

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

Scheme of teaching and examination

## B.E. VIII Computer Science & Engineering

S. No	Board of Study	Subject Code	Subject Name	Periods per week			Scheme of examination			Total Marks	Credits [L+(T+P)/2]
				L	T	P	ESE	CT	TA		
				1	Comp. Science & Engg.	322811(22)	Artificial Intelligence & Expert Systems	4	1		
2	Comp. Science & Engg.	322812(22)	Data Mining & Warehousing	3	1	-	80	20	20	120	4
3	Comp. Science & Engg.	322813(22)	Software Project Management	3	1	-	80	20	20	120	4
4	<b>Refer Table-3</b>		Professional Elective-3	4	-	-	80	20	20	120	4
5	<b>Refer Table-4</b>		Open Elective - 4	4	-	-	80	20	20	120	4
6	Comp. Science & Engg.	322821(22)	Artificial Intelligence & Expert Systems Lab	-	-	3	40	-	20	60	2
7	Comp. Science & Engg.	322822(22)	Network Security Lab	-	-	3	40	-	20	60	2
8	Comp. Science & Engg.	322823(22)	Software Technology Lab-5	-	-	3	40	-	20	60	2
9	Comp. Science & Engg.	322824(22)	Major Project	-	-	7	100	-	80	180	4
10	Comp. Science & Engg.	300825(22)	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>32</b>

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

**\* To be completed after VI Semester and before the commencement of VII Semester**

### Professional Elective-II (Table-3)

S.No.	Board of Studies	Subject Code	Subject Name
1	Computer Science & Engg	322871(22)	Neural Network & Fuzzy Logic
2	Computer Science & Engg	322872(22)	Distributed Parallel Processing
3	Computer Science & Engg	322873(22)	Distributed Multimedia
4	Computer Science & Engg	322874(22)	Decision Support System
5	Computer Science & Engg	322875(22)	Wireless Networks
6	Computer Science & Engg	322876(22)	Real Time Systems
7	Computer Science & Engg	322877(22)	Pattern Recognition
8	Computer Science & Engg	322878(22)	Cyber Crime & Laws

Note-1 : 1/4 of total strength of students subjects to Minimum Strength 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 for future examination.

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai*

**Table –4**

<b>Open 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)	Bioinformatics
11	Mechanical Engg.	300891 (37)	Energy Conservation & Management
12	Nanotechnology	300892 (47)	Nanotechnology
13	Management	300893 (36)	Intellectual Property Rights
14	Mechanical Engg.	300894 (37)	Value Engineering
15	Civil Engg.	300895 (20)	Disaster Management
16	Civil Engg.	300896 (20)	Construction Management
17	Civil Engg.	300897 (20)	Ecology and Sustainable Development
18	Chem. Engg.	300898 (19)	Non Conventional Energy Sources
19	Electrical Engg.	300899 (24)	Energy Auditing and Management

**Note (1) -** 1/4<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.

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

Semester: VIII  
Subject: Artificial Intelligence & Expert System.  
Total Theory Periods: 50  
Total Marks in End Semester Exam: 80.  
Minimum number of class tests to be conducted: 02.

Branch: Computer Science & Engg.  
Code: 322811 (22)  
Total Tut Periods: 12

## **UNIT I Overview & Search Techniques:-**

Introduction to AI, Problem Solving, State space search, Blind search: Depth first search, Breadth first search, Informed search : Heuristic function, Hill climbing search, Best first search, A\* & AO\* Search, Constraint satisfaction. Game tree, Evaluation function, Mini-Max search, Alpha-beta pruning, Games of chance.

## **UNIT II Knowledge Representation (KR):-**

Introduction to KR, Knowledge agent, Predicate logic, WFF, Inference rule & theorem proving : forward chaining, backward chaining, resolution; Propositional knowledge, Boolean circuit agents. Rule Based Systems, Forward reasoning: Conflict resolution, backward reasoning: Use of backtracking, Structured KR: Semantic Net - slots, inheritance, Frames- exceptions and defaults- attached predicates, Conceptual Dependency formalism, Other knowledge representations.

## **UNIT III Handling uncertainty & Learning: -**

Source of uncertainty, Probabilistic inference, Bayes' theorem, Limitation of naïve Bayesian system, Bayesian Belief Network (BBN), Inference with BBN, Dempster-Shafer Theory, Fuzzy Logic, Fuzzy function, Fuzzy measure, Non monotonic reasoning: Dependency directed backtracking, Truth maintenance systems. Learning : Concept of learning, Learning model, learning decision tree, Paradigms of machine learning, Supervised & Unsupervised learning, Example of learning, Learning by induction, Learning using Neural Networks.

## **UNIT IV Natural Language Processing(NLP) & Planning :-**

Overview of NLP tasks, Parsing, Machine translation, Components of Planning System, Planning agent, State-Goal & Action Representation, Forward planning, Backward chaining, Planning example : partial-order planner, Block world.

## **UNIT V Expert System & AI languages:-**

Need & Justification for expert systems- cognitive problems, Expert System Architectures, Rule based systems, Non production system, knowledge acquisition, Case studies of expert system. AI language: Prolog syntax, Programming with prolog, Backtracking in prolog, Lisp syntax, Lisp programming.

## **Text Books :-**

1. Elaine Rich and Kevin Knight: Artificial Intelligence- Tata McGraw Hill.
2. Dan W.Patterson Introduction to Artificial Intelligence and Expert Systems- Prentice Hall of India.

## **Reference Books :-**

1. Nils J.Nilsson: Principles of Artificial Intelligence- Narosa Publishing house.
2. Clocksin & C.S. Melish; Programming in PROLOG- Narosa Publishing house.
3. M. Sasikumar, S.Ramani, et. al.: Rule based Expert Systems (A practical Introduction ) Narosa Publishing House.

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

Semester: VIII

Subject: Data Mining and Ware housing.

Total Theory Periods: 40

Total Marks in End Semester Exam: 80.

Minimum number of class tests to be conducted: 02.

Branch: Computer Science & Engg.

Code: 322812 (22)

Total Tut Periods: 12

## Unit-I

Overview And Concepts: Need for data warehousing, Basic elements of data warehousing, Trends in data ware housing. Planning And Requirements: Project planning and management, Collecting the requirements. Architecture And Infrastructure: Architectural components, Infrastructure and metadata.

## Unit-II

Data Design And Data Representation: Principles of dimensional modeling, Dimensional modeling advanced topics, data extraction, transformation and loading, data quality.

## Unit-III

Information Access And Delivery: Matching information to classes of users, OLAP in data warehouse, Data warehousing and the web. Implementation And Maintenance: Physical design process, data warehouse deployment, growth and maintenance.

## Data Mining:

## Unit-IV

Introduction: Basics of data mining, related concepts, Data mining techniques Data Mining Algorithms: Classification, Clustering, Association rules. Knowledge Discovery : KDD Process.

## Unit-V

Web Mining: Web Content Mining, Web Structure Mining, Web Usage mining. Advanced Topics: Spatial mining, Temporal mining. Visualisation : Data generalization and summarization-based characterization, Analytical characterization: analysis of attribute relevance, Mining class comparisons: Discriminating between different classes, Mining descriptive statistical measures in large databases Data Mining Primitives, Languages, and System Architectures: Data mining primitives, Query language, Designing GUI based on a data mining query language, Architectures of data mining systems Application and Trends in Data Mining: Applications, Systems products and research prototypes, Additional themes in data mining, Trends in data mining

## Text Books:

1. Prabhu, Data ware housing- concepts, Techniques, Products and Applications, Prentice hall of India
2. Soman K P, "Insight into Data Mining: Theory & Praticce" , Prentice hall of India
3. M.H. Dunham, "Data Mining Introductory and Advanced Topics", Pearson Education.

## Name of Reference Books:

1. Paulraj Ponniah, "Data Warehousing Fundamentals", John Wiley.
2. Gupta, "Introduction To Datamining with Case Studies", PHI
3. Ralph Kimball, "The Data Warehouse Lifecycle toolkit", John Wiley.
4. IBM, "Introduction to Building The Datawarehouse" PHI

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

Semester: VIII

Subject: Software Project Management.

Total Theory Periods: 40

Total Marks in End Semester Exam: 80.

Minimum number of class tests to be conducted: 02.

Branch: Computer Science & Engg.

Code: 322813 (22)

Total Tut Periods: 12

## **Unit 1 : Fundamentals of SPM**

Essential elements of Software Project Management, rapid development focus, What's a project?, Project vs. Program Management, PM Tools, Project Manager, Gantt Chart, Network Diagram.

## **Unit 2: Project integration management**

Scope, Time, Cost, Quality, Human resource, Communications, Risk, Why Rapid Development, Four Project Dimensions: People, Process, Product, Technology; Technical Fundamentals, Requirements, Project Phases, Phases Variation, Classic Mistakes, PMI Fundamentals, Project Organization, Project Selection, Project Portfolio Management, Procurement Management, Statement of Work (SOW), Project Charter.

## **Unit 3: Planning**

Project Phases, Time Allocation by Phase, Remember the 40-20-40 Rule, Concept Exploration, Requirements, Analysis & Design, Development, Integration & Test, Deployment & Maintenance, Lifecycle Planning, Pure Waterfall, Waterfall Risk, Evolutionary Prototyping, Staged Delivery, Process Model, RAD, Dynamic System Development Method (DSDM), Planning, Planning Documents, Product Documents, SDP / SPMP, Communications Management Plan. Work Breakdown Structures (WBS), Estimation, Network Fundamentals, PERT & CPM Techniques, Gantt Charts, Partitioning Project, WBS Types, WBS & Methodology, WBS Techniques, Estimation Methodologies, Effort Estimation, COCOMO, Financial Analysis of Projects, Payback Analysis, Scheduling, Scheduling Techniques, Network Diagrams, Critical Path, CPM, Task Dependency Relationships, PERT, PERT Example, Milestone Chart.

## **Unit 4: Risk and Change Management**

Risk Management, Project Risk, Types of Risks, Risk Identification, Risk Analysis, Risk Control, Risk Resolution, Change Management, Change Control Board (CCB), SCM, Development Management, CMM Levels, Document Analysis, Project Control, Progress Monitoring, Status Reports, Programming Status Reporting, Binary Reporting, Earned Value Analysis (EVA), Derived EVA Variances, Effort-Driven Scheduling.

## **Unit 5: Project testing & Project success:**

Integration & Testing, Validation and Verification, Quality Assurance, Testing, Test Cases, Sources of Defects, Black-Box Testing, White-Box Testing, Unit Testing, Integration Testing, System Testing, Regression Testing, External Testing Milestones, Test Scripts, Static Testing, Automated Testing, Test Tools, Load & Stress Testing, Performance Metrics, Test Metrics, Web Site Testing, Final Stages, Migration Strategies, Project Recovery, Project Success.

### **Name of Text Books:**

- 1 Project Management, A Managerial Approach. Jack R. Meredith, Samuel J. Mantel, Jr.
- 2 Software project Management,: A Concise Study, Kelkar, Prentice hall of India

### **Name of Reference Books:**

- 1 Project Management for Business and Technology- Principles and Practice, Nicholas, Prentice Hall Of India
2. Software Engineering, Pressmann, MHI

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

Semester: VIII

Subject: **Neural Network and Fuzzy Logic.**

Total Theory Periods: 50

Total Marks in End Semester Exam: 80.

Minimum number of class tests to be conducted: 02.

Branch: Computer Science & Engg.

Code: 322871 (22)

Total Tut Periods: Nil

## **UNIT-I Introduction to Artificial Neural Networks:**

Elementary Neurophysiology, Models of a Neuron, Neural Networks viewed as directed graphs, Feedback, from neurons to ANN, Artificial Intelligence and Neural Networks; Network Architectures, Single-layered Feed forward Networks, Multi-layered Feed forward Networks, Recurrent Networks, Topologies.

## **UNIT-II Learning and Training :**

Activation and Synaptic Dynamics, Hebbian, Memory based, Competitive, Error-Correction Learning, Credit Assignment Problem: Supervised and Unsupervised learning, Memory models, Stability and Convergence, Recall and Adaptation.

## **UNIT-III A Survey of Neural Network Models :**

Single-layered Perceptron – least mean square algorithm, Multi-layered Perceptrons – Back propagation Algorithm, XOR – Problem, The generalized Delta rule, BPN Applications, Adalines and Madalines – Algorithm and applications.

## **UNIT-IV Applications :**

Talking Network and Phonetic typewriter : Speech Generation and Speech recognition, Neocognitron – Character Recognition and Handwritten Digit recognition, Pattern Recognition Applications.

## **UNIT-V Neural Fuzzy Systems :**

Introduction to Fuzzy sets, operations, relations, Examples of Fuzzy logic, Defuzzification, Fuzzy Associative memories, Fuzziness in neural networks and examples ,

## **Text Books:**

1. Artificial Neural Networks by B. Yagna Narayan, PHI
2. Neural Networks Fuzzy Logic & Genetic Algorithms by Rajshekar & Pai, Prentice Hall

## **Reference Books:**

1. Neural Networks by James A. Freeman and David M. Skapura, Prentice Hall,.
3. Neural Network & Fuzzy System by Bart Kosko, PHI.
4. Neural Network Design by Hagan Demuth Deale Vikas Publication House

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

Semester: VIII

Subject: **Distributed Parallel Processing.**

Total Theory Periods: 50

Total Marks in End Semester Exam: 80.

Minimum number of class tests to be conducted: 02.

Branch: Computer Science & Engg.

Code: 322872 (22)

Total Tut Periods: Nil.

## UNIT - I

Parallel processing – Definition, Architectures; Programmability- Operating Systems Support, Types of Os, Parallel Programming Models, Software Tools; Data Dependency Analysis; Shared Memory Programming ; Thread based Implementation- Management, Example, Attributes Mutual exclusion, Events & condition Variables, Deviation computation

## UNIT-II

Distributed Computing -1- message passing, general model, programming model, PVM-Process Control, Information, Message Buffers, Signaling, Sending, receiving, Group Operations, Starting PVM, Compiling PVM Application, PVM Console Commands.

## UNIT-III

Distributed Computing-II- remote procedure call, parameter passing, Locating the server, semantics, security, problem areas, Java Remote method invocation, DCE, Deploying application in DCE, POSIX Thread reference-Creation, Attributes, Termination, Mutual Exclusion primitives, Condition Variables, Cancellations, Specific data Functions.

## UNIT-IV

Algorithms for parallel machines- Computations, Histogram Computation, Parallel Reduction, Quadrature problem, Matrix Multiplication, Parallel Sorting Algorithms, solving linear systems, probabilistic algorithms.

## UNIT-V

Parallel programming languages- Sample Problem; Fortran 90; n-CUBE C; Occam; C-linda. Debugging parallel programming- techniques, message passing, shared memory; Data Flow Computing,

Systolic Architecture, functional and logical paradigms, distributed shared memory.

Distributed Data Bases- Objectives, Issues, System, Distribution Options Data Base Integrity, Concurrency Control, DDBMS Structure.

Distributed Operating Systems-Need, Network Operating Systems, DOS Goals, Design Issues, Amoeba.

## TEXT BOOKS

- I. Introduction to Parallel Processing by M. Sasikumar et al- Prentice Hall of India.
- II. Parallel Distributed Processing by David E Ramulhat , MIT press

## REFERENCE BOOKS

- I. Parallel Processing by Rajaraman V- Prentice Hall of India.
- II. An Introduction to Distributed and Parallel Processing by John A. Sharp; Alfred Waller Ltd
- III. Parallel and Distributed Processing by Rolim, Jose ; Springer

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

Semester: VIII

Subject: **Distributed Multimedia.**

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Minimum number of class tests to be conducted: 02

Branch: Computer Science & Engg.

Code: 322873 (22)

Total Tut Periods: Nil

### **Unit-I: Components of Distributed system:**

Application software, Document store, Image and still video store, Audio and full motion video store, Object directory service agent, Components service agent, User interface service agent.

**Distributed Client- Server Operation:** Clients in distributed work group computing, Database operations, Middleware in distributed work group computing .

### **Unit-II: Multimedia object server :**

Types of multimedia server, mass storage for multimedia servers, write once read many optical disks, rewritable optical disks, Optical disk libraries, network topologies for multimedia object servers.

**Multi server Network topologies:** traditional LANs, Extended LANs, High Speed LANs, WANs, Network performance issues,

### **Unit-III: Distributed Multimedia database:**

Database organization for multimedia applications, transaction management for multimedia system, managing hypermedia records as objects.

**Managing distributed object:** Inter server communication, object server architecture, object identification, object revision management, optimizing network location of object, object directory services, multimedia object retrieval, database replication techniques, Object migrations schemes, Optimizing object storage.

### **Unit-IV: System Design Methodology and Considerations**

Fundamental Design issue, key deliverables, data mining enterprise requirements, technology assessments, Business information model, Examining current architecture and feasibility, Performance analysis: Performance analysis and monitoring, Impact of performance issues on design.

### **Unit-V: Designing for performance**

Storage management, Access management and optimization of storage distribution, Maximizing network transportation, managing system performance.

**Multimedia system design:** System design methodology, designing system object, object oriented multimedia system, designing objects, system design analysis, system extensibility.

### **Text Books**

- 1) Multimedia system design : Prabhat K.Andleigh , Kiran Thakrar
- 2) Multimedia: Computing, Communication and Application by “ Ralf Steinmetz and Klara Nahrstedt.  
Reference Books
- 3) Data And Computer Communication by “ William Stallings



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

Semester: VIII

Subject: **Decision Support System.**

Total Theory Periods: 50

Total Marks in End Semester Exam: 80.

Minimum number of class tests to be conducted: 02.

Branch: Computer Science & Engg.

Code: 322874 (22)

Total Tut Periods: Nil.

### **Unit-I**

Overview of different types of decision-making: Strategic, tactical and operational. Consideration of organizational structures. Mapping of databases, MIS, EIS, KBS, expert systems, OR modeling systems and simulation, decision analytic systems onto activities within an organization. Extension to other 'non organizational' areas of decision making. Relationship with knowledge management systems

### **Unit-II**

Studies of human cognition in relation to decision making and the assimilation of information. Cultural issues. Implications for design of decision-making support. Communication issues.

### **Unit -III**

Normative, descriptive and prescriptive analysis: requisite modeling. Contrast with recognition primed decision tools.

### **Unit -IV**

Database, MIS, EIS, KBS, Belief nets, data mining. OR modeling tools: simulation and optimization. History, design, implementation: benefits and pitfalls. Risk assessment. Decision analysis and strategic decision support.

### **Unit -V**

Group decision support systems and decision conferencing. Intelligent decision support systems: tools and applications. Cutting-edge decision support technologies. History, design, implementation: benefits and pitfalls. Deliberative e-democracy and e-participation

### **Text Books**

1. P.R. Kleindorfer, H.C. Kunreuther, P.J.H. Schoemaker "Decision Sciences: an integration perspective' Cambridge University Press 1993
2. G.M. Marakas, Decision support Systems in the 21st Century, Prentice Hall, 1999.

### **Reference Books**

1. E. Turban and J.E. Aronson (2001) Decision support Systems and Intelligent Systems. 6th Edition. Prentice Hall
2. V.S.Janakiraman and K.Sarukesi, Decision Support Systems, PHI
3. Efreem G. Mallach, Decision Support and Data Warehouse Systems, tata McGraw-Hill Edition

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

Semester: VIII

Branch: Computer Science & Engg.

Subject: **Wireless Networks.**

Code: 322875(22)

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-1**

Wireless Communication Standard-First, Second and Third Generation Wireless Communication Network, Coverage Extension, Types; Characterization of Wireless Channels- multipath Propagation, Linear Time Variant, Channel Model, Channel Correlation Function, Large Scale Path Loss and Shadowing, Fading.

### **UNIT-2**

Bandpass Transmission Technique for Mobile Radio- Signal Space and Decision Region, Digital Modulation-MPSK, MSK, GMSK, OFDA, Power Spectral Density, Probability of Transmission Error; Receiver Technique for Fading Dispersive Channels.

### **UNIT-3**

CELLULAR COMMUNICATION-Frequency reuse and mobility Management, Cell Cluster Concept, Co Channel and Adjacent Channel Interference, Call Blocking and Delay at Cell Site, Cell Splitting, Sectoring;

### **UNIT-4**

Multiple Access Technique, Random Access, Carrier Sense Multiple Access( CSMA), Conflict Free Multiple Access Technology and Spectral Efficiency-FDMA, TDMA, CDMA; Mobility management and In wireless network-CAC, Handoff Management, Location Management for Cellular Network and PCS network, Traffic calculation.

### **UNIT-5**

Wireless Internetworking-Mobile IP , Internet Protocol (IP), Transmission Control Protocol (TCP), Network Performance, Wireless Application Protocol(WAP) , Mobile AD HOC Network

### **TEXTBOOKS**

1. WIRELESS COMMUNICATION & NETWORKING by Mark & Zuang , PHI
2. Wireless Communications And Networks, WILLIAM STALLINGS , PHI

### **REFERENCES**

1. Wireless Network Performance Handbook , by SMITH , McGraw- Hill
2. Principles Of Wireless Networks, By PAHLAVAN , PHI

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

Semester: VIII

Branch: Computer Science & Engg.

Subject: **Real Time System.**

Code: 322876 (22)

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

### **Basic Real- Time Concepts, Computer Hardware, Language Issues:**

Basic component Architecture, terminology, Real Time Design Issues, CPU, Memories, Input- Output, Other Devices Language Features, Survey of Commonly Used Programming Languages, Code Generation

## Unit-II

### **Software life cycle, Real Time Specification and Design Techniques,Real Time Kernels:**

Phases of software life cycle, Non-temporal Transition in the software life cycle, Spiral model, Natural languages, Mathematical Specification, Flow Charts, Structure Charts, Pseudocode and programmable Design Languages, Finite state Automata, Data Flow Diagrams, Petrinets, Statecharts, Polled Loop Systems, phase/State Driven Code, Coroutines, Interrupt Driven System, Foreground/Background Systems Full Featured Real Time OS

## Unit-III

### **Intertask Communication and Synchronization, Real Time memory Management, System**

**Performance Analysis and Optimization:** Buffering Data, Mail boxes Critical Region, Semaphores, Event Flags and Signals, Deadlock, Process Stack Management, Dynamic Allocation, Static Schemes, Response Time Calculation, Interrupt Latency, Time Loading and its Measurement, Scheduling NP Complete, Relocating Response Times And time Loading, Analysis of Memory Requirements, Reducing Memory Loading, I/O Performance.

## Unit-IV

### **Queuing Models, Reliability, Testing, And Fault Tolerance, Multiprocessing Systems:**

Basic Buffer size Calculation, Classical Queuing Theory, Little's Law, Faults, Failures, bugs AND effects., Reliability, Testing, Fault Tolerance, Classification of Architectures, Distributed Systems, Non Von Neumann Architectures.

## Unit-V

### **Hardware/ Software Integration, Real Time Applications:**

Goals of Real Time System Integration, Tools, Methodology, The Software Heisenberg Uncertainty Principle, Real Time Systems As Complex System, First Real Time Application Real Time Databases, Real time Image Processing Real Time UNIX, building Real Time Applications with Real Time Programming Languages.

## Text Books :

1. Real Time System, Jane W.S.Liu
2. Real Time Systems Design and Analysis by Phillip A. Laplante, PHI

## Reference Books:

- 1 Hard Real Time Computing Systems Predictable Scheduling Algorithms and applications by Giorgio C. Buttazzo
- 2 Real Time Design Patterns: Robust Scalable Architecture for Real Time System by Bruce Powel Douglass
- 3 Real Time System: Scheduling, Analysis and Verification by Albert M. K. Cheng

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

Semester: VIII

Subject: **Pattern Recognition.**

Total Theory Periods: 4 per week.

Total Marks in End Semester Exam: 80.

Minimum number of class tests to be conducted: 02.

Branch: Computer Science & Engg.

Code: 322877(22)

Total Tut Periods: Nil.

## UNIT 1

Introduction; Probability- Probability of events, Random Variables, Joint distributions and density , Moments of Random Variables, estimation, Minimum Risk Estimator.; Matrix Algebra – Eigenvalues & Eigen Vectors.

## UNIT 2

Statistical Decision Making- Bayes' Theorem, Multiple features, Conditional independent features, Decision boundaries, Unequal cost of errors, Leaving- one-out technique, Characteristics curves  
Nonparametric Decision making- Histograms, Kernel & window estimation, Nearest neighbor classification technique, Adaptive Decision boundaries & Discriminant Function, choosing a decision making Technique; Clustering.

## UNIT 3

Artificial Neural Networks- Introduction, Nets without hidden layers, Nets with hidden layers, The Back-Propagation Algorithm, Hopfield Nets, Classifying Sex from facial Images.  
Pattern recognition using SAS.

## UNIT 4

Processing of Waveforms and Images- Introduction, Gray level scaling Transformation, Equalization, Interpolation, Edge detection, Line detection & Template Matching, The Statistical Significance of Image Features.

## UNIT 5

Image Analysis- Scene segmentation & labeling, Counting Objects, Perimeter measurement, Representing boundaries, Projection, Hough transformation, shapes of regions, texture, color, system design, the classification of white blood cell, Image Sequence  
Computer Vision.

## TEXT BOOKS

1. PATTERN RECOGNITION AND IMAGE ANALYSIS by Earl Gose ; Prentice- Hall of India
2. M. I. Schlesinger, V. Hlavác, *Ten Lectures on Statistical and Structural Pattern Recognition*, Kluwer Academic Publishers, 2002.

## REFERENCES

1. S. Theodoridis, K. Koutroumbas, *Pattern recognition*, Academic Press, 1999
2. J. Sklanski and G.N. Wassel, *Pattern Classifiers and Trainable Machines*, Springer, New York
3. Foryth , Computer Vision, PHI

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

**Semester: VIII**

**Subject: Cyber Crime and Laws**

**Total Theory Periods: 50**

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

**Minimum number of class tests to be conducted: 02.**

**Branch: Computer Science & Engg.**

**Code: 322878(22)**

**Total Tut Periods: Nil.**

### **Unit 1**

**Introduction to Cyber Law** Evolution of Computer Technology, emergence of Cyber space. Cyber Jurisprudence, Jurisprudence and law, Doctrinal approach, Consensual approach, Real Approach, Cyber Ethics, Cyber Jurisdiction, Hierarchy of courts, Civil and criminal jurisdictions, Cyberspace-Web space, Web hosting and web Development agreement, Legal and Technological Significance of domain Names, Internet as a tool for global access.

### **Unit 2 :**

**Information technology Act** Overview of IT Act, 2000, Amendments and Limitations of IT Act, Digital Signatures, Cryptographic Algorithm, Public Cryptography, Private Cryptography, Electronic Governance, Legal Recognition of Electronic Records, Legal Recognition of Digital Signature, Certifying Authorities, Cyber Crime and Offences, Network Service Providers Liability, Cyber Regulations Appellate Tribunal, Penalties and Adjudication.

### **Unit 3:**

**Cyber law and related Legislation** Patent Law, Trademark Law, Copyright, Software – Copyright or Patented, Domain Names and Copyright disputes, Electronic Data Base and its Protection, IT Act and Civil Procedure Code, IT Act and Criminal Procedural Code, Relevant Sections of Indian Evidence Act, Relevant Sections of Bankers Book Evidence Act, Relevant Sections of Indian Penal Code, Relevant Sections of Reserve Bank of India Act, Law Relating To Employees And Internet, Alternative Dispute Resolution , Online Dispute Resolution (ODR).

### **Unit 4:**

**Electronic Business and legal issues:** Evolution and development in E-commerce, paper vs paper less contracts E-Commerce models- B2B, B2C,E security.

**Unit 5 Application area :** business, taxation, electronic payments, supply chain, EDI, E-markets, Emerging Trends

### **Text Book**

- 1 Cyber Laws: Intellectual property & E Commerce, Security- Kumar K, dominant Publisher
- 2 Information Security policy & implementation Issues, NIIT, PHI

### **Reference books**

- 1 Cyber CRIME notorious Aspects of the Humans & net Criminals activity in Cyber World  
Barna Y Dayal D P Dominant Publisher
- 2 Cyber Crime Impact in the new millennium, Marine R.C. Auther press
- 3 Spam Attack, Cyber Stalking & abuse, Barna Y, Dayal D P Dominant publisher
- 4 Frauds & Financial criouses in Cyber space, Barna Y, Dayal D P , Dominant publisher
- 5 Information Security , NIIT: PHI

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

Semester: VIII  
Subject: Artificial Intelligence and Expert System Lab  
Total Practical Periods: 40  
Total Marks in End Semester Exam: 40.

Branch: Computer Science & Engg.  
Practical Code: 322821 (22)

## Experiments to be performed:

- (i) Write a prolog program to find the rules for parent, child, male, female, son, daughter, brother, sister, uncle, aunt, ancestor given the facts about father and wife only.
- (ii) Write a program to find the length of a given list
- (iii) Write a program to find the last element of a given list
- (iv) Write a program to delete the first occurrence and also all occurrences of a particular element in a given list.
- (v) Write a program to find union and intersection of two given sets represented as lists.
- (vi) Write a program to read a list at a time and write a list at a time using the well defined read & write functions.
- (vii) Write a program given the knowledge base,  
If x is on the top of y, y supports x.  
If x is above y and they are touching each other, x is on top of y.  
A cup is above a book. The cup is touching that book. Convert the following into wffs, clausal form; Is it possible to deduce that 'The book supports the cup'.
- (viii) Write a program given the knowledge base,  
If Town x is connected to Town y by highway z and bikes are allowed on z, you can get to y from x by bike.  
If Town x is connected to y by z then y is also connected to x by z.  
If you can get to town q from p and also to town r from town q, you can get to town r from town p.  
Town A is connected to Town B by Road 1. Town B is connected to Town C by Road 2.  
Town A is connected to Town C by Road 3. Town D is connected to Town E by Road 4.  
  
Town D is connected to Town B by Road 5. Bikes are allowed on roads 3, 4, 5.  
Bikes are only either allowed on Road 1 or on Road 2 every day. Convert the following into wff's, clausal form and deduce that 'One can get to town B from town D'.
- (ix) Solve the classical Water Jug problem of AI.
- (x) Solve the classical Monkey Banana problem of AI.
- (xi) Solve the classical Crypt arithmetic problems such as DONALD + GERALD = ROBERT of AI.
- (xii) Solve the classical Missionary Cannibals problem of AI.
- (xiii) Solve the classical Travelling Salesman Problem of AI.
- (xiv) Solve the classical Blocks World Problem of AI.
- (xv) Write a program to search any goal given an input graph using AO\* algorithm.

List of Equipments/Machine required :

- (i) PC with Windows XP
- (ii) Visual prolog compiler

## Recommended Books :

- (i) Ivan Bratko : Logic & prolog programming.
- (ii) Carl Townsend : Introduction to Turbo Prolog, ( BPB, Publication).
- (iii) W.F. Clocksin & Mellish : Programming in PROLOG ( Narosa Publication House)

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

Semester: VIII

Subject: **Network Securities Lab**

Total Practical Periods: 40

Total Marks in End Semester Exam: 40.

Branch: Computer Science & Engg.

Practical Code: 322822 (22)

### **List of Experiments to be performed:**

1. Networking Security Programming with TCP/IP for Application layer, Transport layer, Network layer, Datalink layer protocols.
2. Socket Security Programming for address structures, byte manipulation & address conversion functions, elementary socket system calls.
3. APIs security Programming for windows socket API, window socket & blocking I/O model, blocking sockets, blocking functions, timeouts for blocking I/O.
4. Web Security Programming for firewall and others.
5. Web databases security programming.
6. Component Security Programming for CORBA.
7. CGI Security programming and Firewall
8. Programming for Cryptography and Digital Signature.
9. Java network Security programming.
10. Client Server Security Programming.

### **Recommended Books:-**

1. Steven.W.R: UNIX Network Programming, PHI (VOL I& II)
2. Window Socket Programming by [Bobb](#) Quinn and Dave Schutes
3. Davis.R.: Windows Network Programming, Addison Wesley
4. NETWORK PROGRAMMING With Windows Socket By Baner .P., PH New Jersey

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

Semester: VIII

Subject: **Software Technology Lab- 5.**

Total Practical Periods: 40

Total Marks in End Semester Exam: 40.

Branch: Computer Science & Engg.

Practical Code: 322823 (22)

### **List of Experiments to be performed:**

1. Write a program in ASP.Net using text box , control, multiline text box & password.
2. Write a program in ASP.Net using events in text box.
3. Write a program in ASP.Net using Labels,Text Box & Button Control.
4. Write a program in ASP.Net using Radiobutton
5. Write a program in ASP.Net using Checkboxlist.
6. Write a program in ASP.Net using Dropdownlist.
7. Write a program in ASP.Net using Listbox.
8. Write a program in ASP.Net using DataList controls.
9. Write a program in ASP.Net using DataList controls with styles.
10. Write a program in ASP.Net for validation in textbox.
11. Write a program in ASP.Net for insertion using ADO.NET .
12. Write a program in ASP.Net for Searching using ADO.NET.
13. Write a program in ASP.Net for Deletion using ADO.NET.
14. Write a program in ASP.Net for Updation using ADO.NET.
15. Write a program in ASP.Net using HTML Server Controls.
16. Write a program in ASP.Net using Web Server Controls.

### **Text/Reference Books**

- 1) Microsoft .NET, Microsoft Press
- 2) ASP.NET, Techmedia



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

Semester: VIII  
Subject: MAJOR PROJECT.  
Total Practical Periods: 7 per week.  
Total Marks in End Semester Exam: 100.

Branch: Computer Science & Engg.  
Practical Code: 322824(22)

## Guidelines

### Allocation of project:

1. Information regarding broad area must be made available to the students well in advance (may be during previous semester).
2. Information must cover following parameters.
  - I. **Broad area:** Subject or expertise/application area.
  - II. **Required skills:** Knowledge of subject(s), software, tools & other characteristics.
  - III. **Type of project:** Hardware, software, design, survey, study based etc.
  - IV. **Guide available:** Name of Guide (S) from Department & Institute.
  - V. **Other related information** depending upon specific branch & institute.
3. It is also recommended to give proper counselling to pick up suitable project.
4. Students must get chance to select projects as per their choice or decided mutually between students and department faculty (HoD) concern.
5. One project group must contain maximum four students, however students can do project individually but it should be approved by department.
6. Compiled list of projects must be submitted to the University within 25 days of start of semester.
7. Compiled list may contain following parameters.

Sr. No.	Title of Project	Name of Students	Name of Guide

Name of HoD  
Signature of HoD

Signature of Principal

### Monitoring of project:

1. It is recommended to give projects as per the specializations of existing faculty of the department instead of outside person/agency.
2. Project must be allocated, developed and monitored by department / institution itself, but not by outside agencies.
3. Regular review by guide is recommended to ensure development & contribution of students.

**Internal Evaluation & Submission of project:**

1. Evaluation of project would be as per the examination scheme of the University, which is based on internal as well as external evaluation.
2. Internal assessment requires submission of project report for getting approved by the concern authority. However printing and binding would be as per the conventional format.
3. Evaluation will be based on Live demonstration / presentation and Viva.
4. Final submission of project is expected as,
  - ✍✍ Submission of a copy to the University,
  - ✍✍ One copy to the Institution central library,
  - ✍✍ One copy to the department.

**External Evaluation:**

External assessment of project would be like conduction of practical exams of University, and must be executed as per the norms of practical exams.

*NOTE: Completion of Project outside the department/Institution should not be encouraged.*

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai*

**Semester: VIII**

**Subject : Report Writing and Seminar**

**Total No. of periods : 28**

**Total marks in End Semester Exam: Nil**

**Minimum Number of class test to be conducted: Two**

**Branch: Common to all branches**

**Code: 300825 (22)**

**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**

**Branch : Common to All Branches**

**Subject :Enterprise Resource Planning**

**Code : 300881 (36)**

**Total Theory Periods : 40**

**Total Tut Periods : 10**

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

Minimum no. of class tests to be conducted : 2

## **UNIT-I**

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

[No of Periods: 8 + 2]

## **UNIT -2**

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

[No of Periods: 8 + 2]

## **UNIT -3**

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

[No of Periods: 8 + 2]

## **UNIT -4**

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

[No of Periods: 8 + 2]

## **UNIT -5**

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

[No of Periods: 8 + 2]

### **Books:**

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

### **References:**

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

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

Semester: **VIII**

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,

## **NIT – 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, Creativity, 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, Other Techniques, Situational Analysis Design Approaches, Systems Built from Scratch, Using Technology to Form the Basis of the DSS, Evaluating a DSS Generator, Using a DSS Generator, The Design Team, DSS Design and Re-engineering Discussion .

**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**

**Branch: Common to All Branches**

**Subject: Knowledge Entrepreneurship**

**Code: 300886 (36)**

**Total Theory Periods: 40**

**Total Tut Periods: 12**

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

Minimum no. of class tests to be conducted: 2

## **Unit – I**

**Introduction:** Entrepreneurship in Knowledge economy, abundant & accessible information, implication, impact & consequence, knowledge based opportunities, aims, scope, and objectives.

## **Unit-II**

### **Managing knowledge & intellectual capital:**

Knowledge management, loss of knowledge, knowledge implementation, knowledge creation, property intellectual capital.

## **Unit-III**

### **Contemporary information problems:**

Information overload, winning & losing barrier to entry, emerging issues, customers, investors, myth of inevitable program.

## **Unit-IV**

Creating enterprise cultures:

Working with employer, organizing for entrepreneurship, unity & diversity, ten essential freedoms, freedom of operation, effective issue monitoring, establish search criteria.

## **Unit-V**

### **Becoming a knowledge entrepreneur:**

Entrepreneur qualities, knowledge entrepreneur, challenge of launching new product, creating launch support tool, examples of best practice.

## **Text & Reference Books**

Amrit Tiwana ,The Knowledge Management tool kit, Pearson Education.

Lunlin Conlson, Knowledge Entrepreneur, Thomas Press.

Catheriue L Mann, Knowledge entrepreneurship, Oxford

Heinke Robkern ,Knowledge entrepreneurship,.

Bonnie Montano,Knowledge Management, , IRM Press, 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 confined 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, 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

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** Subject:

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, Bilai*

Semester: VIII

Subject: Ecology and Sustainable Development

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: 300897 (20)

Total Tutorial Periods: 12

## **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

Branch: **Common to All Branches**

Subject: Non Conventional Energy Sources

Code : 300898 (19)

Total Theory Periods: 50

Total Tutorial Periods: 00

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.

## 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.