Table - IV

Open Elective –IV			
S.No.	Board of Studies	Code	Name of Subject
1	Management	300851(76)	Enterprise Resource Planning **(Except CSE & IT Branch)**
2	Information Technology	300852(33)	E-Commerce & strategic IT **(Except CSE & IT Branch)**
3	Management	300853(76)	Technology Management
4	Information Technology	300854(33)	Decision Support & Executive Information system
5	Computer Science & Engg.	300855(22)	Software Technology
6	Management	300856(76)	Knowledge Entrepreneurship
7	Management	300857(76)	Finance Management
8	Management	300858(76)	Project Planning, Management & Evaluation
9	Mechanical Engg.	300859(37)	Safety Engineering
10	Computer Science & Engg.	300801(22)	Bio Informatics
11	Mechanical Engg.	300802(37)	Energy Conservation & Management
12	Nanotechnology	300803(47)	Nanotechnology
13	Management	300804(76)	Intellectual Property Rights
14	Mechanical Engg.	300805(37)	Value Engineering
15	Civil Engg.	300806(20)	Disaster Management
16	Civil Engg.	300807(20)	Construction Management
17	Civil Engg.	300808(20)	Ecology and Sustainable Development
18	Chem. Engg.	300809(19)	Non Conventional Energy Sources
19	Electrical Engg.	300810(24)	Energy Auditing & Management **(Except Electrical Engg. Branch)**
20	Mechanical Engg.	300811(37)	Managing Innovation & Entrepreneurship
21	Information Technology	300812(33)	Biometrics
22	Information Technolgy	300813(33)	Information Theory & Coding
23	Computer Science & Engg.	300814(22)	Supply Chain Management
24	Computer Science & Engg.	300815(22)	Internet & Web Technology
25	Electrical Engg.	300816(24)	Electrical Estimation and Costing
26	Electrical& Electronics Engg.	300817(25)	Non Conventional Energy Sources
27	Computer Science & Engg.	300818(22)	Big Data and Hadoop

Note (1) 1/4th of total strength of students is required to offer an elective in thecollege in a particular academic session.
(2) - Choice of elective course once made for an examination cannot be changed

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

Semester: VIII **Branch: Common to All Branches (Except CSE & IT)**
Subject: Enterprise Resource Planning **Code: 300851(76)**
Total Theory Periods: 40 **Total Tutorial Periods: 12**
Total Marks in End Semester Exam: 80 **Minimum number of CT to be conducted: 02**

UNIT - I Overview of Business Functions :
Business function in an organization, material management, scheduling, shop floor control. Forecasting, accounting & finance, human resources, productivity management.

UNIT- II Typical Businesss Processes :
Core processes, product control, sales order processing, purchase, administrative process, human resource, finance support processes, marketing, strategic planning, research & development problems in traditional functional view. Need for integrated process view, information as a resource, motivation for ERP.

UNIT – III Evolution of Information System :
EDP (electronic data processing) system, management information systems (MIS), executive information systems, information needs of organization, ERP as an integrator of information needs at various levels, decision making involved at the above level.

UNIT – IV Erp Models /Functionality:
Salesorderprocessing, MRP, scheduling, forecasting, maintenance, distribution, finance, features of each of the models description of data flows across module, overview of the supporting databases, technologies required for ERP.

UNIT – V Implementation Issues:
Pre Implementation issues, financial justification of ERP, evaluation of commercial software during implementation issues, reengineering of various business process, education & training, project management, post implementation issues, performance measurement.

Text Books

1. V.K. Garg & N.K. Venkatkrishnan ; ERP, concepts & practices, PHI.
2. S. Sadagopan : MIS, PHI

Reference Books:

1. V. Rajaraman : Analysis & Design of Information Systems, PHI
2. K. M. Hussain & D. hussain ; Information systems, Analysis, Design & Implementation, TMH.
3. MONAK & BRADY : Conceptss in ERP, vikas pub. Thosmson
4. J. Kanter : Managing with information, PHI

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

Semester: VIII **Branch: Common to All Branches (Except CSE & IT)**
Subject: E-Commerce and Strategic IT **Code: 300852(33)**
Total Theory Periods: 50 **Total Tutorial Periods: NIL**
Total Marks in End Semester Exam: 80 **Minimum number of CT to be conducted: 02**

Course Objective:
- To understand the business impact and potential of e-commerce
- To learn about the technologies required to make e-Commerce viable
- To learn e-commerce from an enterprise point of view
- To learn about the working of various electronic payment systems

UNIT –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.

Course outcome: After successful completion of the course, students
- Will be able to apply the skills necessary for large-scale web based e-commerce project development.
- Will be able to work on information distribution and messaging services in e-commerce application.
- Will be able to work on business applications of wireless and mobile technologies for e-commerce.

Text books:
1. Frontiers of E-commerce by Kalakota & Whinston, Addison Wesley.
2. E-business road map for success by Dr. Ravi Kalakota& Marcia Robinson, Addison Wesley.

Reference book:
1. Electronic Commerce by Bharat Bhasker, TMH.

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

Semester: VIII **Branch: Common to All Branches**
Subject: Technology Management **Code: 300853(76)**
Total Theory Periods: 50 **Total Tutorial Periods: 10**
Total Marks in End Semester Exam: 80 **Minimum number of CT 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 VIVEKANAD TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VIII **Branch: Common to All Branches**
Subject: Decision Support and Executive Information System **Code: 300854(33)**
Total Theory Periods: 50 **Total Tutorial Periods: NIL**
Total Marks in End Semester Exam: 80 **Minimum number of CT to be conducted: 02**

Course Objective

1. To review and clarify the fundamental terms, concepts and theories associated with Decision Support Systems, computerized decision aids, expert systems, group support systems and executive information systems.
2. To examine examples and case studies documenting computer support for organizational decision making, and various planning, analysis and control tasks.
3. To discuss and develop skills in the analysis, design and implementation of computerized Decision Support Systems.

UNIT-I Decision Support System:
What is a DSS, Decision Making Rational Decisions, Definitions of Rationality, Bounded Rationality and Muddling Through, The Nature of Managers, Appropriate Data Support, Information Processing Models, Group Decision Making?

UNIT-II Component OF DSS:
Data Component : Information and its Usefulness, Characteristics of Information, Databases to Support Decision Making, Database Management Systems, Data Warehouses, Data Mining and Intelligent Agents Model Component-:Models Representation Methodology, TimeModel Based ManagementSystems, Access to Models Understandability of Results, Integrating Models Sensitivity of aDecision, Brainstorming and Alternative Generation, Evaluating Alternatives, Running External Models. Mail Component: Integration of Mail Management Examples of Use implications for DSS.

Unit-III Intelligence and Decision Support Systems:
Programming Reasoning, Backward Chaining Reasoning, Forward Chaining Reasoning, Comparison, Certainty Factors,User-Interface Component:User Interface Components, The Action Language, Menus, Command Language, I/O Structured Formats, Free Form Natural Language, The Display or Presentation Language, Windowing Representations, Perceived Ownership of Analyses, Graphs and Bias Support for All Phases of Decision Making, The Knowledge Base Modes of Communication

Unit-IV Designing A DSS:Planning for DSS, Designing a Specific DSS, Interviewing Techniques, OtherTechniques, Situational AnalysisDesign Approaches, Systems Built from Scratch,
Using Technology to Form the Basis of the DSS, Evaluating a DSS Generator, Using a DSS Generator,The Design Team, DSS Design and Re-engineering Discussion .

Unit-V Implementation and Evaluation of DSS : Implementation Strategy , Prototypes, Interviewing , User Involvement , Commitment to Change, Managing Change, Institutionalize System, Implementation and System Evaluation, Technical Appropriateness, Measurement Challenges , Organizational Appropriateness.

Course outcomes:

On completion of this program student will:

1. Recognize the relationship between business information needs and decision making
2. Appraise the general nature and range of decision support systems
3. Appraise issues related to the development of DSS

Name Of Text Books-:
Decision Support System By Vicki l Sauter
Management Information system-Gerald V. Post & David L. Anderson

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

Semester: VIII **Branch: Common to All Branches**
Subject: Software Technology **Code: 300855(22)**
Total Theory Periods: 50 **Total Tutorial Periods: NIL**
Total Marks in End Semester Exam: 80 **Minimum number of CT to be conducted: 02**

Course Objective

- The basic objective in offering this course is to be employed as a practicing engineer in fields such as design, research, development, testing, and manufacturing

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

Outcomes: After successful completion of the course, student will be able to
1. an ability to apply knowledge of mathematics, science, and engineering.
2. an ability to design and conduct experiments, as well as to analyze and interpret data.

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 VIVEKANAD TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VIII **Branch: Common to All Branches**
Subject: Knowledge Entrepreneurship **Code: 300856(76)**
Total Theory Periods: 40 **Total Tutorial Periods: 12**
Total Marks in End Semester Exam: 80 **Minimum number of CT to be conducted: 02**

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

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

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

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

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

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

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

Semester: VIII **Branch: Common to All Branches**
Subject: Financial Management **Code: 300857(76)**
Total Theory Periods: 30 **Total Tutorial Periods: 12**
Total Marks in End Semester Exam: 80 **Minimum number of CT to be conducted: 02**

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 VIVEKANAD TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VIII **Branch: Common to All Branches**
Subject: Project Planning, Management & Evaluation **Code: 300858(76)**
Total Theory Periods: 40 **Total Tutorial Periods: 12**
Total Marks in End Semester Exam: 80 **Minimum number of CT to be conducted: 02**

OBJECTIVES

Projects are non-recurring activities requiring a different set of skill for planning as compared to regular and operative activities. The course is aimed at developing the understanding of project activities and relevant skills.

COURSE CONTENTS

UNIT I	⇨ Project Identification Analysis: Socio-economic Consideration in Project Formulation; Social Infrastructure Projects for Sustainable Development; Investment Opportunities; Project Screening and Presentation of Projects of Decision Making; Expansion of Capacity; Diversification
UNIT II	⇨ Market and Technical Analysis: Market and Demand Analysis – Market Survey,Demand Forecasting, Uncertainties in Demand Forecasting; Technical Analysis-Product Mix, Plant Capacity, Materials and Inputs, Machinery and Equipment.
UNIT III	⇨ Project Costing and Finance: Cost of project; Cost of production; Break even Analysis; Means of Financing Project; Tax Aspects in Project Finance; Role of Financial Institution in Project Finance.
UNIT IV	⇨ Project Appraisal: Time Value of Money; Project Appraisal Techniques – Playback Period, Accounting Rate of Return, Net Present Value, Internal Rate of Return, Benefit Cost Ratio; Social Cost Benefit Analysis; Effective Rate of Protection. ⇨ Risk Analysis: Measures of Risk; Sensitivity Analysis; Stimulation Analysis; Decision Tree Analysis.
UNIT V	⇨ Project Scheduling/Network Techniques in Project Management: CPM and PERT Analysis; Float times; Crashing of Activities; Contraction of Network for Cost Optimization, Updating; Cost Analysis of Resources Allocation. Basic knowledge of the leading softwares for Project Planning and Analysis.

The examination paper will include question from each unit. The list of cases / specific references including recent articles will be announced and discussed in the class.

TEXT BOOKS

- Khatua, Project Management and Appraisal, ISBN: 9780198066903, Oxford University Press

SUGGESTED READINGS

- Bhavesh, M. Patel (2000): Project Management-Strategic Financial Planning Evaluation and Control, Vikas Publishing House Pvt. Ltd.
- Chandra, P. (6th ed., 2007): Projects. Tata McGraw Hill.
- Wysocki, Robert K., Bick Robert and Crane David B. (2000): Effective ProjectManagement. John
- Wiley and Sons, USA.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program: **Bachelor of Engineering** Branch: **Common to All Branches**
Semester: **VIII** Subject: **Safety Engineering**
Code: **300859(37)**
Total Theory Periods: **4 0** Total Tutorial Periods: **10**
Class Tests: **Two (Minimum)** Assignments: **Two (Minimum)**
ESE Duration: **Three Hours** **Maximum Marks: 80 Minimum Marks: 28**

Course Objectives:

- To Know safety philosophy and principles of accident prevention
- To know the safety rules, regulations, standards and codes
- To achieve an understanding of principles of safety management.
- To learn about various functions and activities of safety department.
- To study various mechanical machines and their safety importance.

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
Standard Operating Procedure (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

1. Safety Management : Strategy And Practice - Pybus R - Butterworth Heinmann, Oxford
2. Safety and Accident Prevention in Chemical Operation – H.H. Faweett and Wood

REFERENCE BOOKS

1. Industrial Safety Management- Trafdar N K, Tarafdar K J – Dhapat Rai, New Delhi
2. Safety Management In Industry- Krishna, N V- Jaico Publication House; New Delhi
3. Industrial Safety And Pollution Control Hand Book - Nagraj, J N & Rameshchandar, R V - Associate Publisher, Securndabad
4. Fire and Safety Manual Refineries and Petrochemical Panel - National Safety Counsil, Bombay
5. Safety in Use of Compressed Gas Cylinders - National Safety Counsil, Bombay
6. Encyclopaedia of Occupational Health and Safety - Stallman I M, Mccann M, Warshaw L, Brabant C - International Labour Office,Geneva
7. Industrial Safety Environmental Pollution Health Hazard And Nuclear Accidents - A Chand - Mittal Publication, New Delhi
8. Personal Protective Equipment – National Safety Counsil, Bombay
9. Accident Prevention Manual for Business and Industrial Administration and Programs - Krieger, G R Montgomerji - National Safety Council, Ittenois.
10. Major Hazard Control A Practical Manual – ILO - National Safety Counsil, Bombay

Course Outcomes:

- Ability to understand the functions and activities of safety engineering department.
- Apply knowledge of safety engineering specialization for hazard identification, risk assessment and control of occupational hazards.
- Communicate effectively on health and safety matters among the employees and with society at large.

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

Semester: VIII **Branch: Common to All Branches**
Subject: Bio Informatics **Code: 300801(22)**
Total Theory Periods: 50 **Total Tutorial Periods: NIL**
Total Marks in End Semester Exam: 80 **Minimum number of CT to be conducted: 02**

Course Objective

1. This course aims to provide students with a practical and hands-on experience with common bioinformatics tools and databases.
2. Students will be trained in the basic theory and application of programs used for database searching, protein and DNA sequence analysis, prediction of protein function.

UNIT-1
Bioinformatics-introduction, Application, Data Bases and Data Management, Central Dogma; information search and Data retrieval, Genome Analysis and Gene mapping- Analysis, Mapping, Human Genome Project (HGP).

UNIT-2
Alignment of Pairs and Sequences; Alignment of Multiple Sequences and Phylogenetic Analysis; Tools for similarity Search and Sequence Alignment- FASTA BLAST.

UNIT-3
Profiles and Hidden Marcov Models (HMMs); Gene Identification and Prediction-Basics, Pattern Recognition, Methods and Tools; Gene Expression and Micro arrays.

UNIT-4
Protein Classification and Structure Visualization; Protein Structure Prediction; Proteomics; Computational methods-Analysis of Pathways, Metabolic Network Properties, Metabolic Control Analysis, Stimulation of Cellular Activities, Biological Mark Up Languages.

UNIT-5
Drug Discovery-Introduction, Technology and Strategies, Cell Cycle, G-protein, Coupled, Receptors. Computer Aided Drug Design-Introduction, Drug Design Approaches, Designing methods, ADME-Tox Property Prediction.

Outcomes: After successful completion of the course, student will be able to have a good working knowledge of basic bioinformatics tools and databases such as GenBank, BLAST, multiple alignment, and phylogenetic tree construction. Further students will understand the basic theory behind these procedures and be able to critically analyze the results of their analysis using such tools.

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

Name of program: Bachelor of Engineering **Branch: Common to All Branches**
Semester: VIII **Subject: Energy Conservation and Management**
Code: 300802(37)
Total Theory Periods: 40 **Total Tutorial Periods: 10**
Class Tests: Two (Minimum) **Assignments: Two (Minimum)**
ESE Duration: Three Hours **Maximum Marks: 80** **Minimum Marks: 28**

Course Objectives:

- understand and analyze the energy data of industries
- carryout energy accounting and balancing
- conduct energy audit and suggest methodologies for energy savings and
- utilize the available resources in optimal ways

UNIT – I: Introduction

Energy – Power – Past & Present scenario of World; National Energy consumption Data – Environmental aspects associated with energy utilization –Energy Auditing: Need, Types, Methodology and Barriers. Role of Energy Managers. Instruments for energy auditing. Energy intensity, Energy production and imports.

UNIT – II: Energy Conservation in Major utilities

Pumps, Fans, Blowers, Compressed Air Systems, Refrigeration and Air Conditioning Systems – Cooling Towers – D.G. sets, Energy management programmes, Energy conservation measures.

UNIT – III: Thermal Systems Utilization

Stoichiometry, Boilers, Furnaces and Thermic Fluid Heaters – Efficiency computation and enconomic measures. Steam: Distribution & Usage: Steam Traps, Condensate Recovery, Flash Steam Utilization, Insulators & Refractories

UNIT – IV: Energy Storage Technologies

Overview of storage technologies, Principal forms of stored energies, Application of energy storage, Specifying energy storage devices, Specifying fuels, Direct electric storage, Electrochemical energy storage, Mechanical energy storage, Direct thermal storage, Thermochemical energy storage

UNIT – V: Industrial Energy Efficiency and Energy Management

Introduction, Industrial energy management and efficiency improvement, Improving industrial energy audits, Industrial electricity end uses and electrical energy management, Thermal energy management in industry, The role of new equipment and technology in industrial energy efficiency

Textbooks:

1. Energy Management and Conservation Handbook - D. Yogi Goswami, and Frank Kreith
2. Energy Management – W.R. Murphy, G. Mckay

Reference Books:

1. Energy Management – Paul O'Callaghan
2. Engineering Economics & Engineering Management – R. Raju – Anuradha Agencies

3. Witte. L.C., P.S. Schmidt, D.R. Brown, "Industrial Energy Management and Utilisation" Hemisphere Publ, Washington, 1988.
4. Dryden. I.G.C., "The Efficient Use of Energy" Butterworths, London, 1982

Course Outcomes:

Upon completion of this course, the students can able to analyse the energy data of industries.

- Can carryout energy accounting and balancing
- Can suggest methodologies for energy savings

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

Semester: **VIII** Branch: **Common to All Branches**

Subject: **Nanotechnology** Code: **300803(47)**

Total Theory Periods: 50 Total tutorial Period: NIL

Total Marks in End Semester Exam: 80 Minimum No. of Class test to be conducted:2

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

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

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

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

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

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

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

References:

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

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

Semester: VIII **Branch: Common to All Branches**
Subject: Intellectual Property Rights **Code: 300804(76)**
Total Theory Periods: 40 **Total Tutorial Periods: 12**
Total Marks in End Semester Exam: 80 **Minimum number of CT to be conducted: 02**

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 ecommerce 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

Name of program: **Bachelor of Engineering**
Semester: **VIII**
Code: **300805(37)**
Total Tutorial Periods: **10**
Assignments: **Two (Minimum)**
Maximum Marks: 80 Minimum Marks: 28

Branch: **Common to All Branches**
Subject: **Value Engineering**
Total Theory Periods: **4 0**
Class Tests: **Two (Minimum)**
ESE Duration: **Three Hours**

Course Objectives:

- The objective of this course is to introduce students with the methodology of Value Engineering and its decision-making process.
- To familiarize students with procedures that provides standards for Value Engineering applications.
- To teach value engineering in a practical, project-based manner.
- During the course student will be engaged in decision-making using Value Engineering tools to ensure quality and value while reducing the cost of projects.
- Student will know about a number of case study applications of the Value Engineering to gain practical experience.

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

1. Value Engineering a How to Manul– S.S. Iyer – New Age International Publishers, New Delhi

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

REFERENCES

1. Techniques of Value Analysis and Engineering – L.D. Miles – McGraw Hill, New York
2. Value Engineering: A Systematic Approach – A.E. Mudge – McGraw Hill, New York
3. Getting More at Less Cost: The Value Engineering Way - Jagannathan G - TMH,New Delhi
4. Value Engineering a Practical Approach for Owners Designers & Constructions – Zimmerman LW & Gilen HD – CBS, New Delhi.
5. Compendium on Value Engineering – H.G. Tufty – Indo-American Society.

Course Outcome:

- Understand the basics of Value Engineering (VE) to ensure that a standardized method is used for VE applications to projects
- Learn to perform function analysis for projects
- Understand the appropriate time to apply VE for projects

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

Name of program: Bachelor of Engineering
Branch: Common to All Branches
Semester: 8th
Subject: Disaster Management

ESE Duration: 3 Hours
Subject Code: 300806(20)

Total Theory Periods: 40
Total Tutorial Periods: 12

Class Tests: 2
Assignments: 2

Maximum Marks: 80
Minimum Marks: 28

Objectives of the Subject:

1. To introduce disaster, its nature and types.
2. To understand disaster zoning and hazard assessment.
3. To know about the disaster mitigation and preparedness.
4. To understand management during disaster and construction technology for its mitigation.
5. To identify relief measures.

Outcomes of the Subject:

1. Students are expected to understand disaster and its nature.
2. Students are expected to understand impact and hazard assessment.
3. Students are expected to understand disaster preparedness and mitigation.
4. Students are expected to understand use of construction technology for disaster management.
5. Students are expected to identify short term and long term relief measures.

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.

Text Books:

1. Design of Earthquake Resistant Buildings – Minoru Wakabayashi (McGraw Hill Publication)
2. Dynamics of Structures: Theory and Application to Earthquake Engineering (2nd edition) – Anil K Chopra (Pearson Education Publication)

Reference Books:

1. Fundamentals of Vibrations – Anderson, R.A. (Mc Millan)
2. IS – 1893 (Part I): 2002, IS – 13920: 1993, IS – 4326: 1993, IS-13828: 1993
3. Earth quake engineering damage assessment and structural design – S.F. Borg
4. Disasters and development – Cuny F (Oxford University Press Publication)

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

Name of program: Bachelor of Engineering
Branch: Common to All Branches
Semester: 8th
Subject: Construction Management

ESE Duration: 3 Hours
Subject Code: 300807(20)

Total Theory Periods: 40
Total Tutorial Periods: 12

Class Tests: 2
Assignments: 2

Maximum Marks: 80
Minimum Marks: 28

Objectives of the Subject:

1. To provide an understanding of owners perspective towards life cycle of project and the changing environment of construction industry.
2. To provide an understanding of organizing for project management.
3. To provide an understanding of innovation, feasibility and value engineering in design and construction.
4. To provide an understanding of labour, material and equipment utilization.
5. To provide an understanding of approaches to cost estimation in construction project.

Outcomes of the Subject:

1. Students should be able to identify owner's perspective / perspective of project participants towards construction projects.
2. Students are expected to identify the structure of project participant's organization and effect of project risks.
3. Students are expected to know design methodology, feasibility aspect and value engineering in design and construction.
4. Students are expected to know importance of labour productivity, material and equipment utilization.
5. Students are expected to know the different approaches of cost estimation of construction project.

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

Definition of 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-Construction Site Environment-Value engineering, Value Management and Value Planning-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-Historical cost data-Cost indices-Applications of cost Indices to Estimating-Estimate based on Engineers List of Quantities-Allocation of Construction costs over time-Estimation of operating costs, concept of pre and post construction cost management.

Text Books:

1. Construction Project Management Planning, Scheduling and Control – Chitkara, K.K. (Tata McGraw Hill Publishing Co., New Delhi, 1998)
2. Project Management: A systems Approach to Planning, Scheduling and Controlling – Harold Kerzner (CBS Publishers & Distributors, Delhi, 1988)

Reference Books:

1. Project management for Construction: Fundamental Concepts for owners, Engineers, Architects and Builders – Chris Hendrickson and Tung Au, (Prentice Hall, Pitsburgh, 2000).
2. Construction Project Management – Frederick E. Gould (Wentworth Institute of Technology, Vary E. Joyce, Massachususetts Institute of Technology, 2000).
3. Project Management – Choudhury, S. (Tata McGraw Hill Publishing Co., New Delhi, 1988).
4. Applied project Engineering and Management – Ernest E. Ludwig (Gulf Publishing Co., Houstan, Texas, 1988).
5. Construction cost management, learning from case studies – Keith Potts, Taylor and Francis, London and New York.

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

Name of program: Bachelor of Engineering
Branch: Common to All Branches
Semester: 8th
Subject: Ecology and Sustainable Development

ESE Duration: 3 Hours
Subject Code: 300808(20)

Total Theory Periods: 40
Total Tutorial Periods: 12

Class Tests: 2
Assignments: 2

Maximum Marks: 80
Minimum Marks: 28

Objectives of the Subject:

1. To learn about the nature of ecology and sustainable development and various obstacles in sustainable development.

Outcomes of the Subject:

1. To be able to plan and handle issues related to sustainable development.

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.

Text Books:

1. Energy and environment – Fowler (McGraw Hill, New Delhi)
2. Restoration Ecology and sustainable development – Krystyna M. Urbanska et.al. (Cambridge University Press, U.K.)

Reference Books:

1. Reuniting Economy and Ecology in Sustainable Development – Russ Beaton et.al.
2. Theory and implementation of economic models for sustainable development – Jeroen C.J.M. Van Den Bergh
3. Economy and Ecology: Towards sustainable development – F. Archibugi et.al.
4. Evaluating Sustainable Development: Giving People a voice in their destiny – Okechukwu Ukaga et.al.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program: **Bachelor of Engineering** Branch: **Common to All Branches**
Semester: **VIII** Subject: **Non Conventional Energy Sources**
Subject Code: **300809(19)**
Class Tests: **Two (Minimum)** **Maximum Marks: 80** **Minimum Marks: 28**
Total Theory Periods: **40** ESE Duration: **Three Hours**
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Note: Internal choices may be given in any three units.

Course Objectives: Energy is the key input to drive and improve the life cycle. The primary source of energy is fossil fuel, however the finiteness of fossil fuel reserves and large scale environmental degradation caused by their widespread use, particularly global warming, urban air pollution and acid rain, strongly suggests that harnessing of non-conventional, renewable and environment friendly energy resources is vital for steering the global energy supplies towards a sustainable path. This subject describes in brief such non-conventional energy sources and their usage.

Unit I An introduction to energy sources, Environmental Aspects of Power Generation.
Heat Transfer from **Solar Energy**, Physical principles of conversion of solar radiation into heat utilization, Flat Plate Collectors (FPC), 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,

Unit II **Solar energy** storage system, Application of solar energy: solar water heating, space heating and cooling, solar photovoltaic, solar cooking, solar distillation & desalination , Solar industrial process heating, Solar power generation. Solar Green Houses, Solar thermo mechanical power, solar refrigeration & air conditioning, Solar ponds.

Unit III **Energy from Biomass**: Type of biomass sources, Energy plantation, Methods for obtaining energy from biomass,
Biomass conversion technologies-wet and dry processes, Biodigestion, Community/Industrial biogas plants, Factors affecting biodigestion, Design of a biogas plant, Classification, advantages and disadvantages of biogas plants, Problems related to biogas plants, Utilization of biogas.
Thermal gasification of biomass, Gasifier- classification, chemistry, advantages, disadvantages and application.
Alcohol fuels from biomass: overview, feedstock, methods for alcohol production, Ethanol as an alternative liquid fuel; engine performance with alcohol fuels, biodiesel from biomass.

Unit IV **Wind Energy**: Basic principles of wind energy conversion: power in the wind, maximum power, forces on the blades, lift and drag, Components of wind energy conversion systems (WEC), Classification, advantages and disadvantages of WEC systems, Types of wind machines, Performance of wind machines, Design considerations, Energy storage, Application of wind energy, Environmental aspect.
Tidal Energy. Components of tidal power plants, Single and double basin arrangements, Estimation of energy and power, Advantages and limitations of tidal power.
Wave energy- its advantages and disadvantages, energy and power from wave energy.

Unit V **Chemical Energy Sources**: Fuel cells: Design, principle, classification, types, advantages and disadvantages, Work output and EMF of fuel cells, Application of fuel cells, Hydrogen energy, Properties of hydrogen, Methods of hydrogen production, Storage and transportation of hydrogen, Advantages and application.

Text Books:
1. G D Rai, 'Non-Conventional Energy Sources', Khanna Publishers. Delhi, 2010
2. S P Sukhatme, 'Solar Energy-Principles of Thermal Collection & Storage', Tata McGraw Hill Publishing Company Ltd., New Delhi

Reference Books
1. John A Duffie & William A Beckman, 'Solar Energy Thermal processes', Wiley Interscience publication .

2. P Garg & J Prakash,' Solar Energy - Fundamentals and Applications', Wiley Interscience publication.
3. Jay Cheng, 'Biomass to Renewable Energy Processes', 1st Edition, CRC press, 2009.

Course Outcomes:
At the end of the course, the student will be able to:
1. Address smart energy and green infrastructure
2. Build models that simulate sustainable and renewable green technology systems
3. Understand the history, global, environmental and economical impacts of green technology
4. Address non renewable energy challenges

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

Semester: BE VIII **Branch:Common to All Branch**
(Except Electrical Engg. Branch)

Subject: Energy Auditing and Management **Code : 300810(24)**
Total Theory Periods - 48
Total marks in End Semester Exam: 80
Course Objectives:

Familiarizing with management especially with management in energy sector engineering. Fundamentals of product strategy management. Studying methods of energy accounting and energy auditing in energy sector, industry and final consumption. Finding opportunities to increase the rational use of energy.

Course Outcomes:

Understanding basics of demand side management and mechanisms (technical, legal or financial) that influence energy consumption. Recognizing opportunities for increasing rational use of energy. Learning the basics of energy auditing with application on different sectors.

UNIT I: Overview

History of Energy Management: Energy forecasting, Limitations of energy resources. Renewable energy recourses. Load management. Energy management. Demand side management (DSM) Energy conservation in realistic distribution system. Short term load forecasting for de-centralized load management.

UNIT II: Energy Situation and Global Energy Sources

World energy consumption. Energy in developing countries. Firewood crises. Indian energy sources. Non-conventional renewable energy sources. Potential of renewable energy sources. Solar energy types. Wind energy. Wave, tidal and OTEC. Super-conductors in power system. Wind power generation for large scale generation of electricity. Wind driven induction generators.

UNIT III: Energy Auditing as Applicable to an Industry

Classification of energy audit System optimization. Power factor improvement. Preventive maintenance. Process modification. Non-conventional energy sources. Electricity tariffs. Types of off-peak tariffs.

UNIT IV: Elements of Energy Auditing and Metering Methodologies (Case Studies):

Capacity utilization. Technology up-gradation. Fine tuning, Energy conservation. Concept and methods of energy conservation.

UNIT V: Demand Side Management

Introduction to DSM. Concept of DSM. Benefits from DSM. DSM techniques. Time of day pricing, Multi-utility exchange model. Time of day pricing models for planning, load management. Load priority technique. Peak clipping. Peak shifting. Valley filling. Strategic conservation. Energy efficient equipment, Socioeconomic awareness programs.

Text Books:

1. Energy Demand: Analysis, Management and Conservatioin, Ashok.V.Desai(ED), Wiley Eastern Ltd., New Delhi.
2. Energy technology, S. Rao, Parulekar, Khanna Pbs.

Reference Books:

1. Demand Side Management , Jyothi Prakash, Tata McGraw-Hill Publishers.
2. Renewable Energy Sources and Conservation Technology,N.K.Bansal, Kleeman Millin, Tata McGraw-Hill Publishers.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program: **Bachelor of Engineering** Branch: **Common to All Branches**
Semester: **VIII**

Subject: **Managing Innovation & Entrepreneurship** Code: **300811(37)**
Total Theory Periods: **40** Total Tutorial Periods: **10**
Class Tests: **Two (Minimum)** Assignments: **Two (Minimum)**
ESE Duration: **Three Hours** **Maximum Marks: 80 Minimum Marks: 28**

Course Objective

1. The course will provide a thorough coverage of conceptual framework on Entrepreneurship development.
2. Enhances student's innovation skill.
3. Helps to provide a quick understanding of essential concepts and issues.
4. Enhance the students to have an understanding about international entrepreneurship.
5. Understand the problems and prospects related to setting up of any type of business.

UNIT – I : Introduction to Entrepreneurship

Evolution of entrepreneurship from economic theory Managerial and entrepreneurial growth and development.

UNIT – II : Creativity and Innovation

Creativity and Innovation: Concepts shifting composition of the Economy purposeful innovation and the seven sources of innovative opportunity the innovation process. Innovative strategies: Strategies that aim at introducing an innovation. Innovation and entrepreneurship: Can they together? Planning – innovation and entrepreneurship.

UNIT – III : Entrepreneurial Motivation

Need for continuous learning & relearning Acquiring technological Innovation Entrepreneurial motivation (nAch story) Achievement Motivation in Real life. Case Study.

UNIT – IV : International Entrepreneurship

Concepts and nature of international entrepreneurship. The changing international environment. Ethics and international entrepreneurship. Strategic issues in international entrepreneurship.

UNIT – V : Problem identification and problem solving

Problem identification. Problem solving. Innovation and diversification.

TEXT BOOK

1. Managing innovation and entrepreneurship in technology based firm-Martin M J-John Willey
2. Managing technology innovation- Ettlite I E - John Willey & Sons.

REFERENCE BOOKS

1. discipline of innovation - Drucker P F -The Harvard business school press , May-June1985.
2. The innovator's solution: Creating and sustaining successful growth - Christensen, C. M. and Raynor, M.E. (2003) - Boston, M. A.: Harvard Business School Press.
3. Innovation(Collection of articles) - Drucker, P. F. (1985) - Harvard Business School Press(2001).
4. Harvard Business Review on entrepreneurship(Collection of articles) - Harvard Business School Press

5) Diffusion of innovations, 5th edition - Rogers, E. M. (2003) - New York: Simon and Schuster.

Course Outcomes

Work effectively with engineering and science teams

CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITYBHILAI (C.G.)

Semester: VIII **Branch: Common to All Branches**
Subject: Biometrics **Code: 300812(33)**
Total Theory Periods: 50 **Total Tutorial Periods: NIL**
Total Marks in End Semester Exam: 80 **Minimum number of CT to be conducted: 02**

Course Objective
The basic objective in offering this course is to study the state-of-the-art in biometrics technology can explore the way to improve the current technology. The students can learn and implement various biometrics technologies using advanced algorithm.

Unit I: Introduction of Biometrics

Biometrics: definition, history, basic working architecture, types; Performance measures of biometrics; applications and benefits of biometrics; design of biometrics; biometric identification versus verification.

Unit II: Face and Iris Biometrics

Background of face and iris recognition; Face recognition methods: Eigen face methods, contractive transformation method; Challenges of face biometrics; Design of iris biometrics: image segmentation, image preprocessing, determination of iris region; Advantages and disadvantages of face and iris biometrics.

Unit III: Fingerprint and Sign Language Biometrics

Fingerprint matching: image acquisition, image enhancement and segmentation, image binarization, minutiae extraction and matching; Sign language biometrics: Indian sign language (ISL) biometrics, SIFT algorithm, advantages and disadvantages of ISL and fingerprint biometrics.

Unit IV: Biometric Cryptography and Privacy Enhancement

Introduction to biometric cryptography; general purpose cryptosystems; Cryptographic algorithms: DES and RSA; Privacy concerns and issues related to biometrics; biometrics with privacy enhancement; soft biometrics; comparison of various biometrics; Identity and privacy.

Unit V: Scope of Biometrics and Biometric Standards

Multimodal biometrics: basic architecture and fusion scheme, application, example of AADHAAR; scope and future market of biometrics; role of biometrics in enterprise and border security; DNA biometrics; biometric standards; biometric APIs.

Suggested Books:

1. Biometrics: concepts and applications by Dr G R Sinha and Sandeep B. Patil, Wiley India Publications, 2013.
2. Introduction to biometrics by Anil K Jain, Arun Ross and Karthik Nandakumar, Springer, 2011.
3. Biometrics Identity verification in a networked world by Samir nanawati, Michael Thieme and Raj Nanawati, US edition of Wiley India, 2012.

Course outcomes:

On completion of this program student will:

1. Understand the basic definition of 'Biometric Recognition' and the distinctive of this form of biometrics.
2. Be able to state precisely what functions these systems perform.
3. Be able to draw a system-level diagram for any biometric system and discuss its components.
4. Be able to solve verification, identification, and synthesis problems for a variety of biometrics such as fingerprint, face, iris, hand gestures and cryptography.
5. Be able to use the biometrics ingredients of existing system to obtain a given security goal.
6. Judge the appropriateness of proposal in research papers for a given applications.
7. Be able to design a biometric solution for a given application.

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

Semester: VIII **Branch: Common to All Branches**
Subject: Information Theory & Coding **Code: : 300813(33)**
Total Theory Periods: 50 **Total Tutorial Periods: NIL**
Total Marks in End Semester Exam: 80 **Minimum number of CT to be conducted: 02**

Course Objective
To learn the basic concepts of information theory and coding, including information, source coding, channel model, channel capacity, channel coding and so on.

UNIT-I: Uncertainty, Information and Entropy Information Measures: Characteristics on information measure; Shannon's concept of information; Shannon's measure of information; Model for source coding theorem; Communication system; Source coding and line/channel coding; channel mutual information capacity (Bandwidth);

UNIT-II: Channel coding, Theorem for discrete memory less channel, Information capacity theorem: Error detecting and error correcting codes; Types of codes; Block codes; Tree codes; Hamming codes; Description of linear block codes by matrices; Description of linear tree code by matrices; Parity check codes; Parity check polynomials;

UNIT-III: Compression: Lossless and lossy; Huffman codes; Binary Image compression schemes; Run – length Encoding; CCITT group-3 1D compression; CCITT group-3 2D compression; CCITT group-4 2D compression;

UNIT-IV: Video Image Compression: Requirement of full motion video compression; CCITT H 261 video coding algorithm; MPEG compression methodology; MPEG-2 compression; Audio (Speech) compression;

UNIT-V: Cryptography: Encryption; Decryption; Cryptogram (cipher text); Concept of cipher; Cryptanalysis; Keys: Single key (Secret key); Cryptography; two-key (Public key) cryptography; Single key cryptography; Ciphers; Block Cipher code; Stream ciphers; Requirements for secrecy; The data Encryption Standard; Public Key Cryptography; Diffie-Hellmann public key distribution; The Rivest- Shamin Adelman(R-S-A) system for public key cryptography; Digital Signature;

Outcomes:

1. Understand and explain the basic concepts of information theory, source coding, channel and channel capacity, channel coding and relation among them.
2. Describe the real life applications based on the fundamental theory.
3. Calculate entropy, channel capacity, bit error rate, code rate, steady-state probability and so on.

Text Books:

1.Digital Communication by Das, Mullick & Chatterjee, New Age Pub.
2.Digital Communication by Proakis, TMH
3.Digital Image Processing by Gonzales & Woods, Pearson (for Unit – III & IV) 4.Local Area Network by G. Keiser, TMH (for Unit – V)

Semester: VIII **Branch: Common to All Branches**
Subject: SUPPLY CHAIN MANAGEMENT **Code: 300814(22)**
Total Theory Periods: 50 **Total Tutorial Periods: NIL**
Total Marks in End Semester Exam: 80 **Minimum number of CT to be conducted: 02**

Course Objective
The objective of this module is to provide the participants with a good knowledge on supply chain management and how these topics can be related with the organization and their business needs.

UNIT I FUNDAMENTALS OF SUPPLY CHAIN MANAGEMENT

Supply chain networks, Integrated supply chain planning, Decision phases in s supply chain, process view of a supply chain, supply chain flows, Overview of supply chain models and modeling systems, Supply chain planning: Strategic, operational and tactical, Understanding supply chain through process mapping and process flow chart.

UNIT II SCM STRATEGIES, PERFORMANCE

Supply chain strategies, achieving strategic fit, value chain, Supply chain drivers and obstacles, Strategic Alliances and Outsourcing, purchasing aspects of supply chain, Supply chain performance measurement: The balanced score card approach, Performance Metrics. Planning demand and supply: Demand forecasting in supply chain, Aggregate planning in supply chain, Predictable variability.

UNIT III PLANNING AND MANAGING INVENTORIES

Introduction to Supply Chain Inventory Management. Inventory theory models: Economic Order Quantity Models, Reorder Point Models and Multiechelon Inventory Systems, Relevant deterministic and stochastic inventory models and Vendor managed inventory models.

UNIT IV DISTRIBUTION MANAGEMENT

Role of transportation in a supply chain - direct shipment, warehousing, cross-docking; push vs. pull systems; transportation decisions (mode selection, fleet size), market channel structure, vehicle routing problem. Facilities decisions in a supply chain. Mathematical foundations of distribution management, Supply chain facility layout and capacity planning,

UNIT V STRATEGIC COST MANAGEMENT IN SUPPLY CHAIN

The financial impacts, Volume leveraging and cross docking, global logistics and material positioning, global supplier development, target pricing, cost management enablers, Measuring service levels in supply chains, Customer Satisfaction/Value/Profitability/Differential Advantage.

Outcomes: On completion of this program student will know how the Supply chain management is essential to company success and customer satisfaction and also how SCM knowledge and capabilities can be used to support medical missions, conduct disaster relief operations, and handle other types of emergencies. SCM also plays a role in cultural evolution and helps improve our quality of life.

REFERENCES
1. David Simchi-Levi, Philip Kaminsky, and Edith Simchi-Levi Designing and Managing the Supply Chain: Concepts, Strategies, and Case Studies, Second Edition, , McGraw-Hill/Irwin, New York, 2003. 31
2. Sunil Chopra and Peter Meindel. Supply Chain Management: Strategy, Planning, and Operation, Prentice Hall of India, 2002.
3. Sunil Chopra & Peter Meindl, Supply Chain Management , Prentice Hall Publisher, 2001
4. Robert Handfield & Ernest Nichols, Introduction to Supply Chain Management , Prentice hall Publishers, 1999.

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

Semester: VIII | **Branch: Common to All Branches**
Subject: Internet and Web Technology | **Code: 300815(22)**
Total Theory Periods: 50 | **Total Tutorial Periods: NIL**
Total Marks in End Semester Exam: 80 | **Minimum number of CT to be conducted: 02**

Course Objective

- Describe the important features of the Web and Web browser software
- Evaluate e-mail software and Web-based e-mail services
- Use FTP and other services to transfer and store data
- Demonstrate the use of real-time chat and briefly describe the history of the wireless Internet
- Create HTML documents and enhance them with browser extensions

UNIT-I INTRODUCTION TO INTERNET

Introduction, Evolution of Internet, Internet Applications, Internet Protocol -TCP/IP, UDP, HTTP, Secure Http(Shttp) Internet Addressing – Addressing Scheme – Ipv4 & IPv6, Network Byte Order, Domain Name Server and IP Addresses, Mapping . Internet Service Providers, Types Of Connectivity Such As Dial-Up Leaded Vsat Etc. Web Technologies: Three Tier Web Based Architecture; Jsp, Asp, J2ee, .Net Systems

UNIT-II HTML CSS AND SCRIPTING

HTML - Introduction, Sgml, Dtd(Document Type Definition, Basic Html Elements, Tags and usages, HTML Standards , Issues in HTML Dhtml: Introduction Cascading Style Sheets: Syntax ,Class Selector, Id Selector Dom (Document Object Model) & Dso (Data Source Object) Approaches To Dynamic Pages: Cgi, Java Applets, Plug Ins, Active X, Java Script – Java Script Object Model, Variables-Constant – Expressions, Conditions-Relational Operators- Data Types – Flow Control – Functions & Objects-events and event handlers – Data type Conversion & Equality – Accessing HTML form elements

UNIT-III XML

What is XML – Basic Standards, Schema Standards, Linking & Presentation Standards, Standards that build on XML, Generating XML data, Writing a simple XML File, Creating a Document type definition, Documents & Data ,Defining Attributes & Entities in the DTD ,Defining Parameter Entities & conditional Sections, Resolving a naming conflict, Using Namespaces, Designing an XML data structure, Normalizing Data, Normalizing
DTDS

UNIT-IV INTERNET SECURITY & FIREWALLS

Security Threats From Mobile Codes, Types Of Viruses, Client Server Security Threats, Data & Message Security, Various electronic payment systems, Introduction to EDI, Challenges–Response System, Encrypted Documents And Emails , Firewalls: Hardened Firewall Hosts, Ip- Packet Screening, Proxy Application Gateways, Aaa (Authentication , Authorization And Accounting).

UNIT-V WEBSITE PLANNING & HOSTING

Introduction, Web Page Lay-Outing, Where To Host Site, Maintenance Of Site, Registration Of Site On Search Engines And Indexes, Introduction To File Transfer Protocol, Public Domain Software, Types Of Ftp Servers (Including Anonymous),Ftp Clients Common Command. Telnet Protocol, Server Domain, Telnet Client, Terminal Emulation. Usenet And Internet Relay Chat

Outcomes: After successful completion of the course, student will be able to

- Understand, analyze and apply the role of languages like HTML, DHTML, CSS, XML, Javascript, and web applications
- Analyze a web page and identify its elements and attributes.
- Create XML documents and XML Schema

Text Books

1. Internet & Intranet Engineering,- Daniel Minoli, TMH.
2 .Alexis Leon and Mathews Leon – Internet for Every One, Tech World.

Reference Books

1. Eric Ladd, Jim O'Donnel –"Using HTML 4, XML and JAVA"-Prentice Hall of India -1999.
2. "Beginning Java Script "– Paul Wilton – SPD Publications –2001.
3. Frontiers of Electronics of Commerce, Ravi kalakota & Andrew B. Whinston Addison Wesley

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

Semester: B.E.VIII **Branch: Common to All Branches**
Subject: Electrical Estimation and costing **Code: 300816(24)**
Total Theory Periods: 40 **Total Tutorial Periods:12**
Total Marks in End Semester Exam: 80

Course Objectives:

1. To give exposure to basic concepts estimating and costing.
2. To impart knowledge about material requirements for various Electrical installations.
3. To provide guidelines for preparation of Electrical drawings for residential and commercial buildings, , distribution substation, grid substation, overhead Lines

Course Outcomes:

At the end of the course the student should be able to :

1. Explain general principles of estimation & residential building electrification
2. Preparation of detailed estimates and costing of residential and commercial installation.
3. Design and estimate of overhead transmission & distribution lines, Substations.

UNIT I: Principles of Estimation and Residential Building Electrification

Introduction to estimation and costing, Electrical Schedule. Determination of cost material and labor Contingencies. Overhead charges.

General Rules guidelines for wiring of residential installation and positioning of equipments**,** Principles of circuit design in lighting and power circuits. Procedures for designing the circuits and deciding the number of circuits, Method of drawing single line diagram. Selection of type of wiring and rating of wires and cables Load calculations and selection of size of conductor, Selection of rating of main switch Distribution board, protective switchgear and wiring accessories, Preparation of detailed estimates and costing of residential installation.

UNIT II: Electrification of Commercial Installation

Design considerations of electrical installation system for commercial building, Load calculation and selection of size of service connection and nature of supply, Deciding the size of the cables, bus bar and bus bar chambers, Mounting arrangements and positioning of switchboards, distribution boards main switch etc, Earthing of the electrical installation, Selection of type wire, wiring system and layout, Preparation of detailed estimate and costing of commercial installation.

UNIT III: Service Connection, Power Circuits, Inspection and Testing of Installation

Concept of service connection, Types of service connection and their features, Method of installation of service connection, Estimates of underground and overhead service connections, Inspection of internal wiring installations, Inspection of new installations, testing of installations, testing of wiring installations,

Important considerations regarding motor installation wiring, Determination of rating of cables Determination of rating of fuse, Determination of size of Conduit, distribution Board main switch and starter.

UNIT IV: Design of Overhead Transmission and Distribution Lines

Introduction, Typical AC electrical LT system, Main components of overhead lines, Line supports. Factors governing height of pole, Conductor materials, Cross arms, Pole brackets and clamps, Guys and Stays, Conductors configuration spacing and clearances, Conductors configuration spacing and clearances, Span lengths, Overhead line insulators, Insulator materials, Types of insulators, Lightning Arrestors, accessories, Erection of supports, setting of stays, Fixing of cross arms, Fixing of insulators, Conductor erection, Repairing and jointing of conductor, Dead end clamps, Positioning of conductors and attachment to insulators Jumpers, Tee-offs, Earthing of transmission lines. Guarding of overhead lines, Clearances of conductor from ground Spacing between conductors.

UNIT V: Design and Estimation of Substation

Introduction, Classification of substation, Indoor substations, Outdoor substations, Selection and location of site for substation, Main Electrical Connections, Graphical symbols for various types of apparatus and circuit elements on substation main connection diagram. Key diagram of typical substations. Equipment for substation and switchgear installations, Substation auxiliaries supply, Substation Earthing.

Note : For estimation and costing calculations refer attached sheets

Textbooks:

Electrical Installation Estimating & Costing, J.B.Gupta,VIII Edition S.K.Katria & Sons New Delhi

Electrical Design Estimating and Costing, K.B.Raina S.K.Bhattacharya, New Age

Reference Books:

Electrical Wiring Estimating and Costing, S.L.Uppal, G.C Garg, Khanna Publishers

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

Semester: B.E. VIII Sem. **Branch: Common to All Branches**
Subject: Non Conventional Energy Sources **Code: 300817(25)**
Total Theory Periods: 40 **Total Tutorial Periods:12**
Total Marks in End Sem Exam: 80

Unit: 1
Introduction : Various non-conventional energy sources, Need, availability, classification, Relative merits & demerits. Energy storage, distribution and conservation.

Unit: 2
Solar Energy: Solar Cells; Theory of Solar Cells, Materials, Solar Cell Power Plants, merits / demerits. Solar Thermal Energy : Solar energy collectors, Applications, storage, Solar Thermal Power Plants, merits / demerits.

Unit: 3
Wind Energy: Basic Principles of Wind Energy conversion Site Selection criterion ,wind Data & Energy Estimation, Types of Rotors, Characteristics, performance & limitations of energy conversion systems.

Unit: 4
Tidal Energy: Basic Principles, Components of Tidal Plants, Operation methods & utilization,
Bio-Mass Energy – Conversion Technology, Classification of Plants, Advantages & Disadvantages
Geo-Thermal Energy – Sources of Geo- Thermal energy, Thermal energy conversion- electrical / Non electrical conversion. Advantage & Disadvantages.

Unit: 5
MHD Power Generation – Principle of working open cycle / close cycle system. Advantages & Disadvantages Thermo Electric Power – Basic Principles, Thermo Electric Materials, Performance & Limitations.
Thermionic Conversion – Principles of working.
Hydrogen Energy – Principles of conversion ,production of H_2.

Text Books: **1.** G.D. Rai – Non Conventional Energy Sources –(4th ed.Khanna Pub.)

2. S.P. Sukhatme – Solar Energy – TMH.

Reference: 1. Bansal, Kleemann & Meliss – Renewable Energy Sources & Conversion Technology – TMH.

Chhattisgarh Swami Vivekananda Technical University, Bhilai

Name of Program: B.E. VIII | **Branch: Common to All Branches**
Subject: Big Data and Hadoop | **Code: 300818(22)**
Duration of period: 50 minutes
Total Theory Periods: 50 | **Total tutorial periods: NIL**
Class Test: 02 | **Assignments: 02**
Maximum Marks: 80 | **Minimum Marks: 28**

COURSE OBJECTIVES:

1. To understand the fundamental concepts of big data analytics
2. To analyze the big data using intelligent techniques.
3. To develop various search methods and visualization techniques.
4. To explore various techniques for mining data streams.
5. To understand the applications using Map Reduce Concepts.

Course Contents:

UNIT I **CONCEPTS OF BIG DATA:** Concept of Big Data Platform – Evolution and Challenges of Conventional Systems - Intelligent data analysis – Nature of Data - Analytic Processes and Tools - Analysis vs Reporting - Modern Data Analytic Tools- Applications of big data.

UNIT II **MINING DATA STREAMS :**Introduction To Streams Concepts – characteristics, Stream Data Model and Architecture - Stream Computing - Sampling Data in a Stream – Filtering Streams – Counting Distinct Elements in a Stream – Estimating Moments – Counting Oneness in a Window – Decaying Window, Role of high speed mass storage.

UNIT III **HADOOP:** History of Hadoop- The Hadoop Distributed File System – Components of Hadoop- Analyzing the Data with Hadoop- Scaling Out- Hadoop Streaming- Map Reduction Working - Anatomy of a Map Reduce Job run Failures-Job Scheduling-Shuffle and Sort – Task execution - Map Reduce Types and Formats- Map Reduce Features.

UNIT IV **HADOOP ENVIRONMENT:** Setting up a Hadoop Cluster - Cluster specification - Cluster Setup and Installation - Hadoop Configuration-Security in Hadoop - Administering Hadoop – HDFS - Monitoring-Maintenance-Hadoop benchmarks Hadoop in the cloud.

UNIT V **FRAMEWORKS:** Applications on Big Data Using Pig and Hive – Data processing operators in Pig – Hive services – HiveQL – Querying Data in Hive - fundamentals of HBase and ZooKeeper. Visualizations - Visual data analysis techniques, interaction techniques.

Course Outcomes:

1. To able to know about intelligent applications.
2. To use knowledge about vast data.
3. To know different big data modelling techniques.
4. Ability to work in Hadoop environment.

Text Books:

1. Michael Berthold, David J. Hand, “Intelligent Data Analysis”, Springer, 2007.
2. Tom White “ Hadoop: The Definitive Guide” Third Edition, O’reilly Media, 2012.
3. Anand Rajaraman and Jeffrey David Ullman,“Mining of Massive Datasets”, Cambridge University Press, 2012.