# *Chhattisgarh Swami Vivekanand Technical University, Bhilai*

## SCHEME OF TEACHING & EXAMINATION

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

| S.No. | Board of Study | Subject Code | Subject | Periods per week | | | Scheme of Exam Theory/Practical | | | Total Marks | Credit L+ (T+P) / 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | ESE | CT | TA | | |
| 1 | Electrical Engg. | 324812 (24 ) | Utilization of Electrical Energy | 3 | 1 | - | 80 | 20 | 20 | 120 | 4 |
| 2 | Electrical & Electronics Engg. | 325812 (25) | Management Concepts & Techniques | 3 | 1 | - | 80 | 20 | 20 | 120 | 4 |
| 3 | Electrical & Electronics Engg. | 325811 ( 25 ) | High Voltage Engg. | 3 | | - | 80 | 20 | 20 | 120 | 3 |
| 4 | **Refer Table –III** | | Professional Elective - III | 3 | 1 | - | 80 | 20 | 20 | 120 | 4 |
| 5 | **Refer Table - IV** | | Open Elective - 4 | 3 | 1 | - | 80 | 20 | 20 | 120 | 4 |
| 6 | Electrical & Electronics Engg. | 325821 ( 25 ) | Utilization of Electrical Energy Lab | - | - | 4 | 40 | - | 20 | 60 | 2 |
| 7 | Electrical Engg. | 325822 (25 ) | Advanced Communication Lab. | - | - | 4 | 40 | - | 20 | 60 | 2 |
| 8 | Electrical & Electronics Engg. | 325823 ( 25) | High Voltage Engg. Lab | - | - | 4 | 40 | - | 20 | 60 | 2 |
| 9 | Electrical & Electronics Engg. | 325824 (25 ) | Major Project | - | - | 6 | 100 | - | 80 | 180 | 4 |
| 10 | Electrical & Electronics Engg. | 300825 ( 25 ) | Report Writing & Seminar | - | - | 1 | - | - | 40 | 40 | 1 |
| 11 | Library | | | - | - | 1 | - | - | - | - | - |
| **Total** | | | | **15** | **4** | **21** | **620** | **100** | **280** | **1000** | **30** |

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

**Tabel –3**

**Professional Elective - III**

| S.No. | Board of Study | Subject Code | Subject |
|---|---|---|---|
| 1 | Electronics & Telecom. Engg. | 328876(28) | Industrial Automation |
| 2 | Electrical Engg. | 324871(24) | EHV AC & DC Transmission |
| 3 | Electrical Engg. | 324872(24) | Flexible AC Transmission System |
| 4 | Electrical Engg. | 324875(24) | VLSI Design |
| 5 | Electronics & Telecom. Engg. | 328874(28) | DSP Processors & Applications |

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

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

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.

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai (C.G.)*

**Semester: 8th** **Branch: Electrical & Electronics Engg. and Electrical Engg.**

**Subject: Utilization Of Electrical Energy** **Code: 324812 (24)**
**Total Theory Periods: 40** **Total Tut Periods: 12**
**Total Marks in End Semester Exam: 80**
**Minimum number of Class tests to be conducted: 2**

**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**
Nature of light, production of light, lighting calculation, factory lighting, flood lighting and street lighting. Measures of Energy Conservation in Electric drives, Use of Efficient semiconductor Converters, Efficient Motors, Variable speed drives etc

**Text Books:**

1. "Fundamentals of electrical drives",G K Dubey, 2nd edition, Narosa Pb
2. "Electric Drives'' Vedam Subramanyam, TMH Pbs.
3. "Utilization of electric energy", Taylor, Orient Longman Pbs.


**Reference Books:**

1. "Electric drives", De and Sen, PHI Pbs.
2. "A first course on Electric drives"S K Pillai, University press.
3. "Modern Power Electronics and A C Drives'' B K Bose, Pearson Education

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai (C.G.)*

**Semester : VIII** **Branch: Electrical & Electronics Engg. and Electrical Engineering**

**Subject: Management Concepts and Techniques** **Code: 325812 (25)**
**Total Theory Periods: 40** **Total Tutorial Periods: 12**
**Total Marks in End Semester Examination: 80**
**Minimum number of Class tests to be conducted: Two**

**UNIT I:**
Basic management and techniques: Planning, nature purpose and objectives of planning, organizing, nature and purpose of organizing, authority and responsibility, staffing, supply of human resources, performance appraisal, controlling, system and process of controlling, control techniques.
Human resource management: nature and scope of human resource planning, training and development, recruitment and selection, career growth, absenteeism, grievances, motivation and its types, need of motivation, reward and punishment, models of motivation, leaders, types of leaders, leadership styles, roles and functions of leaders, conflict management, types and causes of conflict, group and team working, organizational design and development.

**UNIT II**
Marketing management: marketing environment, customer markets and buyer behavior, marketing mix, advertising and sales promotion, channels of distribution.
Financial management and accounting concepts: book keeping, financial statements analysis, financial ratios, capital budgeting, and breakeven analysis.

**UNIT III**
Production/operations management: planning and design of production and operations systems, facilities planning, location, layout and movement of materials, materials management and inventory control, maintenance management, PERT and CPM.

**UNIT IV**
Management information systems: role of information in decision making, information system planning, design and implementation, evaluation and effectiveness of the information system, statistical quality control, total quality management and ISO certificate.

**UNIT V**
Social and ethical issues in management: ethics in management, social factors, unfair and restrictive trade practices.
Strategic and technology management: need, nature, scope and strategy SWOT analysis, value chain concept.

**Text Books:**

1. Industrial management and engineering economics, K. C. Arora, Khanna Pbs.
2. Industrial engineering and production management, Martand Telsang, S. Chand
3. Industrial management and organization, Ahuja, Khanna Pbs.
4. Industrial engineering and management, O. P. Khanna, DRD


**Reference Books:**

1. Industrial organization and management, Ramchandran, Ramana Mutrhy, TMH.
2. Management science, Ramchandra, TMH.
3. Industrial engineering and production management, Mahajan, DRP.
4. Management theory and practice, Chandan, Vikas Pbs.

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai (C.G.)*

**Semester: B.E. VIII Sem.** **Branch: Electrical & Electronics Engg.**
**Subject: High Voltage Engineering.** **Code: 325811(25)**
**Total Theory Periods: 40** **Total Tutorial Periods: Nil**
**Total Marks in End Sem Exam: 80**
**Min no. of class Test to be conducted: Two**

**Unit 1 - Insulation In Electrical Power System**

General Characteristics of Gaseous Insulation, Basic process of ionization in a gas, Breakdown Voltage, Paschen's Law, BDV in gases-gap between two spheres, rod plane & rod gaps, Surface discharge of solid dielectric, Corona discharge on transmission line conductor, Corona loss, methods of reducing corona , Breakdown in liquid dielectric, transformer oil testing, Breakdown in solid dielectric.

**Unit 2 -Line & Substation Insulation**

Electrical & mechanical characteristics of insulators, materials for insulators, Types of insulators( Pin, Post, Suspension), Insulation of OH transmission line, Insulation of transformer, Generator, Cables, rotating machines, Properties of Insulation, Puncture Voltage.

**Unit 3 -Transient Phenomena In Power System**

Sources of Over voltage single phase ground in unearthed system, Lightning discharge, Protection of equipment from lightning stroke, lightning arrestors, protection of rotating machines and substations.

**Unit 4 - Generation of AC & DC High Voltages**

Half Wave rectifier circuit, Voltage multiplier circuit, Van-de Graff generator, generation of impulse voltage & current, measurement of high voltage & current, impulse voltage measurement.

**Unit 5 - Preventive testing of Insulation**

Objective & methods, measurement of tan?, capacitance, PD in insulation, Testing of bushing , Insulators, transformer, cables, rotating machine.

**Text Books:**

1) C.L. Wadhwa - High Voltage Engg.( 2nd Ed New Age International Ltd. )
2) M.S. Naidu & V. Kamraju - High Voltage Engg.(3rd EdTata McGraw Hill )Title

**Refernce Books :**

D.V. Razevig High Voltage Engg.(Translated from Russian by M.P. Chourasia) Khanna Publishers

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai (C.G.)*

**Semester : VIII** **Branch: Electrical & Electronics Engg. and Electronics & Telecommunication**

**Subject: Industrial Automation** **Code: 328876 (28)**
**Total Theory Periods: 40** **Total Tutorial Periods: 12**
**Total Marks in End Semester Examination: 80**
**Minimum number of Class tests to be conducted: Two**

**Unit – I**
**Introduction to process control:** Process Control Nlock Diagram, Control System Evaluation, Digital Control: Supervisory Control, Direct Digital Control, Networked Control Systems, Distributed Digital Control. Smart Sensor. Definitions of the terms used to describe process control. Data Acquisition Systems: DAS Hardware, DAS Software. Data Logger.

**Unit – II**
**Controller Principles:** Process Characteristics: Process Equation, Process Load, Process Lag, Self-Regulation. Control System parameters: Error, Variable Range, Control parameter Range, Control Lag, Dead Time, Cycling, Controller Modes. Discontinuous Controller Mode: Two Position Mode, Multiposition Mode, Floating Control Mode. Continuous Control Mode: Proportional Control Mode, Integral Control Mode, Derivative Control Mode. Composite Control Modes: PI Control, PD Control, PID Control

**Unit – III**
**Analog Controllers:** Introduction, Electronic Controllers: Error Detector, Single Controller Modes, Composite Controller Modes. Pneumatic Controllers: General features, Mode Implementation.

**Unit – IV**
**Programmable Logic Controller:** Evaluation of PLC, PLC Architecture, Basic Structure. PLC Programming: Ladder Diagram – Ladder diagram symbols, Ladder diagram circuits. PLC Communications and Networking, PLC Selection: I/O quanttyt and Type, I/O Remoting requirements, Memory size and type, Programmer Units. PLC Installation, Advantages of using PLCs.

**Unit – V**
**Distributed Control System:** Introduction, Overview of Distributed Control System, DCS Software configuration, DCS Communication, DCS Supervisory Computer Tasks, DCS Integration with PLCs and Computers, Features of DCS, Advantages of DCS.

***Text Books:***


1. *Process Control Instrumentation Technology*, C.D. Johnson, PHI
2. *Computer Aided Process Control*, S.K. Singh, PHI


***Reference Books:***


1. *Introduction to Instrumentation & Control,* A.K. Ghosh, Eastern Economy Edition
2. *Intelligent Instrumentation ,* George C. Barney, Prentice Hall India

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai (C.G.)*

**Semester: 8th** **Branch: Electrical & Electronics Engg. and Electrical Engg.**

**Subject: EHV AC And DC Transmission** **Code: 324871 (24)**
**Total Theory Periods: 40** **Total Tut Periods: 12**
**Total Marks in End Semester Exam: 80**
**Minimum number of Class tests to be conducted: 2**

**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.
3. Padiyar, HVDC Transmission, New Age Pbs.


**Reference Books:**


1. S.Rao, EHV AC & DC Transmission.
2. Arritilaga, HVDC Transmission.

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai (C.G.)*

**Semester: 8th** **Branch: Electrical & Electronics Engg. and Electrical Engg.**

**Subject: Flexible AC Transmission Systems (FACTS)** **Code: 324872 (24)**
**Total Theory Periods: 40** **Total Tut Periods: 12**
**Total Marks in End Semester Exam: 80**
**Minimum number of Class tests to be conducted: 2**

**UNIT I :**
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 (C.G.)*

**Semester: 8th** **Branch: Electrical & Electronics Engg. and Electrical Engg.**

**Subject: VLSI Design** **Code: 324875 (24)**
**Total Theory Periods: 40** **Total Tut Periods: 12**
**Total Marks in End Semester Exam: 80**
**Minimum number of Class tests to be conducted: 2**

## UNIT – I

**Introduction to Integrated Circuits:** SSI, MSI and LSI. VLSI Design flow, Design hierarchy concept of regularity, Modularity and Locality, VLSI design styles with FPGA and CPLD.

## UNIT – II

**Design Aspects:** Standard cell based design, Basic steps of fabrication process of PMOS, CMOS and Bi-CMOS, layout design rules, CMOS lay out design rules, Lay out of CMOS inverter, NAND Gate, NOR Gate, Full Adder, Calculation of resistance and capacitance.

## UNIT – III

**Lay Out Design:** Lay out design of RAM, ROM, PLA Decoder, MUX, 4-bit Adder, Comparator, Combinational and Sequential Logic.

## UNIT – IV

**Combinational Logic Design:** Introduction to VHDL and Verilog, Introduction to CAD Tools, Power dissipation in Lgic gates entity, Signal Architecture, Configuration and Definition, Operators, Data Types, Generic, Generate loops, Data flow, Structural and behavioral programming, process, Procedure, Component in VHDL and Verilog, Libraries, Case Statement..

## UNIT – V

**Sequential Logic Design:** Sequential design by VHDL and Verilog FSM, Bus structure in VHDL, Test bench Synthesis, Operator overloading, Blocks, Delays, Verifications..

**Recommended books :**


1. Modern VLSI Design by Wolf, Pearson Education Pub.
2. VHDL Programming by Perry, TMH Pub.


**Reference Books:**


1. CMOS VLSI Design: A Circuits and Systems Perspective by Weste, Pearson Ecuation Pub.
2. Verilog HDL by Palntikar, Pearson Education Pub.
3. Basic VLSI Design by Pucknell & Esharghian, 3rd Ed., PHI Pub.
4. Modern VLSI Design - System-on-chip Design, Wolf, PHI pub.
5. Fundamentals of Digital Logic with VERILOG Design, Brown, TMH Pub.

# CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
# BHILAI (C.G.)

Semester : **VIII** Branch: **E & T / EEE**
Subject: **DSP Processors and Applications** Code: **328874 (28)**
Total Theory Periods: **40** Total Tutorial Periods: **10**
Total Marks in End Semester Examination: **80**
Minimum number of Class tests to be conducted: **Two**

**UNIT – I**

**Instruction Set and Architecture of DSP Processor:** Computational characteristics of DSP algorithms and applications: their influence on defining a generic instruction-set architecture for DSPs.

**UNIT – II**

**Architectural Requirement of DSPs:** High throughput, low cost, low power, small code size, embedded application techniques for enhancing computational throughput; parallelism and pipelining.

**UNIT – III**

**Data-path of DSPs:** multiple on-chip memories and buses, dedicated address generator units, specialized processing units. Hardware multiplier, ALU, Shifter and on-chip peripherals for communication and control.

**UNIT – IV**

**Control Unit of DSPs:** Pipelined instruction execution, specialized hardware for zero-overhead looping, Interrupts. Architecture of Texas instruments fixed-point and floating-point DSPs, Brief description of ADSP 218X/2106X DSPs, Programmer's model.

**UNIT – V**

**Advanced DSPs:** TI's 320C6X, ADI's Tiger-SHARC, Lucent technologies' DSP 16000 VLIW processors. Applications: a few case studies of application of DSPs in Communication and Multimedia.

**Text Books:**


1. Architecture for Digital Signal Processing, P. Pirsch, Jhon Wiley
2. Digital Signal Processors: Architectures, Implementations and Applications by Kuo, Pearson Education Pub.


**Reference Books:**


1. Digital Signal Processing in VLSI, R.J. Higgins
2. Texas Instruments TMSC5X, C54X and C6X Users manuals.
3. VLSI Digital Signal Processing Systems, K. Parthi, John Wiley
4. Digital Signal Processing for Multimedia Systems, K. Parthi and T. Nishitani, Marcel Dekker.
5. IEEE Signal Processing Magazine, Oct 86, Jan 89, July 97, Jan 98 and March 2000.

# CHHATISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

**Semester: 8th** **Branch: Electrical& Electronics Engg.**
**Subject: Utilization of Electrical Energy Lab** **Code: 325821 (25)**
**Total practical periods: 50**
**Total Marks in end Semester Exam: 40**

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

- ✍✍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.
- ✍✍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.
- ✍✍To study the different types of dc motor binding.
- ✍✍To study the speed control of separately excited dc motor using proportional control and turbo feedback.
- ✍✍To study the speed control of separately excited dc motor using proportional integral controllers.
- ✍✍To study the binding methods of three phase induction motor.
- ✍✍To study the performance of V S I fed three phase induction motor using spwm technique keeping voltage / frequency constant using simulator.
- ✍✍To study the speed control of a three phase induction motor using static voltage controllers for (1) constant $T_h$, (2) $T_h=k?_r^2$
- ✍✍To analyze the speed control of a three phase wound rotor induction motor using external capacitor on rotor side.
- ✍✍To study frequency control synchronous motor drive.
- ✍✍To Study the heating time constant for a short time duty motor.
- ✍✍To Study the heating time constant for a controls duly motor.
- ✍✍To study the cooling time constant for a intermittent duty motor.
- ✍✍To study the cooling time constant for a short time duty motor.

**Reference Books:**


1. "Fundamentals of electrical drives",G K Dubey, 2nd edition, Narosa Pb
2. "Electric Drives'' Vedam Subramanyam, TMH Pbs.
3. "Utilization of electric energy", Taylor, Orient Longman Pbs.

# Chhattisgarh Swami Vivekanand Technical University, Bhilai

**Semester: 8th** **Branch: EEE**
**Subject: Advanced Communication Lab** **Code: 325821 (25)**
**Total practical periods: 36**
**Total Marks in end Semester Exam: 40**

## List of Experiments:

- ✍✍ To perform experiment with delta modulation techniques and to study the waveforms.
- ✍✍ To perform experiment with adaptive delta modulation techniques and to study the waveforms.
- ✍✍ To study Signal sampling and reconstruction techniques.
- ✍✍ To study the effect on reconstructed waveform of the use of sample / hold circuit.
- ✍✍ To study the TDM Pulse Amplitude Modulation / Demodulation & to draw their waveforms.
- ✍✍ To study Time Division Multiplexing [Pulse Code Modulation /Demodulation]
- ✍✍ To study ASK Modulation.
- ✍✍ To study FSK Modulation.
- ✍✍ To study PSK Modulation.
- ✍✍ To study ASK Demodulation.
- ✍✍ To study FSK Demodulation.
- ✍✍ To study PSK Demodulation.
- ✍✍ To study Data Conditioning techniques.
- ✍✍ To study Data Reconditioning circuit.
- ✍✍ To generate any code using digital circuits.

**List of Equipments/Machine Required:**
Communication Trainer Kits, Function Generator, Power Supply, CRO, Discrete Components.

**Recommended Books:**


1. Principles of Communication Systems –Taub and Shilling, Tata Mc Graw Hill.
2. Handbook of Experiments in Electronics and Communication Engineering, Rao, Vikas Publishing House Pvt. Ltd.

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai (C.G.)*

**Semester: B.E. VIII Sem.** **Branch: Electrical & Electronics Engg.**
**Subject: High Voltage Engg lab.** **Code: 325823 (25)**
**Total Practical Periods: 50**
**Total Marks in End Sem Exam: 40**

**List of Experiments**

1. To calibrate the voltmeter of high voltage control panel with the help of standard sphere gap.
2. To determine the corona starting voltage for
    a) rod-plane gap
    b) rod-sphere gap
3. To study & determine breakdown strength of cable (11KV).
4. Study & determination of breakdown voltage of rod& rod gap.
5. To test " One minute with stand voltage " or transformer oil.
6. To test power frequency break down strength of solid insulating materials.
    a) Paper
    b) Presspan
    c) Bakelite
7. To determine flash over voltage of 11 KV Disc insulation.
8. To find the string efficiency of a string of 11KV insulator disc.
9. To study impulse generator & obtained standard impulse voltage wave.

**List of Equipment Required:**

1. Oil Testing Machine ( Min. 60 KV )
1. High Voltage variable supply 0 to 60 KV (A.C.)
2. High Voltage variable supply 0 to 45 KV (D.C.)
3. Measuring Instruments
4. Megger 5 KV

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai (C.G.)*

Semester : **8th** Branch: **EEE**
Subject: **Major Project** Code: **325824 (25)**
Total Practical Periods: **72**
Total Marks in End Semester Examination: **100**

**Major guidelines:**

- The students are expected to take up a Project under the guidance of a faculty from the Institute. This may be an extension of the Minor project undertaken in VII semester or a new one.
- The topic of the project should be justified for the degree of BE (Electronics & Telecommunication)
- The project selected should ensure the satisfaction of the urgent need to establish a direct link between education, Industrial application, national development and productivities.
- The students may be asked to work individually or in a group having not more than FOUR students.
- The student/group of student should collect all necessary information from literature on selected topic/project.
- It should include the scope of project, identification of necessary data, source of data, development of design method and identification, methodology, software analysis *(if any)*.
- Students should deliver a seminar on the selected Project/topic.
- The students are expected to submit the report in standard format approved by the University in partial fulfillment of the requirement for the degree of B.E. (Electronics & Telecommunication).
- There will be an external viva-voce at the end of the semester and the students are to demonstrate the project at the time of viva-voce.
- The project report should contain the following:

  - A cover page mentioning the project title, names of the students, Affiliated Institute/College, Session, Batch and the name of the University.
  - A bonafide certificate to be issued by the Head of the Institute.
  - A forwarding certificate from the Head of the Department.
  - A completion certificate from the Project guide.
  - A certificate of Approval from both Internal and External Examiner.
  - Acknowledgement from the students
  - Abstract
  - Contents
  - Description of the Project (to be divided in chapters)
  - Conclusion
  - Bibliography
  - A CD containing the Software/Program used in the project.

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai*

**Semester : BE 8th** **Branch: Electrical & Electronics Engg.**
**Subject: Report Writing & Seminar** **Code: 300825 (25)**
**Total No. of periods : 2 per week** **Total Tutorial Periods : Nil**
**Total marks in End Semester Exam: Nil** **Teacher's Assessment: 40 marks**
**Minimum Number of class test to be conducted: Two**

**Unit -I**
**Introduction to Technical Writing:** how differs from other types of written communication Purpose of technical writing, Correspondence: prewriting, writing and rewriting Objectives of Technical Writing. Audience Recognition: High-tech audience, Low tech audience, Lay audience, Multiple Audience.

**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**
**Report Writing:** Criteria for report writing, Types of Report: Trip report, Progress report, lab report, Feasibility report, project report, incident report, etc. Case Studies.

**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:

1. Sharon J. Gerson & Steven M. Gerson "Technical Writing - Process& Product", Pearson Education.

Reference Books:

1. Sunita Mishra, "Communication Skills for Engineers" Pearson Education
2. Davies J.W. "Communication for engineering students", Longman
3. Eisenberg, "Effective Technical Communication", Mc. Graw Hill.

# CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

**Semester: VIII** **Branch : Common to All Branches**
**Subject :Enterprise Resource Planning** **Code : 300881 (36)**
**Total Theory Periods : 40** **Total Tut Periods : 10**
**Total Marks in End Semester Exam : 80**
Minimum no. of class tests to be conducted : 2

**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**

# CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY BHILAI (C.G.)

Semester: **VIII** Branch: **Common to All Branches**
Subject: **E-Commerce and Strategic IT** Code:**300882 (33)**
Total Theory Periods: **50** Total Tutorial Periods: **Nil**
Total Marks in End Semester Exam**: 80.**
Minimum number of class tests to be conducted: **02**

**UNIT – I** Introduction: What is E-Commerce, Forces behind E-Commerce, E-Commerce Industry Framework, and Brief History of E-Commerce. Inter Organizational E-Commerce, Intra Organizational E-Commerce, and Consumer to Business Electronic Commerce, Architectural framework

*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**

Innovation Management: - Invention v/s Innovation, Definition and components of innovation. Types of innovations: Product, Process and system innovations, Understanding Innovation Process.

[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**:


1. V. K. Narayanan, “Managing Technology and Innovation for competitive advantage”, Pearson Education.
2. Tarek Khalil, “Management of Technology”, McGraw Hill.


**Reference Books**:


1. Lowell Steele, “Managing Technology”, McGraw Hill.
2. R. A. Burgelman and M. A. Maidique, “Strategic Management of Technology and Innovation”, Irwin.
3. Plsek, Crativity, 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
Model Component-:Models Representation Methodology, TimeModel Based ManagementSystems, Access to Models Understandability of Results, Integrating Models Sensitivity of aDecision,
Brainstorming and Alternative Generation, Evaluating Alternatives, Running External Models.
Mail Component: Integration of Mail Management Examples of Use implications for DSS.

**Unit-III Intelligence and Decision Support Systems**:
Programming Reasoning, Backward Chaining Reasoning, Forward Chaining Reasoning, Comparison, Certainty Factors,User-Interface Component:User Interface Components, The Action Language, Menus, Command Language, I/O Structured Formats, Free Form Natural Language, The Display or Presentation Language, Windowing Representations, Perceived Ownership of Analyses, Graphs and Bias Support for All Phases of Decision Making, The Knowledge Base Modes of Communication

**Unit-IV** Designing A DSS:Planning for DSS, Designing a Specific DSS, Interviewing Techniques, OtherTechniques, Situational AnalysisDesign 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 .

**Unit-V** Implementation and Evaluation of DSS : Implementation Strategy , Prototypes, Interviewing , User Involvement , Commitment to Change, Managing Change, Institutionalize System, Implementation and System Evaluation, Technical Appropriateness, Measurement Challenges , Organizational Appropriateness.

**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
Subject: Software Technology
Total Theory Periods: 4 per week.
Total Marks in End Semester Exam: 80.
Minimum number of class tests to be conducted: 02.

Branch: **Common to All Branches**.
Code: 300885 (22)
Total Tut Periods: Nil.

**UNIT-1**
**ASSEMBLY LANGUAGE PROGRAMMING**
Pentium Assembly languages-Registers, Memory Model, Addressing mode, 1source Link, Installation, Assembler Directives.
ASSEMBLER DESIGN
Simple manual Assembler, Assembler Design Process, Load and Go Assembler, Object File Formats.

**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

# CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

**Semester: VIII** **Branch: Common to All Branches**
**Subject: Knowledge Entrepreneurship** **Code: 300886 (36)**
**Total Theory Periods: 40** **Total Tut Periods: 12**
**Total Marks in End Semester Exam:80**
Minimum no. of class tests to be conducted: 2

**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, Londan

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# *CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY BHILAI (C.G.)*

Semester: VIII
Subject: Financial Management
Total Theory Periods: 3
Total Marks in End Semester Exam: 80
Minimum No. Of Class test to be conducted: 2

Branch: **Common to All Branches**
Code: 300887(36)
Total tutorial Period: 12

**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.

# CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY BHILAI (C.G.)

Semester : VIII
Branch : **Common to All Branches**
Subject : Project planning management and Evaluation
Code : 300888 (36)
Total Theory Periods : 40
Total tutorial Period : 12
Total Marks in End Semester Exam :80
Minimum No. Of Class test to be conducted : 2

**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.

# CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY BHILAI (C.G.)

Semester: VIII
Subject: **Safety Engineering**
Total Theory Periods: 50
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2

Branch: **Common to All Branches**
Code: 300889 (37)
Total Tutorial Period : 12

**UNIT – I**

Safety Philosophy and principles of Accident prevention
Introduction, accident, injury, unsafe act, unsafe condition, reportable accidents, need for safety, break down 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

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# CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VIII
Subject: Bioinformatics
Total Theory Periods: 4 per week.
Total Marks in End Semester Exam: 80.
Minimum number of class tests to be conducted: 02.

Branch: **Common to All Branches**
Code: 300890 (22)
Total Tut Periods: Nil.

**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**
Drug Discovery-Introduction, Technology and Strategies, Cell Cycle, G-protein, Coupled, Receptors.
Computer Aided Drug Design-Introduction, Drug Design Approaches, Designing methods, ADME-Tox Property Prediction.

**TEXT BOOKS**


I. BIOINFORMATICS by S.C. Rastogy, 2nd Edition, Prentice Hall of India.
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
3. Introduction to Bioinformatics, Arthur M. Lesk, 2002, Oxford University Press
4. Current Topics in Computational Molecular Biology (Computational Molecular Biology), Tao Jiang, Ying Xu, Michael Zhang (Editors), 2002, MIT Press

# CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY BHILAI (C.G.)

Semester: VIII
Subject: Energy Conservation & Management
Total Theory Periods: 50
Total Marks in End Semester Exam: 80

Branch: **Common to All Branches**
Code: 300891 (37)
Total Tutorial Period : 12

Minimum number of class tests to be conducted: 2

**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**

Energy costs and two-part tariff, Energy conservation in utility by improving load factor, Load curve analysis, Energy efficient motors, Energy conservation in illumination systems, Importance of Power factor in energy conservation – Power factor improvement methods, Energy conservation in industries, case studies.

**UNIT – III**

**Energy in Manufacturing**

Introduction, Energy and Environmental Analysis of Products, Energy Consumption in Manufacturing, Energy Conservation, Transportation Systems, Water Conservation, Rules for the Efficient Conservation of Energy and Materials, Laws of Energy and Materials Flows.

**UNIT – IV**

**Heat Recovery System**

Sources of waste heat and its potential applications, heat recovery systems in Shell & Tube Heat Exchangers, Plate Heat Exchangers, Tubular Heat Exchangers. Vapour recompression and Energy conservation in Evaporator systems. Thermal Wheel, Heat Pipe, Heat Pumps. Waste Heat Boilers – Low Pressure & High Pressure Applications.

**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**


1. Energy Management – W.R. Murphy, G. Mckay –
2. Energy Management – Paul O'Callaghan –
3. Engineering Economics & Engineering Management – R. Raju – Anuradha Agencies


**REFERENCE BOOKS**


1. Principles of Energy Conversion – Archie W. Culp – Jr. International Student Edition – McGraw Hill Publishers
2. Energy Management in illuminating System – Kao Chen – CRC Publishers
3. Industrial Energy Recovery - D.A. Reay – Wiley Publishers
4. Thermal Energy Recovery – T.L. Boyer – Wiley Publishers
5. Energy Conservation Through Control – E.G. Shinskey – Academic Press
6. Economics of Solar Energy & Conservation Systems, Vol-I & II – F. Kreith & R.E. West – CRC Press

# *CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY BHILAI (C.G.)*

Semester: VIII
Subject: Nanotechnology
Total Theory Periods: 50
Total Marks in End Semester Exam: 80
Minimum No. of Class test to be conducted: 2

Branch: Common to All Branches
Code: 300892 (47)
Total tutorial Period: NIL

**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

**Unit III** : Characterization of Nanostructured materials : Microscopy: TEM, SEM, SPM techniques, confocal scanning microscopy,, Raman microscopy-Basic principles, applicability and practice to colloidal, macromolecular and thin film systems. Sample preparation and artifacts. Polymer fractionation techniques: SEC, FFF, Gel electrophoresis.: Basic theory, principles and practice.
Thermal analysis: Basic principles, theory and practice. Micro DSC in the study of phase behavior and conformational change.
Mass spectrometry of polymers: MALDI TOF MS – Basic theory, principles and practice. Applicability to proteins, polyethers, controlled architecture systems

**Unit IV :** Cross-cutting Areas of Application of Nanotechnology : Energy storage, Production and Conversion. Agriculture productivity enhancement Water treatment and remediation. Disease diagnosis and screening. Drug delivery systems. Food processing and storage. Air pollution and remediation. Construction. Health monitoring..Vector and pest detection, and control. Biomedical applications. Molecular electronics. Nanophotonics. Emerging trends in applications of nanotechnology

**Unit V :** Industrial Implications of Nanotechnology : Development of carbon nanotube based composites. Nanocrystalline silver Antistatic conductive coatings. Nanometric powders. Sintered ceramics. Nanoparticle ZnO and TiO2 for sun barrier products. Quantum dots for biomarkers. Sensors. Molecular electronics. Other significant implications

**References:**


1. Guozhong Cao, “Nanostructures and Nanomaterials”, Imperial College Press, London
2. Mark Ratner and Daniel Ratner, “A Gentle Introduction to Next Big Thing”, Pearson Education 2005

# *CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY BHILAI (C.G.)*

Semester: VIII Branch: **Common to All Branches**
Subject: Intellectual Property Rights Code: 300893 (36)
Total Theory Periods: 40 Total tutorial Period: 12
Total Marks in End Semester Exam: 80
Minimum No. Of Class test to be conducted:2

**Unit-I**
Basic Concepts of Intellectual Property: Introduction to intellectual property rights, laws and its Scope, Trade Related Aspects of Intellectual Property Rights.

**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:**

1. Vinod V Sople ,Managing Intellectual Property, – PHI
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 Ralson- Pearson Education.
2. Intellectual Property –David Bainbridge, Longman

# *CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY BHILAI (C.G.)*

Semester: VIII Branch: **Common to All Branches** Subject: Value Engineering Code: 300894 (37)
Total Theory Periods: 50 Total Tutorial Period: 12
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2

**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**
Value Engineering – S.S. Iyer – New Age International Publishers, New Delhi
Industrial Engineering & Management – O.P. Khanna – Dhanpat Rai & Sons

**REFERENCES**
Techniques of Value Analysis and Engineering – L.D. Miles – McGraw Hill, New York
Value Engineering, A Systematic Approach – A.E. Mudge – McGraw Hill, New York
Compendium on Value Engineering – H.G. Tufty – Indo American Society

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai*

Semester: VIII
Subject: Disaster Management
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2

Branch: **Common to All Branches**
Code: 300895 (20)
Total Tutorial Periods: 12

**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 Book**s:
Design of Earthquake Resistant Buildings – Minoru Wakabayashi (McGraw Hill Publication)
Dynamics of Structures: Theory and Application to Earthquake Engineering ($2^{nd}$ edition) – Anil K Chopra (Pearson Education Publication)

**Name of Reference Books:**
Fundamentals of Vibrations – Anderson, R.A. (Mc Millan)
IS – 1893 (Part I): 2002, IS – 13920: 1993, IS – 4326: 1993, IS-13828: 1993
Earth quake engineering damage assessment and structural design – S.F. Borg
Disasters and development – Cuny F (Oxford University Press Publication)

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai*

Semester: VIII
Subject: Construction Management
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2

Branch: **Common to All Branches**
Code: 300896 (20)
Total Tutorial Periods: 12

**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-Builder-Operation-Turnkey 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**
Design and construction as an integrated system-Innovation and technological Feasibility-Innovation and technological feasibility-Design Methodology-Functional Design-Physical Structures-Geo-Technical Engineering Investigation-Construction Site Environment-Value engineering-Construction Planning-Industrialized Construction and Prefabrication-Computer -Aided Engineering

**Unit 4**
**Labour, Material and Equipment Utilization**
Historical Perspective – Labour Productivity-Factors Affecting Job-Site Productivity-Labor Relations in construction-Problems in collective bargaining-Materials Management-Materials Procurement and Delivery-Inventory control-Tradeoffs of cost in Material Management-Construction Equipment-Choice of Equipment and Standard production Rates-Construction Processes Queues and Resource Bottlenecks

**Unit 5**
**Cost Estimation**
Costs Associated with Construction Facilities-Approaches to cost estimation-Type of construction cost estimates- Effects of scale on construction cost-Unit cost-Method of estimation-Methods for allocation of joint costs- Historical cost data-Cost indices-Applications of cost Indices to Estimating-Estimate based on Engineers List of Quantities-Allocation of Construction costs over time-Computer Aided cost Estimation-Estimation of operating costs

**Name of Text Books:**
Construction Project Management Planning, Scheduling and Control – Chitkara, K.K. (Tata McGraw Hill Publishing Co., New Delhi, 1998)
Project Mangement: A systems Approach to Planning, Scheduling and Controlling – Harold Kerzner (CBS Publishers & Distributors, Delhi, 1988)

**Name of Reference Books:**
Project management for Construction: Fundamental Concepts for owners, Engineers, Architects and Builders – Chris Hendrickson and Tung Au, (Prentice Hall, Pitsburgh, 2000)
Construction Project Management – Frederick E.Gould (Wentworth Institute of Technology, Vary E.Joyce, Massachususetts Institute of Technology, 2000)
Project Management – Choudhury, S. (Tata McGraw Hill Publishing Co., New Delhi, 1988)
Applied project Engineering and Management – Ernest E. Ludwig (Gulf Publishing Co., Houstan, Texas, 1988)

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai*

Semester: VIII
Branch: **Common to All Branches**
Subject: Ecology and Sustainable Development
Code: 300897 (20)
Total Theory Periods: 40
Total Tutorial Periods: 12
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2

**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. (----------)

# CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VIII
Subject: Non Conventional Energy Sources
Total Theory Periods: 50
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 02

Branch: **Common to All Branches**
Code : 300898 (19)
Total Tutorial Periods: 00

**Unit I**

Environmental Aspects of Power Generation, Heat Transfer for Solar Energy, Utilization Flat Plate Collectors: Physical principles of conversion of solar radiation into heat, Thermal losses and efficiency of FPC, Practical considerations for flat plate collectors, Applications of FPC – Water heating and drying .Focusing Type Collectors: Orientation and sun tracking systems, Types of concentrating collectors – Cylindrical parabolic collector, Compound parabolic collector, Thermal performance of focusing collectors, Testing of solar collectors.

**Unit II**

Solar cooking, solar desalination, solar ponds and solar space heating Solar Industrial process heating and Solar power generation. Solar Green Houses, Solar thermo mechanical power, solar refrigeration & air conditioning and Solar High Temperature Applications Gasifier- Classification, Chemistry, Application, advantages, disadvantages and application.

**Unit III**

Energy from Biomass: Type of biomass sources, biomass generation, factors affecting biodigestion, classification, advantages and disadvantages of biogas plants, community biogas plants, problems related to biogas plants, utilization of biogas. Energy plantation, methods for obtaining energy from biomass, thermal gasification of biomass.

**Unit IV**

Chemical Energy Sources: Fuel cells: Design, principle, classification, types, advantages and disadvantages Hydrogen Energy: Properties of hydrogen, methods of hydrogen production, physical and chemical principles, storage, advantages and application

**Unit V**

Wind Energy: Basic principle, wind energy conversion, wind energy conversion systems, design consideration, performance and application. Alcohol fuels: Overview, feedstock, methods for alcohol production, alcohol as an engine fuel; LPG, CNG Hydrogen and Ethanol as an alternative liquid fuel; engine performance with alcohol fuels. Tidal Energy.

**Name of Text Books:**

1. John A Duffie & William A Beckman: Solar Energy Thermal processes Wiley Inter science publication
2 H P Garg & J Prakash, Solar Energy – Fundamentals and Applications: - Wiley Inter science

**Name of Reference Books:**

1. G D Rai, Solar Energy Utilization – Khanna publishers.
2. S P Sukhatme, Solar Energy – Principles of thermal Collection & Storage – Tata McGraw Hill Publishing company ltd., New Delhi

# Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: VIII Branch: **Common to All Branches**
Subject: Energy Auditing Code: 300899 (24)
Total Theory Periods: 50 Total Tut Periods: Nil
Total Marks in End Semester Exam : 80
Minimum number of Class tests to be conducted: 2

**UNIT I:**
History of Energy Management: Energy forecasting, Limitations of energy resources. Renewable energy recourses. Load management. Energy management. Demand side management (DSM) Energy conservation in realistic distribution system. Short term load forecasting for de-centralized load management.

**UNIT II:**
Energy Situation and Global Energy Sources: World energy consumption. Energy in developing countries. Firewood crises. Indian energy sources. Non-conventional renewable energy sources. Potential of renewable energy sources. Solar energy types. Wind energy. Wave, tidal and OTEC. Super-conductors in power system. Wind power generation for large scale generation of electricity. Wind driven induction generators.

**UNIT III:**
Energy Auditing as Applicable to an Industry: Classification of energy audit System optimization. Power factor improvement. Preventive maintenance. Process modification. Non-conventional energy sources. Electricity tariffs. Types of off-peak tariffs.

**UNIT IV:**
Elements of Energy Auditing and Metering Methodologies(Case Studies): Capacity utilization. Technology up-gradation. Fine tuning, Energy conservation. Concept and methods of energy conservation.

**UNIT V:**
Demand Side Management: Introduction to DSM. Concept of DSM. Benefits from DSM. DSM techniques. Time of day pricing, Multi-utility exchange model. Time of day pricing models for planning, load management. Load priority technique. Peak clipping. Peak shifting. Valley filling. Strategic conservation. Energy efficient equipment, Socioeconomic awareness programs.

**Text Books:**

1. Ashok.V.Desai(ED)-Energy Demand: Analysis, Management and Conservatioin, Wiley Eastern Ltd., New Delhi.
2. S. Rao, Parulekar, Energy technology, Khanna Pbs.


**Reference Books:**

1. Jyothi Prakash- Demand Side Management, Tata McGraw-Hill Publishers.
2. N.K.Bansal, Kleeman Millin-Renewable Energy Sources and Conservation Technology, Tata McGraw-Hill Publishers.