comfortable.
   a) Weather Forecasting System.
   b) Legal Expert System.
5. Design parser for NLP using Lex and Yacc utilities

Web Technology Lab.   **(IT-6008)**

Course Code	IT-6008	Credits-2	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: 50	Min Pass Marks: 20	Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25%, Viva 25% & Attendance 20%	Max Marks: 50	Min Pass Marks: 25

Instructions for paper setter / Candidates

Laboratory examination will consist of three parts:

i)   Performing a practical examination assigned by the examiner. (25 marks)
ii) Viva-voce examination. (25 marks)

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.

To create dynamic animation, simulations and interactive web pages using HTML, Java Script.

Create databases using: -
HTML / Java Script / DHTML.

WEB Technology

1.   Setting up intranet.
2.   Learning of tools – DHTML, flash, director
3.   Design of web pages/sites.
4.   Development of web pages/site.
5.   Evaluation of web site.
6.   Registering of website.

Parallel Computing Laboratory   **(IT-6009)**

Course Code	IT-6009	Credits-2	L-0, T-0, P-2
Name of the Course	Parallel Computing Laboratory		
Lectures to be Delivered	26 Hrs. of Lab work (2hrs. each per week)		
Semester End Examination	Max Marks: 50	Min Pass Marks: 20	Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25%, Viva 25% & Attendance 20%	Max Marks: 50	Min Pass Marks: 25

Instructions for paper setter / Candidates

Laboratory examination will consist of three parts:
1. Performing a practical examination assigned by the examiner. (25 marks)
3. Viva-voce examination. (25 marks)

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.

a)   Usage of FORTRAN 77/90 for implementation of following programs.
  (i)   Finding the root of a non linear equation by (a) Bisection Method (b) Newton Raphson method.
  (ii)   Two point and three point numerical differentiation with error estimates.
  (iii)   Integration by Simpson rule with error estimate.
  (iv)   Integration by Gaussian Quadra rule with error estimate.
  (v)   Solving an ordinary differential equation using four point Runge Kutta Method with error estimate and control.
  (vi)   Solution of a system of Linear equations by Gaussian-elimination Method.
  (vii) Diagonalization of Real symmetric Matrix.

b)   Parallel Programming: -
  Developing following elementary programs in FORTRAN 77/C for
   implementation on
  Parallel machines.
  (i)   Fork and Node identity
  (ii)   Expression evaluation
  (iii)   Matrix Addition
  (iv)   Matrix Multiplication
  (v)   Linear curve fit
  (vi)   Gaussian elimination
  (vii) Simpson's 1/3rd rule.

Core Java Lab.   (IT-6010)

Course Code	IT-6010	Credits-2	L-0, T-0, P-2
Name of the Course	Core Java Lab.		

Lectures to be Delivered	26 Hrs. of Lab work (2hrs. each per week)		
Semester End Examination	Max Marks: 50	Min Pass Marks: 20	Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25%, Viva 25% & Attendance 20%	Max Marks: 50	Min Pass Marks: 25

Instructions for paper setter / Candidates

Laboratory examination will consist of two parts:

4. Performing a practical examination assigned by the examiner. (25 marks)
5. Viva-voce examination. (25 marks)

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.

1. Write an application that demonstrates some static method of character class.
2. Create a string buffer object to illustrate how to -
   (a) Display capacity and length of string buffer
   (b) Insert character at the beginning.
   (c) Append & Reverse the string.
3. Write a program that display all the factors of a number entered by user: e.g. If entered 8 it would response with 2 & 4.
4. Write an application that defines sphere class with three constructors first from accepts no arguments. It assume that sphere is centered at origin & has radius of one unit. The record from accept one double value and represents radius and centered at origin, third from accepts four double arguments and specify radius and origin.
5. Write down a programme to implement polymorphism using
   (a) Overloading
   (b) Overriding
6. Write a programme that illustrate how to use throw statement, create class that has static method main (), a (), b (), c () and d (). Mmain invokes a (), a () invokes b (), b () invokes c () and so on. Method d () declares an array with ten elements and then attempts to access 20th element. Therefore array index out of bond exception is generated.
7. Write an application that execute two threads one after another, Create threads by implementing.
   (a) Thread Class
   (b) Runnable Interface.
8. Write a Multithreaded programme that simulate a set of grasshoppers jumping around in a bod. Each grasshopper jumps to a different location.
   Every 2 to 12 seconds. Display the new location of grasshopper after each of these jumps.
9. Write down programme in java to implement following in java.
   (a) Linked List
   (b) Vector Class

(c) Hashtable

(d) Enumeration

10. Write a programme to implement Applet that displays a different Images based on the days of week. The Applet should accept seven parameters that
Identify the Image file.

Semester VII

Natural Language Processing   **(IT-7001)**

Course Code	IT-7001	Credits-4	L-3, T-1, P-0	
Name of the Course	Natural Language 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

Introduction: Knowledge in speech and Language processing, Ambiguity, Models and Algorithms, Language, Thought, and Understanding, The state of the Art and the Near-Term future, Some Brief History, Foundational Insight: 1940s and 1950s, The Two Camp: 1957-1970, Four paradigms: 1970-1983, Empiricism and finite State Models Redux: 1983-1993, The field comes Together: 1994-1999, On Multiple Discoveries.

Regular Expressions and Automata: Regular Expression, Basic Regular Expression patterns, Disjunction, Grouping and Precedence, Example, Advanced Operators, Regular Expression Substitution, Memory, and ELIZA, Finite-State Automata, Using an FSA to recognize Sheeptalk, Formal Languages, Another Example, Non-Deterministic FSAs, Using an NFSA to Accept Strings, Recognition as Search, Relating Deterministic and Non-Deterministic Automata, Regular Languages and FSAs.

Word Classes and Part-of-Speech Tagging: (Mostly) English Word Classes, Tagsets for English, Part-or-speech Tagging, Rule-Based part-of-speech, Stochastic part-of-Speech Tagging, A Motivating Example, The speech Tagging for HMM Tagging, Transformation-Based Tagging, How TBL Rules are applied, How TBL Rules are learned, Other Issues, Multiple Tags and Multiple Words, Class-based N-Grams

Section B

Context-Free Grammars for English: Constituency, Context-Free rules and Trees, Sentence-Level Constructions, The Noun Phrase, Before the Head Noun, After the noun, Coordination, Agreement, The Verb phrase and sub categorization, Auxiliaries, Spoken Language Syntax, Disfluencies, Grammar Equivalence and Normal form, Finite-State and Context-free

Grammars, Grammars and Human Processing, Summary, Bibliographical and Historical, Notes, Exercises.

Parsing with Context-Free Grammars: Parsing as Search, Top-Down Parsing, Bottom-up Parsing, Comparing Top-Down and Bottom-up Parsing, A Basic Top-Drawn Parser, Adding Bottom-up Filtering, Problems with the Basic Top-Down parser, Left-Recursion, Ambiguity, Repeated Parsing of Subtrees, The Earley Algorithm, Finite-State parsing Methods.

Features and Unification: Feature Structures, Unification of Feature Structures, Features Structures in the Grammar, Agreement, Head Features, Sub Categorization, Long-distance Dependencies, Implementing Unification: Unification Data Structures, The unification Algorithm, Parsing with unification.

Constraints: Integrating Unification into an Earley Parser, Unification Parsing; Types and Inheritance, Extensions to Typing, Other Extensions to unification.

Section C

Representing Meaning: Computational Desiderata for representations, Verifiability, Unambiguous Representations, Canonical Form, Inference and Variables, Expressiveness, Meaning Structure of Language, Predicate-Argument Structure, First Order Predicate Calculus, Elements of FOPC, The Semantics of FOPC, Variables and Quantifiers, Inference, Some Linguistically Relevant, Concepts, Categories, Events, Representing Time, Aspect, Representing Beliefs, Pitfalls, Related Representational Approaches, Alternative approaches to Meaning, Meaning as Action, Meaning as Truth.

Semantic Analysis: Syntax-driven Semantic analysis, Semantic Augmentations to Context-Free Grammar Rules, Quantifier Scoping and The Translation of Complex-Term, Attachments for a Fragment of English Sentences, Noun Phrases, Verb Phrases, Prepositional Phrases, Integrating Semantic Analysis into the Earley Parser, Idions and Compositionality, Robust Semantic Grammars, Information Extraction.

Section D

Discourse: Reference Resolution, Reference Phenomena, Syntactic and Semantic: Preferences in Pronoun Interpretation, An Algorithm for pronoun Resolution, Text Coherence, The Phenomenon, An Interference Based Resolution Algorithm, Discourse Structure, Psycholinguistic Studies of References and Coherence.

Natural Language Generation: Introduction to Language generation, An Architecture for generation, Surface Realization, Systemic Grammar, Functional Unification Grammar, Summary, Discourse Planning, Text Schemata Rhetorical Relations, Summary, Other Issues, Microplanning, Lexical Selection, Evaluating Generation Systems, Generating Speech.

Books :
1. Speech and Language Processing by Daniel Jurafsky and James H. Martin
2. Natural Language Understanding by James Allen
3. Theory of Computer Sciences by K.L.P. Mishra and N. Chandrasekaran

Modeling And Simulations   **(IT-7002)**

Course Code	IT-7002	Credits-4	L-3, T-1, P-0
Name of the Course	Modeling And Simulations		
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

    Definition of systems: Types of system, continuous and discrete modeling process and definition of a model. Common types of mathematical models

Section B

    Simulation Process: Discrete and continuous simulation procedures. Random number generation and its testing discrete and continuous random variables, density and distributive functions, study of few distributions such as Poisson, Norma.

Section C

    Simulation of Queuing System: Elementary idea about networks of queuing with particular emphasis to computer system, environment (refer to section 9.1,9.2 & 9.3 of Trivedi's book.),Basic review of queuing and importance of queuing in modeling and simulations

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

Section D

    Simulation Language: A brief introduction to important discrete and continuous languages such as GPSS (Study & use of the language). Use of data base & AI techniques in the area of modeling and simulation.

Books:
1. Deo, Narsing: System Simulation with Digital Computers.
2. Gorden G: System Simulation, Prentice Hall (Two books above can be used as text books).
3. Shridhar Bhai Trivedi, Kishore: Probability & Statistics with reliability Queuing, Computer science Application.
4. Payer, T.A., Introduction to System Simulation, McGraw Hill.
5. Reitman, J., Modeling and performance measurement of Computer System.
6. Spriet, WI A., Computer Aided Modeling and Simulation (Academic Press).

E-Commerce & ERP   **(IT-7003)**

Course Code	IT-7003	Credits-4	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 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

Introduction and Concepts: 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.

Electronic Payment Methods: Updating traditional transactions; secure online offline secure processing; private data networks, Security protocols.

Section B

Electronic Commerce Providers: On-line Commerce options; Company profiles, Electronic Payment System: Digital payment system; First virtual Internet payment system; cyber cash model. On-line Commerce environments; E-commerce Servers.

Digital Currencies Operational process of Digicash, Ecash Trail; Using Ecash; Smart cards; **Electronic Data interchange:** basics, EDI versus Internet and EDI over Internet. Strategies, Techniques and Tools, Shopping techniques and online selling techniques.

Section C

ERP – an Enterprise Perspective: Production finance, Personnel disciplines and their relationships, Transiting environment, MIS Integration for disciplines, Information / workflow, Network Structure, Client Server Integrator System, Virtual Enterprise.

ERP – Resource Management Perspective: Functional and Process of Resource, Management, Introduction to basic Modules of ERP System: HRD, Personnel Management, Training and Development, Skill Inventory, Material Planning and Control, Inventory, forecasting, Manufacturing, Production

Planning, Production Scheduling, Production Control, Sales and Distributions, Finance, Resource Management in global scenario.

Section D

ERP – 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.

Books:
1. Ravi lalakota, Andrew Whinston: Frontiers of Electronics Commerce, 1996, Addison Wesley.
2. V.K. Garg and N.K. Venkita Krishna: Enterprise Resource Planning – Concepts and practice, 1998, PHI.
3. John Antonio, Fernandz: The SAP/3 Handbook, TMH.
4. Denial Amor: The E-Business Revolution, Addison Welsey.
5. From Edi to E-Commerce: A Business Initiative: Sokol TMH.
6. Greenstein and Feinman: E-Commerce, TMH.
7. Diwan, Sharma: E-Commerce Excel.
8. Asset International " Net Commerce", TMH.
9. E-Commerce – Jaffrey F. Rayport, Bernard J. Jaworski, 2002, TMH.
10. Bajan and Nag: E-Commerce: The cutting Edge of Business, TMH.
11. Electronic Commerce – Security, Risk Management and Control, Greenstein, Geinman, 2002, TMH.

Advance Java   **(IT-7004)**

Course Code	IT – 7004	Credits : 4	L-3, T-1, P-0
Name of the Course	Advance Java		
Lectures to be delivered	52 (1 Hr Each) (L = 39, T = 13 for each semester)		
Semester	Max. Time = 3 hrs.	Max. Marks: 100	Min. Pass Marks: 40
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%,	Max. Marks: 50		

Instructions

ForPaperSetters: The question paperwill consist of five sections A, B, C, D, and E. Section Ewill be Compulsory, itwill consist of a single question with 10-20subparts of short answer type, which will cover the entire syllabus andwill carry 20 of the total marks of the semester endexamination 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 15% of the total marks of the semester end examination for the course.

For Candidates: Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C and D of the question paper and all the subparts of the questions in section E. Use of nonprogrammable calculators is allowed.

Section A

Java EE: Introduction Enterprise Architecture ,their types and Goals, Introducing Java EE platform, Architecture of Java EE and concepts, Web Applications and Java EE 5.

JDBC: Introduction to JDBC, Components of JDBC, JDBC Specifications and Architecture, JDBC Drivers, JDBC API, Implementing a Simple JDBC example.

Section B

Servlets: Features of Java Servlets, Servlet API, Servlet Life Cycle, Servlet Configuration, A simple Example of Servlet.

Session Handling and Event Handling:- Introduction to Sessions, Session Tracking Mechanisms with examples, Events, Event Handling and Types of Servlet Events.

Section C

Introduction to JSP: Overview of JSP Technology, JSP Architecture, JSP Page Life-Cycle, JSP Elements (Directives, Scripting Elements, Action Elements, Implicit Objects and Comments), Using JSP Best Practices.

Brief introduction to JSP Tags, JSTL (JSP Standard Tag Library) and Filters.

Section D

Enterprise Java Beans: EJB 3.0 Fundamentals, EJB Architecture and Concepts, Classifications and Configurations of EJBs.

XML:- Introduction and XML Basics, XML Syntax, Declaration, XML Elements and Attributes, XML Parser.

Books Suggested:
1. Java Server Programming, Black Book, Kogent Solutions Inc., 2010.
   2. Head First Servlets and JSP, Willey Estern Publications
  3. Head First EJB Willey Estern Publications

Wireless Communication			**(EC-7012)**
Course Code	EC-7012	Credits-4	L-3, T-1, P-0
Name of the Course	Wireless Communication		
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

Introduction to Wireless Communication System: Evolution of mobile radio communication, examples of wireless comm. system, paging system, Cordless telephone system. Comparison of various wireless systems, GSM
Modern Wireless Communication System: Second generation cellular networks, third generation wireless networks, wireless in local loop, wireless local area networks, blue tooth and personal area networks.

Section B

Introduction to Cellular Mobile System: Spectrum Allocation, basic cellular system, Performance Criteria. Operation of Cellular System, Analog cellular system, Digital Cellular System.
Cellular System Design Fundamentals: Frequency Reuse, Channel assignment strategies, handoff strategies. Interference and System capacity,Improving Coverage and capacity.

Section C

Multiple Access Techniques for Wireless Communication: Introduction to Multiple Access, FDMA, TDMA, Spread Spectrum Multiple Access, Space division multiple access, packet ratio, capacity of a cellular system.
Wireless Networking: Difference between wireless and fixed telephone networks, Development of Wireless Networks, Wireless Data Services, Common Channel Signaling, ISDN (Integrated Service Digital Network, Advanced Intelligent Networks.

Section D

    Intelligent Cell Concept and Application: Intelligent cell concept, Application of Intelligent – cell system, In Building Communication, CDMA Cellular Radio Networks, VSAT-Review of latest cellular technologies(GPS)

Books:
1. Wireless Communication: Theodore S. Rappaport: Pearsons.
2. Mobile Cellular Telecommunication: W.C.Y.Lee: McGraw Hill.
3. Mobile Communications: Jochen Schiller; Pearson.

Advance Java Lab.   **(IT-7005)**

Course Code	IT-7005		Credits-2		L-0, T-0, P-2
Name of the Course	Advance Java Lab				
Lectures to be Delivered	26 Hrs. of Lab work (2hrs. each per week)				
Semester End Examination		Max Marks: 50	Min Pass Marks: 20		Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25%, Viva 25% & Attendance 20%			Max Marks: 50	Min Pass Marks: 25

Instructions for paper setter / Candidates

Laboratory examination will consist of two parts:

6. Performing a practical examination assigned by the examiner. (25 marks)
7. Viva-voce examination. (25 marks)

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. To create a user interface which inputs user's Name, email-ID, City etc. to store in the database through JDBC using SQL server or MS Access.
2. To display Juggler Bean by setting its properties and events.
3. To display the applet designed by the user in Bean Box.
4. To create a user interface using swings which displays pop-up window containing list of courses, option buttons for inputting Male or Female, Check Boxes to display the choices of various institutes and menu bars using event handling. Put the other controls accordingly.
5. To display a stop watch which rings the alarm at the time specified by the user using multithreading.
6. To create a user defined bean which may be used as Font selector in other applications.
7. To study the various types of beans and their corresponding properties:
   a) Jelly bean   b) Tick Tock Bean c) ChangeReporter Bean d) OurButton Bean

8. To design an online polling system using PHP.

9. To create a web form containing required details for entering the user's data for   .   registering himself using javascript.

10. To create a chat server using RMI or socket programming.

Modeling and Simulations Lab.   **(IT-7006)**

Course Code	IT-7006	Credits-2	L-0, T-0, P-2
Name of the Course	Modeling and Simulations Lab.		
Lectures to be Delivered	26 Hrs. of Lab work (2hrs. each per week)		
Semester End Examination	Max Marks: 50	Min Pass Marks: 20	Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25%, Viva 25% & Attendance 20%	Max Marks: 50	Min Pass Marks: 25

Instructions for paper setter / Candidates

Laboratory examination will consist of two parts:

8. Performing a practical examination assigned by the examiner. (25 marks)
9. Viva-voce examination. (25 marks)

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.

(For all the given exercise student has to make GUI)

1. Write a programme for the random number generation and do its testing and validation for various discrete and random variables.
2. Do the modeling and simulation of queuing system (i.e. in computer system).
3. Do the modeling and simulation of the ATC (Air Traffic Control System).
4. Do the modeling and simulation of the Monte-Carlo method.
5. Study the GPSS and implement various programme in it.

E-Commerce Laboratory **(IT-7007)**

Course Code	IT-7007	Credits-2	L-0, T-0, P-2
Name of the Course	E-Commerce Laboratory		
Lectures to be Delivered	26 Hrs. of Lab work (2hrs. each per week)		
Semester End Examination	Max Marks: 50	Min Pass Marks: 20	Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25%, Viva 25% & Attendance 20%	Max Marks: 50	Min Pass Marks: 25

Instructions for paper setter / Candidates

Laboratory examination will consist of two parts:

8. Performing a practical examination assigned by the examiner. (25 marks)
9. Viva-voce examination. (25 marks)

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.

This laboratory will be self-exploratory in nature with the undertaking of case studies such as by culling information from the Internet on

a) Pay roll
b) Back office accounting
c) Supply chain
d) Order Processing
e) Shipments
f) Web and Value addition to traditional business
g) Study of packages such as SAP oracle.

At the end of the laboratory a student is expected to make a presentation of his exploration in the area of e-commerce and ERP.

Project – I   **(IT-7008)**

Course Code	IT-7008	Credits-3		L-0, T-0, P-3
Name of the Course	Project – I			
Semester End Examination	Max Marks: 50	Min Pass Marks: 20		Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25%, Viva 25% & Attendance 20%	Max Marks: 50		Min Pass Marks: 25

This project work shall be carried out by the students during the entire semester under the guidance of Supervisor allotted by the institute and its viva will be conducted at the end of the semester.

Instructions for paper setter / Candidates
Seminar / Viva will be conducted on the project done by the candidate.

Vocational Training   **(IT-7016)**

Course Code	IT-7016	Credits-1	L-0, T-0, P-1
Name of the Course	Vocational Training		
Semester End Examination	Max Marks: 50	Min Pass Marks: 20	Maximum Time: 3 hrs
Continuous Assessment	Based on Multimedia Presentation of the Project under taken & the Training undertaken.		Max Marks: 50	Min Pass Marks: 25

Instructions for paper setter / Candidates

This six weeks training will be related to Industrial Projects / Software Projects to be undertaken under the guidance of Faculty preferably at Industry / Software Park / Incubation Centre or related areas. This may also be undertaken within the Institute. The training will be undertaken during vacation. Student is supposed to submit the project report at the end of the training.

Evaluation will be based on Project Report, presentation and comprehensive Vive-voce examination related to the project.

PROFESSIONAL ELECTIVE - I

Software Maintenance   **(IT-7010)**

Course Code	IT-7010	Credits-4	L-3, T-1, P-0
Name of the Course	Software Maintenance		
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

Fundamentals: Meaning of software maintenance, software change, ongoing support, economic implications of modifying software, the nomenclature and image problem, software maintenance framework, potential solutions to maintenance problem.

Maintenance Process models: Definitions, critical appraisal of traditional process models, maintenance process models.

Program understanding: Aims of program comprehension, maintainers and their information needs, comprehension process models, mental models, program comprehension strategies, factoirs that affect understanding, implication of comprehension theories and studies.

Section B

Reverse Engineering: Definitions, purposes and objectives, level of reverse engineering, supporting techniques, benefits.

Reuse and reusability: Definitions, objectives and benefit of reuse, approach to reuse, domain ANALYSIS, COMPONENTS engineering, reuse process model, factors that impact upon reuse.

Maintenance measures: Definitions, objectives of software maintenance, example measures, guidelines for selecting maintenance measures.

Section C

Configuration management: Definitions, configuration management, change control, documentation.

Management and organizational issues, Management responsibilities, enhancing maintenance productivity, maintenance teams, personnel education and training, organizational modes.

Section D

Building and sustaining maintainability: Quality assurance, fourth generation languages, object-oriented paradigms.

Maintenance tools: Criteria for selecting tools, taxonomy of tools, program understanding and reverse engineering, testing, configuration management, other tasks

Past present and future of software maintenance.

Books:

Software Maintenance: concepts and practice, Armstrong A Takang and Penny A. Grubb, International Thomson Computer press, London.

Corba/XML   **(IT-7011)**

Course Code	IT-7011	Credits-4	L-3, T-1, P-0
Name of the Course	Corba/XML		
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

Introduction to Corba: An overview, CORBA Revisited, The Evolution of CORBA, BOA vs. POA Generation, The invocation Lifecycle, The Object Lifecycle.

CORBA Services Revisited: Core Services, Database Integration and Transaction processing, Scalability Issues. The Stock Watch Components, The Portfolio Manager Component, Performance Considerations, Performance Implications of IDL Design, Transferring Large Amounts of Data.

Section B

Object Location: A Model for Locating Objects, CORBA object Location Services, Other ways to Locate Objects, Selecting an Object Location Mechanism, Selecting Objects For Publication, Measuring, CORBA and Messaging, ORB Support for Messaging, The need for Message – Oriented Middleware, Existing Message-Oriented Middle ware products, Related CORBA Services, Multicast Messaging.

Security: Security Concepts, Enterprise System Security Requirements and Policies, CORBA Security, Solutions for the Real World.

Section C

Database Integration and Transaction Processing: Object Persistence, Introduction, Accessing Relational Data bases, Object/Relational Mapping, Object Databases, Data Consistency.

Database Integration: System Architecture, Related OMG Work, Integration Aspects, CORBA Business Objects, ODBMS, CORBA Relationship Service, CORBA Query Service, Application – Specific Solutions, Tradeoffs, Stateless Servants, Stateful Servants, Database Adapters, The Billion – Object CORBA System, Transaction in a CORBA Environment, Two-Tier vs. Three-Tier, Architectures, Client – Controlled vs. Server – Controlled Transactions, Server Controlled Transaction, Client – Controlled Transactions.

Distributed Transaction Processing: Transaction Processing, CORBA Object Transaction Services, Advanced Transaction Models.

Section D

Introduction to XML: Fundamentals of XML, XML as a Data Format, XML for Web pages, Object Method Parameter Encoding and RPC Protocol, XML and open Exchange, The Flexibility of XML, XML Basics, Digging into the Syntax, XML Anatomy, Elements, Attributes, Test, Entities, Character references, CDATA, Encodings, comments, Processing Instructions, Well-Formed versus valid, XML Namespaces.

Programming the Document Object Model: The idea behind the DOM, DOM requirements, Language and Platform Independent, Core DOM for both HTML and XML, Independent of the User Interface, Accessable elements of the documents, Limitation of the DOM, Objects in the DOM, Fundamental DOM Interfaces, Microsoft Parse Error Object, Platform Neutrality of XML and the DOM, Generic Node methods, Wrapper Functions for Manipulating the DOM, specific node interfaces, extended interfaces, Microsoft Specific Extensions. Displaying the Nodes in a Tree Control, SAX.

Using XML Queries and Transformation: Xapth query syntax, Different Axes, Different Node Tests, Building a Path, Selecting Subsets, Built-in Functions, IES Conformance.

XSLT: Working of Transformation, Some Good XSLT Processors,

XSLT Elements – Composing the XSLT Style sheet: Pre-defined templates, Elements that Generate output elements, commands, what if several templates Match?, Control of flow, variables and parameters, Top Level setting, Built in functions, Simplified syntax, XSLT Language extensions, The IES Implementations, Tricks for using MSXML 2.0.

Giving style to XML: using CSS in HTML, Using XML, XSLT for adding style, Client side XSLT Styling.

Books:

1. Enterprest CORBA, Prentice Hall PTR by Dick Slama, Jason Gaurbis, Perry Russel.

2. Professional Visual Basic 6, XML, Wrox Press Ltd. By James Britt, Teun Duynstee.

Design of Embedded Systems   **(IT-7013)**

Course Code	IT-7013	Credits-4	L-3, T-1, P-0
Name of the Course	Design of Embedded Systems		
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

Real Time Operating System overview, exposure to Windows CE, QNX, Micro Kernels and µc/OS of introduction to process models, Interrupt routines in an RTOs environment, encapsulating semaphores and queues, hard real-time scheduling consideration, saving memory space.

16 & 32 bit microprocessor and micro-controller and DSP hardware with reference to Embedded system.

Section B

Embedded software development tools and compilers host and target machines, linker/locators for embedded software, cross compilers, cross assemblers and tool chairs, gce compiler, basic concept of device drivers, serial communication interface device driver.

Section C

System synthesis of Hardware / Software co-emulation, Simulation speed of emulators, JTAG OCD.

Section D

Communication protocol with special reference to embedded system, TCP/IP, VDP wireless protocol, IRDA, Blue tooth IEE 8.8.11.

Books:

1. An embedded system primer by David E. Simon, 1999, Addison-Wesley.
2. TCP/IP Lean: Web Servers for embedded systems by Jeramy Bentham, 2002.
3. Real – time programming: A guide to 32 bit embedded development, Rick Grchan, 1999.

GIS/Remote Sensing   **(IT-7015)**

Course Code	IT-7015	Credits-4	L-3, T-1, P-0
Name of the Course	GIS/Remote Sensing		
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

Concepts and Foundations of Remote Sensing: Introduction, Energy Sources and Radiation Principles, energy Interactions in the Atmosphere, energy Interactions with Earth Surface Features, Data Acquisition and Interpretation, An Ideal Remote Sensing System, characteristics of Real Remote Sensing System, successful application of Remote Sensing, Land and Geographic Information Systems.

Section B

Multispectral, Thermal and Hyperspectral Scanning: Introduction, Across-Track Multispecial Scanning, Along-track Multispecial Scanning, across – Track Thermal Scanning. Thermal Radiation principles Interpreting Thermal Scanner Imagery, geometry Characteristics of Across-Track Scanner Imagery, Radiometric Calibration of Thermal Scanners, Temperature Mapping with Thermal Scanner Data, FLR Systems, Imaging Spectrometry.

Section C

Earth Resource Satellites Operating in the Optical Spectrum: Entry History of Space Imaging, Landsat Satellite Program, Orbit Characteristics of Landsat-1, -2 and –3, Sensor Onboard Landsat-1, -2 and –3, Landsat MSS image Interpretation, Orbit characteristics of Landsat-4 and –5, Sensors Onboard Landsat-4 and –5, Landsat TM Image Interpretation, Landsat-6 Planned Mission, Landsat ETM Image Simulation, Landsat-7, SPOT HRV Image Interpretation, APOT-4 and –5, Meteorological Satellites, Ocean Monitoring Satellites, Earth Observing system.

Section D

Digital Image Processing: Image Rectification and Restoration, Image Enhancement, contrast Manipulation, spatial Feature Manipulation, Multi-Image Manipulation, Image Classification, Supervised classification, The Classification Stage, The Training Stage, Unsupervised Classification, The output Stage, Post classification Smoothing, Classification Accuracy Assessment, Data Merging and GIS Integration.

Microwave Sensing: Introduction, Radar Development, SLAR System Operation, Spatial Resolution of SLAR system, Geometric Characteristics of SLAR Imagery.

SEMESTER-VIII

Multimedia Technology   **(IT – 8001)**

Course Code	IT – 8001	Credits-4	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 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

Introduction: Motivation, Module Overview, Evolution of Multimedia, Structure and components of Multimedia. Application Domains, Internet and Multimedia, Multimedia and Interactivity, Primary User-Interface Hardware: Mouse. Keyboard, Joystick. Primary Visual Interface Items: Window, Buttons, Textbox, Icons. Basic Metaphors: Side – Show, Book, Hypertext, Hypermedia, Browsers and helper Application overview, User Interface Design Issues.

Technology: Sound and Audio, Psycho accoustics – Frequency and amplitude sensitivity of hearing music and noise, stereo effects. Masking, Frequency domain compression of analog sound signal, 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, MIDI interface, protocol and data format.

Section B

Image & Graphics: Principles of raster graphics, Computer Visual Display concepts, Resolution, colour and pallets, Refresh rates an graphic accelerators, Digital image Representation and formats, Graphic, Image processing and enhancement, Colour 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 etc.

Video Technology: Analog Video, Principles Broadcast standards, CCD Camera, , Digital Video, Principles, PC video and Videoconference standards, TV Cards Frame Grabber Principles, IDTV and HDTV principles.

Section C

Data Compression: Data Compression Requirement, Information Theory based and frequency domain based and compression, Basic Compression Techniques: DPCM, Runlength Coding, Huffman Coding, JPEG/ISO, Real-time encoding and CCITT H.261 (px64) standard, MPEG-I & II, DVI.

Multimedia Document and Interchange formats: Hypertext, HTML, MHEG and Hypermedia, SGML, 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 Synchronisation, Time Abstruction for authoring and visualization, Reference Modle and Specification.

Application Development: Product development overview, Life cycle Models, Human Roles and Teamwork, Product Planning, Basic Authoring Paradigms: Story Scripts, Authoring Metaphors and authoring languages, Content Analysis: Message, platform, Metaphor and Navigation, cost-quality tradeoffs, Intellectual Property Right and Copyright issues.

Books:
1. **Multimedia Systems Design, P.K.Andleigh and K.Thakrar, Prentice hall PTR, 1996.**
2. Multimedia Computing, Communications and Applications, Ralf Steinmetz and Klara Nashtedt, Prentice Hall 1995.
3. Creating Multimedia Presentations, Douglas E.Wolfgram, Que. Crop., 1994.
4. Multimedia Authoring: Building and Developing Documents, Scott Fisher, AP Professional, 1994.
5. Multimedia systems, Ed. By John F.K.Buford, Addison – Wesley Publishing Co., 1994.
6. Multimedia Technology & Applications, David Hillman, Galgotia Publications.
7. Multimedia Systems, Rajneesh Agrawal, Excel Books.
8. Digital Multimedia, Nigel Chapman & Jenny Chapman, Wiley Publications.
9. Fundamentals of Computer Graphics and Multimedia, D.P.Mukherjee.

Information Systems Security   **(IT– 8002)**

Course Code	IT– 8002	Credits-4	L-3, T-1, P-0
Name of the Course	Information Systems 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 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

Basic Encryption and Decryption: Terminology and Background: Encryption, Decryption and Cryptosystems, Plain Text and Cipher Text, Encryption algorithms, Cryptanalysis.

Introduction to Cliphers: 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

Secure Encryption systems: Hard Problems: Complexity: NP – Complete problems, Characteristics of NP- Complete Problems, The Meaning of NP-Completeness and Cryptography.

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)

Applied Cryptography, protocols and Practice: Key Management Protocols: Solving Key Distribution Problem, Diffie – Hellman Algorithm, Key Exchange with public Key Cryptography.

Public Key Infrastructure (PKI): Concept of digital Certificate, Certificate Authorities and it's roles, X509 Structure of Digital Certificate, Types of public Key Infrastructure. Legal Issues: Copyrights, Patents, Trade Secrets, Computer Crime, Cryptography and the Law, Operating System, Database and program Security.

Section D

Operating System Security: Security policies, Models of Security, Security Features of Ordinary Operating System, Security features of Trusted Operating Systems.

Database Security: Security requirements of Database, reliability and integrity, Protection of Sensitive Data, Inference problems: direct and Indirect Attacks

Program Security: Kinds of Malicious Code, How viruses Attach and Gain Control, Homes for Viruses, Virus signatures, Preventing Virus Infection, Trapdoors, Convert Channels, Control Against program Threats, Java Mobile codes.

Network Security

Network Security Issues such as Impersonation, Message Confidentiality, Message Integrity, Code Integrity, Detail of Servie, Secure communication Mechanism such as IPSec, PKI based Authentication and Kerberos, Authentication, biometrics Authentication Mechanism, Access Control Mechanism Firewalls

Web Security: Solving privacy problems, Solving Authentication problem, secure socket layer (SSL) protocol, Secure Electronic Transaction (SET) Protocol, Safe Guarding Web Servers.

Secure Electronic Mail: Privacy Enhanced Email (PEM), Pretty Good Privacy (PGP), Public key Cryptography (PKC) Standards – PKCD#7, Secure/ Multipurpose Internet Mail Extensions (S/MIME)

Books: -

1. " Security in Computing (Second Edition)", Charles P.Pfleeger, 1996, Prentice Hall International, Inc.
2. "Applied Cryptography protocols, Algorithms, and Source Code in C (Second Edition)", Bruce Schneier, 1995, John Willey & Sons. Inc.

3. "Security Technologies for the world wide web", Rolf Oppliger, Artech House, Inc.
4. "Digital Certificates Applied Internet Security", Jallo Feghhi and peter Williams Addison Wesley Longman Inc.
5. " The World Wide Web Security FAQ", Lincoln D. Stein, world wide web Consortium,[online] Available at http://www/w3.org/Security/Faq/www.security.faq.html
6. Cryptography Message Syntax Standard, public Key Cryptography Standard, RSA Laboratories [online] Available at http:/www. rsasecurity.com/rsaabs/pkes/pkes-7/indes.html

Data Warehouse and Data Mining   **(IT- 8003)**

Course Code	IT-8003	Credits-4	L-3, T-1, P-0
Name of the Course	Data Warehouse and Data Mining		
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
    Data ware housing Definition, usage and trends, DBMS vs. Data warehouse, data marts, metadata, Multidimensional data mode, data cubes, Schemas for Multidimensional database: stars, snowflakes and fact constellations.
    Data warehouse process & architecture, OLTP vs. OLAP, ROLAP vs. MOLAP types of OLAP, servers, 3 – Tier data warehouse architecture, distributed and virtual data warehouses, data warehouse manager.

Section B
    Data mining definition & task, KDD versus data mining, data mining techniques, tools and applications,DBMS versus Data Mining,Data Mining application areas,Issues and challenges in Data Mining. *Data mining query languages, data specification, specifying knowledge, hierarchy specification, pattern presentation & visualization specification, Data mining techniques, tools and applications.* Association rules, apriorl algorithm

Section C
    Clustering techniques:Clustering paradigms,partition algorithm,hierarchical clustering, Decision tree knowledge discovery through neural Networks & Generic Algorithm, Rough Sets, Support Victor Machines and Fuzzy techniques.

Section D

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

Books:
1. Data warehousing in Real World; Sam Anahory & Dennis Murray; 1997, Pearson
2. Data Mining – Concepts & Techniques; Jiawei Han & Micheline Kamber – 2001, Morgan kaufmann.
3. Data Mining Techniques; Arun Pujar; 2001, University Press; Hyderabad.

Reference Books: -
1. Data Mining; Pieter Adriaans & Dolf Zantinge; 1997, Pearson
2. Data Warehousing, Data Mining and OLAP; Alex Berson, 1997, McGraw Hill
3. Data Warehousing System; Mallach;2000, McGraw Hill
4. Building the Data Warehouses; W.H. Longhman, C.Klelly, John Wiley & Sons.
5. Developing the Data Warehouses; W.H. Longhman, C.Klelly, John Wiley & Sons.
6. Managing the Data Warehouses; W.H. Longhman, C.Klelly, John Wiley & Sons.
7. Decision support Systems & Data Warehouses, Ravindernath, B., New Age International Publishers, New Delhi.

Project-II   **(IT-8004)**

Course Code	IT-8004	Credits-10	L-0, T-0, P-10
Name of the Course	Project-II		
Semester End Examination	Max Marks: 150	Min Pass Marks: 75	Maximum Time: 3 hrs
Continuous Assessment	Lab work 30%, Lab Record 25%, Viva 25% & Attendance 20%	Max Marks: 100	Min Pass Marks: 50

Instructions for paper setter / Candidates

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

Aim of the project

Project is one of the culmination points of the learning process, which puts to test the acquired ability of the candidate to independently take charge of the project or system development. The effort should be made to open up a window of opportunity with the industry the project can proceed in three steps using software engineering methodology

Preparation of required document

Preparation of Design Document

Writing of Code and its testing with demonstration cases.

An effort should be made by the institute faculty to liaison with the industry and conduct three reviews to meet the dead lines and satisfactory completion of the project.

Following format for documentation for the project be followed:

Forwarding Page
1. Title of the Project
2. Objectives.
3. Definitions of Key Term
   - Approach to Problem solving
   - Limitations. If any
4. Output Generated
5. Details of Hardware platform used
6. Details of software Tools used
7. Implementation Issues (Clearly defining the area of Application)
8. Miscellaneous
9. Signature of Candidate & date

Recommended Chapters/sections (Not Mandatory but only Guidelines)
1. Microscopic Summary
2. Details of candidate and Supervisor along with certificate of
   - Original work;

- Assistance. If any;
- Credits;
3. Aims and Objectives
4. Approach to project and Time Frame
5. Project Design Description with Appendices to cover
- Flow Charts/ Data Flow diagram- Macro/ Micro Level
- Source Code; If any
- Hardware platform
- Software tools;
- Security Measures
- Quality Assurance
- Auditability
6. Test Date and Result

Study of writing and presentation must follow the guidelines for effective3 technical writing. Times for submission.
Project must be submitted by the day of last paper in semester end examination
Seminar/ Viva a comprehensive seminar/ viva-voce should be conducted as part of evaluation.
At the time of seminar/ viva-voce the industry guide/ supervisor may be invited.

MULTIMEDIA TECHNOLOGY LAB **(IT – 8005)**

Course Code	IT – 8005	Credits: 2	L-0, T-0, P-2
Name of the Course	**MULTIMEDIA TECHNOLOGY LAB**		
Lectures to be delivered	**26 hours of Lab sessions**		
Semester End Examination	**Max. Time = 3 hrs.**	**Max. Marks : 50**	**Min. Pass Marks: 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates
Laboratory examination will consist of two parts:
   i.   Performing a practical examination assigned by the examiner (25 marks).
   ii. Viva-voce examination (25 marks).
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.   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.

General Proficiency   **(IT-8016)**

Course Code	IT-8016	Credits-1	L-0, T-0, P-1
Name of the Course	General Proficiency		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs

Instructions for paper setter / Candidates

a) Aim of this course id to judge the overall development of the candidate as a professional in the respective branch of skill and fitness to the profession

a) To test the general fitness of candidate for the pr4ofession of Engineering

b) A comprehensive viva-voce examination will be conducted by a committee of five members of the institute.
   1. Director/ Principal of the institute
   2. Head of the concerned branch of Engineering.
   3. An eminent professional from industry/ Public Sector/ Technical; Institute nominated by the Director/ Principal.
   4. A member drawn from among the faculty of Applied Science & Humanities.
   5. A Faculty member of the concerned branch of engineering.

c) The topic of the Group Discussion will decided by the Committee as C

d) Due weightage be given to technical papers presented at National, International level, Prizes won by the candidate both in curricular and extra curricular activities. Extra curricular activities should include participation in clubs, NCC/ NSS organizational capacity, physical education, Yoga, community service, Technology for a common man and overall conduct.

OPEN ELECTIVES

COMMUNICATION SYSTEM   **(EC – 8020)**

Course Code	*EC – 8020*	Credits : 4	L-3, T-1, P-0
Name of the Course	*COMMUNICATION SYSTEM*		
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.

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

PULSE COMMUNICATION: Information In a communication system, coding, noise in an information carrying channel, Types of pulse modulation, Pulse Amplitude modulation (PAM), Pulse Width Modulation (PWM), Pulse Position Modulation (PPM), Pulse code Modulation (PCM), Telegraphy (& Telex), Telemetry.

SECTION – B

BROADBAND COMMUNICATION SYSTEMS: Frequency division multiplexing, Time division multiplexing, Short & Medium Haul systems – Coaxial Cables, Fiber Optic Links, Microwave Links, Tropospheric scatter links, Long Haul Systems – Submarine cables, Satellite communications.

SECTION – C

SATELLITE COMMUNICATION: Introduction, Orbits, Station keeping, Orientation of Satellite, Transmission Path, It's losses & noise consideration, Satellite Systems, Saturation flux Density, effective Isotropic radiated Power, SPADE, TDMA.

SECTION – D

FIBER OPTIC COMMUNICATION: Introduction, Principle of light transmission in a fiber, Effect of Index profile on Propagation, Modes Of propagation, Number of modes via fiber, Single mode propagation, Rayleigh scattering losses,

Absorption losses, mode coupling losses, bending losses, combined losses. Effects of Dispersion on Pulse Transmission, intermodal dispersion, material dispersion, waveguide dispersion, total dispersion, fiber optic communication system.

BOOKS:
1. Electronics communication systems by Kennedy & Davis, TMH.
2. Electronics Communication by Dennis Roddy & John Coolen.

RELIABILITY OF ELECTRONICS COMMUNICATION SYSTEM   (EC-8021)

Course Code	EC-8021	Credits-4	L-3, T-1, P-0
Name of the Course	**Reliability Of Electronics Communication 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 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
Basic Definitions, concept and need for reliability, inherent value of reliability in modern system, hazard rate, failure density function, mean time to failure & repair. Relationship between basic variables, analytical form of reliability function. Derivation for the exponential distribution function and Webiull distribution.

Section B
Different type and modes of failures, causes of failure in different systems, systems structures, series, parallel, stand by, K-out-of-n configuration their reliability analysis.
Reliability evaluation techniques applicable to general non-series parallel system. Markov processes for repairable & no repairable system & their applications in reliability analysis..

Section C
Maintainability, analysis of down time, Repair Time Distribution, Stochastic Point Processes, System Repair Time, Reliability under Preventive Maintenance, State Dependent Systems With Repair Maintenance Requirements.
Availability, concepts & definitions, Exponential Availability model, System availability, Inspection & Repair availability model, design trade-off Analysis.

Section D
Data collection & Empirical Methods- Data collection, Empirical methods, static life estimation.

Reliability Testing- Product testing, Reliability Life testing, Test time calculations, Burn in testing, Acceptance testing, accelerated life testing, experimental design, Competing failure models.

Books:
1.   Concepts in Reliability by L.S. Sri Nath.
2.   Reliability Engineering by Balaguruswamy   :
3.   Reliability and Maintainability Engineering by Charles E. Ebeling.

NON CONVENTIONAL ELECTRICAL POWER GENERATION   (EE-8008)

Course Code	**EE-8008**	Credits : 4	L-3, T-1, P-0
Name of the Course	**NON CONVENTIONAL ELECTRICAL POWER GENERATION**		
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 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
Energy situation and renewable energy sources: Global Energy scenario, World Energy consumption, Energy in developing countries, fire wood crisis, Indian energy scene, Non conventional renewable energy sources, potential of renewable energy sources.

SECTION – B
Wind Energy: Origin of wind, Basic principle of wind energy, conversion, component of wind energy conversion system, type of windmills, Wind electrical Generations in India.

Solar Energy: Introduction, solar radiation, solar energy collector, solar thermal power generation, low temperature application of solar energy.

SECTION - C
Geo-thermal Power Plants: Introduction, Geothermal sources, comparison of Geo thermal energy with other energy forms, development of Geothermal power in India.

Physical and thermochemical methods of bioconversion: Introduction, biomass definition and potential, physical method of bio conversion, thermo chemical methods.

SECTION – D

Wave, Tidal and OTEC: Introduction, Basic principle of tidal power, Wave energy, component of Tidal power plant, Ocean Thermal Energy Conversions, advantages and disadvantages of tidal power generation.

Small and Mini Hydro power System: Introduction, site development, generation and electrical equipment, system of regulation of Hydroelectric Power in India.

BOOKS:
1.   Renewable Energy Sources – Maheshwar Dyal.
2.   Small and mini Hydropower system by Tata Mc Graw Hill.
3.   An Introduction to power plant technology – G.D.Rai.
4.   Solar Energy – Suhas.P.Sukhatma, Tata Mc Graw Hill.
5.   Modern Power Plant Engg. – Joel

ENERGY ASSESSMENT AND AUDITING   (EE-8009)

Course Code	**EE-8009**	Credits : 4	L-3, T-1, P-0
Name of the Course	**ENERGY ASSESSMENT AND AUDITING**		
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 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

ENERGY MANAGEMENT PRINCIPLES: Systems of Energy flow, principles of Energy flow and Energy conservation, Energy and money, Energy and growth, flow of energy in ecological system, Energy efficiency and demand side management (DSM), Economic evaluation.

SECTION – B

ENERGY AUDIT: Concepts and benefits of Energy Audit, Types of Energy Audits, National Energy Plan and its impact on energy conservation, Energy accounting and analysis, Energy audits of building systems, electrical systems, maintenance and energy audits.

SECTION - C

MEASURING INSTRUMENTS: Temperature measuring instruments, combustion system measuring instruments, measurement of heating, ventilation and air conditioning system performance.

SECTION – D

ENERGY CONSERVATION IN INDIAN SCENARIO: Energy demand and consumption in Indian industries, potential for energy efficiency in Indian industry, government's role in energy conservation and energy efficiency, Energy conservation techniques – conservation in energy intensive industries, economic evaluation of conservation techniques.

BOOKS:
1.   Handbook of Energy Audits by Albert Thuman – Fairman Press Inc.
2.   Energy basis for man and nature by Howard T.Odum & Elisbeth.C.Odum.

COMPUTER SOFTWARE TESTING   **(CS-8020)**

Course Code	**CS-8020**	Credits: 4	L-3, T-1, P-0
Name of the Course	**COMPUTER SOFTWARE TESTING**		
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 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)	Max. Marks: 50		

Instructions
- **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.
- **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
Fundamentals of Testing types: First, second and later cycles of testing. Objectives and limits of testing. Overview of S/W development stages, Planning and Design stages and testing during these stages. Glass box code, Regression and Black box testing Software errors, Categories of software error.
Reporting and analyzing bugs: Problem reports, Content and characteristics of Problem Report, analysis and tactics for analyzing a reproducible bug. Making a bug reproducible.

SECTION-B
Problem Tracking System: Objective of Problem Tracking system, tasks of the system, problem tracking overview, users of the tracking system, mechanics of the database.
Test Case Design: Characteristics of a good test, equivalence classes and boundary values, visible state transitions, Race condition and other time dependencies, load testing, Error guessing, Function equivalence testing, Regression testing, General issues in configuring testing, printer testing.

SECTION-C
Localization and User Manual testing: Translated test expands, Character sets, keyboards, Text filters, Loading, saving, importing and exporting high and low ASCII, Operating system language, Hot keys, Error message

identifiers, Hyphenation rules, Spelling rules, Sorting rules, Uppercase and lower case conversion, Printers, Sizes of paper, CPU's and video, Rodents Data formats and setup options, Rulers and measurements, Culture-bound Graphics and output, European product compatibility, Memory availability, automated testing, Testing user manuals, Effective documentation , documentation tester's objective, How testing documentation contributes to software reliability.

SECTION-D
Testing Tools and Test Planning: Fundamental tools, Automated acceptance and regression standards, Translucent box testing, Overall objective of the test plan: Product or tool? Detailed objective, type of test, strategy for developing components of test planning documents, components of test planning documents, documenting test materials.

Text Book:
1. Testing Computer Software, by Cem Kanern , Jack Falk, Hunk Quoe Nguyen,1999, Pub:Wiley,(Second edition).

COMPUTER NETWORKS AND SECURITY (CS-8021)

Course Code	**CS-8021**		Credits: 4	L-3, T-1, P-0
Name of the Course	**COMPUTER NETWORKS AND SECURITY**			
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 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 networks: Uses of computer networks, Types, LAN, MAN, WAN, wireless networks, Network Topologies, Networks software, Protocol hierarchies, design issues of layers interfaces and services, The OSI reference model, The TCP/IP reference model. Transmission media, Wireless transmission.

SECTION-B

Narrow band ISDN, Broadband ISDN and ATM, Virtual circuit switching, Types of switching. Elementary data link protocol- an Unrestricted simplex protocol, a simplex stop and wait protocol, sliding window protocol, a protocol using Go back-N, a protocol using selective repeat.

IEEE standards 802.3 and Ethernet, IEEE standard 802.4 token bus, IEEE standard 802.5 token ring.

SECTION-C

Network security: Basic encryption and decryption- Ecryption, decryption and cryptosystems, Plain text and Cipher text, Encryption Algorithms, Cryptanalysis.

Introduction to Ciphers: Monoalphabatic substitutions such as Caesar Cipher, Cryptanalysis of Monoalphabatic Ciphers, Polyalphabatic Ciphers such as Vigenere Tableaux, Cryptanalysis of Polyalphabatic Ciphers, Perfect substitution Cipher such as Cryptanalysis of Monoalphabatic Ciphers, Verman Cipher, Stream and Block Cipher.

SECTION-D

Operating System, Database and Program Security: Operating system security-Security policies, Models of security, Security features of ordinary operating system, Security features of trusted Operating system.

Database Security: Security requirements of database, Reliability and Integrity, Protection of sensitive data, Inference problem: Direct and Indirect attacks.

Program security: Kinds of malacious code, How viruses attach and gain control, Homes for viruses, Virus signatures, Preventing virus infection.

TEXT BOOKS:
1.   Computer Networks by Tenanbaum(3rd Edition)
2.   Data ans computer communication by Black
3.   Data communication and Networking by FORAUZAN
4.   "Security in Computing(Second edition)", Charles P. Pfleeger, 1996, Prentic-Hall International, Inc.,
5.   "Appliec Cryptography protocols, Algorithms, and Source code in C(Second Edition)", Bruce Schneier, 19975, John Wiley and Sons, inc.,

REFERENCE BOOKS:
1 "Security Technologies for the World Wide Web", Rolf Oppliger, Artech House, Inc,
2 "Digital Certificates Applied Internet Security", Jalal Feghhi and Peter Williams, Addison Welsley Longman, Inc,
3 "The World Wide Web Security FAQ", World Wide Web Consortism, [online] Available at http://www.w3.org/ Security/Faq/www-securityfaq.html
4 Cryptographic Message Syntax Standards, RSA Laboratories,[online] Available at http://www.rsasecurity.com/rsalabs/ pkcs/pkcs-7/index.html

ENTREPRENEURIAL DEVELOPMENT & NEW ENTERPRISE MANAGEMENT
(HU-8020)

Course Code	HU-8020	Credits-4	L-3, T-1, P-0
Name of the Course	ENTREPRENEURIAL DEVELOPMENT & NEW ENTERPRISE 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 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
- Developing Entrepreneurship: Element for a program.
- Developing Entrepreneurship competencies : Need & process of development, social determinants of Entrepreneurship growth.
- Entrepreneurship development programs.
- Entrepreneurship orientation & awareness programme.
- New enterprise creation programme.

SECTION- B
- Existing Entrepreneurship programmes for existing enterprising for survival & growth. Evolution of various EDP programme in India.
- Managing growth & transition, the organization life cycle, chasing Entrepreneurship roles.

SECTION- C
- Entrepreneurship & new venture opportunities.
- Planning for new ventures.

- Concept of planning paradigm – pre-startup, early growth & later growth stage.

SECTION- D
- Incentive & subsidies available for Entrepreneurship growth.
- Guidance for project report preparation.
- Location, Environmental and managerial problems of new enterprise management .
- Managing family business. Some case studies of family run business in India.

BOOKS:
1. Deshpande, (1980),” Entrepreneurship of small scale industries,” Deep & Deep, New delhi.
2. Peter Kibly,” Entrepreneurship & Economic development ,” The free press ,New York,(1971).
3. Rehman, A.H.M..,Habibur,(1979),” Entrepreneurship & small enterprise development in Bangladesh University of Dacca.
4. Sharma, K.L., (1981), Entrepreneurship & Industrial development in Punjab”,PSE economic analyst , Vol.II, No.2.
5. David H. Holt ,(1998),” Entrepreneurship-New ventura creation,” Prentice Hall , New Delhi.

Accounts And Financial Management   (HU-8021)

Course Code	HU-8021	Credits-4	L-3, T-1, P-0
Name of the Course	Accounts And Financial 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 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

Accounting: Principle, Concepts and conventions, double entry system of accounting, introduction of basic books of accounts of sole proprietary concern, control accounts for debtors and creditors, closing of books of accounts and preparation of trial balance.

Final Accounts: Trading, Profit and Loss Accounts and balance sheet of sole proprietary concern with normal closing entries. Introduction to manufacturing account, Final accounts of Partnership firms, Limited company.

Section B

Financial Management: Meaning and role.

Ration Analysis: Meaning, advantages, limitations, types of rations and their usefulness.

Fund Flow Statement: Meaning of the terms – fund flow and fund working capital cycle, preparation and interpretation of the fund flow statement.

Section C

Costing: Nature, Importance and basic principles, Budget and budgetary control: Nature and scope, importance, method of finalization of master budget and functional budgets.

Marginal Costing: Nature, Scope and importance, break – even analysis, its uses and limitations, construction of break-even chart, practical application of marginal costing.

Section D

Standard Costing: Nature and Scope, Computational and analysis of variances with reference to material cost, labor cost and overhead cost, interpretation of the variances.

Introduction to computerized accounting system: coding logic and codes required, master files transaction files; introduction to documents used for data collection, processing of different file sand output obtained.

Books:

7.   Kellock, J.: Elements of Accounting, Heinemann, 1978.
8.   Rockely, L.E.: Finance for the Non-Accountant, 2nd Edition, and basic books, 1976.
9.   Levy, and Sarnet: Principle of Financial Management, Prentice – Hall International.

Total Quality Management   **(HU-8022)**

Course Code	HU-8022	Credits-4	L-3, T-1, P-0
Name of the Course	Total Quality 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 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
Introduction to TQM & ISO 9000, Total Quality Control, Customer Focus & Total waste Elimination (TWE), Quality Assurance
Quality of Design & Development, Inspection & Measurement workforce Teams, Benchmarking, TQM for Sales Marketing Management.

Section-B
Business Process Re-engineering & Information Technology, Quality control SQC/ SPC, Technology & Product Quality, Quality for After Sales Services Technology & Product Quality.

Section-C
Organization for Quality, Reliability as quality characteristics, Quality leadership, Quality linked productivity, Total Quality, Culture, Quality and environment, Cost of Quality.

Section-D
Cost of Quality, Quality Control for Export Units, Quality Maturity and Discipline, Total commitment for Quality, TQM Implementation, ISOm 9000 series of standards, ISO 9000-1, ISO 9000-2, ISO 9000-3.

References:-
  1. TQM & ISO 14000: K.C.Arora.
  2. Total Quality Control: Armand V. Feigenbaum.
  3. Total Quality Management: Joseph.A.Patrick, Diana.S.Furr.
  4. Total Quality Management – Text: Joel E. Ross Cases & Readin
  5. Total Quality Control Essentials: Sarv Singh Soin

ADVANCED OPERATIONS RESEARCH (ME – 8019)

Course Code	**ME – 8019**	Credits : 4	L-3, T-1, P-0
Name of the Course	**ADVANCED OPERATIONS RESEARCH**		
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 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 Operations Research
Formulation of problems, simplex method problem of degenerals, dual simplex method revised simplex method, bounded variable problems.

Integer Programming
Graphical method, the branch and bound technique, Gomary's ALL-IPP method, transportation model, unbalance in transportation, transshipment problem, sensitivity analysis in transportation problems.

SECTION – B
Dynamic Programming
Bellman's principle of optimality, examples on the application on routing problem, inventory problem, simplex problem, marketing problem.

Network Analysis
PERT and CPM, probability of achieving completion data, cost analysis, graph reduction theory, updating, resource allocation, resource smoothing.

SECTION – C
Inventory Method:
Variables in an inventory problem, inventory problem, inventory models with penalty, storage and quantity discount, safety stock, inventory models with probability, demand, multi item deterministic model.

Queuing Theory

Poison arrivals and exponential service times, waiting time and idle time cost, single channel multi channel problem. Monte technique applied to queuing problems, Poisson arrivals and service time.

SECTION – D

Decision Theory Game

Examples on the application of theory of games 2 XM and MX2 Problems, graphic dominance and linear programming method for different problems, decision trees.

Replacement Models

Replacement of items that deteriorate, gradually, fail suddenly, group placement policy, concept of system reliability.

Text Books:
1. Kumar Gupta, Prem and Hira, D.S., "Operations Research", S Chand & Company Limited, 1986.
2. Swarup, Kanti, Gupta, P.K. and Manmohan, "Operations Research", Sultan Chand & Sons, New Delhi 1988.
3. Srinath L.S., "PERT & CPM Principles and Applications", Affiliate East West Press (P) Limited, New Delhi, 1975.

INDUSTRIAL MANAGEMENT (ME-8020)

Course Code	ME-8020	Credits : 4	L-3, T-1, P-0
Name of the Course	**INDUSTRIAL MANAGEMENT**		
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 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
Management Concept
Management, administration, organization, Difference and relationship between management, administration and organization. Types of organization.
Characteristics of management. Origin of principles of management. Beginning of scientific management. Scientific management, principles of management, functions of management, management development.
Personnel Management, Union and industrial relations
Definition and concept. Aims, objectives or functions or personnel management. Principles of good personnel policy. Recruitment and selection of employees. Safety engineering, labour welfare, Promotion, transfer, lay-off and discharge.
Trade unions, industrial disputes, settlement of industrial disputes, collective bargaining, union-management relations.
Section – B
Material, purchase and stores management.
Material management, purchase and procurement, Purchase organization, purchasing procedure. Stores and material control. Receipts and issue of materials. Store records.
Inventory control and management
Inventory, inventory – control, classification, management. Objectives of inventory control, functions of inventories, Economic order quantity, ABC analysis, material requirement planning.
Section – C
Financial Management

Concept and definition. Purpose of investment. Types of capital. Sources of finance. Book – keeping, terms used in book – keeping. Assets and liabilities. The journal and the ledger. Trading account, capitalization, capital structure, difference between capital, capitalization and capital structure.

Sales and marketing management

Sales management, sales organization, function of sales department, Selling concept v/s marketing concept. Marketing – definition, principles and functions. Marketing research, sales forecasting. Sales promotion. Advertising, international Advertising.

Section – D

Management by objectives

Definition and concept, objectives. Steps in setting up MBO, advantages of MBO, limitations of MBO.

Management information system

Definition, evolution of MIS, Need**/**objectives/functions of MIS. Difference between data and information. Need for information, information as an organizational resource. Management information categories. Designing information system. Computer system, components of computer system, integrated information system. Applications of MIS, future of MIS.

Text Books and References :

1. Industrial Management; Spregiel Johan N. York 1961.
2. Industrial Organization; Kimbell & Kimbell Vakils Fefter & Simons Pvt Ltd. Bombay 1971.
3. Industrial Engineering and Mangement Dhanpat Rai New Delhi1992.

OPTIMIZATION METHODS FOR ENGINEERING SYSTEM (ME-8021)

Course Code	ME – 8021	Credits : 4	L-3, T-1, P-0	
Name of the Course	**Optimization Methods for Engineering System**			
Lectures to be delivered	**65 (1 Hr Each) (L = 52, 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 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 15% 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: 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.

PROFESSIONAL ELECTIVES - II

GPS and Application   **(IT-8006)**

Course Code	IT-8006	Credits-4	L-3, T-1, P-0
Name of the Course	GPS and Application		
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

    Introduction: Overview of techniques of surveying with satellites, introduction to GPS System, applications of using satellites and GPS for 3D position, velocity, determination as a function of time, interdisciplinary applications (e.g., crystal dynamics, user segment, history of GPS constellation, GPS measurement characteristics, selective availability (SA) and antispoofing (AS).

Section B

    Satellite orbits and Reference Systems: Two –Body problem, orbit elements, time system and time transfer using GPS, coordinate systems, GPS orbit design, orbit determination problem, tracking networks, GPS force and measurement models for orbit determination, GPS broadcast ephemeris, precise GPS ephemeris.

    GPS Observable: Measurement types (C/A code, P-code, L1 and L2 frequencies for navigation, pseudoranges), atmospheric delays (tropospheric and ionospheric), data format(RINEX), data combination (narrow/ wide lane combinations, ionosphere – free combinations, single-, double-, triple – differences), undifferenced models, carrier phase vs integrated Doppler, integer biases, cycle slips, clock error.

Section C

Processing Techniques: Pseudorange and carrier phase processing, ambiguity removal, least squares method for state parameter determination, relative positioning, and dilution of precision.

Section D

Surveying with GPS: Kinematics positioning, differential GPS (DGPS): Traditional DGPS, wide Area Differential GPS (WADGPS), Wide Area Augmentation System (WAAS).

GPS Applications: Surveying, geophysics, geodesy, airborne GPS, ground – transportation, space borne GPS orbit determination, attitude control, meteorological and climate research using GPS.

Books: -
1.	A. Leick: GPS Satellite surveying, 2nd edition, John Wiley * Sons 1995.
2.	B. Parkinson, J. Spilker: GPS: Theory and Applications, Jr. (Eds), Vol. I & II, AIAA, 370 L Enfant Promensale SW, Washington.
3.	A. Kleusberb and P.teunnisen (Eds): GPS for Geodesy, Springer – Verlag, 1996
4.	Elliott D. Kaplan: Understanding GPS – Principles and Applications, Publisher: Artech House, Published: March 1996.
5.	B. Hofmann – Wellenhof, H. Lichenegger and J. Collins: GPS: Theory and Practice, 4th Revised Edition ($25), Springer, Wien, New York, 1997.
6.	Scottie Barnes, Lafe Low: GPS Basic Essentials – Globe Pequot Press.

Mobile Computing   **(IT-8007)**

Course Code	IT-8007	Credits-4	L-3, T-1, P-0	
Name of the Course	*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 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.

(TITLE APPROVED CONTENTS TO BE DECIDED LATER)

Neural Networks			(ES-8001)
Course Code	ES-8001	Credits-4	L-3, T-1, P-0
Name of the Course	*Neural 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
Overview of biological neurons: Structure of biological neurons relevant to ANNS. Fundamental concepts of Artificial Neural Networks: Models of ANNS; Fees forward & feedback networks; learning rules; Hebbian learning rule, perception learning rule, delta learning rule, Widrow-Hoff learning rule, correction learning rule, Winner-take all learning rule etc.

Section B
Single layer Perception classifier: Classification model, Features & Decision regions; training & classification using discrete perceptron, algorithm, single layer continuous perceptron networks for linearly separable classifications. Multiplayer Feed forward Networks: linearly non-separable pattern classification, Delta learning rule for multi perceptron layer. Generalized delta-learning rule. Error back-propagation training, learning factors. Examples

Section C
Single layer feed back Networks: Basic concepts Hopfield networks, training & Examples. Associative Memories: Linear Association, Basic Concepts of recurrent Auto associative memory: retrieval algorithm, storage algorithm; By directional associative memory, architecture, Association encoding & decoding, Stability.

Section D

Self organizing networks: Unsupervised learning of clusters, winner – take – all learning, recall mode, Initialization of weights, seperability limitations of weights, seperability limitations.

Books: -

1. Introduction to Artificial Neural System by Jacek M. zurada, 1994, Jaico Publ. House.
2. "Neural Networks: A Comprehensive formulation", Simon Heykin,1998,AW.
3. "Neural Networks", Kosko,1992, PHI
4. "Neural Networks Fundamentals – N.K.Bose, P.Liang,2002. T.M.H.

Multilingual Applications   **(IT-8008)**

Course Code	IT-8008	Credits-4	L-3, T-1, P-0
Name of the Course	*Multilingual 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. **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.

(TITLE APPROVED CONTENTS TO BE DECIDED LATER)

Speech Image & Coding   **(IT-8009)**

Course Code	IT-8009	Credits-4	L-3, T-1, P-0
Name of the Course	*Speech Image & Coding*		
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.

(TITLE APPROVED CONTENTS TO BE DECIDED LATER)

Digital Image Processing   **(IT-8011)**

Course Code	IT-8011	Credits-4	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

Introduction and Fundamentals to Digital Image Processing: What is Digital Image Processing, Origin of Digital Image processing, Example that use Digital Image processing, Fundamental steps in Digital Image processing, Components of Digital Image processing system, Image sensing and acquisition, Image sampling, quantization and representation, Basic relationship between pixels.

Image Enhancement in the Spatial Domain & Frequency domain: Background, Basic gray level transformation, Histogram processing, Basics of Spatial filtering, Smoothing and Sharpening spatial filters, Introduction to Fourier Transform and the Frequency Domain, Discrete Fourier Transform, Smoothing and Sharpening Frequency – Domain filters.

Section B

Image Restoration: Image Degradation/ Restoration Process, Noise models, restoration in presence of noise, Inverse filtering, Minimum mean Square Filtering, geometric menu filter,Geometric transformations.

Color Image Processing: Color Fundamentals, color models, Basis of full color image processing, Color transformations.

Section C

Image Compression: Fundamentals, Image compression models, Error free compression, Lossy compression.

Image Segmentation: Detection of Discontinuities. Edge linking and boundary detection, Thresholding, Region oriented segmentation.

Section D

   Representation, Description and Recognition: Representation-chain codes, polygonal approximation and skeltons , boundary descriptors-simple descriptor, shape numbers, regional descriptor-simple , topological descriptor, Pattern and Pattern classes – Recognition based on matching techniques.

   Recognition: Pattern and Pattern classes, Decision – Theoretic Methods.

Books: -

1. Digital Image Processing by Rafael C. Gonzalez & Ricahrd E. Woods-2002, Pearson Education Pte. Ltd.
2. Digital Immage Processing by A.K.Jain, 1995, PHI
3. Two-Tone Image Processing and Recognition, B.B. Choudhari, D.Dutta Majumdar, New Age International Publishers Ltd., New Delhi.

BIOINFORMATICS   **(IT-8015)**

Course Code	IT-8015	Credits-4	L-3, T-1, P-0
Name of the Course	*BIOINFORMATICS*		
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

Cell and Molecular Biology

1. Bioinformatics – concept and scope. (2)
2. Cell structure, Cell organelle and their function, Differences between prokaryotic & eukaryotic cells, and plant & animal cells. (3)
3. Nucleic acid: types, structure and function. (2)
4. Protein: structure and function. (2)
5. Basics of DNA replication, transcription and translation. (3)

Section B

Genomics

1. Genome, genome organization in prokaryotes and eukaryotes. (2)
2. Genome analysis: genome mapping, sequencing, fragment assembly and annotation. (4)
3. Basics of sequence alignments, Major alignment tools/ software- BLAST nucleic acid sequence/ gene databases and Gene identification approaches – Genscan. (5)

Section C

Proteomics

1. Basic steps in protein isolation and purification (using gel chromatography and electrophoresis) and protein sequencing. (4)
2. Protein sequence analysis: alignment, Homology search, Prediction of secondary structure, Protein families, Protein motif, Software for protein sequence analysis and protein database. (4)
3. Three dimensional (3D) protein structure prediction, 3D structure databases and Software for 3D protein modeling. (4)

Section D

Drug Designing
1. Molecular basis of a disease, molecular approaches to curing diseases. (3)
2. Drug target identification in genome and proteom, protein –ligand docking in drug design, drug screening, screening of drug databases. (4)
3. Modeling protein-protein and protein- DNA docking. (3)
4. Software for prediction of interaction between drug molecules and drug targets. (3)

Books: -

1) Cell and Molecular Biology: by E.D.P. De. Robertis and E.M.F. De. Robertis, B.F. Waverly Pvt. Ltd. New Delhi, 1st edition, 1996.
2) Bioinformatics: From Genome to Drugs, Edited by: Thomas Lengauer John Wiley & Sons, July 25,2001
3) Structural Bioinformatics, Edited by: Philip E. Bourne, Helge Weissig John Wiley & Sons, October 2002.
4) Biological Sequence Analyse: Probabilistic Models of Proteins and Nucleic Acids by Richard Durbin (Author), Sean R. Eddy (Author), Anders Krogh (Author), Graeme Mitchison (Author).
5) Bioinformatics: Sequence and Genome Analysis, Edited by: David W. Mount Cold Spring Harbor Laboratory, 1st edition March 15, 2001
6) Bioinformatics: A Practical Guide to the Analysis of Genes and Protein, Second Edition, Edited by: Andreas D. Baxevansis, B.F. Francis Ouellette, Willey- Interscience, 2nd edition, April 6,2001