Chhattisgarh Swami Vivekanand Technical University, Bhilai

SCHEME OF TEACHING AND EXAMINATION

B.E. VIII SEMESTER MINING ENGINEEEERING

S. No.	Board of Study	Subject Code	Subject	Periods per week			Scheme of Exam			Total Marks	Credit L+(T+P)/2
							Theory/ Practical				
				L	T	P	ESE	CT	TA		
1	Mining Engg.	339811 (39)	Pollution Control Engg.	4	1	-	80	20	20	120	5
2	Mining Engg.	339812 (39)	Mining Machinery - III	4	1	-	80	20	20	120	5
3	Mining Engg.	339813 (39)	Strata Control	4	1	-	80	20	20	120	5
4	Refer Table -3		Professional Elective -III	4	1	-	80	20	20	120	5
5	Refer Table –4		Open Elective - IV	4	1	-	80	20	20	120	5
6	Mining Engg.	339821 (39)	Mining Machinery - III Lab	-	-	4	40	-	20	60	2
7	Mining Engg.	339822 (39)	Strata Control Lab	-	-	2	40	-	20	60	1
8	Mining Engg.	339823 (39)	Pollution Control Engg. Lab	-	-	2	40	-	20	60	1
9	Mining Engg.	339824 (39)	Major Project	-	-	4	100	-	80	180	2
10	Mining Engg.	300825 (39)	Report Writing & Seminar	-	-	2	-	-	40	40	1
11			Library	-	-	1	-	-	-	-	-
			Total Periods 40 per week	**20**	**5**	**15**	**620**	**100**	**280**	**1000**	**32**

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

Table –3

Professional Elective - III			
S.No.	Board of Studies	Code	Name of Subject
1	Mining Engg.	339871 (39)	Surface Mining - II
2	Mining Engg.	339872 (39)	Application of Computer, Geographical Information System (GIS) and Remote Sensing (RS) in Mining

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

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

Table -IV

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

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

Note (2) -   Choice of elective course once made for an examination cannot be changed in future examinations.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: B.E. VIII Sem.   **Branch: Mining Engg.**
Subject: Pollution Control in Mining   **Code: 339811 (39)**
Total Theory Periods: 50   **Total Tutorial Periods: 12**
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 02

UNIT 1:   **ENVIRONMENTAL POLLUTION**
Introduction and classification of environmental pollution, ecological conservation. Salient features of the environmental laws in India and Occupational disease.

UNIT 2:   **AIR POLLUTION**
Air pollution due to various gases and suspended partuculate materials, causes, consequences, prevantive measures, dust sampling equipments.

UNIT 3:   **WATER POLLUTION**
Water pollution, its causes and preventive measures, acid-mine drainage, water pollution in mines and mineral beneficiation plants, water purification schemes in brief.

UNIT 4:   **LAND POLLUTION**
Land scape pollution and land reclamation, methods of land reclamation

UNIT 5:   **NOISE POLLUTION**
Pollution due to noise and its consequences, noise produced by different machinery, control and safety, measurement of noise levels.

Reference Books :
1.   Air & Water Acts
2.   Forest Conservation acts
3.   Legislation in Indian Mines – A Critical appraisal by Rakesh and Prasad
4.   Env. Impact of Mining By Down and Stokes

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester**:**   **B.E. VIII Sem.**
Subject**:**   **Mining Machinery - III**
Total Theory Periods**:   50**
Total Marks in End Semester Exam**: 80**
Minimum number of class tests to be conducted**: 02**

Branch**: Mining Engg.**
Code**: 339812 (39)**
Total Tutorial Periods**: 12**

UNIT 1:   **FACE MACHINERY**
Drills for coal and stone, their constructional details, drill jumbos, their applications, operation and maintenance, introduction to coal cutting machines.

UNIT 2:   **LOADER AND TRANSPORTING MACHINE**
Rocker shovel, gathering arms loaders, LHD and SDL machines- their construction and operation and maintenance, cavo loader, shuttle car and underground trucks, its construction, operation and application.

UNIT 3:   **CUTTER LOADERS**
Different types of cutter loaders suitable for long wall and short wall faces, their constructions, operation and maintenance, different types of road headers their construction, operation and conditions of applicability, mechanics of rock cutting, rock cutting tools and their performance.

UNIT 4:   **COMPRESSED AIR**
Basic concept, compression process, working and constructional features of single stage and multistage compressor, unloading arrangement of compressor, layout of pipelines, transmission of compressed air, testing of compressor, in bye compressors.

UNIT 5:   **USE OF ELECTRICITY IN MINES**
Flame proof apparatus, intrinsically safe circuits, underground cables, drill panel, gate end box, circuit breakers, remote control (pilot circuit), underground substation, Electrical signaling provisions of IER related to mines.

Reference books:

1. Elements of Mining Vol. III by D. J. Deshmukh
2. UMS Booklet
3. Winning and Working of Coal   :   R. T. Deshmukh & D. J. Deshmukh
4. Modern Coal Mining Practices   :   R. D. Singh
5. Longwall Mining   :   Syd. S. Chaing & Peng

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: B.E. VIII Sem.   **Branch: Mining Engg.**
Subject: Strata Control   **Code: 339813 (39)**
Total Theory Periods: 50   **Total Tutorial Periods: 12**
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 02

UNIT 1:   **SUPPORTS**
Timber & steel supports, Examination of roof, Roof bolting, roof stitching, method of supporting roadways. Supporting under different conditions viz. Pit bottom, crossing, junctions, faulted area, longwall faces, depillaring areas and stoping areas, support loads .SSR, CTR, Support plan, Support withdrawal.

UNIT 2:   **POWERED SUPPORTS**
Powered supports - their principles of operation, Classification, designation, constructional features and applications, Hydrulic fluids.

UNIT 3 :   **STOWING**
Principal methods of stowing, their relative merits and applicability, Hydraulic stowing, Pneumatic stowing, Mechanical stowing, Hand packing, face arrangements, pipe wear, pipe jams.

UNIT 4:   **STRATA CONTROL**
Theories of ground movement, Rock pressure due to Narrow and Wide excavation, Front abutment and back abutment, Failure of roof and floor, measurement of strata movement, rock burst, bumps. gas outbursts, pot holes.

UNIT 5:   **SUBSIDENCE**
Theories of subsidence, damage and loss due to subsidence, vertical and lateral movements and their estimation, angle of fracture and angle of draw, factors affecting subsidence, subsidence control , protection of surface structures, design of protection pillars including shaft pillars. Pot holes.

References:

1.	Strata control in mines	:	Chaing & Peng
2.	Winning and Working of Coal	:	R. T. Deshmukh & D. J. Deshmukh
3.	Modern Coal Mining Practices	:	R. D. Singh
4.	D.G.M.S. Circulars (Tech.) 1995 onwards		
5.	Longwall Mining	:	Syd. S. Chaing & Peng

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: B.E. VIII Sem.   **Branch: Mining Engg.**
Subject: Surface Mining -II   **Code: 339871 (39)**
Total Theory Periods: 50   **Total Tutorial Periods: 12**
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 02

Unit I: Layouts of open pit mines, Methods of sidecasting, Sidecasting by Stripping Shovel and Dragline, Range Diagram, calculation of operating radius. Explosive casting, Layouts of waste dumps. Design of Haul roads.

Unit II: Introduction to continuous surface mining equipment, Bucket wheel excavators, their construction , basic operation and productivity, Continuous surface miner, their construction , basic operation and productivity. Face Layouts.

Unit III: Ultimate pit design, Factors affecting ultimate pit limits; Significance of ultimate pit limits; Manual methods of developing ultimate pit limits. Floating cone technique, Production planning, Some basic mine life and plant size concepts, Mine and Mill plant sizing,

Unit IV: Introduction to rock slope engineering, Slopes in surface mines and their formation, Pit slopes and their influence on mine economics, Slope stability, Factors influencing slope stability, Various types of slope failure and their conditions.

Unit V: Determination of factor of safety of a slope under plane and circular failure, Planning of slope stability investigations, Stablisation and protection methods for stability of slopes.

References:

1. Surface Mining   : G.B. Misra
2. Surface mining equipment   : Martin
3. Surface Mining   : Pfleider
4. Rock slope engg.   : Hoek & Bray
5. SME handbook   : Hartman
6. Surface Mine Planning & Design   : Hustralid & Kuchha

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester : BE 8th **Branch: Mining Engg.**
Subject: Report Writing & Seminar **Code: 300825 (39)**
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

Semester: B.E. VIII Sem.   **Branch: Mining Engg.**
Subject: Mining Machinery – III Lab   **Code: 339821 (39)**
Total Practical Periods: 50
Total Marks in End Semester Exam: 40

List of Practical to be Performed :

1. Study of working and construction of Rotary Coal Drill Machine used in U/G Coal Mine.

2. Study of working and construction of Jack hammers drill used in Metal Mine.

3. Study of working and construction of Long Wall Coal Cutting Machine

4. Study of working and construction of Side dump loader.

5. Study of working and construction of a LHD

6. Study of Double ended ranging drum shearer.

7. Study of drill panel and gate end box.

8. Study of working and construction of Gathering Arm Loader.

9. Study of working and construction of Coal Plough.

10. Study of working and construction of Torque Convertor.

11. Study of working and construction of Reciprocating Compressors.

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Semester: B.E. VIII Sem.   **Branch: Mining Engg.**
Subject: Strata Control Lab   **Code: 339822 (39)**
Total Practical Periods: 28
Total Marks in End Semester Exam: 40

List of Practical to be Performed:

1. Study of Conventional support systems.

2. Study of constructional features and working of Friction props

3. Study of constructional features and working of hydraulic props

4. Study of methods to support roof by roof bolts, roof stiching and cable bolts

5. Study of withdrawal of supports by Sylvester prop withdrawer

6. Study of methods to support junctions and faulted area

7. Study of constructional features and working of powered supports

8. Study of Hydraulic stowing System and the arrangement required for it

9. Study of pneumatic stowing System and the arrangement required for it

10. Study of Subsidence measurement techniques.

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Semester: B.E. VIII Sem.   **Branch: Mining Engg.**
Subject: Pollution Control Engg. Lab   **Code: 339823 (39)**
Total Practical Periods: 28
Total Marks in End Semester Exam: 40

List of Practical to be Performed :

1. **Study of Konimeter**

2. **Study of Dust precipitator**

3. **Study of gas chromatograph**

4. **Study of noise measuring instruments**

5. **Measurement of noise**

6. **Study of noise controlling techniques**

7. **Study of vibration measuring instruments**

8. **Measurement of vibration**

9. **Study of land reclamation methods**

10. **Preparation of EIA and EMP for a mining project**

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Semester: B.E. VIII Sem.   **Branch: Mining Engg.**
Subject: Application of Computer, Geographical   **Code: 339872 (39)**
            Information System (GIS) and Remote
            Sensing (RS) in Mining
Total Theory Periods: 50   **Total Tutorial Periods: 12**
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 02

Unit I
Introduction to Remote Sensing: Terminology In Remote Sensing, Types Of Remote Sensing, Advantages And Disadvantages Of Remote Sensing Data, Electromagnetic Radiation, Atmospheric Windows, Remote Sensing Platforms And Sensors Systems, Path-Row Referencing System, Remote Sensing Data Product, Procedure For Obtaining Satellite Data. Hardwares and Softwares related to Remote Sensing.

Unit II
Image Interpretation And Analysis: Elements of Visual Image Interpretation, Digital Image Pre-Processing, Radiometric Correction, Geometric Correction, Resolution Of Remote Sensing Data, Image Enhancement, Contract Enhancement, Spatial Filtering, Band Ratioing   Image Classification, Supervised And Unsupervised Classification. Remote Sensing Applications in Forestry, Geology, Hydrogeology, Land use and Land Cover Mapping.

Unit III
Fundamentals of GIS: Basic Concepts including Definition and History of GIS, Essential Elements of GIS, Uses and Users of GIS, General GIS Applications, Advantages of GIS. Geodesy, Grids, Datum's and Projection Systems, GIS Data Formats, GIS Layers and Digitization. Overview of GPS and its Applications. Hardwares and Softwares related to GIS.

Unit IV
Raster and Vector Based GIS: Raster based GIS, Definition and Concept of Raster Based GIS, Spatial Referencing, Definition and Representation of Raster Data. Vector based GIS, Definition and Concept of Vector Based GIS, Data Structures, Data Capture and Basic Operations of Spatial Analysis, Advantages and Disadvantages in Raster and Vector Based GIS, Introduction to Networks in GIS. GIS-Project Planning, Management and Implementation.

Unit V
Application of computers in mining

Reference Books

Digital Image Processing	- R.C. Gonzalez & R.E. Woods	Pearson Edu. Asia
Principles of Geographical Information Systems	- P.A. Burrough & R.A. McDonnell	Oxford
Text Book of Remote Sensing	- C.S.Agawal & P.K.Garg	Wheeler
Remote Sensing of The Environment	- J.R. Jensen	Pearson Education
Dictionary of Remote Sensing	- S. M. Rashid	
Introduction to GIS	- I. Heywood, S. Cornelius & S. Carver	Pearson Edu. Asia
Introduction to GIS	- Demers	

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

Branch: **Common to All Branches**

Subject Name: Technology Management

Subject Code: 300883 (36)

Total Theory periods: 40

Total Tutorial periods: 10

Total Marks in End Semester Exam: 80

Minimum number of class tests to be conducted: 02

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 I Sauter
Management Information system-Gerald V. Post & David L. Anderson

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

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

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

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

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

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

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

Textbooks
1. SYSTEM SOFTWARE by Santanu Chattopadhyay ; Prentice Hall of India
2. Software Engineering By Roger S Pressman ; Mc-Graw Hill
References
1. Foundations of Software Technology and Theoretical Computer Science, By V. (Venkatesh) Raman: Springer
2. Software Visualization by John Stasko; MIT press
3. Software Engineering By Rajib Mall : PHI

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

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

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

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

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

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

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

Text & Reference Books
Amrit Tiwana ,The Knowledge Management tool kit, Pearson Education.
Lunlin Conlson, Knowledge Entrepreneur, Thomas Press.
Catheriue L Mann, Knowledge entrepreneurship, Oxford
Heinke Robkern ,Knowledge entrepreneurship,.
Bonnie Montano,Knowledge Management, , IRM Press, Londan

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

Semester: VIII   Branch: **Common to All Branches**
Subject: Financial Management   Code: 300887(36)
Total Theory Periods: 3   Total tutorial Period: 12
Total Marks in End Semester Exam: 80
Minimum No. Of Class test to be conducted: 2

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   Branch: **Common to All Branches**
Subject: **Safety Engineering**   Code: 300889 (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
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
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. 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   Branch: Common to All Branches
Subject: Nanotechnology   Code: 300892 (47)
Total Theory Periods: 50   Total tutorial Period: NIL
Total Marks in End Semester Exam: 80
Minimum No. of Class test to be conducted:2

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
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   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   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 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.