## Chhattisgarh Swami Vivekanand Technical University, Bhilai

### SCHEME OF TEACHING AND EXAMINATION

#### B.E. VIII SEMESTER ELECTRICAL ENGINEERING

<table>
<thead>
<tr>
<th>S.N o.</th>
<th>Board of Studies</th>
<th>Subject Code</th>
<th>Subject</th>
<th>Periods per week</th>
<th>Scheme of Exam</th>
<th>Total Marks</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>L</td>
<td>T</td>
<td>P</td>
<td>ESE</td>
</tr>
<tr>
<td>1</td>
<td>Electrical Engg.</td>
<td>324811 (24)</td>
<td>Modern Control System</td>
<td>4</td>
<td>1</td>
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<td>80</td>
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<tr>
<td>2</td>
<td>Electrical Engg.</td>
<td>324812 (24)</td>
<td>Utilization of Electrical Energy</td>
<td>3</td>
<td>1</td>
<td>-</td>
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<td>3</td>
<td>Electrical Engg.</td>
<td>324813 (24)</td>
<td>Installation Maintenance &amp; Testing of Electrical Equipments</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>80</td>
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<tr>
<td>4</td>
<td>Refer Table -3</td>
<td>Elective-III</td>
<td></td>
<td>4</td>
<td>1</td>
<td>-</td>
<td>80</td>
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<tr>
<td>5</td>
<td>Refer Table -4</td>
<td>Open Elective-IV</td>
<td></td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>80</td>
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<tr>
<td>6</td>
<td>Electrical Engg.</td>
<td>324821 (24)</td>
<td>Installation Maintenance &amp; Testing of Electrical Equipments, Lab</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>40</td>
</tr>
<tr>
<td>7</td>
<td>Electrical Engg.</td>
<td>324822 (24)</td>
<td>Utilization of Electrical Energy Lab</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>40</td>
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<tr>
<td>8</td>
<td>Electrical Engg.</td>
<td>324823 (24)</td>
<td>Computer Simulation Lab</td>
<td>-</td>
<td>-</td>
<td>4</td>
<td>40</td>
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<tr>
<td>9</td>
<td>Electrical Engg.</td>
<td>324824 (24)</td>
<td>Major Project</td>
<td>-</td>
<td>-</td>
<td>6</td>
<td>100</td>
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<tr>
<td>10</td>
<td>Electrical Engg.</td>
<td>300825 (24)</td>
<td>Report Writing &amp; Seminar</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>-</td>
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<tr>
<td>11</td>
<td>Library</td>
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<td>-</td>
<td>-</td>
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<tr>
<td><strong>Total</strong></td>
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<td></td>
<td></td>
<td><strong>18</strong></td>
<td><strong>3</strong></td>
<td><strong>19</strong></td>
<td><strong>620</strong></td>
</tr>
</tbody>
</table>

- **L** – Lecture,
- **T** – Tutorial,
- **P** – Practical,
- **ESE** – End Semester Exam,
- **CT** – Class Test,
- **TA** – Teacher’s Assessment

### Table -III

#### Electives-III

<table>
<thead>
<tr>
<th>Board of Studies</th>
<th>Subject Code</th>
<th>Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Electrical Engg.</td>
<td>324871 (24)</td>
<td>EHV AC&amp;DC Transmission</td>
</tr>
<tr>
<td>2. Electrical Engg.</td>
<td>324872 (24)</td>
<td>Flexible AC transmission System</td>
</tr>
<tr>
<td>3. Electrical Engg.</td>
<td>324873 (24)</td>
<td>Bio Medical Instrumentation</td>
</tr>
<tr>
<td>4. Electrical Engg.</td>
<td>324874 (24)</td>
<td>Micro controller &amp; Embedded system</td>
</tr>
<tr>
<td>5. Electrical Engg.</td>
<td>324875 (24)</td>
<td>VLSI Design</td>
</tr>
<tr>
<td>6. Electrical Engg.</td>
<td>324876 (24)</td>
<td>Artificial Neural Network &amp; Fuzzy Logic</td>
</tr>
<tr>
<td>7. Electrical Engg.</td>
<td>324877 (24)</td>
<td>Radar &amp; Television</td>
</tr>
<tr>
<td>8. Electrical Engg.</td>
<td>324878 (24)</td>
<td>Satellite Communication</td>
</tr>
</tbody>
</table>

**Note (1)** – 1/4th of total strength of students subject to minimum of twenty students is required to offer an elective in the college in a particular academic session.

**Note (2)** – Choice of elective course once made for an examination cannot be changed in future examinations.
### Table –IV

#### Elective -IV

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Board of Studies</th>
<th>Code</th>
<th>Name of Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Management</td>
<td>300881 (36)</td>
<td>Enterprise Resource Planning</td>
</tr>
<tr>
<td>2</td>
<td>Information Technology</td>
<td>300882 (33)</td>
<td>E-Commerce &amp; strategic IT</td>
</tr>
<tr>
<td>3</td>
<td>Management</td>
<td>300883 (36)</td>
<td>Technology Management</td>
</tr>
<tr>
<td>4</td>
<td>Information Technology</td>
<td>300884 (33)</td>
<td>Decision Support &amp; Executive Information system</td>
</tr>
<tr>
<td>5</td>
<td>Computer Science &amp; Engg.</td>
<td>300885 (22)</td>
<td>Software Technology</td>
</tr>
<tr>
<td>6</td>
<td>Management</td>
<td>300886 (36)</td>
<td>Knowledge Entrepreneurship</td>
</tr>
<tr>
<td>7</td>
<td>Management</td>
<td>300887 (36)</td>
<td>Finance Management</td>
</tr>
<tr>
<td>8</td>
<td>Management</td>
<td>300888 (36)</td>
<td>Project Planning, Management &amp; Evaluation</td>
</tr>
<tr>
<td>9</td>
<td>Mechanical Engg.</td>
<td>300889 (37)</td>
<td>Safety Engineering</td>
</tr>
<tr>
<td>10</td>
<td>Computer Science &amp; Engg.</td>
<td>300890 (22)</td>
<td>Bio Informatics</td>
</tr>
<tr>
<td>11</td>
<td>Mechanical Engg.</td>
<td>300891 (37)</td>
<td>Energy Conservation &amp; Management</td>
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<tr>
<td>12</td>
<td>Nanotechnology</td>
<td>300892 (47)</td>
<td>Nanotechnology</td>
</tr>
<tr>
<td>13</td>
<td>Management</td>
<td>300893 (36)</td>
<td>Intellectual Property Rights</td>
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<tr>
<td>14</td>
<td>Mech. Engg.</td>
<td>300894 (37)</td>
<td>Value Engineering</td>
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<tr>
<td>15</td>
<td>Civil Engg.</td>
<td>300895 (20)</td>
<td>Disaster Management</td>
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<tr>
<td>16</td>
<td>Civil Engg.</td>
<td>300896 (20)</td>
<td>Construction Management</td>
</tr>
<tr>
<td>17</td>
<td>Civil Engg.</td>
<td>300897 (20)</td>
<td>Ecology and Sustainable Development</td>
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<tr>
<td>18</td>
<td>Chem. Engg.</td>
<td>300898 (19)</td>
<td>Non Conventional Energy Sources</td>
</tr>
<tr>
<td>19</td>
<td>Electrical Engg.</td>
<td>300899 (24)</td>
<td>Energy Auditing and Management</td>
</tr>
</tbody>
</table>

**Note (1)** – 1/4<sup>th</sup> of total strength of students subject to minimum of twenty students is required to offer an elective in the college in a particular academic session.

**Note (2)** - Choice of elective course once made for an examination cannot be changed.
UNIT I: Non-Linear Control System

UNIT II: State Space Analysis

UNIT III: Control System Design By State Space:
Pole placement design, Ackermann’s Formula for Pole Placement, design of full and reduced order state observers, design of Servo system.

UNIT IV: Discrete System Control:
Introduction, Impulse sampling and Data Hold, Reconstructing Original signals from Sampled signals, The Pulse Transfer Function, Mapping between the s Plane and the z Plane, Dominant characteristic Equation Roots, Stability Analysis using Bilinaer transformation Method and Jury’s stability test.

UNIT V: Optimal Control Systems:

Text Books:

Reference Books:
1) Modern Control Engineering, Roy Choudhary, PHI.
3) Control Engineering Theory and Practice by M.N. Bandhopadhyay, PHI.
**UNIT I: Electric Drives**
Basic concept of electric drives, choice of electric drives, fundamental torque equation, speed torque converter and multi quadrant operation, equivalent values of drive parameters, concept of load torque, calculation of time and energy loss in transient operation, steady state stability and load equalization.

**UNIT II: Control Of Electric Drives**
Modes of operation, classification of drives, closed loop control of drives, current, torque speed, position etc. Controllers PI, PID, PLL, Heating and Cooling of motors, Selection of motor power rating under different loading conditions, Continuous, Short and Intermittent periodic duty, Review of torque speed characteristics of AC and DC motors.

**UNIT III: AC Drives**
Induction motor drives, Review of conventional method of Starting, Braking and Speed control, Voltage source inverter (VSI) and Current source inverter (CSI) fed three-phase induction motor drives, Cycloconverter fed drives, Static Kramer & Scherbius drives.
Synchronous motor drives: Speed control of synchronous motor using voltage and current source inverters, Self controlled synchronous motor drives employing load commuted thyristor inverter.

**UNIT IV: Traction drives**
Nature of traction load, Important feature of traction drives, Motors employed in traction, Conventional method for AC and DC traction drives control, Semiconductor converter controlled drives employing DC motors, AC motors for 25 KV AC traction.
Heating and welding: Types of electric heating, resistance ovens, Induction heating, dielectric heating, Arc furnace, Resistance welding and Arc welding.

**UNIT V: Illumination & Energy Conservation**

**Text Books:**

**Reference Books:**
2. “A first course on Electric drives” S K Pillai, University press.
Unit-1 Overview of Site Management, Electrical Safety
Introduction to Site activities; Civil works, Erection, Testing & Commissioning, Operation and Maintenance, Type and Scope of Maintenance, Advantages of programmed preventive maintenance, Safety management, Electrical shocks, Recommended safety precautions against electrical shocks in LV and HV installations, Safety procedure during commissioning phase and Operation & maintenance phase.

Unit 2 - Transformer I.M.T.
Important steps in maintenance of power transformer, maintenance schedule for attended and unattended transformer, causes of troubles and failure of power transformer, Dispatch and shipping, inspection, storage, procedure of filling oil in transformer tank, drying out, various commissioning tests on a power transformer, typical maintenance schedule for transformer up to 1000 KVA and above 1000KVA, transformer oil filtration.

Unit 3 - Switchgear, Circuit Breaker I.M.T.
Introduction to switchgears and equipments in substation and their functions, Type tests, routine test and commissioning tests, high/low voltage ac circuit breakers (Air, Oil, Vacuum, SF6) possible troubles, causes and remedial actions for outdoor circuit breakers, maintenance of CB (Air, Oil, Vacuum, SF6), Trouble shooting of substation equipments.

Unit 4 - Rotating Machines I.M.T.
Standard designation for cooling and degree of protection, Installation and commissioning of introduction motor and rotating machines, drying out of electrical rotating machines, installation resistance measurements, Mechanical maintenance of rotating machines, Care, servicing and maintenance of motor, Troubles, causes, remedies and protective devices during respective abnormal condition in low voltage induction motor, Testing of induction motors.

Unit 5 – Hotline Maintenance
Meaning and advantages of hot-line maintenance. Special type non conductig materials used for preparing tools for Hot line maintenance, Tools, Various types of Hot-line operations, safety during Hot line maintenance.

Text Books:

Reference Books:
Installation maintenance and testing vol. I & II B.V.S. Rao
Installation maintenance and testing of Electrical Equipments by Tarlok S
UNIT – I
Constitution of EHV AC and DC Links, Kind of DC Links, Limitations and advantages of AC and DC Transmission, Principal application of AC and DC Transmission, trends EHV AC and DC Transmission, Power-handling capacity, Converter analysis Garentz circuit, Firing control, overlapping.

UNIT – II
Extra long distance lines, Voltage profile of loaded and unloaded line along the line, Compensation of lines, series and shunt compensation, Shunt reactors, Tuned power lines, Problems of extra long compensated lines, FACT concept and application.

UNIT – III
Traveling waves on transmission systems, Their shape, attenuation and distortion, effect of junction and termination on propagation of traveling waves, Over voltages in transmission system, Lightning, switching and temporary over voltage: Control of lighting and switching over voltages.

UNIT – IV
Components of EHV dc system, converter circuits, rectifier and inverter valves, Reactive power requirements, harmonics generation, adverse effects, Classification, Remedial measures to suppress, filters, Ground return, Converter faults & protection harmonics misoperation, Commutation failure, Multi-terminal D.C. lines.

UNIT – V
Control of EHV dc system desired features of control, control characteristics, constants current control, Constant extinction angle control, Ignition angle control, parallel operation of HVAC & DC system, Problems and advantages.

Textbooks:
1. Begmudre, EHV AC Transmission.
2. Kimbark, HVDC Transmission.

Reference Books:
2. Arritilaga, HVDC Transmission.
Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 8th
Subject: Flexible A C transmission System
Total Theory Periods : 50
Total Marks in End Semester Exam: 80
Minimum number of Class tests to be conducted: 2

Branch: Electrical Engg.
Code: 324872 (24)
Total Tut Periods : 12

Flow of power in AC system, loading capability, controllable parameters, basic types of FACTS controllers, review of semi-conductor devices (diodes, SCR's, MOSFET's, IGBT's etc.)

UNIT II: Voltage Source Converters (VSC)
Basic concepts of VSC, single-phase full wave bridge converter operation, single phase-leg operation, three-phase full wave bridge converter and its operation, transformer connections for 12-pulse, 24-pulse and 48-pulse operation.

UNIT III: Current source converters (CSCs)
Basic concepts, three-phase CSCs, three-phase full wave rectifier, comparison of VSC and CSC.
Static shunt compensators: basic concepts, method of controllable VAR generation, Static VAR compensator (SVC), application of SVC in power systems.

UNIT IV: Static Synchronous Series Compensator (STATCOM)
Introduction, mathematical model, working of STATCOM, V-I and V-Q characteristics, transient stability enhancement and exchange of real power using STATCOM, comparison of SVC and STATCOM, Merits of hybrid compensators.

UNIT V: Static Series Compensators
Objectives of series compensation, variable impedance type series compensation, GTO thyristor controlled series capacitors (GCSC), thyristor controlled series capacitor (TCSC), basic concepts of GCSC and TCSC. Introduction to Unified Power Flow Controller (UPFC)

Text Books:
1. Understanding FACTS by Hingorani.
2. Thyristor controlled FACTS devices, Mathur

Reference Books:
1. FACTS for Transmission lines, Song, Yu.
Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 8th                                                                 Branch: Electrical Engg.
Subject: Bio-Medical Instrumentation                                           Code: 324873 (24)
Total Theory Periods: 50                                                      Total Tut Periods: 12
Total Marks in End Semester Exam: 80                                           Minimum number of Class tests to be conducted: 2

Unit-I
Brief introduction to human physiology, Basic components of bio-medical instruments, bioelectric signals, action potentials, Bio-electrodes.

Unit-II
Biomedical Transducers: displacement, velocity, force, acceleration, flow, temperature, potential, dissolved ions & gases, Analysis of EEG, ECG, EMG, EOG, & Bio-Potential Amplifiers for ECG, EMG, EEG, etc.

Unit-III
Patient care & monitoring system, Remote monitoring through telephone, Internet, Satellite link.

Unit-IV
Cardiovascular measurement-blood pressure, blood flow, stroke volume, Impedance Plethysmography, Cardiac output, heart sound etc. Instrumentation for respiratory & nervous systems.

Unit-V
Safety aspects associated with Biomedical Instrumentation. Recent advances in Bio-Medical Instrumentation, Microprocessor based systems, Laser & optical Fiber systems.

Text books:
1. Biomedical Instruments & Measurements, Leslie Cromwell, Fred J.Weibell, Erich A.Pfeiffer,
2. P E Handbook of Biomedical Instrumentation, R.S.Khandpur, TMH

Reference books:
1. Biomedical Instrumentation, Arumungam, Anuradha Agencies.
2. Introduction to biomedical engineering, Domach, Pearson Education.
Unit –I
Introduction to 8051 family, introductions to general-purpose microprocessor, Micro controller for embedded for system. A brief history of 8051, 8052, 8751, AT8951, pin configuration of 8051, 89C52RD2.

Unit-II
Instruction set, 8051 assembly language programming, Internal Structure of 8051, power resetting, Built up RAM & ROM, I/O programming and addressing modes.

Unit-III
Counter and Timer details, Counter and Timer programming using 8051, interrupt programming, Types of Interrupt.

Unit-IV
Asynchronous serial communication, Data programming, RS232 standard, RS422 standard, 1488 &1489 standard, GPIB, MAX232 Driver, serial communication programming.

Unit-V
ADC & DAC interfacing, stepper motor interfacing, Keyboard interfacing Memory interfacing, embedded design concept, embedded design card, 8096 Architecture.

Textbooks:
1. 8051 programming, interfacing and Application K J Ayala, Penram; TMH
2. 8051 Micro controller & Embedded System: Muhanmmed Ail Mazidi And Janice Gillispie Mazidi
4. Embedded System, Raj Kamal; TMH

Reference Books:
1. Programming and customizing the 8051 micro controller, Predko:TMH
2. Hand book of micro controller, Myke Predko;MH
3. Embedded System,Design: Frank Vihid/Tony Givargis
Unit-I: Overview of VLSI Design Methodology
VLSI design process-Architectural design-Logical design-Physical design-Layout styles-Full custom-semi custom approaches. Basic Electrical properties of MOS & CMOS circuits: NMOS enhancement transistor-PMOS enhancement transistor-threshold voltage-threshold voltage equations-MOS devices equations-Basic DC equations-Second order effects-MOS modules-small signal AC characteristics --NMOS inverter-Steered input to an NMOS modules-Depletion mode & enhancement mode pull ups-CMOS inverter-DC characteristics-Inverter delay-pass transistor- transmission gate

Unit-II: VLSI Fabrication Techniques
An overview of wafer fabrication --wafer Processing-Oxidation-Patterning- Diffusion –Ion implantation-Deposition- Silicon gate NMOS process-CMOS processes-Nwell-Pwell-Wintub-Silicon on insulator- CMOS process enhancement-Interconnect-Circuit elements.

Unit-III: Layout Design Rules
Need for design rules-Mead Conway design rule for the silicon gate NMOS process-CMOS Nwell/Pwell design rules-Simple layout examples-sheet resistance-area Capacitance-Wiring Capacitance-drive large capacitive loads

Unit-IV: Logic Design
Switch logic-pass transistor & transmission gate-Gate logic-Inverter-two point, NAND gate-NOR gate-other forms of CMOS logic-Dynamic CMOS logic-clocked CMOS logic-Precharged domino CMOS logic-structured design-simple combinational logic design examples-Parity generator-Multiplexes-clockeds sequential circuits-two phase clocking-charge storage-dynamic register element-NMOS &CMOS- dynamic shift register-semi static register-JK flip flop circuit.

Unit-V: Subsystem Design Process
Design of a 4 bit shifter-General arrangement of a 4 bit arithmetic processor-Design of a ALU subsystem-Implementing ALU functions with an adder-Carry look ahead adders-Multipliers-serial parallel multipliers-Pipelined multiplier array-Modified Booth’s Algorithm

Text Books:
3. Amar Mukherjee, “Introduction to NMOS & CMOS VLSI system design” Prentice Hall, USA, 1986

Reference books:
Unit-I
Introduction to Network Architecture, Learning Processes, Single Layer Perceptions, Multilayer Perceptions

Unit-II
Radial –Basis Function Networks, Support Vector Machines, Committee Machines

Unit-III
Principal Components Analysis, Self-Organising Maps, Information-Theoretic Models

Unit-IV
Stochastic Machines & their Approximates Rooted: Statistical Mechanics, Euro-dynamic Programming, Temporal Processing Using feed-forward Networks, Neuro-dynamics, and Dynamically Driven Recurrent Networks

Unit-V
Fuzzy Systems, Fuzzy sets & Relations, Fuzzy-To –Crisp Conversion, Simple Application of Fuzzy Systems

Text Book:

Reference Books:
Unit 1
Principal & application: Basic Radar, radar block diagram, radar frequencies, application of radar, radar range equation, probabilities of false alarm, integration of radar pulses, radar cross-section of targets

Unit II: Types of radar system operation with application
Pulse, CW, MTI radar stacking radars, basics of radar Navigational aids

Unit III: Types of antennas display
Parabolic, cosecant square antenna, Radomes, A scope display, B scope, E&F scope displays, Plain position indicator

Unit IV: Fundamental of TV & TV standard
Sound and picture transmission, the scanning process, camera pick-up device, video signal, principle and working of colour television, colour fundamental mixing of colors and colours and colour perception, colour TV Camera. Horizontal and vertical sync and Blanking standards, standard channels characteristics, consolidated CCIR system –B standard, various television broadcast systems.

Unit V: TV Transmission and receiver
Requirements of TV broad –cast transmission, design principle of transmission, design principle of TV transmitters, Visual and aurual exciter, transmitting antennas.
 Receivers: - Block schematic and functional for mono chromatics and colour TV receiver in India

Textbooks:
1. Radar system & Radio aids to Navigations. A K Sen Khanna pub
2. Television and video Engg. by A.M Dhake, TMH publication
3. Microwave & Radar Engineering, Kulkarni, Umesh pub

Reference Books:
1. Introduction to Radars, Skolnik, TMH
Unit –I Introduction:
Synchronous satellite; Synchronous orbit, orbital parameter, satellite location with respect to earth; Look angles; Earth coverage and slant range; Eclipse effect; satellite frequency allocation and band spectrum; General And technical characteristic of satellite communication system; Advantage of satellite communication; Active and Passive satellite systems; current trends in satellite communication.

Unit –II Communication satellite link design:
Link design equation; system noise temperature; C/N, G/T ratio; Atmosphere and ionosphere effect on link design; Uplink design; complete link design interferences effect of complete link design Earth Station parameter, satellite communication link Analog base band Signals; FDM Techniques; SNR and CNR in FM in satellites link SNR in FM with multiplexed telephone signals; SCPC system CSSB system; Analog FM/FDM TV satellites link; inter modulation effects in FM/FDM system; Energy dispersal in FM/FDM signals; Design base band signals; K digital satellite design.

Unit III Multiple Access Techniques:
TDMA Frame and burst structure; Frame Efficiency; Superfarme: TDMA Frame acquisition and synchronization; FDMA compared to TDMA: TDMA burst TME plan multiple beam TDMA satellite system; beam hopping TDMA; CDMA and hybrid access techniques; CSMA

Unit IV Communication Satellite Subsystem:
Power supply; Attitude and orbit control; Propulsion subsystem; Repeaters; Antenna subsystem; TTC subsystem; Thermal sub system structure subsystem: Reliability of satellites subsystem.

Unit –V Satellite Earth stations:
Earth stations design requirements; Earth stations subsystem; Monitoring and control; Frequency coordination; small earth station VSAT; Mobile and transport station; TVRO system.

Textbooks:
1. Satellite communication, Timothy Pratt, Jhn Wiley & sons.

Reference Books:
2. Satellite communication, Robert M. Gagliardi, CSB Publishers & Distributors.
List of Experiments: (To be performed minimum 10 experiments)

(1) Testing of wiring installation.
(2) Calibration of Energy meter.
(3) Calibration of Ammeter & Voltmeter.
(4) Current Transformer Testing.
(5) Potential Transformer Testing.
(6) Relay Testing.
(7) Earthing installation and Earth Resistance determination.
(8) Calibration of Wattmeter.
(9) Routine Test on Motors.
(10) Installation of Induction motor.
(12) Insulating Oil Test.
(13) Testing of Cable.
(14) Testing of Induction Motor as per I.S. Codes

Apparatus Required:
1. CT, PT
2. Energy meters
3. Ammeter, Voltmeter
4. Induction motor
5. Megger
6. Circuit breaker
7. Cables
8. Relays

Reference Books:
1. A course in electrical and electronic measurement and instrumentation, Sawhney.
List of Experiments: (To be performed minimum 10 experiments)

1. To derive the transfer function of an armature controlled separately exited dc motor and to verify how the change in-applied voltage affects the motor speed by simulator.
2. To derive the transfer function of a field controlled separately excited dc motor and to verify how the change in field current affects the motor speed by simulator.
3. To study the different types of dc motor binding.
4. To study the speed control of separately excited dc motor using proportional control and turbo feedback.
5. To study the speed control of separately excited dc motor using proportional integral controllers.
6. To study the binding methods of three phase induction motor.
7. To study the performance of V S I fed three phase induction motor using spwm technique keeping voltage / frequency constant using simulator.
8. To study the speed control of a three phase induction motor using static voltage controllers for (1) constant \( T_h \), (2) \( T_h = k \omega_r^2 \)
9. To analyze the speed control of a three phase wound rotor induction motor using external capacitor on rotor side.
10. To study frequency control synchronous motor drive.
11. To Study the heating time constant for a short time duty motor.
12. To Study the heating time constant for a controls duly motor.
13. To study the cooling time constant for a intermittent duty motor.
14. To study the cooling time constant for a short time duty motor.

Reference Books:

List of Experiments: (To be performed minimum 10 experiments)

1. Simulation of different types of controllers (PID, PLL, PI)
2. Simulation for the addition of poles and zeros in a given transfer function.
3. Simulation of different types of filters.
4. Simulation of the performance of a full wave bridge rectifier for RL load and RLE load.
5. Simulation of step up and step down choppers.
7. Simulation and modeling of synchronous machine. ($X_d, X_{d'}$ etc calculation)
8. Write a MATLAB program for Computation of Real, Reactive power and line loss.
9. Write a MATLAB program to Plot V and inverted V curve.
10. Write a MATLAB program for Transformer parameter calculation.
12. Write a MATLAB program for Load flow solution by Gauss Seidal method.
13. Write a MATLAB program for Load flow solution Load flow solution by Newton Raphson Method.
14. Write a MATLAB program for Economic load dispatch calculation.
15. Write a MATLAB program for load frequency control.

Requirements For the simulation lab:

MATLAB 6.1 or MATLAB 6.5 or MATLAB 7.0 version.

Reference books:

1. Power system analysis, Haddi Saddat.
2. Introduction to MATLAB, Palm.
Unit - I

Unit - II
Correspondence: Memos, Letters, E-mails, Its differentiation, types of letters, Document Design, its importance, Electronic Communication: Internet, Intranet, extranet, Writing effective e-mail.

Unit - III
Summary: Report Strategies, Effective style of technical report writing: Structures: content, introduction, conclusions, references, etc., Presentation, Writing first draft, revising first draft, diagrams, graphs, tables, etc. report lay-out.

Unit - IV

Unit - V
Proposals & Presentation: Title page, Cover letter, Table of Content, list of illustrations, summary, discussion, conclusion, references, glossary, appendix, Case Studies. Oral Presentation/ Seminar:

Text Books:

Reference Books:
1. Sunita Mishra, "Communication Skills for Engineers" Pearson Education
2. Davies J.W. "Communication for engineering students", Longman
UNIT-I

Conceptual foundation of Business Process reengineering: Role of information Technology and BPR; Process improvement and Process redesign, Process identification and mapping; Role/Activity diagrams, Process Visioning, and benchmarking.

[No of Periods: 8 + 2]

UNIT -2

Enterprise Resource Planning: Evolution of ERP- MRP and MRP II, structure of ERP- two tier architecture, three tier architecture, Electronic data processing, management information system, Executive information system, ERP as an integrator of information needs at various Levels.

[No of Periods: 8 + 2]

UNIT -3

Typical Business Processes: Core processes, Product control, Sales order processing, Purchases, Administrative processes, Human resource, Finance support processes, Marketing, Strategic planning, Research and development, Problems in traditional view.

[No of Periods: 8 + 2]

UNIT -4

ERP models/functionality: Sales order processing, Production scheduling, forecasting, distribution, finance, features of each of the models, description of data flow across each module, overview of supporting databases & packages.

[No of Periods: 8 + 2]

UNIT -5

ERP implementation issues: Opportunities and problems in ERP selection, and implementation; ERP implementation: identifying ERP benefits, team formation, Consultant intervention, Selection of ERP, Process of ERP.

[No of Periods: 8 + 2]

Books:
1. V.K. GARG & N.K. VENKATKRISHNAN:, ERP, Concepts and Practices, PM
2. Rahul V. Altekar, Enterprise wide Resource Planning-theory and practice, PHI

References:
1. ALEXIS LEON: Enterprise Resource Planning, TMH
2. S. SADAGOPAN: MIS, PM
3. V. RAJARAMAN: Analysis and Design of Information Systems, PHI
4. MONK & BRADY: Concepts in ERP, Vikas pub, Thomson
UNIT – I

UNIT – II
Network Infrastructure : LAN, Ethernet(IEEE standard 802.3) LAN , WAN , Internet, TCP/IP Reference Model, Domain Name Server , Internet Industry Structure,

UNIT – III
Electronic payment systems, types of electronic payment systems, digital token-based electronic payment systems, smart cards & electronic payment systems, credit card based electronic payment systems, risk and electronic payment systems, designing electronic payment systems.

UNIT – IV
Information Distribution and Messaging: FTP,E-Mail,WWW server,HTTP, Web service implementation, Information publishing , Web Browsers, HTML, Common Gateway Interface

UNIT – V
Mobile & wireless computing fundamentals, mobile computing framework, wireless delivery technology and switching methods, mobile information access devices, mobile data internetworking standards, cellular data communication protocols, mobile computing applications, personal communication service.

BOOKS :
1. Frontiers of E-commerce by Kalakota & Whinston (Addison-wesley) E-business roadmap for success by Dr. Ravi Kalakota & Marcia Robinson (addision wesicy)
2. Electronic Commerce By Bharat Bhasker (TMH)
CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI  
(C.G.)

Semester: VIII  
Subject Name: Technology Management  
Total Theory periods: 40  
Total Marks in End Semester Exam: 80  
Minimum number of class tests to be conducted: 02

Branch: Common to All Branches
Subject Code: 300883 (36)  
Total Tutorial periods: 10

Unit I
Technology: - Definitions, Types and Characteristics, Management of Technology (MOT), Technological Environment, Parameters of Technological Environment; Science & Technology in India.  
[No of Periods: 8 + 2]

Unit II
[No of Periods: 8 + 2]

Unit III
Technology life cycle, Technology evolution and S-curves of Technology Evolution, Technology Diffusion, Dynamics of Diffusion, Mechanism of Diffusion.  
[No of Periods: 8 + 2]

Unit IV
Technology strategies & Intelligence: Technology Strategy & types, Models for technology strategy formulation Definition of Technology Intelligence, Technology Audit, Process of Technology Intelligence: Technology Scanning, Monitoring, Forecasting and Assessment.  
[No of Periods: 8 + 2]

Unit V
Acquisition and technology transfer. Over view of - GATT, Intellectual property rights (IPR)  
[No of Periods: 8 + 2]

Texts Books:

Reference Books:
3. Plsek, Creativity, Innovation and Quality, PHI
CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VIII                          Branch: Common to all Branches
Subject: Decision Support and Executive Information System Code: 300884(33)
Total Theory Periods: 50                     Total Tut Periods: Nil.
Total Marks in End Semester Exam: 80.
Minimum number of class tests to be conducted: 02.

UNIT-I Decision Support System:
What is a DSS, Decision Making, Rational Decisions, Definitions of Rationality, Bounded Rationality and Muddling Through, The Nature of Managers, Appropriate Data Support, Information Processing Models, Group Decision Making?

UNIT-II Component OF DSS:
Data Component: Information and its Usefulness, Characteristics of Information, Databases to Support Decision Making, Database Management Systems, Data Warehouses, Data Mining and Intelligent Agents
Mail Component: Integration of Mail Management Examples of Use implications for DSS.

Unit-III Intelligence and Decision Support Systems:

Unit-IV Designing A DSS: Planning for DSS, Designing a Specific DSS, Interviewing Techniques, Other Techniques, Situational Analysis Design Approaches, Systems Built from Scratch, Using Technology to Form the Basis of the DSS, Evaluating a DSS Generator, Using a DSS Generator, The Design Team, DSS Design and Re-engineering Discussion.


Name Of Text Books:
Decision Support System By Vicki L Sauter
Management Information system-Gerald V. Post & David L. Anderson
CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VIII Branch: Common to All Branches.
Subject: Software Technology Code: 300885 (22)
Total Theory Periods: 4 per week. Total Tut Periods: Nil.
Total Marks in End Semester Exam: 80.
Minimum number of class tests to be conducted: 02.

UNIT-1
ASSEMBLY LANGUAGE PROGRAMMING
Pentium Assembly languages-Registers, Memory Model, Addressing mode, 1source Link, Installation, Assembler Directives.
ASSEMBLER DESIGN

UNIT-2
LINKERS
Linking -Combining Object Modules, Pass I, Pass II; Library Linking; Position Independent Code (PIC); Shared Library Linking.
LOADERS- Binary Image; Types of Loaders.

UNIT 3
MACROPROCESSORS
Macro in NASM- Local Labels in Macro Body, Nested Macros.; Design of Macroprocessors – Major Data Structures, Macroprocessing Technique, Simple macroprocessors without nesting, Nested calls & definitions

UNIT – 4
COMPILERS
Lexical Analysis; Syntax Analysis; Intermediate Code Generation; Target Code Generation; Optimizing Transformation

UNIT – 5
TEXT EDITORS
Design of a Text Editor ; Data Structures for Text Sequences; Text Document Design; Text view Design
DEBUGGER
Features; Breakpoint mechanism; Hardware support; context of Debugger; Check pointing & reverse Execution

Textbooks
1. SYSTEM SOFTWARE by Santanu Chattopadhyay ; Prentice Hall of India
2. Software Engineering By Roger S Pressman ; Mc-Graw Hill

References
1. Foundations of Software Technology and Theoretical Computer Science, By V. (Venkatesh) Raman: Springer
2. Software Visualization by John Stasko; MIT press
3. Software Engineering By Rajib Mall : PHI
Unit – I
Introduction: Entrepreneurship in Knowledge economy, abundant & accessible information, implication, impact & consequence, knowledge based opportunities, aims, scope, and objectives.

Unit-II
Managing knowledge & intellectual capital:
Knowledge management, loss of knowledge, knowledge implementation, knowledge creation, property intellectual capital.

Unit-III
Contemporary information problems:
Information overload, winning & losing barrier to entry, emerging issues, customers, investors, myth of inevitable program.

Unit-IV
Creating enterprise cultures:
Working with employer, organizing for entrepreneurship, unity & diversity, ten essential freedoms, freedom of operation, effective issue monitoring, establish search criteria.

Unit-V
Becoming a knowledge entrepreneur:
Entrepreneur qualities, knowledge entrepreneur, challenge of launching new product, creating launch support tool, examples of best practice.

Text & Reference Books
Amrit Tiwana, The Knowledge Management tool kit, Pearson Education.
Lunlin Conlson, Knowledge Entrepreneur, Thomas Press.
Catheriue L Mann, Knowledge entrepreneurship, Oxford.
Heinke Robkern, Knowledge entrepreneurship,
Bonnie Montano, Knowledge Management, IRM Press, London.
UNIT I
Financial Management –an overview: Introduction, finance and other disciplines, objectives and scope of financial management, role and responsibility of finance manager.
[No of Periods: 8 + 2]

UNIT II
Working capital management-nature, need, importance and concept of working capital, trade off between profitability and risk, Determining finance mix.
[No of Periods: 8 + 2]

UNIT III
Inventory management-Introduction, objectives, ordering cost, carrying cost, lead time, economic order quantity and safety stock, deterministic model.
[No of Periods: 8 + 2]

UNIT IV
Management of cash-introduction motives for holding cash, objectives of cash management and technique/process of cash management.
[No of Periods: 8 + 2]

UNIT V
Receivables management-introduction, objectives, credit terms, credit policies and collection policies.
[No of Periods: 8 + 2]

Text books:
Basic financial management, M Y Khan and P K Jain, TMH
Financial Management, I M Pandey.

References books:
Financial management and policy, V K Bhalla, Anmol publications pvt. Ltd.
Financial management, Van Horne.
UNIT I
Identification of projects-generation and screening of idea, monitoring corporate appraisal, preparing project profiles and project rating index.

UNIT II
Feasibility studies: Market and demand analysis, technical analysis, financial analysis and economic viability.

UNIT III
Project appraisal: Criteria, net present value, internal rate of return, payback period and accounting rate of return method.

UNIT IV
Project management and implementation-
Project planning, project control, prerequisites of implementation. Network techniques of project management-Project evaluation and review technique (PERT) and critical path method (CPM).

UNIT V
Project review and control-
Initial review, performance evaluation, abandonment analysis and its behavioral issues.

Text books:
Project planning, analysis, selection, implementation and review by Prasanna Chandra, TMH.
Reference Books:
Project management-Dr. Harold Kerzner.
Total Project management-Dr. P K Macmillan.
UNIT – I
Safety Philosophy and principles of Accident prevention
Introduction, accident, injury, unsafe act, unsafe condition, reportable accidents, need for safety, breakdown of accidents, hazardous industries.
Theories & Principle of accidents
Casualty, cost of accident, computation of cost, utility of cost data.
Accident reporting & Investigation
Identification of the key facts, corrective actions, classification of facts.
Regulation
American (OSHA) and Indian Regulation.

UNIT – II
Safety Management
Division of responsibility, Location of Safety function, size of safety department, qualification for safety specialist, safety committee – structure and functions.

UNIT – III
Safe Working Condition and Their Development
SOP for various Mechanical equipments, Incidental safety devices and methods, statutory of provisions related to safeguarding of Machinery and working condition.

UNIT – IV
Safety in Operation and Maintenance
Operational activities and hazards, starting and shut down procedures, safe operation of pumps, compressor, heaters, reactors, work permit system, entry into continued spaces.

UNIT – V
Safety in Storage and Emergency Planning
Safety in storage, handling of chemicals and gases, storage layout, ventilation, safety in chemical laboratories, emergency preparedness on site plan, off site plan, toxic hazard control.

TEXT BOOKS
Safety and Accident Prevention in Chemical Operation – H.H. Faweett and Wood
Personal Protective Equipment – NSC Bombay

REFERENCE BOOKS
Ergonomics - P. Krishna Murthy
Fire Prevention Hand Book – Derek James
UNIT-1
Bioinformatics-introduction, Application, Data Bases and Data Management, Central Dogma; information search and Data retrieval, Genome Analysis and Gene mapping- Analysis, Mapping, Human Genome Project (HGP).

UNIT-2
Alignment of Pairs and Sequences; Alignment of Multiple Sequences and Phylogenetic Analysis; Tools for similarity Search and Sequence Alignment- FASTA BLAST.

UNIT-3
Profiles and Hidden Marcov Models (HMMs); Gene Identification and Prediction-Basics, Pattern Recognition, Methods and Tools; Gene Expression and Micro arrays.

UNIT-4
Protein Classification and Structure Visualization; Protein Structure Prediction; Proteomics; Computational methods-Analysis of Pathways, Metabolic Network Properties, Metabolic Control Analysis, Stimulation of Cellular Activities, Biological Mark Up Languages.

UNIT-5

TEXT BOOKS

II. BIOINFORMATICS by V. R Srinivas, Prentice Hall of India

REFERENCES
1. BIOINFORMATIC COMPUTING by Bergeron, MIT Press.
2. Evolutionary Computation in Bioinformatics, Gary B. Fogel, David W. Corne (Editors), 2002
4. Current Topics in Computational Molecular Biology (Computational Molecular Biology), Tao Jiang, Ying Xu, Michael Zhang (Editors), 2002, MIT Press
UNIT – I
Energy Scenario
Commercial and Non-commercial energy, primary energy resources, commercial energy production, final energy consumption, energy needs of growing economy, long term energy scenario, energy pricing, energy sector reforms, energy and environment, energy security, energy conservation and its importance, re-structuring of the energy supply sector, energy strategy for the future, air pollution, climate change, Energy Conservation Act – 2001 and its features.

UNIT – II
Energy Conservation in Electric Utility and Industry

UNIT – III
Energy in Manufacturing

UNIT – IV
Heat Recovery System

UNIT – V
Energy Conservation Economics
Basic discounting, life cycle costing and other methods, factors affecting economics, energy pricing and incentives for conservation, energy conservation of available work identification of irreversible processes, primary energy sources, Optimum use of prime movers, energy efficient house keeping, energy recovery in thermal systems, waste systems and waste heat recovery in thermal systems, waste heat recovery techniques, conservation in energy intensive industries, thermal insulation.

TEXT BOOKS
2. Energy Management – Paul O’Callaghan –

REFERENCE BOOKS
2. Energy Management in illuminating System – Kao Chen – CRC Publishers
Unit I: Introduction to nanotechnology: background, definition, basic ideas about atoms and molecules, physics of solid state, review of properties of matter and quantum mechanics

Unit II: Preparation of Nanostructured Materials: Lithography: nanoscale lithography, E-beam lithography, dip pen lithography, nanosphere lithography. Sol gel technique Molecular synthesis, Self-assembly, Polymerization


References:
1. Guozhong Cao, “Nanostructures and Nanomaterials”, Imperial College Press, London
Unit-I

Unit-II
Patents: Introduction to patent law and condition for patentability, Procedure for obtaining patents, Rights of a patentee, Patent infringements, Biotechnology patents and patents on computer programs, Patents from an international perspective.

Unit-III
Trademark and ‘geographical Indications: Statutory authorities and registration procedure, Rights conferred by registration, Licensing, assignment and transfer of trademark rights, Trademark infringement, Geographical Indication of Goods & Appellations of Origin.

Unit-IV
Copyright: Registration procedure and copyright authorities, Assignment and transfer of copyright, copyright infringement and exceptions to infringement, Software copyright

Unit-V
Introduction to the law on Industrial Designs, Registration and piracy, International perspective, Introduction to the law on semiconductor layout design, Registration, commercial exploitation and infringement.

Text Books:
2. Kumar K ,Cyber law, intellectual property and e-commerce security, Dominent Publication and distribution, New Delhi.

Reference Books:
1. Inventors Guide to Trademarks and Patents- Craig Fellenstein, Rachel Raison- Pearson Education.
2. Intellectual Property –David Bainbridge, Longman
UNIT – I
Basic Concepts
Meaning of the term value, basic kind, reasons for poor value, value addition, origin and history. Benefits, relevance in Indian scenario.

UNIT – II
Techniques
Different techniques, organizing value engineering study, value engineering and quality.

UNIT – III
Job Plan
Different phases, General phase, Information phase, Functional Phase, Creation Phase, Evaluation Phase, Investigation Phase, Implementation Phase, Audit.

UNIT – IV
Selection of evaluation of VE Projects
Project selection, method selection, value standard, application of methodology.

UNIT – V
Value Engineering Program
VE operations in maintenance and repair activities, VE Cost, life cycle, cost model, training for VE, general value engineering, case studies.

TEXT BOOKS
Industrial Engineering & Management – O.P. Khanna – Dhanpat Rai & Sons

REFERENCES
Compendium on Value Engineering – H.G. Tufty – Indo American Society
Unit 1
Nature of disasters – natural and other disasters, Earthquakes, floods, draught, cyclones, fire and other environmental disasters.

Unit 2
Behaviour of structures in disaster prone areas, Disaster zoning, Hazard assessment, Environmental Impact Assessment

Unit 3
Methods of mitigating damage during disasters, disaster preparedness.

Unit 4
Management systems during disasters, Construction Technology for mitigation of damage of structures.

Unit 5
Short-term and long-term relief measures.

Name of Text Books:
Design of Earthquake Resistant Buildings – Minoru Wakabayashi (McGraw Hill Publication)
Dynamics of Structures: Theory and Application to Earthquake Engineering (2nd edition) – Anil K Chopra (Pearson Education Publication)

Name of Reference Books:
Fundamentals of Vibrations – Anderson, R.A. (Mc Millan)
Earthquake engineering damage assessment and structural design – S.F. Borg
Disasters and development – Cuny F (Oxford University Press Publication)
Unit 1
The Owner's Perspective
Introduction-The project life cycle-Major Types of Construction-Selection of Professional Services-Construction contractors-Financing of constructed facilities-Legal and regulatory Requirements-The changing Environment of the construction Industry-The Role Project Managers

Unit 2
Organizing for Project Management
What is project management? – Trends in Modern Management-Strategic planning and project programming- Effects of project risks on organization-Organization of Project Participants-Traditional designer-Constructor sequence-Professional construction management-Owner-Builders-Construction-Download operation-Leadership and Motivation for the Project team-Interpersonal behaviour in project organization-perceptions of Owners and Contractors

Unit 3
The Design and Construction Process

Unit 4
Labour, Material and Equipment Utilization

Unit 5
Cost Estimation

Name of Text Books:
Project Management: A systems Approach to Planning, Scheduling and Controlling – Harold Kerzner (CBS Publishers & Distributors, Delhi, 1988)

Name of Reference Books:
Construction Project Management – Frederick E.Gould (Wentworth Institute of Technology, Vary E.Joyce, Massachusetts Institute of Technology, 2000)
Unit 1
Nature of ecology and sustainable development
Definition, scope of ecology an sustainable development, geomorphology, oceanography, climatology and biogeography.

Unit 2
Energy and environment
Introduction of energy environment, use of solar cells for heating and operated drills, methane gas digesters, environmentally friendly method of energy conservation, difference between conventional and non-conventional energy sources, future trends of energy systems.

Unit 3
Theory of isostasy
Concept of isostasy for sustainable development, discovery of the concept, concept of Hayford and Bowie, Joly, and Holmes, Global isostatic adjustment.

Unit 4
Physical geography and man human impact on the natural environment
Modification of land forms, direct alternation of land forms, wind deflation, coastal erosion and deposition, modification of the atmosphere, ultration process in eco and energy systems.

Unit 5
Obstacles in sustainable development
Pollution growth, species extinction, restriction of bat lands, desertification, soil erosion, soil pollution, characterisation of contaminated soil, global warming and ozone depletion etc.

Name of Text Books:
Energy and environment – Fowler (McGraw Hill, New Delhi)
Restoration Ecology and sustainable development – Krystyna M. Urbanska et.al. (Cambridge University Press, U.K.)

Name of Reference Books:
Reuniting Economy and Ecology in Sustainable Development – Russ Beaton et.al. (-----)
Theory and implementation of economic models for sustainable development – Jeroen C.J.M. Van Den Bergh (------------)
Economy and Ecology: Towards sustainable development – F. Archibugi et.al. (-------)
Evaluating Sustainable Development: Giving People a voice in their destiny – Okechukwu Ukaga et.al. (-------)
Unit I

Unit II

Unit III

Unit IV

Unit V

Name of Text Books:
1. John A Duffie & William A Beckman: Solar Energy Thermal processes Wiley Inter science publication

Name of Reference Books:
UNIT I:

UNIT II:

UNIT III:

UNIT IV:

UNIT V:

Text Books:

Reference Books: