

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Scheme of Teaching & Examination

B.E. VIII Semester Metallurgical Engineering

S. No	Board of Study	Subject Code	Subject	Periods per Week			Scheme of Exam			Total Marks	Credit L+ (T+P)/2
				L	T	P	Theory/practical				
							ESE	CT	TA		
1	Metallurgical Engineering	338811(38)	Structural Metallurgy	4	1	-	80	20	20	120	5
2	Metallurgical Engineering	338812(38)	Foundry Metallurgy	4	1	-	80	20	20	120	5
3	Metallurgical Engineering	338813(38)	Experimental techniques in Metallurgy	4	1	-	80	20	20	120	5
4	Refer Table – III		Professional Elective – III	4	1	-	80	20	20	120	5
5	Refer Table – IV		Open Elective IV	4	1	-	80	20	20	120	5
6	Metallurgical Engineering	338821(38)	Structural Metallurgy Lab	-	-	2	40	-	20	60	1
7	Metallurgical Engineering	338822(38)	Foundry metallurgy Lab	-	-	3	40	-	20	60	2
8	Metallurgical Engineering	338823(38)	Experimental techniques in Metallurgy Lab	-	-	3	40	-	20	60	2
9	Metallurgical Engineering	338824 (38)	Major Project	-	-	4	100	-	80	180	2
10	Metallurgical Engineering	300825(38)	Report Writing and Seminar	-	-	2	-	-	40	40	1
			Library	-	-	1	-	-	-	-	-
Total				20	5	15	620	100	280	1000	34

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 Study	Subject Code	Subject
1	Metallurgical Engineering	338871 (38)	Powder Metallurgy & Ceramics
2	Metallurgical Engineering	338872 (38)	Light Metals

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

Note: (2) - Choice of elective code once made for an examination can not be changed in future examinations.

Table – IV

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

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

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

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

Semester: VIII

Subject: Structural Metallurgy

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Minimum number of class test to be conducted: 2

Branch: Metallurgical Engg.

Code: 338811 (38)

Total Tut Periods: 12

Unit – 1 X-Ray Metallography

Nature of X-ray, white radiation, absorption of X-Ray, filters, fundamental principles of X-Ray diffraction. Bragg's law, diffraction directions. Diffraction methods, Diffraction Intensification scattering by an electron, an atom & a Unit cell, structure factor calculations, diffractometer, its block diagram central features & its use. JCPDS search manual and Data files Hanawalt method, use of powder diffraction files, Determination of crystal structures, grain size, preferred orientation & chemical analysis by X-Ray diffraction, other application of X-Ray diffraction technique, problem on the above.

Unit – 2 Alloys phases & Electron Metallography

Primary & intermediate phases like solid solutions, sigma phases, electron valence and interstitial compound, order-disorder transformation.

Electron microscope, electron gun & condenser lens system, specimen assembly, lens defects, control of focusing and magnification, bright and dark field images, selected area diffraction (SAD), resolution, reordering the Image, microscope attachments, preparation of specimens replica technique & thin metal foil transmission, electron microscope & its applications. Diffraction of electron by perfect & imperfect crystals.

Unit – 3 Deformation of Metals.

Plastic deformation by slip & twinning, slip system in FCC & HCP lattice, critical resolved shear stress for slip, theoretical shear strength of solids.

Edge and screw dislocation, partial dislocation, dislocation climb and cross slip, sessile & glissible dislocation. Application of dislocation theory in the understanding of yield point. Strain aging & work hardening in single-crystal and polycrystals.

Unit – 4 Diffusion in Metals & alloys :

Laws of diffusion, diffusion mechanisms in solid, variation of diffusion coefficient with temperature & concentration, Kirkendall effect, Darken's equation. Determination of diffusivities, application of diffusion in some metallurgical processes like carburizing & nitriding of steels.

Unit – 5 Fracture & failure:

Types & their characteristics Crack nucleation & modes of their propagation, creep fatigue failures & the metallurgical factors effecting them.

Name of Text Books :

1. X-Ray diffraction – by Callity & Ramarao
2. Mechanical Working Processes – by Dieter
3. Physical met. – Raghvan
4. Physical met. –Reed hill.

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

Semester: VIII
Subject: Foundry metallurgy
Total Theory Periods: 50
Total Marks in End Semester Exam: 80
Minimum number of class test to be conducted: 2

Branch: Metallurgical Engg.
Code: 338812 (38)
Total Tut Periods: 12

Unit – 1

Concept of directional and controlled directional solidification and methods to attain directional solidifications, solidification of pure metals and alloys, parameters affecting the solidification. Solidification values in steel castings, effect of values.

Unit – 2

Fluid flow principles for melts and detailed study of aspiration in gating systems and their control, qualifications of gating systems for different metals and alloys and basic criteria for their selection. Interdendritic shrinkage, center line shrinkage phenomenon in castings, Macro and Micro segregation. Evaluation of Chvorinov's equation and its importance in other calculation.

Unit – 3

Risering methods, Caine's method, NRL method, Wlodawer's process, methods of riser design for various shapes of castings, Evaluation of feeding distance of riser and requirement of number of risers for particular casting.

Unit – 4

Introduction of methoding techniques, functional design considerations. Metallurgical phenomena in casting design. Designing for simplification and economy, Actual design of gating, systems for simple cast-iron and steel castings of standard shapes such as plates, bars etc. Brief discussion of foundry layout.

Unit – 5

Foundry practices of light metal alloys, such as Al & Mg Malleable and S.G. Iron foundry practicals, Principles and practices of steel foundries.

Text Book and references:

1. Foundry Technology - P.R. Beeley
2. Principles of metal casting, R.W. Heine, C.R. Loper and P.C. Rosenthal
3. Solidification of casings – Institute of Metals, London – R.W. Ruddle
4. Metal casing. – R.A. Flinn

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

Semester: VIII

Subject: Experimental Techniques in Metallurgy

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Minimum number of class test to be conducted: 2

Branch: Metallurgical Engg.

Code: 338813 (38)

Total Tut Periods: 12

Unit 1

microscopic examination elements of optics, magnifying lens, components of microscope, microscopic techniques, quantitative microscopic analysis.

Election Metallography Comparison with light microscope, elements of electron optics, electron lenses, design of electron microscope, arrangement for microscopy and diffraction, emission microscopes, application of electron microscope.

Unit 2

High temp technique – methods of obtaining high temp resistance furnace, f/Cs for temp. above 1000°C, temp measurement, thermocouples, electrical circuits for resistance thermometers, automatic control of temp. control of the power, anticipating devices, temp programming.

Unit 3

Vacuum techniques – Flow conductance & impedance, speed of pump, design of pumps and systems, Rotary mech. Pumps, calculation of high vacuum systems, choice of pumps. Measuring gauges for low pressure, vacuum connections, typical vacuum system, vacuum system of an electron microscope.

Unit 4

thermal methods – thermal properties of metals and alloys, thermal analysis of phase transformation, calorimetric analysis Electrical methods – electrical properties of metals and alloys, measuring instruments, experimental techniques for resistance measurement. high speed measurements, induction methods.

Unit 5

Do;atp,etroc ,etjpbs – dilu. Substances, ordinary mech. & optical dilatometers, differential optical dilatometers, Elect. Dilato, treatment of dilato datas, measurement of vol effects of phase transformations, quantitative dilato phase analysis.

Name of Text Books :

- (1) Experimental Tech in Phy. Met. by – A k Mallik & V T Chesevin
- (2) Procedures in Experimental Met. by – A V Soybalt & J G Burke John Wiley & Sons. London (1953)

Name of Reference Books :

1. Automation in magnetometric and dilato. Measurements V T Cherepin
2. Instrumentation in Scientific research by – K S Lion Mc Graw Hill, New York.

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

Semester: VIII

Subject: Powder Metallurgy & Ceramics

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Minimum number of class test to be conducted: 2

Branch: Metallurgical Engg.

Code: 338871 (38)

Total Tut Periods: 12

Unit – 1 Powder Preparation Methods

Introduction, characterization of metal powders, manufacturing of metal and composite powders, different methods of metal powder production.

Unit – 2 Compaction & Sintering

Theory & practice of compaction & sintering, compressibility and compatibility of metal powders, different compaction processes, Kinetics & mechanism of sintering of metal powders, Process variables in sintering, attainment of specific qualities by powder metallurgy processes.

Unit – 3 Application of Powder Metallurgy

To the production of typical P/M components – porous products and bearing electrical contacts, magnetic materials, friction materials, hard metals and carbide tools.

Unit – 4 Ceramic

Classification of ceramics, structure of ceramic and glassy materials, strengthening / toughening mechanism, ceramic powder preparation, forming processes.

Unit – 5 Applications & Some recent developments in the processing & applications of ceramics.

Text / References :

1. Powder met. An overview – I Jenkins & J.V. Wood
2. Powder Met. Science & Powder Technology – R.M. German.
3. Powder Metallurgy – A.K. sinha
4. Powder Metallurgy and related high temperature materials – P. Ramkrishnan.
5. Advance Technique in powder metallurgy – F. Clark
6. Introduction to ceramics, (second edition) Wiley & Sons – W.D. Kingery
7. Ceramic Fabrication process – W.D. Kingery.

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

Semester: VIII

Subject: Light Metals

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Minimum number of class test to be conducted: 2

Branch: Metallurgical Engg.

Code: 338872 (38)

Total Tut Periods: 12

Unit – 1

Classification of light metal alloys, their properties, importance of strength / wt ratio in engineering applications. Detailed engineering applications, Indian / International specifications.

Unit – 2

Melting methodology of light metal alloys used of melting / refining flows.

Casting characteristics of light metal alloys (Al, Mg, Ti alloys).

Light metal alloys foundry practices, master alloy used in melting.

Unit – 3

Physical metallurgy of light metals alloys, rolling, sheet metal working, extrusion etc.

Unit – 4

Special Alloys: Duralumin, Al-Li, Mg-Li alloys – production and processing techniques & applications.

Titanium alloys: Alloying elements and their effects, types of alloys, their processing, heat treatment, properties and selection.

Unit – 5

Strategic applications of light metal alloys, air craft industries. Functional considerations

Defects analysis in cast and rolled products.

Failure analysis of light metal alloys components.

Name of Text Books :

1. Non-ferrous Physical Metallurgy – R.J. Raudebaugh
2. Light Alloys – I..J.Polmear
3. Light Metals – C.M. Bickett.
4. Heat Treatment Processing & Properties of Non Ferrous Alloys – C. R. Brooks, ASM

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

Semester: VIII
Subject: Structural Metallurgy Lab
Total Practical Periods: 40
Total Marks in End Semester Exam: 40

Branch: Metallurgical Engg.
Code: 338821 (38)
Total Tut Periods: Nil

Experiment to be performed

1. To study the geometry of close packing in simple crystals (FCC and HCP)
2. Study of interstitial voids in close – packed structures.
3. To obtain a Debye-scherrer x-Ray diffraction photograph of a powder specimen.
4. To identify the crystal structure (cubic only) & calculation of lattice parameter from the powder pattern of an unknown element.
5. Measurement of grain size.
6. determination of the amount of constituent phases (Quantitative metallography).
7. Direct observation of grain and twin boundaries in 70:80 brass (observation of surface imperfections)
8. Direct observation of line imperfection (dislocation) .
9. Drawing equilibrium diagram by direct cooling curves
10. Dilatometric study of polymorphism

List of Equipments/Machine Required:

1. Table-tennis balls stuck together to form close-packed planes (Tetrahedral & octahedral).
2. Wooden blocks of tetrahedral and octahedral voids.
3. x-ray diffraction unit, Debye-Scherrer camera, x-ray film, a film cutting and punching device, Dark room facility for film loading & Processing.
4. Facility for obtaining powder pattern (x-ray diffractometer).
5. Calibrated eye-piece along with metallurgical microscope
6. Microscopes, polishing & etching facilities, Eye-pieces for linear & square grids for superimposition over the micrograph.
7. NaCl, brass, microscope, etching & polishing facilities.
8. Fireclay crucibles, chromel Almel thermocouple, with protective, insulating sheath, vertical furnace, potentiometer for reading thermocouple, stirring rod, samples of varying compositions.
9. Fused silica dial gauge, dilatometer, temp-controller, potentiometer, thermocouple.

Recommended Books:

1. Lab manuals
2. x-ray diffraction by Callity and Rama Rao

Chhattisgarh Swami Vivekanand Technical University, Bilai (C.G.)

Semester: VIII
Subject: Foundry Metallurgy Lab
Total Practical Periods: 40
Total Marks in End Semester Exam: 40

Branch: Metallurgical Engg.
Code: 338822 (38)
Total Tut Periods: Nil

Experiment to be performed:

1. Melting of medium carbon steel in an induction furnace and pouring in a mold cavity.
2. Melting in crucible furnace and pouring of Cu castings
3. Melting in a pot furnace and pouring Al/Al alloys castings
4. Calculation of Metal flow rate and velocity using Bernoulli's Theorem.
5. To Design a sprue using Bernoulli's theorem for a mold.
6. To design a runner and gates of a mold.
7. To design a feeder head (or Riser system) considering freezing time. freezing range and volume feed capacity
8. Determination of an open riser size and shape using Chaine's curve
9. Determination of a blind riser size & shape using Adams and Taylor's equation
10. Calculation of heat loss from open riser
11. Melting of Grey CI in a cupola furnace and pouring in a mold cavity
12. Study of vacuum degassing method during pouring of molten metal in vacuum.
13. Study of coring (or segregation) during fast cooling of casting.
14. To design for a sand casting considering various important factors
15. Design of a new casting.
16. Heat treatment of a steel casting
17. Defects in casting, their causes and remedy.

List of equipments:

1. Crucible furnace
2. Induction furnace
3. Pot furnace (fuel fired)
4. Reverberatory furnace
5. Cupola furnace
6. Bottom pour ladle
7. Vacuum pump
8. Annealing furnace
9. Met microscope
10. Mech testing equipment
11. Nondestructive testing equipment.

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

Semester: VIII
Subject: Experimental Techniques in Metallurgy Lab
Total Practical Periods: 40
Total Marks in End Semester Exam: 40

Branch: Metallurgical Engg.
Code: 338823 (38)
Total Tut Periods: Nil

Experiment to be performed:

1. Measurement of temperature of a furnace using radiation pyrometer.
2. study of microstructure of a metal at high temperature.
3. measurement of hardness of microconstituents, such as ferrite, pearlite, cementite etc.
4. to conduct quantitative phase analysis, using an Image analyzer.
5. Preparation of specimen for electron microscope.
6. To study dislocations in a heavily cold worked metal, using electron microscope.
7. To find out the effect of composition on electrical resistivity of alloys.
8. to carry out differential thermal analysis.
9. To calculate thermal expansion and volume changes associated with phase transformations, using a dilatometer.
10. To find out the wear rate of different materials using wear testing machine.
11. To carry out estimation of phases with the help of thermo magnetic curves.
12. To calculate lattice parameter and to find out the crystal structure of the given metal using x-ray diffract meter.
13. to study the effect of pressure on solidification behavior of metals
14. To carry out vacuum melting of steel
15. Study of vacuum system of an electron microscope.

Equipments/Devices Required:

1. Transmission electron microscope
2. metallurgical microscope
3. Vacuum pump
4. furnaces.
5. High temperature metallograph
6. Dilatometer.
7. Differential thermal analyzer
8. Micro hardness tester.
9. image analyzer
10. Pyrometer.

Books recommended:

1. Lab manuals
2. Experimental techniques in physical metallurgy by – B T Cherepin and A K Mallik
3. Principles of metallographic laboratory practice by – Kehl.

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

Semester: VIII
Subject: Report Writing and Seminar
Total Practical Periods: 40
Total Marks in End Semester Exam: 40

Branch: Metallurgical Engg.
Code: 300825 (38)
Total Tut Periods: Nil

Unit -I

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

Unit - II

Correspondence: Memos, Letters, E-mails, Its differentiation, types of letters, Document Design, its importance, Electronic Communication: Internet, Intranet, extranet, Writing effective e-mail.

Unit - III

Summary: Report Strategies, Effective style of technical report writing: Structures: content, introduction, conclusions, references, etc., Presentation, Writing first draft, revising first draft, diagrams, graphs, tables, etc. report lay-out.

Unit -IV

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

Unit -V

Proposals & Presentation: Title page, Cover letter, Table of Content, list of illustrations, summary, discussion, conclusion, references, glossary, appendix, Case Studies. Oral Presentation/ Seminar:

Text Books:

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

Reference Books:

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

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

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

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

UNIT-I

Conceptual foundation of Business Process reengineering: Role of information Technology and BPR; Process improvement and Process redesign, Process identification and mapping; Role/Activity diagrams, Process Visioning, and benchmarking. [No of Periods: 8 + 2]

UNIT -2

Enterprise Resource Planning: Evolution of ERP- MRP and MRP II, structure of ERP- two tier architecture, three tier architecture, Electronic data processing, management information system, Executive information system, ERP as an integrator of information needs at various Levels. [No of Periods: 8 + 2]

UNIT -3

Typical Business Processes: Core processes, Product control, Sales order processing, Purchases, Administrative processes, Human resource, Finance support processes, Marketing, Strategic planning, Research and development, Problems in traditional view. [No of Periods: 8 + 2]

UNIT -4

ERP models/functionality: Sales order processing, Production scheduling, forecasting, distribution, finance, features of each of the models, description of data flow across each module, overview of supporting databases & packages. [No of Periods: 8 + 2]

UNIT -5

ERP implementation issues: Opportunities and problems in ERP selection, and implementation; ERP implementation: identifying ERP benefits, team formation, Consultant intervention, Selection of ERP, Process of ERP. [No of Periods: 8 + 2]

Books:

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

References:

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

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

Semester: **VIII**

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

Total Theory Periods: **50**

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

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

Branch: **Common to All Branches**

Code:**300882 (33)**

Total Tutorial Periods: **Nil**

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

Unit – II

Network Infrastructure : LAN, Ethernet(IEEE standard 802.3) LAN , WAN , Internet, TCP/IP Reference Model, Domain Name Server , Internet Industry Structure,

UNIT – III

Electronic payment systems, types of electronic payment systems, digital token-based electronic payment systems, smart cards & electronic payment systems, credit card based electronic payment systems, risk and electronic payment systems, designing electronic payment systems.

UNIT – IV

Information Distribution and Messaging: FTP,E-Mail,WWW server,HTTP, Web service implementation, Information publishing , Web Browsers, HTML, Common Gateway Interface

UNIT – V Mobile & wireless computing fundamentals, mobile computing framework, wireless delivery technology and switching methods, mobile information access devices, mobile data internetworking standards, cellular data communication protocols, mobile computing applications, personal communication service.

BOOKS :

1. Frontiers of E-commerce by Kalakota & Whinston (Addison-wesley) E-business roadmap for success by Dr. Ravi Kalakota & Marcia Robinson (addision wesicy)
2. Electronic Commerce By Bharat Bhasker (TMH)

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

Semester: VIII

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
Branches

Branch: Common to all

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, 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

Subject: Knowledge Entrepreneurship

Total Theory Periods: 40

Total Marks in End Semester Exam:80

Minimum no. of class tests to be conducted: 2

Branch: Common to All Branches

Code: 300886 (36)

Total Tut Periods: 12

Unit – I

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

Unit-II

Managing knowledge & intellectual capital:

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

Unit-III

Contemporary information problems:

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

Unit-IV

Creating enterprise cultures:

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

Unit-V

Becoming a knowledge entrepreneur:

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

Text & Reference Books

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

Lunlin Conlson, Knowledge Entrepreneur, Thomas Press.

Catheriue L Mann, Knowledge entrepreneurship, Oxford

Heinke Robkern ,Knowledge entrepreneurship,.

Bonnie Montano,Knowledge Management, , IRM Press, London

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

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

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

UNIT I

Financial Management –an overview: Introduction, finance and other disciplines, objectives and scope of financial management, role and responsibility of finance manager.

[No of Periods: 8 + 2]

UNIT II

Working capital management-nature, need, importance and concept of working capital, trade off between profitability and risk, Determining finance mix.

[No of Periods: 8 + 2]

UNIT III

Inventory management-Introduction, objectives, ordering cost, carrying cost, lead time, economic order quantity and safety stock, deterministic model.

[No of Periods: 8 + 2]

UNIT IV

Management of cash-introduction motives for holding cash, objectives of cash management and technique/process of cash management.

[No of Periods: 8 + 2]

UNIT V

Receivables management-introduction, objectives, credit terms, credit policies and collection policies.

[No of Periods: 8 + 2]

Text books:

Basic financial management, M Y Khan and P K Jain, TMH
Financial Management, I M Pandey.

References books:

Financial management and policy, V K Bhalla, Anmol publications pvt. Ltd.
Financial management, Van Horne.

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

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

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

UNIT I

Identification of projects-generation and screening of idea, monitoring corporate appraisal, preparing project profiles and project rating index.

UNIT II

Feasibility studies: Market and demand analysis, technical analysis, financial analysis and economic viability.

UNIT III

Project appraisal: Criteria, net present value, internal rate of return, payback period and accounting rate of return method.

UNIT IV

Project management and implementation-
Project planning, project control, prerequisites of implementation. Network techniques of project management-Project evaluation and review technique (PERT) and critical path method (CPM).

UNIT V

Project review and control-
Initial review, performance evaluation, abandonment analysis and its behavioral issues.

Text books:

Project planning, analysis, selection, implementation and review by Prasanna Chandra, TMH.

Reference Books:

Project management-Dr. Harold Kerzner.

Total Project management-Dr. P K Macmillan.

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

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

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

UNIT – I

Safety Philosophy and principles of Accident prevention
Introduction, accident, injury, unsafe act, unsafe condition, reportable accidents, need for safety, break down of accidents, hazardous industries.
Theories & Principle of accidents
Casualty, cost of accident, computation of cost, utility of cost data.
Accident reporting & Investigation
Identification of the key facts, corrective actions, classification of facts.
Regulation
American (OSHA) and Indian Regulation.

UNIT – II

Safety Management
Division of responsibility, Location of Safety function, size of safety department, qualification for safety specialist, safety committee – structure and functions.

UNIT – III

Safe Working Condition and Their Development
SOP for various Mechanical equipments, Incidental safety devices and methods, statutory of provisions related to safeguarding of Machinery and working condition.

UNIT – IV

Safety in Operation and Maintenance
Operational activities and hazards, starting and shut down procedures, safe operation of pumps, compressor, heaters, reactors, work permit system, entry into continued spaces.

UNIT – V

Safety in Storage and Emergency Planning
Safety in storage, handling of chemicals and gases, storage layout, ventilation, safety in chemical laboratories, emergency preparedness on site plan, off site plan, toxic hazard control.

TEXT BOOKS

Safety and Accident Prevention in Chemical Operation – H.H. Fawcett and Wood
Personal Protective Equipment – NSC Bombay

REFERENCE BOOKS

Ergonomics - P. Krishna Murthy
Fire Prevention Hand Book – Derek James

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

Semester: VIII

Subject: Bioinformatics

Total Theory Periods: 4 per week.

Total Marks in End Semester Exam: 80.

Minimum number of class tests to be conducted: 02.

Branch: **Common to All Branches**

Code: 300890 (22)

Total Tut Periods: Nil.

UNIT-1

Bioinformatics-introduction, Application, Data Bases and Data Management, Central Dogma; information search and Data retrieval, Genome Analysis and Gene mapping- Analysis, Mapping, Human Genome Project (HGP).

UNIT-2

Alignment of Pairs and Sequences; Alignment of Multiple Sequences and Phylogenetic Analysis; Tools for similarity Search and Sequence Alignment- FASTA BLAST.

UNIT-3

Profiles and Hidden Markov Models (HMMs); Gene Identification and Prediction-Basics, Pattern Recognition, Methods and Tools; Gene Expression and Micro arrays.

UNIT-4

Protein Classification and Structure Visualization; Protein Structure Prediction; Proteomics; Computational methods-Analysis of Pathways, Metabolic Network Properties, Metabolic Control Analysis, Stimulation of Cellular Activities, Biological Mark Up Languages.

UNIT-5

Drug Discovery-Introduction, Technology and Strategies, Cell Cycle, G-protein, Coupled, Receptors.

Computer Aided Drug Design-Introduction, Drug Design Approaches, Designing methods, ADME-Tox Property Prediction.

TEXT BOOKS

- I. BIOINFORMATICS by S.C. Rastogy, 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

Subject: Nanotechnology

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Minimum No. of Class test to be conducted:2

Branch: Common to All Branches

Code: 300892 (47)

Total tutorial Period: NIL

Unit I : Introduction to nanotechnology: background, definition , basic ideas about atoms and molecules, physics of solid state, review of properties of matter and quantum mechanics

Unit II : Preparation of Nanostructured Materials : Lithography : nanoscale lithography, E-beam lithography, dip pen lithography, nanosphere lithography. Sol gel technique Molecular synthesis, Self-assembly, Polymerization

Unit III : Characterization of Nanostructured materials : Microscopy: TEM, SEM, SPM techniques, confocal scanning microscopy,, Raman microscopy-Basic principles, applicability and practice to colloidal, macromolecular and thin film systems. Sample preparation and artifacts. Polymer fractionation techniques: SEC, FFF, Gel electrophoresis.: Basic theory, principles and practice.

Thermal analysis: Basic principles, theory and practice. Micro DSC in the study of phase behavior and conformational change.

Mass spectrometry of polymers: MALDI TOF MS – Basic theory, principles and practice. Applicability to proteins, polyethers, controlled architecture systems

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

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

References:

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

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

Semester: VIII

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

Subject: Value Engineering

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Minimum number of class tests to be conducted: 2

Branch: **Common to All Branches**

Code: 300894 (37)

Total Tutorial Period: 12

UNIT – I

Basic Concepts

Meaning of the term value, basic kind, reasons for poor value, value addition, origin and history. Benefits, relevance in Indian scenario.

UNIT – II

Techniques

Different techniques, organizing value engineering study, value engineering and quality.

UNIT – III

Job Plan

Different phases, General phase, Information phase, Functional Phase, Creation Phase, Evaluation Phase, Investigation Phase, Implementation Phase, Audit.

UNIT – IV

Selection of evaluation of VE Projects

Project selection, method selection, value standard, application of methodology.

UNIT – V

Value Engineering Program

VE operations in maintenance and repair activities, VE Cost, life cycle, cost model, training for VE, general value engineering, case studies.

TEXT BOOKS

Value Engineering – S.S. Iyer – New Age International Publishers, New Delhi

Industrial Engineering & Management – O.P. Khanna – Dhanpat Rai & Sons

REFERENCES

Techniques of Value Analysis and Engineering – L.D. Miles – McGraw Hill, New York

Value Engineering, A Systematic Approach – A.E. Mudge – McGraw Hill, New York

Compendium on Value Engineering – H.G. Tufty – Indo American Society

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: VIII

Subject: Disaster Management

Total Theory Periods: 40

Total Marks in End Semester Exam: 80

Minimum number of class tests to be conducted: 2

Branch: **Common to All Branches**

Code: 300895 (20)

Total Tutorial Periods: 12

Unit 1

Nature of disasters – natural and other disasters, Earthquakes, floods, draught, cyclones, fire and other environmental disasters.

Unit 2

Behaviour of structures in disaster prone areas, Disaster zoning, Hazard assessment, Environmental Impact Assessment

Unit 3

Methods of mitigating damage during disasters, disaster preparedness.

Unit 4

Management systems during disasters, Construction Technology for mitigation of damage of structures.

Unit 5

Short-term and long-term relief measures.

Name of Text Books:

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

Dynamics of Structures: Theory and Application to Earthquake Engineering (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, Pittsburgh, 2000)

Construction Project Management – Frederick E.Gould (Wentworth Institute of Technology, Vary E.Joyce, Massachusetts Institute of Technology, 2000)

Project Management – Choudhury, S. (Tata McGraw Hill Publishing Co., New Delhi, 1988)

Applied project Engineering and Management – Ernest E. Ludwig (Gulf Publishing Co., Houston, Texas, 1988)

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: VIII

Branch: **Common to All Branches**

Subject: Ecology and Sustainable Development

Code: 300897 (20)

Total Theory Periods: 40

Total Tutorial Periods: 12

Total Marks in End Semester Exam: 80

Minimum number of class tests to be conducted: 2

Unit 1

Nature of ecology and sustainable development

Definition, scope of ecology and sustainable development, geomorphology, oceanography, climatology and biogeography.

Unit 2

Energy and environment

Introduction of energy environment, use of solar cells for heating and operated drills, methane gas digesters, environmentally friendly method of energy conservation, difference between conventional and non-conventional energy sources, future trends of energy systems.

Unit 3

Theory of isostasy

Concept of isostasy for sustainable development, discovery of the concept, concept of Hayford and Bowie, Joly, and Holmes, Global isostatic adjustment.

Unit 4

Physical geography and man human impact on the natural environment

Modification of land forms, direct alteration of land forms, wind deflation, coastal erosion and deposition, modification of the atmosphere, ultration process in eco and energy systems.

Unit 5

Obstacles in sustainable development

Pollution growth, species extinction, restriction of bat lands, desertification, soil erosion, soil pollution, characterisation of contaminated soil, global warming and ozone depletion etc.

Name of Text Books:

Energy and environment – Fowler (McGraw Hill, New Delhi)

Restoration Ecology and sustainable development – Krystyna M. Urbanska et.al. (Cambridge University Press, U.K.)

Name of Reference Books:

Reuniting Economy and Ecology in Sustainable Development – Russ Beaton et.al. (-----)

Theory and implementation of economic models for sustainable development – Jeroen C.J.M. Van Den Bergh (-----)

Economy and Ecology: Towards sustainable development – F. Archibugi et.al. (-----)

Evaluating Sustainable Development: Giving People a voice in their destiny – Okechukwu Ukaga et.al. (-----)

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

Semester: VIII

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.