

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai*

## SCHEME OF TEACHING AND EXAMINATION

### B.E. VIII SEMESTER ELECTRICAL ENGINEERING

S.No.	Board of Studies	Subject Code	Subject	Periods per week			Scheme of Exam Theory/ Pract.			Total Marks	Credit L+(T+P)/2
				L	T	P	ESE	CT	TA		
1	Electrical Engg.	324811 (24)	Modern Control System	4	1	-	80	20	20	120	5
2	Electrical Engg.	324812 (24)	Utilization of Electrical Energy	3	1	-	80	20	20	120	4
3	Electrical Engg.	324813 (24)	Installation Maintenance & Testing of Electrical Equipments.	3	-	-	80	20	20	120	3
4	Refer Table -3		Elective-III	4	1	-	80	20	20	120	5
5	Refer Table -4		Open Elective-IV	4	-	-	80	20	20	120	4
6	Electrical Engg.	324821 (24)	Installation Maintenance & Testing of Electrical Equipments. Lab	-	-	3	40	-	20	60	2
7	Electrical Engg.	324822 (24)	Utilization of Electrical Energy Lab	-	-	3	40	-	20	60	2
8	Electrical Engg.	324823 (24)	Computer Simulation Lab	-	-	4	40	-	20	60	2
9	Electrical Engg.	324824 (24)	Major Project	-	-	6	100	-	80	180	3
10	Electrical Engg.	300825 (24)	Report Writing & Seminar	-	-	2	-	-	40	40	1
11			Library	-	-	1	-	-	-	-	-
<b>Total</b>				<b>18</b>	<b>3</b>	<b>19</b>	<b>620</b>	<b>100</b>	<b>280</b>	<b>1000</b>	<b>31</b>

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

**Table -III**  
**Electives-III**

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

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 in future examinations.

**Table –IV**

<b>Elective -IV</b>			
<b>S.No.</b>	<b>Board of Studies</b>	<b>Code</b>	<b>Name of Subject</b>
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	Mech. 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) – 1/4<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

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai*

**Semester: 8<sup>th</sup>**

**Subject: Modern Control 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: 324811 (24)**

**Total Tut Periods: 12**

## **UNIT I: Non-Linear Control System**

Introduction, some common types of nonlinearities, comparison of linear and non-linear systems, properties of non-linear control systems, describing functions, stability analysis using describing functions, limit cycle, Liapunov Stability Analysis Of Linear Systems, Second method of Liapunov with four Stability theorems.

## **UNIT II: State Space Analysis**

Basics: state no uniqueness, eigen values, its invariance, diagonalization and Jordan canonical form, Caylay-Hamilton theorem, Computation of state transition matrix by a) Inverse Laplace method and b) Caylay Hamilton method, controllability and observability (Time Variant Systems), state equations in CCF, OCF and Diagonal Canonical form, Decompositions of Transfer Functions, Effect of Pole-Zero cancellation in Transfer Function.

## **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:** The Discrete Euler-Lagrange Equation, The Discrete Maximum(Minimum) Principle, Solution of the Discrete Riccati Equation by a) Recursive Method of solving the Riccati equation b) The Eigenvalue-Eigenvector Method.

## **Text Books:**

- 1) Control Systems Engineering; I.J.Nagrath and M. Gopal; New Age International Publishers, Fourth Edition.
- 2) Digital Control Systems; Benjamin.C. Kuo; Oxford University Press, Second edition.

## **Reference Books:**

- 1) Modern Control Engineering, Roy Choudhary, PHI.
- 2) Control System Analysis and Design by K.K. Agrawal.
- 3) Control Engineering Theory and Practice by M.N. Bandhopadhyay, PHI.
- 4) Introduction to Control Engg. Model, Analysis and Design by Ajit. K. Mandal, New Age International Publishers.

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai*

**Semester: 8<sup>th</sup>**

**Subject: Utilization Of Electrical Energy**

**Total Theory Periods: 40**

**Total Marks in End Semester Exam: 80**

**Minimum number of Class tests to be conducted: 2**

**Branch: Electrical Engg.**

**Code: 324812 (24)**

**Total Tut Periods: 12**

## **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 commutated 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, 2<sup>nd</sup> 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*

**Semester: 8<sup>th</sup>**

**Subject: Installation Maintenance & Testing of Electrical Equipments.**

**Total Theory Periods: 40**

**Total Marks in End Semester Exam: 80**

**Minimum number of Class tests to be conducted: 2**

**Branch: Electrical Engg.**

**Code: 324813 (24)**

**Total Tut Periods: Nil**

## **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 induction 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 conducting materials used for preparing tools for Hot line maintenance, Tools, Various types of Hot- line operations, safety during Hot line maintenance.

### **Text Books:**

Testing, commissioning, operation and maintenance of Electrical equipments - S. Rao, 6th Edn. Khanna Publishers.

### **Reference Books:**

Installation maintenance and testing vol. I & II B.V.S. Rao

Installation maintenance and testing of Electrical Equipments by Tarlok S

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai*

**Semester: 8<sup>th</sup>**

**Subject: EHV AC and DC Transmission**

**Total Theory Periods: 50**

**Total Marks in End Semester Exam: 80**

**Minimum number of Class tests to be conducted: 2**

**Branch: Electrical**

**Code: 324871 (24)**

**Total Tut Periods: 12**

## **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*

**Semester: 8<sup>th</sup>**

**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: 8<sup>th</sup>**

**Subject: Bio-Medical Instrumentation**

**Total Theory Periods: 50**

**Total Marks in End Semester Exam: 80**

**Minimum number of Class tests to be conducted: 2**

**Branch: Electrical Engg.**

**Code: 324873 (24)**

**Total Tut Periods: 12**

## **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.

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai*

**Semester: 8<sup>th</sup>**

**Subject: Micro Controller & Embedded 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: -324874 (24)**

**Total Tut Periods: 12**

## **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: Muhammed Ail Mazidi And Janice Gillispie Mazidi
3. 8 Micro controller & Embedded System Manual.
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
4. Embedded System Design: An introduction to processes, Tool And Techniques, Arnold. S.Berger

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai*

**Semester: 8<sup>th</sup>**

**Subject: VLSI Design**

**Total Theory Periods: 50**

**Total Marks in End Semester Exam: 80**

**Minimum number of Class tests to be conducted: 2**

**Branch: Electrical Engg.**

**Code: 324875 (24)**

**Total Tut Periods: 12**

## **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-clocked 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:**

1. Douglas A.Pucknell & Kamran Eshranghian,"Basic VLSI Design", Prentice Hall of India, New Delhi, 3rd edition 1994.
2. Neil H.E.West & Kamran Eshranghian,"Principles of CMOS VLSI Design: A system perspective", Addison-Wesley, 2nd edition, 1993.
3. Amar Mukherjee, "Introduction to NMOS & CMOS VLSI system design" Prentice Hall, USA, 1986

## **Reference books:**

1. Caver Mead & Lynn Conway, "Introduction to VLSI system," Addison Wesley.
2. Eugene D.Fabricus,"Introduction to VLSI design", McGraw Hill International edition, 1990.

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai*

**Semester: 8<sup>th</sup>**

**Subject: Artificial Neural Network & Fuzzy Logic**

**Total Theory Periods: 50**

**Total Marks in End Semester Exam: 80**

**Minimum number of Class tests to be conducted: 2**

**Branch: Electrical Engg.**

**Code: 324876 (24)**

**Total Tut Periods: 12**

## ***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:**

1. Neural Networks, A Comprehensive foundation, 2<sup>nd</sup> Edition by: Simon Haykin, Pearson Education.
2. Zimmerman, H.J. "Fuzzy Set Theory & its Applications," Allied Publishers, New Delhi, 1996.

## **Reference Books:**

1. Dan W Patterson, "Artificial Neural Network-Theory & Application ", Prentice Hall of India, 1996
2. Timothy J Ross, "Fuzzy Logic with Engineering Applications," McGraw Hill International Edition, USA, 1997
3. Chin-Teng Line & George C.S., "Neural Fuzzy Systems", Prentice Hall International Inc, USA, 1996.
4. Li Min Fu, "Neural Networks in Computer Intelligence", McGraw Hill, USA, 1994.

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai*

**Semester: 8<sup>th</sup>**

**Subject: Radar & Television**

**Total Theory Periods: 50**

**Total Marks in End Semester Exam: 80**

**Minimum number of Class tests to be conducted: 2**

**Branch: Electrical Engg.**

**Code: -324877 (24)**

**Total Tut Periods: 12**

## **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 aural 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
2. Radar Principles, Peebles, Wiely Pbs.

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai*

**Semester: 8<sup>th</sup>**

**Subject: Satellite Communication**

**Total Theory Periods: 50**

**Total Marks in End Semester Exam: 80**

**Minimum number of Class tests to be conducted: 2**

**Branch: Electrical Engg.**

**Code : 324878 (24)**

**Total Tut Periods: 12**

## **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; Superframe: 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.
2. Satellite communication, Roddy, McGraw Hill Pbs.

## **Reference Books:**

1. Satellite communication, Dr.D.C. Agrawal, Khanna Publishers.
2. Satellite communication, Robert M. Gagliardi, CSB Publishers & Distributors.

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai*

**Semester: 8<sup>th</sup>**

**Subject: : Installation Maintenance & Testing of Electrical Equipments.**

**Total practical periods: 40**

**Total Marks in end Semester Exam: 40**

**Branch: Electrical Engg.**

**Code: 324821 (24)**

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.
- (11) Circuit Breaker Testing.
- (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.

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai*

**Semester: 8<sup>th</sup>**

**Subject: Utilization of Electrical Lab**

**Total practical periods: 40**

**Total Marks in end Semester Exam: 40**

**Branch: Electrical Engg.**

**Code: 324822 (24)**

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

1. To derive the transfer function of an armature controlled separately excited 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:**

4. "Fundamentals of electrical drives", G K Dubey, 2<sup>nd</sup> edition, Narosa Pb
5. "Electric Drives" Vedam Subramanyam, TMH Pbs.
6. "Utilization of electric energy", Taylor, Orient Longman Pbs.

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai*

**Semester: 8<sup>th</sup>**

**Subject: Computer Simulation Lab**

**Total practical periods: 50**

**Total Marks in end Semester Exam: 40**

**Branch: Electrical Engg.**

**Code: 324823 (24)**

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.
6. Simulation of Chopper controlled DC motor.
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.
11. Write a MATLAB program for Transmission line parameter calculation (Z, Y, A, B, C, D).
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.

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai*

**Semester : BE 8th**  
**Subject: Report Writing & Seminar**  
**Total No. of periods : 2 per week**  
**Total marks in End Semester Exam: Nil**  
**Minimum Number of class test to be conducted: Two**

**Branch: Electrical Engg.**  
**Code: 300825(24)**  
**Total Tutorial Periods : Nil**  
**Teacher's Assessment: 40 marks**

## **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  
Subject :Enterprise Resource Planning  
Total Theory Periods : 40  
Total Marks in End Semester Exam : 80  
Minimum no. of class tests to be conducted : 2

Branch : Common to All Branches  
Code : 300881 (36)  
Total Tut Periods : 10

## 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**

Subject: **E-Commerce and Strategic IT**

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:**300882 (33)**

Total Tutorial Periods: **Nil**

**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**

**Subject: Decision Support and Executive Information System**

**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: 300884(33)**

**Total Tut Periods: Nil.**

## **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 I 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  
Subject: Knowledge Entrepreneurship  
Total Theory Periods: 40  
Total Marks in End Semester Exam:80  
Minimum no. of class tests to be conducted: 2

Branch: Common to All Branches  
Code: 300886 (36)  
Total Tut Periods: 12

## **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

**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  
Subject : Project planning management and Evaluation  
Total Theory Periods : 40  
Total Marks in End Semester Exam :80  
Minimum No. Of Class test to be conducted : 2

Branch : **Common to All Branches**  
Code : 300888 (36)  
Total tutorial Period : 12

## **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. Fawcett and Wood

Personal Protective Equipment – NSC Bombay

## **REFERENCE BOOKS**

Ergonomics - P. Krishna Murthy

Fire Prevention Hand Book – Derek James

# 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 Markov 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, 2<sup>nd</sup> 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

Minimum number of class tests to be conducted: 2

Branch: **Common to All Branches**

Code: 300891 (37)

Total Tutorial Period : 12

## 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. Shinsky – 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 TiO<sub>2</sub> 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**

**Subject: Intellectual Property Rights**

**Total Theory Periods: 40**

**Total Marks in End Semester Exam: 80**

**Minimum No. Of Class test to be conducted:2**

**Branch: Common to All Branches**

**Code: 300893 (36)**

**Total tutorial Period: 12**

**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, Dominant 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

Subject: Value 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: 300894 (37)

Total Tutorial Period: 12

**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 Books:**

Design of Earthquake Resistant Buildings – Minoru Wakabayashi (McGraw Hill Publication)

Dynamics of Structures: Theory and Application to Earthquake Engineering (2<sup>nd</sup> 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, Pittsburgh, 2000)

Construction Project Management – Frederick E.Gould (Wentworth Institute of Technology, Vary E.Joyce, Massachusetts 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., Houston, 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 and 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 alteration 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

Note: Internal Choice may be given in any three units.

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  
Subject: Energy Auditing  
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: 300899 (24)  
Total Tut Periods: Nil

## **UNIT I:**

History of Energy Management: Energy forecasting, Limitations of energy resources. Renewable energy resources. 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 Conservation, 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.