SCHEME OF EXAMINATION

&

DETAILED SYLLABUS

for

BACHELOR OF TECHNOLOGY
(Information Technology)

GURU GOBIND SINGH
INDRAPRASTHA UNIVERSITY
KASHMERE GATE, DELHI
## BACHELOR OF TECHNOLOGY
(B.TECH.) DEGREE COURSE (Common to all branches)

### FIRST SEMESTER EXAMINATION

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Paper</th>
<th>L</th>
<th>T/P</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETMA 101</td>
<td>Applied Mathematics – I</td>
<td>3</td>
<td>1</td>
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</tr>
<tr>
<td>ETPH 103</td>
<td>Applied Physics – I</td>
<td>2</td>
<td>1</td>
<td>3</td>
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<tr>
<td>ETCH 105</td>
<td>Applied Chemistry – I</td>
<td>2</td>
<td>1</td>
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<tr>
<td>ETME 107</td>
<td>Manufacturing Process</td>
<td>2</td>
<td>0</td>
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<tr>
<td>ETCS 109</td>
<td>Introduction to Computers and Auto CAD</td>
<td>2</td>
<td>1</td>
<td>3</td>
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<tr>
<td>ETEL 111</td>
<td>Communication Skills – I</td>
<td>2</td>
<td>1</td>
<td>3</td>
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<tr>
<td>ETEL 113*</td>
<td>Impact of Science &amp; Technology on Society</td>
<td>1</td>
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### PRACTICAL/VIVA VOCE

<table>
<thead>
<tr>
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<tr>
<td>ETPH 151</td>
<td>Applied Physics Lab. – I</td>
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<tr>
<td>ETCH 153</td>
<td>Applied Chemistry Lab. – I</td>
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<tr>
<td>ETCS 155</td>
<td>Introduction to Auto CAD Office Automation and Web Design</td>
<td>-</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>ETME 157</td>
<td>Workshop Practice</td>
<td>-</td>
<td>3</td>
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<tr>
<td>ETME 159</td>
<td>Engineering Graphics Lab.</td>
<td>-</td>
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**TOTAL 14 17 26**

ETEL-113* is NUES
# BACHELOR OF TECHNOLOGY

(B.TECH.) DEGREE COURSE (Common to all branches)

## SECOND SEMESTER EXAMINATION

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<tr>
<td>ETMA 102</td>
<td>Applied Mathematics – II</td>
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<tr>
<td>ETPH 104</td>
<td>Applied Physics – II</td>
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<tr>
<td>ETCH 106</td>
<td>Applied Chemistry – II</td>
<td>2</td>
<td>1</td>
<td>3</td>
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<tr>
<td>ETCS 108</td>
<td>Introduction to Programming</td>
<td>2</td>
<td>1</td>
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<tr>
<td>ETME 110</td>
<td>Engineering Mechanics</td>
<td>2</td>
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<tr>
<td>ETEC 112</td>
<td>Electrical Science</td>
<td>2</td>
<td>1</td>
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<tr>
<td>ETEL 114</td>
<td>Communication Skills – II</td>
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### PRACTICAL/VIVA VOCE

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<tr>
<td>ETPH 152</td>
<td>Applied Physics Lab. – II</td>
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<td>ETCH 154</td>
<td>Applied Chemistry Lab. – II</td>
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<td>C Programming Lab.</td>
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<tr>
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<td>Engineering Mechanics Lab.</td>
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<tr>
<td>ETEC 160</td>
<td>Electrical Science Lab.</td>
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**TOTAL 15 18 28**

[http://ipu.ac.in/syllabus/affiliated/sybtechit.htm](http://ipu.ac.in/syllabus/affiliated/sybtechit.htm)
## THIRD SEMESTER EXAMINATION

### THEOREY PAPERS

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<th>Credits</th>
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<tbody>
<tr>
<td>ETMA 201</td>
<td>Applied Mathematics – III</td>
<td>3</td>
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<tr>
<td>ETCS 203</td>
<td>Analog Electronics</td>
<td>3</td>
<td>1</td>
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<tr>
<td>ETEC 205</td>
<td>Circuits and Systems</td>
<td>3</td>
<td>1</td>
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<tr>
<td>ETCS 207</td>
<td>Foundations of Computer Systems</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>ETIT 209</td>
<td>Object Oriented Programming using C++</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>ETCS 211</td>
<td>Data Structures</td>
<td>3</td>
<td>1</td>
<td>4</td>
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### PRACTICAL/VIVA VOCE

<table>
<thead>
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<th>Code No.</th>
<th>Paper</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>ETCS 251</td>
<td>*Analog Electronics Lab.</td>
<td>0</td>
<td>2</td>
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<tr>
<td>ETEC 253</td>
<td>*Circuits &amp; Systems Lab.</td>
<td>0</td>
<td>2</td>
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<tr>
<td>ETIT 255</td>
<td>Object Oriented Programming using C++ Lab.</td>
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<tr>
<td>ETCS 257</td>
<td>Data Structure Lab.</td>
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**TOTAL** 18 14 28

- Some lab experiments must be performed using any circuit simulation software e.g. PSPICE.
# BACHELOR OF TECHNOLOGY

(Information Technology)

## FOURTH SEMESTER EXAMINATION

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Paper</th>
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<tbody>
<tr>
<td>ETCS 202</td>
<td>Software Engineering</td>
<td>3</td>
<td>1</td>
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<tr>
<td>ETCS 204</td>
<td>Algorithm Analysis &amp; Design</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>ETEC 206</td>
<td>Digital Circuits &amp; System – I</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>ETIT 208</td>
<td>Communication Systems</td>
<td>3</td>
<td>1</td>
<td>4</td>
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<tr>
<td>ETCS 210</td>
<td>Computer Graphics</td>
<td>3</td>
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<tr>
<td>ETCS 212</td>
<td>Operating Systems</td>
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<table>
<thead>
<tr>
<th>PRACTICAL/VIVA VOCE</th>
<th>L</th>
<th>T/P</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ETCS 252 Software Engineering Lab.</td>
<td>0</td>
<td>2</td>
<td>1</td>
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<tr>
<td>ETCS 254 Algorithm Analysis and Design Lab.</td>
<td>0</td>
<td>2</td>
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<tr>
<td>ETEC 256 *Digital Circuits &amp; System – I Lab.</td>
<td>0</td>
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<tr>
<td>ETCS 258 Computer Graphics Lab.</td>
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</tbody>
</table>

**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.

[SCHEME OF EXAMINATION](http://ipu.ac.in/syllabus/affiliated/sybtechit.htm)
BACHELOR OF TECHNOLOGY  
(Information Technology)

FIFTH SEMESTER EXAMINATION

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Paper</th>
<th>L</th>
<th>T/P</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ETEC 301</td>
<td>Digital Circuits &amp; Systems – II</td>
<td>3</td>
<td>1</td>
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<tr>
<td>ETIT 303</td>
<td>Java Programming and Website Design</td>
<td>3</td>
<td>1</td>
<td>4</td>
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<tr>
<td>ETCS 305</td>
<td>Computer Architecture</td>
<td>3</td>
<td>1</td>
<td>4</td>
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<tr>
<td>ETIT 307</td>
<td>Digital Communication – I</td>
<td>3</td>
<td>1</td>
<td>4</td>
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<tr>
<td>ETCS 309</td>
<td>Database Management Systems</td>
<td>3</td>
<td>1</td>
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<tr>
<td>ETMS 311</td>
<td>Organizational Behaviour</td>
<td>3</td>
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<table>
<thead>
<tr>
<th>Code No.</th>
<th>Paper</th>
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<tbody>
<tr>
<td>ETEC 351</td>
<td>Digital Circuits &amp; Systems – II Lab.</td>
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<tr>
<td>ETIT 353</td>
<td>Java Programming &amp; Website Design Lab.</td>
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<td>ETIT 355</td>
<td>Digital Communication – I Lab.</td>
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<tr>
<td>ETCS 357</td>
<td>Database Management Systems Lab.</td>
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<td>ETIT 359</td>
<td>Practical Training</td>
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TOTAL 18 14 29

#NUES

^Practical training was conducted after fourth semester. However, Viva-Voce for evaluation of Practical Training will be conducted in this semester.
# BACHELOR OF TECHNOLOGY
## (Information Technology)

## SIXTH SEMESTER EXAMINATION

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Paper</th>
<th>L</th>
<th>T/P</th>
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<tbody>
<tr>
<td><strong>THEORY PAPERS</strong></td>
<td></td>
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<tr>
<td>ETCS 302</td>
<td>Microprocessor Systems</td>
<td>3</td>
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<tr>
<td>ETCS 304</td>
<td>Object Oriented Software Engineering</td>
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<tr>
<td>ETIT 306</td>
<td>Computer Networks</td>
<td>3</td>
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<tr>
<td>ETIT 308</td>
<td>Digital Signal Processing</td>
<td>3</td>
<td>1</td>
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<tr>
<td>ETCS 310</td>
<td>Data Warehousing &amp; Data Mining</td>
<td>3</td>
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<td>ETIT 312</td>
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<td><strong>PRACTICAL/VIVA VOCE</strong></td>
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<tr>
<td>ETCS 352</td>
<td>Microprocessor Lab.</td>
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<td>ETCS 354</td>
<td>Object Oriented Software Engineering Lab.</td>
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<td>ETIT 356</td>
<td>Digital Signal Processing Lab.</td>
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<tr>
<td>ETIT 358</td>
<td>Data Warehousing &amp; Data Mining Lab.</td>
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<td>ETIT 360</td>
<td>Digital Communication - II Lab.</td>
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^Practical training was conducted after sixth semester. However, Viva-Voce for evaluation of Practical Training will be conducted in this semester.
# 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
(Information Technology)

### EIGHTH SEMESTER EXAMINATION

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Paper</th>
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<tbody>
<tr>
<td>ETIT 402</td>
<td>Mobile Communication</td>
<td>3</td>
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<td>ETEC 404</td>
<td>Embedded System</td>
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<td><strong>ELECTIVE PAPERS (Choose any one)</strong></td>
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<tr>
<td>ETCS 406</td>
<td>Soft Computing</td>
<td>3</td>
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<tr>
<td>ETCS 408</td>
<td>Artificial Intelligence</td>
<td>3</td>
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<tr>
<td>ETIT 410</td>
<td>E-Commerce &amp; ERP</td>
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<td>Network Security</td>
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<td>ETIT 414</td>
<td>Software Testing</td>
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<tr>
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<td>ETEC 452</td>
<td>Embedded System Lab.</td>
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<td>ETIT 454</td>
<td>Practicals (based on Electives)</td>
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<td>ETIT 456</td>
<td>*Major Project</td>
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**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:**

1. The total number of the credits of the B.Tech. (IT) Programme = 214
2. 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.
UNIT I


[No. of Hrs. 10]

UNIT II


Finding area under the curves, Length of the curves, volume and surface of solids of revolution.

[No. of Hrs. 15]

UNIT III


[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 – Canchy and Legendre forms.

(No. of Hrs. 10)

TEXT BOOKS:

REFERENCE BOOKS:
3. “Advanced Engineering Mathematics”, Dr. A. B. Mathur, V. P. Jaggi (Khanna publications)
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, Fraunhoffer 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


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:
2. A. Beiser, “Concepts of Modern Physics”
UNIT - I

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.
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, NOx, HC, SOx 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
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
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:
2. 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  
Paper: Introduction to Computer Systems  

\[
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\]

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 World 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:**  

**REFERENCE BOOKS:**  
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

1. Chapter 2: “After 63 years, Why Are They Still Testing Einstein?” by C.P. Gilmore
2. Chapter 5: “Star Wars : The Leaky Shield” By Carl Sagan
[No. of Hrs: 10]

TEXT BOOKS:
1. Maison, Margaret M. Examine Your English, Hyderabad: Orient Longman, 1980
*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.
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 koter’s pendulum.

(4) To determine the frequency of A.C. mains using sonometer and an electromagnet.

(5) To determine the frequency of electrically maintained turning 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 numeral aperture (NA) of a 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.
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\textsubscript{2}Cr\textsubscript{2}O\textsubscript{7} v/s Na\textsubscript{2}S\textsubscript{2}O\textsubscript{3} to determine the percentage purity of K\textsubscript{2}Cr\textsubscript{2}O\textsubscript{7} sample.
8. Argentometric titration one each of Vohlard’s method and of Mohr’s method.
10. Determination of dissolved Oxygen in given sample of water.

TEXT BOOKS:
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.
UNIT - I
Wood Working Shop: Making of various joints, Pattern making.

UNIT - II
Foundary 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

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

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
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, Langranges method of undermined multipliers and Jacobians.

[No. of Hrs. 12]

UNIT - II
FUNCTIONS OF COMPLEX VARIABLES:

[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:

[No. of Hrs. 10]

TEXT BOOKS:

REFERENCE BOOKS:
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 Bollzman, 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 Anorphous solids (Brief) Bragg’s Law, Applications. Ultrasonics: Introduction, Production of Ultrasonics (Magentrostriction 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:
4. Schiff, “Quantum Mechanics”
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, physisorption, 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:
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:


REFERENCE BOOKS:

INSTRUCTIONS TO PAPER SETTERS:

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.

MAXIMUM MARKS: 75

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.

\[ \frac{T_1}{T_2} = e^{md} \text{ and its application} \]

[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:


REFERENCE BOOKS:

1. Irving H. Shames, “Engg Mechanics”, PHI publications
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

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:
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:

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:
Atleast 8 experiments must be carried out.
Proper error – analysis must be carried out with all the experiments.
List of Experiments

1. Determine the heat of hydration of CuSO$_4$.5H$_2$O/FeSO$_4$.7H$_2$O.

2. Determine the heat of neutralization of strong Acid (say H$_2$SO$_4$/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 1$^{st}$ 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 conductmetrically.

TEXT BOOKS:

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
   \[\frac{ax+b}{ax-b}\]
   \[2.5 \log x - \cos 30^\circ + |x^2-y^2| + \sqrt{2xy}\]
   \[(x^5+10x^4+8x^3+4x+2)\]
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
   \[1 + \frac{1}{3} + \ldots + \frac{1}{20}\]
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:
    \[
    \begin{array}{ccccccc}
    1 & & & & & & 1 \\
    2 & 2 & & & & & 2 \\
    3 & 3 & 3 & & & & 3 \\
    4 & 4 & 4 & 4 & & & 4 \\
    5 & 5 & 5 & 5 & 5 & & 5 \\
    \end{array}
    \]
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) Insertion 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.
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.
### List of Experiments

<table>
<thead>
<tr>
<th>No.</th>
<th>Experiment</th>
</tr>
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<tbody>
<tr>
<td>1.</td>
<td>Verification of Thevenin’s theorem</td>
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<tr>
<td>2.</td>
<td>Verification of Superposition theorem</td>
</tr>
<tr>
<td>5.</td>
<td>Calibration of Energy Meter/Wattmeter/Voltmeter/Ammeter</td>
</tr>
<tr>
<td>6.</td>
<td>Two wattmeter method of measuring power in three phase circuit (resistive load only)</td>
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<tr>
<td>7.</td>
<td>Load test on Single Phase Transformer, Regulation and Efficiency of Transformer</td>
</tr>
<tr>
<td>8.</td>
<td>Short Circuit/Open Circuit tests on Single Phase transformer</td>
</tr>
<tr>
<td>9.</td>
<td>Measure the armature and field resistance of a D.C. Machine</td>
</tr>
<tr>
<td>10.</td>
<td>Connection and starting of a Three Phase Induction Motor using direct on line or Star Delta Starter.</td>
</tr>
<tr>
<td>11.</td>
<td>Starting and Speed Control of a D.C. shunt motor</td>
</tr>
<tr>
<td>12.</td>
<td>Resonance</td>
</tr>
</tbody>
</table>
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.

[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
[No. of Hrs.: 11]

TEXT BOOKS:

REFERENCE BOOKS:
**Code No.:** ETCS 203  
**Paper: Analog Electronics**  
L  T  C 3 1 4

<table>
<thead>
<tr>
<th>INSTRUCTIONS TO PAPER SETTERS:</th>
<th>MAXIMUM MARKS: 75</th>
</tr>
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</table>

**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 $I_{co}$, $V_{be}$ & $b$, 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:**

**REFERENCE BOOKS:**
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

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 Tellegen

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:

Reference Books
UNIT – I

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


[No. of Hrs.: 11]

UNIT – II

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

**Relation/function and matrices:** Rotation, properties of binary rotation, operation on binary rotation, 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 particulars, structures with binary operations) subalgebra, direct product and homo-morphism, 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:**

**REFERENCES BOOKS:**
UNIT – I

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


[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: Persistant objects, Streams and files, Namespaces, Exception handling, Generic Classes


[No. of Hrs: 11]

TEXT BOOKS:

REFERENCE BOOKS:
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:

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

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

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

Practical will be based on Data Structure.
INSTRUCTIONS TO PAPER SETTERS:  

MAXIMUM MARKS: 75

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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.


[No. of Hrs.: 11]

TEXT BOOKS:


REFERENCE BOOKS:

UNIT – I


**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


**NP-Complete Problem:** Polynomial-time verification, NP-Completeness and Reducibility, NP-Completeness Proof, NP-Complete problems.

[No. of Hrs.: 11]

TEXT BOOKS:


REFERENCES BOOKS:

UNIT – I

[Unit: 11]

UNIT – II

[Unit: 11]

UNIT - III

[Unit: 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.

[Unit: 11]

TEXT BOOKS:

REFERENCE BOOKS:
INSTRUCTIONS TO PAPER SETTERS:                                                                 MAXIMUM MARKS: 75

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UNIT – I


[No. of Hrs.: 12]

UNIT – II


[No. of Hrs.: 12]

UNIT – III

Digital transmission through career 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 Sowzce coding, channel coding and channel capacity theorem. Huffman code, Lempel – ziv code.

[No. of Hrs.: 09]

TEXT BOOKS:

REFERENCE BOOKS:

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## 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


[No. of Hrs: 11]

## TEXT BOOKS:


## REFERENCES BOOKS:

UNIT – I

[No. of Hrs.: 12]

UNIT – II

[No. of Hrs.: 11]

UNIT – III

[No. of Hrs.: 11]

UNIT – IV

[No. of Hrs.: 10]

TEXT BOOKS:

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<th>L</th>
<th>P</th>
<th>C</th>
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<td>ETCS 252</td>
<td>Software Engineering Lab.</td>
<td>0</td>
<td>2</td>
<td>1</td>
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<tr>
<td>ETCS 254</td>
<td>Algorithm Analysis &amp; Design Lab.</td>
<td>0</td>
<td>2</td>
<td>1</td>
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<tr>
<td>ETEC 256</td>
<td>Digital Circuits &amp; Systems - I Lab.</td>
<td>0</td>
<td>2</td>
<td>1</td>
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<tr>
<td>ETCS 258</td>
<td>Computer Graphics Lab.</td>
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Practical will be based on Software Engineering.

Practical will be based on Algorithm Analysis & Design.

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

Practical will be based on Computer Graphics.
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MAXIMUM MARKS: 75

UNIT – I
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.: 11]

UNIT – II
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.: 09]

TEXT BOOKS:

REFERENCES BOOKS:
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, cotinue 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. 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:

REFERENCES BOOKS:
**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:**


**REFERENCES BOOKS:**

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MAXIMUM MARKS: 75

UNIT – I
Analog-to-Digital Conversion: Sampling theorem, Pulse-Amplitude Modulation, Channel bandwidth for PAM signal, Natural sampling, Flat top sampling, Quantization of signals, Quantization error

[No. of Hrs.: 09]

UNIT – II
Pulse-code modulation (PCM), Electrical representation of binary digits, The PCM system, Companding, Multiplexing PCM signals, Differential PCM, Delta modulation, Adaptive delta modulation, Vocoders, Channel Vocoder, Linear Predictive coder.

[No. of Hrs.: 10]

UNIT – III
Digital Modulation Techniques: Binary Phase-Shift Keying (BPSK), Differential Phase-Shift Keying, Differentially-Encoded PSK (DEPSK), Quadrature Phase-Shift Keying (QPSK), Quadrature Amplitude Shift Keying (QASK), Binary Frequency-Shift Keying (BFSK), Similarity of BPSK and BFSK, M-ary FSK, Minimum Shift Keying (MSK).

[No. of Hrs.: 12]

UNIT – IV

[No. of Hrs.: 13]

TEXT BOOKS:

REFERENCE BOOKS:
UNIT – I

[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

[No. of Hrs.: 11]

TEXT BOOKS:

REFERENCES BOOKS:
UNIT – I

[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

[No. of Hrs.: 11]

TEXT BOOKS:

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

Practical will be based on Java Programming & Website Design.

Practical will be based on Digital Communication - I.

Practical will be based on Database Management System.

*NUES
Practical training conducted after fourth semester will be evaluated in the fifth Semester based on Viva-Voce.
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 abasic 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:
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
Case Studies

[No. of Hrs.: 11]

TEXT BOOKS:

REFERENCES BOOKS:
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:

REFERENCE BOOKS:
UNIT – I
Signals and signal Processing: characterization & classification of signals, typical Signal Processing operations, example of typical Signals, typical Signals Processing applications.

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.

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.
Applications of DSP.

No. of Hrs.: 11

TEXT BOOKS:

REFERENCE BOOKS:
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

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

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

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.

TEXT BOOKS:

REFERENCES BOOKS:
2. Kamber and Han, “Data Mining Concepts and Techniques”, Hartcourt India P. Ltd., 2001
UNIT – I
Information, channel capacity, The concept of amount of information, entropy, Information rate, Conditional and joint entropies.  

UNIT – II

UNIT – III
Channel coding: Error detecting codes, Hamming distance, Error correcting codes, Repitition codes, Linear block codes, binary cyclic codes, BCH codes, Reed-Soleman codes, Golay codes.  

UNIT – IV
Convolution Coding: Code tree, state diagram, Trellis diagram, Maximum-Likelihood decoding – Viterbi’s algorithm, sequential decoding.

Network information theory, introduction to Cryptography

TEXT BOOKS:

REFERENCE BOOKS:
Practical will be based on Microprocessor Systems

Practical will be based on Object Oriented Software Engineering.

Practical will be based on Digital Signal Processing.

Practical will be based on Data Warehousing and Data Mining.

Practical will be based on Digital Communication - II.
UNIT – I
Review of Physical & Data link layer, ISDN, Frame Relay, ATM

[No. of Hrs.: 11]

UNIT – II

[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:

REFERENCE BOOKS:
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
Animation: Different techniques, 2D and 3D Animation, working on 3D animation tools.
Modelling: NURBS, Polygon, Organic modeling.
Animation: Keyframe, Path animation, skeleton animation, etc.  

[No. of Hrs.: 11]

UNIT – IV
Dynamics: Active and Passive bodies, fields, expressions, constrains, etc.
Rendering: Different rendering techniques like IPR, Mental ray, software, hardware etc., Shadows, materials, light and special effects.  

[No. of Hrs.: 11]

TEXT BOOKS:

REFERENCES BOOKS:
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:
2. A. Holub, “Compiler Design in C”, PHI, 2004

REFERENCES BOOKS:
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.


[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:

REFERENCE BOOKS:
UNIT – I

[No. of Hrs.: 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]

UNIT – III

[No. of Hrs.: 11]

UNIT – IV
Sequential MOS Logic Circuits, Dynamic Logic Circuits, Semiconductor Memories.

[No. of Hrs.: 11]

TEXT BOOK:

REFERENCE BOOKS:
UNIT - I


[No. of Hrs.: 10]

UNIT - II


[No. of Hrs.: 12]

UNIT - III

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:


REFERENCES:

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
[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:

REFERENCE BOOKS:
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.

TEXT BOOKS:

REFERENCES BOOKS:
Students may select a project related to any of the subjects of the current semester.
Practical will be based on Advanced Computer Network.

Practical will be based on Multimedia Applications.

Practical will be based on Electives

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

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.

Practical training conducted after sixth semester will be evaluated in the Seventh Semester based on Viva-Voce.
INTRODUCTION TO PAPER SETTERS:

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:

REFERENCE BOOKS:
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 ad 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:

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INSTRUCTIONS TO PAPER SETTERS: MAXIMUM MARKS: 75

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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
[No. of Hrs.: 11]

UNIT – II

[No. of Hrs.: 11]


UNIT – III
[No. of Hrs.: 11]


UNIT – IV

Application of Fuzzy Logic: Medicine, Economics etc.

Genetic Algorithm: An Overview, GA in problem solving, Implementation of GA  
[No. of Hrs.: 11]

TEXT BOOKS:

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

TEXT BOOKS:

REFERENCES BOOKS:
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 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, Shopping techniques and online selling techniques; Internet tools.

Electronic Commerce Online Resources and Guide to the CD-ROM

[No. of Hrs.: 11]

UNIT – III


[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


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

REFERENCE BOOKS:
UNIT – I


Block Ciphers – DES and variant, modes of use of DES. [No. of Hrs.: 11]

UNIT – II
Public Key systems – Knacksack systems – RSK – Diffle 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.
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:
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


[No. of Hrs.: 11]

UNIT - IV

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


[No. of Hrs.: 11]

TEXT BOOKS:


REFERENCE BOOKS:

Practical will be based on Embedded System.

Practical will be based on ELECTIVES

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.