Chhattisgarh Swami Vivekanand Technical University, Bhilai
Scheme of Teaching & Examination

B.E. VIII Semester Metallurgical Engineering

<table>
<thead>
<tr>
<th>S. No</th>
<th>Board of Study</th>
<th>Subject Code</th>
<th>Subject</th>
<th>Periods per Week</th>
<th>Scheme of Exam</th>
<th>Total Marks</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
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<td>L</td>
<td>T</td>
<td>P</td>
<td>ESE</td>
</tr>
<tr>
<td>1</td>
<td>Metallurgical Engineering</td>
<td>338811(38)</td>
<td>Structural Metallurgy</td>
<td>4</td>
<td>1</td>
<td>-</td>
<td>80</td>
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<tr>
<td>2</td>
<td>Metallurgical Engineering</td>
<td>338812(38)</td>
<td>Foundry Metallurgy</td>
<td>4</td>
<td>1</td>
<td>-</td>
<td>80</td>
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<tr>
<td>3</td>
<td>Metallurgical Engineering</td>
<td>338813(38)</td>
<td>Experimental techniques in Metallurgy</td>
<td>4</td>
<td>1</td>
<td>-</td>
<td>80</td>
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<tr>
<td>4</td>
<td>Refer Table – III</td>
<td>Professional Elective – III</td>
<td>4</td>
<td>1</td>
<td>-</td>
<td>80</td>
<td>20</td>
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<td>5</td>
<td>Refer Table – IV</td>
<td>Open Elective IV</td>
<td>4</td>
<td>1</td>
<td>-</td>
<td>80</td>
<td>20</td>
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<tr>
<td>6</td>
<td>Metallurgical Engineering</td>
<td>338821(38)</td>
<td>Structural Metallurgy Lab</td>
<td>-</td>
<td>-</td>
<td>2</td>
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<tr>
<td>7</td>
<td>Metallurgical Engineering</td>
<td>338822(38)</td>
<td>Foundry Metallurgy Lab</td>
<td>-</td>
<td>-</td>
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<tr>
<td>8</td>
<td>Metallurgical Engineering</td>
<td>338823(38)</td>
<td>Experimental techniques in Metallurgy Lab</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>40</td>
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<tr>
<td>9</td>
<td>Metallurgical Engineering</td>
<td>338824 (38)</td>
<td>Major Project</td>
<td>-</td>
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<tr>
<td>10</td>
<td>Metallurgical Engineering</td>
<td>300825(38)</td>
<td>Report Writing and Seminar</td>
<td>-</td>
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<td>20</td>
<td>5</td>
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<td>620</td>
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</tbody>
</table>

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

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Board of Study</th>
<th>Subject Code</th>
<th>Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Metallurgical Engineering</td>
<td>338871 (38)</td>
<td>Powder Metallurgy &amp; Ceramics</td>
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<tr>
<td>2</td>
<td>Metallurgical Engineering</td>
<td>338872 (38)</td>
<td>Light Metals</td>
</tr>
</tbody>
</table>

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

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

Unit – 1 X-Ray Metallography

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.

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.)
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
4. Metal casing. – R.A. Flinn
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

Name of Text Books:
(1) Experimental Tech in Phy. Met. by – A k Mallik & V T Chesepin

Name of Reference Books:
1. Automation in magnetometric and dilato. Measurements V T Cherepin
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
5. Advance Technique in powder metallurgy – F. Clark
7. Ceramic Fabrication process – W.D. Kingery.
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 (Ag., Mg, Te 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
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. Differ 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, potentionmeter, thermocouple.

Recommended Books:

1. Lab manuals
2. X-ray diffraction by Callity and Rama Rao
Chhattisgarh Swami Vivekanand Technical University, Bhilai (C.G.)

Subject: Foundry Metallurgy Lab       Code: 338822 (38)
Total Practical Periods: 40       Total Tut Periods: Nil
Total Marks in End Semester Exam: 40

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 caine’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.
Experiment to be performed:
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 resistively 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

Books recommended:
1. Lab manuals
2. Experimental techniques in physical metallurgy by – B T Cherepin and A K Mallik
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

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:

Reference Books:
1. Sunita Mishra, "Communication Skills for Engineers" Pearson Education
2. Davies J.W. "Communication for engineering students", Longman
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:
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
UNIT – I

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)
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:

Reference Books:
3. Plsek, Creativity, 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,
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

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.


Name Of Text Books:
Decision Support System By Vicki l Sauter
Management Information system-Gerald V. Post & David L. Anderson
CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VIII                        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

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
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
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.
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.
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                  Branch: Common to All Branches
Subject: Bioinformatics       Code: 300890 (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
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

TEXT BOOKS
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
   4. Current Topics in Computational Molecular Biology (Computational Molecular Biology), Tao Jiang, Ying Xu, Michael Zhang (Editors), 2002, MIT Press
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

UNIT – III
Energy in Manufacturing

UNIT – IV
Heat Recovery System

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
2. Energy Management – Paul O’Callaghan –
REFERENCE BOOKS
2. Energy Management in illuminating System – Kao Chen – CRC Publishers
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


References:

1. Guozhong Cao, “Nanostructures and Nanomaterials”, Imperial College Press, London
Unit-I

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

**REFERENCES**
Compendium on Value Engineering – H.G. Tufty – Indo American Society
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)
Earth quake engineering damage assessment and structural design – S.F. Borg
Disasters and development – Cuny F (Oxford University Press Publication)
Semester: VIII
Subject: Construction Management
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
**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-Builders-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**

Unit 4
**Labour, Material and Equipment Utilization**

Unit 5
**Cost Estimation**

Name of Text Books:
Project Management: A systems Approach to Planning, Scheduling and Controlling – Harold Kerzner (CBS Publishers & Distributors, Delhi, 1988)
Name of Reference Books:
Construction Project Management – Frederick E. Gould (Wentworth Institute of Technology, Vary E. Joyce, Massachusetts Institute of Technology, 2000)
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 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. (--------)
Unit I

Unit II

Unit III

Unit IV

Unit V

Name of Text Books:
1. John A Duffie & William A Beckman: Solar Energy Thermal processes Wiley Inter science publication

Name of Reference Books:
UNIT I:

UNIT II:

UNIT III:

UNIT IV:

UNIT V:

Text Books:

Reference Books: