

SCHEME OF EXAMINATION

&

DETAILED SYLLABUS

for

BACHELOR OF TECHNOLOGY (Computer Science & Engineering)

**GURU GOBIND SINGH
INDRAPRASTHA UNIVERSITY
KASHMERE GATE, DELHI**

BACHELOR OF TECHNOLOGY
(B.TECH.) DEGREE COURSE (Common to all branches)

FIRST SEMESTER EXAMINATION

Code No.	Paper	L	T/P	Credits
THEORY PAPERS				
ETMA 101	Applied Mathematics – I	3	1	4
ETPH 103	Applied Physics – I	2	1	3
ETCH 105	Applied Chemistry – I	2	1	3
ETME 107	Manufacturing Process	2	0	2
ETCS 109	Introduction to Computers and Auto CAD	2	1	3
ETEL 111	Communication Skills – I	2	1	3
ETEL 113*	Impact of Science & Technology on Society	1	0	1
PRACTICAL/VIVA VOCE				
ETPH 151	Applied Physics Lab. – I	-	2	1
ETCH 153	Applied Chemistry Lab. – I	-	2	1
ETCS 155	Introduction to Auto CAD Office Automation and Web Design	-	3	2
ETME 157	Workshop Practice	-	3	2
ETME 159	Engineering Graphics Lab.	-	2	1
TOTAL		14	17	26

ETEL-113* is NUES

BACHELOR OF TECHNOLOGY
(B.TECH.) DEGREE COURSE (Common to all branches)

SECOND SEMESTER EXAMINATION

Code No.	Paper	L	T/P	Credits
THEORY PAPERS				
ETMA 102	Applied Mathematics – II	3	1	4
ETPH 104	Applied Physics – II	2	1	3
ETCH 106	Applied Chemistry – II	2	1	3
ETCS 108	Introduction to Programming	2	1	3
ETME 110	Engineering Mechanics	2	1	3
ETEC 112	Electrical Science	2	1	3
ETEL 114	Communication Skills – II	2	1	3
PRACTICAL/VIVA VOCE				
ETPH 152	Applied Physics Lab. – II	-	2	1
ETCH 154	Applied Chemistry Lab. – II	-	2	1
ETCS 156	C Programming Lab.	-	2	1
ETME 158	Engineering Mechanics Lab.	-	3	2
ETEC 160	Electrical Science Lab.	-	2	1
	TOTAL	15	18	28

BACHELOR OF TECHNOLOGY (Computer Science & Engineering)

THIRD SEMESTER EXAMINATION

Code No.	Paper	L	T/P	Credits
THEORY PAPERS				
ETMA 201	Applied Mathematics – III	3	1	4
ETCS 203	Analog Electronics	3	1	4
ETEC 205	Circuits and Systems	3	1	4
ETCS 207	Foundations of Computer Systems	3	1	4
ETIT 209	Object Oriented Programming using C++	3	1	4
ETCS 211	Data Structures	3	1	4
PRACTICAL/VIVA VOCE				
ETCS 251	*Analog Electronics Lab.	0	2	1
ETEC 253	*Circuits & Systems Lab.	0	2	1
ETIT 255	Object Oriented Programming using C++ Lab.	0	2	1
ETCS 257	Data Structure Lab.	0	2	1
	TOTAL	18	14	28

* Some lab experiments must be performed using any circuit simulation software e.g. PSPICE.

BACHELOR OF TECHNOLOGY (Computer Science & Engineering)

FOURTH SEMESTER EXAMINATION

Code No.	Paper	L	T/P	Credits
THEORY PAPERS				
ETCS 202	Software Engineering	3	1	4
ETCS 204	Algorithm Analysis & Design	3	1	4
ETEC 206	Digital Circuits & System – I	3	1	4
ETIT 208	Communication Systems	3	1	4
ETCS 210	Computer Graphics	3	1	4
ETCS 212	Operating Systems	3	1	4
PRACTICAL/VIVA VOCE				
ETCS 252	Software Engineering Lab.	0	2	1
ETCS 254	Algorithm Analysis and Design Lab.	0	2	1
ETEC 256	*Digital Circuits & System – I Lab.	0	2	1
ETCS 258	Computer Graphics Lab.	0	2	1
	TOTAL	18	14	28

*** Some lab experiments must be performed using any circuit simulation software e.g. PSPICE.**

NOTE: 4-6 weeks training will be held after fourth semester. However, Viva-Voce will be conducted in the fifth semester.

BACHELOR OF TECHNOLOGY (Computer Science & Engineering)

FIFTH SEMESTER EXAMINATION

Code No.	Paper	L	T/P	Credits
THEORY PAPERS				
ETEC 301	Digital Circuits & Systems – II	3	1	4
ETIT 303	Java Programming and Website Design	3	1	4
ETCS 305	Computer Architecture	3	1	4
ETCS 307	Linux and X-Windows Programming	3	1	4
ETCS 309	Database Management Systems	3	1	4
ETMS 311	Organizational Behaviour	3	1	4
PRACTICAL/VIVA VOCE				
ETEC 351	Digital Circuits & Systems – II Lab.	0	2	1
ETIT 353	Java Programming & Website Design Lab.	0	2	1
ETCS 355	Linux & X-Windows Programming Lab.	0	2	1
ETCS 357	Database Management Systems Lab.	0	2	1
ETCS 359	#^Practical Training	0	0	1
TOTAL		18	14	29

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^Practical training was conducted after fourth semester. However, Viva-Voce for evaluation of Practical Training will be conducted in this semester.

BACHELOR OF TECHNOLOGY (Computer Science & Engineering)

SIXTH SEMESTER EXAMINATION

Code No.	Paper	L	T/P	Credits
THEORY PAPERS				
ETCS 302	Microprocessor Systems	3	1	4
ETCS 304	Object Oriented Software Engineering	3	1	4
ETIT 306	Computer Networks	3	1	4
ETIT 308	Digital Signal Processing	3	1	4
ETCS 310	Data Warehousing & Data Mining	3	1	4
ETCS 312	Multimedia Technologies	3	1	4
PRACTICAL/VIVA VOCE				
ETCS 352	Microprocessor Lab.	0	2	1
ETCS 354	Object Oriented Software Engineering	0	2	1
ETIT 356	Digital Signal Processing Lab.	0	2	1
ETCS 358	Data Warehousing & Data Mining Lab.	0	2	1
ETCS 360	Multimedia Technologies Lab.	0	2	1
TOTAL		18	16	29

NOTE: 4-6 weeks training will be held after sixth semester. However, Viva-Voce will be conducted in the seventh semester.

BACHELOR OF TECHNOLOGY (Computer Science & Engineering)

SEVENTH SEMESTER EXAMINATION

Code No.	Paper	L	T/P	Credits
THEORY PAPERS				
ETIT 401	Advanced Computer Networks	3	1	4
ETCS 403	Advanced Computer Architecture	3	1	4
ELECTIVE PAPERS (Choose any two)				
ETCS 405	Compiler Construction	3	1	4
ETEC 407	Mobile Computing	3	1	4
ETIT 409	VLSI Design	3	1	4
ETEC 411	Digital Image Processing	3	1	4
ETCS 413	Requirements & Estimation Techniques	3	1	4
ETCS 415	Project	-	-	4
PRACTICAL/VIVA VOCE				
ETIT 451	Advanced Computer Network Lab.	0	2	1
ETCS 453	Practical Lab (based on Electives)	0	2	1
ETCS 455	#Seminar	0	2	1
ETCS 457	*Minor Project	0	8	5
ETCS 459	#^Practical Training	0	0	1
TOTAL		12	18	25

NON UNIVERSITY EXAMINATION SYSTEM

*The student will submit a synopsis at the beginning of the semester for approval from the departmental committee in a specified format. The student will have to present the progress of the work through seminars and progress reports.

^Practical training was conducted after sixth semester. However, Viva-Voce for evaluation of Practical Training will be conducted in this semester.

BACHELOR OF TECHNOLOGY (Computer Science & Engineering)

EIGHTH SEMESTER EXAMINATION

Code No.	Paper	L	T/P	Credits
THEORY PAPERS				
ETCS 402	Artificial Intelligence	3	1	4
ETCS 404	Software Testing	3	1	4
ELECTIVE PAPERS (Choose any one)				
ETCS 406	Soft Computing	3	1	4
ETIT 408	Embedded System	3	1	4
ETIT 410	E-Commerce & ERP	3	1	4
ETIT 412	Network Security	3	1	4
ETEC 414	Mobile Communication	3	1	4
PRACTICAL/VIVA VOCE				
ETCS 452	Artificial Intelligence Lab.	0	2	1
ETCS 454	Software Testing Lab.	0	2	1
ETCS 456	Practical (based on Electives)	0	2	1
ETCS 458	*Major Project	0	12	6
TOTAL		09	21	21

*The student will submit a synopsis at the beginning of the semester for approval from the departmental committee in a specified format. The student will have to present the progress of the work through seminars and progress reports.

NOTE:

- The total number of the credits of the B.Tech. (CSE) Programme = 214
- Each student shall be required to appear for examinations in all courses. However, for the award of the degree a student shall be required to earn the minimum of 200 credits.

Paper Code: ETMA-101**L T C****Paper: Applied Mathematics – I****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT I

COMPLEX NUMBERS AND INFINITE SERIES: De Moivre's theorem and roots of complex numbers. Euler's theorem, Logarithmic Functions, Circular, Hyperbolic Functions and their Inverses. Convergence and Divergence of Infinite series, Comparison test d'Alembert's ratio test. Higher ratio test, Cauchy's root test. Alternating series, Leibnitz test, Absolute and conditional convergence. [No. of

Hrs. 10]**UNIT II**

CALCULUS OF ONE VARIABLE: Successive differentiation. Leibnitz theorem (without proof) McLaurin's and Taylor's expansion of functions, errors and approximation.

Asymptotes of Cartesian curves. Curvature of curves in Cartesian, parametric and polar coordinates, Tracing of curves in Cartesian, parametric and polar coordinates (like conics, astroid, hypocycloid, Folium of Descartes, Cycloid, Circle, Cardioid, Lemniscate of Bernoulli, equiangular spiral). Reduction Formulae for evaluating



Finding area under the curves, Length of the curves, volume and surface of solids of revolution. [No. of Hrs. 15]

UNIT III

LINEAR ALGEBRA – MATRICES: Rank of matrix, Linear transformations, Hermitian and skew – Hermitian forms, Inverse of matrix by elementary operations. Consistency of linear simultaneous equations, Diagonalisation of a matrix, Eigen values and eigen vectors. Cayley – Hamilton theorem (without proof).

[No. of Hrs. 09]**UNIT IV**

ORDINARY DIFFERENTIAL EQUATIONS: First order differential equations – exact and reducible to exact form. Linear differential equations of higher order with constant coefficients. Solution of simultaneous differential equations. Variation of parameters, Solution of homogeneous differential equations – Cauchy and Legendre forms.

(No. of Hrs. 10]**TEXT BOOKS:**

1. Kresyzig, E., "Advanced Engineering Mathematics", John Wiley and Sons. (Latest edition).
2. Jain, R. K. and Iyengar, S. R. K., "Advanced Engineering Mathematics", Narosa, 2003 (2nd Ed.).

REFERENCE BOOKS:

1. Mitin, V. V.; Polis, M. P. and Romanov, D. A., "Modern Advanced Mathematics for Engineers", John Wiley and Sons, 2001.
2. Wylie, R., "Advanced Engineering Mathematics", McGraw-Hill, 1995.
3. "Advanced Engineering Mathematics", Dr. A. B. Mathur, V. P. Jaggi (Khanna publications)

Paper Code: ETPH – 103**L T C****Paper: APPLIED PHYSICS – I****2 1 3**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT - I

Interference of Light: Interference due to division of wavefront and division of amplitude, Young's double slit expt., Interference, Principle of Superposition, Theory of Biprism, Interference from parallel thin films, wedge shaped films, Newton rings, Michelson interferometer.

Diffraction: Fresnel Diffraction, Diffraction at a straight edge, Fraunhofer diffraction due to N slits, Diffraction grating, absent spectra, dispersive power of Grating, resolving power of prism and grating.
[No. of Hrs. 8]

UNIT - II

Polarization: Introduction, production of plane polarized light by different methods, Brewster and Malus Laws. Double refraction, Quarter & half wave plate, Nicol prism, specific rotation, Laurent's half shade polarimeter.

Optical Instruments : Ramdson & Huygen Eye pieces, Electron microscope.

[No. of Hrs. 8]**UNIT - III**

Laser: Introduction, temporal and spatial coherence, principle of Laser, stimulated and spontaneous emission, Einstein's Coefficients, He-Ne Laser, Ruby Laser, Application of Lasers.

Fibre Optics: Introduction, numerical aperture, step index and graded index fibres, attenuation & dispersion mechanism in optical fibers (Qualitative only), application of optical fibres, optical communication (block diagram only)

[No. of Hrs. 8]**UNIT - IV**

Mechanics: Central and non-central forces, Inverse square force, SHM, Damped, undamped and forced Oscillations.

Special theory of Relativity: Frame of reference, Michelson-Morley experiment, basic postulates of special relativity, Lorentz transformations (space – time coordinates & velocity only), mass energy relation.

[No. of Hrs. 8]**TEXT BOOKS:**

1. A. Ghatak, "Optics"
2. N. Subrahmanyam and Brij Lal, "Optics"

REFERENCE BOOKS:

1. Jenkins and White, "Fundamentals of Optics"
2. C. Kittel, "Mechanics", Berkeley Physics Course, Vol.- I.
3. A. Beiser, "Concepts of Modern Physics"

Paper Code: ETCH – 105**L T C****Paper: Applied Chemistry – I****2 1 3**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT - I

Water: Specifications for water, analysis of water – alkalinity, hardness and its determination (EDTA method only). Water for domestic use, Water softening processes – Lime – Soda process, Ion exchange method, boiler feed water, boiler problems-scale, sludge, priming and foaming, caustic embitterment and corrosion, their causes and prevention, removal of silica, removal of dissolved gases, carbonate and phosphate conditioning, colloidal conditioning, calgon treatment, Numerical problems on alkalinity, hardness, Lime-Soda process and Ion exchange method, EDTA method.

[No. of Hrs: 08]**UNIT - II**

Fuels: Classification, combustion and chemical principles involved in it, calorific value: gross and net calorific values and their determination by bomb calorimeter and Boy's gas calorimeter.

Solid Fuels: Proximate and ultimate analysis of coal and their importance, High and low temperature carbonisation, Coke: Its manufacture by Otto Hoffman oven.

Liquid Fuels: Conversion of coal into liquid fuels (Bergius process and Fisher-Tropsch Process) and mechanism, Petroleum: its chemical composition and fractional distillation, cracking of heavy oil residues – thermal and catalytic cracking, knocking and chemical structure, octane number and cetane number and their significance, power alcohol, Analysis of flue gases by Orsat's apparatus, Numerical on calorific value, combustion, proximate and ultimate analysis of coal, flue gas analysis.

[No. of Hrs: 08]**UNIT - III**

Environmental Pollution and Control: Air Pollution: Types of pollutants, source effects, sink and control of primary pollutants – CO, NO_x, HC, SO_x and particulates, effects of pollutants on man and environment – photochemical smog and acid rain.

Water Pollution: Classification of pollutants, their sources, waste water treatment – domestic and industrial.

Soil Pollution: Composition of soil, classification and effects of soil pollutants and their control.

Solid Waste Pollution: Classification, waste treatment & Disposal methods (Composting, sanitary landfilling, thermal processes, recycling and reuse).

Hazardous Wastes: Classification – radioactive, biomedical and chemical, treatment and disposal – physical, chemical and biological processes.

[No. of Hrs: 08]**UNIT - IV**

Solutions: Ideal and non-ideal solutions, Raoult's Law, Distillation of binary solutions, Henry's Law, Nernst distribution law, Arrhenius theory and special behaviour of strong electrolytes.

Corrosion: Types of corrosion (dry, wet, atmospheric and soil corrosion), theories of corrosion, protective measures against corrosion.

[No. of Hrs: 08]**TEXT BOOKS:**

1. Chemistry in Engineering & Technology (Vol I & II) (Latest ed.), By J.C. Kuriacose & J. Rajaram
2. Environmental Chemistry & Pollution Control (Latest ed.), By S.S. Dara
3. Applied Chemistry (Latest ed.), By H.D. Gesser

Paper Code: ETME 107**L T C****Paper: Manufacturing Processes****2 0 2**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT - I**Casting Processes:**

Principles of metal casting: Pattern materials, types and allowance; Study of moulding, sand moulding, tools, moulding materials, classification of moulds, core, elements of gating system, casting defects, description and operation of cupola: special casting processes e.g. die-casting, permanent mould casting, centrifugal casting, investment casting.

[No. of Hrs. 6]**UNIT - II****Smithy and Forging:**

Basic operation e.g. upsetting, fullering, flattening, drawing, swaging: tools and appliances: drop forging, press forging.

Bench Work and Fitting

Fitting, sawing, chipping, thread cutting (die), tapping; Study of hand tools, Marking and marking tools.

[No. of Hrs. 6]**UNIT - III****Metal joining:**

Welding principles, classification of welding techniques; Oxyacetylene Gas welding, equipment and field of application, Arc-welding, metal arc, Carbon arc, submerged arc and atomic hydrogen welding, Electric resistance welding: spot, seam, butt, and percussion welding; Flux: composition, properties and function; Electrodes, Types of joints and edge preparation, Brazing and soldering.

[No. of Hrs. 6]**UNIT - IV****Sheet Metal Work:**

Common processes, tools and equipments; metals used for sheets, standard specification for sheets, spinning, bending, embossing and coining.

[No. of Hrs. 5]**TEXT BOOKS:**

1. Manufacturing Process by Raghuvanshi.
1. Manufacturing Technology by P.N.Rao (TMH publications)

REFERENCE BOOK:

1. Workshop Technology by Hazra-Chowdhary
2. Production Engineering by R.K.Jain
3. Workshop Technology by Chapman

Paper Code: ETCS 109**L T C****Paper: Introduction to Computer Systems****2 1 3**

INSTRUCTIONS TO PAPER SETTERS:		MAXIMUM MARKS: 75
1.	Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2.	Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT - I**Introduction to Computer:**

Overview of Computer organization and historical perspective computer applications in various fields of science and management.

Data representation: Number systems, character representation codes, Binary, hex, octal codes and their inter conversions.

Binary arithmetic, Floating-point arithmetic, signed and unsigned numbers.

[No. of Hrs. 8]**UNIT - II****Introduction to OS and Office Automation**

Concept of computing, Introduction to Operating Systems such as DOS, windows 2000/Xp, UNIX, Client Server Technology, etc. (only brief user level description).

Introduction to Word Processing, Spread Sheet & Presentation software e.g. MS-Word, MS-Excel, MS-Power Point.

[No. of Hrs. 8]**UNIT - III****Introduction to Auto CAD**

Coordinate System, 2D drafting: lines, circles, arc, polygon, etc., Editing, 3D, Solid modeling, Rendering, Use of Auto CAD for engineering drawing practices.

[No. of Hrs. 8]**UNIT - IV****Web Technologies**

Introduction to World Wide Web, Search engines, e-mail, news, gopher, Audio & Video Conferencing, Internet Protocols: FTP, telnet, TCP/IP, SMTP, HTTP, Languages used for WEB Technology: HTML, practical examples using DHTML and Static HTML

[No. of Hrs. 8]**TEXT BOOKS:**

1. Rajaraman, "Fundamentals of Computers", Prentice Hall of India, 3rd Edition.
2. Mark Middlebrook, "Autocad 2004 for Dummies", Wiley Dreamtech, 2000.
3. Vikas Gupta, "Comdex Computer Course Kit", Dreamtech Press, 2004.

REFERENCE BOOKS:

1. Alexis Leon & Mathews Leon, "Fundamentals of Computer Science & Communication Engineering", Leon Techworld, 1998.
2. Omura, "Mastering Autocad 2000 for Mechanical Engineers" BPB Publications, 2nd Edition, 1998.
3. A.S. Tanenbaum, "Computer Networks", Pearson Education India Ltd., 3rd Edition, 2002.

Paper Code: ETEL-111**L T C****Paper: Communication Skills – I****2 1 3**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT - I

Remedial Grammar: Errors of Accidence and syntax with reference to Parts of Speech; Agreement of Subject and Verb; Tense and Concord; Conditional Clauses; Use of connectives in Complex and Compound sentences; Question tags and short responses.

[No. of Hrs: 06]**UNIT - II**

Vocabulary and Usage: Word Formations (by adding suffixes and prefixes); Technical Word Formation; Synonyms, Antonyms, Homophones, and Homonyms; One Word Substitution; Misappropriations; Indianisms; Redundant Words; Phrasal Verb Idioms.

[No. of Hrs: 06]**UNIT - III****Technical Writing:**

- (A) Scientific Attitude and Impersonal Style; Plain Statements, Definitions; Description and Explanations (of objects, instruments, Processes, Scientific Principles, etc.)
Summarizing and abstracting; Expressing ideas within a restricted word limit; Paragraph Writing (Paragraph division, introduction and the conclusion, Variety in sentences and paragraphs)
Interpretation and use of charts, graphs and tables in technical writing.
Punctuation
- (B) Reading at various speeds (slow, fast, very fast); reading different kinds of texts for different purpose (e.g. for relaxation, for information, for discussion at a later stage, etc.); reading between the lines.
Comprehension of Unseen Passages

[No. of Hrs: 10]**UNIT - IV**

Text: The following prose pieces from *Best Science Writing : Reading and Insights* edited by Robert Gannon prescribed text (Hyderabad: University Press (India) Limited, 1991).

- Chapter 2: "After 63 years, Why Are They Still Testing Einstein?" by C.P. Gilmore
- Chapter 5: "Star Wars : The Leaky Shield" By Carl Sagan
- Chapter 10: "Chaos : The Ultimate Asymmetry" by Arthur Fisher
- Chapter 11: "Bill Moss, Tentmaker" by Robert Gannon
- Chapter 12: "Totality - A Report" by Michael Rogers

[No. of Hrs: 10]**TEXT BOOKS:**

- Maison, Margaret M. Examine Your English, Hyderabad: Orient Longman, 1980
- Sharma, R.S. Technical Writing. Delhi: Radha Publication, 1999
- Sudarsanam, R. Understanding Technical English. Delhi: Sterling Publishers Pvt. Ltd., 1992
- Gannon, Robert, Edt. Best Science Writing: Readings and Insights. Hyderabad: University Press (India) Limited, 1991.

Paper Code: ETEL-113

Paper: Impact of Science & Technology on Society

L	T	C
1	0	1

***Non University Examination Scheme (NUES)**

There will not be any external examination of the university. The performance of the candidates should continuously be evaluated by an internal committee. The committee may conduct viva-voce at the end for the award of the marks.

Paper Code: ETPH-151**Paper: APPLIED PHYSICS LAB – I**

L	P	C
0	2	1

List of Experiments

- (1) To plot a graph between the distance of the knife-edge from the center of the gravity and the time period of bar pendulum. From the graph, find
 - (a) The acceleration due to gravity
 - (b) The radius of gyration and the moment of inertia of the bar about an axis.
- (2) To determine the moment of inertia of a flywheel about its own axis of rotation.
- (3) To determine the value of acceleration due to gravity using Kater's pendulum.
- (4) To determine the frequency of A.C. mains using sonometer and an electromagnet.
- (5) To determine the frequency of electrically maintained tuning fork by Melde's method.
- (6) To determine the dispersive power of prism using spectrometer and mercury source.
- (7) To determine the wavelength of sodium light by Newton's Ring.
- (8) To determine the wavelength of sodium light using diffraction grating.
- (9) To determine the refractive index of a prism using spectrometer.
- (10) To determine the specific rotation of cane sugar solution with the help of polarimeter.
- (11) To find the wavelength of He-Ne Laser using transmission diffraction grating.
- (12) To determine the numerical aperture (NA) of an Optical Fibre.
- (13) Compute simulation (simple application of Monte Carlo) e.g. Brownian motion, charging & discharging of capacitor.

Note: Any 8-10 experiments out of the list may be chosen. Proper error – analysis must be carried out with all the experiments.

Paper Code: ETCH – 153**Paper: Applied Chemistry Lab – I**

L	P	C
0	2	1

List of Experiments

1. To determine the percentage composition of a mixture of Sodium hydroxide and Sodium Chloride.
2. To determine the amount of Sodium Carbonate in the given mixture of Sodium Carbonate and Sodium Bicarbonate.
3. Determine the amount of Oxalic Acid and Sulphuric Acid/Hydrochloric Acid in one litre of solution given standard Sodium Hydroxide and Potassium Permanganate.
4. To determine the Carbonate, Bicarbonate and Chloride contents in irrigation water.
5. To determine the no. of water molecules of crystallization in Mohr's salt provided standard dichromate solution using internal indicator.
6. Determine the amount of Cu in the copper ore solution provided hypo solution.
7. Iodometric Titration of $K_2Cr_2O_7$ v/s $Na_2S_2O_3$ to determine the percentage purity of $K_2Cr_2O_7$ sample.
8. Argentometric titration one each of Vohlard's method and of Mohr's method.
9. Complexometric Titrations.
10. Detrmination of dissolved Oxygen in given sample if water.

TEXT BOOKS:

1. Vogel's Textbook of Quantitative Chemical Analysis (Latest ed.), Revised by G.H. Jeffery, J. Bassett, J. Mendham & R.C. Denney
2. Applied Chemistry: Theory and Practice (Latest ed.), By O.P. Vermani & A.K. Narula

Paper Code: ETCS 155**L P C****Paper: Introduction to AutoCAD, Office Automation and Web Design 0 3 2****List of Experiments**

1. Use Microsoft-Word to perform the following:
 - a) Send out invitation letter to several people using mail merge facility.
 - b) Create tabular data in word and insert graph to represent data.
 - c) Create a Macro and use it in an application.

2. Use Microsoft-Excel to perform the following:
 - a) Create a Macro and use it in an application
 - b) Enter the name and marks of 10 students and perform various mathematical functions on it.
 - c) Enter first quarter performance of five companies and create a pie chart showing there shareholders in the market.

3. Use Microsoft Power-Point to perform the following
 - a) Create a slide show on any subject of your choice using minimum five slides.
 - b) Create slideshow in operating sound.
 - c) Create an animation using group, ungroup, order, textbox image insert etc.

4. Use HTML to design a Home page for IGIT using all the features of HTML like buttons, frames, marquee check boxes etc..

5. Use AutoCAD to do the following:
 - a) Use of Drawing & Editing Properties: Modify Object Properties and a know how of layers, colors and prototype drawing.
 - b) Draw line (Poly line, multi line, linear line), polygon, ellipse, circle, arc, rectangle and use cross hatching, regions, boundary, spline, donut, fillet and extent commands.
 - c) Dimensioning commands, styles, control scale factors, drawing set-up, grip editing objects snaps, utility commands.
 - d) Projection of points, lines and solids,
 - e) Section of Solids
 - f) Development and Intersection of Surface
 - g) Isomeric Projections

Create a WEB page containing hyperlinks to the pages having information about Science and Technology.

Paper Code: ETME-157
Paper: Workshop Practice

L	P	C
0	3	2

UNIT - I

Materials: Spectrography method for finding composition of materials.

Wood Working Shop: Making of various joints, Pattern making.

UNIT - II

Foundry Shop: Bench moulding with single piece pattern and two piece pattern.

Floor moulding – Making of bend pipe mould etc.

Machine moulding – Making of mould using Match-plate pattern.

Core making- Making and baking of dry sand cores for placing in horizontal, vertical and hanging positions in the mould cavity.

Fitting Shop: Learning use of fitting hand tools, marking tools, marking gauge.

Exercises: Jobs made out of MS Flats, making saw – cut filling V-cut taper at the corners, circular cut, fitting square in square, triangle in square.

UNIT - III

Welding Shop: Electric arc welding, Edge preparations, Exercises making of various joints. Bead formation in horizontal, vertical and overhead positions.

Gas Welding: Oxy-Acetylene welding and cutting of ferrous metals.

Soldering: Dip soldering.

Brazing: With Oxy-Acetylene gas.

UNIT - IV

Sheet Metal Shop: Learning use of sheet-metal tools, Exercises: Making jobs out of GI sheet metal. Cylindrical, Conical and Prismatic shapes.

Project Shop: Extrusion of soft metals, Plastic coating of copper wires, Plastic moulding.

Paper Code: ETME-159

L P C

Paper: Engineering Graphics Lab

0 2 1

UNIT - I

General: Importance, Significance and scope of engineering drawing, Lettering, Dimensioning, Scales, Sense of proportioning, Different types of projections, Orthographic Projection, B.I.S. Specifications,

Projections of Point and Lines: Introduction of planes of projection, Reference and auxiliary planes, projections of points and Lines in different quadrants, traces, inclinations, and true lengths of the lines, projections on Auxiliary planes, shortest distance, intersecting and non-intersecting lines.

UNIT - II

Planes other than the Reference Planes: Introduction of other planes (perpendicular and oblique), their traces, inclinations etc., Projections of points and lines lying in the planes, conversion of oblique plane into auxiliary Plane and solution of related problems.

Projections of Plane Figures: Different cases of plane figures (of different shapes) making different angles with one or both reference planes and lines lying in the plane figures making different given angles (with one of both reference planes). Obtaining true shape of the plane figure by projection.

UNIT - III

Projection of Solids: Simple cases when solid is placed in different positions, Axis faces and lines lying in the faces of the solid making given angles.

CADD

UNIT - IV

Isometric Projection

Nomography : Basic Concepts and use.

TEXT BOOKS:

1. Engineering drawing by N.D.Bhatt (Charotar Publications).

REFERENCE BOOKS:

1. Engineering Drawing by S.C.Sharma & Navin Kumar (Galgotia Publications)
2. Engineering Drawing by Venugopalan.
3. Engineering Drawing by P.S.Gill

Paper Code: ETMA-102**L T C****Paper: Applied Mathematics - II****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT - I**CALCULUS OF SEVERAL VARIABLES:**

Partial differentiation, ordinary derivatives of first and second order in terms of partial derivatives, Euler's theorem on homogeneous functions, change of variables, Taylor's theorem of two variables and its application to approximate errors. Maxima and Minima of two variables, Lagrange's method of undetermined multipliers and Jacobians.

[No. of Hrs. 12]**UNIT - II****FUNCTIONS OF COMPLEX VARIABLES:**

Derivatives of complex functions, Analytic functions, Cauchy-Riemann equations, Harmonic Conjugates, Conformal mapping, Standard mappings – linear, square, inverse and bilinear. Complex line integral, Cauchy's integral theorem, Cauchy's integral formula, Zeros and Singularities / Taylor series, Laurent's series, Calculation of residues. Residue theorem, Evaluation and real integrals.

[No. of Hrs. 12]**Unit - III****VECTOR CALCULUS:**

Scalar and Vector point functions, Gradient, Divergence, Curl with geometrical physical interpretations, Directional: derivatives, Properties.

Line integrals and application to work done, Green's Lemma, Surface integrals and Volume integrals, Stoke's theorem and Gauss divergence theorem (both without proof).

[No. of Hrs. 10]**UNIT - IV****LAPLACE TRANSFORMATION:**

Existence condition, Laplace transform of standard functions, Properties, Inverse Laplace transform of functions using partial fractions, Convolution and convolution theorem. Solving linear differential equations using Laplace transform. Unit step function, Impulse function and Periodic function and their transforms.

[No. of Hrs. 10]**TEXT BOOKS:**

1. E. Kresyzig, "Advanced Engineering Mathematics", John Wiley and Sons. (Latest edition).
2. R. K. Jain and S. R. K. Iyengar, "Advanced Engineering Mathematics", Narosa, 2003 (2nd Ed.).
3. Dr. A. B. Mathur, V. P. Jaggi, "Advanced Engineering Mathematics", Khanna Publishers.

REFERENCE BOOKS:

1. V. V. Mitin, M. P. Polis and D. A. Romanov, "Modern Advanced Mathematics for Engineers", John Wiley and Sons, 2001.
2. R. Wylie, "Advanced Engineering Mathematics", McGraw-Hill, 1995.

Paper Code: ETPH-104**L T C****Paper: APPLIED PHYSICS – II****2 1 3**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT - I**Electromagnetic Theory (EMT)**

Motion of Charged Particles in crossed electric & magnetic fields, Velocity Selector & Magnetic focussing, Gauss law, continuity equation, inconsistency in Ampere's Law, Maxwell's equations (differential and integral forms), Poynting vector, Poynting Theorem (Statement only), propagation of plane electromagnetic waves in conducting and non-conducting medium. [No. of

Hrs. 8]**UNIT - II****Quantum Mechanics & Statistical Physics:**

De-Broglie Hypothesis, Davisson Germer experiment, wave function and its properties, expectation value, Wave Packet, Uncertainty principle. Schrodinger Equation for free Particle, Time Dependent Schrodinger Equation, Particle in a box (1-D), Single step Barrier, Tunneling effect.

Qualitative Features of Maxwell Boltzman, Bose-Einstein and Fermi-Dirac statistics distribution, functions & their comparison (no derivation) [No. of Hrs. 8]

UNIT - III**Solid State Physics**

Formation of energy bands in metals, semiconductors and insulators; intrinsic and extrinsic semiconductors, Fermi energy levels for doped, undoped semiconductors and pn junction; Tunnel diode, Zener diode.

Superconductivity: Meissner Effect, Type I and Type II Superconductors, BCS theory (Qualitative only), London's equation, properties of superconductors & applications. [No. of Hrs. 8]

UNIT - IV

X-Rays: production and properties, Crystalline and Anorhous solids (Brief) Bragg's Law, Applications.

Ultrasonics: Introduction, Production of Ultrasonics (Magentostriiction and piezoelectric methods), engineering applications. [No. of Hrs. 8]

TEXT BOOKS:

1. A. BEISER, "Concept of Modern Physics"
2. Rajam, "Atomic Physics"
3. Greiner, "Quantum Physics"
4. Griffith, "Introduction to Electrodynamics"

REFERENCE BOOKS:

1. Jordan & Balmain, "Electromagnetic waves and Radiating Systems"
2. Kittel, "Solid State Physics"
3. R.L. Singhal, "Solid State Physics"
4. Schiff, "Quantum Mechanics"

Paper Code: ETCH – 106**L T C****Paper: Applied Chemistry – II****2 1 3**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT - I**Chemical Bonding:**

Potential Energy curve for H₂ molecule, co-ordinate bond, Werner's theory, effective atomic numbers, isomerism in co-ordinate compounds. Hydrogen bonding, Vander Waal's forces, hybridization including d-orbitals, Valence shell Electron Repulsion Theory (VSEPR). Discussion of structures of IF₃, SnCl₂, CO₃²⁻, Molecular Orbital theory, Linear combination of atomic orbitals (LCAO) method. Structures of simple heteronuclear diatomic molecules such as CO, NO, HF, HCl.

[No. of Hrs: 08]**UNIT - II**

Gaseous State: Gas laws and Kinetic theory of gases, Distribution of molecular velocities, Mean free path, Real gases – non ideal behaviour, causes of deviation from ideal behaviour, Vander Waal's equation. Liquefaction of gases. Numericals based on above topics.

Thermochemistry: Hess's Law, Heat of a reaction, Effect of temperature on heat of reaction at constant pressure (Kirchoff's eq.), heat of dilution, heat of hydration, heat of neutralization and heat of combustion, Flame temperature.

[No. of Hrs: 08]**UNIT - III**

Catalysis: Criteria for catalysis : Homogeneous catalysis – acid-base, Enzymatic catalysis, Catalysis by metal salts, Heterogeneous catalysis, concepts of promoters, inhibitors and poisoning, physiosorption, chemisorption, surface area.

The Phase Rule: Definitions of various terms, Gibb's Phase rule, Application of phase rule to one component system – the water system and Sulphur system. Two component system : Lead – Silver, FeCl₃ – water, Na₂SO₄ – water.

No. of Hrs: 08]**UNIT - IV**

Polymers and Composites: Functionality, Degree of polymerization, concept of molecular weight (number average, weight average & numerical based on them), Linear, branched and cross-linked polymers, Tacticity of polymers, Homo and Copolymers (Classification based on repeat unit), Structure – property relationship of polymers. Industrial applications of important thermoplastic, thermosetting polymers, Elastomers, Natural Polymers.

Conducting Polymers : Properties and applications.

Composites : Classification, Fibre and particle reinforced composites. **[No. of Hrs: 08]**

TEXT BOOKS:

1. J.D. Lee, "Inorganic Chemistry", Latest ed.
2. J.C. Kuriacose & J. Rajaram, "Chemistry in Engineering & Technology, Vol I & II, Latest ed.
3. Puri, Sharma & Pathania, "Principles of Physical Chemistry", Latest ed.
4. V.R. Gowarikar, N.V. Viswanathan & Jayadev Sreedha, "Polymer Science", Latest ed.

Paper Code: ETCS 108**L T C****Paper: Introduction to Programming****2 1 3**

INSTRUCTIONS TO PAPER SETTERS:		MAXIMUM MARKS: 75
1.	Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2.	Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT - I

Introduction to Programming: Concept of algorithms, Flow Charts, Data Flow diagrams etc., Introduction to the Editing tools such as vi or MS-VC editors, Concepts of the finite storage, bits bytes, kilo, mega and gigabytes. Concepts of character representation, Number Systems & Binary Arithmetic.

[No. of Hrs. 8]**UNIT - II**

Programming using C: The emphasis should be more on programming techniques rather than the language itself. The C Programming language is being chosen mainly because of the availability of the compilers, books and other reference materials.

Example of some simple C program. Concept of variables, program statements and function calls from the library (Printf for example)

C data types, int, char, float etc., C expressions, arithmetic operation, relational and logic operations, C assignment statements, extension of assignment of the operations. C primitive input output using getchar and putchar, exposure to the scanf and printf functions, C Statements, conditional executing using if, else. Optionally switch and break statements may be mentioned.

[No. of Hrs. 8]**UNIT - III**

Iterations and Subprograms: Concept of loops, example of loops in C using for, while and do-while.

Optionally continue may be mentioned.

One dimensional arrays and example of iterative programs using arrays, 2-d arrays Use in matrix computations.

Concept of Sub-programming, functions Example of functions. Argument passing mainly for the simple variables.

[No. of Hrs. 8]**UNIT - IV**

Pointers and Strings: Pointers, relationship between arrays and pointers Argument passing using pointers

Array of pointers. Passing arrays as arguments.

Strings and C string library.

Structure and Unions. Defining C structures, passing strings as arguments Programming examples.

[No. of Hrs. 8]**TEXT BOOKS:**

1. Yashwant Kanetkar, "Let us C", BPB Publications, 2nd Edition, 2001.
2. Herbert Schildt, "C:The complete reference", Osbourne Mcgraw Hill, 4th Edition, 2002.

REFERENCE BOOKS:

1. Raja Raman, "Computer Programming in C", Prentice Hall of India, 1995.
2. Kernighan & Ritchie, "C Programming Language", The (Ansi C Version), PHI, 2nd Edition.

Paper Code: ETME 110**L T C****Paper: Engineering Mechanics****2 1 3**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT - I**Force system:** Free body diagram, Equilibrium equations and applications.**Friction:** Static and Kinetic friction, laws of dry friction, co-efficient of friction, angle of friction, angle of repose, cone of friction, friction lock, friction of flat pivot and collared thrust bearings, Belt drive- derivation of equation.

$$T_1/T_2 = e^{\mu\theta} \text{ and its application}$$

[No. of Hrs. 8]**UNIT - II****Structure:** Plane truss, perfect and imperfect truss, assumption in the truss analysis, analysis of perfect plane trusses by the method of joints, method of section.**Distributed Force:** Determination of center of gravity, center of mass and centroid by direct integration and by the method of composite bodies, mass moment of inertia and area moment of inertia by direct integration and composite bodies method, radius of gyration, parallel axis theorem, Pappus theorems, polar moment of inertia.**[No. of Hrs. 8]****UNIT - III****Kinematics of Particles:** Rectilinear motion, plane curvilinear motion-rectangular coordinates, normal and tangential component.**Kinetics of Particles:** Equation of motion, rectilinear motion and curvilinear motion, work energy equation, conservation of energy, impulse and momentum conservation of momentum, impact of bodies, co-efficient of restitution, loss of energy during impact.**[No. of Hrs. 8]****UNIT - IV****Kinematics of Rigid Bodies:** Concept of rigid body, type of rigid body motion, absolute motion, introduction to relative velocity, relative acceleration (Corioli's component excluded) and instantaneous center of velocity, Velocity and acceleration polygons for four bar mechanism and single slider mechanism.**Kinetics of Rigid Bodies:** Equation of motion, translatory motion and fixed axis rotation, application of work energy principles to rigid bodies conservation of energy.**Shear force and bending Moment Diagram.****[No. of Hrs. 8]****TEXT BOOKS:**

1. A.K.Tayal, "Engg Mechanics", Umesh Publications
2. Sadhu Singh, "Engg Mechanics", Khanna Publishers

REFERENCE BOOKS:

1. Irving H. Shames, "Engg Mechanics", PHI publications
2. U.C.Jindal, "Engg Mechanics", Galgotia Publications
3. Beer & Johnston, "Engg Mechanics", TMH
4. Subramanyam, "Engg Mechanics"

Paper Code: ETEC-112**L T C****Paper: ELECTRICAL SCIENCE****2 1 3**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT - I**Circuit Analysis**

Ohm's Law, KCL, KVL Mesh and Nodal Analysis, Circuit parameters, energy storage aspects, Superposition, Thevenin's, Norton's, Reciprocity, Maximum Power Transfer Theorem, Millman's Theorem, Star-Delta Transformation. Application of theorem to the Analysis of dc circuits.

[No. of Hrs. 8]**UNIT - II****A.C.Circuits**

R-L, R-C, R-L-C circuits (series and parallel), Time Constant, Phasor representation, Response of R-L, R-C and R-L-C circuit to sinusoidal input Resonance-series and parallel R-L-C Circuits, Q-factor, Bandwidth.

[No. of Hrs. 7]**UNIT - III****Measuring Instruments**

Principles, Construction and application of moving coil, moving iron, dynamometer type, induction type instruments, extension of range of ammeter, voltmeter (shunt and multiplier), Two-wattmeter method, for the measurement of power, Cathol-ray Oscilloscope and Applications.

[No. of Hrs. 7]**UNIT - IV****Transformers**

Construction and Working principles and phaser diagrams of Single-phase Transformer, Emf equation, Equivalent circuit, Regulation and efficiency, and Auto transformer.

Rotating Machines

Construction and working principles of dc motor and generator and its characteristics Applications of DC machines

Construction and working principles of 3-j-Induction motor, Torque-speed characteristics, and Industrial applications.

[No. of Hrs. 10]**TEXT BOOKS:**

1. P.C. Sen "Principles of Electric Machines and Power Electronics", Wiley Eastern 2003.
2. Vincent DEL TORO "Electrical Engineering Fundamental's Prentice Hall India", Ed 2002.

Paper Code: ETEL-114**L T C****Paper: Communication Skills – II****2 1 3**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

Basic Concepts in Communication: Communication as sharing; context of communication; the speaker/writer and the listener/reader; medium of communication; barriers to communication; accuracy, brevity, clarity and appropriateness in communication.

[No. of Hrs: 05]**UNIT - II**

Writing Skills: Types of writings (Expository, Descriptive, Analytic, Argumentative, Narrative etc) and their main features. Resumes and CV's and Cover letters. Memos and Notices. Basics of Formal Reports.

[No. of Hrs: 08]**UNIT - III**

Verbal, Non-Verbal and Listening Skills: Elementary Phonetics (Speech Mechanism, The Description of Speech Sounds, The Phoneme, the syllable; Prosodic Features, Word Accent, Features of Connected Speech); Paralanguage and Body language; and Classroom Presentations, Hearing and Listening; Essentials of Good Listening: Achieving ability to comprehend material delivered at relatively fast speed.

[No. of Hrs: 08]**UNIT - IV**

Group Discussion: Use of persuasive strategies including some rhetorical devices for emphasizing (for instance; being polite and firm; handling questions and taking in criticism of self; turn-taking strategies and effective intervention; use of body language).

[No. of Hrs: 09]**TEXT BOOKS:**

1. R. K. Bansal, and J. B. Harrison, "Spoken English For India: A Manual of Speech and Phonetics", Hyderabad: Orient Longman, 1983.
2. Lewis, Hedwig. "Body Language: A Guide For Professionals. New Delhi: Response Books", A division of Sage Publication, 2000
3. Sides, H. Charles, "How to Write & Present Technical Information", Cambridge: CUP, 1999.
4. Forsyth, Sandy & Lesley Hutchison, "Practical Composition", Edinburgh Oliver & Boyd, 1981

Paper Code: ETPH-152**Paper: Applied Physics Lab – II**

L	P	C
0	2	1

List of Experiments

1. To determine the value of e/m of electron by J.J. Thomson method.
2. To determine unknown resistance of a wire by Carey Foster's Bridge.
3. To determine the internal resistance of Leclanche cell using potentiometer.
4. To study the charging and discharging of a capacitor and to find out the time constant.
5. To find the thermal conductivity of a poor conductor by Lee's disk method.
6. To study the thermo emf using thermocouple and resistance using Pt. Resistance thermometer.
7. To determine the velocity of ultrasound waves using an ultrasonic spectrometer in a given liquid (Kerosene Oil)
8. To measure the frequency of a sine-wave voltage obtain from signal generator and to obtain lissajous pattern on the CRO screen by feeding two sine wave voltage from two signal generator.
9. To determine the temp. coefficient of resistance of platinum by Callender & Griffith's Bridge.
10. To study Hall effect.
11. To determine plank's constant.

Note:

At least 8 experiments must be carried out.

Proper error – analysis must be carried out with all the experiments.

Paper Code: ETCH – 154**L P C****Paper: Applied Chemistry Lab – II****0 2 1****List of Experiments**

1. Determine the heat of hydration of $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ / $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$.
2. Determine the heat of neutralization of strong Acid (say $\text{H}_2\text{SO}_4/\text{HCl}$) with strong base (NaOH).
3. Determine the heat of neutralization of Weak Acid with strong base.
4. Determine the molecular weight of a substance by Rast Method.
5. Determine the reaction rate constant for 1st order reaction.
6. Determine the surface tension of a liquid using drop weight method.
7. To determine the viscosity of the given liquid (density to be determined).
8. Preparation of a Polymer.
9. To determine the cell constant of a conductivity cell.
10. Titration of strong acid/strong base conduct metrically.

TEXT BOOKS:

1. B.D. Khosla, A. Gulati & V.C. Garg, "Practical Physical Chemistry", Latest ed
2. S.K. Bhasin and Sudha Rani, "Laboratory Manual on Engineering Chemistry", Latest ed.

Paper Code: ETCS 156**Paper: C Programming Lab.**

	L	P	C
0	2	1	

List of Experiments

1. Write a program to produce ASCII equivalent of given number
2. Write a program to find divisor or factorial of a given number.
3. Write a program to evaluate the following algebraic expressions after reading necessary values from the user
 - v $(ax+b)/(ax-b)$
 - v $2.5 \log x - \cos 30 + |x^2 - y^2| + \sqrt{2xy}$
 - v $(x^5 + 10x^4 + 8x^3 + 4x + 2)$
4. Write a program to find sum of a geometric series
5. Write a program to cipher a string
6. Write a program to check whether a given string follows English capitalization rules
7. Write a program to find sum of the following series
 $1 + \frac{1}{2} + \frac{1}{3} + \dots + \frac{1}{20}$
8. Write a program to search whether a given substring exist in an input string or not and then delete this string from input string.
9. Write a recursive program for tower of Hanoi problem
10. The fibonacci sequence of numbers is 1,1,2,3,5,8,..... Based on the recurrence relation
 $F(n) = F(n-1) + F(n-2)$ for $n > 2$
 Write a recursive program to print the first m Fibonacci number
11. Write a menu driven program for matrices to do the following operation depending on whether the operation requires one or two matrices
 - a) Addition of two matrices
 - b) Subtraction of two matrices
 - c) Finding upper and lower triangular matrices
 - d) Trace of a matrix
 - e) Transpose of a matrix
 - f) Check of matrix symmetry
 - g) Product of two matrices.
12. Write a program that takes two operands and one operator from the user perform the operation and then print the answer
13. Write a program to print the following outputs:

1						1				
2	2					2	2			
3	3	3				3	3	3		
4	4	4	4			4	4	4	4	
5	5	5	5	5		5	5	5	5	5
14. Write functions to add, subtract, multiply and divide two complex numbers $(x+iy)$ and $(a+ib)$ Also write the main program.
15. Write a menu driven program for searching an sorting with following options:-
 - a) Searching (1) Linear searching (2) Binary searching
 - b) Sorting (1) Inersection sort (2) Selection sorting
16. Write a program to copy one file to other, use command line arguments.
17. Write a program to mask some bit of a number (using bit operations)
18. An array of record contains information of managers and workers of a company. Print all the data of managers and workers in separate files.

Paper Code: ETME 158**Paper: Engineering Mechanics Lab**

	L	P	C
0	3	2	

List of Experiments

1. To verify the law of Force Polygon
2. To verify the law of Moments using Parallel Force apparatus. (simply supported type)
3. To determine the co-efficient of friction between wood and various surface (like Leather, Wood, Aluminum) on an inclined plane.
4. To find the forces in the members of Jib Crane.
5. To determine the mechanical advantage, Velocity ratio and efficiency of a screw jack.
6. To determine the mechanical advantage, Velocity ratio and Mechanical efficiency of the Wheel and Axle
7. To determine the MA, VR, h of Worm Wheel (2-start)
8. Verification of force transmitted by members of given truss.
9. To verify the law of moments using Bell crank lever
10. To find CG and moment of Inertia of an irregular body using Computation method.

Paper Code: ETEC 160**Paper: Electrical Science Lab**

L	P	C
0	2	1

List of Experiments

1. Verification of Thevenin's theorem
2. Verification of Superposition theorem
3. Phasor Diagram and Power factor of LCR circuit.
4. Measurement of Power and Power factor in single phase Load using three ammeters/voltmeters.
5. Calibration of Energy Meter/Wattmeter/Voltmeter/Ammeter
6. Two wattmeter method of measuring power in three phase circuit (resistive load only)
7. Load test on Single Phase Transformer, Regulation and Efficiency of Transformer
8. Short Circuit/Open Circuit tests on Single Phase transformer
9. Measure the armature and field resistance of a D.C. Machine
10. Connection and starting of a Three Phase Induction Motor using direct on line or Star Delta Starter.
11. Starting and Speed Control of a D.C. shunt motor
12. Resonance

Code No.: ETMA 201
Paper: Applied Mathematics – III

L	T	C
3	1	4

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

Laplace Transformation: Laplace Transformation, Inverse Laplace transformation Convolution Theorem, application to linear differential equations with constant coefficients, Unit step function, impulse functions / periodic functions.

[No. of Hrs.: 11]

UNIT – II

Fourier Series: Fourier Series, Euler's formulae, even and odd functions, having arbitrary periods, half range expansion, Harmonic Analysis.

Fourier Transforms: Fourier transform, Sine and Cosine transforms, Application to differential equations.

[No. of Hrs.: 11]

UNIT – III

Special Functions: Beta and Gamma functions, Bessels functions of first kind, Recurrence relations, modified Bessel functions of first kind, Ber and Be functions, Legendre Polynomial, Rodrigue's formula, orthogonal expansion of function. **[No. of Hrs.: 11]**

UNIT – IV

Partial Differential Equation: Formation of first and second order linear equations, Laplace, Wave and heat conduction equation, initial and boundary value problems. **[No. of Hrs.: 11]**

TEXT BOOKS:

1. E. Kresyig, "Advanced Engineering Mathematics", 5th Edition, John Wiley & Sons, 1999.

REFERENCE BOOKS:

1. B.S. Grewal, "Elementary Engineering Mathematics", 34th Ed., 1998.
2. H.K. Dass, "Advanced Engineering Mathematics", S. Chand & Company, 9th Revised Edition, 2001.
3. Shanti Narayan, "Integral Calculus", S. Chand & Company, 1999
4. Shanti Narayan, "Differential Calculus", S.Chand & Company, 1998

Code No.: ETCS 203
Paper: Analog Electronics

L	T	C
3	1	4

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

Semiconductors Diodes and Rectifiers: Introduction, general characteristics, energy levels, extrinsic materials n & p type, ideal diode, basic construction and characteristics, DC & AC resistance, equivalent circuits, drift & diffusion currents, transition & diffusion capacitance, reverse recovery times, temperature effects, diode specifications, different types of diodes (zener, varactor, schottky, power tunnel, photodiode & LED), Half wave & full wave rectifiers

[No. of Hrs.: 11]

UNIT – II

Bipolar junction transistor: Introduction, Transistor, Construction, transistor operations, BJT characteristics, load line, operation point, leakage currents, saturation and cut off mode of operations Eber-mall's model. Bias stabilization: Need for stabilization, fixed Bias, emitter bias, self bias, bias stability with respect of variations in I_{CO} , V_{be} & β , stabilization factors, thermal stability.

[No. of Hrs.: 11]

UNIT – III

Small Signal Amplifiers: CB, CE, CC configurations, hybrid model for transistor at low frequencies, RC coupled amplifiers.

Field Effect Transistors: Classification & characteristics, operating point, biasing, enhancement & depletion type MOSFETS.

[No. of Hrs.: 11]

UNIT – IV

Operational Amplifier: Ideal OPAMP, OPAMP stages, OPAMP Parameters, equivalent circuit, Ideal voltage transfer curve, open loop OPAMP configuration, closed loop OPAMP configuration, OPAMP applications: comparator, current sources, rectifiers, first and second order filters, summer, integrator, differentiators, Clipper, clamper, waveform generators, instrumentation amplifier, log, antilog amplifier.

[No. of Hrs.: 11]

Text Books

1. J. Millman and Halkias, "Electronic devices and circuits" TMH, 1999.
2. Salivahanan, Suresh Kumar, Vallavaraj, "Electronic devices and circuits" TMH, 1999

Reference Book

1. J. Millman and Halkias, "Integrated Electronics, Analog & Digital Circuits & Systems" TMH – 2000.
2. Boylestad & Nashelsky, "Electronic Devices & Circuit Theory" PHI – VIth Edition.
3. Sedra & Smith, "Micro Electronic Circuits" Oxford University Press, 2000
4. J.B.Gupta, "Electronic Devices & Circuits" S. K. Kataria, IInd Edition.

Code No.: ETEC 205
Paper: Circuits and Systems

L T C
3 1 4

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

Unit-I

Introduction to continuous and discrete signals, their classification and types, periodic waveforms and signal synthesis, LTI systems and their properties; system modeling in terms of differential equations and transient response of R, L, C circuits for impulse, step, ramp, sinusoidal and exponential signals.

No. of Hours: 11

Unit-II

Laplace Transform: Review of properties and applications of Laplace transform of complex waveform and transient response of R, L, C series, parallel, series-parallel circuits for all kinds of excitations.

No. of Hours: 11

Unit-III

Graph theory and its applications, two port networks – z, y, ABCD, h, g, inverse ABCD parameters their interconversion, interconnection of two 2-port networks, concept of transform impedance, Network theorems: Reciprocity, Superposition, Thevenin, Norton, Millman, Maximum Power Transfer and Tellegan

No. of Hours: 11

Unit IV

Elements of Network Synthesis: Foster's I and II, Cauer's I & II forms, Synthesis of LC, RC, RL Networks

No. of Hours: 11

Text Books:

1. Valkenburg, "Network analysis" PHI, 2000.
2. D. R. Choudhary, "Networks and Systems" New Age International, 1999.

Reference Books

1. Bhise, Chadda, Kulshreshtha, "Engineering network analysis and filter design" Umesh publication, 2000.
2. Kuo, "Network analysis and synthesis" John Wiley and Sons, 2nd Edition.

Code No.: ETCS 207**L T C****Paper: Foundations of Computer Systems****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:		MAXIMUM MARKS: 75
1.	Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2.	Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

Formal Logic: Statement, Symbolic Representation and Tautologies, Quantifiers, Predicate and validity, Normal form. Propositional Logic, Predicate Logic, Logic Programming and Proof of correctness.

Proof, Relation and Analysis of Algorithm: Techniques for theorem proving: Direct Proof, Proof by Contradiction, Proof by exhausting cases and proof by contradiction, principle of mathematical induction, principle of complete induction. Recursive definitions, solution methods for linear, first-order recurrence relations with constant coefficients, Analysis of Algorithms involving recurrence relations-recursive binary search, quick sort, solution method for a divide-and-conquer recurrence relation. **[No. of Hrs.: 11]**

UNIT – II

Sets and Combinations: Sets, Subsets, powersets, binary and unary operations on a set, set operations/set identities, fundamental counting principles, principle of inclusion, exclusion and pigeonhole principle, permutation and combination, pascal's triangles, binomial theorem, representation of discrete structures.

Relation/function and matrices: Relations, properties of binary relations, operation on binary relations, closures, partial ordering, equivalence relation, Function properties of function, composition of function, inverse, binary and n-ary operations, characteristics for, Permutation function, composition of cycles, Boolean matrices, Boolean matrices multiplication. **[No. of Hrs.: 11]**

UNIT – III

Lattices & Boolean Algebra: Lattices: definition, sublattices, direct product, homomorphism Boolean algebra: definition, properties, isomorphic structures (in particular, structures with binary operations) subalgebra, direct product and homomorphism, Boolean function, Boolean expression, representation & minimization of Boolean function. **[No. of Hrs.: 11]**

UNIT – IV

Graph Theory: Terminology, isomorphic graphs, Euler's formula (proof) four color problem (without proof) and the chromatic number of a graph, five color theorem. Trees terminology, directed graphs, Computer representation of graphs, Warshall's, algorithms, Decision Trees, Euler path & hamiltonian circuits, Shortest path & minimal spanning trees, Depth-first and breadth first searches, trees associated with DFS & BFS). Connected components, in order, preorder & post order trees traversal algorithms. **[No. of Hrs.: 11]**

TEXT BOOKS:

1. Kenneth H. Rosen, "Discrete Mathematics and Its Applications", TMH, 1999.
2. C.L. Liu, "Elements of Discrete Mathematics", TMH, 2000.

REFERENCES BOOKS:

1. Kolman, Busby & Ross, "Discrete Mathematical Structures", PHI, 1996.
2. Narsingh Deo, "Graph Theory With Application to Engineering and Computer Science", PHI, 2004.
3. J. P. Trembley & P. Manohar, "Discrete Mathematical Structures with Applications to Computer Science", McGraw Hill, 1997.
4. Vinay Kumar, "Discrete Mathematics", BPB Publications, 1998.

Code No.: ETIT 209**L T C****Paper: Object Oriented Programming using C++****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:		MAXIMUM MARKS: 75
1.	Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2.	Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked	

to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT – I

Introduction: Introducing Object-Oriented Approach related to other paradigms (functional, data decomposition), Characteristics of Object-Oriented Languages.

Basic terms and ideas: Abstraction, Encapsulation, Information hiding, Inheritance, Polymorphism, Review of C, Difference between C and C++, cin, cout, new, delete operators.
[No. of Hrs: 11]

UNIT – II

Classes and Objects: Abstract data types, Object & classes, attributes, methods, C++ class declaration, State identity and behavior of an object, Constructors and destructors, instantiation of objects, Default parameter value, Copy Constructor, Static Class Data, Constant and Classes, C++ garbage collection, dynamic memory allocation.

[No. of Hrs. 11]**UNIT – III**

Inheritance and Polymorphism: Inheritance, Types of Inheritance, Class hierarchy, derivation – public, private & protected, Aggregation, composition vs classification hierarchies, Polymorphism, Type of Polymorphism – Compile time and runtime, Method polymorphism, Polymorphism by parameter, Operator overloading, Parametric polymorphism, Generic function – template function, function name overloading, Overriding inheritance methods
[No. of Hrs: 11]

UNIT – IV

Files and Exception Handling: Persistent objects, Streams and files, Namespaces, Exception handling, Generic Classes

Standard Template Library: Standard Template Library, Overview of Standard Template Library, Containers, Algorithms, Iterators, Other STL Elements, The Container Classes, General Theory of Operation, Vectors.

[No. of Hrs: 11]**TEXT BOOKS:**

1. A.R.Venugopal, Rajkumar, T. Ravishanker “Mastering C++”, TMH, 1997.
2. R. Lafore, “Object Oriented Programming using C++”, BPB Publications, 2004.
3. Schildt Herbert, “C++ Programming”, 2nd Edition, Wiley DreamTech.

REFERENCE BOOKS:

1. D . Parsons, “Object Oriented Programming with C++”, BPB Publication, 1999.
2. Steven C. Lawlor, “The Art of Programming Computer Science with C++”, Vikas Publication, 2002.
3. Yashwant Kanethkar, “Object Oriented Programming using C++”, BPB, 2004.

Code No.: ETCS 211
Paper: Data Structures

L	T	C
3	1	4

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

Fundamentals of algorithm analysis: Big ‘O’ notations, Time and space complexity of algorithms., Elementary data structures and their applications

Arrays: ordered lists, representation of arrays, sparse matrices, linked lists: singly and doubly linked lists, stacks, queues, multiples stacks and queues, Applications: polynomial arithmetic, infix, postfix and prefix arithmetic expression conversion and evaluations. **[No. of Hrs:**

12]

UNIT – II

Trees: Binary trees: Definition, traversal, threaded binary tree, Counting Binary Tree.

Graphs: Representation, traversal, connected components, shortest path and transitive closure, topological sort, activity network, critical path, path enumeration. Dijkstra’s Algorithm, Floyd Warshall’s Algorithm, Minimum Spanning Tree Definitions.

[No. of Hrs: 11]

UNIT – III

Searching & Sorting: Binary Search Tree, Insertion & Deletion, AVL Trees, Hash function, Hash table, Internal sort: Radixsort, Insertion sort, Exchange sort, Selection sort, Quicksort, Shellsort, Mergesort, Heaport, External sort: K-way mergesort, balanced mergesort, polyphase mergesort **[No. of Hrs: 11]**

UNIT – IV

Files: Files, Queries and sequential organization; Cylinder surface indexing, Hashed Indexed, Tree Indexing, B-Trees, Trie Indexing, Sequential file organizational, random file organization, Hashed file organization, Inverted files, cellular partitions. **[No. of Hrs: 10]**

TEXT BOOKS:

1. E. Horowitz and S. Sahani, “Fundamentals of Data Structures”, Galgotia Booksource Pvt. Ltd, 1999.
2. R. L. Kruse, B. P. Leung, C. L. Tondo, “Data Structures and program design in C”, PHI, 2000.

REFERENCES BOOKS:

1. Schaum’s outline series, “Data Structure”, TMH, 2002
2. Y. Langsam et. al., “Data Structures using C and C++”, PHI, 1999.
3. Yashwant Kanetkar, “Data Structure through C”, BPB, 2005.

Code No. : ETCS 251**L P C****Paper: Analog Electronics Lab.****0 2 1**

Practical will be based on Analog Electronics. Some lab experiments must be performed using any circuit simulation software e.g. PSPICE.

Code No. : ETEC 253**L P C****Paper: Circuits & Systems Lab.****0 2 1**

Practical will be based on Circuits & Systems. Some lab experiments must be performed using any circuit simulation software e.g. PSPICE.

Code No. : ETIT 255**L P C****Paper: Object Oriented Programming using C++ Lab.****0 2 1**

Practical will be based on Object Oriented Programming using C++.

Code No. : ETCS 257**L P C****Paper: Data Structure Lab.****0 2 1**

Practical will be based on Data Structure.

Code No.: ETCS 202**L T C****Paper: Software Engineering****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

Introduction: Software Crisis, Software Processes & Characteristics, Software life cycle models, Waterfall, Prototype, Evolutionary and Spiral Models

Software Requirements analysis & specifications: Requirement engineering, requirement elicitation techniques like FAST, QFD & Use case approach, requirements analysis using DFD, Data dictionaries & ER Diagrams, Requirements documentation, Nature of SRS, Characteristics & organization of SRS.
[No. of Hrs.: 11]

UNIT – II

Software Project Planning: Size Estimation like lines of Code & Function Count, Cost Estimation Models, COCOMO, COCOMO-II, Putnam resource allocation model, Risk Management.

Software Design: Cohesion & Coupling, Classification of Cohesiveness & Coupling, Function Oriented Design, Object Oriented Design
[No. of Hrs.: 11]

UNIT - III

Software Metrics: Software measurements: What & Why, Token Count, Halstead Software Science Measures, Design Metrics, Data Structure Metrics, Information Flow Metrics

Software Reliability: Importance, Hardware Reliability & Software Reliability, Failure and Faults, Reliability Models, Basic Model, Logarithmic Poisson Model, Software Quality Models, CMM & ISO 9001.
[No. of Hrs.: 11]

UNIT - IV

Software Testing: Testing process, Design of test cases, functional testing: Boundary value analysis, Equivalence class testing, Decision table testing, Cause effect graphing, Structural testing, Path Testing, Data flow and mutation testing, Unit Testing, Integration and System Testing, Debugging, Alpha & Beta Testing, Testing Tools & Standards.

Software Maintenance: Management of Maintenance, Maintenance Process, Maintenance Models, Regression Testing, Reverse Engineering, Software Re-engineering, Configuration Management, Documentation.
[No. of Hrs.: 11]

TEXT BOOKS:

1. K. K. Aggarwal & Yogesh Singh, "Software Engineering", 2nd Ed., New Age International, 2005.
2. R. S. Pressman, "Software Engineering – A practitioner's approach", 5th Ed., McGraw Hill Int. Ed., 2001.

REFERENCE BOOKS:

1. Stephen R. Schach, "Classical & Object Oriented Software Engineering", IRWIN, TMH, 1996.
2. James Peter, W. Pedrycz, "Software Engineering: An Engineering Approach", John Wiley & Sons, 2004.
3. I. Sommerville, "Software Engineering", Addison Wesley, 2004
4. K. Chandrasekhara, "Software Engineering & Quality Assurance", BPB, 2005.

Code No.: ETCS 204**L T C****Paper: Algorithm Analysis & Design****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

Preliminaries: Review of growth of functions, Recurrences: The substitution method, The iteration method, The master method, Data Structures for Disjoint Sets.

Divide and Conquer Approach: Merge Sort, Quick sort, Medians and Order statistics, Strassen's algorithm for Matrix Multiplications. **[No. of Hrs.: 11]**

UNIT – II

Dynamic Programming: Elements of Dynamic Programming, Matrix Chain Multiplication, Longest common subsequence and optimal binary search trees problems.

Greedy Algorithms: Elements of Greedy strategy, An activity selection problem, Huffman Codes, A task scheduling problem. **[No. of Hrs.: 11]**

UNIT – III

Graph Algorithms: Representation of Graphs, Breadth First Search, Depth First Search, Topological Sort, Strongly Connected Components, Algorithm for Kruskal's and Prim's for finding Minimum cost Spanning Trees, Dijkstra's and Bellman Fort Algorithm for finding Single source shortest paths. All pair shortest paths and matrix multiplication, Floyd – Warshall algorithm for all pair shortest paths. **[No. of Hrs.: 11]**

UNIT – IV

String matching: The naïve String Matching algorithm, The Rabin-Karp Algorithm, String Matching with finite automata, The Knuth-Morris Pratt algorithm.

NP-Complete Problem: Polynomial-time verification, NP-Completeness and Reducibility, NP-Completeness Proof, NP-Complete problems. **[No. of Hrs.: 11]**

TEXT BOOKS:

1. T. H. Cormen, C. E. Leiserson, R. L. Rivest, Clifford Stein, "Introduction to Algorithms", 2nd Ed., PHI, 2004.

REFERENCES BOOKS:

1. A. V. Aho, J. E. Hopcroft, J. D. Ullman, "The Design and Analysis of Computer Algorithms", Addison Wesley, 1998.
2. Ellis Horowitz and Sartaz Sahani, "Computer Algorithms", Galgotia Publications, 1999.
3. D. E. Knuth, "The Art of Computer Programming", 2nd Ed., Addison Wesley, 1998

Code No.: ETEC 206**L T C****Paper: Digital Circuits & System – I****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

Analog & Digital signals, AND, OR, NOT, NAND, NOR & XOR gates, Boolean algebra. Standard representation of Logical functions, K-map representation and simplification of logical functions, Don't care conditions, X-OR & X-NOR simplification of K-maps. Combinational circuits: Multiplexers, demultiplexers, Decoders & Encoders, Adders & Subtractor, Code Converters, comparators, decoder/drivers for display devices

[No. of Hrs.: 11]**UNIT – II**

Flip Flops: S-R, J-K, D & T Flip-flops, excitation table of a flip-flop, race around condition. Sequential circuits: Shift registers, Ripple counter, Design of Synchronous counters and sequence detectors, 555 Timer and its application as mono-stable and astable multi-vibrator. Nyquist Sampling Theorem

[No. of Hrs.: 11]**UNIT - III**

A/D and D/A converters: Binary-weighted DAC, R-2R Ladder type networks, Successive-approximation ADC, Linear-ramp ADC, Dual-slope ADC Bipolar-Transistor Characteristics, RTL and DTL circuits, TTL, ECL and CMOS Logic families.

[No. of Hrs.: 11]**UNIT - IV**

Logic Implementations using ROM, PAL & PLA., Semiconductor Memories: Memory organization & operation, classification and characteristics of memories, RAM, ROM and content addressable memory.

[No. of Hrs.: 11]**TEXT BOOKS:**

1. R.P. Jain, "Modern Digital Electronics", TMH, 3rd Ed, 2004.
2. Morris Mano, "Digital Design", PHI, 2nd Ed, 2002.

REFERENCE BOOKS:

1. R. J. Tocci, "Digital Systems", PHI, 2000
2. Malvino and Leach, "Digital principles and applications", TMH, 2000.
3. I. J. Nagrath, "Electronics, Analog & Digital", PHI, 1999.
4. J. M. Yarbrough, "Digital Logic-Application and Design", PWS Publishing, 1999.
5. B. S. Nai, "Digital Electronics and Logic Design", PHI, 2000.
6. Balabanian and Carlson, "Digital Logic Design Principles", Wiley Pub., 2000.

Code No.: ETIT 208
Paper: Communication Systems

L	T	C
3	1	4

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT - I

Analog Modulation: Amplitude Modulation, Generation & Demodulation of AM DSBSC waves, Coherent Detection of DSBSC Signal, Quadrature-Carrier Multiplexing, Generation of SSB waves, Demodulation of SSB waves.

Pulse Analog Modulation: Sampling theorem, Sampling of Low Pass and band pass signals, Aliasing, Aperture effect, PAM, PWM and PPM generation and modulation, TDM, Cross talk, Spectral analysis of PAM, PWM and PPM Waves, S/N ratio for different pulse modulation. **[No. of Hrs.: 12]**

UNIT – II

Angle Modulation: Frequency & phase Modulation, narrow & wide-band, FM, BW of FM waves, Generation & demodulation of FM waves, S/N ratio, Comparison of AM, FM & PM.

Random Process: Probability Random variable, Probability density, mean, moments, transformation of random variables, Stationary Process, mean, autocorrelation and covariance functions, ergodicity, power spectral density, response of linear systems to random signals, Gaussian distribution, central limit theorem. **[No. of Hrs.: 12]**

UNIT – III

Pulse Digital Modulation: Pulse Code Modulation signal to quantization noise ratio, Companding, Probability of error for PCM in AWGN Channel, DPCM, DM and ADM modulators and demodulators, Prediction Filter, line coding, Inter symbol Interference.

Digital transmission through carrier modulation

Amplitude, Frequency and phase shift keying, Differential phase shift keying, CPFSK, MSK OPSK and QAM modulation & detection, probability of error calculation, Matched Filter.

[No. of Hrs.: 11]

UNIT - IV

Introduction to Information Theory: Measurement of Information, mutual information Shannon's Theorem Source coding, channel coding and channel capacity theorem. Huffman code, Lempel – ziv code. **[No. of Hrs.: 09]**

TEXT BOOKS:

1. Taub & Schilling, "Principles of Communication Systems", TMH, 1998.

REFERENCE BOOKS:

1. J. C. Hancock, "An Introduction to the Principles of Communication Theory", TMH, 1998.
2. Simon Haykins, "Communication Systems", John Wiley, 1998.

Code No.: ETCS 210
Paper: Computer Graphics

L	T	C
3	1	4

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

Transformation, Projections, and Clipping Algorithms: Bresenham's Line Drawing Algorithm, Homogeneous Coordinate System for 2D and 3D, Various 2D, 3D Transformation matrices (Translation, Scaling, Rotation, Shear), Rotation about an arbitrary point (2D), Rotation about an arbitrary axis (3D), Computing location of V.P, Clipping Algorithms, Sutherland-Cohen Clipping Algorithm.

[No. of Hrs. : 11]

UNIT – II

Curves and Surfaces: Bresenham's Circle Drawing Algorithm, Bezier Curves, 4 point and 5 point Bezier curves using Bernstein Polynomials, Conditions for smoothly joining curve segments, Bezier bi-cubic surface patch, B-Spline Curves, Cubic B-Spline curves using uniform knot vectors, Testing for first and second order continuities

[No. of Hrs: 11]

UNIT – III

Projection and Solid Modelling: Parallel Projection, Oblique Projection on xy plane, Isometric Projection, Perspective Projection, One Vanishing Point (V.P.) projection from a point on z axis, Generation of 2 V.P. Projection, Isometric Projection, Perspective, Projection, one vanishing Pint (VP), projection from 0 point on z axis, Generation of 2 VP Projector & Projections, Solid Modelling.

[No. of Hrs: 11]

UNIT – IV

Shading and Hidden Surface Removal: Shading, Illumination Model for diffused Reflection, Effect of ambient lighting, distances, Specular Reflection Model, Computing Reflection Vector, Curved Surfaces, Polygonal Approximations, Gourard Shading, Phong Model, Hidden Surface Removal, Back Face Detection, Depth Buffer (Z-Buffer, A-Buffer) Method, Scan Line Method, Depth Sorting Method, Area Subdivision Method.

[No. of Hrs: 11]

TEXT BOOKS:

1. Foley et. al., "Computer Graphics Principles & practice", Addison Wesley, 1999.
2. David F. Rogers, "Procedural Elements for Computer Graphics", McGraw Hill Book Company, 1985.

REFERENCES BOOKS:

1. D. Rogers and J. Adams, "Mathematical Elements for Computer Graphics", MacGraw-Hill International Edition, 1989.
2. D. Hearn and P. Baker, "Computer Graphics", Prentice Hall, 1986.
3. R. Plastock and G. Kalley, "Theory and Problems of Computer Graphics", Schaum's Series, McGraw Hill, 1986.

Code No.: ETCS 212**L T C****Paper: Operating Systems****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

Introduction, What is an Operating System, Simple Batch Systems, Multiprogrammed Batches systems, Time-Sharing Systems, Personal-computer systems, Parallel systems, Distributed Systems, Real-Time Systems
 Memory Management: Background, Logical versus Physical Address space, swapping, Contiguous allocation, Paging, Segmentation, Segmentation with Paging

Virtual Memory: Demand Paging, Page Replacement, Page-replacement Algorithms, Performance of Demand Paging, Allocation of Frames, Thrashing, Other Considerations, Demand Segmentation
[No. of Hrs.: 12]

UNIT – II

Processes: Process Concept, Process Scheduling, Operation on Processes, Cooperating Processes, Interprocess Communication

CPU Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Multiple-Processor Scheduling, Real-Time Scheduling, Algorithm Evaluation

Process Synchronization: Background, The Critical-Section Problem, Synchronization Hardware, Semaphores, Classical Problems of Synchronization, Critical Regions, Monitors, Synchronization in Solaris 2, Atomic Transactions
[No. of Hrs.: 11]

UNIT – III

Deadlocks: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock, Combined Approach to Deadlock Handling.

Device Management: Techniques for Device Management, Dedicated Devices, Shared Devices, Virtual Devices; Device Characteristics-Hardware Consideration, Input or Output Devices, Storage Devices, Channels and Control Units, Independent Device Operation, Buffering, Multiple Paths, Block Multiplexing, Device Allocation Consideration,

Secondary-Storage Structure: Disk Structure, Disk Scheduling, Disk Management, Swap-Space Management, Disk Reliability, Stable-Storage Implementation
[No. of Hrs.: 11]

UNIT – IV

Information Management: Introduction, A Simple File System, General Model of a File System, Symbolic File System, Basic File System, Access Control Verification, Logical File System, Physical File System
 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.
[No. of Hrs.: 10]

TEXT BOOKS:

1. Silberschatz and Galvin, "Operating System Concepts", Pearson, 5th Ed., 2001
2. Dr. R. C. Joshi, "Operating Systems", Wiley Dreamtech, 2005.

REFERENCES BOOKS:

1. Tannenbaum, "Operating Systems", PHI, 4th Edition, 2000
2. E. Madnick, J. Donovan, "Operating Systems", Tata McGraw Hill, 2001

Code No. : ETCS 252	L	P	C
Paper: Software Engineering Lab.	0	2	1

Practical will be based on Software Engineering.

Code No. : ETCS 254	L	P	C
Paper: Algorithm Analysis & Design Lab.	0	2	1

Practical will be based on Algorithm Analysis & Design.

Code No. : ETEC 256	L	P	C
Paper: Digital Circuits & Systems - I Lab.	0	2	1

Practical will be based on Digital Circuits & Systems – I. Some lab experiments must be performed using any circuit simulation software e.g. PSPICE.

Code No. : ETCS 258	L	P	C
Paper: Computer Graphics Lab.	0	2	1

Practical will be based on Computer Graphics.

Code No.: ETEC 301
Paper: Digital Circuits & Systems – II

L	T	C
3	1	4

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

Concepts of ASM, Realization through GATES, MUX, PLD devices.

Specification of combinational systems using VHDL, Introduction to VHDL, Basic Language element of VHDL, Behavioral Modeling, Signal Assignment Statement, Structural modeling, Component Declaration, component instantiation, package declaration, package body, Design of standard combinational modules, Generate Statement [No. of Hrs.: 12]

UNIT – II

Asynchronous sequential circuits design, Flow table, merger diagram, transition table, Description and design of sequential circuits using VHDL, Flip-flop, Register and Counter, Design of a Serial Adder with Accumulator, State Graph for Control Network, design of a Binary Multiplier, Multiplication of a Signed Binary Number [No. of Hrs.: 12]

UNIT – III

Subprogram Overloading, Operator Overloading, Signatures, Generics and Configuration, Functions and Procedure, Model simulation, Writing a test bench, Dumping results into a text file, reading vectors from a text file, state machine modeling [No. of Hrs.: 12]

UNIT – IV

Overview of FPGA and CPLD. Study of internal architecture of xilinx's vertex series of devices and altera's cyclone processor. [No. of Hrs.: 08]

TEXT BOOKS:

1. J. Bhaskar, "A VHDL Primer", Addison Wesley, 1999.
2. C. H. Roth, "Digital System Design using VHDL", PWS Publishing, 2003.
3. Moris Mano, "Fundamentals of Logic Design", Pearson Education, 3rd Edition, 2003.

REFERENCES BOOKS:

1. M. Ercegovic, T. Lang and L.J. Moreno, "Introduction to Digital Systems", Wiley, 2000
2. J.F. Wakerly, "Digital Design-Principles and Practices", PHL, 2000.
3. Douglas Perry, "VHDL", MGH, 2000.
4. Michae John Sebastian Smith, "Application-Specific Integrated Circuits", Addison-Wesley, 2000.
5. Z. Navabi, "VHDL-Analysis and Modeling of Digital Systems", MGH, 2000.

Code No.: ETIT 303**L T C****Paper: Java Programming and Website Design****3 1 4****INSTRUCTIONS TO PAPER SETTERS:****MAXIMUM MARKS: 75**

- | | |
|----|---|
| 1. | Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks. |
| 2. | Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks. |

UNIT – I

Introduction to Java: Importance and features of Java, Keywords, constants, variables and Data Types, Operators and Expressions, Decision Making, Branching and Looping: if..else, switch,?: operator, while, do, for statements, labeled loops, jump statements: break, cotnue return. Introducing classes, objects and methods: defining a class, adding variables and methods, creating objects, constructors, class inheritance.

Arrays and String: Creating an array, one and two dimensional arrays, string array and methods, Classes: String and String Buffer classes, Wrapper classes: Basics types, using super, Multilevel hierarchy abstract and final classes, Object class, Packages and interfaces, Access protection, Extending Interfaces, packages.

[No. of Hrs.: 12]**UNIT – II**

Exception Handling: Fundamentals exception types, uncaught exceptions, throw, throw, final, built in exception, creating your own exceptions, Multithreaded Programming: Fundamentals, Java thread model: priorities, synchronization, messaging, thread classes, Run able interface, inter thread Communication, suspending, resuming and stopping threads. Input/Output Programming: Basics, Streams, Byte and Character Stream, predefined streams, Reading and writing from console and files. Using Standard Java Packages (lang, util, io, net). Networking: Basics, networking classes and interfaces, using java.net package, doing TCP/IP and Data-gram Programming

[No. of Hrs.: 12]**UNIT – III**

Event Handling: Different Mechanism, the Delegation Event Model, Event Classes, Event Listener Interfaces, Adapter and Inner Classes, Working with windows, Graphics and Text, using AWT controls, Layout managers and menus, handling Image, animation, sound and video, Java Applet. Beans: Introduction to Java Beans and Swings, Servlets

[No. of Hrs.: 10]**UNIT – IV**

Website Designing: Overview of Internet and Intranet Services, Sending and Receiving Mails, HTML Tags, Creating Tables, Check Boxes, Text Books, Frames, Graphical and animation techniques, Static & Dynamic Web Pages, Guidelines for a good website design, DHTML, ASP, Javascript

[No. of Hrs.: 10]**TEXT BOOKS:**

1. Patrick Naughton and Herbertz Schildt, "Java-2 The Complete Reference", 1999, TMH
2. Rick Dranell, "HTML 4 unleashed", Techmedia Publication, 2004.
3. Shelley Powers, "Dynamic Web Publishing", 2nd Ed., Techmedia, 1998.

REFERENCES BOOKS:

1. E. Balaguruswamy, "Programming with Java: A Primer", TMH, 1998.
2. Horstmann, "Computing Concepts with Java 2 Essentials", John Wiley, 2004.
3. Decker & Hirshfield, "Programming Java: A introduction to programming using JAVA", Vikas Publication, 2000.
4. Tmy Gaddies, "Starting out with Java", Wiley Dreamtech, 2005.
5. Holzner, "HTML Blackbook", Wiley Dreamtech, 2005.

Code No.: ETCS 305**L T C****Paper: Computer Architecture****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I**Introduction and overview:** Review of digital components, Evolution of computers.**Register Transfer and Microoperation:** Register transfer language, register transfer, bus and memory transfer, arithmetic microoperations, logic microoperations, shift microoperations.**Basic Computer Organization and Design:** Instruction codes, computer registers, computer instructions, timing & control, instruction cycle, memory reference instructions, input-output and interrupts, design of basic computer, design of accumulator logic. **[No. of Hrs: 11]****UNIT – II****Microprogrammed Control Unit:** Control memory, address sequencing.**Central Processing Unit:** Introduction, general register organization, stack organization, instruction formats, addressing modes.Pipeline and vector processing Parallel Processing, pipelining, arithmetic pipeline, RISC Pipeline, Vector Processing, Array Processors. **[No. of Hrs: 11]****UNIT – III****Computer Arithmetic:** Introduction, addition and subtraction, multiplication algorithms, division algorithms, floating point arithmetic operation, decimal arithmetic unit, decimal arithmetic operations.**Input-Output Organization:** Peripheral devices, input-output interface, asynchronous data transfer, modes of data transfer, priority interrupt, direct memory access, input-output processor. **[No. of Hrs: 11]****UNIT – IV****Memory organization:** Memory hierarchy, main memory, auxiliary memory, associative memory, cache memory, virtual memory, memory management hardware.Multiprocessors: Characteristics of multiprocessor, Interconnection Structure, Interprocessor Communication & Synchronization **[No. of Hrs: 11]****TEXT BOOKS:**

1. M Mano, "Computer System and Architecture", PHI, 1993.

REFERENCES BOOKS:

1. Malvino, "Digital Computer Electronics: An Introduction to Microcomputers", McGraw Hill, 1993.
2. J. P. Hayes, "Computer Architecture and Organization", McGraw Hill, 1998.
3. W. Stallings, "Computer Organization & Architecture", PHI, 2001.
4. Dandamudi, "Fundamental of Computer Organization & Design", Wiley Dreamtech, 2005.

Code No.: ETCS 307**Paper: Linux & X-Windows Programming**

L	T	C
3	1	4

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks. 2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

Linux – The Operating System: Linux history, Linux features, Linux distributions, Linux’s relationship to Unix, Overview of Linux architecture, Installation, Booting, Login and Shutdown Process, Start up scripts, controlling processes, system processes (an overview), Linux Security, Networking on Linux: Preparing Linux for Networking, Network Installation, configuring network setting after installation. **[No. of**

Hrs.: 11]**UNIT – II**

User Management: Types of users, The powers of Root, managing users (adding and deleting): using the command line, shell scripts and GUI tools.

The Linux File System: Basic Principles, Pathnames, Mounting and Unmounting File Systems, Different File Types, File Permissions, Disk Usage Limits, Directory Structure, The Ext2 and Ext3 File Systems, Check and Repair File Systems. **[No. of Hrs.: 12]**

UNIT – III

Shell in Linux: Available shells under Linux (viz. Bash, TCSH, Korn or so on), different shell features, editors, shell commands, shell scripts: shell variables, environmental variables, purpose of shell scripts, writing, storing and executing scripts, Filters- The grep family, advanced filters-sed and awk. **[No. of Hrs.: 11]**

UNIT – IV

Using the X-Windows System: What is X clients, servers and Windows Management, Exploring X Applications X – Lib Programming Model, creating and managing windows, handling events: key board and mouse management, an overview of drawing graphics, text handling colormap and manipulation. **[No. of Hrs.: 10]**

TEXT BOOKS:

1. N. Barkakati, “X-Windows System Programming”, PHI, 2001
2. K. Cox, “Red Hat Linux Administrator’s Guide”, PHI, 2001
3. Michael Jain, “Red Hat Linux 9”, BPB Publications, 2003.
4. Peterson Richard, “The Complete References Linux”, 2nd Ed., Tata McGraw Hill, 2002.

REFERNCES BOOKS:

1. O’Reilly and Associates Vol. 0: Protocol Reference Manual, 1992
2. O’Reilly and Associates Vol. 1: Xlib Programming Manual, 1992
3. O’Reilly and Associates Vol. 2: Xlib Programming Manual, 1992
4. Bach, “The Design of the Unix Kernel”, PHI, 2000.

Code No.: ETCS 309**L T C****Paper: Database Management Systems****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

Basic Concepts and Conceptual Database Design: Database administrator & Database Users, Characteristics of the Database, Database Systems, Concepts and Architecture, Data Models, Schemes & Instances, DBMS Architecture & Data Independence, Database Languages & Interfaces, Overview of Hierarchical, Network & Relational Data Base Management Systems, Data Modelling Using The Entity-Relationship Model – Entities, Attributes and Relationships, Cardinality of Relationships, Strong and Weak Entity Sets, Generalization, Specialization, and Aggregation, Translating your ER Model into Relational Model

[No. of Hrs.: 11]**UNIT – II**

Relational Model, Languages & Systems: Relational Data Model & Relational Algebra, Relational Model Concepts, Relational Model Constraints, Relational Algebra, SQL – A Relational Database Language, Data Definition in SQL, View and Queries in SQL, Specifying Constraints and Indexes in SQL, Practicing SQL commands using ORACLE.

[No. of Hrs.: 11]**UNIT – III**

Relational Data Base Design and Oracle Architecture: Functional Dependencies & Normalization for Relational Databases, Functional Dependencies, Normal Forms Based on Primary Keys, (1NF, 2NF, 3NF & BCNF), Lossless Join and Dependency Preserving Decomposition, Oracle 8 Architecture, Database Storage, Oracle Software Structures, Shared Database Access Mechanism, Database Protection.

[No. of Hrs.: 11]**UNIT – IV**

Transaction Management: Transaction Concept and State, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Concurrency Control Techniques, Lock-Based Protocols, Timestamp-based Protocols, Deadlock Handling, Recovery System, Failure Classification, Storage Structure, Recovery and Atomicity, Log-based Recovery, Shadow Paging, Recovery with Concurrent Transactions, Buffer Management, Indexing, Hashing and Query Processing: Query Processing, Overview, Measures of Query Cost, Selection Operation, Sorting, Join Operation, Other Operations, Evaluation of Expressions, Concepts of Object Oriented Database Management Systems, Distributed Data Base Management Systems.

[No. of Hrs.: 11]**TEXT BOOKS:**

1. Korth, Silberschatz, “Database System Concepts”, 4th Ed., TMH, 2003.
2. Steve Bobrowski, “Oracle 8 Architecture”, TMH, 2000

REFERENCES BOOKS:

1. C. J. Date, “An Introduction to Database Systems”, 7th Ed., Narosa Publishing, 2004
2. Elmsari and Navathe, “Fundamentals of Database Systemes”, 4th Ed., A. Wesley, 2004
3. J. D. Ullman, “Principles of Database Systems”, 2nd Ed., Galgotia Publications, 1999.

Code No.: ETMS 311**L T C****Paper: Organizational Behaviour****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

Meaning & Nature of Management, Management Systems and Processes, Managerial Skills, Tasks & Responsibilities of a Professional Manager.

[No. of Hrs.: 11]**UNIT – II**

Planning Types and Process, Management by Objectives, Decision-Making Models, Organizational context of decisions, Problem solving techniques and processes, Controlling: Process and Techniques

[No. of Hrs.: 11]**UNIT – III**

Organizational Climate, Culture and Managerial ethos, Organisational structure & Design, Managerial Communication.

[No. of Hrs.: 11]**UNIT – IV**

Individual Determinants of organizational, Behaviours: Perceptions, Learning, Personality, Attitudes & Values, Motivation, Job Anxiety & Stress, Analysing, Interpersonal relations, Group Dynamics, Management of Organizational Conflicts, Management of Change, Leadership Styles & Influence.

[No. of Hrs.: 11]**TEXT BOOKS:**

1. Stephen P. Robbins, David & Decenzo, “Fundamentals of Management”, 3rd Edition, Pearson Education, 2002.
2. Stoner, et. al., “Management”, 6th Edition, PHI, 2002.
3. J. S. Chandan, “Organisational Behaviour”, Vikas Publishing House, 2004.
4. John M. Ivancevich, T. N. Duening, “Business & Management: Principles and Guidelines”, biztantra, Dreamtech, 2005.

REFERENCES BOOKS:

1. Joseph W. Weiss, “Organisational Behaviour & Change, Managing Diversity, Cross-Cultural Dynamics & Ethics”, 2nd Edition, Vikas Publishing House, 2003
2. Richard Pettinger, “Introduction to Management”, 3rd Edition, Palgrave MacMillan, 2002.
3. Udai Pareek, “Understanding Organisational Behaviour”, 1st Edition, Oxford University Press, 2004.
4. Fred Luthans, “Organisational Behaviour,” 9th Edition, McGraw Hill International Edition, 2004.

Code No. : ETEC 351	L	P	C
Paper: Digital Circuits & Systems – II Lab.	0	2	1

Practical will be based on Digital Circuits & Systems – II.

Code No. : ETIT 353	L	P	C
Paper: Java Programming & Website Design Lab.	0	2	1

Practical will be based on Java Programming & Website Design.

Code No. : ETCS 355	L	P	C
Paper: Linux & X – Windows Programming Lab.	0	2	1

Practical will be based on Linux & X – Windows Programming.

Code No. : ETCS 357	L	P	C
Paper: Database Management Systems Lab.	0	2	1

Practical will be based on Database Management System.

Code No. : ETCS 359	L	P	C
Paper: *Practical Training	0	0	1

*NUES

Practical training conducted after fourth semester will be evaluated in the fifth Semester based on Viva-Voce.

Code No.: ETCS 302**L T C****Paper: Microprocessor Systems****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

Computer Number Systems, Codes, and Digital Devices: Computer Number Systems and Codes, Microprocessor Evolution and Types, the 8086 microprocessor family-overview, 8086 internal architecture, introduction to programming the 8086, addressing modes of 8086.

8086 Family Assembly Language Programming: Program Development Steps, Constructing the machine codes for 8086 instructions, writing programs for use with an assembler, assembly language program development tools

[No. of Hrs.: 11]**UNIT – II**

Implementing Standard Program Structures in 8086 Assembly Language: Simple Sequence Programs, Jumps, Flags, and Conditional Jumps, If-Then, if-then-else, and multiple if-then-else programs, while-do programs, while-do programs, repeat-until programs, instruction timing and delay loops

Strings, Procedures, and macros: the 8086 string instructions, writing and using procedures, writing and using assembler macros

8086 Instruction Descriptions and Assembler Directives

[No. of Hrs.: 11]**UNIT – III**

8086 System Connections, Timing, and Troubleshooting: A basic 8086 microcomputer System, An example Minimum-mode System, the SDK-86, Troubleshooting a simple 8086-based microcomputer, Timing Diagrams

8086 Interrupts and Interrupt Applications: 8086 interrupts and Interrupt Responses, Hardware Interrupt Applications

[No. of Hrs.: 11]**UNIT – IV**

Interfacing 8086 with 8255, 8254, 8259, 8253, 8251, 8259, 8279.

Brief Introduction to Architecture of 80186, 80286, 80386, 80486, 8087 and Pentium architecture.

[No. of Hrs.: 11]**TEXT BOOKS:**

1. D. V. Hall, "Microprocessors and Interfacing", TMH, 2nd Edition, 1999

REFERENCES BOOKS:

1. Peter Able, "IBM PC Assembly language programming", PHI, 1994.
2. James. L. Antonaks, "An Introduction to the Intel Family of Microprocessors", Addison Wesley, 1999.
3. Liu Gibson, "Microprocessor Systems: The 8086/8088 family Architecture, Programming & Design", PHI, 1999.

Code No.: ETCS 304**L T C****Paper: Object Oriented Software Engineering****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

Introduction to Software Engineering: Software Engineering Development, Software Life Cycle Models, Comparison of various models

Requirement Elicitation: Introduction to Object Oriented Methodology, Overview of Requirements Elicitation, Requirements Model-Action & Use cases, Requirements Elicitation Activities, Managing Requirements Elicitation.

[No. of Hrs.: 11]**UNIT – II**

Architecture: Introduction, System development is model building, model architecture, requirements model, analysis model, the design model, the implementation model, test model

Analysis: Introduction, the requirements model, the analysis model

[No. of Hrs.: 11]**UNIT – III**

Construction: Introduction, the design model, block design, working with construction

Testing: introduction, on testing, unit testing, integration testing, system testing, the testing process

[No. of Hrs.: 11]**UNIT – IV**

Modelling with UML: Basic Building Blocks of UML, A Conceptual Model of UML, Basic Structural Modeling, UML Diagrams.

Case Studies

[No. of Hrs.: 11]**TEXT BOOKS:**

1. Ivar Jacobson, "Object Oriented Software Engineering", Pearson, 2004.
2. Grady Booch, James Runbaugh, Ivar Jacobson, "The UML User Guide", Pearson, 2004.
3. Wendy Boggs, Boggs, Michael Boggs "Mastering UML with Rational Rose", BPB Publication, 2003.

REFERENCES BOOKS:

1. Stephen R. Scach, "Classical & Object Oriented Software Engineering with UML and Java: McGraw Hill, 1999.
2. Richard C. Lee, William M. Tepfenhard, "UML and C++, A Practical guide to object-oriented Development", Pearson Education, 2002.

Code No.: ETIT 306**L T C****Paper: Computer Networks****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

Uses of Computer Networks, Network Architecture, Reference Model (ISO-OSI, TCP/IP-Overview, IP Address Classes, Subnetting), Domain Name Registration & Registrars

The Physical Layer: Theoretical basis for data communication, transmission media-Magnetic Media, Twisted Pair, Baseband Coaxial Cable, Broadband Coaxial Cable, Fibre Cable, Structured Cabling, Cable Mounting, Cable Testing, Wireless transmission, the telephone system, narrowband ISDN, broadband ISDN and ATM. **[No. of Hrs.: 11]**

UNIT – II

The Data Link Layer: Data link layer design issues, error detection and correction, data link protocols, sliding window protocols, Examples of Data Link Protocols. **[No. of Hrs.: 11]**

UNIT - III

The Medium Access Sublayer: The channel allocation problem, multiple access protocols, IEEE standard 802 for LANS and MANS, high-speed LANs, satellite networks, Network devices-repeaters, hubs, switches and bridges. **[No. of Hrs.: 11]**

UNIT – IV

The Network Layer: Network layer design issues, routing algorithms, congestion control algorithm, internetworking, the network layer in the internet, the network layer in ATM networks. **[No. of Hrs.: 11]**

TEXT BOOKS:

1. A. S. Tananbaum, “Computer Networks”, 3rd Ed, PHI, 1999.

REFERENCE BOOKS:

1. U. Black, “Computer Networks-Protocols, Standards and Interfaces”, PHI, 1996.
2. W. Stallings, “Computer Communication Networks”, PHI, 1999.
3. Laura Chappell (ed), “Introduction to Cisco Router Configuration”, Techmedia, 1999.
4. Michael A. Miller, “Data & Network Communications”, Vikas Publication, 1998.
5. William A. Shay, “Understanding Data Communications & Networks”, Vikas Publication, 1999.

Code No.: ETIT 308**L T C****Paper: Digital Signal Processing****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

Discrete time signals and systems, Z-transforms, structures for digital filters, design procedures for FIR and IIR filters. Frequency transformations: linear phase design; DFT. Methods for computing FFT. Noise analysis of digital filters, power spectrum estimation.

Signals and signal Processing: characterization & classification of signals, typical Signal Processing operations, example of typical Signals, typical Signals Processing applications.

Time Domain Representation of Signals & Systems: Discrete Time Signals, Operations on Sequences, the sampling process, Discrete-Time systems, Time-Domain characterization of LTI Discrete-Time systems, state-space representation of LTI Discrete-Time systems, random signals.

[No. of Hrs.: 11]**UNIT – II**

Transform-Domain Representation of Signals: the Discrete-Time Fourier Transform, Discrete Fourier Transform, DFT properties, computation of the DFT of real sequences, Linear Convolution using the DFT. Z-transforms, Inverse z-transform, properties of z-transform, transform domain representations of random signals, FFT Algorithms.

[No. of Hrs.: 11]**UNIT – III**

Transform-Domain Representation of LTI Systems: the frequency response, the transfer function, types of transfer function, minimum-phase and maximum-Phase transfer functions, complementary transfer functions, Discrete-Time processing of random signals.

Digital Processing of Continuous-Time Signals : sampling of Continuous Signals, Analog Filter Design, Anti-aliasing Filter Design, Sample-and-hold circuits, A/D & D/A converter, Reconstruction Filter Design.

[No. of Hrs.: 11]**UNIT – IV**

Digital Filter Structure: Block Diagram representation, Signal Flow Graph Representation, Equivalent Structures, FIR Digital Filter Structures, IIR Filter Structures, Parallel all pass realization of IIR transfer function, Digital Sine-Cosine generator.

Digital Filter Design: Impulse invariance method of IIR filter design, Bilinear Transform method of IIR Filter Design, Design of Digital IIR notch filters, FIR filter Design based on truncated forner sens, FIR filter design based on Frequency Sampling approach.

Applications of DSP.

[No. of Hrs.: 11]**TEXT BOOKS:**

- Sanjit K. Mitra, "DSP a Computer based approach", TMH, 2nd Ed., 2001.
- Allan Y. Oppenheim & Ronald W. Schater, "Digital Signal Processing", PHI, 2004.

REFERENCE BOOKS:

- J. R. Jhohnson, "Intorduction to Digital Signal Processing", PHI, 2000.
- B. Somanthan Nair, "Digital Signal Processing: Theory, Analysis & Digital Filter Design", PHI, 2004.

Code No.: ETCS 310**L T C****Paper: Data Warehousing and Data Mining****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

The Compelling Need for data warehousing: Escalating Need for strategic information, failures of Past decision-support systems, operational versus decision-support systems, data warehousing – the only viable solution, data warehouse defined

Data warehouse – The building Blocks: Defining Features, data warehouses and data marts, overview of the components, metadata in the data warehouse

Defining the business requirements: Dimensional analysis, information packages – a new concept, requirements gathering methods, requirements definition: scope and content

[No. of Hrs.: 11]**UNIT – II**

Principles of dimensional modeling: Objectives, From Requirements to data design, the STAR schema, STAR Schema Keys, Advantages of the STAR Schema

Dimensional Modeling:

Updates to the Dimension tables, miscellaneous dimensions, the snowflake schema, aggregate fact tables, families of STARS

[No. of Hrs.: 11]**UNIT – III**

OLAP in the Data Warehouse:

Demand for Online analytical processing, need for multidimensional analysis, fast access and powerful calculations, limitations of other analysis methods, OLAP is the answer, OLAP definitions and rules, OLAP characteristics, major features and functions, general features, dimensional analysis, what are hypercubes? Drill-down and roll-up, slice-and-dice or rotation, OLAP models, overview of variations, the MOLAP model, the ROLAP model, ROLAP versus MOLAP, OLAP implementation considerations

[No. of Hrs.: 11]**UNIT – IV**

Data Mining Basics: What is Data Mining, Data Mining Defined, The knowledge discovery process, OLAP versus data mining, data mining and the data warehouse, Major Data Mining Techniques, Cluster detection, decision trees, memory-based reasoning, link analysis, neural networks, genetic algorithms, moving into data mining, Data Mining Applications, Benefits of data mining, applications in retail industry, applications in telecommunications industry, applications in banking and finance.

[No. of Hrs.: 11]**TEXT BOOKS:**

1. Paul Raj Poonia, “Fundamentals of Data Warehousing”, John Wiley & Sons, 2004.
2. Sam Anahony, “Data Warehousing in the real world: A practical guide for building decision support systems”, John Wiley, 2004

REFERENCES BOOKS:

1. W. H. Inmon, “Building the operational data store”, 2nd Ed., John Wiley, 1999.
2. Kamber and Han, “Data Mining Concepts and Techniques”, Hartcourt India P. Ltd., 2001
3. “Data Warehousing”, BPB Publications, 2004.

Code No.: ETCS 312**L T C****Paper: Multimedia Technologies****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

Introductory Concepts: Multimedia – Definitions, CD-ROM and the Multimedia Highway, Uses of Multimedia, Introduction to making multimedia – The Stages of project, the requirements to make good multimedia, Multimedia skills and training, Training opportunities in Multimedia. Motivation for multimedia usage, Frequency domain analysis, Application Domain & ODA etc.

Multimedia-Hardware and Software: Multimedia Hardware – Macintosh and Windows production Platforms, Hardware peripherals – Connections, Memory and storage devices, Media software – Basic tools, making instant multimedia, Multimedia software and Authoring tools, Production Standards.

[No. of Hrs.: 11]**UNIT – II**

Multimedia – making it work – multimedia building blocks – Text, Sound, Images, Animation and Video, Digitization of Audio and Video objects, Data Compression: Different Compression algorithms concern to text, audio, video and images etc., Working Exposure on Tools like Dream Weaver, 3D Effects, Flash Etc.,

[No. of Hrs.: 11]**UNIT – III**

Multimedia and the Internet: History, Internet working, Connections, Internet Services, The World Wide Web, Tools for the WWW – Web Servers, Web Browsers, Web page makers and editors, Plug-Ins and Delivery Vehicles, HTML, VRML, Designing for the WWW – Working on the Web, Multimedia Applications – Media Communication, Media Consumption, Media Entertainment, Media games.

[No. of**Hrs.: 11]****UNIT – IV**

Multimedia-looking towards Future: Digital Communication and New Media, Interactive Television, Digital Broadcasting, Digital Radio, Multimedia Conferencing,

Assembling and delivering a project-planning and costing, Designing and Producing, content and talent, Delivering, CD-ROM technology.

[No. of Hrs.: 11]**TEXT BOOKS:**

1. Steve Heath, “Multimedia & Communication Systems”, Focal Press, UK, 1999.
2. Tay Vaughan, “Multimedia: Making it work”, TMH, 1999.
3. K. Andleigh and K. Thakkar, “Multimedia System Design”, PHI, PTR, 2000.

REFERENCES BOOKS:

1. Keyes, “Multimedia Handbook”, TMH, 2000.
2. Ralf Steinmetz and Klara Naharstedt, “Multimedia: Computing, Communications & Applications”, Pearson, 2001.
3. Steve Rimmer, “Advanced Multimedia Programming”, MHI, 2000.

Code No. : ETCS 352	L	P	C
Paper: Microprocessor Lab.	0	2	1

Practical will be based on Microprocessor Systems

Code No. : ETCS 354	L	P	C
Paper: Object Oriented Software Engineering Lab.	0	2	1

Practical will be based on Object Oriented Software Engineering.

Code No. : ETIT 356	L	P	C
Paper: Digital Signal Processing Lab.	0	2	1

Practical will be based on Digital Signal Processing.

Code No. : ETCS 358	L	P	C
Paper: Data Warehousing and Data Mining Lab.	0	2	1

Practical will be based on Data Warehousing and Data Mining.

Code No. : ETCS 360	L	P	C
Paper: Multimedia Technology Lab.	0	2	1

Practical will be based on Multimedia Technology.

Code No.: ETIT 401**L T C****Paper: Advanced Computer Networks****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

Review of Physical & Data link layer, ISDN, Frame Relay, ATM

[No. of Hrs.: 11]**UNIT – II**

Network Layer: ARP and RARP, Routing algorithms and protocols, Congestion control algorithm, Router Operation, Router configuration, Internetworking, IP Protocol, IPv6 (an overview).

[No. of Hrs.: 11]**UNIT – III**

Transport Layer: UDP, TCP (Flow Control, Error Control, Connection Establishment)

[No. of Hrs.: 11]**UNIT – IV**

Application layer: DNS, SNMP, RMON, Electronic Mail, WWW.

Network Security: Firewalls (Application and packet filtering), Cryptography, Virtual Print,

[No. of Hrs.: 11]**TEXT BOOKS:**

1. B. A. Forouzan, "TCP/IP Protocol Suite", TMH, 2nd Ed., 2004.

REFERENCE BOOKS:

1. U. Black, "Computer Networks-Protocols, Standards and Interfaces", PHI, 1996.
2. W. Stallings, "Computer Communication Networks", PHI, 1999.
3. W. Stallings, "SNMP, SNMPv2, SNMPv3, RMON 1&2", 3rd Ed., Addison Wesley, 1999.
4. Michael A. Miller, "Data & Network Communications", Vikas Publication, 1996.
5. William A. Shay, "Understanding Data Communications & Networks", Vikas Publication, 1999.
6. A. S. Tananbaum, "Computer Networks", 3rd Ed, PHI, 1999.
7. Laura Chappell (ed), "Introduction to Cisco Router Configuration", Techmedia, 1999.

Code No.: ETCS 403**L T C****Paper: Advanced Computer Architecture****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

Parallel computer models: The state of computing , Multiprocessors and multicomputers, Multivector and SIMD computers, Architectural development tracks

Program and network properties :Conditions of parallelism, Data and resource dependences,Hardware and software parallelism,Program partitioning and scheduling, Grain size and latency, Program flow mechanisms,Control flow versus data flow,Data flow architecture,Demand driven mechanisms,Comparisons of flow mechanisms[**No. of Hrs.: 11**]

UNIT - II

System Interconnect Architectures : Network properties and routing, Static interconnection networks, Dynamic interconnection Networks, Multiprocessor system interconnects, Hierarchical bus systems, Crossbar switch and multiport memory,Multistage and combining network.

Processors and Memory Hierarchy : Advanced processor technology, Instruction-set Architectures,CISC Scalar Processors, RISC Scalar Processors, Superscalar Processors, VLIW Architectures, Vector and Symbolic processors

Memory Technology :Hierarchical memory technology, Inclusion, Coherence and Locality, Memory capacity planning, Virtual Memory Technology [**No. of Hrs.: 11**]

UNIT - III

Backplane Bus System: Backplane bus specification, Addressing and timing protocols, Arbitration transaction and interrupt, Cache addressing models, Direct mapping and associative caches.

Pipelining :Linear pipeline processor, Nonlinear pipeline processor, Instruction pipeline design, Mechanisms for instruction pipelining, Dynamic instruction scheduling, Branch handling techniques, Arithmetic Pipeline Design, Computer arithmetic principles, Static arithmetic pipeline, Multifunctional arithmetic pipelines [**No. of Hrs. 11**]

UNIT - IV

Vector Processing Principles : Vector instruction types, Vector-access memory schemes.

Synchronous Parallel Processing : SIMD Architecture and Programming Principles, SIMD Parallel Algorithms, SIMD Computers and Performance Enhancement [**No. of Hrs.: 11**]

TEXT BOOKS:

1. Kai Hwang, “Advanced computer architecture”; TMH, 2000.

REFERENCES BOOKS:

1. J.P.Hayes, “computer Architecture and organization”, MGH, 1998.
2. M.J Flynn, “Computer Architecture, Pipelined and Parallel Processor Design”, Narosa Publishing, 1998.
3. D.A.Patterson, J.L.Hennessy, “Computer Architecture :A quantitative approach”, Morgan Kauffmann, 2002.
4. Hwang and Briggs, “ Computer Architecture and Parallel Processing”; MGH, 2000.

Code No.: ETCS 405**L T C****Paper: Compiler Construction****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT - I

Classification of grammars, Context free grammars, Deterministic finite state automata (DFA) Non-DFA.

[No. of Hrs.: 10]**UNIT - II**

Scanners, Top down parsing, LL grammars, Bottom up parsing, Polish expression Operator Precedence grammar, IR grammars, Comparison of parsing methods, Error handling.

Symbol table handling techniques, Organization for non-block and block structured languages.

[No. of Hrs.: 12]**UNIT - III**

Run time storage administration, Static and dynamic allocation, Intermediate forms of source program, Polish N-tuple and syntax trees, Semantic analysis and code generation.

[No. of Hrs.: 12]**UNIT - IV**

Code optimization, Folding, redundant sub-expression evaluation, Optimization within iterative loops.

[No. of Hrs.: 10]**TEXT BOOKS:**

1. Tremblay, et. al., "The Theory and Practice of Compiler Writing", McGraw Hill, New York, 1985.
2. A. Holub, "Compiler Design in C", PHI, 2004
3. Aho, Ullman & Ravi Sethi, "Principles of Compiler Design", Pearson Education, 2002

REFERENCES BOOKS:

1. Andrew L. Appel, "Modern Compiler Implementation in C", Delhi, Foundation Books, 2000.
2. Dick Grune et. Al., "Modern Compiler Design", Wiley Dreamtech, 2000.

Code No.: ETEC 407**L T C****Paper: Mobile Computing****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

Introduction to Personal Communications Services (PCS): PCS Architecture, Mobility management, Networks signalling.

Global System for Mobile Communication (GSM) system overview: GSM Architecture, Mobility management, Network signalling.

General Packet Radio Services (GPRS): GPRS Architecture, GPRS Network Nodes.

[No. of Hrs.: 11]**UNIT – II**

Mobile Data Communication: WLANs (Wireless LANs) IEEE 802.11 standard, Mobile IP.

Wireless Application Protocol (WAP): The Mobile Internet standard, WAP Gateway and Protocols, wireless mark up Languages (WML).

[No. of Hrs.: 11]**UNIT – III**

Third Generation (3G) Mobile Services: Introduction to International Mobile Telecommunications 2000 (IMT 2000) vision, Wideband Code Division Multiple Access (W-CDMA), and CDMA 2000, Quality of services in 3G.

Wireless Local Loop(WLL): Introduction to WLL Architecture, wireless Local Loop Technologies.

[No. of Hrs.: 11]**UNIT – IV**

Global Mobile Satellite Systems; case studies of the IRIDIUM and GLOBALSTAR systems.

Wireless Enterprise Networks: Introduction to Virtual Networks, Blue tooth technology, Blue tooth Protocols.

[No. of Hrs.: 11]**TEXT BOOKS:**

1. Yi-Bing Lin & Imrich Chlamtac, “Wireless and Mobile Networks Architectures”, John Wiley & Sons, 2001.
2. Raj Pandya, “Mobile and Personal Communication systems and services”, Prentice Hall of India, 2001.
3. Hansmann, “Principles of Mobile Computing”, Wiley Dreamtech, 2004.

REFERENCE BOOKS:

1. Mark Ciampa, “Guide to Designing and Implementing wireless LANs”, Thomson learning, Vikas Publishing House, 2001.
2. Ray Rischpater, “Wireless Web Development”, Springer Publishing, 2000.
3. Sandeep Singhal, “The Wireless Application Protocol”, Pearson Education Asia, 2000.
4. P.Stavronlakis, “Third Generation Mobile Telecommunication systems”, Springer Publishers, 2001.

Code No.: ETIT 409**L T C****Paper: VLSI Design****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

MOS Transistor Theory: nMOS Enhancement Transistor, pMOS Enhancement transistor, Threshold voltage, Fabrication of MOSFET: Silicon Semiconductor technology, Wafer processing, Oxidation, Epitaxy, Deposition, Ion-implanation and diffusion, The silicon gate Process, CMOS Technology, basic n-well cmos process, p-well process, twin tub process CMOS process enhancement: metal interconnect, Polysilicon / Refractory metal interconnect, Circuit element: Resistor, Capacitor. **[No. of Hrs.: 11]**

11]**UNIT – II**

Operation of MOS transistor as a switch, Design and analysis of nMOS, pMOS and CMOS circuits, CMOS Logic, The Inverter, NAND gate, NOR Gate, Compound Gate. **[No. of Hrs.: 11]**

[No. of Hrs.: 11]**UNIT – III**

Modeling of MOS transistors using SPICE, MOS Inverters: Static Characteristics, MOS Inverters: Switching Characteristics and Interconnect Effects, Combinational MOS Logic Circuits: MUX, DMUX, Transmission gate, Differential Inverter, Tristate Inverter. **[No. of Hrs.: 11]**

[No. of Hrs.: 11]**UNIT – IV**

Sequential MOS Logic Circuits, Dynamic Logic Circuits, Semiconductor Memories. **[No. of Hrs.: 11]**

[No. of Hrs.: 11]**TEXT BOOK:**

1. Sung-Mo Kang and Yusuf Leblebici, “CMOS – Digital Integrated Circuits Analysis and Design”, TMH, 2004.

REFERENCE BOOKS:

1. Douglas A. Pucknell, “Basic VLSI Design, 3rd Edition, 2004.
2. Neil H. E. Weste & K. Eshraghian, “Principles of CMOS VLSI design”, 2nd Edition, Addison Wesley, 2003.
3. S. M. Sze, “VLSI Technology, Wiley, 2000.
4. Demassa & Ciccone, “Digital Integrated Circuits”, Wiley Publications, 2003.
5. Jacob Millman and Arvin Grabel, “Microelectronics”, TMH, 2004.

Code No.: ETEC 411**L T C****Paper: Digital Image Processing****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT - I

Introduction And Digital Image Fundamentals: The origins of Digital Image Processing, Examples of Fields that Use Digital Image Processing, Fundamentals Steps in Image Processing, Elements of Digital Image Processing Systems, Image Sampling and Quantization, Some basic relationships like Neighbours, Connectivity, Distance Measures between pixels, Linear and Non Linear Operations.

Image Enhancement in the Spatial Domain: Some basic Gray Level Transformations, Histogram Processing, Enhancement Using Arithmetic and Logic operations, Basics of Spatial Filters, Smoothing and Sharpening Spatial Filters, Combining Spatial Enhancement Methods.

[No. of Hrs.: 10]**UNIT - II**

Image Enhancement in the Frequency Domain: Introduction to Fourier Transform and the frequency Domain, Smoothing and Sharpening Frequency Domain Filters, Homomorphic Filtering.

Image Restoration: A model of The Image Degradation / Restoration Process, Noise Models, Restoration in the presence of Noise Only Spatial Filtering, Periodic Noise Reduction by Frequency Domain Filtering, Linear Position-Invariant Degrations, Estimation of Degradation Function, Inverse filtering, Wiener filtering, Constrained Least Square Filtering, Geometric Mean Filter, Geometric Transformations. **[No. of Hrs.: 12]**

UNIT - III

Image Compression: Coding, Interpixel and Psychovisual Redundancy, Image Compression models, Elements of Information Theory, Error free comparison, Lossy compression, Image compression standards.

Image Segmentation: Detection of Discontinuities, Edge linking and boundary detection, Thresholding, Region Oriented Segmentation, Motion based segmentation. **[No. of Hrs.: 12]**

UNIT - IV

Representation and Description: Representation, Boundary Descriptors, Regional Descriptors, Use of Principal Components for Description, Introduction to Morphology, Some basic Morphological Algorithms.

Object Recognition: Patterns and Pattern Classes, Decision-Theoretic Methods, Structural Methods. **[No. of Hrs.: 10]**

TEXT BOOKS:

- Rafael C. Gonzalez & Richard E. Woods, "Digital Image Processing", 2nd edition, Pearson Education, 2002.
- A.K. Jain, "Fundamental of Digital Image Processing", PHI, 1989.

REFERENCES:

- Bernd Jahne, "Digital Image Processing", 5th Ed., Springer, 2002.
- William K Pratt, "Digital Image Processing: Paks Inside", John Wiley & Sons, 2001.

Code No.: ETCS 413**L T C****Paper: Requirements & Estimation Techniques****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

Requirements engineering: Requirements Elicitation, Requirement Elicitation techniques, Requirement Analysis, Requirement Analysis Models, Requirement Documentation, Requirement Management, IEEE Std. For SRS
[No. of Hrs.: 10]

UNIT - II

Size Estimation: Function Point Analysis, Mask II FPA, LOC estimation, Conversion between size measures
[No. of Hrs.: 12]

UNIT - III

Effort, schedule & cost estimation: Estimation factors, COCOMO-II, Putnam Estimation Model, Estimation by Analogy, Validating Software Estimates
[No. of Hrs.: 12]

UNIT - IV

Introduction to software life cycle, management activities in software project
 Tools: Software Estimation Tools

Industry Resources; IFPUG, UQAM-SEMRL, COSMIC, IEEE, COCOMO**[No. of Hrs.: 10]**

TEXT BOOKS:

1. Swapna Kishore, Rajesh Naik, “Software Requirements and Estimation”, TMH, 1992.

REFERENCE BOOKS:

1. K.K. Aggarwal & Yogesh Singh, "Software Engineering", 2nd Ed., New Age International Publishers, New Delhi, 2005.
2. Roger Pressman, “Software Engineering: A Practitioner’s Approach”, 3rd Edition, McGraw Hill, 1992.

Code No.: ETCS 415
Paper: Project

L	P	C
-	4	4

Students may select a project related to any of the subjects of the current semester.

Code No. : ETIT 451	L	P	C
Paper: Advanced Computer Network Lab.	0	2	1

Practical will be based on Advanced Computer Network.

Code No. : ETCS 453	L	P	C
Paper: Practical Lab.	0	2	1

Practical will be based on Electives

Code No. : ETCS 455	L	P	C
Paper: *Seminar	0	2	1

*NUES

A college committee will evaluate the performance of the students & marks will be awarded accordingly.

Code No. : ETCS 457	L	P	C
Paper: Minor Project	0	8	5

Students may choose a project based on any subject of Computer Science. The student will submit a synopsis at the beginning of the semester for approval from the departmental committee in a specified format. The student will have to present the progress of the work through seminars and progress reports.

Code No. : ETCS 459	L	P	C
Paper: *Practical Training	0	0	1

*NUES

Practical training conducted after sixth semester will be evaluated in the Seventh Semester based on Viva-Voce.

Code No.: ETCS 402**L T C****Paper: Artificial Intelligence****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

Scope of AI: Games, theorem proving, natural language processing, vision and speech processing, robotics, expert systems, AI techniques-search knowledge, abstraction.

Problem Solving (Blind): State space search; production systems, search space control; depth-first, breadth-first search.

Heuristic Based Search: Heuristic search, Hill climbing, best-first search, branch and bound, Problem Reduction, Constraint Satisfaction End, Means-End Analysis. **[No. of Hrs.: 12]**

UNIT – II

Game Playing: Game Tree, Minimax Algorithm, Alpha Beta Cutoff, Modified Minimax Algorithm, Horizon Effect, Futility Cut-off.

Knowledge Representation: Predicate Logic: Unification, Modus Ponens, Modus Tolens, Resolution in Predicate Logic, Conflict Resolution Forward Chaining, Backward Chaining, Declarative and Procedural Representation, Rule based Systems.

Structured Knowledge Representation: Semantic Nets: Slots, exceptions and default frames, conceptual dependency, scripts. **[No. of Hrs.: 12]**

UNIT – III

Handling Uncertainty: Non-Monotonic Reasoning, Probabilistic reasoning, use of certainty factors, fuzzy logic.

Natural Language Processing: Introduction, Syntactic Processing, Semantic Processing, Pragmatic Processing. **[No. of Hrs.: 10]**

UNIT – IV

Learning: Concept of learning, learning automation, genetic algorithm, learning by inductions, neural nets.

Expert Systems: Need and justification for expert systems, knowledge acquisition, Case Studies: MYCIN, RI. **[No. of Hrs.: 10]**

TEXT BOOKS:

1. E. Rich and K. Knight, "Artificial Intelligence", TMH, 2nd Ed., 1992.
2. N. J. Nilsson, "Principles of AI", Narosa Publ. House, 1990.
3. M. N. Hoda, "Foundation Course in Artificial Intelligence", Vikas Pub., 2004.

REFERENCES BOOKS:

1. P. H. Winston, "Artificial Intelligence", Pearson Education, 3rd Edition, 2002.
2. D. W. Patterson, "Introduction to AI and Expert Systems", PHI, 1992.
3. R. J. Schalkoff, "Artificial Intelligence – An Engineering Approach", McGraw Hill Int. Ed. Singapore, 1992.
4. M. Sasikumar, S. Ramani, "Rule Based Expert Systems", Narosa Publishing House, 1994.
5. Tim Johns, "Artificial Intelligence, Application Programming", Wiley Dreamtech, 2005.

Code No.: ETCS 404**L T C****Paper: Software Testing****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

Introduction: What is software testing and why it is so hard?, Error, Fault, Failure, Incident, Test Cases, Testing Process, Limitations of Testing, No absolute proof of correctness, Overview of Graph Theory.

[No. of Hrs.: 11]**UNIT - II**

Functional Testing: Boundary Value Analysis, Equivalence Class Testing, Decision Table Based Testing, Cause Effect Graphing Technique.

Structural Testing: Path testing, DD-Paths, Cyclomatic Complexity, Graph Metrics, Data Flow Testing, Mutation testing.

[No. of Hrs.: 11]**UNIT - III**

Reducing the number of test cases:

Prioritization guidelines, Priority category, Scheme, Risk Analysis, Regression Testing, Slice based testing

Testing Activities: Unit Testing, Levels of Testing, Integration Testing, System Testing, Debugging, Domain Testing.

[No. of Hrs.: 11]**UNIT - IV**

Object Oriented Testing: Issues in Object Oriented Testing, Class Testing, GUI Testing, Object Oriented Integration and System Testing.

Testing Tools: Static Testing Tools, Dynamic Testing Tools, Characteristics of Modern Tools.

[No. of Hrs.: 11]**TEXT BOOKS:**

1. William Perry, "Effective Methods for Software Testing", John Wiley & Sons, New York, 1995.
2. Louise Tamres, "Software Testing", Pearson Education Asia, 2002
3. Robert V. Binder, "Testing Object-Oriented Systems-Models, Patterns and Tools", Addison Wesley, 1999.

REFERENCE BOOKS:

1. Cem Kaner, Jack Falk, Nguyen Quoc, "Testing Computer Software", Second Edition, Van Nostrand Reinhold, New York, 1993.
2. K.K. Aggarwal & Yogesh Singh, "Software Engineering", 2nd Ed., New Age International Publishers, New Delhi, 2005
3. Boris Beizer, "Software Testing Techniques", Second Volume, Second Edition, Van Nostrand Reinhold, New York, 1990.
4. Boris Beizer, "Black-Box Testing – Techniques for Functional Testing of Software and Systems", John Wiley & Sons Inc., New York, 1995.

Code No.: ETCS 406**L T C****Paper: Soft Computing****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

Neural Networks: History, overview of biological Neuro-system, Mathematical Models of Neurons, ANN architecture, Learning rules, Learning Paradigms-Supervised, Unsupervised and reinforcement Learning, ANN training Algorithms-perceptions, Training rules, Delta, Back Propagation Algorithm, Multilayer Perceptron Model, Hopfield Networks, Associative Memories, Applications of Artificial Neural Networks.

[No. of Hrs.: 11]

UNIT – II

Fuzzy Logic: Introduction to Fuzzy Logic, Classical and Fuzzy Sets: Overview of Classical Sets, Membership Function, Fuzzy rule generation.

Operations on Fuzzy Sets: Compliment, Intersections, Unions, Combinations of Operations, Aggregation Operations.

[No. of Hrs.: 11]

Fuzzy Arithmetic: Fuzzy Numbers, Linguistic Variables, Arithmetic Operations on Intervals & Numbers, Lattice of Fuzzy Numbers, Fuzzy Equations.

UNIT – III

Fuzzy Logic: Classical Logic, Multivalued Logics, Fuzzy Propositions, Fuzzy Qualifiers, Linguistic Hedges.

[No. of Hrs.: 11]

Uncertainty based Information: Information & Uncertainty, Nonspecificity of Fuzzy & Crisp Sets, Fuzziness of Fuzzy Sets.

UNIT – IV

Introduction of Neuro-Fuzzy Systems, Architecture of Neuro Fuzzy Networks.

Application of Fuzzy Logic: Medicine, Economics etc.

Genetic Algorithm: An Overview, GA in problem solving, Implementation of GA

[No. of Hrs.: 11]

TEXT BOOKS:

1. J. A. Anderson, "An Introduction to Neural Networks", PHI, 1999.
2. Hertz J. Krogh, R.G. Palmer, "Introduction to the Theory of Neural Computation", Addison-Wesley, California, 1991.
3. G.J. Klir & B. Yuan, "Fuzzy Sets & Fuzzy Logic", PHI, 1995.

REFERENCE BOOKS:

1. "Neural Networks-A Comprehensive Foundations", Prentice-Hall International, New Jersey, 1999.
2. J. A. Freeman, D.M. Skapura, "Neural Networks: Algorithms, Applications and Programming Techniques", Addison Wesley, Reading, Mass, (1992).
3. Melanie Mitchell, "An Introduction to Genetic Algorithm", PHI, 1998.

Code No.: ETIT 408**L T C****Paper: Embedded System****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

Introduction to an embedded systems design & RTOS: Introduction to Embedded system, Processor in the System, Microcontroller, Memory Devices, Embedded System Project Management, ESD and Co-design issues in System development Process, Design cycle in the development phase for an embedded system, Use of target system or its emulator and In-circuit emulator, Use of software tools for development of an ES.

Inter-process Communication and Synchronization of Processes, Tasks and Threads, Problem of Sharing Data by Multiple Tasks, Real Time Operating Systems: OS Services, I/O Subsystems, Interrupt Routines in RTOS Environment, RTOS Task Scheduling model, Interrupt Latency and Response times of the tasks.

[No. of Hrs.: 11]**UNIT – II**

Overview of Microcontroller: Microcontroller and Embedded Processors, Overview of 8051 Microcontroller family: Architecture, basic assembly language programming concepts, The program Counter and ROM Spaces in the 8051, Data types, 8051 Flag Bits and PSW Register, 8051 Register Banks and Stack Instruction set, Loop and Jump Instructions, Call Instructions, Time delay generations and calculations, I/O port programming Addressing Modes, accessing memory using various addressing modes, Arithmetic instructions and programs, Logical instructions, BCD and ASCII application programs, Single-bit instruction programming, Reading input pins vs. port Latch, Programming of 8051 Timers, Counter Programming

[No. of Hrs.: 11]**UNIT – III**

Communication with 8051: Basics of Communication, Overview of RS-232, I²C Bus, UART, USB, 8051 connections to RS-232, 8051 serial communication programming, 8051 interrupts, Programming of timer interrupts, Programming of External hardware interrupts, Programming of the serial communication interrupts, Interrupt priority in the 8051

[No. of Hrs.: 11]**UNIT - IV**

Interfacing with 8051: Interfacing an LCD to the 8051, 8051 interfacing to ADC, Sensors, Interfacing a Stepper Motor, 8051 interfacing to the keyboard, Interfacing a DAC to the 8051, 8255 Interfacing with 8031/51, 8051/31 interfacing to external memory

[No. of Hrs.: 11]**TEXT BOOKS:**

1. Raj Kamal, "Embedded Systems", TMH, 2004.
2. M.A. Mazidi and J. G. Mazidi, "The 8051 Microcontroller and Embedded Systems", PHI, 2004.

REFERENCES BOOKS:

1. David E. Simon, "An Embedded Software Primer", Pearson Education, 1999.
2. K.J. Ayala, "The 8051 Microcontroller", Penram International, 1991.
3. Dr. Rajiv Kapadia, "8051 Microcontroller & Embedded Systems", Jaico Press
4. Dr. Prasad, "Embedded Real Time System", Wiley Dreamtech, 2004.

Code No.: ETIT 410**L T C****Paper: E-Commerce & ERP****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked	

to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT – I

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.

Security Technologies: Insecurity Internet; A brief introduction to Cryptography; Public key solution; Key distribution and certification; prominent cryptographic applications.

Electronic Payment Methods: Updating traditional transactions; secure online transaction models; Online commercial environments; digital currencies and payment systems; Offline secure processing; private data networks.

[No. of Hrs.: 11]

UNIT – II

Protocols for Public Transport of Private Information: Security protocols; secure protocols; Secure hypertext transfer protocols; Secure sockets layers; Integrating security protocols into the web; Non technical provide.

Electronic Commerce Providers: On-line Commerce options: Company profiles.

Electronic Payment Systems: Digital payment systems; First virtual internet payment system; cyber cash model.

On-line Commerce Environments: Servers and commercial environments; Netscape product line; Netscape commerce server; Microsoft internet explorer and servers; open market.

Digital Currencies: Optional process of Digicash, Ecash Trail; Using Ecash; Smart cards, Electronic Data Interchange; Its basics; EDI versus Internet and EDI over Internet.

Strategies, Techniques and Tools: Internet Strategies: Internet Techniques, Shopping techniques and online selling techniques; Internet tools.

Electronic Commerce Online Resources and Guide to the CD-ROM **[No. of Hrs.: 11]**

UNIT – III

ERP – An Enterprise Perspective; Production Finance, Personnel disciplines and their relationship, Transiting environment, MIS Integration for disciplines, Case Study, Information / Workflow, Network Structure, Client Server Integrator System, Virtual Enterprise.

ERP – Resource Management Perspective; Functional and Process of Resource. Management, 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 Distribution, Finance, Resource Management in global scenario, dynamic data management in complex global scenario.

[No. of Hrs.: 11]

UNIT – IV

ERP – Information System Perspective: Evolution of Application Software Technology Management, EDP, MIS, DBMS, DSS OLAP (Online Analysis and Processing), TP, OAS, KBS, MRP, BPR, SCM, REP, CRM, Information Communication Technology, E-Business, E-Commerce, EDI

ERP-Key Managerial Issues: Concept Selling, IT Infrastructure, Implication, of ERP Systems on Business Organization, Critical success factors in ERP System, ERP Culture Implementation Issues, Resistance to change, Public Service and Organizations (PSO) Project, ERP Selection issues, Return on Investment, Pre and Post Implementation Issues.

[No. of Hrs.: 11]

TEXT BOOKS:

1. Pete Loshin and P.A.Murphy, “ Electronic Commerce ” Jaico Publishing House, 1999.
2. Gary Schneider and James T. Perry, “Electronic Commerce” by Thomson learning, 2001.
3. S. Sadagopan, “Enterprise Resource Planning”, Tata McGraw Hill, 1999.
4. Alexis Leon, “Enterprise Resource Planning”, Tata McGraw Hill, 2000.

REFERENCE BOOKS:

1. Kalakota, "Frontiers of E-Commerce " Addition Wesley long man Publishers, 1999.
2. Kamlesh Bajaj & Debjani Nag, "E-Commerce: The cutting edge of Business" Tata Mcgraw Hill, 2000.
3. Trepper, "E-Commerce strategies", Prentice Hall of India, 2001.

Code No.: ETIT 412**L T C****Paper: Network Security****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

Introduction: Codes and Ciphers – Some Classical systems – Statistical theory of cipher systems – Complexity theory of Crypto systems – Stream ciphers, Block ciphers.

Stream Ciphers: Rotor based system – shift register based systems – Design considerations for stream ciphers – Cryptanalysis of stream ciphers – Combined encryption and encoding.

Block Ciphers – DES and variant, modes of use of DES.

[No. of Hrs.: 11]**UNIT – II**

Public Key systems – Knacksack systems – RSK – Diffie Hellman Exchange 0 Authentication and Digital signatures, Elliptic curve based systems.

System Identification and clustering

Cryptology of speech signals – narrow band and wide band systems – analogue & digital systems of speech encryption.

[No. of Hrs.: 11]**UNIT – III**

Network Security: Hash function – Authentication:

Protocols – Digital Signature standards.

Electronics Mail Security – PGP (Pretty Good Privacy) MIME, Data Compression technique.

IP Security: Architecture, Authentication Leader, Encapsulating security Payload – Key management.

Web Security: Secure Socket Layer & Transport Layer security, Secure electronic transactions.

Firewalls Design principle, established systems.

[No. of Hrs.: 12]**UNIT – IV**

Telecommunication Network architecture, TMN management layers, Management information Model, Management servicing and functions, Structure of management information and TMN information model.

[No. of Hrs.: 10]**TEXT BOOKS:**

1. William Stallings, “Network Security Essentials, 2nd Edition, 2002.
2. William Stallings, “Cryptography & Network Security”, 3rd Edition, 1999.

Code No.: ETEC 414**L T C****Paper: Mobile Communication****3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

UNIT – I

Introduction to Cellular Mobile Systems: A basic cellular system, performance criteria, uniqueness of mobile radio environment, operation of cellular systems, planning a cellular system, overview of generations of cellular systems.

Elements of Cellular Radio Systems Design and Interference: General description of the problem, concept of frequency reuse channels, co-channel interference reduction factor, desired C/I from a normal case in an omni directional antenna system, cell splitting, consideration of the components of cellular systems, Introduction to co-channel interference, co-channel measurement design of antenna system, antenna parameter and their effects.

[No. of Hrs.: 11]**UNIT – II**

Cell Coverage for Signal & Antenna Structures: General introduction, obtaining the mobile point to point mode, propagation over water or flat open area, foliage loss, propagation near in distance, long distance propagation, point to point prediction model – characteristics, cell site, antenna heights and signal coverage cells, mobile to mobile propagation, Characteristics of basic antenna structures, antenna at cell site, mobile antennas.

Frequency Management & Channel Assignment, Hand Off & Dropped Calls: Frequency Management, fixed channel assignment, non-fixed channel assignment, traffic & channel assignment, Why hand off, types of handoff and their characteristics, dropped call rates & their evaluation.

[No. of Hrs.: 11]**UNIT – III**

Modulation methods and coding for error detection and correction: Introduction to Digital modulation techniques, modulation methods in cellular wireless systems, OFDM, Block Coding, convolution coding and Turbo coding.

Multiple access techniques: FDMA, TDMA, CDMA: Time-division multiple access (TDMA), code division multiple access (CDMA), CDMA capacity, probability of bit error considerations, CDMA compared with TDMA.

[No. of Hrs.: 11]**UNIT – IV**

Second generation, digital, wireless systems: GSM, IS_136 (D-AMPS), IS-95, mobile management, voice signal processing and coding.

[No. of Hrs.: 11]**TEXT BOOKS:**

1. William, C. Y. Lee, "Mobile Cellular Telecommunications", 2nd Edition, McGraw Hill, 1990.
2. Mischa Schwartz, "Mobile Wireless Communications", Cambridge University Press, UK, 2005.

REFERENCE BOOKS:

1. "Mobile Communication Hand Books", 2nd Edition, IEEE Press.
2. Theodore S Rappaport, "Wireless Communication Principles and Practice", 2nd Edition, Pearson Education, 2002.
3. Lawrence Harte, "3G Wireless Demystified", McGraw Hill Publications, 2001.
4. Kaveh Pahlavan and Prashant Krishnamurthy, "Principles of Wireless Networks", PHI, 2001.

Code No. : ETCS 452**L P C****Paper: Artificial Intelligence Lab.****0 2 1**

Practical will be based on Artificial Intelligence.

Code No. : ETCS 454

Paper: Software Testing Lab.

L	P	C
0	2	1

Practical will be based on Software Testing.

Code No. : ETCS 456

Paper: Electives

L	P	C
0	2	1

Practical will be based on ELECTIVES :

Code No. : ETCS 458

Paper: Major Project

L	P	C
0	12	6

The student will submit a synopsis at the beginning of the semester for approval from the departmental committee in a specified format. The student will have to present the progress of the work through seminars and progress reports.