Choice Form for Open Elective at Institute Level. (B. Tech VII Semester AY 2020-21)

Name of the Student			
Roll No		Discipline	
SPI of 5th Semester		CPI till 5th Semester	
Contact No (mobile)		Email I.D.	

Sr No	Course Title	Department Offering Elective Course	Following Discipline Students are not Eligible for respective elective	Preference No
1	Basic Laws of Electrical Engineering	Electrical	Production, Electrical, Electronics, Electronics and Telecommunication	
2	Data Management System	Computer and IT	Production, Computer, Information Technology	
3	Web Technology	Computer and IT	Production, Computer, Information Technology	
4	Sustainable Development	Civil	Production, Civil	
5	Energy Conservation and Management	Mechanical	Production and Mechanical	
6	Total Quality Management	Mechanical	Production and mechanical	
7	Textiles in Field of Engineering Applications	Textile	Production, Textile	

Notes:

1.   VII semester of B.Tech Production students are having In-plant Training, they are not eligible for all open elective.

2.   Elective will be offered based on preference of elective and CPI till 5th semester.

3.   Minimum number of students for each elective shall be 25.

4.   Students have to give preferences for eligible courses as per his/her choice.

5.   Course contents and Course Outcome of each Elective Course is attached with this application form. Students are advised to see the Course Contents and Course Outcomes of each elective before giving the preferences of elective.

6.   Scanned copy of this form shall be submitted on email to srshelar@vjti.ac.in with Subject Title of email as " Choices for Open Elective –VII SEM AY 2020-21" till 29th July 2020 In case student failed to submit the choice form, he/she will have to register for the allotted course as per availability and no change request will be entertained.

7.   List of students along with offered elective course will be displayed on www.vjti.ac.in on or before 1st August 2020

Date:-   Signature of the Student

1. BASIC LAWS OF ELECTRICAL ENGINEERING

COURSEOUTCOMES

Students should be able to:
1 Analyze the condition of Electrical System as non - electrical engineering graduate.
2 Demonstrate the basic knowledge of Electrical system.
3 Apply Ampere's law and Bio-Savart's law to physical problems.
4 Justify theuse of different batteries.

COURSE CONTENTS

Module I	Electric field, Coulombs Law, Gauss Law, Formation of capacitances, Magnetic Field, Flemings Left/Right hand rules, Biot-Savart Law, Ampere Circuital Law, Conduction Current, Convection Current, Displacement Current, Formation of Inductances, Proximity effect, skin effect, Brief introduction of EMI/EMC
Module II	Role of Insulation, Types of Insulators, Different types of cables, Cable and Wire sizing, Brief introduction of dielectric breakdown, Different faults in electrical systems, Line to Line, Line to ground, Double Line to Ground
Module III	Role of Relay and switches, Circuit Breakers, Miniature Circuit Breakers, Moulded Case Circuit Breakers, HRC fuse
Module IV	Symbol of Electrical Equipments in industry, Single Line Diagram concept, Single line diagram for house hold and commercial installation. standard voltage and current ratings of generation, transmission and distribution in India, concept of Earthing, Brief Introduction of Indian Electricity Act, Indian Standards for Electrical Equipments.
Module V	Different batteries like Nickel Cadmium (NiCd) battery, The Nickel-Metal Hydride (NiMH) battery, Lithium Ion battery, Lithium Polymer battery.

Text Books:	1."A Textbook of Electrical Technology", B. L Theraja, Volume 1-IV, S. Chand Publishing
	2. "Handbook of Electrical Engineering", Alan L. Sheldrake, John Wiley & Sons, 2003

Reference Books:	1. "Handbook of Electrical Sciences, Vol 1-4", U.S Department of Energy, Free release, available on net for free download.
	2. "Monograph of IEEMA articles of Dr K. Rajamani& Co-authors", IEEMA Journal

2. DATA MANAGEMENT SYSTEM

COURSE OUTCOMES:
After completion of course students will be able to
1. Investigate database management systems, architecture and database operations.
2. Explore data models for the real life systems and logical database design
3. Analyze and design normalized database system.
4. Write SQL queries for data and database operations and administrations and understand storage and data accessing methodologies, data recovery security.

COURSE CONTENTS:	
Module I	Overview of DBMS: Databases and Information Systems, Database System Architecture, Database system concepts: Data modeling, data definition, data dictionary, data manipulation, Database administration function, Levels of abstractions, Data Independence, views, Systems Comparison Of RDBMS, OODBMS, ORDBMS.
Module II	Storage and Indexing Data: Storage structures: Secondary storage devices, buffering of blocks, Basic file systems – File organization – Serial, Sequential, Indexed Sequential, Searching &Indexing. File Organization & Indexing: Clustered Indexing, Primary & secondary indexes.
Module III	Entity Relationship Model: Relational model concepts, Strong & weak entities, attributes & its types, The ER model, Extended E-R features; Integrity constraints, Key constraints, Participation constraints, EREER to Relational mapping. Subclasses and inheritance, Specialization and Generalization, Modeling of UNION types using categories
Module IV	Database Design: Codd's 12 rules for relational database management, Functional dependencies, Closure of FDs, Finding primary keys using FDs, Normal forms: 1NF, 2NF,3NF, Boyce-Codd Normal Forms. Logical schema design: conceptual design, Design of an E-R database schema; Reduction of an E-R schema to tables, Relational Algebra: selection, projection, set operations, renaming, joins, division, subtraction, Relational Calculus: Tuple relational calculus, domain relational calculus. Physical Database Design.
Module V	Query Processing: SQL: DDL: Create Modify, Alter, Drop, View definition, etc. DML: SELECT, INSERT, DELETE, Update, Nested Query, SQL with SET operations: Union, Intersect, Except, etc, Aggregate Functions: Group By, Having, SUM, etc, SQL with Logical operations, Nested and Complex Queries, Join Queries. DCL: GRANT, REVOKE, etc DBA level query.PL/SQL Block: Pl/SQL Variables and Data types: PL/SQL Control structures: PL/SQL Cursors and Triggers: Exception Handling, PL/SQL Subprograms – Procedures and Functions; PL/SQL Packages. An Overview of SQL3, Implementation Issues for Extended Type.
Module I	Database Security: Transaction processing: Concepts; ACID Properties of Transaction; Serializability and Recoverability; Concurrency control: Lock-based Concurrency Control protocols; Database recovery: database backup, Recovery System, Database security issues, access control, authorization, Introduction to Parallel and Distributed databases.
TEXT BOOKS	1.Elmasri & Navathe , Fundamentals of Database System, Addison Wesely Publication 5th EdiAbraham Silberschatz, Henry Korth, Sudarshan, Database System Concepts, McGraw-Hill, 6th Edition, 2010. 2.Raghu Ramakrishnan, Johannes Gehrke, Database Management Systems, McGraw-Hill, Second Edition, 2002.
REFERENCE BOOKS	1 Michael Mannino, Database design, Application Development and Administration, Chicago Business Press, 6th Edition, 2017. 2 Peter Rob and Coronel, Database systems: Design, Implementation and Management, Thomson Learning,5th Edition, 2001. 3 C. J. Date, Introduction To Database Systems, Addison Wesley Longman, Seventh Edition, 2011.

3. WEB TECHNOLOGY

COURSE OUTCOMES:

1. Explain the history of the internet and related internet concepts that are vital in understanding web development.
2. Use the important HTML tags for designing static pages and separate design from content using Cascading Style sheet.
3. Implement dynamic web pages using JavaScript.
4. Demonstrate web application development software tools i.e. PHP and XML etc. and identify the environments currently available on the market to design web sites.

COURSE CONTENTS:	
Module I	Introduction: Fundamental of Web, History of world wide web, Web development overview, Internetworking concept and architectural model, Classful internet addresses, Domain Name System (DNS), DHCP, and SMTP and other servers, Internet service provider (ISP), Concept of IP Address, Internet Protocol, TCP/IP Architecture and protocol (IP), Web Browser and Web Server.
Module II	Web Designing: HTML and DHTML: HTML, HTML Tags, Rules of HTML, Text Formatting & Style, Ordered & Unordered Lists Tags, List, Inserting image, Links: text, Image links, Image mapping, Tables, Frames, Forms, text box: text area, buttons, List box, radio, checkbox etc, Tables and Layout, Linking Documents, Frame, Forms, Project in HTML, Introduction to HTML5, DHTML, Multimedia objects.
Module III	Web Designing: CSS and Bootstrap: Cascaded Style Sheet (CSS), Types of stylesheets- Inline, External, Embedded CSS, Text formatting properties, CSS Border, Margin properties, Positioning, Use of classes in CSS, Color properties, use of <div>&<span>, Bootstrap.
Module IV	Client side Programming: Java Script: Java Script (JS) in Web Page, Advantage of Java Script, JavaScript identifiers, operators, control & Looping structure, Introduction of Array, Array with methods, Math, String, Date Objects with methods, User defined & Predefined functions, JS object model and hierarchy, handling event, Validation on forms, Client side JS Vs Server side JS, JQuery.
Module V	XML: XML, XML in Action, Commercial Benefits of XML, Gaining Competitive advantage with XML, Programming in XML, XML Schema, XSLT, DOM structure model, XML quires and transformation, JSON.
Module VI	PHP: PHP, Syntax, Variable Types, Constants, Operator Types, Decision Making, Loops, Arrays, Strings, Web Concepts, GET & POST, Files & I/O, Functions, Cookies, Sessions.
TEXT BOOKS	1. Robert W. Sebesta, Programming the World Wide Web, Pearson education, 4th Edition, 2012. 2. Jeffrey C. Jackson, Web Technologies: A Computer Science Perspective, Pearson Education, 11th Edition, 2012.
REFERENCE BOOKS:	1. Thomas A. Powell, HTML & CSS: The Complete Reference, McGraw Hill, NY, USA, 5th Edition, 2012. 2. Chris Bates, Web Programming Building Internet Applications, Wiley India, 3rd Edition,2009. 3. Internet Technology and Web Design, Instructional Software Research and Development(ISRD) Group, Tata McGraw Hill, 2011.

4. SUSTAINABLE DEVELOPMENT

COURSE OUTCOMES:

After completion of course students will be able to

1. Describe sustainable development and development processes and relate impact of various levels of development

2. Formulate the methodology for assessment of sustainability of project using various indicators.

3. Apply environmental legislations to various developments processes and projects Course Contents

COURSE CONTENTS

Module I	Development: Goals and means of development, sustainable development, Comparing levels of development, gross domestic product and gross national product, Global Development level
Module II	Population: World population growth, economic, growth Rates; health and longevity, global trends, Population age structures, burden of infectious disease, lifestyle challenges
Module III	Industrialization and Post-industrialization era: Major structural shifts, knowledge revolution, implications for development sustainability
Module IV	Environmental episodes: Ozone depletion, global warming, greenhouse effect, Bhopal gas tragedy etc
Module V	Pollutions: Basics, major sources, permissible standards and controls of Urban air pollution, water pollution, Solid and hazardous waste disposals.
Module VI	Climate Change : The Risk of Global Climate Change
Module VII	Environmental legislation: legislative provisions and measures towards sustainability
Module VIII	Indicators of Development Sustainability: Composition of National wealth, Accumulation of National Wealth as an Indicator of Sustainable Development, Development Goals and Strategies, Gross happiness index, Millennium Development Goals, Role of National Development Policies
Text Books:	1 Beyond Economic Growth: An Introduction to Sustainable Development by Tatyana P. Soubbotina; Second Edition, WBI Learning Series 2 An Introduction to Sustainable Development by Peter P. Roger ,Kazi F. Jalal, John A. Boyd Publisher: Earthscan 2008
Reference Books:	1 Sustainable Development: Linking Economy, Society, Environment : by Tracey Strange, Anne Bayley. 2 Sustainable Development and Sustainability Transition Studies Series: Springer Briefs in Environment, Security, Development and Peace ; Series Ed.: Brauch, Hans Günter. 3 Mapping Sustainability Transitions: Networks of Innovators, Techno-economic Competences and Political Discourses @ 2016 Authors: Marletto, G., Franceschini, S., Ortolani, C.,Sillig, C. ; SpringerBriefs in Business.

5. ENERGY CONSERVATION AND MANAGEMENT

COURSE OUTCOMES:
After completion of course students will be able to
1. Examine various parameters in energy systems and energy auditing.
2. Apply Energy Planning and forecasting techniques for performing energy analysis.
3. Illustrate the current energy scenario, challenge of climate change & peak oil, importance of energy conservation and need for alternative energy resources.
4. Integrate energy economics and relevance of sound energy policies for sustainable development.

COURSE CONTENTS

Module I	Introduction: Energy Scenario-world and India. Energy Resources Availability in India. Energy consumption pattern. Energy conservation potential in various Industries and commercial establishments. Energy intensive industries - an overview. Peak oil. Challenge of climate change - Energy conservation and energy efficiency – needs and advantages.
Module II	Pollution from energy generation: Coal and Nuclear based Power Plants – Fly Ash generation and environment impact, Fly ash utilization and disposal, nuclear fuel cycle, radioactive wastes – treatment and disposal- Environmental pollution limits guidelines for thermal power plant pollution control- Environmental emissions from extraction, conversion, transport and utilization of fossil fuels- Greenhouse effect- Global warming.
Module III	Energy auditing and forecasting: Energy auditing - Definition, need, types of energy audit methodologies, barriers. Role, Duties and responsibilities of energy managers and auditors. Energy audit questionnaire. Energy Conservation Act 2003.Energy forecasting techniques - Energy demand – supply balancing, Energy models, Simulation and forecasting of future energy demand consistent with macroeconomic parameters in India. Basic concept of Econometrics (OLS) and statistical analysis (Multiple Regression), Econometrics techniques used for energy analysis and forecasting with case studies from India.
Module IV	Energy conservation and management: Energy management (audit) approach: Understanding energy costs, bench marking, energy performance, matching energy use to requirement, maximizing system efficiencies for – (a) Thermal utilities: operation and energy conservation (i)Boilers (ii) Thermic Fluid Heaters (iii)Furnaces (iv)Waste Heat Recovery Systems (v) Thermal Storage, A.C. & refrigeration systems; and (b) thermal energy transmission / protection systems such as Steam traps–refractories – optimum insulation thickness– insulation – piping design , optimizing the input energy requirements; Fuel & energy substitution.
Module V	Energy economics: Investment - need, appraisal and criteria, financial analysis techniques - break even analysis simple payback period, return on investment, net present value, internal rate of return, cash flows, DSCR, financing options, ESCO concept.
Module VI	Energy policies :National energy policy in the last plan periods, Energy use and Energy supply, Overview of renewable energy policy and the Five Year Plan programmes, Basic concept of Input-Output analysis, Concept of energy multiplier and implication of energy multiplier for analysis of regional and national energy policy- Carbon Trading- Renewable Energy Certification –CDM. The Sustainable Energy Utility (SEU) Model.
Text Books:	1. Hamies, Energy Auditing and Conservation; Methods Measurements, Management and Case study, Hemisphere, Washington, 1980. 2. YP Abbi and Shashank Jain, Handbook on Energy Audit and Environment Management, TERI Publications, 2009. 3. Steve Doty, Wayne C. Tur, ENERGY FORECASTING TECHNIQUES
Reference Books:	1. Guide book for National Certification Examination for Energy Managers and Energy Auditors (Could be downloaded from www.energymanagertraining.com) 2. R Loulou, P R Shukla and A Kanodia, Energy and Environment Policies for a sustainable Future, Allied Publishers Ltd, New Delhi, 1997. 3.http://ceep.udel.edu/wp-content/uploads/2013/08/2009_es_BSTS_SEU_model_DE_Wash-DC Houck_Rickerson_2.pdf

6. TOTAL QUALITY MANAGEMENT

COURSE OUTCOMES:
After completion of course students will be able to
1. Apply basic tools of TQM for achieving overall quality in organization
2. Develop a strategy for implementing TQM in an organization.
3. Implement the quality control tools for industrial problem
4. Analyze the voice of the customer for product/service development.
5. Evaluate the impact of quality on economic performance and long-term business success of an organization

COURSE CONTENTS

Module I	Basic TQM Concepts: Introduction, Development of the Importance of Quality Management, Quality and Public, Factors Affecting Quality, Total Quality Management: Introduction and Principles.
Module II	TQM Philosophies and Principles : Approach to Quality: Deming, Juran, Crosby, Kaizen, Shigeo Shingo, Ishikawa, Taguchi. Customer satisfaction – Customer Perception of Quality, Customer Complaints, Service Quality, Customer Retention, Employee Involvement – Motivation, Empowerment, Teams, Recognition and Reward, Performance Appraisal, Benefits, Continuous Process Improvement – Juran Trilogy, PDSA Cycle, 5S, Kaizen, Supplier Partnership – Partnering, sourcing, Supplier Selection, Supplier Rating, Relationship Development, Performance Measures –Basic Concepts, Strategy, Performance Measure.
Module III	Concept of Quality Circles: Objective, Process of Operation of Quality Circles, Using the Concept, Fish Bone, Application in Organization.
Module IV	Six Sigma :Deviation and Standard Deviation, Phases and Defective Units of Six Sigma, Its Importance, Overview of Master Black and Green Belt
Module V	Leadership: Definition, Characteristics of Quality Leaders, Leadership Concepts, Role of TQM Leaders
Module VI	Customer Satisfaction: Introduction, Customer Perception of Quality, Feedback, Service Quality, Customer Retention
Module VII	Performance Measures; Quality Costs, Basic Concepts, Performance Measure Presentation, Appraisal Cost Category, Collection and Reporting, Analysis, Deming Prize
Module VIII	Tools and Techniques :Pareto and Process Flow Diagram Check Sheets and Histograms, Control Charts, Quality Management Systems, Benchmarking – Reasons to Benchmark, Benchmarking Process, Quality Function Deployment (QFD) – House of Quality, QFD Process, Benefits, Taguchi Quality Loss Function, Total Productive Maintenance (TPM) – Concept, Improvement Needs, FMEA – Stages of FMEA.
Module IX	Case Studies: Changing Company Culture, Xerox Corporation – Using TQM as a Competitive Strategy, Motorola's Secret to TQC, Motorola's Quest for Quality
Text Books:	1. Dale H. Besterfield, Total Quality Management, Pearson, Third Edition, 2011 2. N, Logothetis, Managing of Total Quality, Prentice Hall of India Private Limited, First Edition, 1992
Reference Books:	1. J. Bicheno and M. R Gopalan, A Management Guide to Quality and Productivity, Wiley Dreamtech, New Delhi 2. Janakiraman, B and Gopal, R.K, Total Quality Management – Text and Cases, Prentice Hall (India) Pvt. Ltd., 2006

7. TEXTILES IN FIELD OF ENGINEERING APPLICATIONS

COURSE OUTCOMES:
After completion of course students will be able to
1. Learn the properties and structure of various fibers for high end engineering applications
2. Explain the fundamental principles of textile materials for engineering applications
3. Develop the engineering concept in the textile production
4. Associate and interpret the relation between the textile and engineering material
5. Select the quality control and characterization techniques for evaluation of textile materials for industrial applications

COURSE CONTENTS

Module I	Introduction to Textile Materials and Production : Study of various textile materials such as fiber, yarn and fabrics, Production process of various textile products, Production of innovative fibers, yarns and fabric
Module II	Textiles in Civil Engineering Applications: Study of various fibers used in civil engineering area, Requirements and structural properties of fibers such as length, diameter and aspect ratio, Concept and design of fiber reinforced concrete, evolution and analysis of FRC products
Module III	Textiles in Geotechnical Applications : Study of various fibers used in geotechnical engineering, Requirements of geotextiles and Geosynthetics materials, Materials for PVD, geo-separator, geo-cell and road embankment, tunnel lining, Testing and evaluation of geotextile products etc.
Module IV	Textiles in Mechanical Engineering Applications: Study of material used for production of belts, polymeric gears, polymeric zig and fixtures and thermal insulators for refrigeration and air condition operations, Concept of creep and relaxation in the fiber for analysis of belts, Principles of polymer base composites and its microstructural analysis such as tensile, fatigue failure, impact, tribological characteristics etc.
Module V	Textiles in Automobile Engineering Applications: Study of various fibers used for automotive applications, Polymer matrix composites for automotive applications, manufacturing technique of roof lining material. Comparative analysis of metal matrix composite materials and polymer matrix composites in the designing of vehicle with respect to strength the weight ratio, fatigue failure and fuel efficiency. Designing of air bags, types of air bags, simulation of air bags etc.
Module VI	Intelligent Textiles for Defense Applications :Properties of various textile materials for the production of bullet and ballistic (NBC) protection, Production and performance evaluation of bullet proof materials, Concept of soft and hard armor materials. Textiles used for high altitude applications (extreme cold and extreme hot area), Materials for parachute applications
Module VII	Smart Textiles for Electrical and Electronics Engineering Applications:Study of various textile fibers in the specific application area. Concept of clean room garment in electronic industries, Use of carbon and carbon nanotubes in electrical applications such as conductive materials and EMI shielding. E-textiles for sensors, digital signal processing and microcontroller applications, flexible solar cells using textiles.
Module VIII	Textiles for Agriculture Applications : Material used in the production of agricultural products, Requirement of aggrotech products, Design of weed control fabric, Design of shed net for green house applications, Concept of shade factor in shade net, Materials for crop protection: UV protection textiles.
Module IX	Nano fibers and Nano-embedded textiles for chemical engineering applications: Fibers used and its properties for development of filters for chemical engineering applications, Production of Nano fibers, Concept of micro and nono-filteration, design aspects of filter fabric. Mechanism and types of filtration, evaluation of filter fabric

Text Books:	1. Seyam A M, "Structural Design of Woven Fabrics", Textile Progress Vol.31, No: 3. Wood Head Publishing Ltd, 2002. 2. Jones F.R. – 'Hand Book of Polymer Fibre Composites, Polymer Science & Tech. Series Longman House, Harlow, 1994. 3. Horrocks A R and Anand S C, "Handbook of Technical Textiles", Woodhead Publishers and Textile Institute, 2000 4. Tao X., "Smart Fibres, Fabric and Clothing", Textile Institute, 2001.
Reference Books:	1. Hearle J W S, Grosberg P and Backer S, "Structural Mechanics of Fibres Yarn and Fabrics", Wiley Interscience Pub., 1999. 2. Sabit Adanur, "Wellington Sears Handbook of Industrial Textiles ", Technomic Publishing Co., Inc, 1995. 3. Russel.S, "Handbook of Nonwovens", The Textile Institute Publication, 2004.. Mattilla H.R. "Intelligent textiles and clothing", Textile Institute, 2006.