Chhattisgarh Swami Vivekanand Technical University, Bhilai

Scheme of Teaching and Examination

B.E. VIII SEMESTER

ELECTRONICS AND INSTRUMENTATION

S.No.	Board of studies	Subject Code	Subject Name	Period Per Week			Scheme of Exam			Total Marks	Credit L+(T+P)/2
				L	T	P	Theory / Practical				
							ESE	CT	TA		
1	Electronics & Instrumentation	327811 (27)	Instrumentation System Design	3	1	-	80	20	20	120	4
2	Electronics & Instrumentation	327812 (27)	Optical Instrumentation	3	1	-	80	20	20	120	4
3	Electronics & Instrumentation	327813 (27)	Embedded Instrumentation System	3	1	-	80	20	20	120	4
4	Refer Table –III		Elective - III	3	1	-	80	20	20	120	4
5	Refer Table – IV		Elective - IV	3	1	-	80	20	20	120	4
6	Electronics & Instrumentation	327821 (27)	Instrumentation System Design Laboratory	-	-	4	40	-	20	60	2
7	Electronics & Instrumentation	327822 (27)	Optical Instrumentation Laboratory	-	-	4	40	-	20	60	2
8	Electronics & Instrumentation	327823 (27)	PC Based Instrumentation Laboratory	-	-	4	40	-	20	60	2
9	Electronics & Instrumentation	327824 (27)	Major Project	-	-	5	100	-	80	180	3
10	Electronics & Instrumentation	300825 (27)	Report Writing & Seminar	-	-	2	-	-	40	40	1
11			Library	-	-	1	-	-	-	-	-
Total				**15**	**5**	**20**	**620**	**100**	**280**	**1000**	**30**

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

Table – III
Professional Elective – III

Sl. No.	Board of Study	Code	Subject
1	Electronics & Instrumentation	327871 (27)	Robotics and Automation
2	Electronics & Instrumentation	327872 (27)	Logic & Distributed Control Systems
3	Electronics & Instrumentation	327873 (27)	Power Plant Instrumentation
4	Electronics & Instrumentation	327874 (27)	Instrumentation for Pollution Control
5	Electronics & Instrumentation	327875 (27)	Hardware Descriptive Language
6	Electronics & Instrumentation	327876 (27)	Operating Systems

Note (1) - $1/4^{th}$ 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
Professional Elective – IV

Sl. No.	Board of Study	Code	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	**Comp. Sc. & 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 Engineering**	300889 (37)	Safety Engineering
10	**Comp. Sc. & Engg.**	300890 (22)	Bio Informatics
11	**Mechanical Engineering**	300891 (37)	Energy Conservation & Management
12	**Nanotechnology**	300892 (47)	Nanotechnology
13	**Management**	300893 (36)	Intellectual Property Rights
14	**Mechanical Engineering**	300894 (37)	Value Engineering
15	**Civil Engineering**	300895 (20)	Disaster Management
16	**Civil Engineering**	300896 (20)	Construction Management
17	**Civil Engineering**	300897 (20)	Ecology & Sustainable Development
18	**Chemical Engineering**	300898 (19)	Non Conventional Energy Sources
19	**Electrical Engineering**	300899 (24)	Energy Auditing and Management

Semester : VIII **Branch: E&I**
Subject: Instrumentation System Design **Code: 327811 (27)**
Total Theory Periods: 40 **Total Tutorial Periods: 12**
Total Marks in End Semester Examination: 80
Minimum number of Class tests to be conducted: 2

UNIT – I : Design of Electrical Components and Transducers
Variable capacitance transducers, associated circuits, variable resistance transducers, wire potentiometers, strain gauge, metal resistors and thermistors, variable inductance transducers, ferromagnetic cores with air gaps, ferromagnetic plunger type core, associated circuits, Design of LVDT with output circuitry, permanent magnet moving coil instruments, capacitive transducers, clamped diaphragm and membrane, bridge circuit, Piezo electric transducers, charge amplifiers.

UNIT – II : Interface of primary elements with and devices
Temperature sensing from a distance, current mode transmission of signals, ambient referenced thermocouples.

UNIT – III : Design of Controllers
Controller configurations (P,PI,PD,PID Cascade, etc) Setting, tuning, realization of controllers, electrical, pneumatic displacement, balanced and forced balance, controllers for interacting processes.

UNIT – IV : Reading and Drawing of Circuit Diagrams of Instrumentation Systems
Standards, Specifications, one line diagram of hydraulic, pneumatic and electrical instrumentation systems.

UNIT – V : System Design (Case Study)
Microprocessor- Based system design for temperature & Pressure .
PC-Based system design for. Thermal Power station & Cement plant.

Text Books:

1. Neubort,H.K.P.-Instrumentation Transducers-An Introduction to Their Performance and design, Clarendon Press,Oxford.
2. Dobelin,E,O,- Measurement Systems: Applications and Design, Mc-Graw Hill Kogakusha Ltd.

Reference Books:

1. Rangan, Mani & Sharma, Instrumentation Devices and Systems, Tata Mc-Graw Hill Publication Co.
2. Norton H.N., Handbook of transducers : Prentice Hall.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester : VIII **Branch: E&I/AE&I**
Subject: Optical Instrumentation **Code: 327812 (27)**
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 : **Optical Fibers and Their Properties**
Principles of light propagation through a fiber – different types of fibers and their properties transmission characteristics of optical fiber – absorption losses – scattering losses – dispersion – optical fiber measurement – optical sources – optical detectors – LED – LD – PIN and APD

UNIT – II : Industrial Application of Optical Fibers
Fiber optic sensors – fiber optic instrumentation system – different types of modulators – detectors – application in instrumentation – interferometric method of measurement of length – moiré fringes – measurement of pressure, temperature, current, voltage liquid level and strain – fiber optic gyroscope – polarization maintaining fibers.

UNIT – III : Laser Fundamentals
Fundamental characteristics of lasers – three level and four level lasers – properties of laser – laser modes – resonator configuration – Q-switching and mode locking – cavity dumping – types of lasers: gas lasers, solid lasers, liquid lasers and semi conductor lasers

UNIT – IV : Industrial Application of Lasers
Laser for measurement of distance, length velocity, acceleration, current, voltage and atmospheric effect – material processing – laser heating, welding melting and trimming of materials – removal and vaporization.

UNIT – V : Hologram and Medical Application
Holography – basic principle; methods; holographic interferometry and applications, holography for non – destructive testing – holographic components – medical applications of lasers; laser and tissue interaction – laser instruments for surgery, removal of tumors of vocal cords, brain surgery, plastic surgery, gynecology and oncology

Text Books:

1. John and Harry, Industrial lasers and their applications, McGraw-ill, 1974
2. Senior J.M., Optical Fiber Communication Principles and Practice, Prentice Hall, 1985

Reference Books:

1. John F Read, Industrial Applications of Lasers, Academic Press.
2. Monte Ross, Laser Applications, McGraw-Hill.
3. Keiser G., Optical Fiber Communication, McGraw-Hill.
4. Jasprit Singh, Semiconductor Optoelectronics, McGraw-Hill.
5. Ghatak A.K and Thiagarajar K, Optical Electronics, TMH.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester : VIII **Branch: E&I**
Subject: Embedded Instrumentation System **Code: 327813 (27)**
Total Theory Periods: 40 **Total Tutorial Periods: 12**
Total Marks in End Semester Examination: 80
Minimum number of Class tests to be conducted: 2

UNIT – I : Introduction
Embedded system evolution trends – basic real time concepts – real time design issues – 68HCII Microcontrollers – architecture – instruction set – interrupt handling – integrating interrupts in a system – examples – the shared data problem – software architecture.

UNIT – II : Real Time Operating Systems (RTOS)
Real time specifications – real time kernels – inter-task communications and synchronizations – real time memory management.

UNIT – III : System Performance, Analysis and Optimization
Response – time calculation – interrupt latency – time loading and its measurement – scheduling – reducing response times and time loading – analysis of memory requirements – reducing memory loading – input – output performance.

UNIT – IV : Debugging Techniques and Development Tools
Faults, failures, bugs and effects – reliability – testing – fault tolerance – host and target machines – linker / locators for embedded software – getting embedded software into target system.

UNIT – V : Real Time Applications
Real time system as complex systems – real time databases – real time image processing – real time Unix – building real time applications with real time programming languages. An example : The tank monitoring system

Text Books:

1. Philip A. Laplante, “Real Time Systems Design and Analysis: An Engineer’s Handbook”, edition, Prentice Hall of India, New Delhi, 2000
2. David E. Simon, “An Embedded Software Primer”, Addision Wesley, New Delhi, 2000

Reference Books:

1. Raymond J.A. Bhur and Donald L. Bialey, “An Introduction to Real Time Systems: From Design to Networking with C/C++”, Prentice Hall of Inc., New Jersey, 1999
2. John B.Peatman, “Design with Microcontrollers”, McGraw Hill Book Co., New york, 1988
3. Jonathan W. Valvano, “Embedded Micro Computer System: Real Time Interfacing”, Brooks/Cole, USA, 2000
4. C.M. Krishnan and Kang G. Shin, “Real Time Systems”, McGraw Hill, New Delhi, 1997

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: VIII **Branch: E&I/AE&I**
Subject: Robotics and Automation **Code: 327871 (27)**
Total Theory Periods: 40 **Total Tutorial Periods: 12**
Total Marks in End Semester Examination: 80
Minimum number of Class tests to be conducted: 2

UNIT – I : BASIC CONCEPTS IN ROBOTICS
Advantages, Applications, Basic structure of robots, Numerical control of machine tools, Resolution, Accessories and Repeatability. Classification and Structure: Point to point Robotic system, control tool of Robotic systems, Manipulator, The wrist motors and the grips, structure of continuous path rot Robot systems.

UNIT – II : DRIVES AND CONTROL SYSTEMS
Hydraulic system Direct current serve motors, Control approaches of Robots, Control and loops using current amplifier, Control loop using voltage amplifier, Elimination of Stationary position errors, Control loop in CNC system. Kinematics Analysis and Coordinate Transformation: - Direct Kinetic problems in Robotics, Geometry based Direct Kinematics Analysis, Co-ordinate and vector Transformations using matrices, Denourt – Hartenberg convention, Applications of the DH method , Quaternion and rotation vector representations .

UNIT – III : TRAJECTORY INTERPOLATORS
Necessity of Interpolators , Generation of motion commands Trajectory planning , Basic structure of Interpolators , Particular Solutions for the Inverse Kinetics problem Resolved motion state control method , solving the Inverse Kinetic problem using rotation vector .

UNIT – IV : SENSORS AND INTELLIGENT ROBOTS
Introduction to Robotic Sensors, Vision System, Range detectors, Assembly aid devices, Force and torques Sensors Brief concept of Artificial Intelligence .
Installing a Robot: Plant Survey, Selecting Robots, Economic Analysis, case study, Robot safety.

UNIT – V : APPLICATION OF ROBOTS
Handing , Loading and Unloading , the manufacturing cell , Wielding , Spray painting , Assembly , Machining ,
Press work & Forging , Heat treatment applications , Robots in Electroplating .

Text Books :-

1. Korem Yoram ROBOTICS FOR Engineering : Tata McGraw Hall

Reference Books :-

1. Koyreu Yu. Industrial Robotics –(Mir Publishers Moscow)
2. Anthony CMC Donad, Robot Technology : (Theory Design and Application) (Prentice Hall)
3. Mikell P. Groover etal, “Industrial Robots – Technology Programming & Applications” McGraw Hill Ltd.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester : VIII **Branch: E&I**
Subject: Logic & Distributed Control Systems **Code: 327872 (27)**
Total Theory Periods: 40 **Total Tutorial Periods: 12**
Total Marks in End Semester Examination: 80
Minimum number of Class tests to be conducted: 2

UNIT – I : Review of Computers in Process Control
Data loggers: Data acquisition systems (DAS): alarms, computer control hierarchy levels. Direct Digital control (DDC). Supervisory digital control (SCADA). Characteristics of digital data. Controller software. Linearization. Digital Controller modes, error, proportional, derivative and composite controller modes.

UNIT-II : Programmable Logic Controller(PLC) Basics
Definition- overview of PLC systems - Input/ Output modules - Power supplies –ISO slots. General PLC programming procedures - programming on-off outputs. Auxiliary commands and functions - creating ladder diagrams from process control descriptions. PLC basic functions - register basics - timer functions - counter functions.

UNIT – III : PLC Intermediate Functions
Arithmetic functions - number comparison functions - skip and MCR functions - data move systems. PLC Advanced intermediate functions- utilizing digital bits - sequencer functions - PLC Advanced functions: alternate-programming languages - operation. PLC-PID functions - PLC installation - trouble shooting and maintenance - controlling a robot - processes with PLC - design of inter locks and alarms using PLC.

UNIT – IV : Introduction to (DCS)
Evolution of DCS - building blocks - detailed descriptions and functions of field control units - operator stations - data highways - redundancy concepts.

UNIT – V : Implementation of DCS
DCS - supervisory computer tasks and configuration - DCS- system integration with PLC and computers. Communication in DCS. Case studies in DCS.

Text Books:

1. John Webb, W, Ronald Reis, A.,: " Programmable logic controllers principles and applications", 3/e, Prentice Hall Inc.
2. Krishna Kant.,: " Computer Based Industrial Control", Prentice Hall India.

Reference Books:

1. Lukcas , M.P.,: " Distributed control systems", Van Nostrand Reinhold Co.
2. Moore., : " Digital control devices" , ISA Press.
3. Hughes, T, " Programmable logic controllers", ISA Press.
4. Mckloni, D.T.,: "Real time control networks" , ISA Press.
5. Deshpande, P.B, and Ash ,R.H.,: " Elements of process control applications" , ISA Press.

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

Semester : VIII **Branch: E&I/AE&I**
Subject: Power Plant Instrumentation **Code: 327873 (27)**
Total Theory Periods: 40 **Total Tutorial Periods: 12**
Total Marks in End Semester Examination: 80
Minimum number of Class tests to be conducted: 2

UNIT – I : Overview Of Power Generation
Brief survey of methods of power generation – hydro, thermal, nuclear, solar and wind power – importance of instrumentation in power generation – thermal power plants – building blocks – details of boiler processes UP&I diagram of boiler – cogeneration.

UNIT – II : Measurements In Power Plants
Electrical measurements – current, voltage, power, frequency, power – factor etc. – non electrical parameters – flow of feed water, fuel, air and steam with correction factor for temperature – steam pressure and steam temperature – drum level measurement – radiation detector – smoke density measurement – dust monitor.

UNIT – III : Analyzers In Power Plants
Flue gas oxygen analyser – analysis of impurities in feed water and steam – dissolved oxygen analyser – chromatography – PH meter – fuel analyser – pollution monitoring instruments.

UNIT – IV : Control Loops In Boiler
Combustion control – air/fuel ratio control – furnace draft control – drum level control – main stem and reheat steam temperature control – superheater control – attemperator – deaerator control – distributed control system in power plants – interlocks in boiler operation.

UNIT – V : Turbine – Monitoring And Control
Speed, vibration, shell temperature monitoring and control – steam pressure control – lubricant oil temperature control – cooling system

TEXT BOOKS

1. Sam G. Dukelow, The control of Boilers, instrument Society of America.
2. Modern Power Station Practice, Vol.6, Instrumentation, Controls and Testing, Pergamon Press, Oxford.

REFERENCE*S*

1. Elonka,S.M.and Kohal A.L.Standard Boiler Operations, McGraw-Hill, New Delhi.
2. R.K.Jain, Mechanical and industrial Measurements, Khanna Publishers, New Delhi.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester : VIII **Branch: E&I**
Subject: Instrumentation for Pollution Control **Code: 327874 (27)**
Total Theory Periods: 40 **Total Tutorial Periods: 12**
Total Marks in End Semester Examination: 80
Minimum number of Class tests to be conducted: 2

UNIT – I : Environmental Monitoring
Classification, ambient environmental monitoring –source monitoring –implant environment monitoring-personal monitoring.

UNIT – II : Air Pollution Monitoring
Air Pollutants- basics of monitoring technologies like conductimetry,coulemetry – pizeo eletric oscillations methods-paper tape method- optical method-air pollution monitoring instruments.

UNIT – III : Water Pollution Monitoring
Water pollutants –basic techniques –spectrometric methods- emission spectrograph- atomic absorption spectra photometry- water pollution monitoring instruments.

UNIT – IV : Noise pollution monitoring
Noise pollution and its measurement

UNIT – V : Industrial pollutants and its monitoring
Monitoring Instruments of industrial pollution.

Text Books

1. Soli J. Arceilala, “Waste Water Treatment for Pollution Control”, Tata McGraw Hill, 1998, ISBN-0-07-463002-4
2. M.N.Rao, HVN Rao, “Air Pollution”, Tata McGraw Hill, 2000,ISBN-0-07-457871-2
3. V.P. Kuderia, “Noise Pollution & Its Control”, Pragari Prakasan, 2000, ISBN-81-7556-186-6.

Reference Book

1. Faith W.L., and Atkinson A.A., : “Air pollution”, 2nd edition Wiley Interscience Inc., New York, 1972.
2. B.C. Punmia, Ashok Jain, “Waste Water Engineering”, Laxmi Publication, 1998, ISBN – 81-7008-091-6

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester : VIII **Branch: E&I**
Subject: Hardware Descriptive Language **Code: 327875 (27)**
Total Theory Periods: 40 **Total Tutorial Periods: 12**
Total Marks in End Semester Examination: 80
Minimum number of Class tests to be conducted: 2

UNIT – I : Introduction to VHDL

VHDL Terms, Describing Hardware in VHDL, Entity, Architectures, Concurrent Signal Assignment, Event Scheduling, Statement Concurrency, Structural Designs, Sequential Behavior, Process Statements, Process Declarative Region, Process Statement Part, Process Execution, Sequential Statements, Architecture Selection, Configuration Statements, Power of Configurations,

UNIT – II : Behavioral Modeling

Introduction to Behavioral Modeling, Transport Versus Inertial Delay, Inertial Delay, Transport Delay, Inertial Delay Model, Transport Delay Model, Simulation Deltas, Drivers,
Driver Creation, Bad Multiple Driver Model, Generics, Block Statements, Guarded Blocks,

UNIT – III : Sequential Processing

Process Statement, Sensitivity List, Process Example, Signal Assignment Versus Variable Assignment, Incorrect Mux Example, Correct Mux Example, Sequential Statements, IF Statements, CASE Statements, LOOP Statements, NEXT Statement, EXIT Statement, ASSERT Statement, Assertion BNF, WAIT Statements, WAIT ON Signal, WAIT UNTIL Expression, WAIT FOR time Expression, Multiple WAIT Conditions, WAIT Time –Out,
Sensitivity List Versus WAIT Statement, Concurrent Assignment Problem, Passive Processes,

UNIT – IV : Date Types

Object Type, Signal, Variables, Constants, Data Types, Scalar Types, Composite Types,
Incomplete Types, File Type Caveats, Subtypes,

UNIT – V : VHDL Synthesis

Register Transfer Level Description, Synthesis, IF Control Flow Statements, RTL Simulation, VHDL synthesis

Text 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.

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Semester : VIII **Branch: E&I**
Subject: Operating Systems **Code: 327876 (27)**
Total Theory Periods: 40 **Total Tutorial Periods: 12**
Total Marks in End Semester Examination: 80
Minimum number of Class tests to be conducted: 2

UNIT – I : Introduction
Concept of an operating system, Early systems, simple monitor, Performance, Multiprogramming, Time sharing, Real time system, protection, Different losses of computers, Multiprocessor system, Operating system services, Type of services, The user view, The operating system view.

UNIT – II : File Systems
File concept , file support , Access methods , Allocation methods, directory system , file protection , Implementation issues , CPU Scheduling , Review of multiprogramming concepts , scheduling concepts , scheduling Algorithms . Algorithm Evaluation , Multiple processor scheduling , memory management , Preliminaries , Bare machine Resident Monitor , swapping , multiple partition paging other consideration .

UNIT – III : Virtual Memory
Overlays , Demand paging , Performance of demand paging , page replacement , virtual memory concept , page replacement algorithms , Allocations algorithms , Thrashing , Other consideration , DISK scheduling , Physical characteristics , FCFS scheduling , SSTF , SCAN , Selecting a disk scheduling algorithm, sector queuing , Deadlocks , The deadlock problem , deadlock characterization , Deadlock prevention , Deadlock Avoidance , Deadlock Detection , Recovery from dead lock combined approach to deadlock handling .

UNIT – IV : Concurrent Processes
Precedence graphs specification review of process concept , Hierarchy of process , The critical section problem semaphores , Inter process communication CONCURRENT PROGRAMMING Motivation , Modularization , synchronization , Concurrent languages PROTECTION , Goals of protection , mechanism and policies , domain of protection , Access matrix and its implementation ,Dynamic protection structure , Revocation , Exiting systems , languages based protection , security .

UNIT – V : Design Principle
Goals , Mechanisms and policies , Layered approach , virtual machines , multiprocessor , Implementation , system generation disturbed systems , Motivation , Topology , Communication systems , type , file system modes of computations , Event ordering synchronization , Deadlock handling Robustness , Reaching agreement , Elector Algorithms, The unix operating system , History , design principles , Programmer interface , V ser interface , file systems process management, memory management , I/O system interprocess communication .

Text Books:

1. Paterson J.L. and silberschutz A., “Operating system concepts”

Reference Books:

1. Tanenbaun A. S., “Design and implementation”, prentice Hall of India.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: VIII **Branch: E&I**
Subject: Instrumentation System Design Laboratory **Code: 327821 (27)**
Total Practical Periods: 50
Total Marks in End Semester Examination: 40

Experiments to be performed:

1. On-Off Controller with and without neutral zone
2. Controller tuning using continuous cycling methods
3. Controller tuning using Process Reaction Curve
4. Study of P, I, D, PI, PD and PID Controller for : Temperature, Pressure, Flow and Level control system
5. RTD based temperature transmitter
6. Differential Pressure Transmitter Characteristics
7. Thermocouple based Temperature Transmitter
8. Calibrations and tuning of a PID controllers.
9. Test and find the characteristics of a given control valve.
10. Study of hydraulic components and simple circuits.
11. Study of pneumatic components and simple circuits.
12. Study of two-wired transmitter and square root extractor.
13. Study of alarm annunciator.
14. Study of PLC and simple programming.
15. Study of specific related equipment e.g. RTD (Resistant temperature Detector), transducer, pH simulator, pressure regulators and safety devices.

List of Instruments:
All sorts of transducers with kits, Discrete components like OPAMP, Resistor & Capacitors, Voltage source, Function generator, CRO.

Reference Book:
Handbook of Instrumentation, Liptak

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester : VIII **Branch: E&I**
Subject: Optical Instrumentation Laboratory **Code: 327822 (27)**
Total Practical Periods: 50
Total Marks in End Semester Examination: 40

Experiments to be performed:

1. To measure bending loss of a fiber.
2. To propagation or attenuation loss in a fiber.
3. To obtain amplitude modulation and to transmit the same over fiber optic cable and to demodulate the same at the receiver end.
4. To determine the numerical aperture of a fiber.
5. To measure various types of losses occur in an optical fiber.
6. To study the AC characteristics of intensity modulation of laser and fiber optic system.
7. To measure optical power of a laser diode Vs. forward current.
8. To monitor photo diode current Vs. laser optical output.
9. Demonstration of voice transmission through optical fiber using FM.
10. Communication between two computers using RS232 interface via optical fiber.
11. To measure plastic fiber patch cord loss for various lengths of fiber.
12. To study voice transmission through fiber optic cable using PWM.
13. To transmit and receive text files over fiber optic cable.
14. To transmit, receive and observe digital signals over fiber optic cable.
15. To measure rise time, fall time, pulse width distortion of a laser and to determine transmission delay.

List of Equipments/Machine Required:
Fiber optic trainer kit, optical fiber, Splicing unit, Data Acquisition card for optical signal, O/E & E/O Converter, CRO.

Recommended Books:
Fundamentals of Optical Fiber Communication – Sathish Kumar, PHI

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester : VIII **Branch: E&I**
Subject: PC Based Instrumentation Laboratory **Code: 327823 (27)**
Total Practical Periods: 50
Total Marks in End Semester Examination: 40

List of Experiments to be performed:

- Computer Simulation of All sorts of Thermocouple to study their characteristics
- Computer Simulation of PID controller action
- Computer Simulation of PLC programming
- Computer simulation of flow control loop
- Processing of simulated ECG signal
- Processing of simulated EEG signal
- Processing of simulated Heart sound
- Interconnection of two microcomputers through serial interface through serial ports.
- Data Acquisition System.
- Interfacing of an analog signal to microcomputer through ADC.
- Interfacing of a Digital signal to Microcomputer through DAC.
- PC Based Data acquisition using ADC/DAC Add-on cards
- Computer Interface for PID Controllers
- Computer Controlled Lathe Machine

List of equipments:

NI Labview software, Electronic Workbench

Reference book:

Labview manual, National Instruments.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester : BE 8th **Branch: Electronics & Instrumentation**
Subject: Report Writing & Seminar **Code: 300825 (27)**
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
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** 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
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, Londan

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

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
Branch: **Common to All Branches**
Subject: Energy Conservation & Management
Code: 300891 (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
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 Books:
Design of Earthquake Resistant Buildings – Minoru Wakabayashi (McGraw Hill Publication)
Dynamics of Structures: Theory and Application to Earthquake Engineering (2nd edition) – Anil K Chopra (Pearson Education Publication)

Name of Reference Books:
Fundamentals of Vibrations – Anderson, R.A. (Mc Millan)
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
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 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.