PAAVAI ENGINEERING COLLEGE(AUTONOMOUS)

ACADEMIC YEAR 2015 - 2016

VALUE ADDED COURSE

15CEVC301 POLLUTANTS AND WATER SUPPLY

COURSE OBJECTIVES

To enable the students to

- gain knowledge on pollutants in air, land & water
- understand the concepts of water softening & distribution
- acquire knowledge on analysis & design of distribution network

Module I

Pollutants and their Effects - Air pollution –Land Pollution - Water Pollution - Water Quality-Criteria & Analysis - Water Requirements - Sources and Collection of Water - Overview of Purification and Pre-Treatment - Theory and Design of Sedimentation

Module II

Theory and Design of Filtration - Theory and Design of Disinfection - Water Softening and Specific Treatments- Storage and Distribution Reservoirs

Module III

Pumps and Pumping Requirements, Valves and Appurtenances - Hydraulic Considerations and Design - Distribution Network-Analysis and Design

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply field procedure on testing pollutants
- calculate the water distribution quantity
- design the distribution network

TEXT BOOKS

1. Water Supply Engineering by Dr. B.C. Punmia, Ashok Kr. Jain and Arun K Jain, 2005

REFERENCES

1. Water Supply and Sanitary Engineering by G. S. Birdie and J. S. Birdie, 2010

15CEVC401 DIGITAL LAND SURVEYING AND MAPPING (DLS&M)

COURSE OBJECTIVES

To enable the students to

- gain knowledge on digital surveying
- understand the concepts of modern digital land surveying & its application
- learn the applications of digital survey

Module I

Fundamentals of Land Surveying & GPS - Global Positioning System (GPS) - TOTAL STATION(TS)

Module II

TS & DIGITAL LAND SURVEYING (DLS) - DLS& DIGITAL MAPPING (DM) – Applications

Module III

DM & DIGITAL DATA MANIPULATION (DDM) - DIGITAL LAND SURVEYING AND MAPPING (DLS&M) – Applications in Civil Field

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply digital instrument in land surveying
- calculate the area & volume by modern digitalized surveying equipment
- apply the digital data manipulation in civil field

TEXT BOOKS

1. Surveying & Levelling by Basak , Tata Mc grawhill publication, 2011

REFERENCES

1. Surveying & Levelling By PunmiaB.C , Laxmi publiactions , 2005

15CEVC501 ELECTRONIC WASTE MANAGEMENT - ISSUES AND CHALLENGES

COURSE OBJECTIVES

To enable the students to

- gain knowledge on E-waste management and understand the concepts of Recycling of E wastes in safe manner

Module I

Overview of the course - Exposure pathway of pollutants emitted from Recycling of E-Waste – E Waste Management Rules of India (2011 and 2016 Rules) - E-waste Management: Case Studies and Unique Initiatives from around the World

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply field procedure of handling E wastes and concept of Recycling E waste in construction industry

TEXT BOOKS

1. Electronic Waste Management Rules 2016, Govt. of India, available online at CPCB website.

REFERENCES

1. MSW Management Rules 2016, Govt. of India, available online at CPCB website.

15CEVC601 ARCHITECTURAL CONSERVATION AND HISTORIC PRESERVATION

COURSE OBJECTIVES

To enable the students to

- gain knowledge on architectural conservation & its heritage

Module I

Course overview and introduction - heritage conservation- need, debate and purpose; understanding heritage and types of heritage resources, Significance and value assessment, approaches of conservation. Divergent approaches and ethics of conservation; history of conservation movement; concepts and definitions; international agencies like ICCROM, UNESCO and their role in conservation- World Heritage Sites, selection criteria, authenticity and integrity, case studies, endangered sites.

Design of new building in historic settings- townscape analysis , visual integration; heritage impact assessment - adaptive reuse of heritage structures - organisational framework and heritage site management ,financial incentives and planning tools- role of agencies in safeguarding heritage in India

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply the concept townscape in design of new building in historic places

TEXT BOOKS

1. Basu, S., Mukerji A (Eds.) (2017). Integrated Urban Conservation: An Approach towards Development, ISBN: 978-93-5268-866-1, Kharagpur: Department of Architecture and Regional Planning, IIT, Kharagpur.

REFERENCES

1. Appleyard, D. (Ed.). (1979). The Conservation of European Cities. Massachusetts: M.I.T. Press

15CEVC701 INDIAN VASTUSHASTRA

COURSE OBJECTIVES

To enable the students to

- gain knowledge on Indian vasthushastra
- understand the concepts of vasthushatra in constructing temples, houses etc.,
- acquire knowledge on vastu perfect & adverse house

Module I

Introduction to Indian Vastushastra -Various texts and scholars of Vastushastra - Vastu purusha, concept of Ayadi, various measurements in Vastu

Module II

Vastupadchakra, Introduction to Temple Architecture - Various styles and general theories of Temple architecture -Various traditions and foundation of temples - Tree palntation in vastu.

Module III

Brihadvastumala- Examples of Vastu perfect and adverse houses - Measurement techniques in Vastu, Roads near plot - City planning in Vastu, Configuration Vastu mandala

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply field procedure vasthushatra
- apply the concepts of vasthushatra in city planning
- avoid adverse vastu effects in houses

TEXT BOOKS

1. Prabhu, Balagopal, T.S and Achyuthan, A, "A text Book of Vastuvidya", Vastuvidyapratisthanam, Kozhikode, New Edition, 2011.

REFERENCES

1. Vastu-Silpa Kosha, Encyclopedia of Hindu Temple architecture and Vastu/S.K.Ramachandara Rao, Delhi, Devine Books

15CEVC801 WATER SUPPLY AND ITS TREATMENT

COURSE OBJECTIVES

To enable the students to

- gain knowledge on pollutants in air, land & water
- understand the concepts of water softening & distribution
- acquire knowledge on pumps requirements for distribution

Module I

Pollutants and their Effects - Air pollution –Land Pollution - Water Pollution - Water Quality-Criteria & Analysis - Water Requirements - Sources and Collection of Water - Overview of Purification and Pre-Treatment - Theory and Design of Sedimentation

Module II

Theory and Design of Filtration - Theory and Design of Disinfection - Water Softening and Specific Treatments- Storage and Distribution Reservoirs

Module III

Pumps and Pumping Requirements, Valves and Appurtenances - Hydraulic Considerations and Design - Distribution Network-Analysis and Design

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply field procedure on testing pollutants
- calculate the water distribution quantity
- apply design concepts of distribution network

TEXT BOOKS

1. Water Supply Engineering by Dr. B.C. Punmia, Ashok Kr. Jain and Arun K Jain, 2005

REFERENCES

1. Water Supply and Sanitary Engineering by G. S. Birdie and J. S. Birdie, 2010

15CSVC301 **SQL FUNDAMENTALS**

COURSE OBJECTIVES

To enable the students to

- Retrieve row and column data from tables with the SELECT statement
- Create reports of sorted and restricted data
- Employ SQL functions to generate and retrieve customized data and schema.

UNIT I

Introduction - Retrieving Data Using the SQL SELECT Statement -Restricting and Sorting Data - Single-Row Functions to Customize Output - Conversion Functions and Conditional Expressions

UNIT II

Reporting Aggregated Data Using the Group Functions - Displaying Data from Multiple Tables - Sub-queries - SET Operators - Manipulating Data

UNIT III

Manipulating Data - DDL Statements to Create and Manage Tables - Schema - Creating Other Schema Objects.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Understand the concept of row and column data from tables with the SELECT statement
- Analyze reports of sorted and restricted data
- Implement SQL functions to generate and retrieve customized data and schema.

TEXT BOOKS

1. SQL Fundamentals (3rd Edition) 3rd Edition, Kindle Edition

REFERENCES

1. Microsoft SQL Server 2012 T-SQL Fundamentals (Developer Reference) 1st Edition, Kindle Edition

15CSVC401 .NET

COURSE OBJECTIVES

To enable the students to

- To understand about the concept of Web technology
- To be familiar with creating of database using ADO.NET.
- To study about ASP.NET

Unit I

Introductions, course mechanics, .NET Overview, CLR, Assemblies (monolithic vs. component-based applications), Execution Model, Client-Side vs. Server-Side Programming, Web Technologies. Development Environment Setup, ISS, SQL Server and Visual Studio, Advanced C#: OOP, Delegates, Events, Attributes, unsafe code, .NET Interop

Unit II

.NET Framework Class Library (FCL): System, Collections, I/O, Networking, Threading, Transactions, Exceptions. Databases and Data Access using ADO.NET & LINQ.

Unit III

Introduction to ASP.NET, programming model, server controls, data binding-ASP.NET state management, tracing, caching, error handling, security, deployment, user and custom controls, DotNetNuke. Exposing and consuming ASP.NET Web Services, XML, RESTful, SOAP, DISCO, UDDI

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- understand the concept of Web technology
- Implement creating of database using ADO.NET.
- Analyze about ASP.NET

TEXT BOOKS

1. “Trueman’s UGC NET/SET General Paper I” M. Gagan, Sajit Kumar

REFERENCES

1. **“**Functional Concurrency in .net: With Examples in C# and F#” by Riccardo Terrell
2. “Dot Net Technology” by Damini Grover

15CSVC501 **PHP**

COURSE OBJECTIVES

To enable the students to

- To Understand about concept of PHP
- To learn the concept of web designing
- To be familiar with creating of database in PHP.

Unit I Core PHP

Introduction to PHP-Handling Html Form With Php-Decisions and loop-Function-String-Working with file and Directories

Unit II Web Designing

HTML- CSS- Java Script- JQuery- AJAX

Unit III Framework- Cake PHP

Introduction to CakePHP- Models: Creating up model for a database table- Controller: Creating controller- Views: Creating Views- Cake session:

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Explain about concept of PHP
- Analyze the concept of web designing
- Implement creating of database in PHP.

TEXT BOOKS

1. Head First PHP & MySQL: A Brain-Friendly Guide Paperback – Illustrated, 6 January 2009

REFERENCES

1. Murach's PHP & MySQL Paperback – 1 December 2014

15CSVC601 **WEB DEVELOPMENT**

COURSE OBJECTIVES

To enable the students to

- learn about HTML, DHTML concepts.
- Understand t a variety of presentation effects in HTML
- know about appropriate client-side applications and the Knowledge of XML, PHP.

Unit I HTML, Frames and Forms

History of the Internet and World Wide Web – HTTP, SMTP, POP3, MIME, Understanding roles of Web Browsers and Web Servers. Structure of HTML, Text formatting, Text styles, hyper link, image, and tables. **Frames, Forms** : CSS Frames, Forms and controls, Embedding audio, video and animated files in HTML, CSS –Understanding CSS, Internal CSS, External CSS, Font Properties, Text Properties, Color and Background properties, Table properties, Numbering and List Properties.

Unit II JavaScript

Data types and literals, operators, conditional statements, loop constructs, reserved words; core Objects Array Object, Date Object; Functions passing value to JavaScript functions, user defined functions, Handling old browsers , java script events, formatting cookie, retrieving cookie value from the cookie file, removing a cookie , animations using events.

Unit PHP & MySQL

Why PHP and MySQL - Server-Side Web Scripting - Getting Started with PHP - Adding PHP to HTML -Syntax and Variables - Control and Functions - Passing Information between Pages – Strings – Arrays and Array Functions – Numbers - MySQL Database Administration - PHP/MySQL Functions - Displaying Queries in Tables - Building Forms from Queries

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- ldentify about HTML, DHTML concepts.

- implement a variety of presentation effects in HTML
- Explore about appropriate client-side applications and the Knowledge of XML, PHP.

TEXT BOOKS

1. Kris Jamsa, konrad King and Andy Anderson, “HTML & Web Design Tips and Techniques”, Tata McGraw-Hill, First Edition, 2002.
2. Powell T.A. HTML Complete Reference, Tata McGraw-Hill, Fifth Edition, 2010

REFERENCES

1. Deitel & Deitel, Goldberg, Internet and World Wide Web – How to Program, Third Edition, Pearson Education Asia, 2005
2. Deitel & Deitel, Goldberg, Internet and World Wide Web – How to Program, Third Edition, Pearson Education Asia, 2005
3. Rajkamal, “Web Technology”, First Edition, Tata McGraw-Hill, 2001. Tim Converse, Joyce Park and Clark Morgan “PHP5 and MySQL Bible”, Wiley Publishing, Inc. 2004

15CSVC701 MULTIMEDIA

COURSE OBJECTIVES

To enable the students to

- To understand about Animation and special effects.
- To know about digital photography
- To understand about various concept of photoshop

Unit I Introduction to Multimedia

Multimedia Hardware- Software. Desktop publishing, Multimedia Animation & Special effects (2D/3D animation). Social Networking & Publishing (Blogging, Facebook, Youtube, Instagram etc.) Content Distribution Systems (CD/DVD, Internet, Radio, Television)

Unit II Art & Science of Multimedia

Audio fundamentals (Audio quality, formats and devices), Understanding Image and Video (Resolution, Color, Video standards, formats). Film and Digital photography (technology, techniques, composition & lighting etc.). Introduction to Printing technology

Unit III Photoshop

Introduction Vector Shapes and Bitmaps - Explore the Photoshop Environment - Using the File Browser Basic Photo Corrections Working with Selections - Layer Basics - Masks and Channels - Retouching and Repairing .Painting and Editing Basic Pen Tool Techniques - Vector Masks, Paths, and Shapes - Advanced Layer Techniques .Creating Special Effects Preparing Images for Two-Color Printing - Composite Images - Creating a Composite Image Creating an Animated GIF -Creating Composite Images Using Photo merge Unit 5: The Finished Product Saving Images for the Web and Creating a Web Gallery - Photoshop Elements Print Options – Basics of Adobe Illustrator – Basics of Acrobat Reader

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Explain about Animation and special effects.

- Identify about digital photography
- Implement various concept of photoshop

TEXT BOOKS

1. Fundamentals of Computer Graphics Paperback – 12 December 2015 by MARSCHNER

REFERENCES

1. Absolute beginner's guide to mastering Photoshop and creating world class photos(2015),Andrew Mckinnon

15CSVC801 FREE AND OPEN SOURCE SOFTWARES (FOSS)

COURSE OBJECTIVES

To enable the students to

- Explain the features of free &open source software and Familiarization with LINUX
- Work with PHP
- Demonstrate the working of MySQL

Unit I Open source software

Features, advantages over proprietary software, examples**, Free software:** concepts, features, Free software Vs Open Source software, Free software movements. Policies, GPL, Free OS, History and Features of Linux, Various flavours of Linux, Linux Kernel and Shell, Graphical Desktops- GNOME, KDE, Linux File System and Directories

Unit II Forms in PHP

Creating a simple input form, combining HTML & PHP code on a single page, redirecting the user ,creating a send mail form, File upload form Cookies: Introduction, setting a cookie with PHP, deleting a cookie, session function overview: starting a session,working with session variables, passing session IDs in the query string, destroying sessions &unsetting variables

Unit III Database concepts:

Open source database software: MySQL features MySQL data types: Numeric,date & time,string Table creation in MySQL:insert,select,where clause,ordering the result,like operator Selecting Multiple tables:using join,using queries Modifying records:update command,replace command,delete command date & time functions in MySQL Interacting with MySQL using PHP:connecting to MYSQL, Executing queries, Retrieving error messages,inserting data with PHP, retrieving data with PHP

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Analyze the features of free &open source software and Familiarization with LINUX
- Implement about Work with PHP

- Evaluate the working of MySQL

TEXT BOOKS

1.Julie C.Meloni, PHP, MySQL and Apache,Pearson Education

2.Ivan Byross, HTML,DHTML,Javascript,Perl, BPB Publication

REFERENCES

1.Free/Open Source Software Development Hardcover – Import, 31 July 2004 by Stefan Koch

15ECVC301 ROLE OF SENSORS AND TRANSDUCERS IN HOME AUTOMATION

COURSE OBJECTIVE

To enable the students to

- expertise in various calibration techniques and signal types for sensors.
- understand the working principle of different Transducers.

UNIT I INTRODUCTION AND VARIOUS KINDS OF SENSORS 15

Basics of Sensors-Motion Sensors – Potentiometers, Resolver, Encoders – Optical, Magnetic, Inductive, Capacitive, Synchro – Microsyn, Accelerometer, Range Sensors– RF beacons, Ultrasonic, Ranging, Reflective beacons, Laser Range Sensor (LIDAR). Photo conductive cell, photo voltaic, Photo resistive, LDR – Fiber optic sensors – Pressure – Diaphragm, Bellows, Piezoelectric Thermistor, RTD, Thermocouple. Acoustic Sensors – flow and level measurement sensors- Smart Sensors- Film sensor, MEMS & Nano Sensors.

UNIT II TRANSDUCERS 15

Classification of Transducers, Advantages and Disadvantages of Electrical Transducers, Transducers Actuating Mechanisms, Resistance Transducers, Variable Inductance Transducers, Capacitive Transducers, Piezoelectric Transducers, Hall Effect Transducers, Thermoelectric Transducers, Photoelectric Transducers. Strain gauges, Resistance thermometer, Thermistor, LVDT and RVDT.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- study the basics of sensor technology and the various sensor technologies for the measurement of Force, Pressure, acceleration, vibration and Torque.
- acquire the Knowledge and Measure different electrical parameters using Transducers.

TEXT BOOK & MANUALS

1. D. Patranabis – “Sensors and Transducers” –PHI Learning Private Limited.
2. Jacob Fraden, “Hand Book of Modern Sensors: physics, Designs and Applications”, 3rd ed., Springer, 2010.

15ECVC401 **BASIC STANDARDS OF INSTRUMENTS**

COURSE OBJECTIVE

To enable the students to

- know the necessity of different measuring instruments and their design principle
- understand the working principle of different measuring instruments and technical solutions to handle different errors.

UNIT I PHILOSOPHY OF MEASUREMENT & ANALOG MEASUREMENT OF ELECTRICAL QUANTITIES **15**

Unit & dimensions, standards, Errors, Characteristics of Instruments and measurement system, basics of statistical analysis. PMMC instrument, DC ammeter, DC voltmeter, Ohm meter, Moving Iron instrument, Electro dynamic Wattmeter, errors and remedies, Three Phase Wattmeter, Power in three phase system, Energy meter.

UNIT II MEASUREMENT OF PARAMETERS AND DIGITAL MEASUREMENT **15**

Different methods of measuring low, medium and high resistances**,** measurement of inductance & capacitance with the help of AC Bridges- Wheatstone, Kelvin, Maxwell, Hay's, Anderson, Owen, Campbell, Schering, Wien bridges, Wagner Earthing device, Q Meter. Concept of digital measurement, Digital voltmeter, Frequency meter, Power Analyzer, Electronic, and phase Multimeter. CRT, time base, dual trace oscilloscope Measurement of voltage Measurement of voltage, frequency by CRO, Sampling Oscilloscope, DSO, DSO applications.

TOTAL PERIODS **30**

COURSE OUTCOMES

Upon completion of this course, the students would have

- learn units, dimensions, standards and errors and basics of different types of measuring instruments to measure different electrical quantities.
- measure different electrical parameters using conventional bridges and acquire data through digital measuring instruments and interpret the data.

TEXT BOOK & MANUALS

1. W. Golding & F.C. Widdis, "Electrical Measurement &Measuring Instrument", A.W.Wheeler& Co. Pvt. Ltd. India.
2. K. Sawhney,"Electrical & Electronic Measurement & Instrument", Dhanpat Rai & Sons

15ECVC501 **BASICS OF WEB TECHNOLOGY**

COURSE OBJECTIVE

To enable the students to

- which Computers Communicate With Each Other Using Mark-up Languages and Multimedia Packages
- understand about client-server communication and protocols used during communication

Unit-I Web Essentials **15**

Clients, Servers, and Communication. The Internet-Basic Internet Protocols, The World Wide Web-HTTP request message-response message-Web Clients Web Servers-Case Study Markup Languages.

Unit II – XHTML **15**

An Introduction to HTML History-Versions-Basic XHTML Syntax and Semantics-Some Fundamental HTML Elements-Relative URLs-Lists-tables-Frames-Forms-XML Creating HTML Documents

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- design simple web pages using markup languages like HTML
- design simple web pages using markup languages like XHTML

TEXT BOOK & MANUALS

1. Jeffrey C.Jackson, "Web Technologies--A Computer Science Perspective", Pearson Education, 2006.

15ECVC601 **BASICS OF GPS TECHNOLOGY**

COURSE OBJECTIVE

To enable the students to

- a clear understanding of the GPS signal, codes and biases
- understand about similarities between GPS and trilateration

Unit-Introduction to Geodesy **15**

Definitions and fundamentals of Geodesy, Earth, Geoid and Ellipsoid of rotation, Reference surface, Geodetic systems, Indian Geodetic System, Coordinate systems and transformation. Relationship between satellite and conventional geodetic systems

Unit II – Introduction to GPS **15**

History: Transit, Timation, NAVSTAR GPS, GLONASS, GALILEO.

GPS design objectives and details of segments space, control and user, blocks of GPS- Block I, II/IIA, IIR Satellites, IIF, Advantages and current limitations of GPS, Status of GPS Surveying, and Applications.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- describe the pertinence of the navigation code.
- describe how to use some GPS processing services.

TEXT BOOK

1. P. R. Wolf, and C. D. Ghilani, 1997. Adjustment Computations: Statistics and Least Squares in Surveying and GIS, Publisher: John Wiley & Sons, New York (USA)

15ECVC701 **FUNDAMENTALS OF SIMULATION TECHNIQUES**

COURSE OBJECTIVE

To enable the students to

- understand the technique of Simulation.
- understand discrete System Simulation.

Unit I **Continuous and discrete systems** **15**

Inventory Concept: The technique of Simulation, Major application areas, concept of a System, Continuous and discrete systems, Systems modelling, types of models, Progress of a Simulation Study, Comparison of Simulation and Analytical Methods.

Unit II **Conditional transfers, program control statements** **15**

Discrete System Simulation and GPSS: Discrete Events, Representation of Time, generation of arrival patterns. Fixed time step versus next event simulation, Simulation of a Telephone System. Introduction to GPSS: Creating and moving transactions, queues. Facilities and storages, gathering statistics, conditional transfers, program control statements, priorities and parameters. Standard numerical attributes, functions, gates, logic switches and tests, Variables, Select and Count.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- Continuous and discrete systems.
- Conditional transfers, program control statements.
- Standard numerical attributes, functions.

TEXT BOOK & MANUALS

- Acha, E., Fuerte-Esquivel, C. R., Ambriz-Pérez, H., and Angeles-Camacho, C. (2004), FACTS: Modelling and Simulation in Power Networks. John Wiley and Sons.
- Al-Begain, K., and Bargiela, A., Eds. (2016), Seminal Contributions to Modelling and Simulation: 30 Years of the European Council of Modelling and Simulation. Springer.

15ECVC801 **INTRODUCTION TO REMOTE SENSING**

COURSE OBJECTIVE

To enable the students to

- introduce the students to the basic concepts and principles of various components of remote sensing.
- provide an exposure to various platforms and satellites

Unit I Fundamentals of Remote Sensing **15**

Remote sensing –history & development, definition, concept and principles Energy resources, radiation principles, EM Radiation and EM Spectrum Black body radiation, laws of radiation, Interaction of EMR with atmosphere and earth's surface.

Unit II Fundamentals of Satellite communication **15**

Platforms –types and their characteristics, Satellites and their characteristics –geo-stationary and sun-synchronous, Earth Resources Satellites -LANDSAT, SPOT, IRS, IKONOS satellite series, Meteorological satellites –INSAT, NOAA, GOES

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- understand the basic principles of remote sensing
- recognize the platforms and various satellite systems employed in remote sensing.

TEXT BOOK & MANUALS

1. Campbell, J.B., "Introduction to Remote Sensing", Taylor Publications, 2002.

15EEVC301 **BUSINESS SCOPE IN SOLAR ENERGY**

COURSE OBJECTIVES

To enable the students to

- To understand the essential components required for solar PV installation
- To ensure the quality of material in solar plant and handling
- To have an idea on selling the market products.

UNIT I FUNDAMENTALS OF SOLAR PV 10

Solar PV Essentials - Different types of Solar Panels - Components of a Solar PV - Installation Systems – Solar Lighting and other application systems - Assessing site conditions.

UNIT II PV INSTALLATION 10

Understanding installation requirements - Collecting material for installation - Ensuring quality of material and handling - Material usage procedure

UNIT III IMPLEMENTATION OF PV PANEL 10

Assessing mounting - Installing the panel - Connecting the system - check for functioning - Completing the work.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Understand the essential components required for solar PV installation
- Ensure the quality of material in solar plant and handling
- Have an idea on selling the market products.

TEXT BOOKS

1. Wind and Solar Power Systems, Mukund R. Patel, CRC Press, ISBN 0-8493-1605-7

REFERENCES

1. Solar Energy: Principles of Thermal Collection and Storage, Suhas Pandurang Sukhatme

15EEVC401 POWER CONVERTER ANALYSIS AND DESIGN

COURSE OBJECTIVES

To enable the students to

- To know the fundamental design and operation of the power semiconductors.
- To study the functions of the IGBT.
- To understand the functions and performance of the convertor.

UNIT I INTRODUCTION 10

Power Devices and their driving circuitry IGBT, Power MOSFET, IGCT, SCR data sheet interpretation and gate drive Circuit Design, SiC MOSFET devices and their characteristics AC/DC Converters Review of three phase SCR bridge converters and performance analysis. Three phase and cascaded bridge structure with phase shifting transformer

UNIT II FUNCTIONS OF IGBT 10

IGBT front end converter and their control in sync ref frame (ref frames should be taken up in beginning section in machine modeling course for this) four quadrant operation resistance emulation methods.

UNIT III CONVERTOR 10

Single phase power factor correction circuits and control DC/AC converters Two level inverters: Selective Harmonic Elimination, SPWM, Space Vector. Advances in Space Vector Approach. Effect of dead time on performance and compensation schemes

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Fundamental design and operation of the power semiconductors are studied.
- Functions of the IGBT are understood.
- Configurations and performance of the convertors are analysed.

TEXT BOOKS

1. Marty Brown, Power Supply Cookbook, Newnes Publishers, 2001.

REFERENCES

1. D.G.Holmes, Thomas.A.Lipo, Pulse Width Modulation for Power Converters Principles and Practice, John Wiley & Sons Publishers, 2003

15EEVC501 ULTRASONIC INSTRUMENTATION

COURSE OBJECTIVES

To enable the students to

- This course provides adequate knowledge about the properties of ultrasonic wave and the method of generation.
- It also gives the knowledge about the testing and applications of ultrasonic waves
- To study the testing methods of ultrasonic

UNIT I ULTRASONIC WAVES CHARACTERISTICS 10

Ultrasonic waves – Principle and propagation of various waves – Characterization of ultrasonic transmission – Reflection and transmission coefficients – Intensity and attenuation of sounds beam Power level – Medium parameters.

UNIT II ULTRASONIC WAVE GENERATION 10

Generation of ultrasonic waves – Magneto stricture and piezoelectric effects – Search unit types – Construction and characteristics

UNIT III ULTRASONIC TEST METHODS 10

Ultrasonic test methods – Pulse echo – Transit time – Resonance – Direct contact and immersion type – Ultrasonic methods of flaw detection.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Demonstrate properties and characteristics of ultrasonic wave.
- Demonstrate properties and characteristics of ultrasonic wave.
- Measure the properties of ultrasonic wave and apply to various real time applications

TEXT BOOKS

1. J David and N Cheeke, " Fundamentals and Applications of Ultrasonic Waves", CRC Press 2002

REFERENCES

1. Dale Ensminger, " Ultrasonic: Fundamentals, Technology and Applications", CRC press 1988.

15EEVC601 **MIXED SIGNAL IC DESIGN**

COURSE OBJECTIVES

To enable the students to

- To know the fundamental of the CMOS amplifiers.
- To know the response of the frequency compensation schemes.
- To know the functions of the different amplifier switching techniques.

UNIT I CMOS AMPLIFIERS 10

Building blocks for CMOS amplifiers: design of current mirrors, differential amplifiers, CMOS operational transconductance amplifiers: design of single ended telescopic cascade, folded cascade and two-stage amplifiers.

UNIT II FREQUENCY COMPENSATION SCHEMES 10

Frequency compensation schemes: Miller compensation, Ahuja compensation and Nested Miller compensation.

UNIT III DIFFERENTIAL AMPLIFIERS AND SWITCHING TECHNIQUES 10

Design of fully differential amplifiers, discussion of common mode feedback circuits. Switched capacitor circuits, design of switched capacitor amplifiers and integrators, effect of op amp finite gain, bandwidth and offset, circuit techniques for reducing effects of op amp imperfections, switches and charge injection and clock feed-through effects

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Fundamental of the CMOS amplifiers are studied.
- The response of the frequency compensation schemes is analysed.
- Switching techniques are amplifiers are understood.

TEXT BOOKS

1. R. Gregorian and Temes - Analog MOS integrated circuits for signal processing

REFERENCES

1. R.Gregorian - Introduction to CMOS opamps and comparators.

15EEVC701 SIGNAL PROCESSING TECHNIQUES ON LABVIEW

COURSE OBJECTIVES

To enable the students to

- To understand and become familiar with the analysis capabilities of LabVIEW
- To implement the VIs from the analysis library in practical applications for solving real- world problems.
- To learn about the various specialized toolkits such as those available for solving mathematical problems, analyzing non stationary signals, or designing digital filters

UNIT I LABVIEW PROGRAMMING ENVIRONMENT 10

Virtual Instruments (VIs) – Graphical Environment– Building a Front Panel, Building a Block Diagram, Grouping Data: Array and Cluster, Debugging and Profiling VIs , Building a Simple VI, Using Structures and SubVIs, Create an Array with Indexing , Debugging VIs: Probe Tool.

UNIT II DSP TECHNIQUES 10

Sampling, Quantization, Signal Reconstruction, FIR Filtering System, IIR Filtering System, Building a Filtering System Using Filter Coefficients,Filter Design without Using DFD Toolkit

UNIT III APPLICATIONS OF DSP 10

Adaptive Filtering Systems, System Identification, Noise Cancellation, Dual-Tone Multi-Frequency - DTMF Tone Generator System, DTMF Decoder System, DSP System Design: Software-Defined Radio-QAM Transmitter, QAM Receiver. Speech and Audio Signal Processing

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Apply mathematical knowledge for solving mathematical problems, analyzing non stationary signals, or designing digital filters using various specialized toolkits
- Apply the VIs from the analysis library in practical applications for solving real- world problems.
- Create new VIs for signal processing applications

TEXT BOOKS

1. Lab view Signal Processing Book and CD-ROM Edition, Mahesh L Chugani

REFERENCES

1. LabVIEW Digital Signal Processing: And Digital Communications For Kindle, C.L.Clark

15EEVC801 ADAPTIVE SIGNAL PROCESSING

COURSE OBJECTIVES

To enable the students to

- To know the fundamentals of the adaptive filter.
- Understand the complex values of filter.
- To know the RLs filters for digitalization.

UNIT I FUNDAMENTALS OF ADAPTIVE FILTER 10

General concept of adaptive filtering and estimation, applications and motivation, Review of probability, random variables and stationary random processes, Correlation structures, properties of correlation matrices.

UNIT II COMPLEX VALUES OF FILTER 10

Optimal FIR (Wiener) filter, Method of steepest descent, extension to complex valued The LMS algorithm (real, complex), convergence analysis, weight error correlation matrix, excess mean square error and mis-adjustment

UNIT III RLS FILTERS 10

Introduction to recursive least squares (RLS), vector space formulation of RL Sestimation, seudo-inverse of a matrix, time updating of inner products, development of RLS lattice filters, RLS transversal adaptive filters. Advanced topics: affine projection and subspace based adaptive filters, partial update algorithms, QR decomposition and systolic array.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Understand the non-linear control and the need and significance of changing the control parameters w.r.t. real-time situation.
- Mathematically represent the adaptability requirement
- Understand the mathematical treatment for the modeling and design of the signal processing systems.

TEXT BOOKS

1. S. Haykin, Adaptive filter theory, Prentice Hall, 1986

REFERENCES

1. C.Widrow and S.D. Stearns, Adaptive signal processing, Prentice Hall, 1984.

15MEVC301 **AUTOCAD AND ITS APPLICATIONS**

COURSE OBJECTIVES

To enable the students to

- how to organize the drawing within the printing area.
- Write the single text and multi-line text in the drawing.
- make the hatching to provide the sectioning area.

1. **Drawing Templates**
   Using Template Files (.dwt) to Make New Drawing Exploring what Settings and Elements are saved with Templates?
2. **Organizing Your Drawing with Layer and Advanced Object Types**
   Layer States Properties by Layer Layer Tools. Polylines ,Arcs ,Polygons, Ellipses
3. **Advanced Editing Commands and Inserting Blocks**
   Trim and Extend, Fillet and Chamfer, Polyline Edit and Spline, Offset and Explode Join, The Insert Block Command Inserting Blocks with Tool Palettes Dynamic Blocs Migrating Blocks and other Elements between Drawings with Design Center.
4. **Text**
   The Multiline Text Tool the Single Line Text Tool Editing Text Text in Model Space vs. Paper Space the Multilayer Tool
5. **Hatching**
   The Hatch Command The Hatch Editor Ribbon Tab Saving and Applying Hatches with Tool Palettes.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Create the drawing within the printing zone.
- Write the text and hatching in the drawing zone.
- Create the drawing by using advanced tools.

TEXT BOOKS

1.CAD Exercises, Sachidanand Jha

REFERENCES

1. AutoCAD 2020 Beginning and Intermediate, Munir Hamad.

15MEVC401 INTRODUCTION TO MAT LAB

COURSE OBJECTIVES

To enable the students to

- know the basic commands.
- Create the simple syntax for making the deferent analysis.
- adapt the concept for their analysis.

1. **Introduction**

   Basic of MATLAB, Types of Window, Types of File, Basic Operations.

2. **Matrix (Array Design)**

   Matrix Operation, Array Design, Array Operation, Multidimensional Array.

3. **Symbolic Calculation**

   Symbols, Design Formula, Differentiation, Integration, Solve Equation

4. **Operators**

   Arithmetic Operator, Logical, Relational, Example for above operators.

5. **Branch and Loop**

   If statement, If-else statement, Else-if statement, Pause, Break, Continue, Switch-case, try-catch, Return Statement For Loop, While Loop

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Open the MAT lab software and use the code and symbols.
- Create simple syntax and making the simple progammes.
- Move, copy and resizing the object by using Tools.

TEXT BOOKS

1. An Introduction to Matlab and Mathcad, Troy Siemers, Virginia Military Institute

REFERENCES

1. Understanding MATLAB: A Textbook for Beginners S. N. Alam ,S. S. Alam

15MEVC501 CONSERVATION OF ENERGY

COURSE OBJECTIVES

To enable the students to

- know familiar with the energy efficient devices.
- know the various approaches to conserve energy.
- Understand how to approaches efficient energy management.

1. **Energy Conservation and Efficiency**

   Introduction , About Bureau of Energy Efficiency and it's Schemes, Energy Rating , consumption and energy efficient devices Energy Efficiency and its significance

2. **Energy Efficiency in Buildings and Energy Audit**

   ECBC and Tips for Energy Conservation, Definition, objective, types and methodology of Energy Audit

3. **Instrument for Energy Audit**

   Instruments for Energy Audit ,Case studies and Building survey

4. **Cost Benefit Analysis**

   Arithmetic Operator, Logical, Relational, Example for above operators.

5. **Energy and its use**

   Introduction, Types of Renewable Energy Sources ,Electric vehicle

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- differentiate the various energy efficient devices.
- use of various methods Energy conserve methods.
- approach the various Energy management techniques

TEXT BOOKS

1. Energy Conservation and Audit by Mr. Amit L. Nehete

REFERENCES

1. Energy Conservation Case studies in ceramic industry, sugar industry, fertilizer industry, cement industry. CII, Energy Management Cell etc

15MEVC601 **SENSORS AND IT'S USE**

COURSE OBJECTIVES

To enable the students to

- Examine the fundamental knowledge of biomedical sensors.
- Understand the principle and operation of electrodes
- To design advanced sensors.

1 **INTRODUCTION**

Chemical Sensors: Blood, Gas and Acid, base physiology Electrochemical sensors, Chemical Fibro sensors.

2 **OPTICAL SENSORS**

Fiber optic light propagation, Graded index fibers, Fiber optic communication driver circuits.

3 **LASER**

Classifications, Driver circuits for solid; state laser diodes, Radiation sensors, and Optical combinations.

4 **BIOMEDICAL SENSORS**

Biomedical Sensors: Sensors Terminology in the human body, Introduction, Cell, Body Fluids Musculoskeletal system,

5 **SENSOR DESIGN**

Fluoroscopic machines design, Nuclear medical systems, EMI to biomedical sensors, types and sources of EMI, Fields, EMI effects

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Illustrate the basic concepts and principles of sensors
- Identify the fundamentals of biomedical sensors.
- Design advanced sensor for the required applications

TEXT BOOKS

1. Sabaree Soloman, "Sensors Hand Book", Sensors Hand Book, McGraw Hill,2010.

REFERENCES

1. Carr and Brown, "Introduction to Medical Equipment Technology", Addison Wesley. 2008.

15MEVC701 **CNC BASIS**

COURSE OBJECTIVES

To enable the students to

- know the basics of CNC codes and Machine.
- know different Coding for different operations. .
- write the program to various operations.

1. **Fundamentals of process planning**

   Process planning Structure of process plan Factors influencing process plan Sequence of operation of process plan.

2. **CNC systems**

   CAM, NC, CNC and DNC2.2Selection criteria for CNC machines.2.3Adoptive Control.

3. **Constructional Features of CNC machines**

   Classifications of CNC Machine, Modes of operation of CNC,Working of :Machine Structure, Sideways, Spindle drive, Axis drive,

4. **Special features in CNC machines**

   Recirculating ball screw Feedback devices(transducers, encoders), Automatic tool changer (ATC), Automatic pallet changer (APC),CNC axis and motion nomenclature ,CNC tooling's – tool pre-setting, qualified tool, tool holders and inserts

5. **CNC Part Programming**

   Machine zero, home position, work piece zero, programme zero.4.3CNC part programming: Programming format and Structure of part programme.4.4ISO G and M codes for turning and milling-meaning and applications of important codes

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Identify different axes, machine zero, home position, systems and controls CNC machines.
- Select, mount and set cutting tools and tool holders on CNC
- Prepare part programmes using ISO format for given simple components with and without Use of MACRO, CANNED CYCLE and SUBROUTINE using ISO format.

TEXT BOOKS

1 CNC Machines, Pabla, B.S. Adithan M.

REFERENCES

1. Introduction to NC/CNC Machines, Vishal, S

15MEVC801 **BASICS OF SOLAR ENERGY**

COURSE OBJECTIVES

To enable the students to

- Identify the availability of solar energy
- Identify the availability solar collectors
- Know the solar energy resources and panel design

1 **INTRODUCTION**

Sun as Source of Energy, Availability of Solar Energy, Nature of Solar Energy, Solar Energy and Environment

2 **METHODS OF SOLR ENERGY**

Various Methods of using solar energy; Photothermal, Photovoltaic, Photosynthesis, Present & Future Scope of Solar energy

3 **SOLAR COLLECTORS**

Solar collectors- types of collectors; characteristics and design principles of different type of collectors, performance and testing of Collectors

4 **SOCIAL ISSUES**

Sustainable development: Unsustainable to sustainable development – urban problems related to energy

5 **APPLICATIONS**

Solar water and air heaters; performance, and applications; solar cooling; solar Drying; solar ponds; solar tower concept; solar furnace

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Discuss the available solar energy and the current solar energy collectors.
- Identify available solar energy resources and techniques to utilize them effectively.
- Categorize the availability and the conversion method of solar.

TEXT BOOKS

1. Sukhatme, S.P., "Solar Energy, Principles of Thermal Collection and Storage", 3rd Edition,Tata MCGraw Hill, 2008

REFERENCES

1. Garg.H. P and Prakash. J., “Solar Energy - Fundamentals and applications”, 21st revised edition, Tata McGraw Hill, 2008.

15MTVC301 **SENSORS BASICS**

COURSE OBJECTIVES

To enable the students to

- Examine the fundamental knowledge of biomedical sensors.
- Understand the principle and operation of electrodes
- To design advanced sensors.

UNIT 1 INTRODUCTION

Chemical Sensors: Blood, Gas and Acid, base physiology Electrochemical sensors, Chemical Fibro sensors.

UNIT 2 OPTICAL SENSORS

Fiber optic light propagation, Graded index fibers, Fiber optic communication driver circuits.

UNIT 3 LASER

Classifications, Driver circuits for solid; state laser diodes, Radiation sensors, and Optical combinations.

UNIT 4 BIOMEDICAL SENSORS

Biomedical Sensors: Sensors Terminology in the human body, Introduction, Cell, Body Fluids Musculoskeletal system,

UNIT 5 SENSOR DESIGN

Fluoroscopic machines design, Nuclear medical systems, EMI to biomedical sensors, types and sources of EMI, Fields, EMI effects

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Illustrate the basic concepts and principles of sensors
- Identify the fundamentals of biomedical sensors.
- Design advanced sensor for the required applications

TEXT BOOKS

1. Sabaree Soloman, “Sensors Hand Book”, Sensors Hand Book, McGraw Hill,2010.

REFERENCES

1. Carr and Brown, “Introduction to Medical Equipment Technology”, Addison Wesley. 2008.

15MTVC401 **SOLAR ENERGY**

COURSE OBJECTIVES

To enable the students to

- Identify the availability of solar energy
- Identify the availability solar collectors
- Know the solar energy resources and panel design

UNIT 1 INTRODUCTION

Sun as Source of Energy, Availability of Solar Energy, Nature of Solar Energy, Solar Energy and Environment

UNIT 2 METHODS OF SOLR ENERGY

Various Methods of using solar energy; Photothermal, Photovoltaic, Photosynthesis, Present & Future Scope of Solar energy

UNIT 3 SOLAR COLLECTORS

Solar collectors- types of collectors; characteristics and design principles of different type of collectors, performance and testing of Collectors

UNIT 4 SOCIAL ISSUES

Sustainable development: Unsustainable to sustainable development – urban problems related to energy

UNIT 5 APPLICATIONS

Solar water and air heaters; performance, and applications; solar cooling; solar Drying; solar ponds; solar tower concept; solar furnace

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Discuss the available solar energy and the current solar energy collectors.
- Identify available solar energy resources and techniques to utilize them effectively.
- Categorize the availability and the conversion method of solar.

TEXT BOOKS

1. Sukhatme, S.P., "Solar Energy, Principles of Thermal Collection and Storage", 3rd Edition,Tata MCGraw Hill, 2008

REFERENCES

1. Garg.H. P and Prakash. J., “Solar Energy - Fundamentals and applications”, 21st revised edition, Tata McGraw Hill, 2008.

15MTVC501 **ANSYS - I**

COURSE OBJECTIVES

To enable the students to

- learn system requirements and units
- Understand the concepts sketching and part modelling
- familiarize with defining material properties

UNIT 1 **INTRODUCTION TO CAE**

General working of FEA - Stiffness matrix - Boundary conditions - Elements and Element Shapes - General procedure to conduct FEA.

UNIT 2 **INTRODUCTION TO ANSYS WORKBENCH**

System requirements - Starting ANSYS Workbench 14.0 - ANSYS Workbench 14.0 GUI - Working on a Project - Units in ANSYS Workbench - ANSYS Workbench Database and File format - Changing the unit system - Components of the system.

UNIT 3 **SKETCHING AND PART MODELLING IN DESIGN MODELER**

Introduction to Modelling - Introduction to Design Modeler Window - Leaf Spring Section - Gear box housing Section - Air-duct Section

UNIT 4 **SOLID MODELLING FUNDAMENTALS**

Introduction - Leaf Spring 2D modelling - Gear Box Housing 3D modelling - Air Duct 3D modelling.

UNIT 5 **DEFINING MATERIAL PROPERTIES**

Introduction to Engineering Workspace - Creating and Adding Materials - Assigning Material to the Beam - Assigning Material to the Clamp - Assigning Material to the Assembly

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Familiarize the requirements and units of ANSYS
- Apply knowledge on sketching and modelling
- Evaluate the material properties.

TEXT BOOKS

1. Jha, N.K. “Handbook of flexible manufacturing systems”, Academic Press Inc., 2010.

REFERENCES

1. Raouf, A. and Ben-Daya, M., Editors, “Flexible manufacturing systems: recent development”, Elsevier Science, 2008.

16MTVC601 YOGA FOR HUMAN EXCELLENCE

COURSE OBJECTIVES

To enable the students to

- know about the history and schools of yoga
- know the difference between supreme consciousness and individual consciousness
- apply the knowledge by the way of practice and introspection

UNIT 1 INTRODUCTION

What is Yoga, History of Yoga - Yoga in today's scenario- Schools of Yoga.

UNIT 2 LIMBS OF YOGA

Eight Limbs of Yoga - Sathvic, Rajasic, Tamasic Foods and Thoughts - Science of Yoga Loosening Exercises.

UNIT 3 YOGA BENEFITS

Yogasanas & Benefits - Super Brain Yoga - Surya Namaskar Standing Asanas.

UNIT 4 ASANAS AND BALANCE DIET

Sitting Asanas - Prone Asanas - Supine Asanas; Nutrition and Balance Diet: Needs and Important, Significant of Nutritional Food - Tips for balance diet. Common Diseases for IT professionals: Common diseases – cause, prevention First aid for common sports injuries

UNIT 5 MEDITATION

Mudras Relaxation- Pranayama – Meditation - Meaning and definition; Principles of practicing; Basic Asana and it important, Pranayama and Meditation - Relaxation Techniques.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Understand the historical aspects and schools of yoga
- Ensure their physical & mental wellness through yoga practice
- Develop the power to concentrate and have stress free mind

TEXT BOOKS

1. Ramesh Partani, The Complete Secret, Ru Education, 2013.

REFERENCES

1. Iyengar B.K.S. Yoga: Wisdom & Practice, B.K.S. Iyengar, 2009.

15MTVC701 **NANO ELECTRONICS**

COURSE OBJECTIVES

To enable the students to

- Have a concept on the scope and recent development of the science and technology of Nano-systems.
- Gain the physical knowledge underlying the operation principles and design of Nano-systems
- Learn some typical or potentially applicable nano-systems at the frontier of the development of the field.

UNIT 1 INTRODUCTION

Nano and nature - physical scales of nano technology - Genealogy and Philosophy of nano technology - Methods of measuring properties - structure - Microscopy - Spectroscopy.

UNIT 2 MOLECULAR NANOTECHNOLOGY

Basics of nano-electronics; Nano electronics with tunnelling devices; super conducting devices; Molecular nanotechnology; Applications of MNT

UNIT 3 NANO ASSEMBLY

Direct self; assembly; device assembly; Electrostatic self; assembly nano tubes; nano wire and carbon 60; Dielectrophoretic nano assembly.

UNIT 4 ARCHITECTURE

Architecture of MEMS; Requirements of nano systems; Development of nano electronics and structuring;

UNIT 5 APPLICATIONS

Application of NEMS; Deposition of coatings; Three dimensional materials; Dewatering.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Ability to understand the operation of nano devices; nano systems and their application
- Ability to design the nano devices; nano systems using the NEMS fabrication process.
- Gain a knowledge of basic approaches for various sensor design

TEXT BOOKS

1. Michael PycraftInrushes , “Nano Electro Mechanics in Engineering & biology ’’ ,CRC press New York,2011.

REFERENCES

1. Norio Taniguchi, “Nano Technology”, Oxford University Press, New York, 2010.

15MTVC801 INTRODUCTION TO WOMEN'S STUDIES

COURSE OBJECTIVES

To enable the students to

- sensitize the participants regarding the issues of gender and the gender inequalities prevalent in society.
- initiate the gender perspective in all domains of understanding Gender Studies with the issues of their daily life.
- introduce gender sensitization and related issues.

UNIT 1 FUNDAMENTAL CONCEPTS OF WOMEN'S STUDIES

Definition- Objectives of Women's Studies; Importance of Women's Studies; Women's Studies as an Academic Discipline; Role of UGC Centre for Women's Studies; Women's Studies in India and Abroad – Origin and Growth.

UNIT 2 SOCIAL EMPOWERMENT

Women in Higher Education; Gender issues in Health, Environment, Family welfare Measures, Indecent representation of Women in media; Women in Difficult circumstances; Constitutional.

UNIT 3 ECONOMIC EMPOWERMENT

Introduction-organized sector, unorganized sector; Role of Women in Economic Development – Female Poverty and Poverty alleviation programmes; Status of Women farmers and land rights; Women Entrepreneurs; Impact of Globalization on working women; National Policy for the empowerment of women 2001.

UNIT 4 POLITICAL EMPOWERMENT

Political participation of women – Political Socialization- Women leaders in politics- Women in Local Governance- Barriers- Reservation policies- Women's Political Rights: CEDAW.

UNIT 5 SOCIAL ISSUES REGARDING WOMEN

Issues of Girl child, Female, infanticide and foeticide, Sex Ratio child marriage, Dowry & Property Rights, Violence against Women, Domestic violence, Female Headed Households', Women in the Unorganized sector of Employment, Women's work- Status and problems, problems of Dalit women.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- develop social consciousness among the students

- encourage capacity building among the students to enable them to engage in policy decisions
- remove gender biases in all fields of life in the process of gender equality for nation building

TEXT BOOKS

1. Amy S. Wharton. (2005). “The Sociology of Gender: An Introduction to Theory and Research”. (KeyThemes in Sociology) Blackwell Publishing, UK, Indian Reprint, Kilaso Books, New Delhi.

REFERENCES

1. Maithreyi Krishna Raj. (1986). “Women Studies in India: Some Perspectives”. Popular Prakasham, Bombay.

15ITVC301 DATABASE FUNDAMNTALS

COURSE OBJECTIVES

To enable the students to

- Retrieve row and column data from tables with the SELECT statement
- Create reports of sorted and restricted data
- Employ SQL functions to generate and retrieve customized data and schema.

UNIT I

Introduction - Retrieving Data Using the SQL SELECT Statement -Restricting and Sorting Data - Single-Row Functions to Customize Output - Conversion Functions and Conditional Expressions

UNIT II

Reporting Aggregated Data Using the Group Functions - Displaying Data from Multiple Tables - Sub-queries - SET Operators - Manipulating Data

UNIT III

Manipulating Data - DDL Statements to Create and Manage Tables - Schema - Creating Other Schema Objects.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Understand the concept of row and column data from tables with the SELECT statement
- Analyze reports of sorted and restricted data
- Implement SQL functions to generate and retrieve customized data and schema.

TEXT BOOKS

1. SQL Fundamentals (3rd Edition) 3rd Edition, Kindle Edition

REFERENCES

1. Microsoft SQL Server 2012 T-SQL Fundamentals (Developer Reference) 1st Edition, Kindle Edition.

15ITVC401 DOT NET FRAMEWORK

COURSE OBJECTIVES

To enable the students to

- To understand about the concept of Web technology
- To be familiar with creating of database using ADO.NET.
- To study about ASP.NET

Unit I

Introductions, course mechanics, .NET Overview, CLR, Assemblies (monolithic vs. component-based applications), Execution Model, Client-Side vs. Server-Side Programming, Web Technologies. Development Environment Setup, ISS, SQL Server and Visual Studio, Advanced C#: OOP, Delegates, Events, Attributes, unsafe code, .NET Interop

Unit II

.NET Framework Class Library (FCL): System, Collections, I/O, Networking, Threading, Transactions, Exceptions. Databases and Data Access using ADO.NET & LINQ.

Unit III

Introduction to ASP.NET, programming model, server controls, data binding-ASP.NET state management, tracing, caching, error handling, security, deployment, user and custom controls, DotNetNuke. Exposing and consuming ASP.NET Web Services, XML, RESTful, SOAP, DISCO, UDDI

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- understand the concept of Web technology
- Implement creating of database using ADO.NET.
- Analyze about ASP.NET

TEXT BOOKS

1. “Trueman’s UGC NET/SET General Paper I” M. Gagan, Sajit Kumar

REFERENCES

1. **“**Functional Concurrency in .net: With Examples in C# and F#” by Riccardo Terrell
2. “Dot Net Technology” by Damini Grover

15ITVC501 WEB DESIGNING

COURSE OBJECTIVES

To enable the students to

- To Understand about concept of PHP
- To learn the concept of web designing
- To be familiar with creating of database in PHP.

Unit I Core PHP

Introduction to PHP-Handling Html Form With Php-Decisions and loop-Function-String-Working with file and Directories

Unit II Web Designing

HTML- CSS- Java Script- JQuery- AJAX

Unit III Framework- Cake PHP

Introduction to CakePHP- Models: Creating up model for a database table- Controller: Creating controller- Views: Creating Views- Cake session:

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Explain about concept of PHP
- Analyze the concept of web designing
- Implement creating of database in PHP.

TEXT BOOKS

1. Head First PHP & MySQL: A Brain-Friendly Guide Paperback – Illustrated, 6 January 2009

REFERENCES

1. Murach's PHP & MySQL Paperback – 1 December 2014

15ITVC601 **PHP AND MYSQL**

COURSE OBJECTIVES

To enable the students to

- learn about HTML, DHTML concepts.
- Understand t a variety of presentation effects in HTML
- know about appropriate client-side applications and the Knowledge of XML, PHP.

Unit I HTML, Frames and Forms

History of the Internet and World Wide Web – HTTP, SMTP, POP3, MIME, Understanding roles of Web Browsers and Web Servers. Structure of HTML, Text formatting, Text styles, hyper link, image, and tables. **Frames, Forms** : CSS Frames, Forms and controls, Embedding audio, video and animated files in HTML, CSS –Understanding CSS, Internal CSS, External CSS, Font Properties, Text Properties, Color and Background properties, Table properties, Numbering and List Properties.

Unit II JavaScript

Data types and literals, operators, conditional statements, loop constructs, reserved words; core Objects Array Object, Date Object; Functions passing value to JavaScript functions, user defined functions, Handling old browsers , java script events, formatting cookie, retrieving cookie value from the cookie file, removing a cookie , animations using events.

Unit PHP & MySQL

Why PHP and MySQL - Server-Side Web Scripting - Getting Started with PHP - Adding PHP to HTML -Syntax and Variables - Control and Functions - Passing Information between Pages – Strings – Arrays and Array Functions – Numbers - MySQL Database Administration - PHP/MySQL Functions - Displaying Queries in Tables - Building Forms from Queries

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- ldentify about HTML, DHTML concepts.

- implement a variety of presentation effects in HTML
- Explore about appropriate client-side applications and the Knowledge of XML, PHP.

TEXT BOOKS

1. Kris Jamsa, konrad King and Andy Anderson, “HTML & Web Design Tips and Techniques”, Tata McGraw-Hill, First Edition, 2002.
2. Powell T.A. HTML Complete Reference, Tata McGraw-Hill, Fifth Edition, 2010

REFERENCES

1. Deitel & Deitel, Goldberg, Internet and World Wide Web – How to Program, Third Edition, Pearson Education Asia, 2005

2 Deitel & Deitel, Goldberg, Internet and World Wide Web – How to Program, Third Edition, Pearson Education Asia, 2005

3. Rajkamal, “Web Technology”, First Edition, Tata McGraw-Hill, 2001. Tim Converse, Joyce Park and Clark Morgan “PHP5 and MySQL Bible”, Wiley Publishing, Inc. 2004

15ITVC701 INTRODUCTION TO MULTIMEDIA

COURSE OBJECTIVES

To enable the students to

- To understand about Animation and special effects.
- To know about digital photography
- To understand about various concept of photoshop

Unit I Introduction to Multimedia

Multimedia Hardware- Software. Desktop publishing, Multimedia Animation & Special effects (2D/3D animation). Social Networking & Publishing (Blogging, Facebook, Youtube, Instagram etc.) Content Distribution Systems (CD/DVD, Internet, Radio, Television)

Unit II Art & Science of Multimedia

Audio fundamentals (Audio quality, formats and devices), Understanding Image and Video (Resolution, Color, Video standards, formats). Film and Digital photography (technology, techniques, composition & lighting etc.). Introduction to Printing technology

Unit III Photoshop

Introduction Vector Shapes and Bitmaps - Explore the Photoshop Environment - Using the File Browser Basic Photo Corrections Working with Selections - Layer Basics - Masks and Channels - Retouching and Repairing .Painting and Editing Basic Pen Tool Techniques - Vector Masks, Paths, and Shapes - Advanced Layer Techniques .Creating Special Effects Preparing Images for Two-Color Printing - Composite Images - Creating a Composite Image Creating an Animated GIF -Creating Composite Images Using Photo merge Unit 5: The Finished Product Saving Images for the Web and Creating a Web Gallery - Photoshop Elements Print Options – Basics of Adobe Illustrator – Basics of Acrobat Reader

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Explain about Animation and special effects.

- Identify about digital photography
- Implement various concept of photoshop

TEXT BOOKS

1. Fundamentals of Computer Graphics Paperback – 12 December 2015 by MARSCHNER

REFERENCES

1. Absolute beginner's guide to mastering Photoshop and creating world class photos(2015),Andrew Mckinnon.

15ITVC801 OPEN SOURCE SOFTWARES

COURSE OBJECTIVES

To enable the students to

- Explain the features of free &open source software and Familiarization with LINUX
- Work with PHP
- Demonstrate the working of MySQL

Unit I Open source software

Features, advantages over proprietary software, examples**, Free software:** concepts, features, Free software Vs Open Source software, Free software movements. Policies, GPL, Free OS, History and Features of Linux, Various flavours of Linux, Linux Kernel and Shell, Graphical Desktops- GNOME, KDE, Linux File System and Directories

Unit II Forms in PHP

Creating a simple input form, combining HTML & PHP code on a single page, redirecting the user ,creating a send mail form, File upload form Cookies: Introduction, setting a cookie with PHP, deleting a cookie, session function overview: starting a session,working with session variables, passing session IDs in the query string, destroying sessions &unsetting variables

Unit III Database concepts:

Open source database software: MySQL features MySQL data types: Numeric,date & time,string Table creation in MySQL:insert,select,where clause,ordering the result,like operator Selecting Multiple tables:using join,using queries Modifying records:update command,replace command,delete command date & time functions in MySQL Interacting with MySQL using PHP:connecting to MYSQL, Executing queries, Retrieving error messages,inserting data with PHP, retrieving data with PHP

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Analyze the features of free &open source software and Familiarization with LINUX
- Implement about Work with PHP

- Evaluate the working of MySQL

TEXT BOOKS

1.Julie C.Meloni, PHP, MySQL and Apache,Pearson Education

2.Ivan Byross, HTML,DHTML,Javascript,Perl, BPB Publication

REFERENCES

1.Free/Open Source Software Development Hardcover – Import, 31 July 2004 by Stefan Koch

15PCEVC101 MODERN APPLICATION DEVELOPMENT

COURSE OBJECTIVES

To enable the students to

- Understand the concept of internet application
- Know about the third party web services

Module 1

- From desktop application to internet application
- Stateful applications
- The front end

Module 2

- Databases and Simple files
- Setting up a website
- Using third party web services
- Extended project

TOTAL PERIODS 30

COURSE OUTCOME

- Understand the concept of internet application
- Know about the third party web services

REFERENCE

- https://www.nginx.com/principles-of-modern-application-development/

15PCEVC201 **DEVOPS**

COURSE OBJECTIVES

To enable the students to

- Understand the concept of devops
- Know about the agile skills association
- Understand the concept of organization

Module 1: Emergence of DevOps

- Digital Transformation and DevOps
- Why organizations should do DevOps?
- Business Case for DevOps
- DevOps History • Benefits of DevOps
- DevOps Definitions
- Culture of High Performance IT
- How DevOps is tightly intertwined with Agile and Lean IT?
- DevOps Principles and Aspects of IT

Module 2 DevOps Agile Skills Association (DASA):

- DevOps Skills Areas, Knowledge Areas, and Competence Framework
- DASA Qualification Scheme, Mission, and Vision
- Introduction to a DevOps Culture:
- Key Elements of DevOps:
- Implementation of a DevOps Culture:

Module 3 ORGANIZATION

- Organizational Models
- Autonomous Teams
- Architecting for DevOps
- Governance:

TOTAL PERIODS 30

COURSE OUTCOME

- Understand the concept of devops
- Know about the agile skills association
- Understand the concept of organization

REFERENCE

- https://microsoft.com/en-us/azure

15PCOVC101

15PVLVC101

BASICS OF RESEARCH METHODOLOGY

(Common for M .E. Communication Systems/VLSI Design)

COURSE OBJECTIVE

To enable the students to

- know the basics of Research methodology and developing research plan.
- understand the data collection and analysis of Literature review.

UNIT I Introduction to Research Methodology **15**

Meaning and importance of Research – Types of Research – Selection and formulation of Research Problem Research Design – Need – Features – Inductive, Deductive and Development of models, Developing a Research Plan – Exploration, Description, Diagnosis, Experimentation, Determining Experimental and Sample Designs, Analysis of Literature Review – Primary and Secondary Sources, Web sources –critical Literature Review.

UNIT II Data Collection and Analysis **15**

Sources of Data – Primary, Secondary and Tertiary – Types of Data – Categorical, nominal & Ordinal, Methods of Collecting Data: Observation, field investigations, Direct studies – Reports, Records or Experimental, observations. Sampling methods – Data Processing and Analysis strategies- Graphical representation – Descriptive Analysis – Inferential Analysis- Correlation analysis – Least square method - Data Analysis using statistical package– Hypothesis, – testing – Generalization and Interpretation – Modeling.

TOTAL PERIODS **30**

COURSE OUTCOMES

Upon completion of this course, the students will be able to

- development of the research models and developing the Research Plan.
- analyze the data and interpret the data correlation.

TEXT BOOK & MANUALS

1. Garg.B.L., Karadia, R., Agarwal,F. and Agarwal, U.K., 2002. An introduction to Research Methodology, RBSA Publishers.
2. Kothari, C.R.(2008). Research Methodology: Methods and Techniques. Second Edition. New Age International Publishers, New Delhi.

15PCOVC201/

15PVLVC201

STUDY OF RESEARCH FELLOWSHIP

(Common for M .E. Communication Systems/VLSI Design)

COURSE OBJECTIVE

To enable the students to

- understand the concept of Research methodology and Research Aptitude.
- understand the designing of Research plan and models.

Unit-I Research aptitude including Research Methodology **15**

Research Methodology with emphasis on Clinical Research Conduct & Monitoring, Good Clinical Practices, Protocol Development, Bio-ethics, Bio-statistics.

Unit II – Research design and Plan **15**

Research Design – Need – Features – Inductive, Deductive and Development of models, Developing a Research Plan – Exploration, Description, Diagnosis, Experimentation, Determining Experimental and Sample Designs.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students will be able to

- Analyze Research methodology and developing the protocols.
- develop the Research plan and developing the models.

TEXT BOOK & MANUALS

1. Garg, B.L., Karadia, R., Agarwal, F. and Agarwal, U.K., 2002. An introduction to Research Methodology, RBSA Publishers

2. Kothari, C.R., 1990. Research Methodology: Methods and Techniques. New Age International. 418p

15PCOVC301/ 15PVLVC301 **RESEARCH PAPER WRITING AND JOURNAL SUBMISSION**

(Common for M .E. Communication Systems/VLSI Design)

COURSE OBJECTIVE

To enable the students to

- understand the concept of Research writing and publishing.
- understand the Research paper report writing.

Unit-I Research Paper Writing and Journal submission **15**

Layout of a Research Paper, Journals in Computer Science, Impact factor of Journals, When and where to publish- Ethical issues related to publishing, Plagiarism and Self-Plagiarism.

Unit II – Research report writing **15**

Types of research reports – Brief reports and Detailed reports; Report writing: Structure of the research report- Preliminary section, Main report, Interpretations of Results and Suggested Recommendations; Report writing: Formulation rules for writing the report: Guidelines for presenting tabular data, Guidelines for visual Representations.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students will be able to

- Analyze Research paper writing and Journal submission.
- Analyze the report writing and publish in the Journal.

TEXT BOOK & MANUALS

1. Trochim, W.M.K., 2005. Research Methods: the concise knowledge base, Atomic Dog Publishing. 270p.
2. Kothari, C.R., 1990. Research Methodology: Methods and Techniques. New Age International. 418p

15PEDVC101 ARTIFICIAL INTELLIGENCE FOR ENGINEERS

COURSE OBJECTIVES

To enable the students to

- Know the basics concept artificial intelligence.
- Know the effect artificial intelligence in industry oriented.
- Apply AI techniques for different industrial application

1. **Introduction**:
   A brief review of AI history, What is artificial intelligence? , Related research fields , Scope of this course
2. **Production System**
   Production system, Inference engine, Working memory, Knowledge base, Pattern matching,
3. **Ontology**
   What is ontology? , Semantic network, Frame, Structural knowledge, Declarative knowledge, Procedural knowledge.
4. **Fuzzy Logic: Human-like decision making**
   Definition of fuzzy set ,Membership function , Notation of fuzzy set ,Operations of fuzzy set, Fuzzy number and operations , Extension principle , Fuzzy rules , De-fuzzification , Fuzzy control.
5. **Pattern Recognition**
   Concept and concept learning, Pattern classification and recognition. Feature vector representation of patterns. Nearest neighbour based learning. , Discriminant function and decision boundary. Multi-class pattern recognition. , General formulation of machine learning. The k-means algorithm.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Identify the need of AI
- Apply the concepts for automation of industry.
- Apply the various engineering application.

TEXT BOOKS

1. Qiangfu ZHAO and Tatsuo Higuchi, Artificial Intelligence: from fundamentals to intelligent searches, Kyoritsu, 2017, ISBN:978-4-320-12419-6 (in Japanese)

REFERENCES

1. Introduction to Artificial Intelligence, Shinji Araya, KYORITSU SHUPPAN, ISBN4-320-12116-3

15PEDVC201 GEOMETRIC DIMENSIONING & TOLERANCING

COURSE OBJECTIVES

To enable the students to

- Know the basics of Geometric Dimensioning and Tolerancing
- Know how set the tolerancing limits for the given dimension.
- Representation procedure for the dimensioning and Tolerancing for the given drawing.

1. **Introduction** **(6)**
   Terms and definitions, Common symbols & Terminology, Fundamental Rules (Drawing)
2. **Feature definition and Material** **(6)**
   Feature definition, With Size and Without Size, Material Condition (Maximum, Least, Regard of Material Condition),Limit Tolerancing, Dimension Origin
3. **Selection of Datum reference** **(6)**
   Datum Reference Frame - Theory & Interpretation, Datum Elements, View Oriented Datum's
4. **Form Tolerances** **(6)**
   Flatness, Verification, Surface Roughness Straightness, Line Elements Applied to a Flat Surface Circularity, Average Diameter
5. **Profile Tolerances** **(6)**
   Bilateral, Bilateral - Unequal, Unilateral Run out Tolerance, Circular Run out Total Run out.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Provide Tolarancing limits for the different diagram.
- Provide the different symbols for various position.
- Mark the various form tolerance in its appropriate places,

TEXT BOOKS

1. Fundamentals of Geometric Dimensioning and Tolerancing, Alex Krulikowski

REFERENCES

1 GD&T: Application and Interpretation, Bruce A Wilson

15PPEVC101 **INTRODUCTION TO ARTIFICIAL NEURAL NETWORKS**

COURSE OBJECTIVES

To enable the students to

- explore the architecture and learning principles of Neural Networks.
- develop the various hybrid algorithms involved in Neural Networks.
- provide adequate knowledge of application of Neural Networks to real time systems.

UNIT I **ARTIFICIAL NEURAL NETWORKS** **10**

Biological Neurons and Neural Networks, Basic Structures and Properties of Artificial NeuralNetworks, Basic Neuron Models-McCulloch-Pitts –Different Activation Functions,Singe Layer Perceptrons-Linear Seperability, Single Layer Perceptron Architecture-Learning rule, Algorithm, Applications.

UNIT II **BACK PROPAGATION NEURAL NETWORKS** **10**

Multi-Layer Perceptron -Architecture, activation functions, Learning, Back PropagationAlgorithm – Practical considerations - Limitations–Network Paralysis, Local Minima, Temporal Instability – Deep learning- introduction, Networks Classes .

UNIT III **NETWORK BASED ON COMPETITION** **10**

Fixed weight competitive Network-Maxnet, Mexican Hat andHamming Net, Counter Propagation Networks-Kohonen's self-organizing map – Training theKohonen layer – Training the Grossberg layer – Full counter propagation network .

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply the concept of neural networks in practical applications.
- design, implement and analyze the performance of Back Propagation and Deep Neural Networks
- solve real world problems using Associative Neural Network Techniques

TEXT BOOKS

1. Laurence Fausett, "Fundamentals of Neural Networks, Architecture, Algorithm and Applications", Prentice Hall, Third Edition, 2015.

REFERENCES

1. Jang J.S.R., Sun C.T and Mizutani E, "Neuro Fuzzy and Soft computing"- A Computational Approach to Learning and Machine Intelligence, PHI Learning Private Limited, Indian Reprint , 2014.

15PPEVC201 **BASICS OF NETWORK ROUTING ALGORITHMS**

COURSE OBJECTIVES

To enable the students to

- get familiarized with different protocols in internet routing and optical WDM networks
- get acquainted with the concepts of supporting protocols in Mobile-IP networks.
- differentiate the routing processes involved in mobile ad-hoc networks and wireless sensor networks from conventional networks.

UNIT I **ROUTING IN TELEPHONE NETWORKS AND INTERNET** **10**

General Classification of routing, Routing in telephone networks, Dynamic Non-hierarchical Routing (DNHR), Trunkstatus map routing (TSMR), Real-Time Network Routing (RTNR), Hierarchical routing.Exterior Routing Protocols: Exterior Gateway Protocol (EGP) and Border Gateway Protocol (BGP).

UNIT II **ROUTING IN OPTICAL WDM NETWORKS** **10**

Classification of RWA algorithms, RWA algorithms, Fairness and Admission Control, Distributed Control Protocols,Permanent Routing and Wavelength Requirements, Wavelength Rerouting- Benefits and Issues, Light path Migration, Rerouting Schemes, Algorithms- AG, MWPG.

UNIT III **ROUTING IN MOBILE - IP NETWORKS** **10**

Macro-mobility Protocols, Micro-mobility protocol: Tunnel based: Hierarchical Mobile IP, Intra domain Mobility Management, Routing based: Cellular IP, Handoff Wireless Access Internet Infrastructure (HAWAII).

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- identify various routing schemes and their applications to the real world circuit-switched networks
- compute the blocking probability of various routing schemes.
- explore the characteristics of mobile ad hoc networks

TEXT BOOKS

1. C.Siva Ram Murthy and B.S.Manoj, “Ad hoc Wireless Networks Architectures and protocols”, Pearson Education, Second Edition, 2007

REFERENCES

1. KazemSohraby, Daniel Minoli and TaiebZnati, “Wireless Sensor Networks”, A John Wiley & Sons Inc. Publication, First Edition, 2007.

15PPEVC301 **FUNDAMENTALS TO SOFTWARE AND COGNITIVE RADIO SYSTEMS**

COURSE OBJECTIVES

To enable the students to

- apply and implement the design methodologies in the wireless applications
- learn about software defined radio and cognitive radio systems.
- provide adequate knowledge of Cognitive Radio Systems

UNIT I SOFTWARE RADIO **10**

Evolution- architecture perspectives- Software radio concepts-SDR front end technology: Transmitter specifications-Receiver specifications- operating frequency bands- receiver design considerations- transmitter design considerations- Candidate architecture for SDR- Multimode SDR architecture.

UNIT II COGNITIVE RADIO **10**

Introduction to cognitive radios –economics of cognitive radio-spectrum awareness, spectrum subleasing, spectrum sharing- cognitive networks: motivation &requirements-foundation &related works in cognitive radio- cognitive radio implementation.

UNIT III COGNITIVE RADIO APPLICATIONS **10**

Cognitive radios in wireless communication- Mobility management- location estimation & sensing- UWB Cognitive radio.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Design the architecture of Software and Cognitive Radio Systems
- Analyze the performance of Cognitive Radio Systems.
- Identify the applications of Cognitive Radio Systems

TEXT BOOKS

1. EkramHossain, DusitNiyato, Zhu Han, “Dynamic Spectrum Access and Management in Cognitive Radio Networks”, Cambridge University Press, First Edition, 2009

REFERENCES

1. Linda Doyle, “Essentials of Cognitive Radio”, Cambridge University Press, First Edition, 2009

15PPSVC101 **SENSING TECHNIQUES AND SENSORS**

COURSE OBJECTIVES

To enable the students to

- gain knowledge on the sensor characteristics and the fundamental principles of sensing
- learn the optical components of sensors and characteristics of interface electronic circuits
- get acquainted with motion-related sensors

UNIT I PRINCIPLES OF SENSING 10

Data acquisition – Sensor characteristics: Transfer function – Calibration – Accuracy – Calibration error -Nonlinearity – Saturation – Repeatability – Reliability – Uncertainty. Physical principles of sensing: electric charges, fields, potentials – capacitance – magnetism – resistance – piezoelectric effect – pyroelectric effect – Hall effect – thermoelectric effects – sound waves

UNIT II OPTICAL COMPONENTS AND INTERFACE ELECTRONICS 10

Optical Components of sensors: Radiometry – Photometry – Windows - mirrors – lenses – Fresnel Lenses – fiber optics – concentrators. Interface electronic circuits: Input characteristics – amplifiers – light-to-voltage converters – Excitation circuits – Analog-to-Digital converters – Direct digitization.

UNIT III MOTION RELATED SENSORS 10

Occupancy and motion detectors: Ultrasonic – microwave motion – capacitive occupancy – triboelectric – optoelectronic motion – optical presence sensors – Pressure-gradient sensors. Velocity and acceleration: Accelerometer characteristics – capacitive accelerometers.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- extrapolate the characteristics of sensors by knowing the physical principles of sensors
- predict the optical components of sensors
- apply appropriate motion-related sensors

TEXT BOOKS

1. Jacob Fraden, “Handbook of Modern Sensors: Physics, Designs, and Applications”, Fourth Edition, Springer, 2010

REFERENCES

1. John Vetelino and AravindReghu, “Introduction to sensors”, CRC Press, 2011.

15PPSVC201 **ETHICAL HACKING**

COURSE OBJECTIVES

To enable the students to

- examine the different phases involved in ethical hacking.
- learn technologies for scanning and the steps involved in performing enumeration.
- get exposure on the password cracking techniques and wireless network hacking.

UNIT I INTRODUCTION AND GATHERING TARGET INFORMATION 10

Introduction to Ethical Hacking: Problem Definition –Need for Security – Can Hacking Be Ethical? – Essential Terminology – Elements of Security –Phases – Hacktivism – Modes of Ethical Hacking – Keeping it Legal. Footprinting: Information Gathering Methodology – Unearthing Initial Information - Tool: Sam spade – Locate the Network Range – Tool: NeoTrace , Visual Route – Social engineering.

UNIT II GATHERING NETWORK AND HOST INFORMATION 10

Scanning: Detecting 'Live' Systems On Target Network –Tools: War Dialers, Ping Utilities – Port Scanning – Tool: SuperScan 3.0,NMap(Network Mapper) – Active Stack Fingerprinting – Passive Fingerprinting - Proxy Servers – Anonymizers. Enumeration: Net Bios Null Sessions – NetBIOS Enumeration – SNMP Enumeration- Hacking Tool: GetAcct - Active Directory Enumeration – AD Enumeration countermeasures.

UNIT III SYSTEM AND NETWORK HACKING 10

System Hacking: Administrator Password Guessing– Performing automated password guessing– Tool: Legion, NTInfoScan – Password Types- Cracking a password - Tool: Keyloggers - Password Sniffing - Privilege Escalation - Manual Password Cracking Algorithm - Automatic Password Cracking Algorithm – Understanding Rootkits – Hiding Files – Covering tracks and erasing evidence.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- identify appropriate hacking tools for different phases of hacking.
- work with scanning tools and enumeration techniques.
- construct and Sql Injection Attack.

TEXT BOOKS

1. Michael Gregg, Certified Ethical Hacker, Pearson publication, 2014.

REFERENCES

1. Matt Walker, All-in-one Certified Ethical Hacker Exam Guide, McGraw Hill Edition, 2012.

15PPSVC301 INTELLIGENT OPTIMIZATION TECHNIQUES

COURSE OBJECTIVES

To enable the students to

- impart in-depth knowledge on different advanced optimization techniques to solve engineering problems
- impart the concept of multi-objective optimization and its applications to real world problems.
- apply Swarm Optimization techniques for solving engineering problems

UNIT I FUNDAMENTALS OF OPTIMIZATION 10

Definition - Classification of optimization problems - Unconstrained and Constrained optimization – Optimality conditions - Classical Optimization techniques - Linear and non - linear programming - Quadratic programming - Mixed integer programming

UNIT II EVOLUTIONARY COMPUTATION TECHNIQUES 10

Evolution in nature - Fundamentals of Evolutionary algorithms - Principle of Genetic Algorithm – Evolutionary Strategy and Evolutionary Programming - Genetic Operators - Selection, Crossover and Mutation - Issues in GA implementation - Differential Evolution technique.

UNIT III ADDITIONAL OPTIMIZATION METHODS 10

Simulated annealing algorithm - Tabu search algorithm - Ant colony optimization - Bacteria Foraging optimization -Artificial immune system.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- familiarize with the basic concept of optimization techniques.
- apply Genetic Algorithm for solving engineering problems.
- apply Swarm Optimization techniques for solving engineering problems.

TEXT BOOKS

1. Kalyanmoy Deb, “Multi objective optimization using Evolutionary Algorithms”, John Wiley and Sons,2008

REFERENCES

1. Carlos A.Coello Coello, Gary B.Lamont, David A.Van Veldhuizen, “Evolutionary Algorithms for solving Multi Objective Problems”, 2nd Edition, Springer, 2007.

15PSEVC101 **GLOBAL HOUSING DESIGN**

COURSE OBJECTIVES

To enable the students to

- Learn about the key design strategies required to develop adequate housing

Housing Designed to accommodate growth and change through time -Housing project in Indore a case study -interwoven urban fabric built in (mud) brick construction houses a diverse set of dwelling types -orchestrated in a master plan consisting of gardens, paved squares, covered and shaded resting places, arcades and bazaars.

Ingenious clustering of four-and five-story apartment blocks, organized around a large central square in which the mosque, markets and festival hall are located.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Formulate a design hypothesis and/or a managerial strategy to develop an inclusive housing cluster dwelling community

TEXT BOOKS

1. Local Planning: Contemporary Principles and Practice Edited by Gary Hack, et al. (2009)

REFERENCES

1. Cities of Tomorrow: An Intellectual History of Urban Planning and Design in the Twentieth Century by Peter Geoffrey Hall (1996 Updated Edition)

15PSEVC201 **SUSTAINABLE CITIES**

COURSE OBJECTIVES

To enable the students to

- Know how technology is shaping transportation, energy, urban resilience, and more

The urban opportunity - Cities: cultural and social transformation - Challenge of urban politics, planning and governance - Urban research methods - Urban theory and history - Understanding urban systems - Municipal, regional and national governance -Urban utilities -Urban public finance and taxation Law, order and conflict -Land management and planning - urban poverty - Measuring urban poverty - Poverty reduction in cities - Affordable and adequate housing -Safety and violence - Urban vulnerabilities- City production and consumption- Migration and the refugee crisis- Improving human development in cities –Providing universal urban services and infrastructure Sustainable environmental services and infrastructure - Sustainable transport planning

Sustainable urban energy systems

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- examines how urban sustainability can be delivered with increasing productivity and reduced inequality

TEXT BOOKS

1. Local Planning: Contemporary Principles and Practice Edited by Gary Hack, et al. (2009)

REFERENCES

1. Cities of Tomorrow: An Intellectual History of Urban Planning and Design in the Twentieth Century by Peter Geoffrey Hall (1996 Updated Edition)

15PSEVC301 LIMITE STATE DESIGN OF STEEL STRUCTURES

COURSE OBJECTIVES

To enable the students to

- Understand how to design steel connections for any combination of axial, shear, and moment loads is fundamental to effective building design.

Bolted Connections Review bolted connection basics including force transfer mechanisms, bolt shear and bearing, and slip critical connections- Welded Connections Review welded connection basics including types of welding, AISC360 provisions for fillet welds, and weld limit states. Eccentrically Loaded Bolts – Elastic Method - Introduce eccentrically loaded connections and detail the elastic design method for eccentrically loaded bolt groups. Eccentrically Loaded Bolts – Ultimate Strength Methods

Introduce the ultimate strength method for eccentric design and contrast it to the elastic method. Develop design tools to calculate the strength of an eccentrically loaded bolted connection.

Eccentrically Loaded Welds – Elastic Method

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply the design concepts in realistic design scenarios.

TEXT BOOKS

1. Arya A. S., Ajmani J. L., Design of Steel Structures, Nemchand and Bros.

REFERENCES

1. Subramaniam N., Design of Steel Structures, Oxford University Press

15PSEVC401 STRUCTURAL ENGINEERING OPTIMIZATION

COURSE OBJECTIVES

To enable the students to

- understand the theory of optimization methods and algorithms developed for solving various types of optimization problems.

Introduction to Optimization: Introduction - Historical developments – Engineering applications of Optimization - Statement of an Optimization problem - Classification of Optimization problems - Optimization Techniques. Optimization by calculus: Introduction - Unconstrained functions of a single variable - Problems involving simple constraints - Unconstrained functions of several variables - treatment of equality constraints – Extension to multiple equality constraints - Optimization with inequality constraints - The generalized Newton-Raphson method. Network Analysis: Introduction - Elementary graph theory - Network variables and problem types - Minimum-cost route - Network capacity problems - Modification of the directional sense of the network - Application of Optimization techniques to trusses, Beams and Frames.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- formulate optimization models for a wide range of civil engineering problems and able to solve them.

TEXT BOOKS

1. Optimization: Theory and Applications by S.S.Rao. New Age International (p) Ltd

REFERENCES

1. Numerical Optimization Techniques for Engineering Design with applications by G.N.Vanderplaats 2007.

15BAVC101 ENHANCING SOFT SKILLS

COURSE OBJECTIVES

To enable the students to

- Familiarise with the ways and means by which soft skills can be utilized in the day to day life
- Gain the ability to face the everyday challenges of life with confidence
- Develop the ability to showcase ones skills in a creative manner

1.	Introduction to Soft Skills	2
2.	Importance of Soft Skills	2
3.	Understanding Oneself	2
4.	Self Motivation	2
5.	Creative Innovative Thinking	2
6.	Problem Management	2
7.	Time Management	2
8.	Decisiveness	2
9.	Flexibility	2
10.	Stress and emotion management	2
11.	Leadership	2
12.	Teaming up	2
13.	Communication	2
14.	Negotitation & Conflict Resolution	2

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Showcase their ability to deal with unpleasant situations
- Identify and display ones leadership skills via good people management
- Become an outstanding personality in the social and work environment by skillfully maneuvering individual emotions

TEXT BOOKS

1. "communication and soft skill development (first edition)" by career publications and Ashwini Deshpande

REFERENCES

1. "Successful Career Soft Skills And Business English Personality Development And Career Path" by Varanasi Bhaskara Rao and Y Kameswari

15BAVC201 CENTRE FOR RURAL DEVELOPMENT

COURSE OBJECTIVES

To enable the students to

- Understand climate change
- Adaptation for Sustainable rural livelihoods
- Climate Change and Adaptation Planning

Unit I Sustainable Rural Livelihoods Concept of Sustainable Rural Livelihoods (SRL) –Objectives – Strategies –Issues-Natural Resources conservation and SRL – Sustainable Crop Production – Indigenous Animals Breeding – Health & Nutrition – Income generation. 6

Unit II Climate Change(15 Hours) Climate Change – Components – Natural Resources Management(NRM) – Water Resources – Land Resources – Forest Conservation – Joint Forest Management (JFM) – Watershed Management – Eco-environmental Sustainability – Conservation of Local Water Bodies – Kudimaramathu System – Rainwater Harvesting – Indigenous Methods & Techniques.

6

Unit III Earth Sciences and Natural Resources Earth Sciences and Natural Resources – Water Table – Ground Water Recharging Structures – Natural Vegetation – Geospatial technology – GIS – Geo-informatics – Geo-morphology – ISRO and Rural Development – RESPOND Projects – Remote sensing – Resource Mapping – Types, Methods & Techniques. Faculty of Arts Department of Population Studies 56

6

Unit IV Adaptation Techniques Adaptation Techniques – Concepts – Weather Crop Advisory Services (WCAS) – Livestock Advisory – Vermicompost – Soil Resources Development – Tree Based Nursery & Cropping – Organic – fertilizers & Pesticides:- Production & Usage Zero Tillage – Direct Seeded Rice – Crop Intensification – Solar pumped Irrigation. 6

Unit V Climate Change and Adaptation Planning Climate Change Adaptation Planning – Technology & Knowledge Management – Village Tool Bank – Community Managed crop Production & Resource Conservation: Approaches and adaptation package – Exposure Visit and Observation - Applications and Present Trends- Thoughts- Ideas Sharing – Community based Initiatives- Results and Impact. 6

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- will be able to work in Climate Change related Projects
- can get the complete information on natural Resources
- analysis the adaptation techniques in business

TEXT BOOKS

1. Regina et.al, (2019) The Global Environment: Institutions, Law and Policy, Sage Publications

REFERENCES

1. Goleman, D. (1998). *Working with emotional intelligence*. New York: Bantam.

15BAVC301 INDUSTRIAL RELATIONS

COURSE OBJECTIVES

To enable the students to

- explore the basic concepts and issues related to Industrial Relations.
- gain conceptual understanding of Industrial Disputes and Collective Bargaining.
- familiarise with the legal principles governing the welfare of employees

UNIT I INDUSTRIAL RELATIONS AND TRADE UNION 8

Overview and Concept of Industrial Relations, Objectives, Importance, scope & Evolution of IR in India – Factors affecting

UNIT II INDUSTRIAL CONFLICTS & COLLECTIVE BARGAINING 4

Industrial Disputes: Impact, Causes - Strikes: Types, Prevention of Strikes - Dispute Settlement Machinery: Conciliation, Conciliation Officer and Conciliation Board, Conciliation Procedure – Arbitration: Concept, Types, Qualification of Arbitrator, and Procedure

UNIT III LABOUR WELFARE 6

Labour Welfare: Concept, Importance, Approaches, Scope – Labour Welfare Facilities under Welfare Funds – Labour Welfare Officer: Duties - Worker's Education: Concept, Objectives, and Workers Education in India.

UNIT IV INDUSTRIAL SAFETY 6

Causes of Accidents-Prevention-Safety Provisions-Industrial Hazards and Hygiene-Importance-Problems-Occupational Hazards-Disease-Psychological Problems-Counseling-Statutory provisions.

UNIT V 6

WORKER'S PARTICIPATION IN MANAGEMENT Worker's Participation in Management – Concept, Objective – Forms of participation – Levels of participation – Evaluation of Worker's Participation in Management Scheme – Conditions necessary for effective working of the scheme

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- acquire knowledge on various aspects of Industrial Relations and Trade Union.
- analyse the causes for Industrial conflicts and the need for Collective Bargaining.
- evaluate the impact of providing labor welfare facilities on employee productivity.

TEXT BOOKS

1. Mamoria C.B, Satish Mamoria & Subba Rao P, Dynamics of Industrial Relations, Himalaya Publishing House, 16th Edition, Mumbai, 2016.

2. Sarma A. M, Aspects of Labour

REFERENCES

2. Sarma A. M, Aspects of Labour

15BAVC401 PRODUCT BRANDING

COURSE OBJECTIVES

To enable the students to

- Know about the business brand
- Enhance the delivering self marketing
- Know the techniques of self building the products

1. Effective Branding 4
2. approach to product branding 4
3. Branding Strategy used in the product market 4
4. advertisement industry teach you about designing your product brand 4
5. Delivering Self-Marketing 4
6. Product life cycle 4
7. Product branding in the industrial production 3
8. Techniques used in to build the product brand 3

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Analyse the branding of the products
- Develop the product life cycle
- Analyse the design of the products

TEXT BOOKS

3. Start With Why

REFERENCES

3. Power Branding

15CAVC101 APPLICATION OF ASP.NET

COURSE OBJECTIVES

To enable the students to

- understand about the concept of Web technology
- be familiar with creating of database using ADO.NET.
- study about ASP.NET

UNIT I Introduction

Introductions, course mechanics, .NET Overview, CLR, Assemblies (monolithic vs. component-based applications), Execution Model, Client-Side vs. Server-Side Programming, Web Technologies. Development Environment Setup, ISS, SQL Server and Visual Studio, Advanced C#: OOP, Delegates, Events, Attributes, unsafe code, .NET Interop

UNIT II NET Framework

NET Framework Class Library (FCL): System, Collections, I/O, Networking, Threading, Transactions, Exceptions. Databases and Data Access using ADO.NET & LINQ.

UNIT III ASP.NET

Introduction to ASP.NET, programming model, server controls, data binding-ASP.NET state management, tracing, caching, error handling, security, deployment, user and custom controls, DotNetNuke. Exposing and consuming ASP.NET Web Services, XML, RESTful, SOAP, DISCO, UDDI

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- understand the concept of Web technology
- implement creating of database using ADO.NET
- analyse about ASP.NET

TEXT BOOKS

1. Trueman's UGC NET/SET General Paper I" M. Gagan, Sajit Kumar

REFERENCES

1. **"**Functional Concurrency in .net: With Examples in C# and F#" by Riccardo Terrell
2. "Dot Net Technology" by Damini Grover

15CAVC201 MULTIMEDIA AND PHOTOSHOP

COURSE OBJECTIVES

To enable the students to

- understand about Animation and special effects
- know about digital photography
- understand about various concept of photoshop

UNIT I Introduction to Multimedia

Multimedia Hardware- Software. Desktop publishing, Multimedia Animation & Special effects (2D/3D animation). Social Networking & Publishing (Blogging, Facebook, Youtube, Instagram etc.) Content Distribution Systems (CD/DVD, Internet, Radio, Television)

UNIT II Art & Science of Multimedia

Audio fundamentals (Audio quality, formats and devices), Understanding Image and Video (Resolution, Color, Video standards, formats). Film and Digital photography (technology, techniques, composition & lighting etc.). Introduction to Printing technology

UNIT III Photoshop

Introduction Vector Shapes and Bitmaps - Explore the Photoshop Environment - Using the File Browser Basic Photo Corrections Working with Selections - Layer Basics - Masks and Channels - Retouching and Repairing .Painting and Editing Basic Pen Tool Techniques - Vector Masks, Paths, and Shapes - Advanced Layer Techniques .Creating Special Effects Preparing Images for Two-Color Printing - Composite Images - Creating a Composite Image Creating an Animated GIF -Creating Composite Images Using Photo merge Unit 5: The Finished Product Saving Images for the Web and Creating a Web Gallery - Photoshop Elements Print Options

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- explain about Animation and special effects
- identify about digital photography
- implement various concept of photoshop

TEXT BOOKS

1. Fundamentals of Computer Graphics Paperback – 12 December 2015 by Marschner

REFERENCES

1. Absolute beginner's guide to mastering Photoshop and creating world class photos (2015), Andrew Mckinnon

15CAVC301 OPEN SOURCE SOFTWARES

COURSE OBJECTIVES

To enable the students to

- explain the features of free &open source software and Familiarization with LINUX
- work with PHP
- demonstrate the working of MySQL

UNIT I Open Source Software

Features, advantages over proprietary software, examples**,** Free software**:** concepts, features, Free software Vs Open Source software, Free software movements. Policies, GPL, Free OS, History and Features of Linux, Various flavors of Linux, Linux Kernel and Shell, Graphical Desktops- GNOME, KDE, Linux File System and Directories

UNIT II Forms in PHP

Creating a simple input form, combining HTML & PHP code on a single page, redirecting the user ,creating a send mail form, File upload form Cookies: Introduction, setting a cookie with PHP, deleting a cookie, session function overview: starting a session, working with session variables, passing session IDs in the query string, destroying sessions &unsetting variables

UNIT III Database Concepts

Open source database software: MySQL features MySQL data types: Numeric, date & time, string table creation in MySQL: insert, select, where clause, ordering the result, like operator Selecting Multiple tables: using join, using queries Modifying records: update command, replace command, delete command date & time functions in MySQL Interacting with MySQL using PHP: connecting to MYSQL, Executing queries, Retrieving error messages, inserting data with PHP, retrieving data

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- analyze the features of free &open source software and Familiarization with LINUX
- implement about Work with PHP
- evaluate the working of MySQL

TEXT BOOKS

1. Julie C.Meloni, PHP, MySQL and Apache, Pearson Education

REFERENCES

1. Free/Open Source Software Development Hardcover – Import, 31 July 2004 by Stefan Koch

15GEVC101 GENDER SENSITIZAITON

COURSE OBJECTIVES

To enable the students to

- introduce basic concepts relating to gender and to provide logical understanding of gender roles
- develop gender sensitization and related issues
- enable them to engage in policy decisions to remove gender biases in all fields of life in the process of gender equality for nation building
- trace the evolution of gender studies from women's studies

MODULE 1: Introduction to Women's Studies

Sex and Gender, socialization, Definition, Nature, Scope and various dimensions

MODULE 2: Approaches of Feminism

Feminism and Patriarchy, Feminist ideology, Feminist Movements in brief

MODULE 3: Basic concepts of Gender and Society

Sexual division of Labour, Masculinity & feminity, Man and Woman relationship, Self awareness, consciousness raising

MODULE 4: Women and Law

Constitutional Laws and Fundamental rights, Human Rights, Women related Law,

Women in Politics – PRI.

TOTAL PERIODS 30

COURSE OUTCOMES

Students must gain knowledge on

- The concepts relating to gender and gains the logical understanding of gender roles
- Familiarize the evolution of gender studies from women's studies
- the removal of gender biases in all fields of life in the process of gender equality for nation building
- the evolution of gender studies from women's studies

TEXT BOOKS

1. Gill, Rajesh, Contemporary Indian Urban Society- Ethnicity, Gender and Governance, Bookwell Publishers, New Delhi, 2009
2. Jain, Devaki and Rajput, Pam, (eds), Narratives from the Women's Studies Family, Sage, New Delhi, 2003.

REFERENCES

1. Mies, Maria, Indian Women and Patriarchy, Concept Publishing Company, New Delhi, 2004.
2. Chatterjee, Mohini, Feminism and Gender Equality, Aavishkar, Jaipur,2005

15GEVC201

INTRODUCTION TO INDIAN CONSTITUTION

COURSE OBJECTIVES

To enable the students to

- assimilate and get familiarized with basic information about Indian constitution
- aware of the functional aspects of the local Administration System.
- understand human rights/ values and its implications in their life.

MODULE- 1 : INTRODUCATION ABOUT INDIAN CONSTITUTION

History of Making of the Indian Constitution: History Drafting Committee, (Composition & Working) - Philosophy of the Indian Constitution: Preamble Salient Features.

MODULE 2 - LOCAL ADMINISTRATION

Local Administration: District's Administration head: Role and Importance, Municipalities: Introduction, Mayor and role of Elected Representative, CEO of Municipal Corporation. Pachayati raj: Village level: Role of Elected and Appointed officials,

MODULE 3 - CONSTITUTIONAL RIGHTS & DUTIES

Contours of Constitutional Rights & Duties: Fundamental Rights , Right to Equality, Right to Freedom, Right against Exploitation, Right to Freedom of Religion, Cultural and Educational Rights, Right to Constitutional Remedies, Directive Principles of State Policy, Fundamental Duties.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics
- Familiarize with the various levels of local administration.
- Gain knowledge on election commission of India

TEXT BOOKS

1. Durga Das Basu (DD Basu): "Introduction to the Constitution on India", (Students Edition.) Prentice –Hall EEE, 19th / 20th Edn., (Latest Edition) or 2008.
2. Shubham Singles, Charles E. Haries, and Et al : "Constitution of India and Professional Ethics" byCengage Learning India Private Limited, Latest Edition – 2018
3. Dr. S. N. Busi, Dr. B. R. Ambedkar framing of Indian Constitution, 1st Edition, 2015
4. M. P. Jain, Indian Constitution Law, 7th Edn., Lexis Nexis, 2014.

5. D.D. Basu, Introduction to the Constitution of India, Lexis Nexis, 2015

REFERENCES

1.M.Govindarajan, S.Natarajan, V.S.Senthilkumar, “Engineering Ethics”, Prentice –Hall of India Pvt. Ltd. New Delhi, 200

2. M.V.Pylee, “An Introduction to Constitution of India”, Vikas Publishing, 2002.

3. Latest Publications of NHRC - Indian Institute of Human Rights, New Delhi.

PAAVAI ENGINEERING COLLEGE(AUTONOMOUS)

ACADEMIC YEAR 2016 - 2017

VALUE ADDED COURSE

16AEVC301 **NON DESTRUCTIVE TESTING**

COURSE OBJECTIVES

To enable the students

- gain practical knowledge on conventional NDT techniques
- develop a strong hands on experience for inspecting and evaluating components in accordance with industry specifications.

1. **LIQUID PENETRANT TESTING**

   Introduction

   Equipment &Materials

   Inspection Methods

   Interpretation

   Discontinuities

2. **MAGNETIC PARTICLE TESTING**

   Introduction

   Magnetization Methods

   Magnetization Equipment

   Interpretation

   Discontinuities

3. **ULTRASONIC TESTING**

   Introduction

   Ultrasonic Principle

   Equipment

   Reference Block

   Testing Methods

   Inspection & Evaluation

4. **RADIOGRAPHIC TESTING**

   Principles

   Techniques

   Applications

   Limitations

   Standards and Specifications related to Radiography

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of the course students will be able to

TEXT BOOK & MANUALS

- Baldev Raj, T.Jayakumar, M.Thavasimuthu Practical Non-Destructive Testing, Narosa Publishing House, 2014.
- Ravi Prakash, Non-Destructive Testing Techniques, 1st revised edition, New Age International Publishers, 2010

16AEVC401 COMPUTER AIDED DESIGN CATIA-BASIC

COURSE OBJECTIVE

To enable the students to

- gain strong ground on solid modeling techniques that would enhance the productivity in modeling
- develop the analysis process of mechanical components.
-

INTRODUCTION TO CATIA

Introduction to CATIA-History of CATIA-CATIA modeling process, Parametric design concept, feature based design etc-CATIA Features-SKETCHER-Creating a new part.

SKETCHER WORKBENCH

Basic sketch, Sketch in task environment, Selection tools-Profile, Predefined shapes, Circles, Spline, Conics, Line, Points-Operations, Corner, Chamfer, Relimitation tools-Projections, Transformations-Constraints, Sketch tools, Grid, Snap on grid, Construction-Geometrical constraints, Dimensional constraints., Sketch analysis-Visualization tools, View tool bar, Workbench

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- Learnt advanced solutions for conceptual design, 3D modelling, and documentation.
- Learnt to do product design, industrial design and styling (optimize form, fit, function and user experience), streamline 2D design, drafting, documentation with powerful tools for layout.

TEXT BOOK & MANUALS

- Jonathan M. Weaver, Nader G. Zamani CATIA V5 Tutorials Mechanism Design & Animation Release 20

16AIVC301 AGRICULTURAL INFORMATICS

COURSE OBJECTIVES

To enable the students to

- Acquire a clear understanding of theory and application of Information
- Community technology in various fields and promoting the applications of ICT in Agriculture

Unit I

Introduction to Computers, Anatomy of Computers, Memory Concepts, Units of Memory, Operating System, definition and types, Applications of MS-Office for creating, Editing and Formatting a document, Data presentation, tabulation and graph creation, statistical analysis, mathematical expressions, Database, concepts and types, creating database, uses of DBMS in Agriculture, Internet and World Wide Web (WWW), Concepts, components and creation of web, HTML, XML coding.

Unit II

Computer Programming, General Concepts, Documentation and Program Maintenance, Debugging programs, Errors. Introduction to Visual Basic, Java, Fortran, C/ C++, etc, concepts and standard input/output operations, Variables and Constants, Operators and Expressions, Flow of control, Inbuilt and User defined functions, programming techniques for agriculture. e-Agriculture, concepts, design and development. Application of innovative ways to use information and communication technologies (IT) in Agriculture.ICT for Data Collection, formation of development prorammes, monitoring and evaluation of Programmers.

UNIT III

Models in Agriculture: statistical, weather analysis and crop simulation models, concepts, structure, inputs-outputs files, limitation, advantages and application of models for understanding plant processes, sensitivity, verification, calibration and validation. IT application for computation of water and nutrient requirement of crops, Computer-controlled devices (automated systems) for Agri-input management, Smartphone mobile apps in Agriculture for farm advises, market price, postharvest management etc; Geospatial technology, concepts, techniques, components and uses for generating valuable agri-information. Decision support systems, taxonomy, components, framework, classification and applications in Agriculture, DSS, Agriculture Information/Expert System, Soil Information Systems etc for supporting Farm decisions.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Understanding basic concept of computer.
- Basic concept database, Internet and WWW.
- Use of IT application and different IT tools in Agriculture.

TEXT BOOKS

1. Pradeep K. Sinha and PritiSinha Computer Fundamentals, III edition, BPB Publications, B-14,Connaught Place, New Delhi – 110 001.

REFERENCES

1. 1.P.K. Sinha Computer Fundamentals, BPB Publications, B-14, Connaught Place, New Delhi – 110 001.

16AIVC401 HUMAN RESOURCE MANAGEMENT AND DEVELOPMENT

COURSE OBJECTIVES

To enable the students to

- To achieve the organizational goals by proper utilization of human resources.
- To develop and maintain healthy working relationships among all the employees and to adopt sound, desirable organization structure.
- To integrate individual and group goals within an organization.

UNIT I

Human Resources Management: Definition, Nature, Scope and objectives of HRM, Difference between HRM and PM, Importance of HRM, The changing environment of HRM, The changing role of HRM. HRP / Manpower Planning: Definition, Need HRP, Career Planning and Succession Planning.Job Analysis:Job Terminology, Process of Job Analysis, Job Description, Job Specification.

UNIT II

Human Resource Acquisition: Meaning, Sources, and Process of Recruitment, Meaning, Process Test of Selection, Meaning, Objectives and Types of Interview, Meaning, Purpose, Process and Problems of Induction, Meaning and Problems of Placement.Training and Development: Meaning, Benefits and Process of Training, Methods and Problems of Training, Career Development, Meaning and Techniques of Executive Development.

UNIT III

Performance Appraisal: Nature, Objectives and Methods of Performance Appraisal, Meaning and Types of Promotion, Meaning and Types of Transfers, Meaning of Demotion, Separation, Suspension, Redundancy, Retrenchment, Lay Off, (Meaning only)Wage and Salary Administration: Nature and Purpose, Compensation, Reward, Wage levels and Wage Structures, Minimum, Fair and Living Wage, Basic Kinds of Wage Plan, Ingredients of a Good Wage Plan, Types of Wages, Wage Differentials, Executive Compensation.Rewards and Incentives: Meaning and Features, Types of Rewards, Wage Incentives – Meaning and ObjectivesEmployee Benefits and Service: Terminology and Meaning,
Special Features of Fringe Benefits, Objectives & Classification of Fringe BenefitManagement of Grievances: Meaning, Causes and Needs of Grievance Procedure.Industrial Relations: Definition,
Objectives and Participants in Industrial RelationsResolving .

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- To ensure seamless experience for the staff and other people associated to management and organisational goals.
- To handling employees and acknowledging their requirements for maintaining a positive work culture.

TEXT BOOKS

1. K. Ashwathappa- Human Resource and Personnel ManagementTata McGraw Hill Publishing COLtd.
2. C. B. Mamoria and S. V. Gankar Personnel Management Text & Cases
3. Performance Appraisal, Theory & Practice- AIMA- Vikas Management Series, New Delhi-1986.

REFERENCES

1. Dr. Anjali GhanekarHuman Resource Management.
2. Dr. C. B. Gupta- Sultan and Sons Human Resource Management-.

16CEVC301 BUILDING COST ESTIMATION SIMPLIFIED

COURSE OBJECTIVES

To enable the students to

- gain knowledge on building Estimation
- understand the concepts of preparation of BOQ
- acquire knowledge on the principles of building services

Module I

Introduction to building cost estimation- Measurement procedures - Mensuration – Specifications- Rates – Labour, material, machine.

Module II

Finding quantities from construction drawing –Excavation - Ground work and Foundation - Superstructure- Walls, partitions, floors, roofs- Internal finishes - Doors and windows - Staircases

Module III

General approach to measurements of building services - External work- Bill of quantities – Abstract and BOQ

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply knowledge on calculation of building cost
- prepare BOQ and Abstract
- apply the principles on building services

TEXT BOOKS

1. Estimation and Costing book by M. Chakraborti ,M. Chakraborti publications, 2011

REFERENCES

1. Estimating and Costing in Civil Engineering (Theory and Practice) by B.N.Dutta - 28/Revised Edition 2020

16CEVC401 ADVANCED SOIL MECHANICS

COURSE OBJECTIVES

To enable the students to

- gain knowledge on soil structure and properties
- understand the concepts of stress , strain mechanism of soil
- acquire knowledge on finding stress path in undrained & drained cases

Module I

Introduction to continuum mechanics - Important constitutive relationship -3D to 2D idealization - Mathematical formulation of plane stress, plane strain -Mathematical formulation of axisymmetric conditions

Module II

Basics of shear strength -Stress representation - Shear strength granular soil-Shear strength cohesive soil

Module III

Stress path-triaxial test-drained -Stress path-triaxial test-undrained- Stress path-additional undrained case - Stress path-field cases

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply gained knowledge on finding properties of soil
- calculate the stress & strain path for both drained & undrained cases
- apply acquired knowledge to find stress path in undrained & drained cases

TEXT BOOKS

1. Das, B. M., Advanced Soil Mechanics, Taylor and Francis, 2nd Edition, 1997

REFERENCES

1. Wood, D.M., Soil Behavior and Critical State Soil Mechanics, Cambridge University Press, 1990.

16CEVC501 WATER POLLUTANTS AND ITS TREATMENT

COURSE OBJECTIVES

To enable the students to

- gain knowledge on pollutants in air, land & water
- understand the concepts of water softening & distribution
- learn the design procedure

Module I

Pollutants and their Effects - Air pollution –Land Pollution - Water Pollution - Water Quality-Criteria & Analysis - Water Requirements - Sources and Collection of Water - Overview of Purification and Pre-Treatment - Theory and Design of Sedimentation

Module II

Theory and Design of Filtration - Theory and Design of Disinfection - Water Softening and Specific Treatments- Storage and Distribution Reservoirs

Module III

Hydraulic Considerations and Design - Distribution Network-Analysis and Design- Pumps and Pumping Requirements, Valves and Appurtenances

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply field procedure on testing pollutants
- calculate the water distribution
- manipulate design of distribution network

TEXT BOOKS

1. Water Supply Engineering by Dr. B.C. Punmia, Ashok Kr. Jain and Arun K Jain, 2005

REFERENCES

1. Water Supply and Sanitary Engineering by G. S. Birdie and J. S. Birdie, 2010

16CEVC601 FIRE PROTECTION AND SERVICE MAINTENANCE

COURSE OBJECTIVES

To enable the students to

- gain knowledge on fire protection & service maintenance in building
- understand the concepts lift design , Ad-hoc maintenance
- acquire knowledge on periodic maintenance

Module I

Basic concepts of fire protection – Fire resistance- Introduction process of combustion- Design of fire resistance steel and concrete – Urban Planning

Module II

Introduction to lift design – Design of lift system – Introduction to system & flow system – life cycle cost and basics of building maintenance

Module III

Planning for Building Maintenance – Building inspection & Ad-hoc maintenance- Diagnosis of building by visual survey

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply knowledge on maintenance of building fire protection
- prepare lift design & know Ad-hoc maintenance service
- perform periodic maintenance in building

TEXT BOOKS

1. Fire Protection Handbook (NATIONAL FIRE PROTECTION ASSOCIATION//FIRE PROTECTION HANDBOOK)

REFERENCES

1. Bureau of Indian Standards, " HAND BOOK OF FUNCTIONAL REQUIREMENTS OF BUILDINGS, (SP-41 & SP- 32)", BIS 1987 and 1989.

16CEVC701 ENVIRONMENTAL REMEDIATION OF CONTAMINATED SITES

COURSE OBJECTIVES

To enable the students to

- gain knowledge on laws , regulations & remediation
- understand the risk assessment & remedial options in contaminated sites
- learn the remedial options available

Module I

Introduction - Laws, Regulations and Remediation - Legal Concepts - Types of Law – Regulations – Federal - Laws/Regulations – History – Objectives - Remediation Process - Definition of hazardous waste - Waste Classification - Corrective Action

Module II

Risk Assessment - Steps in Human Health Risk Assessment - Data Collection and Evaluation - Exposure Assessment - Toxicity Assessment - Risk Characterization - Risk Management - Risk Communication - Ecological Risk Assessment

Module III

Remedial Options - Plume Containment - extraction wells- extraction trenches - injection wells/trenches - wells/barriers- Permeable Reactive Barriers

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply gained knowledge on environmental remediation of contaminated sites
- find reclamation solution for contaminated sites
- apply the remedial options to improve contaminated sites

TEXT BOOKS

1. LaGrega, M.D., Buckingham, P.L., Evans, J.C., Hazardous Waste Management, McGraw-Hill, 1994.Haas, C.N

REFERENCES

1. Vamos, R.J., Hazardous and Industrial Waste Treatment, Prentice Hall, Englewood Cliffs, NJ, 1995.

16CEVC801 BITUMEN FOR BETTER ROADS AND INNOVATIVE APPLICATIONS

COURSE OBJECTIVES

To enable the students to

- gain knowledge on type and properties of bitumen for good roads
- understand the quality , health & safety aspects of bitumen
- acquire knowledge on researches in bitumen

Module I

Bitumen market, generalities, the manufacture of bitumen, transport, uses of bitumen, main developments and alternatives

Module II

Constitution, structure and characterization of bitumen - specifications-rheology - Modifications of bitumen and applications (roads, roofing)

Module III

Health, Safety, Environment & Quality concerns regarding bitumen, and examples of research & innovation actions

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply the gained knowledge on application of bitumen
- manipulate quantity of bitumen for roads stretch
- apply new bituminous materials

TEXT BOOKS

1. Advances in Asphalt materials by Shin-Che Huang Hervé Di Benedetto Woodhead Publishing, April 2015

REFERENCES

1. Bituminous Road Construction in India by Prithvi Singh Kandhal , Eatern Economy Edition , 2014

16CSVC301 PROGRAMMING WITH PL/SQL

COURSE OBJECTIVES

To enable the students to

- Describe the features and syntax of PL/SQL
- Describe stored procedures and functions
- Use PL/SQL programming constructs and conditionally control code flow (loops, Control structures, and explicit cursors)

Unit 1

Introduction to PL/SQL-Declaring PL/SQL Identifiers-Interacting with the Oracle Server

Unit 2

Writing Control Structures-Working with Composite Data Types- Explicit Cursors

Unit 3

Handling Exceptions with PL/SQL-Creating Stored Procedures- Stored Functions

Creating Packages-Oracle Supplied Packages in Application Development-Dynamic SQL and Metadata

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Analyze the features and syntax of PL/SQL
- Analyze stored procedures and functions
- Implement PL/SQL programming constructs and conditionally control code flow (loops, Control structures, and explicit cursors)

TEXT BOOKS

1.Oracle PL/SQL Programming, 6th Editionby Steven Feuerstein, Bill Pribyl

REFERENCES

1.Oracle PL/SQL Language Pocket Reference byReleased April 1999 O'Reilly Media, Inc.

16CSVC401 GRAPHIC DESIGNING

COURSE OBJECTIVES

To enable the students to

- To learn about Drawing and Shaping objects
- To understand about corelDRAW
- To learn about working with Bitmaps

Unit I

Introduction to CorelDRAW: Getting Started - Moving Around and Viewing Drawings - Basic Drawing Skills Selecting and Manipulating Objects - Drawing and Shaping Objects - Arranging Objects . **Using Text** : Working With Text - Working With Objects - Outlining and Filling Objects - Using Symbols and Clipart - Transforming Objects

Unit II

Adding Special Effects Special Effects - Creating Output - Exporting Drawings - Printing Customizing CorelDRAW Introduction - Customizing Options - Using Text and Color - Working With Color - Working With Paragraph Text - Special Text Effects - Layouts and Layers - Special Page Layouts - Arranging Objects - Using Layer

Unit III

Styles and Templates Using Styles and Templates - Advanced Effects - Special Interactive Effects - Custom Creation Tools - Working With Bitmaps - CorelTRACE and Corel R.A.V.E.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Describe about Drawing and Shaping objects
- Explore the concepts of corelDRAW
- Implement working with Bitmaps

TEXT BOOKS

1.The Design of Everyday Things: Revised and Expanded Edition Paperback – Illustrated, 5 November 2013

REFERENCES

1.The Graphic Design Reference & Specification Book: Everything Graphic Designers Need to Know Every Day Paperback – 1 September 2013

16CSVC501 **ANGULAR J S**

COURSE OBJECTIVES

To enable the students to

- To understand about HTML tags.
- To learn about concept of CSS
- To understand about Javascript

Module 1: Introduction to HTML

- HTML Basics, Elements, Attributes, Styles
- Forms, Form Elements, Input Element Types
- Input Attributes, File Paths, Script tag
- HTML &XHTML

Module 2: Introduction to CSS

- CSS Introduction, Syntax, Selectors, Styling
- Pseudo class, Pseudo Elements
- CSS Tables, CSS Box Models
- CSS Opacity, CSS Navigation Bar, Dropdowns

Module 3: Introduction to JavaScript

- JavaScript Statements, Keywords, Functions
- JavaScript Programs, Operators, Functions
- Function Parameters, Function Return Types
- Data Types, Primitive Types

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Implement the HTML tags.
- Analyze the concept of CSS
- Demonstrate about Javascript

TEXT BOOKS

1.Angular: From Theory To Practice: Build the web applications of tomorrow using the Angular web framework from Google. Kindle Edition

REFERENCES

1. Angular Projects: Build nine real-world applications from scratch using Angular 8 and TypeScript Kindle Edition

16CSVC601 ARDUINO PROGRAMMING

COURSE OBJECTIVES

To enable the students to

- To understand about Embedded system.
- To learn about Concept of digital and analog ports
- To Understand about basic concepts of arduino

Module1 Introduction

- Introduction to embedded system
- Understanding Embedded System
- Overview of basic electronics and digital electronics.
- Microcontroller vs. Microprocessor
- Common features of Microcontroller.
- Comparison between the two
- Different types of microcontrollers.

Module2 Getting Started with Arduino

- Introduction to Arduino
- Pin configuration and architecture.
- Device and platform features.
- Concept of digital and analog ports.
- Familiarizing with Arduino Interfacing Board
- Introduction to Embedded C and Arduino platform

Module3 Review of Basic Concepts

- Arduino data types
- Variables and constants
- Operators
- Control Statements
- Arrays
- Functions

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Design and implement Embedded system.
- Implement the Concept of digital and analog ports
- Analyze about basic concepts of arduino

TEXT BOOKS

1.Exploring Arduino: Tools and Techniques for Engineering Wizardry 1st Edition.

REFERENCES

1.Beginning C for Arduino, Second Edition: Learn C Programming for the Arduino Paperback – July 1, 2015

16CSVC701 **VISUAL BASICS**

COURSE OBJECTIVES

To enable the students to

- To understand about the concept of NET Framework
- To be familiar with creating of database using VB.NET.
- To study about VB Language

UNIT I

Introduction to VB.NET: Event Driven Programming, NET as better Programming Platform, NET Framework, NET Architecture, The Just-In-Time Compiler, NET Framework class library

UNIT II

VB.NET Development Environment: Creating Applications, Building Projects, Using simple components, Running VB.NET applications

UNIT III

Mastering VB Language: Data, Operators, Conditionals and Loops, Procedures, Error Handling, Classes and Objects.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Implement the concept of NET Framework
- Implement creating of database using VB.NET.
- Analyze the concept of VB Language

TEXT BOOKS

1.Introduction: Visual BASIC 6.0, Gary Haggard, Wade Hutchison, Christy Shibata, Steven Holzner, Lou Tylee, Bookboon (2012)

REFERENCES

1.Learn Visual Basic 6.0, Lou Tylee, Carfield

16CSVC801 **RUBY**

COURSE OBJECTIVES

To enable the students to

- Obtain a working level of skills required for a Junior Developer
- Practice attention to detail
- Documentation skills

Module 1

- Syllabus / Introduction to the course
- Pivotal Tracker Intro
- Build your Brand
- Setup a Blog
- Agile Intro
- Git 101 / 102
- Learn Command Line homework

Module 2

- Mentorship Intro
- Pair Programming
- Learn Ruby homework

Module 3

- Numbers, Letters and Variables
- Methods and Flow Control
- Methods and Recursion
- Arrays

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Understand a working level of skills required for a Junior Developer
- Implement Practice attention to detail
- Analyze Documentation skills

TEXT BOOKS

1. Beginning Ruby: From Novice to Professional (3rd Edition)

REFERENCES

1. Programming Ruby 1.9 & 2.0: The Pragmatic Programmers' Guide (4th Edition) by Dave Thomas

16ECVC301 **TROUBLE SHOOTING OF COMPUTER SYSTEMS**

COURSE OBJECTIVE

To enable the students to

- study the fundamentals of hardware, handling and testing
- learn trouble shooting of personal computer problems

Unit I Computer System Fundamental **15**

Microcomputer fundamentals, system architecture and construction, PC expansion buses, semiconductor memory, serial communication ports, hard disk drives, displays, viruses

Unit II Trouble shooting **15**

PC maintenance, troubleshooting PC problem, repairing software problems.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- testing and troubleshooting of personal computer problems
- repair problems of Desktop/Laptop.

TEXT BOOK & MANUALS

1. "PC trouble shooting" Howard Andersone & Mike Tooley, Newnes, 2nd edition, 2003.
2. "PC trouble shooting and maintenance guide", Hewlett-Packard Development Company, 2006.

16ECVC401 CONVERSION OF METERS

COURSE OBJECTIVE

To enable the students to

- know the necessity of different measuring Meters and their basic principle
- understand the working principle of different measuring instruments and technical solutions to handle different errors.

UNIT I BASIS STANDARDS OF METERS 15

Unit & dimensions, standards, Errors, Characteristics of Instruments and measurement system, basics of statistical, analysis. PMMC instrument, DC ammeter, DC voltmeter, Ohm meter, Moving Iron instrument, Electrodynamic Wattmeter, errors and remedies, Three Phase Wattmeter, Power in three phase system, Energy meter.

UNIT II MEASUREMENT OF PARAMETERS AND DIGITAL MEASUREMENT 15

Different methods of measuring low, medium and high resistances**,** measurement of inductance & capacitance with the help of AC Bridges- Wheatstone, Kelvin, Maxwell, Hay's, Anderson, Owen, Campbell, Schering, Wien bridges, Wagner Earthing device, Q Meter. Concept of digital measurement, Digital voltmeter, Frequency meter, Power Analyzer, Electronic, and phase Multimeter. CRT, time base, dual trace oscilloscope, Measurement, of voltage, frequency by CRO, Sampling Oscilloscope, DSO and DSO applications.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- learn units, dimensions, standards and errors and basics of different types of measuring instruments to measure different electrical quantities
- measure different electrical parameters using conventional bridges and acquire data through digital measuring instruments and interpret the data.

TEXT BOOK & MANUALS

1. W. Golding & F.C. Widdis, "Electrical Measurement &Measuring Instrument", A.W.Wheeler& Co. Pvt.Ltd. India.
2. K. Sawhney,"Electrical & Electronic Measurement & Instrument", Dhanpat Rai & Sons

16ECVC501 **WEB TECHNOLOGY**

COURSE OBJECTIVE

To enable the students to

- learn server-side programming using servlets and JSP.
- understand about client-server communication and protocols used during communication

Unit-I Style Sheets **15**

CSS-Introduction to Cascading Style Sheets-Features-Core Syntax-Style Sheets and HTML Style Rule Cascading and Inheritance-Text Properties-Box Model Normal Flow Box Layout-Beyond the Normal Flow-Other Properties-Case Study.

Unit II – JavaScript **15**

The JavaScript Language-History and Versions Introduction JavaScript in Perspective-Syntax Variables and Data Types-Statements-Operators- Literals-Functions-Objects-Arrays-Built-in Objects-JavaScript Debuggers.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- enough knowledge about what are the technologies used in internet.
- capability to make own web site and host their own web site on internet.

TEXT BOOK

1. Jeffrey C.Jackson, "Web Technologies--A Computer Science Perspective", PearsonEducation, 2006

16ECVC601 **GPS TECHNOLOGY**

COURSE OBJECTIVE

To enable the students to

- define the creation of the GPS modulated carrier wave.
- discuss the practical applications of GPS and the implications of its modernization

Unit I - GPS Signal structure **15**

Carriers, GPS codes: C/A, P, navigational message, GPS receiver: Types and Structure of receivers, Principles of GPS position fixing: Pseudo ranging**.** GPS observables

Unit II – **GPS Orbits:** **15**

Determination of GPS satellite coordinates, Types of ephemerides, GPS data formats: RINEX, SP3. GPS codes on signals, Describe the orbital bias.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- explain the uses of real-time kinematic GPS and DGPS
- recognize GPS Modernization

TEXT BOOK

1. J. V. Sickle, 2001. GPS for Land Surveyors Publisher: Ann Arbor Press, Michigan(USA),

16ECVC701 SCOPE FOR VARIOUS SIMULATION TECHNIQUES

COURSE OBJECTIVE

To enable the students to

- understand Computer simulation of physical systems.
- understand physical dynamics of unknown entities.

Unit I Introduction Computer simulations 15

Computer simulation of physical systems, function Simulate *(*Starting State; Starting Time; Boundary Conditions, Termination Condition*)*, Simulation: challenges in automated systems, The challenge of finding an appropriate modelling approach, The challenge of discretizing time, The challenge of discontinuous dynamics, The challenge of choosing an idealization.

Unit II Limits to simulation 15

The physical dynamics of unknown entities, the challenge of irrelevant information, the challenge of range of scales. Interpolation between two states at two different times, Inferring the shape of an object from its physical behaviour, Inferring the physical properties of an object from its physical behaviour. The challenge of the frame problem, the challenge of using common sense to check simulations.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- simulation is effective for automated physical reasoning when the task is prediction.
- probabilistic simulation can be effective when a plausible probability distribution can be posited.

TEXT BOOK & MANUALS

1. Banks, J., Ed. (1998), Handbook of Simulation: Principles, Methodology, Advances, Applications, and Practice, John Wiley & Sons, New York, NY.
2. Banks, J., J.S. Carson, B.L. Nelson, and D.M. Nicol (2005), Discrete-Event System Simulation, Fourth Edition, Prentice-Hall, Upper Saddle River, NJ.

16ECVC801 **REMOTE SENSING**

COURSE OBJECTIVE

To enable the students to

- provide an exposure to various sensors, sensing and scanning techniques available in remote sensing.
- provide an exposure to various image interpretation techniques

Unit I Characteristics of Sensors **15**

Sensors –types and their characteristics, across track (whiskbroom) and along track (push broom) scanning, Optical mechanical scanners –MSS, TM, LISS, WiFi, PAN-Concept of resolution –spatial, spectral, temporal, radiometric, Basic concept and principles of thermal, microwave and hyperspectral sensing.

Unit II Image interpretation of Sensor **15**

Basic principles, types, steps and elements of image interpretation, Techniques of visual interpretation and interpretation keys, Multidate, multispectral and multidisciplinary concepts, Instruments for visual interpretation

TOTAL PERIODS **30**

COURSE OUTCOMES

Upon completion of this course, the students would have

- recognize the sensing and scanning techniques
- understand the image interpretation techniques employed in remote sensing

TEXT BOOK & MANUALS

1. Campbell, J.B., “Introduction to Remote Sensing”, Taylor Publications, 2002.
2. Lillesand,T.M., Kiefer, R.W. and J.W.Chipman. “Remote Sensing and Image Interpretation” 5th Edition., John Willey and Sons Asia Pvt. Ltd., New Delhi, 2004

16EEVC301 ANTENNA DESIGN USING HFSS

COURSE OBJECTIVES

To enable the students to

- To know the fundamentals of the antenna.
- Understand the arrays of the antenna.
- To know the fundamentals of the HFSS

UNIT I FUNDAMENTALS OF ANTENNA 10

Fundamental Theory of antenna: Reciprocity theorem, antenna equivalent circuit, Classification f antennas, Special types of antennas for different frequency bands. Antenna Parameters: Radiation Impedance, Radiation Pattern, Antenna Impedance, Bandwidth, Directivity, Gain, Antenna efficiency, Radiation Efficiency, Antenna Polarization, Antenna Apertures, Antenna temperature ,near-field and far-field concepts, and radiation mechanism.

UNIT II ANTENNA ARRAYS 10

Two-Element Array N-Element Linear Array: Uniform Amplitude and Spacing N Element Linear Array: Directivity Design Procedure, N Element Linear Array: Three-Dimensional Characteristics, Rectangular-to-Polar Graphical Solution, N-Element Linear Array: Uniform Spacing, Non uniform, Binomial Array Amplitude, Planar and Circular Arrays.

UNIT III INTRODUCTION TO HFSS 10

The mathematical method used by HFSS, The adaptive solution process and its importance to HFSS, The Six Balanis C.A, "Antenna Theory", 2nd Edition, Wiley, 2003Kyohei Fujimoto, Koichi Ito, Antennas for Small Mobile Terminals,ArtechHouse,2018general steps in HFSS simulation, The three solution types in HFSS, available boundaries with in HFSS, Excitation in HFSS, HFSS Solution setup, HFSS Post Processing

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Fundamentals of the antenna are studied.
- Understood the arrays of the antenna.
- Fundamentals of the HFSS are studied.

TEXT BOOKS

1. Balanis C.A, "Antenna Theory", 2nd Edition, Wiley, 2003Kyohei Fujimoto, Koichi Ito, Antennas for Small Mobile Terminals,ArtechHouse,2018

REFERENCES

1. An Introduction to HFSS: Fundamental Principles, Concepts, and Use, 2013

16EEVC401 COMPUTER NETWORK

COURSE OBJECTIVES

To enable the students to

- To understand the concepts of networking.
- To design a network for a particular application.
- To analyze the performance of the network.

UNIT I INTRODUCTION 10

Introduction to computer networks and the Internet: Application layer: Principles of network applications, The Web and Hyper Text Transfer Protocol, File transfer, Electronic ail, Domain name system, Peer-to-Peer file sharing, Socket programming, Layering concepts.

UNIT II SWITCHING IN NETWORKS 10

Switching in networks: Classification and requirements of switches, a generic switch, Circuit Switching, Time-division switching, Space-division switching, Crossbar switch and evaluation of blocking probability, 2-stage, 3-stage and n-stage networks, Packet switching, Blocking in packet switches, Three generations of packet switches, switch fabric, Buffering, Multicasting, Statistical .

UNIT III MULTIPLEXING 10

Transport layer: Connectionless transport - User Datagram Protocol, Connection- oriented transport – Transmission Control Protocol, Remote Procedure Call.

Congestion Control and Resource Allocation: Issues in Resource Allocation, Queuing Disciplines.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Understand the concepts of networking thoroughly.
- Design a network for a particular application
- Analyze the performance of the network

TEXT BOOKS

1. J.F. Kurose and K. W. Ross, ―Computer Networking – A top down approach featuring the Internet‖, Pearson Education, 5th Edition

REFERENCES

1. Andrew Tanenbaum, ―Computer networks‖, Prentice Hall

16EEVC501 **SCIENTIFIC COMPUTING**

COURSE OBJECTIVES

To enable the students to

- Understand the significance of computing methods, their strengths and application areas.
- To perform the computations on various data using appropriate computation tools.
- To understand the interpolation

UNIT I INTRODUCTION 10

Introduction: Sources of Approximations, Data Error and Computational, Truncation Error and Rounding Error, Absolute Error and Relative Error, Sensitivity and Conditioning, Backward Error Analysis, Stability and Accuracy

UNIT II SYSTEM OF LINER EQUATIONS 10

System of liner equations: Linear Systems, Solving Linear Systems, Gaussian elimination, Pivoting, Gauss-Jordan, Norms and Condition Numbers, Symmetric Positive Definite Systems and Indefinite System, Iterative Methods for Linear Systems

UNIT III INTERPOLATION 10

Interpolation: Purpose for Interpolation, Choice of Interpolating, Function, Polynomial Interpolation, Piecewise Polynomial Interpolation. Numerical Integration And Differentiation: Quadrature Rule, Newton-Cotes Rule, Gaussian Quadrature Rule, Finite Difference Approximation.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Understand the significance of computing methods, their strengths and application areas.
- Perform the computations on various data using appropriate computation tools.
- Interpolation is studied and applied for various applications.

TEXT BOOKS

1. Xin-she Yang (Ed.)., ― Introduction To Computational Mathematics‖ , World Scientific Publishing Co., 2nd Ed., 2008

REFERENCES

1. Kiryanov D. and Kiryanova E., ― Computational Science‖, Infinity Science Press, 1st Ed., 2006

16EEVC601 **TRANSPORT SAFETY**

COURSE OBJECTIVES

To enable the students to

- To provide the students about the various activities/steps to be followed in safe handling the hazardous goods transportation from one location to another location.
- To educate the reasons for the road accident and the roles and responsibilities of a safe Driver and the training needs of the driver.
- To inculcate the culture of safe driving and fuel conservation along with knowing of basic traffic symbols followed throughout the highways.

UNIT I TRANSPORTATION OF HAZARDOUS GOODS 10

Transport emergency card (TREM) – driver training-parking of tankers on the highways speed of the vehicle –warning symbols – design of the tanker lorries -static electricity, responsibilities of driver – inspection and maintenance of vehicles-check list- loading and decanting procedures – communication.

UNIT II ROAD TRANSPORT 10

Introduction – factors for improving safety on roads – causes of accidents due to drivers and pedestrians-design,selection, operation and maintenance of motor trucks, preventive maintenance-check lists, motor vehicles act – motor vehicle insurance and surveys.

UNIT III DRIVER AND SAFETY 10

Driver safety programme – selection of drivers – driver training-tachograph-driving test, driver's responsibility-accident reporting and investigation procedures-fleet accident frequency-safe driving incentives- slogans in driver cabin-motor vehicle transport workers act- driver relaxation and rest pauses – speed and fuel conservation – emergency planning and Hazmat codes.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Know various safety activities undertaken in transporting of hazardous goods.
- Understand the various symbols which are specific to the road safety and could acquire the knowledge on the importance of Motor Vehicle Act and insurance.
- Apply for the safe driving by proper training aids and the procedure involved in accident investigation and emergency planning.

TEXT BOOKS

1. Pasricha, "Road Safety guide for drivers of heavy vehicle" Nasha Publications, Mumbai, 1999

REFERENCES

1. Kadiyali,"Traffic Engineering and Transport Planning" Khanna Publishers, New Delhi, 1983.

16EEVC701 INDUSTRIAL AUTOMATION

COURSE OBJECTIVES

To enable the students to

- This course produces students who can use their multidisciplinary skills to meet growing demand from an industry that is pushing the limits of technology by exploiting the growing convergence of these fields
- The course aims to provide knowledge on fundamentals of robots, robot programming, and its vision system and apply to demonstrate their knowledge in real time application.
- To identify the appropriate configuration for the application.

UNIT I BASIC CONCEPTS 10

Definition and origin of robotics –different types of robotics–various generations of robots –degrees of freedom – Asimov's laws of robotics – dynamic stabilization of robots.

UNIT II POWER SOURCES AND SENSORS 10

Hydraulic, pneumatic and electric drives–determination of HP of motor and gearing ratio–variable speed arrangements –path determination –micro machines in robotics–machine vision–ranging –laser –acoustic– magnetic, fiber optic and tactile sensors.

UNIT III MANIPULATORS, ACTUATORS AND GRIPPERS 10

Construction of manipulators–manipulator dynamics and force control–electronic and pneumatic manipulator control circuits–end effectors–U various types of grippers–design considerations.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Demonstrate the concepts of robotic principles and various robot configurations.
- Develop solutions for the robot position and orientation for given application.
- Identify the appropriate configuration for the application.

TEXT BOOKS

1. Industrial Robotics (SIE): Technology, Programming and Applications Nicholas Odrey, Mitchell Weiss, Mikell Groover, Roger Nagel, Ashish Dutta , Mcgrawhill, 2012.

REFERENCES

1. Ghosh, Control in Robotics and Automation: Sensor Based Integration, Allied Publishers, Chennai, 1999

16EEVC801 PIC, ARDUINO AND RASBERY PI WITH IOT

COURSE OBJECTIVES

To enable the students to

- explore knowledge on IoT Platform and IO Configurations and Networking of Raspberry Pi
- IoT connectivity using a remote desktop
- Develop and test an IoT weather monitoring station

UNIT I INTRODUCTION TO PIC 10

Introduction to PIC Family of microcontroller - Architecture of PIC controller Developing - Building and Debugging ALP using MPLAB software.

UNIT II INTERNET OF THINGS & ESP8266 10

Architecture of IoT - Application development life cycle in IoT - Esp8266 introduction and programming. Creating HTML webserver: Scanning the available Wi-fi networks - Connecting ESP8266 to Wi-fi Network - Controlling LED via Web Server input.

UNIT III SETTING UP RASPBERRY PI 10

Interfacing digital sensors with raspberry pi – Making raspberry pi as software defined FM transmitter - Raspberry PI interfacing with Arduino – Web cam interfacing HTML Programming: Creating a webpage to control I/O devices - Reading data from sensor and passing to web page.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Develop the simple program on PIC controller
- Accessing Digital sensor via wi-fi with HTML Web server using ESP866
- Build your computer using Raspberry Pi platform

TEXT BOOKS

1. Internet of Things with Raspberry Pi and Arduino By Rajesh Singh, Anita Gehlot, Lovi Raj Gupta, Bhupendra Singh, Mahendra Swain

REFERENCES

1. An Introduction to Programming the Internet of Things (IOT) Specialization, Ian Harris

16MEVC301 ARTIFICIAL INTELLIGENCE

COURSE OBJECTIVES

To enable the students to

- know the basic concept artificial intelligence.
- know the effect artificial intelligence in industry oriented.
- apply AI techniques for different industrial application

1. **Introduction**:

   A brief review of AI history, What is artificial intelligence? , Related research fields , Scope of this course

2. **Production System**

   Production system, Inference engine, Working memory, Knowledge base, Pattern matching,

3. **Ontology**

   What is ontology? , Semantic network, Frame, Structural knowledge, Declarative knowledge, Procedural knowledge.

4. **Fuzzy Logic: Human-like decision making**

   Definition of fuzzy set ,Membership function , Notation of fuzzy set ,Operations of fuzzy set, Fuzzy number and operations , Extension principle , Fuzzy rules , De-fuzzification , Fuzzy control.

5. **Pattern Recognition**

   Concept and concept learning, Pattern classification and recognition. Feature vector representation of patterns. Nearest neighbour based learning. , Discriminant function and decision boundary. Multi-class pattern recognition. , General formulation of machine learning. The k-means algorithm.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Identify the need of AI
- Apply the concepts for automation of industry.
- Apply the various engineering application.

TEXT BOOKS

1. Qiangfu ZHAO and Tatsuo Higuchi, Artificial Intelligence: from fundamentals to intelligent searches, Kyoritsu, 2017, ISBN: 978-4-320-12419-6 (in Japanese)

REFERENCES

1. Introduction to Artificial Intelligence, Shinji Araya, KYORITSU SHUPPAN, ISBN4-320-12116-3

16MEVC401 **ANSYS - I**

COURSE OBJECTIVES

To enable the students to

- learn system requirements and units
- Understand the concepts sketching and part modelling
- familiarize with defining material properties

1 **INTRODUCTION TO CAE**

General working of FEA - Stiffness matrix - Boundary conditions - Elements and Element Shapes - General procedure to conduct FEA.

2 **INTRODUCTION TO ANSYS WORKBENCH**

System requirements - Starting ANSYS Workbench 14.0 - ANSYS Workbench 14.0 GUI - Working on a Project - Units in ANSYS Workbench - ANSYS Workbench Database and File format - Changing the unit system - Components of the system.

3 **SKETCHING AND PART MODELLING IN DESIGN MODELER**

Introduction to Modelling - Introduction to Design Modeler Window - Leaf Spring Section - Gear box housing Section - Air-duct Section

4 **SOLID MODELLING FUNDAMENTALS**

Introduction - Leaf Spring 2D modelling - Gear Box Housing 3D modelling - Air Duct 3D modelling.

5 **DEFINING MATERIAL PROPERTIES**

Introduction to Engineering Workspace - Creating and Adding Materials - Assigning Material to the Beam - Assigning Material to the Clamp - Assigning Material to the Assembly

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Familiarize the requirements and units of ANSYS
- Apply knowledge on sketching and modelling
- Evaluate the material properties.

TEXT BOOKS

1. Jha, N.K. “Handbook of flexible manufacturing systems”, Academic Press Inc., 2010.

REFERENCES

1. Raouf, A. and Ben-Daya, M., Editors, “Flexible manufacturing systems: recent development”, Elsevier Science, 2008.

16MEVC501 AUTOMOBILE DESIGN –I (SOFTWARE BASED PRO-E)

COURSE OBJECTIVES

To enable the students to

- know the basics design procedure of Automobile parts.
- know various kind of commands and order used in particular software.
- write the program to various operations.

1. **BODY SYSTEMS**

   Complete Body-In-White , Floor Pans ,Underbody Assemblies, Door/Hood/Deck Assemblies, Roof Panels

2. **CHASSIS SYSTEMS**

   Cross member Assemblies ,Radiator Supports ,Shock Towers, Engine Cradles, Front and Rear Sub-Frame Assemblies ,Front and Rear Suspension Modules

3. **EXTERIOR SYSTEMS**

   Front and Rear Fascias , Energy Management Systems

4. **VEHICLE ENHANCEMENT PACKAGES**

   Ground Effects, Roof Racks, Running Boards.

5. **INTERIOR SYSTEMS**

   Door module, power closure system, Driver control, Latching system

TOTAL PERIODS 30

COURSE OUTCOMES At the end this course, students will be able to

- Use the Pro-e software to design the various elements in the particular area.
- .Develop the various elements in the automobile structure and assemble to convert as single unit.
- Make different unit in the Automobile structure.

TEXT BOOKS

1 How to Draw Cars Like a Pro, 2nd Edition Thom Taylor and Lisa Hallett

REFERENCES

1. A Century of Automotive Style Michael Lamm and Dave Holls

16MEVC601 INTRODUCTION TO CREO

COURSE OBJECTIVES

To enable the students to

- study the basics of Creo.
- understand the concepts of Sketching and Creating Extrudes, Revolves, and Ribs.
- familiar in Assembling with Constraints.

1 BASIC MODELLING PROCESS

Understanding Solid Modelling Concepts – Feature Based Concepts - Understanding Parametric Concepts and Associative Concepts - Understanding Model-Centric Concepts - Recognizing File Extensions

2 CREATING SKETCHER GEOMETRY

Reviewing Sketcher Theory - Understanding Design Intent - Modifying the Sketcher Display - Utilizing Constraints -Sketching with on the fly constraints -Sketching Lines, Centre lines, Rectangles, Sketching Circles, Arcs, Circular Fillets and Chamfers.

3 CREATING EXTRUDES, REVOLVES, AND RIBS

Creating Solid Extrude Features - Adding Taper to Extrude Feature - Common Dashboard Options: Extrude Depth - Common Dashboard Options: Feature Direction - Common Dashboard Options: Thicken Sketch - Creating Solid Revolve Features - Common Dashboard Options: Revolve Angle - Automatically Adding and Removing Material - Creating Rib Features.

4 ASSEMBLY

Understanding Assembly Theory - Creating New Assembly Models - Understanding Constraint Theory - Understanding Assembly Constraint Status - Assembling Components using the Default Constraint- Automatic- Distance, Angle Offset, Parallel, Coincident, Centred, Tangent.

5 CREATE DRAWING

Analyzing Detail Concepts and Types - Showing and Erasing Detail Items - Cleaning Up Dimensions - Manipulating Dimensions - Creating Driven Dimensions.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- describe the basics and commands in Creo.
- . dimension the modelled components.

- design the part model of different components and assembly

TEXT BOOKS

1. Sham Tickoo, “Creo for Designers”, CADCAM Technologies, 2012.

REFERENCES

1. Henry M. Morris and James M. Wiggert., "Basis of Creo elements", John Wiley & Sons Publications., New York, 2005.

16MEVC701 GREEN ENERGY RESOURCES

COURSE OBJECTIVES

To enable the students to

- concepts of the renewable energy sources like wind, solar, Bio and other renewable energy resources.
- environmental friendly energy production and consumption.
- energy-efficient systems and products for various applications.

1. **Introduction**

   Energy needs of India, classification of energy sources, energy efficiency and energy security, importance of renewable energy resources.

2. **Solar Energy**

   Basic concepts, types of collectors, collection systems, photo voltaic (PV) technology: solar thermal effect, solar cells, characteristics of PV systems, equivalent circuit, and array design

3. **Wind Energy**

   Wind power systems, wind speed and power relation components, turbine types, turbine rating. Choice of generators and site selection

4. **Bio Energy**

   Bio-mass and bio-gas: principles of bioconversion, bio-gas digesters types, gas yield, and combustion characteristics

5. **Other Renewable Energy Resources**

   Geothermal energy, ocean thermal energy, wave energy, Tidal energy, waste to energy, heat to energy, Fuel cells: types and applications.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Provide Environmental friendly energy production and consumption system.
- Design energy-efficient systems and products for various applications

TEXT BOOKS

1. A.Duffie and W.A.Beckmann, Solar Engineering of Thermal Processes-John Wiley.

REFERENCES

1. David Hu. Hand Book of Industrial Energy Conservation, Van Nostrand Co., 1983.

16MEVC801 **CATIA**

COURSE OBJECTIVE

To enable the students to

- gain strong ground on solid modeling techniques that would enhance the productivity in modeling
- develop the analysis process of mechanical components.
-

INTRODUCTION TO CATIA

Introduction to CATIA-History of CATIA-CATIA modeling process, Parametric design concept, feature based design etc-CATIA Features-SKETCHER-Creating a new part.

SKETCHER WORKBENCH

Basic sketch, Sketch in task environment, Selection tools-Profile, Predefined shapes, Circles, Spline, Conics, Line, Points-Operations, Corner, Chamfer, Relimitation tools-Projections, Transformations-Constraints, Sketch tools, Grid, Snap on grid, Construction-Geometrical constraints, Dimensional constraints., Sketch analysis-Visualization tools, View tool bar, Workbench.

TOTAL PERIODS **30**

COURSE OUTCOMES

Upon completion of this course, the students would have

- Learnt advanced solutions for conceptual design, 3D modelling, and documentation.
- Learnt to do product design, industrial design and styling (optimize form, fit, function and user experience), streamline 2D design, drafting, documentation with powerful tools for layout.

TEXT BOOK & MANUALS

- Jonathan M. Weaver, Nader G. Zamani CATIA V5 Tutorials Mechanism Design & Animation Release 20

16MTVC301 **INTRODUCTION TO CATIA**

COURSE OBJECTIVES

To enable the students to

- study the basics of CATIA.
- understand the concepts of part design and assembly.
- familiar in sheet metal design and drafting.

UNIT 1 **BASICS OF CATIA**

CATIA - Design Intent - System Requirements - Getting Started - Understand the CATIA Interface - Workbenches - Menus and Toolbars - Finding Tools -Specification Tree - Compass -Graphic Properties - Message Bar - Document Management.

UNIT 2 **UNDERSTANDING VIEW MANIPULATION**

Fly mode- Fit All In- Pan -Rotate - Zoom In - Zoom Out- Normal View- Multi View- Quick View- View mode- Hide/Show- Swap Visible Space.

UNIT 3 **PROFILE CREATION USING**

Profile - Predefined Profile - Circle - Spline – Conic - Line – Point- Axis.

UNIT 4 **VISUALIZATION**

Cut part by Sketch Plane - 3D Element visualization - 2D Element visualization - Diagnostics - Dimensional Constraints - Geometrical Constraints

UNIT 5 **CONSTRAINTS**

Constraint Creation - Contact Constraint - Fix together - Auto Constraint - Animate Constraint - Edit Multi Constraint.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- describe the basics and commands in CATIA.
- design the part model of different components.
- dimension the modelled components.

TEXT BOOKS

1. Emmett Ross, “CATIA V5: Tips and Tricks”, Create space Independent Pub; 1st edition, 2014

REFERENCES

1. Michel Michaud, “CATIA Core Tools: Computer Aided Three-Dimensional Interactive Application”, McGraw-Hill Education, 2012.

16MTVC401 CREO

COURSE OBJECTIVES

To enable the students to

- study the basics of Creo.
- understand the concepts of Sketching and Creating Extrudes, Revolves, and Ribs.
- familiar in Assembling with Constraints.

UNIT 1 BASIC MODELLING PROCESS

Understanding Solid Modelling Concepts – Feature Based Concepts - Understanding Parametric Concepts and Associative Concepts - Understanding Model-Centric Concepts - Recognizing File Extensions

UNIT 2 CREATING SKETCHER GEOMETRY

Reviewing Sketcher Theory - Understanding Design Intent - Modifying the Sketcher Display - Utilizing Constraints -Sketching with on the fly constraints -Sketching Lines, Centre lines, Rectangles, Sketching Circles, Arcs, Circular Fillets and Chamfers.

UNIT 3 CREATING EXTRUDES, REVOLVES, AND RIBS

Creating Solid Extrude Features - Adding Taper to Extrude Feature - Common Dashboard Options: Extrude Depth - Common Dashboard Options: Feature Direction - Common Dashboard Options: Thicken Sketch - Creating Solid Revolve Features - Common Dashboard Options: Revolve Angle - Automatically Adding and Removing Material - Creating Rib Features.

UNIT 4 ASSEMBLY

Understanding Assembly Theory - Creating New Assembly Models - Understanding Constraint Theory - Understanding Assembly Constraint Status - Assembling Components using the Default Constraint-Automatic- Distance, Angle Offset, Parallel, Coincident, Centred, Tangent.

UNIT 5 CREATE DRAWING

Analyzing Detail Concepts and Types - Showing and Erasing Detail Items - Cleaning Up Dimensions - Manipulating Dimensions - Creating Driven Dimensions.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- describe the basics and commands in Creo.
- dimension the modelled components.

- design the part model of different components and assembly

TEXT BOOKS

1. Sham Tickoo, “Creo for Designers”, CADCAM Technologies, 2012.

REFERENCES

1. Henry M. Morris and James M. Wiggert., "Basis of Creo elements", John Wiley & Sons Publications., New York, 2005.

16MTVC501 INTRODUCTION TO MACHINE LEARNING

COURSE OBJECTIVES

To enable the students to

- Understand the fundamentals of various machine learning algorithms
- gain knowledge on important methods in ANN, Fuzzy and Genetic algorithm
- study the machine learning algorithms for various heuristic and non-heuristic algorithms

UNIT 1 INTRODUCTION

Introduction to learning & classifiers- LDA - ANN - Naive Bayes classifier- decision tree Regression.

UNIT 2 SUPERVISED LEARNING METHODS

Ordinary Least Squares - linear and Logistic Regression- Gaussian process -Stepwise Regression - Multivariate Adaptive Regression Splines (MARS).

UNIT 3 SEMI SUPERVISED LEARNING METHODS

Locally Estimated Scatterplot Smoothing (LOESS) - overview of nearest neighbour - Support vector machines- Temporal difference learning - Q-learning.

UNIT 4 UNSUPERVISED

Expectation -maximization (EM) - Vector quantization, Clustering Fuzzy K & C means algorithm - Density-based spatial clustering of applications with noise (DBSCAN) - Conceptual Clustering- Association rule learning - Apriori algorithm- SVD

UNIT 5 NEURAL NETWORK

Perceptron - Probabilistic Neural Network (PNN) - Back-Propagation (BPN) - Hopfield Network - Self-Organizing Map (SOM).

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Differentiate the basics of supervised and semi supervised learning methods.
- Retrieve the unsupervised and reinforcement learning methods involved in artificial learning
- Interpret the concept of artificial neural networks and their control applications

TEXT BOOKS

1. Ethem Alpaydin, Introduction to Machine Learning, The MIT Press, Cambridge, London.2014.

REFERENCES

1. Simon Haykin, Neural Networks Ã¢?? A comprehensive foundation, Prentice Hall, 3rd Edition, 2004.

16MTVC601 INDUSTRIAL ELECTRONICS

COURSE OBJECTIVES

To enable the students to

- impart students with analysis of converters and inverters
- outline the formal procedures for relays, heating & welding control
- introduce the concept of process control

UNIT 1 CONVERTERS AND INVERTERS

Analysis of controlled and fully controlled converters-Dual converters; Analysis of voltage source and current source- current source and series converters

UNIT 2 DC AND AC MOTOR CONTROL

Method of controlling speed- Basic control circuit-DC motor control- AC motor control

UNIT 3 SERVO AND STEPPER MOTOR CONTROL

Servo motor control- Stepper motor control- micro controller-based speed control – solid state motor control-PLL control of a DC motor control

UNIT 4 RELAYS, HEATING CONTROL

Introduction- principle of relays- electromechanical relay- solid state relays- Latching relays timing relays- Induction heating- dielectric heating

UNIT 5 MOTION CONTROL

Elements of process control- temperature control- Flow control- Level control- Methods of motion control- feedback control- Direct digital control

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- design Analysis of voltage source and current source
- acquire knowledge on the basics about principle of relays
- design the process control of elements

TEXT BOOKS

1. Biswanath Paul- Industrial electronics and control- prentice Hall India publisher-20011.

REFERENCES

1. Terry Baltelt- Industrial electronics, devices, systems and applications- Delmar publishers-2008.

15MTVC701 **ANSYS - II**

COURSE OBJECTIVES

To enable the students to

- learn the concept of Static Structural Analysis
- Understand the concepts Surface and Line Model
- familiarize with thermal analysis.

UNIT 1 **STATIC STRUCTURAL ANALYSIS**

Static Structural Analysis of Cantilever Beam, Plate with a central circular hole, Plate with a square slot, Pressure vessel, Bracket, Clevis assembly.

UNIT 2 **SURFACE AND LINE MODEL**

Introduction - Sheet with circular hole-plane stress - Pressure vessel - Line body model

UNIT 3 **NATURAL FREQUENCIES**

Modal analysis - Gear Box Housing without Prestress - Gear Box Housing with Prestress - Rotor Assembly.

UNIT 4 **BUCKLING LOADS**

Buckling analysis of - Fixed free column (flag pole) - Pinned-pinned column - Built-up structure.

UNIT 5 **THERMAL ANALYSIS**

Important terms used in thermal analysis - Types of thermal analysis - Steady state thermal analysis of - Car Disk Brake Rotor - Heat sink.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Familiarize the requirements of Static Structural Analysis
- Apply knowledge on Surface and Line Model
- Evaluate the various analysis.

TEXT BOOKS

1. Jha, N.K. “Handbook of flexible manufacturing systems”, Academic Press Inc., 2010.

REFERENCES

1. Raouf, A. and Ben-Daya, M., Editors, “Flexible manufacturing systems: recent development”, Elsevier Science, 2008.

16MTVC801 DISRUPTIVE INNOVATION BASED START UP ACTIVITIES

COURSE OBJECTIVES

To enable the students to

- make the participants understand as to how to get along with the task disruption led innovations.
- get the budding young entrepreneurs to do start-ups
- appreciate the structured knowledge of the dynamics of operationalizing creativity-based disruption strategy

UNIT 1 INNOVATION

Creativity linked innovation – Differences between Disruptive & incremental Innovations - Historical, theoretical, and practical evolution of disruptive innovation (DI).

UNIT 2 DISRUPTIVE INNOVATION

Idea generation & communication of creativity leading to DI. Innovation management concepts in DI based entrepreneur generation

UNIT 3 DISRUPTIVE BUSINESS MODEL

How do firms bring in new business models and get new products and services to the market? – Investor preferences in core versus new or disruptive business model.

UNIT 4 MARKET AND STRATEGY

Disruptors and the disrupted frameworks for assessing company's capabilities and rethinking product, market and strategy - Right customers for DI.

UNIT 5 APPLICATIONS

Strategy in a world that is changing so rapidly – Application of disruptive theories to complex problems and opportunities

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Understanding contemporary entrepreneurship as an important career option
- Concept and methodology of creative disruption to viable start-ups
- Events to occur in the building of a technology-based venture for students or working professionals or women with disruptive technology option

TEXT BOOKS

1. Misra R.C and Sanjaykumar Mishra “A HAND BOOK OF START UPS’’ (English), Kanti Prakashan, 2016.

REFERENCES

1. Gupta R. K, “Handbook of entrepreneurship” RPH Editorial Board, 2015.

16CMVC301 ENVIRONMENTAL MANAGEMENT SYSTEM

COURSE OBJECTIVES

To enable the students to learn

- Basic concepts related to Environmental Management system.
- Elements of Legal and other requirements pertaining to the Environment.
- • Requirements to become auditor of Environmental Management System.

INTRODUCTION TO ENVIRONMENTAL MANAGEMENT SYSTEMS Introduction to Environment management system - Definitions and overview of EMS 14001 - Environmental policy - Planning, Structure and features of ISO14001.

LEGAL REQUIREMENTS Environmental aspects and impacts - Legal and other requirements – Environmental act- Biomedical waste -The noise pollution Rules - Manufacture, Storage and Import of Hazardous chemical rules, Hazardous wastes - Air Act 1981 and Water Act 1981.

IMPLEMENTATION AND OPERATION Resources, roles, responsibility and authority-Competence, training and awareness-Communication-Documentation- Control of documents-Emergency preparedness and response Evaluation of compliance - Nonconformity, corrective action and preventive action - Internal audit - Management review

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Get familiarized with the fundamental concepts of Environmental Management Systems and Standards.
- Prepare documents needed for establishing Environmental Management System.
- Conduct EMS Audit and prepare audit report.

TEXT BOOKS

1. ISO 14001-2004 Second edition, Environmental Management Systems – Requirements with guidance for use.

REFERENCES

1. Rao C S, “Environmental Pollution Control Engineering”, New Age International, 2007
2. Dr. Arora K.C. “ISO 9000 to OHSAS 18001”, S. K. Kataria & Sons, 2012.

16CMVC401 SYNTHESIS & APPLICATION OF NANO MATERIALS

COURSE OBJECTIVES

To enable the students to gain knowledge on

- Basic concepts related to fundamentals of nano materials.
- Fabrication of CNT related materials.
- Applications of nano materials in various fields

FUNDAMENTALS OF NANOMATERIALS Scientific Revolutions - Zero, one, two, and three dimensional nanostructures - surface area and aspect ratio - Size and shape dependent optical, emission, mechanical, magnetic, Catalytic and photo catalytic properties.

CHEMICAL & PHYSICAL APPROACHES Sol gel process - Electro spraying and spin coating - SAMs - LB films - epitaxial growth techniques - pulsed laser deposition - Magnetron sputtering – lithography.

CNT FABRICATION Allotropes of Carbon, CNT- Synthesis of CNT- Laser evaporation - carbon arc method - Chemical vapour deposition .

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Understand the knowledge about the properties of nano materials.
- Fabricate carbon nano tube by employing various methods.
- Utilize different nano materials for different applications.

TEXT BOOKS

1. Kamal K. Kar, Carbon Nanotubes: Synthesis, Characterization and Applications, Research publications, Singapore, 1st Edition, 2011

REFERENCES

1. Robert W. Kelsall, Ian W. Hamley, Mark Geoghegan, Nanoscale Science and Technology, John Wiley & Sons, 2005.

16ITVC301 PL/SQL FUNDAMENTALS

COURSE OBJECTIVES

To enable the students to

- Describe the features and syntax of PL/SQL
- Describe stored procedures and functions
- Use PL/SQL programming constructs and conditionally control code flow (loops, Control structures, and explicit cursors)

Unit 1

Introduction to PL/SQL-Declaring PL/SQL Identifiers-Interacting with the Oracle Server

Unit 2

Writing Control Structures-Working with Composite Data Types- Explicit Cursors

Unit 3

Handling Exceptions with PL/SQL-Creating Stored Procedures- Stored Functions

Creating Packages-Oracle Supplied Packages in Application Development-Dynamic SQL and Metadata

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Analyze the features and syntax of PL/SQL
- Analyze stored procedures and functions
- Implement PL/SQL programming constructs and conditionally control code flow (loops, Control structures, and explicit cursors)

TEXT BOOKS

1. Oracle PL/SQL Programming, 6th Editionby Steven Feuerstein, Bill Pribyl

REFERENCES

1. Oracle PL/SQL Language Pocket Reference byReleased April 1999 O'Reilly Media, Inc.

16ITVC401 INTRODUCTION TO CORELDRAW

COURSE OBJECTIVES

To enable the students to

- To learn about Drawing and Shaping objects
- To understand about corelDRAW
- To learn about working with Bitmaps

Unit I

Introduction to CorelDRAW: Getting Started - Moving Around and Viewing Drawings - Basic Drawing Skills Selecting and Manipulating Objects - Drawing and Shaping Objects - Arranging Objects . **Using Text** : Working With Text - Working With Objects - Outlining and Filling Objects - Using Symbols and Clipart - Transforming Objects

Unit II

Adding Special Effects Special Effects - Creating Output - Exporting Drawings - Printing Customizing CorelDRAW Introduction - Customizing Options - Using Text and Color - Working With Color - Working With Paragraph Text - Special Text Effects - Layouts and Layers - Special Page Layouts - Arranging Objects - Using Layer

Unit III

Styles and Templates Using Styles and Templates - Advanced Effects - Special Interactive Effects - Custom Creation Tools - Working With Bitmaps - CorelTRACE and Corel R.A.V.E.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Describe about Drawing and Shaping objects
- Explore the concepts of corelDRAW
- Implement working with Bitmaps

TEXT BOOKS

1.The Design of Everyday Things: Revised and Expanded Edition Paperback – Illustrated, 5 November 2013

REFERENCES

1.The Graphic Design Reference & Specification Book: Everything Graphic Designers Need to Know Every Day Paperback – 1 September 2013

16ITVC501 **ANGULAR J S WITH JAVASCRIPT**

COURSE OBJECTIVES

To enable the students to

- To understand about HTML tags.
- To learn about concept of CSS
- To understand about Javascript

Module 1: Introduction to HTML

- HTML Basics, Elements, Attributes, Styles
- Forms, Form Elements, Input Element Types
- Input Attributes, File Paths, Script tag
- HTML &XHTML

Module 2: Introduction to CSS

- CSS Introduction, Syntax, Selectors, Styling
- Pseudo class, Pseudo Elements
- CSS Tables, CSS Box Models
- CSS Opacity, CSS Navigation Bar, Dropdowns

Module 3: Introduction to JavaScript

- JavaScript Statements, Keywords, Functions
- JavaScript Programs, Operators, Functions
- Function Parameters, Function Return Types
- Data Types, Primitive Types

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Implement the HTML tags.
- Analyze the concept of CSS
- Demonstrate about Javascript

TEXT BOOKS

1. Angular: From Theory To Practice: Build the web applications of tomorrow using the Angular web framework from Google. Kindle Edition

REFERENCES

1. Angular Projects: Build nine real-world applications from scratch using Angular 8 and TypeScript Kindle Edition

16ITVC601 INTRODUCTION TO ARDUINO

COURSE OBJECTIVES

To enable the students to

- To understand about Embedded system.
- To learn about Concept of digital and analog ports
- To Understand about basic concepts of arduino

Module1 Introduction

- Introduction to embedded system
- Understanding Embedded System
- Overview of basic electronics and digital electronics.
- Microcontroller vs. Microprocessor
- Common features of Microcontroller.
- Comparison between the two
- Different types of microcontrollers.

Module2 Getting Started with Arduino

- Introduction to Arduino
- Pin configuration and architecture.
- Device and platform features.
- Concept of digital and analog ports.
- Familiarizing with Arduino Interfacing Board
- Introduction to Embedded C and Arduino platform

Module3 Review of Basic Concepts

- Arduino data types
- Variables and constants
- Operators
- Control Statements

- Arrays
- Functions

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Design and implement Embedded system.
- Implement the Concept of digital and analog ports
- Analyze about basic concepts of arduino

TEXT BOOKS

1. Exploring Arduino: Tools and Techniques for Engineering Wizardry 1st Edition

REFERENCES

1. Beginning C for Arduino, Second Edition: Learn C Programming for the Arduino Paperback – July 1, 2015

16ITVC701 VB.NET

COURSE OBJECTIVES

To enable the students to

- To understand about the concept of NET Framework
- To be familiar with creating of database using VB.NET.
- To study about VB Language

UNIT I

Introduction to VB.NET: Event Driven Programming, NET as better Programming Platform, NET Framework, NET Architecture, The Just-In-Time Compiler, NET Framework class library

UNIT II

VB.NET Development Environment: Creating Applications, Building Projects, Using simple components, Running VB.NET applications

UNIT III

Mastering VB Language: Data, Operators, Conditionals and Loops, Procedures, Error Handling, Classes and Objects.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Implement the concept of NET Framework
- Implement creating of database using VB.NET.
- Analyze the concept of VB Language

TEXT BOOKS

1.Introduction: Visual BASIC 6.0, Gary Haggard, Wade Hutchison, Christy Shibata, Steven Holzner, Lou Tylee, Bookboon (2012)

REFERENCES

1.Learn Visual Basic 6.0, Lou Tylee, Carfield

16ITVC801 **RUBY ON WINDOWS**

COURSE OBJECTIVES

To enable the students to

- Obtain a working level of skills required for a Junior Developer
- Practice attention to detail
- Documentation skills

Module 1

- Syllabus / Introduction to the course
- Pivotal Tracker Intro
- Build your Brand
- Setup a Blog
- Agile Intro
- Git 101 / 102
- Learn Command Line homework

Module 2

- Mentorship Intro
- Pair Programming
- Learn Ruby homework

Module 3

- Numbers, Letters and Variables
- Methods and Flow Control
- Methods and Recursion
- Arrays

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Understand a working level of skills required for a Junior Developer
- Implement Practice attention to detail

- Analyze Documentation skills

TEXT BOOKS

1.Beginning Ruby: From Novice to Professional (3rd Edition)

REFERENCES

1. Programming Ruby 1.9 & 2.0: The Pragmatic Programmers' Guide (4th Edition) by Dave Thomas

16PCOVC101/

16PVLVC101/

16PAEVC101

PEDAGOGY

(Common for M.E. communication Systems/ VLSI Design, Applied Electronics)

COURSE OBJECTIVE

To enable the students to

- give an exposure to the basic concepts, in pedagogy
- provide the key learning theories of pedagogy

Unit I: Basic concepts, in pedagogy **15**

Theories of Teaching, Teaching Strategies, Simulated Teaching, Team Teaching, Models of Teaching, Micro Teaching, Modification of Teacher, Behavior and Interaction Analysis

Unit II: learning theories of pedagogy **15**

Concept Nature Types and Importance, Factors Affecting Learning- Behaviorism and Behavioristic Theories of Learning, Cognitivism and Cognitivist Theories of Learning- Humanism and Humanistic Theories of Learning- Constructivism and Constructivist Learning- Cognition and Learning- learning Strategies

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- know the concepts in pedagogy
- Recognize the key learning theories in pedagogy

TEXT BOOK & MANUALS

1. Hooks, Bell. (2008), Teaching Community: Pedagogy of Hope (TC), Cambridge University Press

16PCOVC201/

16PVLVC201/

16PAEVC201

BASICS OF JOURNAL WRITING

(Common for M.E. communication Systems/VLSI Design, Applied Electronics)

COURSE OBJECTIVE

To enable the students to

- introduce basic concepts in Research
- provide an exposure to Data Collection and Analysis

Unit I Research Methodology **15**

Introduction to Research Methodology, Meaning and importance of Research – Types of Research – Selection and formulation of Research Problem -Research Design –Developing a Research Plan – Exploration, Description, -Diagnosis, Experimentation, -determining Experimental and Sample Designs. -Analysis of Literature Review –Primary and Secondary Sources, -Web sources –critical Literature Review Hypothesis – Different Types

Unit II Data Collection and Analysis **15**

Data Collection and Analysis- Sources of Data – Primary, Secondary and Tertiary – Types of Data – Categorical, nominal & Ordinal. - Methods of Collecting Data: Observation, field investigations, -Direct studies – Reports, Records or Experimental observations. -Sampling methods – Data Processing and Analysis strategies- Graphical representation – Descriptive Analysis – Inferential Analysis- Data Analysis using statistical package – Hypothesis – testing – Generalization and Interpretation – Modeling.

TOTAL PERIODS **30**

COURSE OUTCOMES

Upon completion of this course, the students would have

- understand the basic concepts in Research
- recognize the Data Collection and Analysis methods

TEXT BOOK & MANUALS

1. Garg.B.L., Karadia, R., Agarwal,F. and Agarwal, U.K., 2002. An introduction to Research Methodology, RBSA Publishers.
2. Kothari, C.R.(2008). Research Methodology: Methods and Techniques. Second Edition. New Age International Publishers, New Delhi.
3. Sinha, S.C. and Dhiman, A.K., 2002. Research Methodology, Ess Ess Publications. 2 volumes.

16PCOVC301/

16PVLVC301/

16PAEVC301

STUDY OF RESEARCH FELLOWSHIP

(Common for M.E. communication Systems/ VLSI Design, Applied Electronics)

COURSE OBJECTIVE

To enable the students to

- understand the concept of Research methodology and Research Aptitude.
- understand the designing of Research plan and models.

Unit-I Research aptitude including Research Methodology **15**

Research Methodology with emphasis on Clinical Research Conduct & Monitoring, Good Clinical Practices, Protocol Development, Bio-ethics, Bio-statistics

Unit II – Research design and Plan **15**

Research Design – Need – Features – Inductive, Deductive and Development of models, Developing a Research Plan – Exploration, Description, Diagnosis, Experimentation, Determining Experimental and Sample Designs.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students will be able to

- analyze Research methodology and developing the protocols.
- develop the Research plan and developing the models.

TEXT BOOK & MANUALS

1. Garg, B.L., Karadia, R., Agarwal, F. and Agarwal, U.K., 2002. An introduction to Research Methodology, RBSA Publishers

2. Kothari, C.R., 1990. Research Methodology: Methods and Techniques. New Age International. 418p

16PCEVC101 **WEB VIRTUAL REALITY**

COURSE OBJECTIVES

To enable the students to

- understand the concept everything from the basics of VR- the hardware
- know better about VR- to different applications of VR, the psychology of Virtual Reality, and the challenges of the medium.
- design the evaluate existing VR applications, and design, test, and implement their own VR experiences/games

Module 1: Virtual Reality- Hardware and History

- What is VR and How is it Different from Other Media?
- Displays | CAVE and HMDs
- Head Tracking
- Controllers
- Choosing your VR Device
- HMD | Oculus Rift
- HMD | HTC Vive
- HMD | Sony PlayStation VR

Module 2: VR Applications

- Introduction to the VR Technical Framework
- 360 Video and Model Based VR
- News and Documentary Films
- Scientific Data Visualisation
- Medical Training

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- know the basics of everything from the basics of VR- the hardware
- understand the the psychology of Virtual Reality, and the challenges of the medium.
- know the concept of VR applications, and design, test, and implement their own VR experiences/games.

REFERENCE

- https://www.w3.org/ Virtual_Reality_and_Accessibility_References

16PCEVC201 INTRODUCTION TO MODERN APPLICATION DEVELOPMENT

COURSE OBJECTIVES

To enable the students to

- understand the concept of VR
- know about VR in detail
- understand the concept of VR application

Module 1: Virtual Reality- Hardware and History

- What is VR and How is it Different from Other Media?
- Displays | CAVE and HMDs
- Head Tracking
- Controllers
- Choosing your VR Device
- HMD | Oculus Rift
- HMD | HTC Vive
- HMD | Sony PlayStation VR

Module 2: VR Applications

- Introduction to the VR Technical Framework
- 360 Video and Model Based VR
- News and Documentary Films
- Scientific Data Visualisation
- Medical Training

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Knowledge about VR application.
- Design the VR techniques in real life
- Develop the VR application

REFERENCE

- https://www.imad.tech

16PEDVC101 **MAT LAB AND ITS APPLICATION**

COURSE OBJECTIVES

To enable the students to

- know the basics of MAT LAB
- know how to change data's into matrix form.
- understand how to represent the basic operation and logical operation into MAT LAB codes.

1. **Introduction**

   Basic of MATLAB, Types of Window, Types of File, Basic Operations.

2. **Matrix (Array Design)**

   Matrix Operation, Array Design, Array Operation, Multidimensional Array.

3. **Symbolic Calculation**

   Symbols, Design Formula, Differentiation, Integration, Solve Equation

4. **Operators**

   Arithmetic Operator, Logical, Relational, Example for above operators.

5. **Branch and Loop**

   If statement, If-else statement, Else-if statement, Pause, Break, Continue, Switch-case, try-catch, Return Statement For Loop, While Loop

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Open the MAT LAB window and represent the data into Matrix form.
- Write the code for arithmetic operator and logical operators.
- Write code using if- else, While loop for the give statement.

TEXT BOOKS

1. MATLAB, an Introduction with Applications, Amos Gilat

REFERENCES

1. MATLAB for Beginners: A Gentle Approach, Peter Issa Kattan

16PEDVC201 AUTOMATION ANYWHERE

COURSE OBJECTIVES

To enable the students to

- know the basics of automation.
- know key elements of automation.
- apply the concepts of automation in industry.

1. **Introduction to Robotic Process Automation**

   Introduction to RPA and Use cases – Automation Anywhere Enterprise Platform – Advanced features and capabilities.

2. **Web Control Room**

   Introduction - Features Panel - Dashboard (Home, Bots, Devices, Audit, Workload, Insights) - Features Panel – Activity (View Tasks in Progress and Scheduled Tasks) - Bots (View Bots Uploaded and Credentials)

3. **Coating methods**

   Roll coating, Reverse roll coating, gravure roll coating, Premiered coatings like extrusion coaters Slide or cascade coaters, curtain coaters, cast Coating

4. **Bot Creator**

   Introduction – Recorders – Smart Recorders – Web Recorders – Screen Recorders - Task Editor – Variables - Command Library – Loop Command – Excel Command – Database Command - String Operation Command

5. **Meta Bot and Bot Insight**

   Introduction - MetaBot Designer - MetaBot With AI Sense - Bot Insight - Transactional Analytics - Operational Analytics - Course Key Points.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Identify the need of automation in industry.
- Use basic key elements in appropriate place for automation.
- Design and make the industry in complete automation sector.

TEXT BOOKS

1 Learning Robotic Process Automation: Create Software robots and automate business processes with the leading RPA tool - UiPath: Create Software robots. with the leading RPA tool – UiPath Kindle Edition

REFERENCES

1. Robotic Process Automation A Complete Guide - 2020 Edition Kindle Edition

16PPEVC101 **INVENTORY SYSTEMS ANALYSIS**

COURSE OBJECTIVES

To enable the students to

- analyze the basic concepts of inventory theory.
- understand the different types of deterministic inventory models.
- develop probabilistic inventory models in several aspects.

UNIT I DETERMINISTIC INVENTORY SYSTEM 10

Introduction – Types of Inventory – Costs and factors of inventory – Basics of constrained and unconstrained optimization - Economic Order Quantity (EOQ) model with and without shortages – Economic Production Quantity (EPQ) model with and without shortages.

UNIT II EXTENSIONS OF DETERMINISTIC INVENTORY SYSTEM 10

Multi product Inventory system – Constraints of Inventory system – Inventory model with one and multiple Price Break – Inventory with variable Setup/or Ordering cost - Integrated Procurement Production (IPP) model - EOQ and EPQ model with various demand patterns.

UNIT III PROBABILISTIC INVENTORY SYSTEM 10

Inventory problem with uncertain demand – Forecasting demand - One period inventory problem – Probabilistic scheduling period - Uncertain received quantity model - Probabilistic order level system - Dynamic order quantity – Controllable lead time.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- state the objectives of inventory system and recognize their impact on cost and service.
- use optimization techniques to minimize total inventory system cost in deterministic environment.
- use inventory-theoretic models to design optimal supply chain management.

TEXT BOOKS

1. Nick T Thomopoulos, “Fundamentals of Production, Inventory and the Supply Chain” Atlantic Publishers, New Delhi, 2012.

REFERENCES

1. Max Muller, “Essentials of Inventory Management” Amacom, New York, 2011.

16PPEVC201 **FUNDAMENTALS OF CLOUD SECURITY**

COURSE OBJECTIVES

To enable the students to

- introduce the Cloud Computing Model and Cloud Infrastructure Security
- discuss the threats to data security and identity management
- explore the methods for security management and privacy in cloud Computing

UNIT I CLOUD COMPUTING FUNDAMENTALS, ARCHITECTURE AND RISK ISSUES 10

Fundamentals: Cloud computing – Essential characteristics – Architectural, Technical and Operational Influence architecture: Cloud delivery models (SaaS, PaaS, IaaS) – Cloud Service Providers (Amazon, Google, Azure, Salesforce) – Cloud deployment models (Public, Private, Community, Hybrid) – Benefits. Risk Issues: CIA – Privacy & Compliance Risks .

UNIT I I CLOUD COMPUTING SECURITY CHALLENGES AND ARCHITECTURE 10

Security Challenges: Security policy types – Virtualization Security Management – Virtual Threats – VM Securityrecommendations – VM specific security techniques.Security Architecture: General Issues – Trusted cloud computing – Secure execution environments and communications – Identity management – Access control – Autonomic security.

UNIT I II INFRASTRUCTURE, DATA SECURITY AND IDENTITY MANAGEMENT 10

Infrastructure & Data Security: Network Level – Host Level – Application Level – Data security Mitigation – Provider data and its security.Identity & Access Management (IAM): Trust Boundaries and IAM – IAM Challenges – IAM Architecture and Practice – IAM Standards and Protocols for Cloud Services – IAM Practices in the Cloud – Cloud Authorization Management – Cloud Service Provider IAM Practice

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Design a Cloud Computing Model and Cloud Secure Infrastructure
- Manage the threats to data security and do identity management in Cloud
- Deploy the appropriate methods for security management in cloud computing

TEXT BOOKS

1. Raj Samani, Brian Honan, Jim Reavis and Vladimir Jirasek, "CSA Guide to Cloud Computing Implementing Cloud Privacy and Security", Elsevier, 2015.

REFERENCES

1. Siani Pearson, George Yee (Eds), "Privacy and Security for Cloud Computing", Springer-Verlag 2013.

16PPEVC301 **SENSORS AND SENSING TECHNIQUES**

COURSE OBJECTIVES

To enable the students to

- gain knowledge on the sensor characteristics and the fundamental principles of sensing
- learn the optical components of sensors and characteristics of interface electronic circuits
- get acquainted with motion-related sensors

UNIT I PRINCIPLES OF SENSING 10

Data acquisition – Sensor characteristics: Transfer function – Calibration – Accuracy – Calibration error -Nonlinearity – Saturation – Repeatability – Reliability – Uncertainty. Physical principles of sensing: electric charges, fields, potentials – capacitance – magnetism – resistance – piezoelectric effect – pyroelectric effect – Hall effect – thermoelectric effects – sound waves

UNIT II OPTICAL COMPONENTS AND INTERFACE ELECTRONICS 10

Optical Components of sensors: Radiometry – Photometry – Windows - mirrors – lenses – Fresnel Lenses – fiber optics – concentrators. Interface electronic circuits: Input characteristics – amplifiers – light-to-voltage converters – Excitation circuits – Analog-to-Digital converters – Direct digitization.

UNIT III MOTION RELATED SENSORS 10

Occupancy and motion detectors: Ultrasonic – microwave motion – capacitive occupancy – triboelectric – optoelectronic motion – optical presence sensors – Pressure-gradient sensors. Velocity and acceleration: Accelerometer characteristics – capacitive accelerometers.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Extrapolate the characteristics of sensors by knowing the physical principles of sensors
- Predict the optical components of sensors
- Apply appropriate motion-related sensors

TEXT BOOKS

1. Jacob Fraden, “Handbook of Modern Sensors: Physics, Designs, and Applications”, Fourth Edition, Springer, 2010

REFERENCES

1. John Vetelino and AravindReghu, “Introduction to sensors”, CRC Press, 2011.

16PPSVC101 NANOELECTRONIC DEVICES AND NANOSENSORS

COURSE OBJECTIVES

To enable the students to

- make students to learn the basic concepts of Nano-electronics
- understand the quantum devices
- know the tunneling devices and its uses

UNIT I BASICS OF NANOELECTRONICS AND QUANTUM DEVICES 10

Physical fundamentals – basic information theory – data & bits – data processing - Quantum Electronic devices –Electrons in mesocopic structures – Short channel, MOS Transistor – split Gate Transistor – Electron wavetransistor – Electron spin transistor – Quantum Dot array

UNIT II TUNNELING DEVICES 10

Tunneling element – Tunnel Effect -Tunneling Diode – Resonant Tunneling Diode – Three -Terminal Resonate Tunneling Devices-Technology of RTD-Digital circuits design based on RTDs - Basics Logic Circuits – Single Electron Transistor (SET) – Principle – Coulomb Blockade

UNIT III LIMITS OF INTEGRATED ELECTRONICS AND REPLACEMENT TECHNOLOGIES 10

Survey about the limits- replacement technologies-energy supply and heat dissipation-parameter spread as limitingeffect- limits due to thermal particle motion- reliability as limiting factor-physical limits-final objectives of integrated chips and systems.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- design advanced electronic systems integrated on a miniaturized Silicon chip
- analyze and design a range of devices using relevant mechanical/electrical engineering principles.
- apply the basic Nano-sensor concepts for their applications.

TEXT BOOKS

1. Keith Barnham, DimitriVvedensky, “Low-dimensional semiconductor structures: Fundamentals and device applications”, Cambridge University Press, 2001.

REFERENCES

1. K. Goser, P. Glosekotter and J. Dienstuhl, “Nanoelectronics and Nanosystems: From Transistors to Molecular Quantum Devices”, Springer,2004.

16PPSVC201 **THEORY OF PLASTICITY**

COURSE OBJECTIVES

To enable the students to

- review fundamentals of elasticity theory.
- learn the plastic stress-strain relations and its applications in design
- know the yield criteria for ductile metal

UNIT I FUNDAMENTALS OF ELASTICITY 10

Concept of stress - Stress transformation - Spherical and deviator stress tensors - Equilibrium equations – Octahedral stresses - Concept of strain - deviator and spherical strain tensors - strain transformation laws - Generalized Hooke's law - Compatibility equations - Theories of strength - Problems.

UNIT II PLASTIC DEFORMATION OF METALS 10

Crystalline structure in metals - Mechanism of plastic deformation - Factors affecting plastic deformation – Strain hardening - Recovery, recrystallization and grain growth

UNIT III STRESS STRAIN RELATIONS 10

Introduction - Types of materials - Empirical equations - Theories of plastic flow - Experimental verification of St.Venant's theory of plastic flow - Concept of plastic potential, the maximum work hypothesis and mechanical work for deforming a plastic substance.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- demonstrate the applications of elasticity to field problems
- describe the elastic and plastic behavior from typical stress-strain curves formaterials.
- apply the typical plastic yield criteria and accordingly design the elements.

TEXT BOOKS

1. Chakrabarthy.T.,"Theory of Plasticity",Elsevier Butterworth-Heinemann publications, 2006.

REFERENCES

1. Sadhu Singh, "Theory of Plasticity", Khanna Publishers, New Delhi, 2008.

16PPEVC301 **EVOLUTIONARY COMPUTING**

COURSE OBJECTIVES

To enable the students to

- formulate and assess problems in evolutionary computation.
- assess the strengths and weaknesses of several approaches to evolutionary computation
- analyze various classifier systems

UNIT I EVOLUTIONARY ALGORITHM 10

Evolutionary Algorithm: Introduction – Components of Evolutionary Algorithms -Working of an Evolutionary Algorithm – Evolutionary Computing and Global Optimization – Genetic Algorithms: Representation of Individuals – Mutation – Recombination - Population Models – Parent Selection– Survivor Selection

UNIT II EVOLUTION STRATEGIES AND PROGRAMMING 10

Evolution Strategies : Representation – Uncorrelated Mutation with One Step Size and n Step Sizes– Correlated Mutations – Self-Adaptation – Example: Ackley Function – Subjective Evolution of Colour Mixes – Evolutionary Programming: Recombination – Parent Selection –Survivor Selection.

UNIT III MULTIMODAL PROBLEMS AND SPATIAL DISTRIBUTION 10

Multimodal Problems and the Need for Diversity – Implicit Measures – Explicit Diversity Maintenance –Multiobjective Evolutionary Algorithms– Example Application

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- practice evolutionary and genetic algorithm
- apply evolution algorithm for hardware design
- analyze the algorithms for multimodal problems

TEXT BOOKS

1. A.E. Eiben, and J.E. Smith, "Introductionto Evolutionary Computing", Springer 2nd Edition 2009.

REFERENCES

1. Daniel Ashlock,"Evolutionary Computation for Modeling and Optimization, Springer,2006.

16PSEVC101 DESIGN OF URBAN WATER MANAGEMENT STRUCTURES

COURSE OBJECTIVES

To enable the students to

- Learn about spatial distribution of rainfall, perform statistical analysis, fit different distributions to the data, and calculate design rainfall.

Compute design rainfall, calculate runoff and storm water flows; design storm sewer systems and detention storage structures- Rainfall temporal and spatial variation, design rainfall and hydrologic risk - Runoff using Rational Method, storm sewer design -Detention storage design, SCS CN method - Hydrographs, SCS triangular and curvilinear unit hydrographs - Superposition, computing runoff hydrographs from unit hydrograph theory

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Analyze and design storm sewer systems and detention storage volumes by rational method

TEXT BOOKS

1. Varghese P. C., Design of Reinforced Concrete Foundations, PHI

REFERENCES

1. Vedula S. and Mujumdar, P.P., Water Resources Systems, Tata McGraw

16PSEVC201 RESERVOIR GEOMECHANICS

COURSE OBJECTIVES

To enable the students to

- Understand the concepts of hydrocarbon plant design

Basic Principles- The tectonic stress field -Pore pressure at depth in sedimentary basins- Basic constitutive laws- Rock failure in compression, tension and shear - Fractures and faults in three dimensions- Measuring Stress Orientation and Magnitude- Compressive and tensile failures in vertical wells - Determination of S3 from mini fracs and extended leak-off tests and constraining the magnitude of SHmax from wellbore failures in vertical wells- Wellbore failure and stress determination in deviated wells - Stress fields – from tectonic plates to reservoirs around the world –Applications - Minimizing wellbore instability- Critically stressed faults and fluid flow- Reservoir depletion

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- estimate of hydrocarbon column heights and fault seal potential

TEXT BOOKS

1. Reservoir geomechanics by Mark D. Zoback, Stanford University, California, 2011

REFERENCES

1. Vedula S. and Mujumdar, P.P., Water Resources Systems, Tata McGraw

16PSEVC301 CONNECTIONS IN STEEL STRUCTURES

COURSE OBJECTIVES

To enable the students to

- Understand how to design steel connections for any combination of axial, shear, and moment loads is fundamental to effective building design.

Connection Design Review - Bolted Connections Review bolted connection basics including force transfer mechanisms, bolt shear and bearing, and slip critical connections.

Connection Design Review – Welded Connections Review welded connection basics including types of welding, AISC360 provisions for fillet welds, and weld limit states. Eccentrically Loaded Bolts – Elastic Method - Introduce eccentrically loaded connections and detail the elastic design method for eccentrically loaded bolt groups. Eccentrically Loaded Bolts – Ultimate Strength Methods

Introduce the ultimate strength method for eccentric design and contrast it to the elastic method. Develop design tools to calculate the strength of an eccentrically loaded bolted connection.

Eccentrically Loaded Welds – Elastic Method

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply the design concepts in realistic design scenarios.

TEXT BOOKS

1. Arya A. S., Ajmani J. L., Design of Steel Structures, Nemchand and Bros.

REFERENCES

1. Subramaniam N., Design of Steel Structures, Oxford University Press

16PSEVC401 STEEL BEAM AND PLATE GIRDER DESIGN

COURSE OBJECTIVES

To enable the students to

- Understand basic buckling theory including beam and plate buckling behavior.

Steel as a Material and Beam Buckling Review - Proportioning Plate Girders and Local Buckling -Plate Girder Flexural Capacity (AISC 360 F2 and F3) -Plate Girder Flexural Capacity (AISC360 F4 and F5)

Plate Girder Shear Capacity – Intro and Basic Theory of Shear Capacity - Plate Girder Shear Capacity – Tension Field Action -Plate Girder Shear Capacity – Transverse Stiffeners and Design Examples

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Evaluate the shear capacity of an I-shaped plate girder and design transverse stiffeners as appropriate

TEXT BOOKS

1. Arya A. S., Ajmani J. L., Design of Steel Structures, Nemchand and Bros.

REFERENCES

1. Subramaniam N., Design of Steel Structures, Oxford University Press

16BAVC401

INTEGRATED MARKETING MANAGEMENT

COURSE OBJECTIVES

To enable the students to

- Knowing the basics of integrated marketing management
- know about the product life cycle
- Enable the sales techniques in the market

COURSE CONTENT

Marketing concept, Coordinated marketing - Meta marketing, Holistic marketing dimensions - Marketing Environment - Marketing decisions - Customer delivered value - Buyer Behaviour, Input - output map - Marketing Planning - Marketing mi -, Product policy - New products - PLC - Price - Distribution, Advertising and Promotion - Marketing organization - Product Management - Sales Management - Marketing Control - Case Analysis, Case Discussion.

TOTAL PERIODS – 30

COURSE OUTCOMES

At the end this course, students will be able to

- Apply Holistic marketing management strategies
- Analyse the life cycle product
- Apply techniques of marketing products

TEXT BOOKS :

1. "Integrated Marketing Communications" by Kirti Dutta
2. "Advertising and Promotion: An Integrated Marketing Communications Perspective" by Belch

REFERENCES

1. Making Marketing Music: Integrated Marketing Communications At Work

16BAVC301

ADVANCED CORPORATE STRATEGY

COURSE OBJECTIVES

To enable the students to

- Basics of corporate strategies
- Know the different types of vertical integrations
- Familiarize with the Modes of Diversification

COURSE CONTENT

Corporate Advantage - Product Diversification - different types of diversification - Horizontal & Vertical Integration - Different types of horizontal & vertical integration - The underlying motives for vertical / horizontal integration - Geographic Diversification - Broad trends in geographic diversification and globalization - how to manage a globally diversified firm - Modes of Diversification - Business alliances - Joint ventures, outsourcing – Media - Advertising and internationalization.

TOTAL PERIODS – 30

COURSE OUTCOMES

At the end this course, students will be able to

- Frame corporate strategies for business
- Apply vertical integration in business
- Apply the tactics of diversified business

TEXT BOOKS :

1. Business Strategy: Managing Uncertainty, Opportunity, and Enterprise by J.C. Spender

REFERENCES

1. "Strategic Management" course from IIMB for understanding the basics.

16BAVC101

EMOTIONAL INTELLIGENCE

COURSE OBJECTIVES

To enable the students to

Know the concept of Emotional Intelligence & Emotional Quotient.

Learn the concept, causes and consequences of stress management.

Learn the correlate of Emotional Intelligence. Introduction to emotions & emotional intelligence

COURSE CONTENT

Concept & theory of intelligence & wisdom- Measurement and applications of intelligence- Types & Determinants of Emotions- Emotional intelligence: concept, theory and measurement- Correlates of emotional intelligence, Theories of Emotional Intelligence- Emotional intelligence, culture and happiness - EQ mapping for enhancing emotional intelligence- Managing stress, suicide prevention, through emotional intelligence- Spirituality and Meditation Application of emotional intelligence in family and workplace

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Map the Emotional Quotient of individuals
- Manage stress and control stress in the official & domestic set up
- Apply Emotional Intelligence in all social transactions

TEXT BOOKS

1. Abraham, R. (1999). Emotional dissonance in organizations: conceptualizing the role of self-estemm and job induced tension. Leadership and Organization Development Journal 20, (1), 18-25.

2. Cherniss, C. (1999) The business case for emotional intelligence. Consortium for Research on Emotional Intelligence in Organization. Retrieved July 2, 2008 from www.eiconsortium.org

3. Fariselli,L., Freedman, J., Ghini, M., & Valentini, F.(2008). Stress, emotional intelligence, and performance in health care. Retrieved July 12th, 208 from www.6seconds.org/sei/wp-stress.php

4. Goleman, D. (1998). Working with emotional intelligence. New York: Bantam.

REFERENCES

1. Promis, P. (2008). Are employers asking for the right competencies: a case for emotional intelligence. Library Administration and Management 22, (1), 24-30.

2. Sewell, J. (2002.) Managing the stress of organizational change. FBI Law Enforcement Bulletin 71, (3)14-20.

16BAVC201

COMMUNICATION SKILLS

COURSE OBJECTIVES

to enable the students to

- Familiarise with the factices of verbal commutation
- Learn the art of writing report
- Acquire the skills to appear for interviews

COURSE CONTENT

The Basics of Communication - Social Skills - Preparing Portfolio - Preparing Resume Vs Curriculum Vitae - The Job Interview - Presentation Skills - Telephone Skills - Group Discussion - Body Language - Writing Skills: Some Basic Guidelines - Basic Features of Proposals - Writing Reports- time management – resource management- business communication- jam- group discussion- group discussion level 1- group discussion level 2.

TOTAL PERIODS – 30

COURSE OUTCOMES

At the end this course, students will be able to

- Communicate freely with confidence
- Independently Prepare written report in the work setup
- Gain an edge in the job interview

TEXT BOOKS :

1. Adair, John. Effective Communication. London: Pan Macmillan Ltd., 2003.

2. Ajmani, J. C. Good English: Getting it Right. ...

REFERENCES

1. Raman, Meenakshi & Sangeeta Sharma. Technical Communication: Principles and Practice.

16CAVC101 **SQL FUNDAMENTALS**

COURSE OBJECTIVES

To enable the students to

- retrieve the row and column data from tables with the SELECT statement
- create reports of sorted and restricted data
- employ SQL functions to generate and retrieve customized data and schema

UNIT 1 Introduction

Introduction - Retrieving Data Using the SQL SELECT Statement -Restricting and Sorting Data - Single-Row Functions to Customize Output - Conversion Functions and Conditional Expressions

UNIT 2 Queries

Reporting Aggregated Data Using the Group Functions - Displaying Data from Multiple Tables - Sub-queries - SET Operators - Manipulating Data

UNIT 3 DDL Statements

Manipulating Data - DDL Statements to Create and Manage Tables - Schema - Creating Other Schema Objects.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- understand the concept of row and column data from tables with the SELECT statement
- analyze reports of sorted and restricted data
- Implement SQL functions to generate and retrieve customized data and schema

TEXT BOOKS

1. SQL Fundamentals (3rd Edition) 3rd Edition, Kindle Edition

REFERENCES

1. Microsoft SQL Server 2012 T-SQL Fundamentals (Developer Reference) 1st Edition, Kindle Edition

16CAVC201 WEB DEVELOPMENT

COURSE OBJECTIVES

To enable the students to

- learn about HTML, DHTML concepts
- understand the variety of presentation effects in HTML
- know about appropriate client-side applications and the Knowledge of XML, PHP

UNIT I HTML, Frames and Forms

History of the Internet and World Wide Web – HTTP, SMTP, POP3, MIME, Understanding roles of Web Browsers and Web Servers. Structure of HTML, Text formatting, Text styles, hyper link, image, and tables. **Frames, Forms** : CSS Frames, Forms and controls, Embedding audio, video and animated files in HTML, CSS –Understanding CSS, Internal CSS, External CSS, Font Properties, Text Properties, Color and Background properties, Table properties, Numbering and List Properties.

UNIT II Java Script

Data types and literals, operators, conditional statements, loop constructs, reserved words; core Objects Array Object, Date Object; Functions passing value to JavaScript functions, user defined functions, Handling old browsers , java script events, formatting cookie, retrieving cookie value from the cookie file, removing a cookie, animations using events.

UNIT III PHP & MySQL

Why PHP and MySQL - Server-Side Web Scripting - Getting Started with PHP - Adding PHP to HTML -Syntax and Variables - Control and Functions - Passing Information between Pages – Strings – Arrays and Array Functions – Numbers - MySQL Database Administration - PHP/MySQL Functions - Displaying Queries in Tables - Building Forms from Queries

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- identify the HTML, DHTML concepts
- implement a variety of presentation effects in HTML
- explore about appropriate client-side applications

TEXT BOOKS

1. Kris Jamsa, konrad King and Andy Anderson, “HTML & Web Design Tips and Techniques”, Tata McGraw-Hill, First Edition, 2002.
2. Powell T.A. HTML Complete Reference, Tata McGraw-Hill, Fifth Edition, 2010

REFERENCES

1. Deitel & Deitel, Goldberg, Internet and World Wide Web – How to Program, Third Edition, Pearson Education Asia, 2005
2. Deitel & Deitel, Goldberg, Internet and World Wide Web – How to Program, Third Edition, Pearson Education Asia, 2005
3. Rajkamal, “Web Technology”, First Edition, Tata McGraw-Hill, 2001. Tim Converse, Joyce Park and Clark Morgan “PHP5 and MySQL Bible”, Wiley Publishing, Inc. 2004

16CAVC301 PROGRAMMING WITH PHP

COURSE OBJECTIVES

To enable the students to

- understand about concept of PHP
- learn the concept of web designing
- be familiar with creating of database in PHP

UNIT I Core PHP

Introduction to PHP-Handling Html Form With Php-Decisions and loop-Function-String-Working with file and Directories

UNIT II Web Designing

HTML- CSS- Java Script- JQuery- AJAX

UNIT III Framework- Cake PHP

Introduction to CakePHP- Models: Creating up model for a database table- Controller: Creating controller- Views: Creating Views- Cake session:

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- explain about concept of PHP
- analyze the concept of web designing
- implement creating of database in PHP

TEXT BOOKS

1. Head First PHP & MySQL: A Brain-Friendly Guide Paperback – Illustrated, 6 January 2009

REFERENCES

1. Murach's PHP & MySQL Paperback –1 December 2014

16GEVC101/201 CONSTITUTION OF INDIA

COURSE OBJECTIVES

To enable the students to

- assimilate and get familiarized with basic information about Indian constitution
- aware of the functional aspects of the local Administration System.
- understand human rights/ values and its implications in their life.

MODULE- 1 : INTRODUCTION ABOUT INDIAN CONSTITUTION

Definition, historical back ground, features, preamble, territory, citizenship.

MODULE 2 : CONSTITUTIONAL RIGHTS & DUTIES

State, fundamental rights, directive principles, duties.

MODULE 3 : UNION AND STATE PROVISIONS

The machinery of the union government , Government machinery in the states, The federal system, Statutory Institutions, miscellaneous provisions

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics
- Familiarize with the various levels of local administration.
- Gain knowledge on election commission of India

TEXT BOOKS

1. Durga Das Basu (DD Basu): "Introduction to the Constitution on India", (Students Edition.) Prentice –Hall EEE, 19th / 20th Edn., (Latest Edition) or 2008.
2. Shubham Singles, Charles E. Haries, and Et al : "Constitution of India and Professional Ethics" byCengage Learning India Private Limited, Latest Edition – 2018
3. Dr. S. N. Busi, Dr. B. R. Ambedkar framing of Indian Constitution, 1st Edition, 2015
4. M. P. Jain, Indian Constitution Law, 7th Edn., Lexis Nexis, 2014.
5. D.D. Basu, Introduction to the Constitution of India, Lexis Nexis, 2015

REFERENCES

1.M.Govindarajan, S.Natarajan, V.S.Senthilkumar, "Engineering Ethics", Prentice –Hall of India Pvt. Ltd. New Delhi, 200

2. M.V.Pylee, "An Introduction to Constitution of India", Vikas Publishing, 2002.

3. Latest Publications of NHRC - Indian Institute of Human Rights, New Delhi.

16GEVC101/201 **INTRODUCTION OF GENDER STUDIES**

COURSE OBJECTIVES

To enable the students to

- introduce basic concepts relating to gender and to provide logical understanding of gender roles
- trace the evolution of gender studies from women's studies
- enable them to engage in policy decisions to remove gender biases in all fields of life in the process of gender equality for nation building

MODULE 1: Introduction

Sex and Gender, Types of Gender, Gender roles and Gender division of Labour, Gender stereotyping and Gender Discrimination

MODULE 2: Social Construction of Feminity

Bio-Social perspective of Gender, Gender as Attribution fact , Essentialism in the construction of feminity, Challenging cultural notions of feminity, images of women in sports, arts , entertainment and fashion industry, media and feminine identities

MODULE 3: Women's studies and Gender studies

Evaluation and scope of women's studies, from women's to gender studies: A Paradigm shift, Women's studies VS Gender studies

TOTAL PERIODS 30

COURSE OUTCOMES

Students must gain knowledge on

- The concepts relating to gender and gains the logical understanding of gender roles
- Familiarize the evolution of gender studies from women's studies
- the removal of gender biases in all fields of life in the process of gender equality for nation building

TEXT BOOKS

1. Cornell R W (1995) Gender. Cambridge, Polity Press.

2. Gatens M (1991) A Critique of the Sex/Gender Distinction in S. Gunew (ed.) A Reader in FeministKnowledge. London: Routledge.

REFERENCES

1. Andrea N (1989) Feminist Theory and Philosophies of Men. New York: Routledge.
2. Arora P (2011) Gender and Power. Delhi: Pacific Publication.

PAAVAI ENGINEERING COLLEGE(AUTONOMOUS)
ACADEMIC YEAR 2017 - 2018

VALUE ADDED COURSE

17AEVC301 COMPUTER AIDED ANALYSIS FLUENT

COURSE OBJECTIVES

To enable students to

- know about the fundamentals and applications of CFD and Ansys Fluent.
- gain knowledge incoupled solver and transonic flow in Ansys Fluent.

INTRODUCTION TO CFD

Introduction to CFD- CFD theory fundamentals and applications-ANSYS Fluent application-Fluent Simulation process - ANSYS Fluent GUI and Software preliminaries- Solver fundamentals-Boundary conditions-Flow mix and heat transfer (3D)-Geometry in design modeler-Meshing using ANSYS Meshing application-CFD Simulation setup-Models-Defining regions-Material definition-Cell zone conditions-Extracting preliminary results.

COUPLED SOLVER AND TRANSONIC FLOW

Flow mix and heat transfer (3D) –Coupled solver – Mesh adaption – Transonic flow – Airfoil - CFD Simulation setup – Models - Defining regions - Material definition – Solution – Post Processing.

TURBULENCE MODEL

Turbulence model in Fluent – Setting up model – Materials and operating conditions – Solution extraction – Convergence modeling.

PERIODIC HEAT FLOWAND TURBULENT FLOW

Modeling Periodic heat Flow – Creation of zones – Model setup – Material definition – Cell zone definitions – Periodicity definition – Boundary conditions – Solution extraction – Advanced post processing. Turbulent flow in heat exchanger – Model setup – Boundary conditions – Solving – Post Processing.

RADIATION AND CONVECTION

Radiation and Convection - Model setup – Thermal boundary conditions - Solution - Post Processing. Siphoning using Multiphase – Review, test and Project discussion.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon successful completion of this course, students will be able to

- know the Ansys Fluent GUI and software preliminaries and solver fundamentals.
- learn about coupled solver, material definitions and post processing in Fluent.

TEXT BOOK & MANUALS

- Huei-Huang Lee, Finite Element Simulations with ANSYS Workbench 16 Theory, Applications, Case Studies 2015ISBN: 978-1-58503-983-8

17AEVC401 **COMPUTER AIDED DESIGN CREO**

COURSE OBJECTIVE

To enable the students to

- gain strong ground on solid modeling techniques that would enhance the productivity in modeling and analysis of mechanical components.

INTRODUCTION

Introduction to CAD, CAE Features of Creo, Concepts:-Modeling ,Parametric , Associative , Feature based Creo Graphical User Interface - Feature manager design tree, , Handles, mouse buttons, keyboard shortcuts, Understanding the Windows Menu Hardware and Software requirements

SKETCHER WORKBENCH

Sketch Entities – Inference line, Centerline line, Line, Circle, Arc, Ellipse, Rectangle, Slots, Polygon, Parabola, Ellipse, Partial Ellipse, Spline, Spline tools, Spline on surface, Equation driven curve, Points, Text, Construction geometry, Snap, grid,

PART MODELING

Creating reference planes Creating Extrude features – Direction1, Direction2, From option, Thin feature, Applying draft, Selecting contours Creating Revolve features – Selecting Axis, Thin features, Selecting contours Creating Swept features-Selecting, Profile and Path, Orientation/twist type, Path Alignment, Guide Curves, Start/End tangency, Thin feature

ASSEMBLY DESIGN

Introduction to Assembly Modeling & Approaches – Top down and Bottom up approach Applying Standard Mates- Coincident, Parallel, Perpendicular, Tangent, Concentric, Lock, Distance, Angle.

DRAFTING AND DETAILING

Inserting Annotations - Datum Features, Geometric Tolerance, Surface Finish, Jog Leaders, Hole Callout, Datum Target, Dowel Pins, Area Hatch, Cosmetic Thread, Balloon, Centre Mark, Centre Lines, Layers, Working With Tables, Bill Of Materials, Hole Table, Sheets And Templates, Sheet Format.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- Learnt advanced solutions for conceptual design, 3D modelling, and documentation.
- Learnt to do product design, industrial design and styling (optimize form, fit, function and user experience), streamline 2D design, drafting, documentation with powerful tools for layout.

TEXT BOOK & MANUALS

- Sham Tickoo, Pro / Engineer PTC Creo Parametric 3.0 for Engineers and Designers,Dream tech press 2016

COMPUTER AIDED DESIGN UNIGRAPHICS

17AEVC501

COURSE OBJECTIVE

To enable the students to

- gain strong ground on solid modeling techniques that would enhance the productivity in modeling
- understand the analysis of mechanical components.

INTRODUCTION

Introduction, Sketch, Curve, Curve Operations, Form Feature, Feature Operation, Transform

ASSEMBLY DESIGN

Assembly of Components, Exploded Views, Sequencing, Context Control, Cloning and Component arrays editing, Top Down Assembly.

DRAFTING AND DETAILING

Drawing sheets, Views, Dimensioning, Annotations, Symbols, Tabular note and Part list.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- Learnt advanced solutions for conceptual design, 3D modeling, and documentation.
- Learnt to do product design, industrial design and styling (optimize form, fit, and function and user experience), streamline 2D design, drafting, documentation with powerful tools for layout.

TEXT BOOK & MANUALS

- https://web.mst.edu/~mleu/nx_manuals/nx10.pdf

17AEVC601 COMPUTER AIDED DESIGN SOLIDWORKS

COURSE OBJECTIVES

To enable the students to

- Use basic and advanced features of current CAD software.
- Understand how CAD technology can be leveraged in the design process.

INTRODUCTION TO CAD, CAE, PDM

Features of solid works, various tools available in Solid works for product design – Solid Works GUI – feature manager, design tree, Callouts, Handles, Confirmation corner, mouse buttons. Keyboard shortcuts, Command manager–File management.

SKETCHING

Sketching environment – Sketch entities – Inference line, Centerline line, Line, Circle, Arc, Ellipse, Rectangle, Slots, Polygon, Ellipse, Partial Ellipse, Spline, Spline tools, Points, Text, Construction geometry, Snap, grid – Sketch Relations– Blocks – Make block, Edit block, Insert block, Add/Remove Entities, Rebuild, Save, Explode.

INTRODUCTION TO PART MODELING

Reference geometry – Co–ordinates, Plane, Axis and Points – Modeling features – Extrude, Revolve, Swept and Loft– Relations –Adding Sketch Relation, Automatic relations – Creating extrude features — Creating revolve features–Creating helix and spiral – Creating loft features

PART MODELING – FEATURES

Fillets, Chamfers, Shell, Rib, Draft, Hole – Creating pattern – Linear pattern, Circular pattern, Sketch driven pattern, Curve driven pattern, Table driven pattern, Fill pattern, Mirror – Other tools – Inserting library feature, Measuring geometries, Materials, Mass properties, Selection manager, Multiple body concepts

ASSEMBLY MODELING

Introduction to assembly modeling & approaches – Top down and bottom up approach – Applying standard mates–Coincident, Parallel, Perpendicular, Tangent, Concentric, Lock, Distance, Angle – Top down design – Layout sketch, Work part in the context of an assembly

TOTAL PERIODS 30

COURSEOUTCOMES

Upon completion of this course the student will

- demonstrate competency with multiple drawing and modification commands in SolidWorks.
- create three-dimensional solid models.

TEXT BOOK & MANUALS

- https://files.solidworks.com/pdf/introsw.pdf

17AIVC301 VALUE ADDITION OF FRUITS AND VEGETABLES

course objectives

To enable the students to

- To gain knowledge on various management technologies on pre- harvest and post harvest of fruits and vegetables.
- Gain knowledge on conventional and modern packaging methods

Unit I

The Importance of post harvest technology of horticultural crops - Maturity indices, harvesting and post harvest handling of fruits and vegetables -Maturity and ripening process – factors affecting ripening of fruits and vegetables- chemicals used for hastening and delaying ripening of fruits and vegetables.

UNIT II

Pre harvest factors affecting quality on post harvest life of fruits and vegetables – factors responsible for deterioration of harvested fruits and vegetables. Methods of storage-precooling, pre storage treatments, low temperature storage, controlled atmosphere storage, hypobaric storage, irradiation and low cost storage structures.

UNIT III

Various methods of packaging-packaging materials and transport – packaging technology for export. Fabrication of type of containers, cushioning material, vacuum packaging, poly shrink packaging, specific packaging for export of mango, banana, grapes, etc.,

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Acquire knowledge on post harvest management tools and novel paclkaging technique

- Analyze the value addition in fruits crop

- Identify the best quality fruits used for value addition

TEXT BOOKS

1. .K.L.Chadha. 1993.Advances in Horticulture. Malhotra publishing house. New Delhi
2. M.S.Dhaliwal, 2008.Handbook of Vegetable Crops. Kalyani Publishers. Ludhiana

17AIVC401 **RENEWABLE ENERGY**

COURSE OBJECTIVES

To enable the students to

- To introduce to renewable energy sources
- To impart knowledge on biomass
- To introduce the manipulator thermochemical conversion technology

Module –I Overview of renewable energy sources

Classification of energy sources

Introduction to renewable energy

Renewable Energy-Potentials and Achievements

Module –II Characterization of Biomass

Characterization of biomass

Densification of biomass-Briqquetting

Module –III Thermochemical conversion Technology (TCCT)

Biomass Combustion Technology

Gasifier Technology

Biomass Gasification Methods

Removal of tar and impurities from gasification

Principles of pyrolysis and methods

Module –IV Wind Energy Conversion System (WECS)

Wind energy conversion principles

wind mill- aero generator

Module-V. Energy conservation in agriculture

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Ability to understand basic concept of renewable energy
- To analyze Instrumentation systems and their applications to various
- To know about the different energy conservation in agriculture

TEXT BOOKS

1. Rai., G.D. "Solar Energy Utilization*"* Khanna publishers, New Delhi, 2002
2. More, H.S and R.C. Maheshwari, " Wind Energy Utilization in India" CIAE Publication - Bhopal, 1982

REFERENCES

1. Mathew Buresch, Photovoltaics Energy Systems. McGraw-Hill Book Company, London, 1986.

17AIVC501 ENGINEERING PROPERTIES OF AGRICULTURAL PRODUCE

COURSE OBJECTIVES

To enable the students to

- To make students understand the basic theoretical aspects and importance of engineering properties of agricultural produce
- To learn the physical and thermophysical properties of agricultural materials
- To learn the requirement of engineering properties of materials for analysis and design of agricultural food and biological systems.

UNIT I

Classification and importance of engineering properties of Agricultural Produce, shape, size, roundness, sphericity, volume, density, porosity, specific gravity, surface area of grains, fruits and vegetables, Thermal properties, Heat capacity, Specific heat, Thermal conductivity, Thermal diffusivity, Heat of respiration; Co-efficient of thermal expansion, Friction in agricultural materials; Static friction, Kinetic friction, rolling resistance, angle of internal friction, angle of repose, Flow of bulk granular materials, Aero dynamics of agricultural products, drag coefficients, terminal velocity.

UNIT II

Rheological properties; force, deformation, stress, strain, elastic, plastic and viscous behaviour, Newtonian and Non-Newtonian liquid, Visco-elasticity, Newtonian and NonNewtonian fluid, Pseudo-plastic, Dilatant, Thixotropic, Rheopectic and Bingham Plastic Foods, Flow curves.

UNIT III

Electrical properties; dielectric loss factor, loss tangent, A.C. conductivity and dielectric constant, method of determination. Application of engineering properties in handling processing machines and storage structures

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Identify engineering properties of Agricultural materials.

- Explain related measurement methods.

- Relate engineering properties of food and agricultural materials to process design and quality control.

TEXT BOOKS

1. Engineering Properties of Agricultural ProduceEdited By Suresh Chandra,Samsher ,Suneel Kumar GoyalDurveshKumari ISBN 9780367635008Published November 27, 2020 by CRC Press

17AIVC601 **ARTIFICIAL INTELLIGENCE**

COURSE OBJECTIVES

To enable the students to

- To have an appreciation for and understanding of both the achievements of AI
- Explain the basic knowledge representation ,problem solving and learning method of AI

Unit I

Foundation and history of artificial intelligent, problems and techniques – AI programming languages, introduction to LISP and PROLOG- problem spaces and searches, blind search strategies, Breadth first- Depth first- heuristic search techniques Hill climbing: best first-A algorithm AO algorithm- game tree, Min max algorithms, game playing- alpha beta pruning. Knowledge representation issues, predicate logic- logic programming, semantic nets- frames and inheritance, constraint propagation, representing knowledge using rules, rules based deduction systems.

UNIT II

Reasoning under uncertainty, review of probability, Baye's probabilistic interferences and Dempstershafer theory, Heuristic methods, symbolic reasoning under uncertainty, Statistical reasoning, Fuzzy reasoning, Temporal reasoning, Non monotonic reasoning.

UNIT III

Planning and planning in situational calculus, representation for planning, partial order planning algorithm, learning from examples, discovery as learning, learning by analogy, explanation based learning, neural nets, genetic algorithms. Principles of Natural language processing, rule based systems architecture, Expert systems, knowledge acquisition concepts, AI application to robotics, and current trends in intelligent systems.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Understand the role of knowledge representation problem solving and learning in intelligent system engineering
- Assess the applicability, strengths, and weaknesses of the basic knowledge representation, problem solving, and learning methods in solving particular particular engineering problems
- Develop on interest in the sufficient to take more advanced subject

TEXT BOOKS

1. Maloof, Mark. "Artificial Intelligence: An Introduction, p.37" . georgetown.edu. Archived from the original on 25 August 2018.

17CEVC301 RENEWABLE ENERGY AND GREEN BUILDING ENTREPRENEURSHIP

COURSE OBJECTIVES

To enable the students to

- gain knowledge on renewable energy sources & real time examples
- understand the concepts of making a start up with financial sustainability
- acquire knowledge on green building concepts

Module I

Inside Entrepreneurship: Entrepreneurs Solve Problems -Opportunities in Green Building Design - Financial Opportunities in Renewable Energy -Green Building Case Study: Cherokee Investment Partners

Module II

Renewable Energy Case Study: Strata Solar - The Importance of Entrepreneurial Thinking for the Green Building Industry - Green Building Global Status Report and World Green Building Trends 2016

Module III

Logic behind green building & renewable energy -Generating Ideas for a Startup - Building a Great Team - Financing and launching Your Business

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply procedure of renewable energy & green building to real time projects
- establish a start up business
- apply concepts of green building & renewable energy sources

TEXT BOOKS

1. Green Building: Principles and Practices in Residential Construction by Carl Seville ,Delmar Cengage Learning publications,2012

REFERENCES

1. Renewable Energy Sources: Engineering, Technology, Innovation by Wróbel, Marek, Jewiarz, Marcin, Szlek, Adnrzej (Eds.) by springer 2018

17CEVC401 DEVELOPMENT AND APPLICATIONS OF SPECIAL CONCRETES

COURSE OBJECTIVES

To enable the students to

- gain knowledge on special concrete applications
- understand the concepts of mix design, properties of special concrete
- acquire knowledge on Self compacting concrete properties

Module I

Basic properties of fresh concrete & hardened concrete- Fundamentals of proportioning concrete mixes - Proportioning of normal concrete mixes - Concrete mix proportions: Analysis and adjustments - Pores and porosity in concrete -admixtures in concrete

Module II

Importance of Right Methods and Specifications - Heat of Hydration of Cement and Thermal Stresses – Anti washout Underwater Concrete - Concreting Underwater- Roller Compacted Concrete

Module III

Self compacting concrete – Fibre reinforced concrete – grouting, mix design – shot crete- high strength concrete & its Applications

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply special concrete for various applications
- calculate the mix proportions for special concrete
- prepare mix design for self compacting concrete

TEXT BOOKS

1. Special Concretes, Mortars and Concrete Products by Portland cement association, 1975

REFERENCES

1. Special Concrete and Composites by Pavel Reiterman, Trans Tech Publications ,2018

17CEVC501 GEOSYNTHETICS AND REINFORCED SOIL STRUCTURES

COURSE OBJECTIVES

To enable the students to

- gain knowledge on geosynthetics and reinforced soil structures applications

Module I

Introduction to Geosynthetics-Strength of reinforced soils-Different Types of Soil Retaining Structures -External Stability Analysis of Reinforced Soil Retaining Walls -Design of Reinforced soil Retaining walls - simple geometry -stability analysis of soil slopes- Infinite slopes -Reinforced soil for supporting shallow foundations -Accelerated consolidation of soft clays using geosynthetics **Drainage application of geosynthetics** -Erosion control using geosynthetics -Geosynthetics for construction of municipal and hazardous waste landfills

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply field procedure geosynthetics

TEXT BOOKS

1. Geosynthetics in Civil Engineering by R W Sarsby , Woodhead Publishing,2006

REFERENCES

2. Designing with Geosynthetics by Robert M. Koerner , Pearson publishing , 2017

17CEVC601 INTEGRATED WASTE MANAGEMENT FOR A SMART CITY

COURSE OBJECTIVES

To enable the students to

- gain knowledge on integrated waste management
- understand the concepts of implementing waste management for a city
- gain knowledge on reuse of waste electronic materials

Module I

Introduction to Solid Waste Management Municipal Solid Waste Characteristics and Quantities MSW Rules 2016, Swachh Bharat Mission and Smart Cities Program Municipal Solid Waste Collection, Transportation, Segregation and Processing Disposal of Municipal Solid Waste Biochemical Processes and Composting Energy Recovery from Municipal Solid Waste

Module II

Current Issues in Solid Waste Management and Review of MSW Management Status in First List of 20 Smart Cities in the Country Construction and Demolition (C&D) Waste Management - Overview C&D Waste – Regulation

Module III

Beneficial Reuse of C&D Waste Materials Electronic Waste (E-Waste) Management – Issues and Status in India and Globally E-Waste Management Rules 2016 and Management Challenges

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply gained knowledge on integrated waste management
- implement the concepts of waste management for a city
- implement reuse ideas of waste electronic materials in consttruction

TEXT BOOKS

1. Sustainable Environment: A Text Book for Environmentalist, Researchers, Academia, Ecologists, Waste-Preneurs, Entrepreneurs by Shailesh Jha and Preeti Jha , 2015

REFERENCES

1. Integrated Solid Waste Mgmt by Tchobanoglous , McGraw Hill Education,2014

17CEVC701 LIMIT STATE DESIGN OF REINFORCED CONCRETE COLUMN

COURSE OBJECTIVES

To enable the students to

- gain knowledge on design of reinforced columns and understand the concepts of Limit state design

Module I

Concept of reinforced concrete- Working Stress Method (WSM) of design for reinforced concrete, permissible stresses as per IS-456-2000; stress- strain curve of concrete and steel, characteristics of concrete steel reinforcement.

Concept of balanced, under reinforced and over reinforced sections. Analysis design of singly reinforced and doubly reinforced rectangular beams for flexure, shear by WSM, Analysis and design of Cracked and un-cracked RCC column sections by WSM

Introduction to limit state method of design as per IS-456-2000; concepts of probability and reliability, characteristic loads, characteristic strength, partial safety factors for loads and materials, introduction to various limit states

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply gained knowledge on design of reinforced columns and implement the concepts of Limit state design

TEXT BOOKS

1. Varghese P. C., Advanced Reinforced Concrete Design, PHI Learning

REFERENCES

1. Krishna Raju N., Advanced Reinforced Concrete Design, CBS Publishers

17CEVC801 LIMIT STATE DESIGN OF REINFORCED CONCRETE BEAM

COURSE OBJECTIVES

To enable the students to

- gain knowledge on design of reinforced beams and understand the concepts of Limit state design

Module I

Concept of reinforced concrete, Working Stress Method (WSM) of design for reinforced concrete, permissible stresses as per IS-456-2000; stress- strain curve of concrete and steel, characteristics of concrete steel reinforcement.

Module II

Concept of balanced, under reinforced and over reinforced sections.Analysis design of singly reinforced and doubly reinforced rectangular beams for flexure, shear by WSM, Analysis and design of Cracked and un-cracked RCC column sections by WSM

Module III

Limit state of collapse in flexure, shear and Limit state of serviceability in deflection and cracking, design of singly and doubly reinforced rectangular and T sections for flexure, design of members in shear and bond, design of beam subjected to bending and torsion. Requirements governing reinforcement detailing. Deflection and crack width calculation for RCC members.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply gained knowledge on design of reinforced beams and implement the concepts of Limit state design

TEXT BOOKS

1. Varghese P. C., Advanced Reinforced Concrete Design, PHI Learning

REFERENCES

1. Krishna Raju N., Advanced Reinforced Concrete Design, CBS Publishers

17CSVC301 ETHICAL HACKING

COURSE OBJECTIVES

To enable the students to

- To Explore ethical hacking basics
- To Explore wireless network hacking
- To Investigate reconnaissance: Information gathering for the ethical hacker

Module 1: Introduction

- Course Introduction
- Introduction to the CEH Certification

Module 2: Introduction to Ethical Hacking

- Fundamental Security Concepts
- Information Security Threats and Attacks
- Introduction to Ethical Hacking
- Introduction to the Cyber Kill Chain
- Introduction to Security Controls
- Introduction to Security Laws and Standards

Module 3: Footprinting and Reconnaissance

- Introduction to Footprinting
- Website Footprinting
- DNS Footprinting
- HTTrack (Demo)
- Shodan (Demo)
- Google Hacking Database (Demo)
- LinkedIn (De no)
- Job Boards (Demo)
- whois (Demo)

- Banner Grabbing (Demo)
- theHarvester (Demo)
- Footprinting Countermeasures

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Analyze ethical hacking basics
- Implement wireless network hacking
- Implement Information gathering for the ethical hacker

TEXT BOOKS

1. Hacking: The Art of Exploitation, 2nd Edition 2nd Edition, Kindle Edition by Jon Erickson

REFERENCES

1.Black Hat Python: Python Programming for Hackers and Pentesters 1st Edition, Kindle Edition

17CSVC401 VMWARE

COURSE OBJECTIVES

To enable the students to

- To Explore the many significant benefits of virtualization
- To Understand about VMware Virtualization
- To Understand, create and manage high availability clusters to protect against VM service loss caused by ESXi server failures

Module 1 Introduction to Virtualization Technologies

• VMware workstation

• VMware player

• Virtual box

Module 2. Introduction to VMware Virtualization

• Introduce Virtualization

• Introduce Virtual machines

• Introduce vSphere components

Module 3. VMware ESX and ESXi (ESX/ESXi 4.1)

• Introduce the architecture of ESX and ESXi

• Manually configure ESX/ESXi

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Analyze the many significant benefits of virtualization
- Implement about VMware Virtualization
- Demonstrate create and manage high availability clusters to protect against VM service loss caused by ESXi server failures.

TEXT BOOKS

1. Learning VMware vSphereby Abhilash G B, Rebecca Fitzhugh Released October 2016

REFERENCES

1.VCA-DCV: VMware Certified Associate-Data Center Virtualization on vSphere Study Guide: VCAD-510 1st Edition

17CSVC501 OPEN STACK

COURSE OBJECTIVES

To enable the students to

- To Explore OpenStack architecture with both CLI and API functionalities
- To Implement and use Nova, Neutron, Image and other OpenStack services
- To Work on an interactive project around implementing OpenStack

Module 1: Introduction

- Introduction to Linux
- Linux admin commands
- Introduction to Cloud
- Comparison with Amazon AWS and RackSpace cloud
- Other Cloud frameworks
- Introduction to OpenStack and its components
- Virtualization techniques

Module 2: Compute (Nova)

- What is nova
- Supported hypervisors
- Xen, LXC, KVM, Qemu, VMWare
- Architecture & features
- Control Flow
- Building a Platform as a Service using Docker/LXC?

Module 3: OpenStack image service (Glance)

- What is Glance
- Supported image formats
- Creating, uploading and using an image
- Architecture & features
- Control flow

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Analyze OpenStack architecture with both CLI and API functionalities
- Implement and use Nova, Neutron, Image and other OpenStack services
- Analyze interactive project around implementing OpenStack

TEXT BOOKS

1. Learning OpenStack Networking - Third Edition By James Denton

REFERENCES

1. OpenStack Cloud Computing Cookbook - Fourth Edition By Kevin Jackson , Cody Bunch

17CSVC601 ORACLE

COURSE OBJECTIVES

To enable the students to

- To Understand about basics of SQL.
- To Learn about retrieving data from stored data.
- To Focuses on the creating table with DDL commands.

Module 1: Introduction To SQL

1. Introduction Database
2. Understanding DBMS vs RDBMS
3. Gone through SQL Standards
4. Sub languages of SQL
5. Difference between 10g vs 11g vs 12c
6. Installation of 12c
7. About SQL*Plus and use of developer tool
8. Datatypes in Oracle
9. Operators in Oracle
10. Understanding Schema design and objects

Module 2: Data Retrieval Techniques

1. How to use select statement in different ways to retrieve records?
2. Working with Column alias
3. Working with Table alias
4. Data filtering and sorting with in single table
5. Clauses and its types in oracle

    - Where clause
    - Having clause
    - From clause

- Group by clause
- Order by clause
- Using clause
- Constraint clause
- For update clause

Module 3: Working With DDL Commands

1. Table creation using CREATE statement
2. Creating table from another table
3. Dropping a table using DROP command
4. Altering the column of a table
5. Modifying the column datatype in a table
6. Renaming the column of a table
7. Renaming an entire table
8. Using truncate command
9. Difference between Delete and Truncate command

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Analyze basics of SQL.
- Demonstrate retrieving data from stored data
- Implement creating table with DDL commands.

TEXT BOOKS

1. Oracle Database 12c The Complete Reference (Oracle Press) Hardcover – Illustrated, 16 October 2013

REFERENCES

1. Oracle Database 11g The Complete Referenceby Kevin LoneyReleased October 2008

17CSVC701 **BLOCKCHAIN**

COURSE OBJECTIVES

To enable the students to

- To be able to explain the different components involved within Blockchain
- To understand what Blockchain is and why it is used
- To understand about basic Crypto primitives

Module 1: Introduction

- Need for Distributed Record Keeping
- Modeling faults and adversaries
- Byzantine Generals problem
- Consensus algorithms and their scalability problems
- Why Nakamoto Came up with Blockchain based cryptocurrency? Technologies Borrowed in Blockchain – hash pointers, consensus, byzantine fault-tolerant distributed computing, digital cash

Module 2: Basic Distributed Computing

Atomic Broadcast, Consensus, Byzantine Models of fault tolerance

Module 3: Basic Crypto primitives

Hash functions, Puzzle friendly Hash, Collison resistant hash, digital signatures, public key crypto, verifiable random functions, Zero-knowledge systems

TOTAL PERIODS 30

COURSEOUTCOMES

At the end this course, students will be able to

- Analyze different components involved within Blockchain
- Analyze what Blockchain is and why it is used

- Implement basic Crypto primitives

TEXT BOOKS

1. Attack of the 50 Foot Blockchain: Bitcoin, Blockchain, Ethereum and Smart Contracts:

Bitcoin, Blockchain, Ethereum & Smart Contracts Paperback – 24 July 2017.

REFERENCES

1. BlockchainBy Released January 2015 Publisher(s): O'Reilly Media, Inc.

17CSVC801 R PROGRAMMING

COURSE OBJECTIVES

To enable the students to

- To understand about basic concept data Analytics
- Integrate R in a Hadoop platform
- write R codes to manipulate data

Module1 Introduction

- What are Data Analysis, Data Analytics and Data Science?
- Business Decisions
- Case study of Walmart

Module2 Various analytics tools

- Descriptive
- Predictive
- Web Analytics
- Google Analytics
- R and features
- Evolution of R?
- Big data Hadoop and R

Module3 Data Types

- R & R Studio Installation
- Scalar
- Vectors
- Matrix
- List
- Data frames
- Factors
- Handling date in R

- Conversion of data types
- Operators in R

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Analyze basic concept data Analytics
- Demonstrate R in a Hadoop platform
- Implement R codes to manipulate data

TEXT BOOKS

1. R for data science : Import, Tidy, Transform, Visualize, And Model Data Paperback – 20 January 2017

REFERENCES

1. The Art of R Programming: A Tour of Statistical Software Design Paperback – 11 October 2011

17ECVC301 **BASICS OF 8 BIT PROCESSORS**

COURSE OBJECTIVE

To enable the students to

- study the architecture of microprocessor
- learn the operations of microprocessor

Unit I Architecture **15**

Introduction and evolution microprocessor-Architecture of microprocessor, Bus organization,

Register organization, semiconductor memory fundamentals

Unit II Operations with microprocessor **15**

Instruction set, Addressing mode, programming with 8 bit processor, Real time programming

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- understood the functionality of microprocessor
- ability to perform simple programming with 8 bit processor

.

TEXT BOOK & MANUALS

1. "4- and 8-bit Microprocessors, Architecture and History" Patrick H. Stakem, PRRB Publishing; 4th edition (2 June 2013)

2. "Advanced 8-bit Microprocessor: MC6809 Its Software, Hardware, Architecture & Interfacing Techniques", Robert J. Simpson, Raveendran Paramesran, Springer, 2007.

17ECVC401 SENSORS AND TRANSDUCERS

COURSE OBJECTIVE

To enable the students to

- expertise in various calibration techniques and signal types for sensors.
- understand the working principle of different Transducers.

UNIT I INTRODUCTION AND VARIOUS KINDS OF SENSORS 15

Basics of Sensors-Motion Sensors – Potentiometers, Resolver, Encoders – Optical, Magnetic, Inductive, Capacitive, Synchro – Microsyn, Accelerometer, Range Sensors– RF beacons, Ultrasonic, Ranging, Reflective beacons, Laser Range Sensor (LIDAR). Photo conductive cell, photo voltaic, Photo resistive. LDR – Fiber optic sensors – Pressure – Diaphragm, Bellows, Piezoelectric Thermistor, RTD, Thermocouple. Acoustic Sensors – flow and level measurement sensors- Smart Sensors- Film sensor, MEMS & Nano Sensors.

UNIT II TRANSDUCERS 15

Classification of Transducers, Advantages and Disadvantages of Electrical Transducers, Transducers, Resistance Transducers, Variable Inductance Transducers, Capacitive Transducers, Piezoelectric Transducers, Hall Effect Transducers, Thermoelectric Transducers, Photoelectric Transducers. Strain gauges, Resistance, thermometer, Thermistor, LVDT and RVDT

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- study the basics of sensor technology and the various sensor technologies for the measurement of Force, Pressure, acceleration, vibration and Torque.
- acquire the Knowledge and Measure different electrical parameters using Transducers.

TEXT BOOK & MANUALS

1. D. Patranabis – “Sensors and Transducers” –PHI Learning Private Limited.
2. Jacob Fraden, “Hand Book of Modern Sensors: physics, Designs and Applications”, 3rd ed., Springer, 2010.

17ECVC501 **ADVANCED WEB TECHNOLOGY**

COURSE OBJECTIVE

To enable the students to

- learn server-side programming using servlets and JSP.
- understand about client-server communication and protocols used during communication

Unit-I Advance script **15**

Server-Side Programming: Java Servlets- Architecture -Overview-A Servlet-Generating Dynamic Content-Life Cycle-Parameter Data-Sessions-Cookies- URL Rewriting-Other Capabilities-Data Storage Servlets and Concurrency-Case Study- Related Technologies.

Unit II – Host Objects **15**

Browsers and the DOM-Introduction to the Document Object Model DOM History and Levels-Intrinsic Event Handling-Modifying Element Style-The Document Tree-DOM Event Handling-Accommodating Noncompliant Browsers Properties of window-Case Study.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- understand server-side scripting with PHP language
- understand server-side scripting with Host Objects

TEXT BOOK

1. Jeffrey C.Jackson, "Web Technologies--A Computer Science Perspective", Pearson Education, 2006

17ECVC601 **ADVANCED GPS TECHNOLOGY**

COURSE OBJECTIVE

To enable the students to

- understand the pertinence of the navigation code
- be aware of some of the opportunities afforded by the coming GNSS systems

Unit-I GPS errors and accuracy: **15**

Satellite dependent: Ephemeris errors and orbit perturbations, Forces on GPS satellites, Effects of orbital bias, Types of satellite ephemerides, Satellite clock bias, Selective availability.

Receiver dependent: Receiver clock bias, Cycle slip, Selective availability (SA).

Unit II – GPS Measurement **15**

Observation medium dependent: Ionospheric errors, Tropospheric errors.

Station dependent: Multipath, Station coordinates. Satellite geometry-based measures: Geometry dependent (Dilution of Precision: DOP), User Equivalent Range Error UERE.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- describe the orbital bias
- recognize some of the important issues in choosing a GPS receiver

TEXT BOOK

1. B. Hofmann-Wellenhof, H. Lichtenegger and J. Collins, 1994. Global Positioning System: Theory and Practice, Publisher: Springer, Berlin (Germany)

17ECVC701 **BASICS OF SIMULATION TOOLS**

COURSE OBJECTIVE

To enable the students to

- understand the saving of development time.
- understand testing and finding of critical states and regions of operation.

Unit I **Simulation tools** **15**

Principle of simulation in the past and today, Analog computers, Digital computers, Simulation tools, Mathematical input, Netlist input, Critical tasks and other critical points, A selection of simulation tools, PSpice, Matlab / Simulink / Sim Power Systems / PLECS, PSIM.

Unit II **Models for switched power stages** **15**

Switches, semiconductors, and passive elements, CASPOC, Saber, Switches, switching elements the following four states - Semiconductors, Snubbers, Passive elements, Fast models for switched power stages, Electrical circuit design, Controller design, Circuits and modelling, Electrical behavior of a reduced model.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- fast models/high simulation speed.
- open to other programs (data import and export).
- macros and sub-circuit capabilities.

TEXT BOOK & MANUALS

1. Cantot, P., and Luzeaux, D., Eds. (2013), Simulation and Modeling of Systems of Systems. John Wiley and Sons.
2. Cellier, F.E. and E. Kofman (2006), Continuous System Simulation, Springer-Verlag, New York, NY.

17ECVC801 **PROCESSING OF REMOTE SENSING**

COURSE OBJECTIVE

To enable the students to

- provide an exposure to various data types and data formats available in remote sensing.
- provide an exposure to various image processing techniques

Unit I DATA RECEPTION AND DATA PRODUCTS 15

Ground segment organization – Data product generation – Sources of errors in received data – Referencing scheme – Data product output medium – Digital products–Super structure, Fast,GeoTIFF, Hierarchical and HDF formats – Indian and International Satellite - Data Products – Ordering of data

Unit II DATA ANALYSIS 15

Data products and their characteristics – Digital image processing – Preprocessing – Image rectification – Image enhancement techniques – Image classification – Supervised and unsupervised classification algorithms for multispectral and hyperspectral images – Accuracy assessment.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- identify the types of data available in remote sensing
- understand the image processing techniques employed

TEXT BOOK & MANUALS

1. Lilles and, T.M., Kiefer, R.W. and J.W.Chipman. “Remote Sensing and Image Interpretation” 5th Edition., John Willey and Sons Asia Pvt. Ltd., New Delhi, 2004.
2. Anji Reddy, M. “Textbook of Remote Sensing and Geographical Information System” 2nd edition. BS Publications, Hyderabad, 2001.

17EEVC301 ENGINEERING ECONOMICS, ESTIMATION AND COSTING

COURSE OBJECTIVES

To enable the students to

- know the basic of the costing of engineering.
- understand the estimation of the engineering.
- know the methods of costing for the various applications.

UNIT I MODULE 1 10

Basic Principles and Methodology of Economics. Demand/Supply – elasticity – Government Policies and Application. Theory of the Firm and Market Structure. Basic Macro-economic Concepts (including GDP/GNP/NI/Disposable Income) and Identities for both closed and open economies. Aggregate demand and Supply (IS/LM). Price Indices (WPI/CPI), Interest rates, Direct and Indirect Taxes

UNIT II MODULE 2 10

Public Sector Economics –Welfare, Externalities, Labor Market. Components of Monetary and Financial System, Central Bank –Monetary Aggregates; Commercial Banks & their functions; Capital and Debt Markets. Monetary and Fiscal Policy Tools & their impact on the economy – Inflation and Phillips Curve.

UNIT III MODULE 3 10

Elements of Business/Managerial Economics and forms of organizations. Cost & Cost Control – Techniques, Types of Costs, Lifecycle costs, Budgets, Break even Analysis, Capital Budgeting, Application of Linear Programming. Investment Analysis – NPV, ROI, IRR, Payback Period, Depreciation, Time value of money (present and future worth of cash flows). Business Forecasting – Elementary techniques. Statements – Cash flow, Financial. Case Study Method.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Have an idea of Economics in general, Economics of India particularly for public sector agencies and private sector businesses
- Be able to perform and evaluate present worth, future worth and annual worth analyses on one of more economic alternatives.
- Be able to carry out and evaluate benefit/cost, life cycle and breakeven analyses on one or more economic alternatives.

TEXT BOOKS

1. Mankiw Gregory N. (2002), *Principles of Economics*, Thompson Asia

REFERENCES

1. Dutta, B.N., Estimating and Costing in Civil Engineering (Theory & Practice), UBS Publishers, 2016

17EEVC401 **AUTOCAD ELECTRICAL**

COURSE OBJECTIVES

To enable the students to

- How to use the powerful electrical drawing creation tools in the AutoCAD Electrical software.
- Describe the You will create schematic drawings such as ladder logic and point to point, panel drawings, and PLC-I/O circuits using automated commands for symbol insertion, component tagging, wire numbering, and drawing modification.
- Know methods of customizing AutoCAD Electrical symbols, circuits, and databases. Other topics covered include title block linking, reporting tools, templates, and project files.

UNIT I **INTRODUCTION** **10**

AutoCAD Electrical-GUI-Project-Introduction to Project Manager-Working with Projects-Drawing-Adding a Drawing-Create a new Drawing-Drawing Properties-Insert a Component-Connecting a-component

UNIT II **CIRCUIT BUILDER** **10**

Create a Library Symbol-Symbol Builder-Circuit Builder-Inserting a One-line Motor Circuit-Inserting a Dual One-line Power Feed Circuit-Copy circuitry-Save circuit to icon menu-Component Tools-Inserting Components-Relocating Components-Inserting a Child Components-Aligning and Editing the Components-Catalog Information

UNIT III **COMPONENT ATTRIBUTE TOOLS AND WIRES** **10**

Wire layers-Wire types-Insert wire-Modify wire-Project

TOTAL PERIODS **30**

COURSE OUTCOMES

At the end this course, students will be able to

- How to use the powerful electrical drawing creation tools in the AutoCAD Electrical software.
- Describe the You will create schematic drawings such as ladder logic and point to point, panel drawings, and PLC-I/O circuits using automated commands for symbol insertion, component tagging, wire numbering, and drawing modification.
- Know methods of customizing AutoCAD Electrical symbols, circuits, and databases. Other topics covered include title block linking, reporting tools, templates, and project files.

REFERENCES

1. Introduction to autocad- David Martin

17EEVC501 ADAPTIVE SIGNAL PROCESSING

COURSE OBJECTIVES

To enable the students to

- know the fundamentals of the adaptive filter.
- Understand the complex values of filter.
- know the RLs filters for digitalization.

UNIT I FUNDAMENTALS OF ADAPTIVE FILTER 10

General concept of adaptive filtering and estimation, applications and motivation, Review of probability, random variables and stationary random processes, Correlation structures, properties of correlation matrices.

UNIT II COMPLEX VALUES OF FILTER 10

Optimal FIR (Wiener) filter, Method of steepest descent, extension to complex valued The LMS algorithm (real, complex), convergence analysis, weight error correlation matrix, excess mean square error and mis-adjustment

UNIT III RLS FILTERS 10

Introduction to recursive least squares (RLS), vector space formulation of RL Sestimation, seudo-inverse of a matrix, time updating of inner products, development of RLS lattice filters, RLS transversal adaptive filters. Advanced topics: affine projection and subspace based adaptive filters, partial update algorithms, QR decomposition and systolic array.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Understand the non-linear control and the need and significance of changing the control parameters w.r.t. real-time situation.
- Mathematically represent the adaptability requirement
- Understand the mathematical treatment for the modeling and design of the signal processing systems.

TEXT BOOKS

1. S. Haykin, Adaptive filter theory, Prentice Hall, 1986

REFERENCES

1. C.Widrow and S.D. Stearns, Adaptive signal processing, Prentice Hall, 1984.

17EEVC601 ARTIFICIAL INTELLIGENCE

COURSE OBJECTIVES

To enable the students to

- know the fundamentals of the artificial neural networks.
- understand the ANN paradigms.
- Understand the concepts of the fuzzy logic.

UNIT I ARTIFICIAL NEURAL NETWORKS 10

Introduction, Models of Neuron Network-Architectures –Knowledge representation, Artificial Intelligence and Neural networks–Learning process-Error correction learning, Hebbian learning – Competitive learning-Boltzmann learning, supervised learning Unsupervised learning–Reinforcement learning-Learning tasks.

UNIT II ANN PARADIGMS 10

Multi-layer perceptron using Back propagation Algorithm (BPA), Self –Organizing Map (SOM), Radial Basis Function Network-Functional Link Network (FLN), Hopfield Network

UNIT III FUZZY LOGIC 10

Introduction –Fuzzy versus crisp, Fuzzy sets-Membership function –Basic Fuzzy set operations, Properties of Fuzzy sets –Fuzzy cartesion Product, Operations on Fuzzy relations –Fuzzy logic –Fuzzy Quantifiers, Fuzzy Inference-Fuzzy Rule based system, Defuzzification methods .

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Fundamentals of the artificial neural networks are studied.
- ANN paradigm is understood for various applications.
- Concepts of the fuzzy logic is studied.

TEXT BOOKS

1. S.Rajasekaran and G.A.V.Pai Neural Networks, Fuzzy Logic & Genetic Algorithms, PHI, New Delhi, 2003.

REFERENCES

1. Rober J. Schalkoff, Artificial Neural Networks, Tata McGraw Hill Edition, 2011

17EEVC701 MACHINE LEARNING

COURSE OBJECTIVES

To enable the students to

- know the introduction of the machine learning.
- Understand the functions of the vector network.
- know the fundamental and classification of the neural networks.

UNIT I INTRODUCTION 10

Introduction: Learning, Types of Machine Learning. **Some Basic Statistics:** Averages, Variance and Covariance, Gaussian distribution, Bayes theorem. **Concept learning:** Introduction, Version Spaces and the Candidate Elimination Algorithm. **Learning with Trees:** Constructing Decision Trees, CART, Classification Example

UNIT II VECTOR MACHINES 10

Time Series: AR, MA, ARMA, ARIMA , ARMAX for predictions using time dependent data. **Linear Discriminants**: Linear Separability, Linear Regression, **Dimensionality Reduction:** Linear Discriminant Analysis, Principal Component Analysis SUPPORT **Vector Machines**: Optimal Separation, Kernels The Bias-Variance Tradeoff.

UNIT III NEURAL NETWORKS 10

Bayesian learning: Introduction, Bayes Optimal Classifier, Naive Bayes Classifier, Bayesian networks, Approximate Inference, Making Bayesian Networks, Hidden Markov Models, The Forward Algorithm, **Neural Networks :**The Perceptron, Multilayer Perceptron (MLP): Going Forwards, Backwards, MLP in practices, Deriving back Propagation

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Introduction of the machine learning is understood
- Functions of the vector network is understood.
- Fundamental and classification of the neural networks are studied.

TEXT BOOKS

1. Stephen Marsland, Machine Learning - An Algorithmic Perspective, CRC Press, 2009

REFERENCES

1. GalitShmueli, Nitin R Patel, Peter C Bruce, Data Mining for Business Intelligence, Wiley India Edition, 2007

17EEVC801 SOLAR PV SYSTEM DESIGN

COURSE OBJECTIVES

To enable the students to

- know the basics of the solar PV.
- Understand the basic components and functions of the PV.
- know the design procedure of the solar PV.

UNIT I BASICS OF SOLAR PHOTOVOLTAICS 10

Solar Technologies: Crystalline technology, thin film technology, Bi-facial technology, Comparison between PV module technologies. Solar PV Module: Rating of Solar PV Module, PV Module Parameters and Efficiency of PV Module. Solar photovoltaic system configuration: Grid Connected solar Power Plant, Grid interactive solar power plant, Off-Grid / Hybrid solar power plant, Schemes of solar power plant.

UNIT II COMPONENTS OF A SOLAR PV SYSTEM 10

Solar panels: Connection of PV Module in Series and Parallel, Estimation and Measurement of PV Module Power, Selection of PV Module. Inverters: Types of solar inverter, Selection of string /central / off grid inverter, Selection of power conditioning unit (PCU), Sizing of solar inverter for roof top and grid connected projects. Batteries: Battery function, Types of Batteries, Battery parameters, Selection of Battery, Charge Controllers: Functions, PWM charge controllers, MPPT charge controllers.

UNIT III DESIGN GUIDE FOR SOLAR PV SYSTEM 10

Introduction: Energy calculations of a system, Preliminary Planning, Calculating the Energy Yield for a PV Grid-Connected System, Specific Yield. Load calculations: Sizing of Module /Array, Sizing of Storage Battery, Sizing of Charge Controller, Sizing of Wire/ Cable, Sizing of Inverter, Sizing of DCDC Converter.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Describe the Fundamentals of the solar PV studied.
- Analyse the Functions of the PV are studied.
- Design procedure of the solar PV understand.

TEXT BOOKS

1. Chetansingh Solanki, “Solar Photovoltaic”, PHI Learning Private Ltd., New Delhi, 2018.

REFERENCES

1. Sukhatme and J K Nayak, Solar Energy, 4th Edition, McGraw Hill, New Delhi,2017

17MEVC301 CONCEPT IN ENERGY STORAGE

COURSE OBJECTIVES

To enable the students to

- know the need of energy storage.
- know different form of energy storage system.
- Understand the concepts and application of energy storage.

1. **Introduction to Renewable Energy Systems and the Role of Energy Storage**
   History of energy storage from the perspective of the carbon cycle. Natural process of photosynthesis, Biomass, peat, and fossil carriers, and finish in the time of renewables.
2. **Energy Storage Classification**
   storage and energy storage systems, application and how they are classified according to physical, temporal and economic criteria
3. **Lead Acid Batteries**
   Electro-chemical energy storage the terms batteries and accumulators, electrodes, electrolyte Ion-conductive phase.
4. **Lithium Batteries**
   Electro-chemical energy storage the terms batteries and accumulators, electrodes, electrolyte Ion-conductive phase for lithium batteries.
5. **Chemical Energy Storage I**
   Chemical energy storage is the backbone of the conventional energy supply. Solid (wood & coal), fluent (crude oil) and gaseous (natural gas) energy carriers are different types of energy storage

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Select suitable energy storage system depending on necessity.
- Use relevant storage system for particular application.
- Differentiate the various storage system.

TEXT BOOKS

1 Energy Storage Systems and Components, Alfred Rufer

REFERENCES

1. Advanced Energy Storage Technologies and Their Applications Hailong Li(Eds.)

17MEVC401 **ANSYS - II**

COURSE OBJECTIVES

To enable the students to

- learn the concept of Static Structural Analysis
- Understand the concepts Surface and Line Model
- familiarize with thermal analysis.

1 **STATIC STRUCTURAL ANALYSIS**

Static Structural Analysis of Cantilever Beam, Plate with a central circular hole, Plate with a square slot, Pressure vessel, Bracket, Clevis assembly.

2 **SURFACE AND LINE MODEL**

Introduction - Sheet with circular hole-plane stress - Pressure vessel - Line body model

3 **NATURAL FREQUENCIES**

Modal analysis - Gear Box Housing without Prestress - Gear Box Housing with Prestress - Rotor Assembly.

4 **BUCKLING LOADS**

Buckling analysis of - Fixed free column (flag pole) - Pinned-pinned column - Built-up structure.

5 **THERMAL ANALYSIS**

Important terms used in thermal analysis - Types of thermal analysis - Steady state thermal analysis of - Car Disk Brake Rotor - Heat sink.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Familiarize the requirements of Static Structural Analysis
- Apply knowledge on Surface and Line Model
- Evaluate the various analysis.

TEXT BOOKS

1. Jha, N.K. “Handbook of flexible manufacturing systems”, Academic Press Inc., 2010.

REFERENCES

1. Raouf, A. and Ben-Daya, M., Editors, “Flexible manufacturing systems: recent development”, Elsevier Science, 2008.

17MEVC501 INSPECTION TECHNIQUE FOR WELDING

COURSE OBJECTIVES

To enable the students to

- describe importance of welding inspection
- prepare test plan for given welded job as per ASME / AWS
- describe mechanical testing of weldments as per ASTM / ASME

1. **Basics of Welding Inspection and Testing**

   Scope, Definition, Application Basic Testing Symbols Illustration of Welding & Testing Symbols. Ethical and essential requirements for the Welding Inspector. Welding Inspection Operation. Quality Assurance for WI&T. Welding Metallurgy related toWI&T.

2. **Weld and Weld Related Discontinuities**

   Classification of welding related Discontinuities Dimensional Discontinuities -Distortion-Overlap -Desirable, acceptable and unacceptable fillet weld profiles.-Acceptable and unacceptable Butt weld profiles.

3. **Weldment & related discontinuities**

   Standard versus special equipment-material of construction for process equipments, selection criteria, and specification sheets.

4. **Mechanical and chemical weld metal properties**

   Filler metal properties-Base metal properties-Edge laminations -Lamellar Tearing -Arc Strikes

5. **Welding Procedure Specification (WPS & PQR)**

   Description ,Application important details, Example of Qualification WPS, Preparation of sample joints, Testing of representative samples, Evaluation of overall preparation, welding testing & end results

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Identify the need of plant design for an industry.
- Apply the concepts for making plant designing for an industry.
- Represent the designing structure of the plant.

TEXT BOOKS

1. Welding Inspection, AWS Committee, American Welding Society

REFERENCES

1. Welding Technology, O.P.Khanna, Dhanpatrai publication

17MEVC601 **CATIA V5**

COURSE OBJECTIVE

To enable the students to

- gain strong ground on solid modeling techniques that would enhance the productivity in modeling
- develop the analysis process of mechanical components.
-

INTRODUCTION TO CATIA

Introduction to CATIA-History of CATIA-CATIA modeling process, Parametric design concept, feature based design etc-CATIA Features-SKETCHER-Creating a new part.

SKETCHER WORKBENCH

Basic sketch, Sketch in task environment, Selection tools-Profile, Predefined shapes, Circles, Spline, Conics, Line, Points-Operations, Corner, Chamfer, Relimitation tools-Projections, Transformations-Constraints, Sketch tools, Grid, Snap on grid, Construction-Geometrical constraints, Dimensional constraints., Sketch analysis-Visualization tools, View tool bar, Workbench.

TOTAL PERIODS **30**

COURSE OUTCOMES

Upon completion of this course, the students would have

- Learnt advanced solutions for conceptual design, 3D modelling, and documentation.
- Learnt to do product design, industrial design and styling (optimize form, fit, function and user experience), streamline 2D design, drafting, documentation with powerful tools for layout.

TEXT BOOK & MANUALS

- Jonathan M. Weaver, Nader G. Zamani CATIA V5 Tutorials Mechanism Design & Animation Release 20

17MEVC701 APPLICATIONS OF SURFACE COATINGS

COURSE OBJECTIVES

To enable the students to

- know the basics of coatings.
- know different materials used for coating.
- understand the concepts and application of surface coating.

1. **Coating**

   Properties and applications of the given materials used in surface coating preparation, solvent containing systems and enamels.

2. **Application of Coatings**

   Rod coating, Dip coating, Effects of given factors on bio-degradation. Premiered coatings occurring procedure of coatings and its application.

3. **Coating methods**

   Roll coating, Reverse roll coating, gravure roll coating, Premiered coatings like extrusion coaters Slide or cascade coaters, curtain coaters, cast Coating

4. **Adhesives**

   Interfacial contact, Surface tension wettability and spreading, Basic terminology-adhesive, adherent, substrate. Types of adhesives.

5. **Composition of adhesives**

   Composition of adhesives-backbone polymer, solvent thinner, catalyst, hardener, extension-filler, plasticizers, prevention process, resin kettle.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Select coating method for a given product.
- Use relevant coating for particular application.
- Use surface treatments with the substrates for adhesion.

TEXT BOOKS

1 Paints and surface coatings: Theory and Practice. Lambourne, R. and Strivens, T. A.

REFERENCES

1. Hand book of adhesives Skiest, I Van Nostrand Reinhold Company, Washington

17MEVC801 INTRODUCTION TO MACHINE LEARNING

COURSE OBJECTIVES

To enable the students to

- Understand the fundamentals of various machine learning algorithms
- gain knowledge on important methods in ANN, Fuzzy and Genetic algorithm
- study the machine learning algorithms for various heuristic and non-heuristic algorithms

1 INTRODUCTION

Introduction to learning & classifiers- LDA - ANN - Naive Bayes classifier- decision tree Regression.

2 SUPERVISED LEARNING METHODS

Ordinary Least Squares - linear and Logistic Regression- Gaussian process -Stepwise Regression - Multivariate Adaptive Regression Splines (MARS).

3 SEMI SUPERVISED LEARNING METHODS

Locally Estimated Scatterplot Smoothing (LOESS) - overview of nearest neighbour - Support vector machines- Temporal difference learning - Q-learning.

4 UNSUPERVISED

Expectation -maximization (EM) - Vector quantization, Clustering Fuzzy K & C means algorithm - Density-based spatial clustering of applications with noise (DBSCAN) - Conceptual Clustering- Association rule learning - Apriori algorithm- SVD

5 NEURAL NETWORK

Perceptron - Probabilistic Neural Network (PNN) - Back-Propagation (BPN) - Hopfield Network - Self-Organizing Map (SOM).

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Differentiate the basics of supervised and semi supervised learning methods.
- Retrieve the unsupervised and reinforcement learning methods involved in artificial learning
- Interpret the concept of artificial neural networks and their control applications

TEXT BOOKS

1. Ethem Alpaydin, Introduction to Machine Learning, The MIT Press, Cambridge, London.2014.

REFERENCES

1. Simon Haykin, Neural Networks Ã¢?? A comprehensive foundation, Prentice Hall, 3rd Edition, 2004.

17MTVC301 INTRODUCTION TO MOBILE ROBOTICS

COURSE OBJECTIVES

To enable the students to

- learn the fundamentals of robotics and components of robots.
- impart knowledge on end effectors and its design.
- familiarize with the robot kinematic equations

UNIT 1 INTRODUCTION

Mobile Robots – Types of mobile robots: Automated Guided vehicles (AGVs)- Service robots -Cleaning robots – Social Robots – Field Robots –Inspection and exploration robots- Humanoid robots– Nuclear robots – Underwater Robots - Autonomous Surface Vessels. Applications of mobile robots

UNIT 2 KINEMATICS

Kinematics models of mobile robots: Kinematic Models and Constraints – Hilaire mobile robots – Car-like mobile robots –Mobile Robot Manoeuvrability-Mobile Robot Workspace. Motion Control.

UNIT 3 LOCOMOTION

Introduction- Legged Mobile Robots- Leg configurations and stability- Examples of legged robot locomotion- Wheeled Mobile Robots- Wheeled locomotion: the design space- Wheeled locomotion.

UNIT 4 SENSORS FOR MOBILE ROBOTS

Representing Uncertainty- Feature Extraction -Mobile robot localization- Challenge of Localization: Noise and Aliasing - Map Representation - Probabilistic Map based Localization - Probabilistic Map-Based Localization.

UNIT 5 PLANNING AND NAVIGATION

Introduction- Competences for Navigation: Planning and Reacting- Navigation Architectures- Modularity for code reuse and sharing- Control localization- Techniques for decomposition- Case studies: tiered robot architectures.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- identify various domains for robotic systems applications
- develop the kinematic model of mobile robots
- analyse the different concepts of locomotion

TEXT BOOKS

1. Roland Siegwart, Illah Reza Nourbakhsh and Davide Scaramuzza, ―Introduction to Autonomous Mobile Robots‖, 2nd Edition, MIT Press, Cambridge, 2011.

REFERENCES

1. Ingemar J. Cox, and Gordon Thomas Wilfong, ―Autonomous Robot Vehicles‖, Springer, 2012.

17MTVC401 HEALTH AND FITNESS

COURSE OBJECTIVES

To enable the students to

- understand the fundamental concepts about physical.
- understand the importance of fitness & its types,
- aware of training and assessment of physical fitness.

UNIT 1 FITNESS

Meaning & Definition, Need & importance of Physical fitness Types Physical fitness - Exercise, Training and Conditioning and it is important

UNIT 2 YOGA AND MEDITATION

Meaning and definition; Principles of practicing; Basic Asana and it important, Pranayama and Meditation - Relaxation Techniques

UNIT 3 NUTRITION AND BALANCE DIET

Nutrition and Balance Diet: Needs and Important, Significant of Nutritional Food - Tips for balance diet. Common Diseases for IT professionals: Common diseases – cause, prevention First aid for common sports injuries

UNIT 4 LIMBS OF YOGA

Eight Limbs of Yoga - Sattvic, Rajasic, Tamasic Foods and Thoughts - Science of Yoga Loosening Exercises.

UNIT 5 YOGA BENEFITS

Yogasanas & Benefits - Super Brain Yoga - Surya Namaskar Standing Asanas - Yoga in today's scenario- Schools of Yoga.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- acquire the knowledge and training of the individual physical, mental and social concepts
- understand the fundamental concepts of yogic practice and physical fitness
- acquire the knowledge about nutrition and health consciousness

TEXT BOOKS

2. Anderson, Bob., Pearl, Bill.,&Burke, Edmund R., (2011). Getting in Shape Workout Programs for Men&Women. Mumbai: Jaico Publishing House

REFERENCES

2. Iyengar, BKS., (2010). The Art of Yoga. New Delhi: Harper Collins Publishers

17MTVC501 AUTOCAD AND ITS APPLICATIONS

COURSE OBJECTIVES

To enable the students to

- how to organize the drawing within the printing area.
- Write the single text and multi-line text in the drawing.
- make the hatching to provide the sectioning area.

UNIT 1 DRAWING TEMPLATES

Using Template Files (.dwt) to Make New Drawing Exploring, Settings and Elements are saved with Templates.

UNIT 2 ORGANIZING YOUR DRAWING WITH LAYER AND OBJECT TYPES

Layer States Properties by Layer Tools. Polylines, Arcs, Polygons, Ellipses

UNIT 3 ADVANCED EDITING COMMANDS AND INSERTING BLOCKS

Trim and Extend, Fillet and Chamfer, Polyline Edit and Spline, Offset and Explode Join, The Insert Block Command Inserting Blocks with Tool Palettes Dynamic Blocs Migrating Blocks and other Elements between Drawings with Design Center.

UNIT 4 TEXT

The Multiline Text Tool the Single Line Text Tool Editing Text in Model Space vs. Paper Space the Multilayer Tool

UNIT 5 HATCHING

The Hatch Command, the Hatch Editor Ribbon Tab Saving and Applying Hatches with Tool Palettes.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Create the drawing within the printing zone.
- Write the text and hatching in the drawing zone.
- Create the drawing by using advanced tools.

TEXT BOOKS

1. CAD Exercises, Sachidanand Jha

REFERENCES

1. AutoCAD 2020 Beginning and Intermediate, Munir Hamad.

17MTVC601 **CNC BASIS**

COURSE OBJECTIVES

To enable the students to

- know the basics of CNC codes and Machine.
- know different Coding for different operations. .
- write the program to various operations.

UNIT 1 FUNDAMENTALS OF PROCESS PLANNING

Process planning Structure of process plan Factors influencing process plan Sequence of operation of process plan.

UNIT *2* CNC SYSTEMS

CAM, NC, CNC and DNC2.2Selection criteria for CNC machines.2.3Adoptive Control.

UNIT 3 CONSTRUCTIONAL FEATURES OF CNC MACHINES

Classifications of CNC Machine, Modes of operation of CNC, Working of: Machine Structure, Sideways, Spindle drive, Axis drive,

UNIT 4 SPECIAL FEATURES IN CNC MACHINES

Recirculating ball screw Feedback devices (transducers, encoders), Automatic tool changer (ATC), Automatic pallet changer (APC), CNC axis and motion nomenclature, CNC tooling's –tool pre-setting, qualified tool, tool holders and inserts

UNIT 5 CNC PART PROGRAMMING

Machine zero, home position, work piece zero, programme zero.4.3CNC part programming: Programming format and Structure of part programme.4.4ISO G and M codes for turning and milling-meaning and applications of important codes

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Identify different axes, machine zero, home position, systems and controls CNC machines.
- Select, mount and set cutting tools and tool holders on CNC
- Prepare part programmes using ISO format for given simple components with and without Use of MACRO, CANNED CYCLE and SUBROUTINE using ISO format.

TEXT BOOKS

1. CNC Machines, Pabla, B.S. Adithan M.

REFERENCES

1. Introduction to NC/CNC Machines, Vishal, S

17MTVC701 CONSERVATION OF ENERGY

COURSE OBJECTIVES

To enable the students to

- know familiar with the energy efficient devices.
- know the various approaches to conserve energy.
- Understand how to approaches efficient energy management.

UNIT 1 ENERGY CONSERVATION AND EFFICIENCY

Introduction, About Bureau of Energy Efficiency and it's Schemes, Energy Rating, consumption and energy efficient devices Energy Efficiency and its significance

UNIT 2 ENERGY EFFICIENCY IN BUILDINGS AND ENERGY AUDIT

ECBC and Tips for Energy Conservation, Definition, objective, types and methodology of Energy Audit

UNIT 3 INSTRUMENT FOR ENERGY AUDIT

Instruments for Energy Audit, Case studies and Building survey

UNIT 4 COST BENEFIT ANALYSIS

Arithmetic Operator, Logical, Relational, Example for above operators.

UNIT 5 ENERGY AND ITS USE

Introduction, Types of Renewable Energy Sources, Electric vehicle.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- differentiate the various energy efficient devices.
- use of various methods Energy conserve methods.
- approach the various Energy management techniques

TEXT BOOKS

1. Energy Conservation and Audit by Mr. Amit L. Nehete

REFERENCES

1. Energy Conservation Case studies in ceramic industry, sugar industry, fertilizer industry, cement industry. CII, Energy Management Cell etc

17MTVC801 BASICS OF ARTIFICIAL INTELLIGENCE

COURSE OBJECTIVES

To enable the students to

- Know the basics concept artificial intelligence.
- Know the effect artificial intelligence in industry oriented.
- Apply AI techniques for different industrial application

UNIT 1 INTRODUCTION

A brief review of AI history, what is artificial intelligence, Related research fields.

UNIT 2 PRODUCTION SYSTEM

Production system, Inference engine, Working memory, Knowledge base, Pattern matching,

UNIT3 ONTOLOGY

What is ontology, Semantic network, Frame, Structural knowledge, Declarative knowledge, Procedural knowledge.

UNIT 4 FUZZY LOGIC: HUMAN-LIKE DECISION MAKING

Definition of fuzzy set, Membership function, Notation of fuzzy set, Operations of fuzzy set, Fuzzy number and operations, Extension principle, Fuzzy rules, De-fuzzification, Fuzzy control.

UNIT 5 PATTERN RECOGNITION

Concept and concept learning, Pattern classification and recognition. Feature vector representation of patterns. Nearest neighbor-based learning, Discriminant function and decision boundary. Multi-class pattern recognition, General formulation of machine learning. The k-means algorithm.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Identify the need of AI
- Apply the concepts for automation of industry.
- Apply the various engineering application.

TEXT BOOKS

1. Qiangfu ZHAO and Tatsuo Higuchi, Artificial Intelligence: from fundamentals to intelligent searches, Kyoritsu, 2017, ISBN:978-4-320-12419-6 (in Japanese)

REFERENCES

1. Introduction to Artificial Intelligence, Shinji Araya, KYORITSU SHUPPAN, ISBN4-320-12116-3.

17CMVC301 ADVANCED MATERIALS & CHARACTERIZATION

COURSE OBJECTIVES

To enable the students to gain knowledge on

- Processing methods, microstructure and mechanical characterization techniques used in industries and research.
- Advances on materials for diversified applications.

ADVANCED MATERIALS Advanced materials for automobile, space, defense etc. - Importance - case studies - Functionally graded materials - SAP - ECAP process - ultrafine grained materials - composite preparation by stir casting – quality control.

POWDER METALLURGY RESEARCH Selection and characterization of powders - compacting and sintering : Metal, polymer and ceramic based composites - advantages – applications

MODERN METALLIC MATERIALS Dual phase steels - High strength low alloy steel - Transformation induced plasticity steel - maraging steel - nitrogen steel – Ni and Ti aluminides – smart materials - shape memory alloys – Metallic glass and nano crystalline materials.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- to fabricate the components by various manufacturing techniques.
- Do their research in the areas of materials science and metallurgical engineering.
- Understand the knowledge about the properties of nano materials.

TEXT BOOKS

1. Selvakumar N, “Engineering Metallurgy and Nanotechnology”, Scitech publishers, 2016.

REFERENCES

1. William D Callister, “Material Science and Engineering”, John Wiley and Sons 2007

17CMVC401 RENEWABLE ENERGY RESOURCES

COURSE OBJECTIVES

To enable the students to

- Discuss the challenges and problems associated with the use of energy sources.
- Explain the current energy scenario and future energy usage in India.

ENERGY PERSPECTIVES Conventional and non conventional energies - Energy and sustainable development - Global energy scenario - Energy scenario in India

SOLAR ENERGY PERSPECTIVES Concept of solar energy - Solar energy to light and to thermal conversions - Total energy and necessary infrastructure - Units and measurement of solar radiation - Temperature dependent collecting devices and their efficacies Typical applications

WIND ENERGY PERSPECTIVES Wind potential in India - Wind turbines and their types - Merits and demerits -performance of wind machines -Energy conversion

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Explain the current energy scenario and future energy usage in India.
- Explain the concepts of solar energy, wind energy, tidal energy and biomass energy.
- Discuss the challenges and problems associated with the use of energy sources.

TEXT BOOKS

1. Rai, G.D., "Solar Energy Utilization", Khanna Publishers, New Delhi, 1993.

REFERENCES

1. Sukathme, S.P, "Solar Energy", Tata McGraw-Hill Book Co., New Delhi, 1993.

17CMVC501 SOLAR ENERGY UTILISATION

COURSE OBJECTIVES

To enable the students to gain knowledge on

- Solar energy, Photovoltaic cells, Solar cell and its applications
- Thermal conversion and methods, Thermo electric Conversion systems

INTRODUCTION TO SOLAR ENERGY Introduction, overview of applications - calculation of solar constant, terminology related to solar radiation, definition and calculation of solar times, definition and calculation of all solar angles and related earth angles.

PHOTOVOLTAICS Fundamentals of solar cells: types of solar cells, semiconducting materials Solar cell properties and design

SOLAR CELL Solar Cell Applications - Solar cell manufacturing processes: material resources, environmental impacts; Thin film solar cells - Single crystal, polycrystalline and amorphous silicon solar cells, cadmium telluride thin-film solar cells, conversion efficiency.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Calculate solar time, local time, direct and indirect solar radiation for the given location using earth sun geometry
- Categorize solar cell materials with its properties and calculate energy conversion efficiency of solar cells
- Analyze the Performance of thermo-electric devices: generators, refrigerators and heat pumps

TEXT BOOKS

1. Garg H.P., Prakash J., "Solar Energy: Fundamentals & Applications", Tata McGraw Hill, New Delhi, 1997

REFERENCES

1. S. P. Sukhatme, "Solar Energy", Tata McGraw Hill, New Delhi, 1999

17CMVC601 GREEN TECHNOLOGY

COURSE OBJECTIVES

To enable the students to gain knowledge on

- the green technology concepts and relevance in twenty first century requirements
- indicators of sustainability and their use
- the environmental and sustainability issues

INTRODUCTION The concept of green technology; evolution; nature, scope, importance and types; developing a theory; green technology in India; relevance in twenty first century.

SUSTAINABILITY & ENVIRONMENT Organizational environment; Indian corporate structure and environment; how to go green; spreading the concept in organization; environmental and sustainability issues for the production of high-tech components and materials.

ECOSYSTEM APPROACHES Approaches from ecological economics; indicators of sustainability; ecosystem services and their sustainable use; bio-diversity; Indian perspective; alternate theories.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Outline the green technology concepts
- Criticize the environmental reporting, ISO 14001, ISO 14064, financial initative by UNEP.
- Analyze the green tax incentives and rebates, business redesign and its models.

TEXT BOOKS

1. Green Technology and Green Technologies: Exploring the Causal Relationship by Jazmin Seijas Nogarida, 2008.

REFERENCES

1. Green Marketing and Technology: A global Perspective by John F. Whaik, 2005.

17ITVC301 INTRODUCTION TO CEH

COURSE OBJECTIVES

To enable the students to

- To Explore ethical hacking basics
- To Explore wireless network hacking
- To Investigate reconnaissance: Information gathering for the ethical hacker

Module 1: Introduction

- Course Introduction
- Introduction to the CEH Certification

Module 2: Introduction to Ethical Hacking

- Fundamental Security Concepts
- Information Security Threats and Attacks
- Introduction to Ethical Hacking
- Introduction to the Cyber Kill Chain
- Introduction to Security Controls
- Introduction to Security Laws and Standards

Module 3: Footprinting and Reconnaissance

- Introduction to Footprinting
- Website Footprinting
- DNS Footprinting
- HTTrack (Demo)
- Shodan (Demo)
- Google Hacking Database (Demo)
- LinkedIn (Demo)
- Job Boards (Demo)
- whois (Demo)
- Banner Grabbing (Demo)

- The Harvester (Demo)
- Foot printing Countermeasures

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Analyze ethical hacking basics
- Implement wireless network hacking
- Implement Information gathering for the ethical hacker

TEXT BOOKS

1. Hacking: The Art of Exploitation, 2nd Edition 2nd Edition, Kindle Edition by Jon Erickson

REFERENCES

1. Black Hat Python: Python Programming for Hackers and Pentesters 1st Edition, Kindle Edition

17ITVC401 # VMWARE VIRTUALIZATION

COURSE OBJECTIVES

To enable the students to

- To Explore the many significant benefits of virtualization
- To Understand about VMware Virtualization
- To Understand, create and manage high availability clusters to protect against VM service loss caused by ESXi server failures

Module 1 Introduction to Virtualization Technologies

• VMware workstation

• VMware player

• Virtual box

Module 2. Introduction to VMware Virtualization

• Introduce Virtualization

• Introduce Virtual machines

• Introduce vSphere components

Module 3. VMware ESX and ESXi (ESX/ESXi 4.1)

• Introduce the architecture of ESX and ESXi

• Manually configure ESX/ESXi

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Analyze the many significant benefits of virtualization
- Implement about VMware Virtualization
- Demonstrate create and manage high availability clusters to protect against VM service loss caused by ESXi server failures.

TEXT BOOKS

1. Learning VMware vSphereby Abhilash G B, Rebecca Fitzhugh Released October 2016

REFERENCES

1.VCA-DCV: VMware Certified Associate-Data Center Virtualization on vSphere Study Guide:

VCAD-510 1st Edition

17ITVC501 LINUX COMMANDS WITH OPEN STACK

COURSE OBJECTIVES

To enable the students to

- To Explore OpenStack architecture with both CLI and API functionalities
- To Implement and use Nova, Neutron, Image and other OpenStack services
- To Work on an interactive project around implementing OpenStack

Module 1: Introduction

- Introduction to Linux
- Linux admin commands
- Introduction to Cloud
- Comparison with Amazon AWS and RackSpace cloud
- Other Cloud frameworks
- Introduction to OpenStack and its components
- Virtualization techniques

Module 2:Compute (Nova)

- What is nova
- Supported hypervisors
- Xen, LXC, KVM, Qemu, VMWare
- Architecture & features
- Control Flow
- Building a Platform as a Service using Docker/LXC?

Module 3:OpenStack image service (Glance)

- What is Glance
- Supported image formats
- Creating, uploading and using an image
- Architecture & features
- Control flow

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Analyze OpenStack architecture with both CLI and API functionalities
- Implement and use Nova, Neutron, Image and other OpenStack services
- Analyze interactive project around implementing OpenStack

TEXT BOOKS

1. Learning OpenStack Networking - Third Edition By James Denton

REFERENCES

1. OpenStack Cloud Computing Cookbook - Fourth Edition By Kevin Jackson , Cody Bunch

17ITVC601 ORACLE WITH MYSQL

COURSE OBJECTIVES

To enable the students to

- To Understand about basics of SQL.
- To Learn about retrieving data from stored data.
- To Focuses on the creating table with DDL commands.

Module 1: Introduction To SQL

1. Introduction Database
2. Understanding DBMS vs RDBMS
3. Gone through SQL Standards
4. Sub languages of SQL
5. Difference between 10g vs 11g vs 12c
6. Installation of 12c
7. About SQL*Plus and use of developer tool
8. Datatypes in Oracle
9. Operators in Oracle
10. Understanding Schema design and objects

Module 2: Data Retrieval Techniques

1. How to use select statement in different ways to retrieve records?
2. Working with Column alias
3. Working with Table alias
4. Data filtering and sorting with in single table
5. Clauses and its types in oracle

    - Where clause
    - Having clause
    - From clause

- Group by clause
- Order by clause
- Using clause
- Constraint clause
- For update clause

Module 3: Working With DDL Commands

1. Table creation using CREATE statement
2. Creating table from another table
3. Dropping a table using DROP command
4. Altering the column of a table
5. Modifying the column datatype in a table
6. Renaming the column of a table
7. Renaming an entire table
8. Using truncate command
9. Difference between Delete and Truncate command

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Analyze basics of SQL.
- Demonstrate retrieving data from stored data
- Implement creating table with DDL commands.

TEXT BOOKS

1. Oracle Database 12c The Complete Reference (Oracle Press) Hardcover – Illustrated, 16 October 2013

REFERENCES

1.Oracle Database 11g The Complete Referenceby Kevin LoneyReleased October 2008

17ITVC701 INTRODUCTION TO BLOCK CHAIN

COURSE OBJECTIVES

To enable the students to

- To be able to explain the different components involved within Blockchain
- To understand what Blockchain is and why it is used
- To understand about basic Crypto primitives

Module 1: Introduction

- Need for Distributed Record Keeping
- Modeling faults and adversaries
- Byzantine Generals problem
- Consensus algorithms and their scalability problems
- Why Nakamoto Came up with Blockchain based cryptocurrency? Technologies Borrowed in Blockchain – hash pointers, consensus, byzantine fault-tolerant distributed computing, digital cash

Module 2: Basic Distributed Computing

Atomic Broadcast, Consensus, Byzantine Models of fault tolerance

Module 3: Basic Crypto primitives

Hash functions, Puzzle friendly Hash, Collison resistant hash, digital signatures, public key crypto, verifiable random functions, Zero-knowledge systems

TOTAL PERIODS 30

COURSEOUTCOMES

At the end this course, students will be able to

- Analyze different components involved within Blockchain
- Analyze what Blockchain is and why it is used
- Implement basic Crypto primitives

TEXT BOOKS

1. Attack of the 50 Foot Blockchain: Bitcoin, Blockchain, Ethereum and Smart Contracts: Bitcoin, Blockchain, Ethereum & Smart Contracts Paperback – 24 July 2017

REFERENCES

1. BlockchainBy Released January 2015 Publisher(s): O'Reilly Media, Inc.

17ITVC801 DATA ANALYTICS

COURSE OBJECTIVES

To enable the students to

- To understand about basic concept data Analytics
- Integrate R in a Hadoop platform
- write R codes to manipulate data

Module1 Introduction

- What are Data Analysis, Data Analytics and Data Science?
- Business Decisions
- Case study of Walmart

Module2 Various analytics tools

- Descriptive
- Predictive
- Web Analytics
- Google Analytics
- R and features
- Evolution of R?
- Big data Hadoop and R

Module3 Data Types

- R & R Studio Installation
- Scalar
- Vectors
- Matrix
- List
- Data frames
- Factors
- Handling date in R
- Conversion of data types
- Operators in R

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Analyse basic concept data Analytics
- Demonstrate R in a Hadoop platform
- Implement R codes to manipulate data

TEXT BOOKS

1. R for data science: Import, Tidy, Transform, Visualize, And Model Data Paperback – 20 January 2017.

REFERENCES

1. The Art of R Programming: A Tour of Statistical Software Design Paperback – 11 October 2011.

17PCEVC101 BIG DATA USING HADOOP

COURSE OBJECTIVES

To enable the students to

- Understand the Big Data Platform and Provide an overview of Apache Hadoop (HDFS)
- Understand Map Reduce Jobs
- Provide hands on Hadoop Eco System

Module 1: INTRODUCTION TO BIG DATA AND HADOOP

- Introduction to Big Data,
- Big Data Analytics, History of Hadoop,
- Apache Hadoop - Analysing Data with Hadoop,
- Hadoop Streaming, Hadoop Echo System.
- HDFS(Hadoop Distributed File System): The Design of HDFS, HDFS Concepts
- Command Line Interface, Hadoop file system interfaces,
- Data flow, Data Ingest with Flume and Scoop and Hadoop archives,
- Hadoop I/O: Compression, Serialization, Avro and File-Based Data structures.

Module 2 Map Reduce

- Anatomy of a Map Reduce Job Run
- Failures, Job Scheduling
- Shuffle and Sort
- Task Execution
- Map Reduce Types and Formats
- Map Reduce Features.

Module 3 : Hadoop Eco System

- Pig
- Hive
- Hbase
- Big SQL

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Identify Big Data and its Business Implications
    - List the components of Hadoop and Hadoop Eco-System
    - Develop Big Data Solutions using Hadoop Eco System

REFERENCE

- https://repository.stcloudstate.edu/cg

17PCOVC101/

17PVLVC101

TEACHING LEARNING PROCESS

(Common for M .E. Communication Systems/VLSI Design)

COURSE OBJECTIVE

To enable the students to

- give an exposure to the teaching methods
- provide an exposure to Learning methods

Unit I: Teaching process **15**

Principles of Teaching -. Maxims of Teaching -Devices of Teaching -Curriculum development-curriculum Activities-. Educational Technology: Meaning Importance and Types-Micro- Teaching and Modification of Teacher Behavior-. Indian Model of Micro-Teaching

Unit II: Learning process **15**

Types of learning-Models of methods - Role of Mass Media in Education-. Evaluation -Class-Room Problems -Team methods -Programmed Learning-Simulated learning

TOTAL PERIODS **30**

COURSE OUTCOMES

Upon completion of this course, the students would have

- understand the types teaching methods
- recognize the types of Learning methods

TEXT BOOK & MANUALS

1. Tickoo, M. L Teaching and Learning Orient Blackswan Pvt Ltd

17PCOVC201/

17PVLVC201

ADVANCES IN JOURNAL WRITING

(Common for M .E. Communication Systems/VLSI Design)

COURSE OBJECTIVE

To enable the students to

- give an exposure to the scientific journal writing
- provide an exposure to journal. patent publication

Unit I: Scientific Writing **15**

Scientific Writing- Structure and components of Scientific Reports – types of Report – Technical Reports– Significance – Different steps in the preparation – Layout, structure and Language of typical reports Illustrations and tables – Use of word processing, spread sheet and database software. Plotting of graphs, drawing inferences from data Bibliography, Referencing and foot notes – Importance of Effective Communication.

Unit II: Preparing Research papers for journals **15**

Preparing Research papers for journals, Seminars and Conferences –Design of paper using TEMPLATE, Calculations of Impact factor of a journal, citation Index, ISBN & ISSN. Documentation and scientific writing Results and Conclusions, Preparation of manuscript for Publication of Research paper, Presenting a paper in scientific seminar. Ethical Issues –copy right – royalty – Intellectual Property rights and patent law – Track Related aspects of intellectual property Rights – Reproduction of published material – Plagiarism – Citation and Acknowledgement – Reproducibility and accountability.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- understand the concepts in scientific journal writing
- recognize the key issues in journal and patent publication.

TEXT BOOK & MANUALS

1. Wadehra, B.L.2000. Law relating to patents, trademarks, copyright designs and geographical indications. Universal Law Publishing.
2. Research Methodology Dr P M Bulakh,Dr P. S. Patki and Dr A S Chodhary 2010 Published by Expert Trading Corporation Dahisar West, Mumbai 400068

17PCOVC301 /17PVLVC301

LANGUAGE AND COMMUNICATION IN TEACHING PROFESSION

(Common for M .E. Communication Systems/VLSI Design)

COURSE OBJECTIVE

To enable the students to

- understand the features of literature and use it for language teaching
- familiarize them with different approaches to using literature in language classes and the major criteria for selecting literary texts to use them in class

Unit-I- USING LITERATURE IN LANGUAGE CLASSES **15**

Definitions of literature - the reader and the text - literary competence and grammatical competence – distinct features of the language of literature – reasons for using literature as a resource in language class– preparing a lesson plan for different genres of literature

Unit II – APPROACHES TO USING LITERATURE IN LANGUAGE CLASSES **15**

Approaches: language-based approach, literature as content, literature for personal enrichment – stylistics for making meaningful interpretations of a literary text – literary meta-language to identify distinctive features in a literary text – criteria for selecting literary texts

TOTAL PERIODS **30**

COURSE OUTCOMES

Upon completion of this course, the students would have

- gain knowledge of Design language activities and lesson plans for developing both receptive and productive skills
- gain knowledge of Make use of their knowledge about various features of literature to create a favorable atmosphere for the acquisition of language skills

TEXT BOOK

1. Brumfit, C.J. and Carter, R. (eds.) Literature and Language Teaching. Oxford: Oxford University Press, 1986.
2. Carter, Ronald. (ed.). Language and Literature, London: Allen and Unwin, 1983

17PEDVC01 **AUTOMOBILE DESIGN**

COURSE OBJECTIVES

To enable the students to

- Know the basics design procedure of Automobile parts.
- Know various kind of commands and order used in particular software.
- Write the program to various operations.

1. **BODY SYSTEMS**

   Complete Body-In-White , Floor Pans ,Underbody Assemblies, Door/Hood/Deck Assemblies, Roof Panels

2. **CHASSIS SYSTEMS**

   Cross member Assemblies ,Radiator Supports ,Shock Towers, Engine Cradles, Front and Rear Sub-Frame Assemblies ,Front and Rear Suspension Modules

3. **EXTERIOR SYSTEMS**

   Front and Rear Fascias , Energy Management Systems

4. **VEHICLE ENHANCEMENT PACKAGES**

   Ground Effects, Roof Racks, Running Boards.

5. **INTERIOR SYSTEMS**

   Door module, power closure system, Driver control, Latching system

TOTAL PERIODS 30

COURSE OUTCOMES At the end this course, students will be able to

- Use the Pro-e software to design the various elements in the particular area.
- .Develop the various elements in the automobile structure and assemble to convert as single unit.
- Make different unit in the Automobile structure.

TEXT BOOKS

1 How to Draw Cars Like a Pro, 2nd Edition Thom Taylor and Lisa Hallett

REFERENCES

1. A Century of Automotive Style Michael Lamm and Dave Holls

17PEDVC02 DESIGN OF SOLAR ENERGY SYSTEM

COURSE OBJECTIVES

To enable the students to

- know the basic concept power consumption.
- know the need of solar power plant design.
- understand the concept designing the solar power Plant and the elements needed for designing.

1. **Types of Solar Power Plant**

   Grid Connected solar Power Plant, Grid interactive solar power plant, Net Metering Solar Power Plant, Off-Grid / Hybrid solar power , plant Schemes of solar power plant

2. **Selection of PV module technology**

   Introduction, Crystalline technology, Thin film technology,Bi-facial technology,Comparison between PV module technology,Comparison between solar power plant energy out put

3. **Selection of PV module (cells and BOM) and sizing**

   Types Crystalline module cells, Manufacturing process of PV cells, Comparison between mono crystalline Selection of PV cells, Selection of front and rear sheet, Selection of PV module glass

4. **Inverters Selection and Sizing (Grid Connection and Off Grid)**

   Factors affecting plant location, factors in planning layouts, principles of plant layout, use of scale models.

5. **Connection of PV Module(Series and Parallel Circuit**

   Series Circuits, Parallel Circuits, Combining Series & Parallel Circuits,PV module string connection Matching the PV Array ToThe Voltage Specifications of An Inverter, Matching the PVArray to the Inverter's Current Rating, Matching the PVArray to the Inverter's Power Rating Summary of Calculations for Matching Array and Inverter.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Identify the need of solar power plant over other sources.
- Apply the concepts for making plant designing for an industry and domestic appliances.
- Represent the designing structure of the plant.

TEXT BOOKS

1. Solar Power Systems Design: From the Sun into Electricity, Taleb Al-theanatEdition: 1st

Publisher: GIEEISBN: 978-0-9986916-0-2

REFERENCES

1. Power Generation, Operation and Control" by Wood A J and Wollenberg B F

17PPEVC101 **GRAPH THEORY**

COURSE OBJECTIVES

To enable the students to

- familiarize the students in the field of distance in graphs and its applications.
- introduce types of digraphs and various matrix representations.
- expose the students to flows in networks.

UNIT I DISTANCE IN GRAPHS **10**

The center of a graph - Distant vertices - Locating Numbers - Detour and Directed distance - Channel assignment

UNIT II DIRECTED GRAPHS **10**

Types of digraphs - Digraphs and binary relations - Directed paths and connectivity - Euler digraphs - Trees withdirected edges - Fundamental circuits in digraphs - Matrices A,B and C of Digraph - Adjacency matrix of a Digraph.

UNIT III NETWORK FLOWS **10**

Cut sets - Some properties of a cut set - All cut sets in a graph - Fundamental circuits and cuts sets - Connectivity andseparability Network flows - 1-Isomorphism - 2-Isomorphism.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Familiar with the concept of distance in graphs and its applications.
- Acquire the knowledge of types of digraphs and the matrix representations.
- Acquire the concept of Domination in graphs and applications.

TEXT BOOKS

1. Gary Chartrand, Ping Zhang, “Introduction to Graph Theory”, Tata McGraw-Hill Publishing company Limited, New Delhi, 2017.

REFERENCES

1. Narsingh Deo “Graph Theory with Applications to Engineering and Computer science”, Prentice-Hall of India Private Limited, New Delhi, 2016.

17PPEVC201 MAINTAINABILITY ENGINEERING

COURSE OBJECTIVES

To enable the students to

- provide the students about the basic concept of maintainability engineering.
- provide knowledge on various maintenance models, maintenance policies and replacement model of various equipment.
- Inculcate the knowledge on logistics for the effective utilization of existing resources and facilities availability of spares parts.

UNIT I MAINTENANCE CONCEPT 10

Need for maintenance – Maintenance definition – Maintenance objectives – Challenges of Maintenance management – Tero technology – Scope of maintenance department – Maintenance costs.

UNIT II MAINTENANCE MODELS 10

Proactive/Reactive maintenance – Imperfect maintenance – Maintenance policies – PM versus break downmaintenance – Optimal PM schedule and product characteristics – Optimal Inspection frequency: Maximizing profit– Minimizing downtime – Replacement models.

UNIT III MAINTENANCE LOGISTICS 10

Human factors – Crew size decisions: Learning curves – Simulation – Maintenance resource requirements: Optimalsize of service facility – Optimal repair effort – Maintenance planning – Maintenance scheduling – Spare parts control – Capital spare.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- recall various terms and terminologies about the maintenance concept.
- understand and explain the various maintenance models to reduce downtime and maximize profit.
- illustrate the logistics meant for the execution of various services.

TEXT BOOKS

2. Andrew K.S.Jardine & Albert H.C.Tsang, “Maintenance, Replacement and Reliability”,Taylor and Francis, 2nd edition, 2013.

REFERENCES

2. Bikas Badhury & S.K.Basu, “Tero Technology: Reliability Engineering and Maintenance Management”, Asian Books, 2003.

17PPEVC301 **SAFETY IN TRANSPORT**

COURSE OBJECTIVES

To enable the students to

- provide the students about the various activities/steps to be followed in safe handling the hazardous goods transportation from one location to another location.
- educate the reasons for the road accident and the roles and responsibilities of a safe Driver and the training needs of the driver.
- inculcate the culture of safe driving and fuel conservation along with knowing of basic traffic symbols followed throughout the highways.

UNIT I TRANSPORTATION OF HAZARDOUS GOODS 10

Transport emergency card (TREM) – driver training-parking of tankers on the highways speed of the vehicle –warning symbols – design of the tanker lorries -static electricity, responsibilities of driver – inspection and maintenance of vehicles-check list- loading and decanting procedures – communication.

UNIT II ROAD TRANSPORT 10

Introduction – factors for improving safety on roads – causes of accidents due to drivers and pedestrians-design,selection, operation and maintenance of motor trucks, preventive maintenance-check lists, motor vehicles act – motor vehicle insurance and surveys.

UNIT III DRIVER AND SAFETY 10

Driver safety programme – selection of drivers – driver training-tachograph-driving test, driver's responsibility-accident reporting and investigation procedures-fleet accident frequency-safe driving incentives- slogans in driver cabin-motor vehicle transport workers act- driver relaxation and rest pauses – speed and fuel conservation – emergency planning and Hazmat codes.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- know various safety activities undertaken in transporting of hazardous goods.
- understand the various symbols which are specific to the road safety and could acquire the knowledge on the importance of Motor Vehicle Act and insurance.
- apply for the safe driving by proper training aids and the procedure involved in accident investigation and emergency planning.

TEXT BOOKS

1. Pasricha, "Road Safety guide for drivers of heavy vehicle" Nasha Publications, Mumbai, 1999

REFERENCES

1. Kadiyali,"Traffic Engineering and Transport Planning" Khanna Publishers, New Delhi, 1983.

17PPSVC101 **CLOUD SECURITY**

COURSE OBJECTIVES

To enable the students to

- introduce the Cloud Computing Model and Cloud Infrastructure Security
- discuss the threats to data security and identity management
- explore the methods for security management and privacy in cloud Computing

UNIT I CLOUD COMPUTING FUNDAMENTALS, ARCHITECTURE AND RISK ISSUES **10**

Fundamentals: Cloud computing – Essential characteristics – Architectural, Technical and Operational Influence architecture: Cloud delivery models (SaaS, PaaS, IaaS) – Cloud Service Providers (Amazon, Google, Azure, Salesforce) – Cloud deployment models (Public, Private, Community, Hybrid) – Benefits. Risk Issues: CIA – Privacy & Compliance Risks .

UNIT I I CLOUD COMPUTING SECURITY CHALLENGES AND ARCHITECTURE **10**

Security Challenges: Security policy types – Virtualization Security Management – Virtual Threats – VM Securityrecommendations – VM specific security techniques.Security Architecture: General Issues – Trusted cloud computing – Secure execution environments and communications – Identity management – Access control – Autonomic security.

UNIT I II INFRASTRUCTURE, DATA SECURITY AND IDENTITY MANAGEMENT **10**

Infrastructure & Data Security: Network Level – Host Level – Application Level – Data security Mitigation – Provider data and its security.Identity & Access Management (IAM): Trust Boundaries and IAM – IAM Challenges – IAM Architecture and Practice – IAM Standards and Protocols for Cloud Services – IAM Practices in the Cloud – Cloud Authorization Management – Cloud Service Provider IAM Practice

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Design a Cloud Computing Model and Cloud Secure Infrastructure
- Manage the threats to data security and do identity management in Cloud
- Deploy the appropriate methods for security management in cloud computing

TEXT BOOKS

1. Raj Samani, Brian Honan, Jim Reavis and Vladimir Jirasek, "CSA Guide to Cloud Computing Implementing Cloud Privacy and Security", Elsevier, 2015.

REFERENCES

1. Siani Pearson, George Yee (Eds), "Privacy and Security for Cloud Computing", Springer-Verlag 2013.

17PPSVC201 MAINTAINABILITY IN ENGINEERING

COURSE OBJECTIVES

To enable the students to

- provide the students about the basic concept of maintainability engineering.
- provide knowledge on various maintenance models, maintenance policies and replacement model of various equipment.
- Inculcate the knowledge on logistics for the effective utilization of existing resources and facilities availability of spares parts.

UNIT I MAINTENANCE CONCEPT 10

Need for maintenance – Maintenance definition – Maintenance objectives – Challenges of Maintenance management – Tero technology – Scope of maintenance department – Maintenance costs.

UNIT II MAINTENANCE MODELS 10

Proactive/Reactive maintenance – Imperfect maintenance – Maintenance policies – PM versus break downmaintenance – Optimal PM schedule and product characteristics – Optimal Inspection frequency: Maximizing profit– Minimizing downtime – Replacement models.

UNIT III MAINTENANCE LOGISTICS 10

Human factors – Crew size decisions: Learning curves – Simulation – Maintenance resource requirements: Optimalsize of service facility – Optimal repair effort – Maintenance planning – Maintenance scheduling – Spare parts control – Capital spare.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- recall various terms and terminologies about the maintenance concept.
- understand and explain the various maintenance models to reduce downtime and maximize profit.
- illustrate the logistics meant for the execution of various services.

TEXT BOOKS

1. Andrew K.S.Jardine & Albert H.C.Tsang, “Maintenance, Replacement and Reliability”,Taylor and Francis, 2nd edition, 2013.

REFERENCES

1. Bikas Badhury & S.K.Basu, “Tero Technology: Reliability Engineering and Maintenance Management”, Asian Books, 2003.

17PPSVC301 **TRANSPORT SAFETY**

COURSE OBJECTIVES

To enable the students to

- provide the students about the various activities/steps to be followed in safe handling the hazardous goods transportation from one location to another location.
- educate the reasons for the road accident and the roles and responsibilities of a safe Driver and the training needs of the driver.
- inculcate the culture of safe driving and fuel conservation along with knowing of basic traffic symbols followed throughout the highways.

UNIT I TRANSPORTATION OF HAZARDOUS GOODS 10

Transport emergency card (TREM) – driver training-parking of tankers on the highways speed of the vehicle –warning symbols – design of the tanker lorries -static electricity, responsibilities of driver – inspection and maintenance of vehicles-check list- loading and decanting procedures – communication.

UNIT II ROAD TRANSPORT 10

Introduction – factors for improving safety on roads – causes of accidents due to drivers and pedestrians-design,selection, operation and maintenance of motor trucks, preventive maintenance-check lists, motor vehicles act – motor vehicle insurance and surveys.

UNIT III DRIVER AND SAFETY 10

Driver safety programme – selection of drivers – driver training-tachograph-driving test, driver's responsibility-accident reporting and investigation procedures-fleet accident frequency-safe driving incentives- slogans in driver cabin-motor vehicle transport workers act- driver relaxation and rest pauses – speed and fuel conservation – emergency planning and Hazmat codes.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- know various safety activities undertaken in transporting of hazardous goods.
- understand the various symbols which are specific to the road safety and could acquire the knowledge on the importance of Motor Vehicle Act and insurance.
- apply for the safe driving by proper training aids and the procedure involved in accident investigation and emergency planning.

TEXT BOOKS

1. Pasricha, "Road Safety guide for drivers of heavy vehicle" Nasha Publications, Mumbai, 1999

REFERENCES

1. Kadiyali,"Traffic Engineering and Transport Planning" Khanna Publishers, New Delhi, 1983.

17 PSEVC101 STRUCTURAL MATERIALS: SELECTION AND ECONOMICS

COURSE OBJECTIVES

To enable the students to

- Understand the principles of structural materials selection through a practical curriculum rooted in the real world.

Introduction to externalities of materials selection- comprising social, political, economic, military, cultural, environmental and other effects. Introduction to relationship between material cost, abundance and usage. Factors influencing availability such as energy density and recyclability are also discussed. Introduction to the properties of materials that influence use in structural applications. Discussion of ratio analysis using among other examples steel, aluminum, and titanium. Discusses manufacturing and processing factors that effect material choice in various applications. Introduction to causes of material failures.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Apply the Limits and Ratio Analysis of Structural Materials

TEXT BOOKS

1. Iyengar, N. G. R., Structural Stability of columns and plates, Eastern West.

REFERENCES

1. Swamy R.N., Blackie, New Concrete Materials, Academic & Professional Publishers

17PSEVC201 **PRETENSIONED STRUCTURES**

COURSE OBJECTIVES

To enable the students to

- design prestressed concrete members and structural systems.

Design of pretensioned Hollow-Core slabs, Double-Tee and I-Beam members, and one-way post-tensioned floor slabs is exercised using current building code requirements to provide experiences in realistic design practice. The following subjects are used to solve engineering problems: calculus and differential equations; use of computer tools, data manipulation, statistical analysis, numerical calculation, and reinforced concrete design principles.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- design Pretensioned structures, Flexure Design ,Bond of pretensioned strand

TEXT BOOKS

1. S.B. Vanakudre, Prestressed Concrete, Khanna Books, Delhi

REFERENCES

1. Krishnaraju N., Prestressed Concrete, Tata McGraw Hill, New Delhi

17PSEVC301 **STRUCTURE OF MATERIALS**

COURSE OBJECTIVES

To enable the students to

- learn the properties of higher-order defects such as stacking faults and grain boundaries.

An Introduction to Materials Science -Structure of materials roadmap -States of matter and bonding – Descriptors -Descriptors: concept and function -Free volume -Pair distribution function –Glasses - Glass processing methods -Continuous network model -Network modifiers- Polymer- Random walk model - Chain-to-chain end distance -Order and disorder in polymers - An Introduction to the Crystalline State -Translational symmetry -The crystalline state in 2D -The crystalline state in 3D

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- identify defects impact numerous properties of materials—from the conductivity of semiconductors to the strength of structural materials

TEXT BOOKS

1. Suryja Kuamar Maiti, Fracture Mechanics, Cambridge University Press

REFERENCES

1. K.K. Chawla, Composite Materials, Springer India

17 PSEVC401 WAVE-BASED NDT METHODS

COURSE OBJECTIVES

To enable the students to

- Learn the basic principles of various wave-based NDT techniques

Wave-based NDT methods- ultrasonic inspection, acoustic emission, resonant frequency testing, and electromechanical impedance testing- long-range inspection; for example, in pipelines, Piezoelectric effect, basic principles of various wave-based NDT methods, and their associated data acquisition.

Applications on wave-based NDT techniques, ultrasonic testing, acoustic emission to inspect the structural integrity of civil engineering structures, including highways, bridges, dams, and buildings.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Interpret the obtained data of wave-based NDT methods

TEXT BOOKS

1. Arbind Kumar Singh, Mechanics of Solids, Prentice-Hall of India

REFERENCES

1. Srinath S L, Advanced Mechanics of Solids, Tata McGraw Hill Education,New Delhi

17BAVC101 PRICING STRATEGIES AND PRODUCT MANAGEMENT

COURSE OBJECTIVES

to enable the students to

- Learn about the different pricing practices
- Learn how to price for profitability
- Become acquainted with pricing in practice

COURSE CONTENT

Unit 1 Cost in Pricing Decisions Cost as 'Floor' in pricing decisions Incremental costs and pricing Role of opportunity costs Limitations of cost based pricing

Unit 2 Role of Value in pricing Role of value in pricing Economic value analysis in pricing Factors influencing value perceptions: Reference price-switching cost effect-price quality effect-framing effect-fairness effect Price sensitivity analysis Faculty of Arts Department of Economics

Unit 3 Pricing and Competition -Responding to price competition- Skim pricing. Penetration pricing. Pricing differentiated products Life cycle pricing.

Unit 4 Segmented pricing Segmenting by buyer identification. Segmenting by purchase location. Segmenting by purchase quality Segmenting by product bundling

Unit 5 Applications (including field trips) Consumer goods Hospitals Online retailing Information on goods Unit 6 Current Streams of Thought: The Faculty will impart the current developments in the subject during the semester to the Students and this component will not be a part of Examinations.

TOTAL PERIODS 30

COURSE OUTCOMES

to the end this course, students will be able to

- Apply Basic Economics Principles to reflect on a range of pricing issues

- Compare and Evaluate alternate perspective on prince sensitivity analysis
- Formulate the segmenting by purchase location and Quality

TEXT BOOKS

1. Thomas T. Nagle and Reed K. Holden The Strategy and Tactics of Pricing

REFERENCES

1. A Guide to Profitable Decision Making (3rded New Delhi: Pearson Education,2002)

17BAVC201 STRESS MANAGEMENT COURSE

COURSE OBJECTIVES

to enable the students to

- Understand the basic stress management
- Know the Challenging Stressful Thinking
- Control the The Body's Reactions to Stress

COURSE CONTENT

The Body's Reactions to Stress -Sources of Stress Across the Lifespan -Adaptive and Maladaptive Behavior- Individual and Cultural Differences -Challenging Stressful Thinking - Problem Solving and Time Management -Preparing for the Future: College and Occupational Stress Psychological and Spiritual Relaxation Methods- Physical Methods of Stress Reduction - Care of the Self: Nutrition and Other Lifestyle Issues -Stress and Conflict in Relationships Stress and Conflict in Relationships - Stress management as a conflits

TOTAL PERIODS 30

COURSE OUTCOMES

t the end this course, students will be able to

- Analyse and solve the stress
- Adopt to the situation
- Analyse the conflits i the organization

TEXT BOOKS

1. Management Communication – A Case Analysis Approach – Fifth Edition, James S. O'Rourke, IV, Pearson, 2013

REFERENCES

1. Business Communication, Peter Hartley and Clive G. Bruckmann, Routledge, UK, 2002

17BAVC301

SOFT SKILLS FOR BUSINESS NEGOTIATIONS AND MARKETING STRATEGIES

OURSE OBJECTIVES

to enable the students to

- Understand the purpose of the soft skill
- Adopt to the Marketing Strategy
- Know the process of power marketing

COURSE CONTENT

Soft Skills and Hard Skills -Non-verbal communications- Professional Negotiations - Negotiations Negotiations- Business Negotiation - Product Marketing Negotiation -Marketing Strategy -Negotiation for Service -Marketing Strategy - Power Marketing - Power Marketing Strategies - Power Marketing Strategies- Power Marketing Presentation- Time Management in Marketing - Management in Marketing

TOTAL PERIODS 30

OURSE OUTCOMES

to the end this course, students will be able to

- Analyse the case of negotiation in the market stratiges
- Implement the techniques of time management in the business
- Analyse the product market negotiation

TEXT BOOKS

1. Selling and Sales Management – Third Edition by Geoffrey Lancaster & David Jobber, Macmillan India Limited, 1994

2. Harvard Business Essentials - Negotiation, Harvard Business School Publishing Corporation, 2003

3. Management Communication – A Case Analysis Approach – Fifth Edition, James S. O'Rourke,IV, Pearson, 2013

4. Business Communication, Peter Hartley and Clive G. Bruckmann, Routledge, UK, 2002

REFERENCES

1. Business Communication, Peter Hartley and Clive G. Bruckmann, Routledge, UK, 2002

17BAVC401 **PRICING STRATEGIES**

COURSE OBJECTIVES

to enable the students to

- Learn about the different pricing practices
- Learn how to price for profitability
- Become acquainted with pricing in practice

COURSE CONTENT

Unit 1 Cost in Pricing Decisions Cost as 'Floor' in pricing decisions Incremental costs and pricing Role of opportunity costs Limitations of cost based pricing

Unit 2 Role of Value in pricing Role of value in pricing Economic value analysis in pricing Factors influencing value perceptions: Reference price-switching cost effect-price quality effect-framing effect-fairness effect Price sensitivity analysis Faculty of Arts Department of Economics

Unit 3 Pricing and Competition -Responding to price competition- Skim pricing. Penetration pricing. Pricing differentiated products Life cycle pricing.

Unit 4 Segmented pricing Segmenting by buyer identification. Segmenting by purchase location. Segmenting by purchase quality Segmenting by product bundling

Unit 5 Applications (including field trips) Consumer goods Hospitals Online retailing Information on goods

TOTAL PERIODS 30

COURSE OUTCOMES

to the end this course, students will be able to

- Apply Basic Economics Principles to reflect on a range of pricing issues
- Compare and Evaluate alternate perspective on prince sensitivity analysis
- Formulate the segmenting by purchase location and Quality

TEXT BOOKS

1. Information Rules by Hal Variad (Boston: Harvard Press ,2002)

REFERENCES

2. The Art of Pricing: How to find the Hidden Profits to grow your business by Refi Mohammed (New York : Random House,2005)

17CAVC101 PROGRAMMING WITH PL/SQL

COURSE OBJECTIVES

To enable the students to

- describe the features and syntax of PL/SQL
- describe stored procedures and functions
- use PL/SQL programming constructs and conditionally control code flow

UNIT I PL/SQL

Introduction to PL/SQL-Declaring PL/SQL Identifiers-Interacting with the Oracle Server

UNIT II Control Structures

Writing Control Structures-Working with Composite Data Types- Explicit Cursors

UNIT III Exception Handling

Handling Exceptions with PL/SQL-Creating Stored Procedures- Stored Functions Creating Packages-Oracle Supplied Packages in Application Development-Dynamic SQL and Metadata

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- analyze the features and syntax of PL/SQL
- analyze stored procedures and functions
- implement PL/SQL programming constructs and conditionally control code flow

TEXT BOOKS

1. Oracle PL/SQL Programming, 6th Edition by Steven Feuerstein, Bill Pribyl

REFERENCES

1. Oracle PL/SQL Language Pocket Reference by Released April 1999 O'Reilly Media, Inc.

17CAVC201 GRAPHICS DESIGNING

COURSE OBJECTIVES

To enable the students to

- learn about Drawing and Shaping objects
- understand about corelDRAW
- learn about working with Bitmaps

UNIT I Introduction to CorelDRAW

Introduction to CorelDRAW: Getting Started - Moving Around and Viewing Drawings - Basic Drawing Skills Selecting and Manipulating Objects - Drawing and Shaping Objects - Arranging Objects . Using Text : Working With Text - Working With Objects - Outlining and Filling Objects - Using Symbols and Clipart - Transforming Objects

UNIT II Adding Special Effects

Adding Special Effects - Creating Output - Exporting Drawings - Printing Customizing CorelDRAW Introduction - Customizing Options - Using Text and Color - Working With Color - Working With Paragraph Text - Special Text Effects - Layouts and Layers - Special Page Layouts - Arranging Objects - Using Layer

UNIT III Styles and Templates

Styles and Templates Using Styles and Templates - Advanced Effects - Special Interactive Effects - Custom Creation Tools - Working With Bitmaps - CorelTRACE and Corel R.A.V.E.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- describe about Drawing and Shaping objects
- explore the concepts of corelDRAW
- implement working with Bitmaps

TEXT BOOKS

1. The Design of Everyday Things: Revised and Expanded Edition Paperback – Illustrated, November 2013

REFERENCES

1. The Graphic Design Reference & Specification Book: Everything Graphic Designers Need to Know Every Day Paperback – 1 September 2013

17CAVC301 PROGRAMMIN IN ANGULAR JS

COURSE OBJECTIVES

To enable the students to

- understand about HTML tags
- learn about concept of CSS
- understand about Javascript

UNIT I Introduction to HTML

HTML Basics, Elements, Attributes, Styles - Forms, Form Elements, Input Element Types - Input Attributes, File Paths, Script tag - HTML &XHTML

UNIT II Introduction to CSS

CSS Introduction, Syntax, Selectors, Styling - Pseudo class, Pseudo Elements - CSS Tables, CSS Box Models - CSS Opacity, CSS Navigation Bar, Dropdowns

UNIT III Introduction to JavaScript

JavaScript Statements, Keywords, Functions - JavaScript Programs, Operators, Functions - Function Parameters, Function Return Types - Data Types, Primitive Types

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- implement the HTML tags
- analyze the concept of CSS
- demonstrate about Javascript

TEXT BOOKS

1. Angular: From Theory To Practice: Build the web applications of tomorrow using the Angular web framework from Google. Kindle Edition

REFERENCES

1. Angular Projects: Build nine real-world applications from scratch using Angular 8 and Type Script Kindle Edition

17GEVC101 GENDER EQUALITY AND LAW

COURSE OBJECTIVES

To enable the students to

- To search, analyse, and work with legally relevant information by using the juridical, comparative and other specific methods
- Learn how to work cooperatively in groups.

MODULE 1: Gender theory and law (10)

Approaches to gender and law, Gender theory, Conflict, integrationist and hermeneutic approaches, Feminist theory, Human rights of women and legal theory, Feminist jurisprudence, Legal and gender expertise

MODULE 2: Gender equality and human rights (10)

Gender and human rights theory, History of human rights movements, Suffrage movements, International treaties and prohibition of gender-based discrimination, EU human rights law and gender

MODULE 3: Gender equality and labour law (10)

rrent challenges for Gender equality, Anti-gender movements, Biopolitics and legal instruments of body control. Sexual violence in conflict. Challenges to human rights of women, mainstreaming and neoliberal jurisprudence, women and austerity. How to achieve gender equality: gender and sustainable development goals 2015-2030.

TOTAL PERIODS 30

COURSE OUTCOMES

Students must gain knowledge on

- To work with information (search, evaluate, use information, necessary for fulfilment of scientific and professional tasks, from various sources, including application of the systematic approach)
- To carry out professional activities in the international environment

TEXT BOOKS

1. Cornell R W (1995) Gender. Cambridge, Polity Press.

2. Gatens M (1991) A Critique of the Sex/Gender Distinction in S. Gunew (ed.) A Reader in FeministKnowledge. London: Routledge.

REFERENCES

1. Andrea N (1989) Feminist Theory and Philosophies of Men. New York: Routledge.

2. Arora P (2011) Gender and Power. Delhi: Pacific Publication.

17GEVC101/201 **INDIAN CONSTITUTION AND ELECTION COMMISION**

COURSE OBJECTIVES

To enable the students to

- understand the most diversified legal document of India and philosophy behind it.
- thinking towards basic understanding of the Organs of Governance and its implications for engineers.
- learn about the role and function of election commission

MODULE 1 : INTRODUCTION ABOUT INDIAN CONSTITUTION

Meaning of the constitution law and constitutionalism, Historical Background of the Constituent Assembly, Government of India Act of 1935 and Indian Independence Act of 1947,Enforcement of the Constitution, Indian Constitution and its Salient Features, The Preamble of the Constitution,

MODULE 2: ORGANS OF GOVERNANCE

Organs of Governance: Parliament, Composition, Qualifications and Disqualifications, Powers and Functions, Executive, President, Governor, Council of Ministers, Judiciary, Appointment and Transfer of Judges, Qualifications, Powers and Functions

MODULE 3 : ELECTION COMMISSION

Election Commission: Election Commission: Role and Functioning. Chief Election Commissioner and Election Commissioners. State Election Commission: Role and Functioning. Institute and Bodies for the welfare of SC/ST/OBC and women.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Identify and explore the basic features and modalities about Indian constitution
- Understand the various organs of Indian governance.
- Gain knowledge on election commission of India

TEXT BOOKS

1. Brij Kishore Sharma: Introduction to the Indian Constitution, 8th Edition, PHI LearningPvt. Ltd.
2. Shubham Singles, Charles E. Haries, and Et al : "Constitution of India and Professional Ethics" byCengage Learning India Private Limited, Latest Edition – 2018
3. Dr. S. N. Busi, Dr. B. R. Ambedkar framing of Indian Constitution, 1st Edition, 2015
4. M. P. Jain, Indian Constitution Law, 7th Edn., Lexis Nexis, 2014.

5. D.D. Basu, Introduction to the Constitution of India, Lexis Nexis, 2015

REFERENCES

1.M.Govindarajan, S.Natarajan, V.S.Senthilkumar, “Engineering Ethics”, Prentice –Hall of India Pvt. Ltd. New Delhi, 200

2. M.V.Pylee, “An Introduction to Constitution of India”, Vikas Publishing, 2002.

3. Subhash C. Kashyap: Our Constitution: An Introduction to India’s Constitution and constitutional Law,NBT,2018.

PAAVAI ENGINEERING COLLEGE(AUTONOMOUS)
ACADEMIC YEAR 2018 - 2019

VALUE ADDED COURSE

18AEVC301 COMPUTER AIDED DESIGN AUTOCAD

COURSE OBJECTIVES

To enable the students

- gain strong ground on solid modeling techniques that would enhance the productivity in modeling
- understand the analysis of mechanical components

1. Creating a Simple Drawing

o AutoCAD's Screen Layout

o Working with Commands

o Opening an Existing Drawing File

o Saving Your Work

o AutoCAD's Cartesian Workspace

2.Setting Up a Layout

o Printing Concepts

o Creating Viewports

o Setting up Layouts

o Guidelines for Layouts

3.Adding Dimensions

o Dimensioning Concepts

o Adding Linear Dimensions

o Adding Radial and Angular Dimensions

o Editing Dimensions

o Adding Notes to Your Drawing

4.Working Effectively with AutoCAD

o Setting up the Interface

o Using the Keyboard Effectively

o Working in Multiple Drawings

o Using Grips Effectively

o Additional Layer Tools

5.Advanced Layouts

o Creating and Using Named Views

o Creating Additional Viewports

o Layer Overrides in Viewports

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of the course students will be able to

- Inspect and evaluate the surface imperfections using penetrant testing method.
- Inspect subsurface defects by magnetic particle.

TEXT BOOK & MANUALS

- https://images-na.ssl-images-amazon.com/images/I/C1BxaOC0-IS.pdf

18AEVC401 COMPUTER AIDED ANALYSIS ANSYS

COURSE OBJECTIVES

To enable the students to

- Use basic and advanced features of Analysis
- Understand how CAE technology can be leveraged in the analysis process.

INTRODUCTION TO FEA & ANSYS

GUI, Basics & general analysis procedure.

MODELING

Creating Solid model, Finite element modeling and importing models, Select Entities and Component manager.

MESHING

Quad and Tetrahedron mesh, Volumes, Areas, Line meshing. Free and mapped meshing, check mesh.

STRUCTURAL ANALYSIS

Static, Modal, Harmonic, Spectrum, p-method, Nonlinear & Transient analysis.

THERMAL ANALYSIS

Steady state thermal analysis.

ANSYS WORKBENCH

Simulation, CFX Mesh, Engineering Data sheet and FE modeler.

TOTAL PERIODS 30

COURSEOUTCOMES

Upon completion of this course the student will

- demonstrate competency with multiple analysis
- apply industry standards in the preparation of mechanical analysis

TEXT BOOK & MANUALS

- https://www.hpc.kaust.edu.sa/sites/default/files/files/public/ANSYS_Workshop/2017/5.ANSYS-Mechanical.pdf

18AEVC501 COMPUTER AIDED ANALYSIS HYPERMESH

COURSE OBJECTIVES

To enable the students to

- use basic and advanced features of Analysis
- understand how CAE technology can be leveraged in the analysis process.

HYPERMESH

Basic modeling, Geometry cleanup, Organizing the model with collectors, Extracting mid surfaces & simplifying, Selecting the user Profiles, Project, Numbering, Mask, Normals, Interactive surface meshing, Element density, Algorithms, Checking element quality. Introduction to solid meshing: Solid panels, Drag, spin, Line drag, element offset, linear solid.

OPTISTRUCT

Linear Static Analysis, Thermal Analysis, Modal Analysis, Harmonic Analysis, Inertia Relief Analysis.

OPTIMIZATION

Topology, optimization for solid problems, Optimization for stress problems

HYPERMORPH

morph volumes, Morph to geometry, freehand morph, morph options

TOTAL PERIODS 30

COURSEOUTCOMES

Upon completion of this course the student will

- demonstrate competency with multiple analysis
- apply industry standards in the preparation of mechanical analysis

TEXT BOOK & MANUALS

- https://imechanica.org/files/HM%20Advanced%20Training.pdf

18AEVC601 COMPUTER AIDED ANALYSIS FLUENT

COURSE OBJECTIVES

To enable students to

- know about the fundamentals and applications of CFD and Fluent.
- gain knowledge incoupled solver and transonic flow in Fluent.

INTRODUCTION

Flow mix and heat transfer (3D) –Coupled solver – Mesh adaption – Transonic flow – Airfoil - CFD Simulation setup – Models - Defining regions - Material definition – Solution – Post Processing.

TURBULENCE MODEL

Turbulence model in Fluent – Setting up model – Materials and operating conditions – Solution extraction – Convergence modeling.

PERIODIC HEAT FLOWAND TURBULENT FLOW

Modeling Periodic heat Flow – Creation of zones – Model setup – Material definition – Cell zone definitions – Periodicity definition – Boundary conditions – Solution extraction – Advanced post processing. Turbulent flow in heat exchanger – Model setup – Boundary conditions – Solving – Post Processing.

RADIATION AND CONVECTION

Radiation and Convection - Model setup – Thermal boundary conditions - Solution - Post Processing. Siphoning using Multiphase – Review, test and Project discussion.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon successful completion of this course, students will be able to

- know the Ansys Fluent GUI and software preliminaries and solver fundamentals.
- learn about coupled solver, material definitions and post processing in Fluent.

TEXT BOOK & MANUALS

- http://users.abo.fi/rzevenho/ansys%20fluent%2018%20tutorial%20guide.pdf

18AEVC701 COMPUTER AIDED ANALYSIS NASTRAN PATRAN

COURSE OBJECTIVES

To enable students to

- prepare a finite element model using surface representation of an object from CAD system.
- perform a linear static analysis of the model.

1. MODEL SETUP

- Create new working folder

2. MODEL DEFINITION

- Choose model preferences
- Mesh definition
- Boundary conditions
- Material properties

3. LOADCASE

- Definition

4. RESULT EVALUATION

TOTAL PERIODS 30

COURSE OUTCOMES

Upon successful completion of this course, students will be able to

- learn about coupled solver, material definitions and post processing
- gain through knowledge in model analysis

TEXT BOOK & MANUALS

- https://www.mscsoftware.com/training-materials

18AEVC801 COMPUTER AIDED ANALYSIS MATLAB

COURSE OBJECTIVES

To enable students to

- learn basics of MATLAB programming
- get introduced to numerical methods for engineering problems

1. INTRODUCTION TO MATLAB PROGRAMMING

- Basics of MATLAB programming
- Array operations in MATLAB
- Loops and execution control
- Working with files: Scripts and Functions
- Plotting and program output

2. APPROXIMATIONS AND ERRORS

- Defining errors and precision in numerical methods
- Truncation and round-off errors
- Error propagation, Global and local truncation errors

3. NUMERICAL DIFFERENTIATION AND INTEGRATION

- Numerical Differentiation in single variable
- Numerical differentiation: Higher derivatives
- Differentiation in multiple variables
- Newton-Cotes integration formulae
- Multi-step application of Trapezoidal rule
- MATLAB functions for integration

4. LINEAR EQUATIONS

- Linear algebra in MATLAB
- Gauss Elimination
- LU decomposition and partial pivoting
- Iterative methods: Gauss Siedel
- Special Matrices: Tri-diagonal matrix algorithm

TOTAL PERIODS 30

COURSE OUTCOMES

Upon successful completion of this course, students will be able to

- solve the numerical problems
- gain through knowledge in model analysis

TEXT BOOK & MANUALS

- https://www.mscsoftware.com/training-materials

18AIVC301 AGRO-METEOROLOGY AND CLIMATE CHANGE

COURSE OBJECTIVES

To enable the students to

- Impart the basic knowledge of agriculture meteorology
- Study the climate changes and causes
- Acquire knowledge in tolerance in plant at different climate condition

UNIT I

Agricultural MeteorologyIntroduction, definition of meteorology, scope and practical utility of Agricultural meteorology. Composition and structure of atmosphere and definition of weather and climate, aspects involved in weather and climate, atmospheric temperature, soil temperature, solar radiation, atmospheric pressure, atmospheric humidity, evaporation and transpiration, monsoons, rainfall, clouds, drought. Basics of weather forecasting.

UNIT II

Climate change-causes. Global warming-causes and remote sensing. Effect of climate change on horticulture Past and future changes in greenhouse gases within the atmosphere. Sources and sinks for greenhouse gases. Plants sense and respond to changes in CO2 concentration. Measurement of short-term effects and mechanisms underlying the observed responses in C3 and C4 species.

UNIT III

The mechanisms of ozone and UV damage and tolerance in plants. Increased temperature and plants in tropical/sub-tropical climates- effect on growing season, timing of flowering, duration of fruit development and impacts on crop yields and potential species ranges, interaction of temperature with other abiotic/biotic stress. Mitigation strategies and prospects for genetic manipulation of crops to maximize production in the future atmosphere..

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Understand the concept agro metrology

- Analyze globle warming and remadies
- Gain idea about duration of fruit development.

TEXT BOOKS

1. K. Srivastava and P. K. Tyagi, 2011. Practical Agricultural Meteorology. New Delhi Publishing Agency, New Delhi.

REFERENCES

1. T.Yellamanda Reddy and G.H.Sankara Reddi, 2010. Principles of Agronomy. Kalyani Publishers, New Delhi.

18AIVC401 **ORGANIC AGRICULTURE**

COURSE OBJECTIVES

To enable the students to

- Impartbasic knowledge of organic manure production
- Study the uses of bio fertilizer
- Understand the role of microorganism in soil.

Unit I

introduction, concept, relevance in present context; Organic production requirements; Biological intensive nutrient management-organic manures, vermicomposting, green manuring, recycling of organic residues,

Unit II

.biofertilizers; Soil improvement and amendments; Integrated diseases and pest management – use of biocontrol agents, biopesticides pheromones, trap crops, bird perches;

Unit III

Weed management; Quality considerations, certification, labeling and accreditation processors, marketing, exports. Role of microorganisms in organic matter- decomposition – humus formation. Importance of C:N ratio.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- understand the concept of organic farming
- analyze the bio pesticide uses for better growth of plant
- gain idea about decomposition and humus formation

TEXT BOOKS

1. A.K.Dahama. 2007. Organic farming for sustainable agriculture. Agrobios (India), Jodhpur.

REFERENCES

1. G.K.Veeresh. 2006. Organic farming. Foundation Books. New Delhi.
2. S.P. Palaniappan and K.Annadurai. 2010. Organic farming – Theory and Practice.

18AIVC501 BASICS OF FARM POWER AND MACHINERY

COURSE OBJECTIVES

To enable the students to

- To Understand about concept of farm machinery
- To learn the Basic principles of operation of compression
- To leatn the uses of tillage implements

Unit I

Basic concepts of various forms of energy **,** unit and dimensions of force energy and power, calculations with realistic examples. IC Engines: Basic principles of operation of compression, ignition and spark ignition engines, two stroke and four stroke engines, cooling and lubrication system, power transmission system, broad understanding of performance and efficiency, tractors, power tillers and their types and uses.

Unit II

Electric motors: types, construction and performance comparison. Tillage: objectives, method of ploughing. Primary tillage implements: construction and function of indigenous ploughs, improved indigenous ploughs, mould board ploughs, disc and rotary ploughs.

Unit III

Secondary tillage implements: construction and function of tillers, harrows, levelers, ridgers and bund formers. Sowing and transplanting equipment: seed drills, potato planters, seedling transplanter. Grafting, pruning and training tools and equipment. Inter-culture equipment: sweep. Junior hoe, weeders, long handle weeders

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Explain about concept of primary tillage implements
- Analyze the various uses of transplanter
- Gain idea about different types weeders and uses

TEXT BOOKS

1. T. P. Ojhaand A.M.Michael. 2005. Principles of Agricultural Engineering (Volume - 1)

REFERENCES

1. Surendra Singh & Verma. 2009. Farm Machinery Maintenance & Management. ICAR Publication.

18AIVC601 SOIL, WATER AND PLANT ANALYSIS

COURSE OBJECTIVES

To enable the students to

- learn about soil and water nutrient content analysis
- Understand the water quality for irrigation
- know about appropriate micro nutrient present in the soil and water

Unit I

Introduction to analytical chemistry, Collection and preparation of soil, water and plant samples for analysis. Sodium adsorption ratio and exchangeable sodium percentage of soils.

Unit II

Estimation of nutrient elements in soils and their contents in plants. Irrigation water quality analysis. Determination of pH and EC in irrigation water samples, Determination of Carbonates and bicarbonates in soil and irrigation water

Unit III

Determination of N, P, K, Ca, Mg, S and micronutrients in plant samples. Determination of Sodium, Potassium, Chlorine and Boron in irrigation water..

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Understand the water quality test
- Analyze the soil and plant nutrient content.
- Gain idea about determination of carbonates and bicarbonates in soil and irrigation water

TEXT BOOKS

1. H.L.S. Tandon. 2013, Methods of analysis of soil, plant, water and fertilizers. FDCO, New Delhi. Yawalkar,K.S.Agarwal,J.P.and Bokde,S.,1977.
2. Jaiswal, P.C., 2006. Soil, Plant and Water Analysis (2nd Edition), Kalyani Publishers,

Ludhiana.

REFERENCES

1. P. K. Gupta., 2013, Soil, plant, water and fertilizer analysis. Agrobios, India
2. M. V. Durai., 2014, Hand book of Soil, plant, water, fertilizers and manure analysis. New India publishing agency
3. Manures and Fertilizers. Agri Horticultural Publishing House, Nagpur. Sehgal J. A., 2005. Textbook of Pedology Concepts and Applications. Kalyani Publishes

AI18VC701 **HI-TECH HORTICULTURE**

COURSE OBJECTIVES

To enable the students to

- Impart basic knowledge in high density planting
- Study the nursery management and meganization
- Understand the precision farming under protected cultivation

Unit I

Introduction & importance; Nursery management and mechanization; micro propagation of horticultural crops; Modern field preparation and planting methods.

UNIT II

Protected cultivation: advantages, controlled conditions, method and techniques, Micro irrigation systems and its components; EC, pH based fertilizer scheduling, canopy management, high density orcharding.

UNIT III

Components of precision farming: Remote sensing, Geographical Information System (GIS), Differential Geo-positioning System (DGPS), Variable Rate applicator (VRA), application of precision farming in horticultural crops (fruits, vegetables and ornamental crops); mechanized harvesting of produce.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Acquire knowledge of Modern field preparation
- gain idea about Protected cultivation advantages, controlled conditions
- understand the horticulture crop management practices

TEXT BOOKS

1. Prasad and Kumar Commercial Floriculture –Proceeding of International Seminar on Protected cultivation in India, Held at Bangalore 1997.

REFERENCES

1. T. A. More, Karale A.R. and Patil M.T. 2001. Hi-tech horticulture, CAFT (Fruits) MPKV, Rahuri

18AIVC801 STRUCTURE AND DYNAMICS OF INDIAN AGRICULTURE

COURSE OBJECTIVES

To enable the students to

- introduce about the management of crop in all aspects
- study the Different Types of Revolutions in India.
- Understand the five years plan and its silent features

Unit I

Indian Economy: Pattern of Agriculture Holdings, Fragmentation, Sub-Division and Consolidation of Land Holdings. Place of Agriculture in National Economy and Comparison with other Countries.

UNIT II

Different Types of Revolutions in India. Agricultural Productivity: Trends, Causes and Consequences of Low Productivity in India. Green Revolution: New Strategy in Development of Indian Agriculture, High Yielding Varieties (HYV) Programme, Irrigation Development Agriculture and Farm Mechanization.

UNIT III

Five Year Plans- Silent Features, NITI Ayog, Place of Agriculture in National Planning, Problems of Food Security.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Understand the New Strategy in Development of Indian Agriculture
- Identify the gain idea about Problems of Food Security.
- Gain knowledge place of Agriculture in National Planning

TEXT BOOKS

1. Mamoria, C.B. Agricultural Problems of India. Kitab Mahal, Allahabad.
2. by S. Subba Reddy Agricultural Economics, Oxford and IBH Publ. Co. Pvt. Ltd.

REFERENCES

1. By Ruddar Datta and K. P. M. Sundharam, S..Indian Economy, Chand Publications.

18CEVC301 UNSATURATED SOIL MECHANICS

COURSE OBJECTIVES

To enable the students to

- gain knowledge on unsaturated soil mechanics properties
- understand the fundamental principles, mechanisms, and behaviour of partly saturated soils

Module I

Introduction; Application areas; Basic parameters-Basic parameters; Phase equilibrium-Concept of water retention; Soil water characteristics (SWCC); Hysteresis; Mechanisms

Module II

Measurement of state variables -Measurement of state variables; Theoretical SWCC -Demonstration of software for fitting SWCC; Pedo-Transfer functions (PTF) -Hydraulic Conductivity; Measurement; Predictive models

Module III

Hydraulic Conductivity prediction; Capillary barriers; Software demonstration -Steady-state flow; Absence and influence of gravity -Analytical methods for transient flow; Shear strength-Shear strength; Swell and Collapse behavior

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply behaviour of different clays and clay minerals for their application in engineering,
- manipulate the infiltration and drainage characteristics of unsaturated soils, diffusion characteristics of various clays.

TEXT BOOKS

1. Unsaturated Soil Mechanics by Ning Lu and William J. Likos, Wiley India Pvt Ltd ,2013

REFERENCES

1. Unsaturated Soil Mechanics in Engineering Practice by Delwyn G. Fredlund, Hendry Rahardjo , Wiley-Interscience ,2012

18CEVC401 WASTEWATER TREATMENT AND RECYCLING

COURSE OBJECTIVES

To enable the students to

- understand on technologies for water reclamation and reuse
- understand the concepts of wastewater treatment,
- learn the principles of various wastewater treatment units, recycling and reuse opportunities

Module I

Introduction: General outline; Introduction to wastewater Waste water Generation and Characteristics Natural Attenuation of Pollutants in Wastewater Treatment Philosophy

Module II

Objectives of wastewater treatment Preliminary and Primary Treatment Processes Secondary Treatment Processes

Module III

Secondary Treatment Processes-Anaerobic Sludge Management Tertiary (Advanced) Treatment Processes Current Treatment Approaches Wastewater Recycling: Scope and demands Technology Selection and Decision Making

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply technologies for water reclamation and reuse
- find solution for recycling of polluted water
- design various wastewater treatment units, recycling and reuse opportunities

TEXT BOOKS

1. LaGrega, M.D., Buckingham, P.L., Evans, J.C., Hazardous Waste Management, McGraw-Hill, 1994.Haas, C.N

REFERENCES

1. Vamos, R.J., Hazardous and Industrial Waste Treatment, Prentice Hall, Englewood Cliffs, NJ, 1995

18CEVC501 URBAN TRANSPORTATION SYSTEMS PLANNING

COURSE OBJECTIVES

To enable the students to

- gain knowledge on challenging need for effective and efficient planning of urban transport addressing the growing travel demand in a sustainable and affordable way

Module I

Overview of Urban Transportation Planning Process - Overview of Urban Transportation Planning Process (Continued) - Trip Generation- Trip Generation (Continued) Week 5: Trip Distribution - Trip Distribution (Continued) - Modal Split - Modal Split (Continued) - Traffic Assignment Week Traffic Assignment (Continued) - Land use and transport - Urban Goods Movement

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- understand urban transport in all relevant dimensions, and develop urban transport plans, programs and projects

TEXT BOOKS

1. Strategic Planning for Urban Transportation: A Dynamic Performance Management Approach: 3 (System Dynamics for Performance Management & Governance) by Guido Noto, 2017

REFERENCES

1. Urban Transportation System: Politics and Policy Innovation by Alan Altshuler, 2010

18CEVC601 SAFETY IN CONSTRUCTION

COURSE OBJECTIVES

To enable the students to

- make the students well-versed with the latest safety and health regulations
- understand the Indian Standards applicable to the construction industry.
- Learn the Safe operating procedures

Module I

Basic terminology in safety, types of injuries, safety pyramid - Accident patterns, theories of accident-causation - Planning for safety budget, safety culture - Introduction to OSHA regulations; Role of stakeholders in safety

Module II

Site safety programs - Job hazard analysis, accident investigation & accident indices-violation, penalty - Safety during construction, alteration, demolition works - Earthwork, steel construction, temporary structures, masonry & concrete construction, cutting & welding

Module III

SoPs (Safe Operating Procedures) - Construction equipment, materials handling-disposal & hand tools - Other hazards - fire, confined spaces, electrical safety; BIM & safety

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply latest safety and health regulations in construction industry
- follow the Indian Standards applicable to the construction industry.
- Apply the SoP's in BIM & safety

TEXT BOOKS

1. Safety Management in Construction (Principles and Practice) by S. K. Bhattacharjee, KHANNA PUBLISHERS, January 2011

REFERENCES

1. Construction safety by R.K.Mishra , Aitbs Publishers ,2013

18CEVC701 CONSTRUCTION METHODS AND EQUIPMENT MANAGEMENT

COURSE OBJECTIVES

To enable the students to

- provides comprehensive information on guidelines for selection of equipment, estimation of cost and productivity of various equipment
- determine the optimum replacement time of equipment
- gain knowledge on pile driving equipment

Module I

Introduction to course and Planning Process for Equipment - Cost of Owning and Operating Construction Equipment

Module II

Equipment Life and Replacement Analysis - Engineering fundamentals of moving earth - Earthmoving and Excavating equipment

Module III

Piles and Pile driving equipment - Lifting Equipment - Concreting Equipment - Applications

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply guidelines for selection of equipment, estimation of cost and productivity of various equipment
- manipulate the optimum replacement time of equipment
- calculate number of piles required for a site

TEXT BOOKS

1. Safety Management in Construction (Principles and Practice) by S. K. Bhattacharjee, KHANNA PUBLISHERS, January 2011

REFERENCES

1. Construction safety by R.K.Mishra , Aitbs Publishers ,2013

18CEC801 GEOGRAPHIC INFORMATION SYSTEMS

COURSE OBJECTIVES

To enable the students to

- understand about Geographic Information Systems and their applications in Civil Engineering and Earth Sciences

Module I

Essential components of GIS, Different types of vector data, Concept of topology, Demonstration through GIS software- Raster data model and comparisons with vector, TIN data model and comparisons with raster, Non-spatial data (attributes) and their types, Vector Data Compression Techniques, Demonstration through GIS software

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply GIS softwares in construction industry

TEXT BOOKS

1. Remote sensing & GIS by Basudeb Bhatta, OUP PUBLISHERS, January 2011

REFERENCES

1. Understanding place : GIS and mapping across the curriculum by Diana Stuart Sinton; Jennifer J. Lund

18CSVC301 ROBOTICS

COURSE OBJECTIVES

To enable the students to

- To introduce the functional elements of Robotics
- To impart knowledge on the direct and inverse kinematics
- To introduce the manipulator differential motion and control

UNIT I BASIC CONCEPTS

Brief history-Types of Robot–Technology-Robot classifications andSpecifications-Design and control issues- Various manipulators – Sensors -work cell – Programminglanguages.

UNIT II DIRECT AND INVERSE KINEMATICS

Mathematical representation of Robots - Positionand orientation – Homogeneoustransformation Various joints- Representation using the DenavitHattenberg parameters

UNIT III MANIPULATOR DIFFERENTIAL MOTION AND STATICS

Linear and angular velocities-Manipulator Jacobian-Prismatic and rotary joints–Inverse -Wrist and arm singularity - Static analysis –Force and moment Balance.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Ability to understand basic concept of robotics.
- To analyze Instrumentation systems and their applications to various
- To know about the differential motion add statics in robotics

TEXT BOOKS

1.R.K.Mittal and I.J.Nagrath, Robotics and Control, Tata McGraw Hill, New Delhi,4th Reprint, 2005.

REFERENCES

1.Ashitava Ghoshal, Robotics-Fundamental Concepts and Analysis', Oxford University Press, Sixth impression, 2010

18CSVC401 DATA VISUALIZATION WITH R

COURSE OBJECTIVES

To enable the students to

- To Understand the concept of Basic Visualization Tools
- To Understand the concept of Basic Visualization Tools
- To learn about the concept Specializedof Visualization Tools

Module 1 - Basic Visualization Tools

- Bar Charts
- Histograms
- Pie Charts

Module 2 - Basic Visualization Tools Continued

- Scatter Plots
- Line Plots and Regression

Module 3 - Specialized Visualization Tools

- Word Clouds
- Radar Charts
- Waffle Charts
- Box Plots

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Implement the concept of Basic Visualization Tools
- Implement the concept of Basic Visualization Tools
- Analyze the concept Specializedof Visualization Tools

TEXT BOOKS

1. Data Visualization with R - Rob kabacoff PhD, Quantitative analysis center Wesleyan University.

REFERENCES

1. Data Visualization with R , The visual display of quantitative information, second edition.

18CSVC501 DATA SCIENCE

COURSE OBJECTIVES

To enable the students to

- To know the fundamental concepts of data science
- To learn various techniques for mining data streams
- To learn Event Modelling for different applications.

UNIT I INTRODUCTION TO DATA SCIENCE

Introduction to Data Science – Applications - Data Science Process – Exploratory Data analysis – Collection of data – Graphical presentation of data – Classification of data – Storage and retrieval of data.

UNIT II DATA MINING TECHNIQUES

Rule Induction - Neural Networks: Learning and Generalization - Competitive Learning - Principal Component Analysis and Neural Networks

UNIT III MINING DATA STREAMS

Introduction To Streams Concepts – Stream Data Model and Architecture - Stream Computing - Sampling Data in a Stream – Filtering Streams – Counting Distinct Elements in a Stream – Estimating Moments

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Work with big data platform and its analysis techniques.
- Design efficient algorithms for mining the data from large volumes.
- Model a framework for Human Activity Recognition

TEXT BOOKS

1. Michael Berthold, David J. Hand, “Intelligent Data Analysis”, Springer, 2007

REFERENCES

1. Bill Franks, “Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics”, John Wiley & sons, 2012.

18CSVC601 CLOUD COMPUTING

COURSE OBJECTIVES

To enable the students to

- Course gives students an insight into the basics of cloud computing along with virtualization
- Understand the Overview Origins of Cloud computing basic
- Provide the students basic understanding about cloud and virtualization along with it how one can migrate over it.

Module-1

Cloud Computing Overview Origins of Cloud computing – Cloud components - Essential characteristics – On-demand selfservice, Broad network access, Location independent

Module-2

Cloud Insights Architectural influences – High-performance computing, Utility and Enterprise grid computing, Cloud scenarios – Benefits: scalability ,simplicity ,vendors ,security, Limitations – Sensitive information

Module-3

Cloud Architecture- Layers and Models Layers in cloud architecture, Software as a Service (SaaS), features of SaaS and benefits, Platform as a Service (PaaS), features of PaaS and benefits.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Course gives students an insight into the basics of cloud computing along with virtualization.
- Understand about cloud and virtualization along with it how one can migrate over it.
- Implement the students basic understanding about cloud and virtualization along with it how one can migrate over it.

TEXT BOOKS

1. Cloud computing a practical approach - Anthony T.Velte , Toby J. Velte Robert Elsenpeter,

TATA McGraw- Hill , New Delhi – 2010.

REFERENCES

1. Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online

18CSVC701 IOT USING RASPBERRY PI

COURSE OBJECTIVES

To enable the students to

- Elucidates concepts related to Internet of Things
- The students will get handson experience in working with Raspberry Pi 3 and exploring IoT.
- To understand about the concept of RPi

UNIT I

Overview of IoT Understanding IoT fundamentals , IOT Architecture, protocols ,Various Platforms for IoT ,Real time Examples of IoT ,Overview of IoT components and IoT Communication Technologies

UNIT II

Getting started with Raspberry Pi Introduction to Raspberry Pi , Comparison of various Rpi Models Understanding SoC architecture and SoCs used in Raspberry Pi , Pin Description of Raspberry Pi , On-board components of Rpi, Projects using Raspberry Pi

UNIT III

Booting Up RPi Operating System and Linux Commands, Linux- Introduction, Architecture, File System, Raspbian O.S.- Introduction, Tools like Leafpad Editor, Installing Raspbian on Pi, First boot and Basic Configuration of Pi, Popular Linux Commands

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- completion of the course, the students will be able to understand the working of Raspberry Pi.
- features and how various components can be used with Pi.
- Implement the concept of RPi

TEXT BOOKS

1. The official raspberry Pi Projects Book https://www.raspberrypi.org/magpi-issues/Projects_Book_v1.pdf

REFERENCES

1. . Raspberry Pi Cookbook by Simon Monk
   http://www.stilson.net/documentation/raspberrypi/Raspberry%20Pi%20Cookbook.pdf

18CSVC801 EMBEDDED OS & RTOS

COURSE OBJECTIVES

To enable the students to

- understanding of the techniques essential to the design and implementation of device drivers and kernel internals of embedded operating systems.
- Provides the students with an understanding of the aspects of the Realtime systems.
- Provide an understanding of the techniques essential to the design and implementation of real-time embedded systems.

Module 1

Embedded OS (Linux) Internals Linux internals: Process Management, File Management, Memory Management, I/O Management. Overview of POSIX APIs, Threads – Creation, Cancellation, POSIX Threads Inter Process Communication – Semaphore, Pipes, FIFO, Shared Memory Kernel: Structure, Kernel Module Programming

Module 2

Open source RTOS Basics of RTOS: Real-time concepts, Hard Real time and Soft Real-time, Differences between General Purpose OS & RTOS, Basic architecture of an RTOS

Module 3

VxWorks / Free RTOS VxWorks/ Free RTOS Scheduling and Task Management – Realtime scheduling, Task Creation, Intertask Communication, Pipes, Semaphore, Message Queue, Signals, Sockets, Interrupts

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Understand the Embedded Real Time software that is needed to run embedded systems
- Understand the open source RTOS and their usage
- Understand the VxWorks RTOS and realtime application programming with it.

TEXT BOOKS

1. Embedded Systems Architecture Programming and Design: Raj Kamal, Tata McGraw Hill.

REFERENCES

1. Real Time Concepts for Embedded Systems – Qing Li, Elsevier.

18ECVC301 **RECENT TRENDS IN WEB TECHNOLOGY**

COURSE OBJECTIVE

To enable the students to

- develop web pages using XML/XSLT
- understand about JavaScript and XML.

Unit-I-XML Web Data **15**

XML-Documents and Vocabularies-Versions and Declaration –Namespaces JavaScript and XML: Ajax-DOM based XML processing Event-oriented Parsing: SAX-Transforming XML Documents-Selecting XML Data: XPATH-Template based Transformations: XSLT Displaying XML Documents in Browsers-Case Study Related Technologies.

Unit II – JSP Technology **15**

JSP Technology Introduction-JSP and Servlets-Running JSP Applications Basic JSP Java Beans Classes and JSP-Tag Libraries and Files-Support for the Model-View-Controller Paradigm-Case Study-Related Technologies.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- design simple web pages using markup languages like XML and XSLT
- design simple web pages using JSP Technology

TEXT BOOK

1. Jeffrey C.Jackson, "Web Technologies--A Computer Science Perspective", Pearson Education, 2006

18ECVC401 **RECENT TRENDS GPS TECHNOLOGY**

COURSE OBJECTIVE

To enable the students to

- identify the two GPS Observables
- understand some GPS surveying methods

Unit-I- GPS Observables: **15**

Introduction to adjustment computations, Observation equations, Code-based, Carrier phase-based.

Navigational solution: Code/phase based, Data Processing Models, Models for single point positioning and relative/differential positioning, Data combinations, Ambiguity resolution, Single difference, Double difference, Triple difference, Static relative positioning, Kinematic relative positioning.

Unit II – GPS Survey Methods: **15**

Single Point or Point Vs Relative, Static Vs Kinematic, Real time Vs Post mission. Practical GPS survey field procedures: Code and Carrier-based positioning, Accuracy and recording time. Preparation of GPS surveys: Setting up an observation plan, Practical aspects of field observations, Observation strategies, Network design**.**

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- recognize the pseudo-range equation
- describe GPS Segment Organization

TEXT BOOK

1. B. Hofmann-Wellenhof, H. Lichtenegger and J. Collins, 1994. Global Positioning System: Theory and Practice, Publisher: Springer, Berlin (Germany)

18ECVC501 **RECENT TRENDS IN SIMULATION TOOLS**

COURSE OBJECTIVE

To enable the students to

- understand the Evolution of Systems Formalisms.
- understand Simulation Relation.

Unit I **Introduction to Systems Modeling Concepts** **15**

Systems Specification Formalisms, Relation to Object Orientation, Evolution of Systems Formalisms, Levels of System Knowledge, Introduction to the Hierarchy of Systems Specifications, The Specification Levels Informally Presented, System Specification Morphisms: Observation Frame I/O, Behavior and I/O Function, State Transition System Specification.

Unit II **Framework for Modeling and Simulation** **15**

The Entities of the Framework, Source System, Experimental Frame, Model. Primary Relations Among Entities Modeling Relation: Validity, Simulation Relation: Simulator Correctness, Other Important Relationships, Modeling as Valid Simplification, Experimental Frame: Model Relationships.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- levels of System Knowledge.
- state Transition System Specification.
- standard numerical attributes, functions.

TEXT BOOK & MANUALS

1. Gibson, D., C. Aldrich, and M. Prensky (2007), Games and Simulations in Online Learning: Research and Development Frameworks, Idea Group Inc. (IGI)
2. Korn, G. A. (2013), Advanced Dynamic-System Simulation: Model Replication and Monte Carlo Studies. John Wiley and Sons.

18ECVC601 **APPLICATIONS OF REMOTE SENSING TOOLS**

COURSE OBJECTIVE

To enable the students to

- provide an exposure to urban mapping application
- provide an exposure to forest resource management

Unit I Urban Mapping and Spatial Analysis **15**

Urban process, The physical structure and composition of urban areas, Urbanization process, growth trend, problems of urbanization, information requirements for perspective planning, Scale and resolution concepts and interpretation techniques for urban and regional analysis, urban GIS, spatial analytical techniques, statistics and visualization, conceptual modelling of urban processes; Urban Sprawl: Change detection in Land Use Land Cover monitoring physical growth of urban area, Trends in urban sprawl and associated problems

Unit II Applications of remote sensing technique in forest resources **15**

Introduction of Forest Resources and its Management, Use of Multispectral & Temporal Remote Sensing data, GIS and GPS in Forest Studies, Identification and classification of forest type and forest density, Quantification of forest resources, Wildlife Management, Identification of suitable site for Afforestation and assessing the Bio-diversity and Forest Carbon Dynamics, Social Forestry.

TOTAL PERIODS **30**

COURSE OUTCOMES

Upon completion of this course, the students would have

- understand the basics of urban mapping application
- understand the basics of forest resource management

TEXT BOOK & MANUALS

1. Remote Sensing in Geosciences Nitin K. Tripathi & Vishwanath Bajpai.
2. Forestry Handbook Reginald D. Forbes & Arthur B.Meger.
3. Local Forest Management David Edmunds & Eva Wallenberg.
4. Forest Environment & Biodiversity Singh and Vinita Vishwakarma

18ECVC701 **INTRODUCTION TO MATLAB**

COURSE OBJECTIVE

To enable the students to

- know the basics of MATLAB Programming.
- plot the various functions of MATLAB Programming

Unit I **Basics of MATLAB** **15**

Basics of MATLAB, Overview of features and workspace, Data types, Arrays: Initialization and definition, Array functions, 2--D Arrays, Multidimensional Arrays, Processing Array elements, Array sorting, Matrices: Matrix Operations, Matrix Functions, Manipulating matrices, Special Matrices.

Decision Making using If--Else and Switch

Unit II **Functions and Plotting of MATLAB** **15**

Function definitions, Function arguments, Function returns, Embedded Functions, Files and I/O, reading from a file, Writing to a file, Formatting output, For Loops, Do While Loop, Plots and Graphs, Plot Types, Plot Formatting, Multiple Plots, Plot Fits: Extrapolation and Regression, Solving basic matrix equations, Modelling and solving system of equations.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- understand the basics of MATLAB Programming.
- understand the various functions of MATLAB Programming.

TEXT BOOK & MANUALS

1. Introduction to MATLAB for Engineers by William J. Palm III.
2. Essentials of MATLAB Programming by Stephen J. Chapman
3. MATLAB Guide to Finite Elements: An Iterative Approach by Peter I. Kattan.
4. An Introduction to Scientific Computing: Twelve Computational Projects Solved with MATLAB.
5. A Guide to MATLAB: For Beginers and Experienced Users by Brian R. Hunt (Editor).
6. Solving Odes with MATLAB by Lawerence F. Shampine.

18ECVC801 **SOFT SKILL MANAGEMENT**

COURSE OBJECTIVE

To enable the students to

- imbibe positive personality traits to focus on goal-setting and to manage time effectively
- instill strategies of true management for students

Unit I **Personality Enrichment** **15**

Positive attitude, SWOT Analysis, Self-confidence and motivation, Inter-personal skills, projecting a positive social image, Goal setting and prioritization, ABC Analysis—preparing a personal schedule, Short term and long-term goals, Implementing goals, Task list organization

Unit II **Leadership Skills** **15**

Planning, organizing, setting objectives and taking initiatives, Persuading and negotiating, Team work, Maintaining morale, Inspiring others

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- to focus on goal-setting and good leadership qualities
- personality and leadership techniques

TEXT BOOK & MANUALS

1. Developing Reading Skills – Françoise Grellet, Cambridge University Press, Cambridge 2007.
2. Cambridge First Certificate: Listening and Speaking – Sue O' Connell with Lousie Hashemi, Cambridge University Press, Cambridge 2000.
3. Inspired to Write – Jean Withrow, Gay Brookers and Martha Cumings, Cambridge University Press, New York, 2004.
4. How to Build a Better Vocabulary- Maxwell Nurnberg and Morris Rosenblum, Warner Books, New York 1989

18EEVC301 AUTOMOTIVE ELECTRONICS

COURSE OBJECTIVES

To enable the students to

- To study the electronic instruments for automobiles
- To study the advanced electronics instruments for ignition and braking systems
- To study the functions of manipulators

UNIT I INTRODUCTION 10

Automotive component operation - Electrical wiring terminals and switching - Multiplexed wiring systems - Circuit diagrams and symbols - Charging Systems and Starting Systems: Charging systems principles, alternations and charging circuits - Basic starting circuit.

UNIT II IGNITION SYSTEMS 10

Hydraulic, pneumatic and electric drives–determination of HP of motor and gearing ratio–variable speed arrangements –path determination –micro machines in robotics–machine vision–ranging –laser –acoustic–magnetic, fiber optic and tactile sensors.

UNIT III MANIPULATORS, ACTUATORS AND GRIPPERS 10

Construction of manipulators–manipulator dynamics and force control–electronic and pneumatic manipulator control circuits–end effectors–U various types of grippers–design considerations.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Provide an introduction and a deep knowledge in various ignition and instrumentation systems in vehicles
- Model and stimulate the various modern electronics automotive systems by using various numerical analysis and simulation tools
- Formulate and solves electronic engineering challenges related to the most representative automotive systems using the classical and modern methodologies in electronics engineering

TEXT BOOKS

- Industrial Robotics (SIE): Technology, Programming and Applications Nicholas Odrey, Mitchell Weiss, Mikell Groover, Roger Nagel, Ashish Dutta , Mcgrawhill, 2012.

REFERENCES

1. Ghosh, Control in Robotics and Automation: Sensor Based Integration, Allied Publishers, Chennai, 1999

18EEVC401 REWINDING OF INDUCTION MOTOR

COURSE OBJECTIVES

To enable the students to

- Understand the concept of induction motor
- Acquaire knowledge on coil preparation
- Gain details about insulation preparation

UNIT I SINGLE PHASE INDUCTION MOTOR 10

Working principle, different method of starting and running (capacitor start, permanent capacitor, capacitor start & run, shaded pole technique). FHP motors, Repulsion motor, stepper motor, Application of single phase motor. Single phase induction motor -

UNIT II COIL PREPARATION 10

Preparation of the core before winding - Manufacture of formers - Preparation of coils on different types of coil winding machines as applied - Cutting operations on various types of insulating materials used for slot liner, layer Separators, slot wedge, phase, separator etc. and shaping and binding of overhangs.

UNIT III **INSULATION PREPARATION**

Winding Extensive shop floor practice on actual winding, consisting of the following operations - Insertion of insulating materials in the slots, Insertion of coils and folding over the insulation and wedges driving, End connection inclusive of commutator if involved, Soldering / brazing of coil ends of the winding wire and lead cables and core, Overhang banding with cord, steel wire or semi cured polyester glass tape.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Describe the basics of concept of induction motor
- analyse on coil preparation
- demonstrate insulation preparation

TEXT BOOKS

1. Electrical Machines and Appliances , Government of Tamilnadu, First edition 2011

18EEVC501 **INTRODUCTION TO MATLAB**

COURSE OBJECTIVES

To enable the students to

- Familiarization of the syntax, semantics, data-types and library functions of numerical computing languages such as MATLAB and/or SCILAB .
- Application of such languages for implementation/simulation and visualization of basic mathematical functions relevant to electronics applications.
- acquire knowledge on programming concepts

UNIT I INTRODUCTION TO MATLAB AND MATLAB SOFTWARE 10

Brief Introduction- Installation of MATLAB- Use of MATLAB- Key features- Introduction to MATLAB Software- MATLAB window- Command window- Workspace- Command history- Setting directory- Working with the MATLAB user interface- Basic commands- Assigning variables- Operations with variables- Working with script tools- Writing Script file- The MATLAB Editor.

UNIT II MATLAB SIMULINK 10

Introduction Of Simulink- Simulink Environment & Interface- Study of Library- Circuit Oriented Design- Equation Oriented Design- Model- Subsystem Design- Connect Call back to subsystem- Application

UNIT III MATLAB PROGRAMMING 10

MATLAB Programming- Writing programs with logic and flow control- Writing functions- Control statement Programming- Conditional Statement Programming- Examples.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Understand the need for simulation/implementation for the verification of mathematical functions.
- Understand the main features of the MATLAB/SCILAB program development environment to enable their usage in the higher learning.
- Implement simple mathematical functions/equations in numerical computing environment such as MATLAB/SCILAB.

TEXT BOOKS

1.MATLAB and Simulink Based Book, Electrical Engineering: Principles and Applications

REFERENCES

1. MATLAB and Simulink Based Book, Practical Electrical Engineering, 2nd edition

18EEVC601 **ETHICAL HACKING**

COURSE OBJECTIVES

To enable the students to

- To impart knowledge on the Ethical hacking terminology
- To examine the different phases involved in ethical hacking
- To learn technologies for footprinting and scanning.

UNIT I INTRODUCTION **10**

Introduction to Ethical Hacking: Problem Definition – Need for Security – Essential Terminology – Elements of Security – Phases – Hacktivism – Modes of Ethical Hacking – Security Testing – Computer Crimes and Implications – Legal Perspective (US Federal Law).

UNIT II FOOTPRINTING AND SCANNING **10**

Defining Footprinting: Information Gathering Methodology – Unearthing Initial Information -Tool: Sam spade – Locate the Network Range – Tool: NeoTrace , Visual Route –Scanning: Detecting 'Live' Systems On Target Defining Footprinting: Information Gathering Methodology – Unearthing Initial Information -Tool: Sam spade – Locate the Network Range – Tool: NeoTrace , Visual Route –Scanning: Detecting 'Live' Systems On Target.

UNIT III ENUMERATION AND SYSTEM HACKING **10**

Introduction to Enumeration – Net Bios Null Sessions – NetBIOS Enumeration – Hacking Tool: DumpSec, NAT, - SNMP Enumeration- Hacking Tool: GetAcct - Active Directory Enumeration - AD Enumeration countermeasures – System Hacking: Administrator Password Guessing – Performing automated password guessing – Tool: Legion.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Identify the risk factors in hacking
- Work with footprinting and scanning
- Hack the system

TEXT BOOKS

1. Kimberly Graves, Certified Ethical Hacker STUDY GUIDE, Wiley publication, 2010

REFERENCES

1. Michael Gregg, Certified Ethical Hacker, Pearson publication, 2014.

18EEVC701 **SCADA**

COURSE OBJECTIVES

To enable the students to

- Understand the concept of SCADA
- Know the details of deploying SCADA systems
- Gain knowledge about security and vulnerability of SCADA systems

UNIT I SCADA OVERVIEW **10**

Field Data Interface Devices- Communications Network - Central Host Computer -Operator Workstations and Software Components -SCADA Architectures-Monolithic SCADA Systems - Distributed SCADA Systems -Networked SCADA Systems.

UNIT II DEPLOYING SCADA SYSTEMS **10**

Twisted-Pair Metallic Cable -Coaxial Metallic Cable-Fiber Optic Cable-Power Line Carrier –Satellites-Leased Telephone Lines-Very High Frequency Radio-Ultra High Frequency Radio-Point-to-Point-Multiple Address Radio Systems-Spread Spectrum Radio-Microwave Radio.

UNIT III SECURITY AND VULNERABILITY OF SCADA SYSTEMS **10**

Attacks Against SCADA System- Developing a SCADA Security Strategy-SCADA Standards Organizations -The Institute of Electrical and Electronics Engineers (IEEE) - American National Standards Institute-Electric Power Research Institute-International Electrotechnical Comm.

TOTAL PERIODS **30**

COURSE OUTCOMES

At the end this course, students will be able to

- Describe the concept of SCADA
- analyse the details of deploying SCADA systems
- explain about security and vulnerability of SCADA systems

REFERENCES

1. PLC & SCADA SYSTEMS: Quick Reference Guide Kindle Edition by Francis G.L (Auth r)

18EEVC801 **INTELLIGENT SYSTEMS**

COURSE OBJECTIVES

To enable the students to

- To understand the significance of computing methods, their strengths and application areas.
- To perform the computations on various data using appropriate computation tools.
- To know and analysis the issues.

UNIT I FUNDAMENTAL ISSUES IN IS **10**

Definition of AI , History ,Domains AI ,AI problems & State space ,Some examples problems representations like Travelling Salespersons, Syntax analysis Problem. Basic issues to solve AI problems, Underlying assumptions, AI techniques, Level of model, Criteria for success, Control strategies, DFS, BFS

UNIT II HEURISTIC SEARCH TECHNIQUES **10**

Generate & Test, Hill Climbing (simple &stipest), Best first search, A*, AO*, Constraint Satisfaction.

UNIT III KNOWLEDGE REPRESENTATION ISSUES **10**

Syntax & Semantic for Propositional logic, Syntax & Semantic for FOPL, Properties for WFF_s, Resolution Basics : conversion to clausal form ,Resolution of proposition logic, Resolution algorithms for predicates, Problems with FOPL ,Semantic nets ,Frames ,Scripts

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Understand the significance of computing methods, their strengths and application areas.
- Perform the computations on various data using appropriate computation tools.
- Issues are analysed and control measures are studied.

TEXT BOOKS

1. Artificial Intelligence by Elain Rich & Kevin Knight, Tata McGraw Hills Pub.

REFERENCES

1. Artificial Intelligence by DAN. W.Petterson. Printice Hall of India

18MEVC301 INTRODUCTION TO ARTIFICIAL INTELLIGENCE

COURSE OBJECTIVES

To enable the students to

- know the basics concept artificial intelligence.
- know the effect artificial intelligence in industry oriented.
- apply AI techniques for different industrial application

1. **Introduction**:

   A brief review of AI history, What is artificial intelligence? , Related research fields , Scope of this course

2. **Production System**

   Production system, Inference engine, Working memory, Knowledge base, Pattern matching,

3. **Ontology**

   What is ontology? , Semantic network, Frame, Structural knowledge, Declarative knowledge, Procedural knowledge.

4. **Fuzzy Logic: Human-like decision making**

   Definition of fuzzy set ,Membership function , Notation of fuzzy set ,Operations of fuzzy set, Fuzzy number and operations , Extension principle , Fuzzy rules , De-fuzzification , Fuzzy control.

5. **Pattern Recognition**

   Concept and concept learning, Pattern classification and recognition. Feature vector representation of patterns. Nearest neighbour based learning. , Discriminant function and decision boundary. Multi-class pattern recognition. , General formulation of machine learning. The k-means algorithm.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Identify the need of AI
- Apply the concepts for automation of industry.
- Apply the various engineering application.

TEXT BOOKS

1. Qiangfu ZHAO and Tatsuo Higuchi, Artificial Intelligence: from fundamentals to intelligent searches, Kyoritsu, 2017, ISBN:978-4-320-12419-6 (in Japanese)

REFERENCES

1. Introduction to Artificial Intelligence, Shinji Araya, KYORITSU SHUPPAN, ISBN4-320-12116-3

18MEVC401 INDUSTRIAL ELECTRONICS

COURSE OBJECTIVES

To enable the students to

- impart students with analysis of converters and inverters
- outline the formal procedures for relays, heating & welding control
- introduce the concept of process control

1 CONVERTERS AND INVERTERS

Analysis of controlled and fully controlled converters-Dual converters; Analysis of voltage source and current source- current source and series converters

2 DC AND AC MOTOR CONTROL

Method of controlling speed- Basic control circuit-DC motor control- AC motor control

3 SERVO AND STEPPER MOTOR CONTROL

Servo motor control- Stepper motor control- micro controller-based speed control – solid state motor control-PLL control of a DC motor control

4 RELAYS, HEATING CONTROL

Introduction- principle of relays- electromechanical relay- solid state relays- Latching relays timing relays- Induction heating- dielectric heating

5 MOTION CONTROL

Elements of process control- temperature control- Flow control- Level control- Methods of motion control- feedback control- Direct digital control

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- design Analysis of voltage source and current source
- acquire knowledge on the basics about principle of relays
- design the process control of elements

TEXT BOOKS

1. Biswanath Paul- Industrial electronics and control- prentice Hall India publisher-20011.

REFERENCES

1. Terry Baltelt- Industrial electronics, devices, systems and applications- Delmar publishers- 2008.

18MEVC501 NEED OF AUTOMATION IN INDUSTRY

COURSE OBJECTIVES

To enable the students to

- know the basics of automation.
- know key elements of automation.
- apply the concepts of automation in industry.

1. **Introduction to Robotic Process Automation**

   Introduction to RPA and Use cases – Automation Anywhere Enterprise Platform – Advanced features and capabilities.

2. **Web Control Room**

   Introduction - Features Panel - Dashboard (Home, Bots, Devices, Audit, Workload, Insights) - Features Panel – Activity (View Tasks in Progress and Scheduled Tasks) - Bots (View Bots Uploaded and Credentials)

3. **Coating methods**

   Roll coating, Reverse roll coating, gravure roll coating, Premiered coatings like extrusion coaters Slide or cascade coaters, curtain coaters, cast Coating

4. **Bot Creator**

   Introduction – Recorders – Smart Recorders – Web Recorders – Screen Recorders - Task Editor – Variables - Command Library – Loop Command – Excel Command – Database Command - String Operation Command

5. **Meta Bot and Bot Insight**

   Introduction - MetaBot Designer - MetaBot With AI Sense - Bot Insight - Transactional Analytics - Operational Analytics - Course Key Points.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Identify the need of automation in industry.
- Use basic key elements in appropriate place for automation.
- Design and make the industry in complete automation sector.

TEXT BOOKS

1 Learning Robotic Process Automation: Create Software robots and automate business processes with the leading RPA tool - UiPath: Create Software robots. with the leading RPA tool – UiPath Kindle Edition

REFERENCES

1. Robotic Process Automation A Complete Guide - 2020 Edition Kindle Edition

18MEVC601 COMPUTER AIDED DESIGN CREO

COURSE OBJECTIVE

To enable the students to

- gain strong ground on solid modeling techniques that would enhance the productivity in modeling and analysis of mechanical components.

INTRODUCTION

Introduction to CAD, CAE Features of Creo, Concepts:-Modeling ,Parametric , Associative , Feature based Creo Graphical User Interface - Feature manager design tree, , Handles, mouse buttons, keyboard shortcuts, Understanding the Windows Menu Hardware and Software requirements

SKETCHER WORKBENCH

Sketch Entities – Inference line, Centerline line, Line, Circle, Arc, Ellipse, Rectangle, Slots, Polygon, Parabola, Ellipse, Partial Ellipse, Spline, Spline tools, Spline on surface, Equation driven curve, Points, Text, Construction geometry, Snap, grid,

PART MODELING

Creating reference planes Creating Extrude features – Direction1, Direction2, From option, Thin feature, Applying draft, Selecting contours Creating Revolve features – Selecting Axis, Thin features, Selecting contours Creating Swept features-Selecting, Profile and Path, Orientation/twist type, Path Alignment, Guide Curves, Start/End tangency, Thin feature

ASSEMBLY DESIGN

Introduction to Assembly Modeling & Approaches – Top down and Bottom up approach Applying Standard Mates- Coincident, Parallel, Perpendicular, Tangent, Concentric, Lock, Distance, Angle.

DRAFTING AND DETAILING

Inserting Annotations - Datum Features, Geometric Tolerance, Surface Finish, Jog Leaders, Hole Callout, Datum Target, Dowel Pins, Area Hatch, Cosmetic Thread, Balloon, Centre Mark, Centre Lines, Layers, Working With Tables, Bill Of Materials, Hole Table, Sheets And Templates, Sheet Format.

TOTAL 30 PERIODS

COURSE OUTCOMES

Upon completion of this course, the students would have

- Learnt advanced solutions for conceptual design, 3D modelling, and documentation.
- Learnt to do product design, industrial design and styling (optimize form, fit, function and user experience), streamline 2D design, drafting, documentation with powerful tools for layout.

TEXT BOOK & MANUALS

- Sham Tickoo, Pro / Engineer PTC Creo Parametric 3.0 for Engineers and Designers,Dream tech press 2016

18MEVC701 **AUTOCAD**

COURSE OBJECTIVES

To enable the students to

- utilize the engineering drawing concepts.
- understand the basic 2D diagrams.
- model the materials with different shapes.

1. **Basic Drawing & Editing Commands**
   Using the Mouse, Keyboard, and Enter Key to work quickly and efficiently in AutoCAD Lines Circles Rectangles
2. **Creating a Simple Drawing**
   Creating Simple Drawings Using Object Snap Tracking to extrapolate a projected top view Using Modify tools to arrange an office layout
3. **Drawing Precision in AutoCAD**
   Polar and Ortho Tracking Entering Coordinates and Angles Object Snaps and Tracking.
4. **Making Changes in Your Drawing**
   Move, Copy, Rotate, Mirror, Scale Using the reference option with the Scale Tool
5. **Advanced Object Types**
   Polylines ,Arcs ,Polygons ,Ellipses

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Create the drawing within the printing zone.
- Write the text and hatching in the drawing zone.
- Create the drawing by using advanced tools.

TEXT BOOKS

1.CAD Exercises, Sachidanand Jha

REFERENCES

1. AutoCAD 2020 Beginning and Intermediate, Munir Hamad.

18MEVC801 **NANO ELECTRONICS**

COURSE OBJECTIVES

To enable the students to

- Have a concept on the scope and recent development of the science and technology of Nano-systems.
- Gain the physical knowledge underlying the operation principles and design of Nano-systems
- Learn some typical or potentially applicable nano-systems at the frontier of the development of the field.

1 INTRODUCTION

Nano and nature - physical scales of nano technology - Genealogy and Philosophy of nano technology - Methods of measuring properties - structure - Microscopy - Spectroscopy.

2 MOLECULAR NANOTECHNOLOGY

Basics of nano-electronics; Nano electronics with tunnelling devices; super conducting devices; Molecular nanotechnology; Applications of MNT

3 NANO ASSEMBLY

Direct self; assembly; device assembly; Electrostatic self; assembly nano tubes; nano wire and carbon 60; Dielectrophoretic nano assembly.

4 ARCHITECTURE

Architecture of MEMS; Requirements of nano systems; Development of nano electronics and structuring;

5 APPLICATIONS

Application of NEMS; Deposition of coatings; Three dimensional materials; Dewatering.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Ability to understand the operation of nano devices; nano systems and their application
- Ability to design the nano devices; nano systems using the NEMS fabrication process.
- Gain a knowledge of basic approaches for various sensor design

TEXT BOOKS

1. Michael PycraftInrushes , “Nano Electro Mechanics in Engineering & biology ’’ ,CRC press New York,2011.

REFERENCES

1. Norio Taniguchi, “Nano Technology”, Oxford University Press, New York, 2010.

18MTVC301 GEOMETRIC DIMENSIONINS

COURSE OBJECTIVES

To enable the students to

- Know the basics of Geometric Dimensioning and Tolerancing
- Know how set the tolerancing limits for the given dimension.
- Representation procedure for the dimensioning and Tolerancing for the given drawing.

1. **INTRODUCTION**

   Terms and definitions, Common symbols & Terminology, Fundamental Rules (Drawing)

2. **FEATURE DEFINITION AND MATERIAL**

   Feature definition, With Size and Without Size, Material Condition (Maximum, Least, Regard of Material Condition),Limit Tolerancing, Dimension Origin

3. **SELECTION OF DATUM REFERENCE**

   Datum Reference Frame - Theory & Interpretation, Datum Elements, View Oriented Datum's

4. **FORM TOLERANCES**

   Flatness, Verification, Surface Roughness Straightness, Line Elements Applied to a Flat Surface Circularity, Average Diameter

5. **PROFILE TOLERANCES**

   Bilateral, Bilateral - Unequal, Unilateral Run out Tolerance, Circular Run out Total Run out.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Provide Tolarancing limits for the different diagram.
- Provide the different symbols for various position.
- Mark the various form tolerance in its appropriate places,

TEXT BOOKS

1. Fundamentals of Geometric Dimensioning and Tolerancing, Alex Krulikowski,

REFERENCES

1. GD&T: Application and Interpretation, Bruce A Wilson.

18MTVC401 **AUTOMATION IN INDUSTRIES**

COURSE OBJECTIVES

To enable the students to

- know the basics of automation.
- know key elements of automation.
- apply the concepts of automation in industry.

1. **INTRODUCTION TO ROBOTIC PROCESS AUTOMATION**

   Introduction to RPA and Use cases – Automation Anywhere Enterprise Platform – Advanced features and capabilities.

2. **WEB CONTROL ROOM**

   Introduction - Features Panel - Dashboard (Home, Bots, Devices, Audit, Workload, Insights) - Features Panel – Activity (View Tasks in Progress and Scheduled Tasks) - Bots (View Bots Uploaded and Credentials)

3. **COATING METHODS**

   Roll coating, Reverse roll coating, gravure roll coating, Premiered coatings like extrusion coaters Slide or cascade coaters, curtain coaters, cast Coating

4. **BOT CREATOR**

   Introduction – Recorders – Smart Recorders – Web Recorders – Screen Recorders - Task Editor – Variables - Command Library – Loop Command – Excel Command – Database Command - String Operation Command

5. **META BOT AND BOT INSIGHT**

   Introduction - MetaBot Designer - MetaBot With AI Sense - Bot Insight - Transactional Analytics - Operational Analytics - Course Key Points.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Identify the need of automation in industry.
- Use basic key elements in appropriate place for automation.
- Design and make the industry in complete automation sector.

TEXT BOOKS

1. Learning Robotic Process Automation: Create Software robots and automate business processes with the leading RPA tool - UiPath: Create Software robots. with the leading RPA tool – UiPath Kindle Edition

REFERENCES

1. Robotic Process Automation A Complete Guide - 2020 Edition Kindle Edition

18MTVC501 **BASICS OF MAT LAB**

COURSE OBJECTIVES

To enable the students to

- know the basics of MAT LAB
- know how to change data's into matrix form.
- understand how to represent the basic operation and logical operation into MAT LAB codes.

1. **INTRODUCTION**

   Basic of MATLAB, Types of Window, Types of File, Basic Operations.

2. **MATRIX (ARRAY DESIGN)**

   Matrix Operation, Array Design, Array Operation, Multidimensional Array.

3. **SYMBOLIC CALCULATION**

   Symbols, Design Formula, Differentiation, Integration, Solve Equation

4. **OPERATORS**

   Arithmetic Operator, Logical, Relational, Example for above operators.

5. **BRANCH AND LOOP**

   If statement, If-else statement, Else-if statement, Pause, Break, Continue, Switch-case, try-catch, Return Statement For Loop, While Loop.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Open the MAT LAB window and represent the data into Matrix form.
- Write the code for arithmetic operator and logical operators.
- Write code using if- else, While loop for the give statement.

TEXT BOOKS

1. MATLAB, an Introduction with Applications, Amos Gilat

REFERENCES

1. MATLAB for Beginners: A Gentle Approach, Peter Issa Kattan

18MTVC601 ENERGY CONSERVATION AND IT'S EFFICIENCY

COURSE OBJECTIVES

To enable the students to

- Know familiar with the energy efficient devices.
- Know the various approaches to conserve energy.
- Understand how to approaches efficient energy management.

1. **ENERGY CONSERVATION AND EFFICIENCY**

   Introduction about Bureau of Energy Efficiency and it's Schemes, Energy Rating, Consumption and energy efficient devices Energy Efficiency and its significance

2. **ENERGY EFFICIENCY IN BUILDINGS AND ENERGY AUDIT**

   ECBC and Tips for Energy Conservation, Definition, objective, types and methodology of Energy Audit.

3. **INSTRUMENT FOR ENERGY AUDIT**

   Instruments for Energy Audit, Case studies and Building survey

4. **COST BENEFIT ANALYSIS**

   Arithmetic Operator, Logical, Relational, Example for above operators.

5. **ENERGY AND ITS USE**

   Introduction, Types of Renewable Energy Sources, Electric vehicle.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Differentiate the various energy efficient devices.
- Use of various methods Energy conserve methods.
- Approach the various Energy management techniques

TEXT BOOKS

1. Energy Conservation and Audit by Mr. Amit L. Nehete.

REFERENCES

1. Energy Conservation Case studies in ceramic industry, sugar industry, fertilizer industry, cement industry. CII, Energy Management Cell etc.

18MTVC701 RENEWABLE ENERGY SYSTEMS

COURSE OBJECTIVES

To enable the students to

- know the need of energy storage.
- know different form of energy storage system.
- Understand the concepts and application of energy storage.

1. **INTRODUCTION TO RENEWABLE ENERGY SYSTEMS AND THE ROLE OF ENERGY STORAGE**

   History of energy storage from the perspective of the carbon cycle. Natural process of photosynthesis, Biomass, peat, and fossil carriers, and finish in the time of renewables.

2. **ENERGY STORAGE CLASSIFICATION**

   storage and energy storage systems, application and how they are classified according to physical, temporal and economic criteria

3. **LEAD ACID BATTERIES**

   Electro-chemical energy storage the terms batteries and accumulators, electrodes, electrolyte Ion-conductive phase.

4. **LITHIUM BATTERIES**

   Electro-chemical energy storage the terms batteries and accumulators, electrodes, electrolyte Ion-conductive phase for lithium batteries.

5. **CHEMICAL ENERGY STORAGE I**

   Chemical energy storage is the backbone of the conventional energy supply. Solid (wood & coal), fluent (crude oil) and gaseous (natural gas) energy carriers are different types of energy storage

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Select suitable energy storage system depending on necessity.
- Use relevant storage system for particular application.
- Differentiate the various storage system.

TEXT BOOKS

1. Energy Storage Systems and Components, Alfred Rufer.

REFERENCES

1. Advanced Energy Storage Technologies and Their Applications Hailong Li(Eds.)

18MTVC801 PLANT DESIGN, LOCATION AND LAYOUT

COURSE OBJECTIVES

To enable the students to

- know the basics of plant design.
- know need of plant designing.
- design the plant for new industrial sector.

1. **INTRODUCTION**

   Basic considerations in engineering plant design, optimization and feasibility of plant design.

2. **PROCESS DESIGN ASPECTS**

   Selection of process-factors affecting process selection. Types of project design, Importance of Laboratory development pilot plant, safety factors, types of flow diagrams.

3. **SELECTION OF PROCESS EQUIPMENT**

   Standard versus special equipment-material of construction for process equipment, selection criteria, and specification sheets.

4. **PROCESS AUXILIARIES AND PROCESS UTILITIES**

   Piping design, layout, and supports for piping insulations. Pipe fittings, types of valves, selection of valves, process control and instrumentation control system design

5. **PLANT LOCATION AND LAYOUT**

   Factors affecting plant location, factors in planning layouts, principles of plant layout, use of scale models.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Identify the need of plant design for an industry.
- Apply the concepts for making plant designing for an industry.
- Represent the designing structure of the plant.

TEXT BOOKS

1. M.S. Peters and Timmerhaus, “Plant design and Economics for Chemical Engineers”, McGraw Hill 3rd Edition

REFERENCES

1. Industrial Engineering and Management by O. P. Khanna, Dhanpat Rai & Sons, 1985 7th Edition

18CMVC301 **LIFE SKILLS FOR ENGINEERS**

COURSE OBJECTIVES

To enable the students to

- To develop communication competence in prospective engineers.
- To enable them to convey thoughts and ideas with clarity and focus

Communication Skill: Introduction to Communication, The Process of Communication, Barriers to Communication, Listening Skills, Writing Skills, Technical Writing, Letter Writing, Job Application, Report Writing, Non-verbal Communication and Body Language, Interview Skills, Group Discussion, Presentation Skills, Technology-based Communication.

Critical Thinking & Problem Solving: Creativity, Lateral thinking, Critical thinking, Multiple Intelligence, Problem Solving, Six thinking hats, Mind Mapping & Analytical Thinking.

Teamwork: Groups, Teams, Group Vs Teams, Team formation process, Stages of Group, Group Dynamics, Managing Team Performance & Team Conflicts.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- To create an awareness on Engineering Ethics and Human Values.
- To instill Moral and Social Values, Loyalty and also to learn to appreciate the rights of others.
- To learn leadership qualities and practice them.

TEXT BOOKS

1. Life Skills for Engineers, Complied by ICT Academy of Kerala, McGraw Hill Education (India) Private Ltd., 2016

REFERENCES

1. “Development of Life Skills and Professional Practice”; First Edition; Sultan Chand (G/L) & Company John C. Maxwell (2014)

18CMVC401 **NATURAL HEALTH**

COURSE OBJECTIVES

To enable the students to gain knowledge on

- Nutrition, different energy levels of food
- Diets, weight loss and treatments
- Detoxification, assess nutritional levels

Introduction of Nutrition, Food and energy levels, Protein, vitamins, minerals, water, nutrients, carbohydrates and fats,

Obesity Preventative measures, Weight loss, Diets and planning diets, Treatments, Medical conditions, Digestion and absorption

Assessing nutritional needs, Natural Food, Detoxification Creating plans, Providing consultations to client

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Explain the different energy levels of food.
- Formulate diets and weight loss, treatment methods.
- Create plans for detoxification

TEXT BOOKS

1. Taylor, S.E. (2006). Health Psychology (6th ed.). New York: Tata McGraw Hill.

REFERENCES

1. Snyder, C.R & Lopez,S.J.(2007).Positive psychology :The scientific and practical explorations of human strengths. Thousand Oaks, CA: Sage.

18CMVC501 ANALYSIS OF DOMESTIC AND WASTE WATER

COURSE OBJECTIVES

To enable the students to

- understand the basic characteristics of wastewater
- Understanding the kinetics of biological system
- Understand the design and working principle of various treatment methods

Objectives of wastewater treatment, characteristics, flow variations, types of reactors and reactors analysis. Wastewater Treatment Flow Diagrams and Hydraulic Profile.

Wastewater treatment – aerobic, anaerobic, suspended and attached growth systems. Kinetics of biological treatment systems

Theoretical principles and design considerations – suspended growth system - conventional activated sludge process and its modifications. Theoretical principles and design considerations – attached growth system – trickling filter, bio-towers and rotating biological contactors.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- know the basic characteristics of wastewater and the kinetics of biological system.
- Understand the design and working principle of various treatment methods
- Outline the types of reactors used in waste water treatment

TEXT BOOKS

1. "Wastewater Engineering - Treatment and Reuse", Metcalf and Eddy Inc., (2003), 4th Edition, Tata McGraw Hill Publishing Co. Ltd., New Delhi.

REFERENCES

1. "Wastewater Treatment Concepts and Design Approach", Karia G.L., and Christian R.A., (2001), Prentice Hall of India Pvt. Ltd., New Delhi.

18CMVC601 TESTING OF PETROLEUM DISTILLATES

COURSE OBJECTIVES

To enable the students to gain knowledge on

- theoretical principles and experimental procedures for quantitative estimation
- the environmental and sustainability issues
- Introduction: Overview of petroleum exploration in India,
- Introduction to Geophysical/Geological methods used in petroleum exploration.
- Determination of acidity of petroleum
- Determination of smoke point and in flammability of petroleum & petroleum products
- Determination of Specific gravity and API gravity of petroleum and petroleum products
- Determination of flash point and fire point of petroleum products
- Aromatioc content Determination
- Carbon residue determination
- Foaming characteristics of tube oil
- Mercaptan as sulphur estimation
- Corrosion testing of petroleum oils and copper

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Outline the petroleum exploration techniques
- Determine different properties of petroleum products
- Analyze the coking tendency of oil

TEXT BOOKS

1. Modern Petroleum Refining Processes, Bhaskara Rao, 3rd Edition, Oxford & IBH Publication, Reprint, 1999.
2. Petroleum Refining Engineering, WL Nelson, 4 th Edition, McGraw Hill Company, 1958.

REFERENCES

1. Handbook of Petrochemicals Production Processes, R.A. Meyers, TRW,Inc., 2005

18CMVC701 **MATLAB FOR CHEMICAL ENGINEERS**

COURSE OBJECTIVES

- To enable the students to gain knowledge on
- Material balance & energy balance equations for a system with multiple unit operations with and without chemical reaction
- To solve vapor-liquid equilibrium relationship for ideal and non-ideal liquid mixture

- Formulate number of independent material balance equations of the system for degree of freedom analysis.
- Solution of the set of linear/nonlinear equations using MATLAB user defined functions such as, matrix solver, fsolve, etc.
- Study of temperature and level dynamics of a stirred tank heater
- Dynamics of state variables (temperature of each tank) with the help of transient analysis.
- Computation of bubble point temperature of ideal liquid mixture.
- Transient analysis in a non-adiabatic CSTR using lumped parameter model.
- Transient analysis in a PFR using distributed parameter model.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Formulate number of independent material balance and energy balance equations of the system for degree of freedom analysis.
- Solve the set of linear/nonlinear equations using MATLAB user defined functions such as, matrix solver, fsolve, etc.
- Solve the energy balance equations using MATLAB user defined functions

TEXT BOOKS

1. Process Modeling, Simulation and Control for Chemical Engineers, William L. Luyben, McGraw Hill

REFERENCES

1. Introduction to MATLAB For Engineering Students by David Houcque.

18CMVC801 **PLASTIC TECHNOLOGY**

COURSE OBJECTIVES

To enable the students to gain knowledge on

- principles of Plastic technology
- Different Moulding techniques
- Applications of Plastic moulding

INTRODUCTION Basic principles of processing - shape and size – Effect of polymer property on processing – Newtonion and Non-Newtonion fluids - Rheology of polymer melts.

COMPRESSION MOULDING & TRANSFER MOULDING Basic principles of compression and transfer moulding- Bulk factor and flow properties as applied to moulding materials- Types of compression mould-Common moulding faults and their correction Finishing of mouldings. Fundamental principles of transfer moulding-advantages over compression moulding- Equipment used

INJECTION MOULDING Principles processing outline - Process variables - Mould cycle - Machinery used – Parts and functions –Specifications - Construction and maintenance - Start-up and shut down procedures

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Acquire the knowledge of processing of plastic materials by injection moulding, extrusion, and blow moulding
- Understand processing techniques like compression molding and transfer moulding of thermoset plastics.

TEXT BOOKS

1. Injection Molding Hand Book By Rusto,D.V &Rosato, D.V Plastic Engineering Hand Book & D–5 By Society of Plastic Industry Inc.,2000..

REFERENCES

1. A Guide to Injection Molding of Plastics By Bolur, P.C.

18ITVC301 FUNDAMENTALS OF ROBOTICS

COURSE OBJECTIVES

To enable the students to

- To introduce the functional elements of Robotics
- To impart knowledge on the direct and inverse kinematics
- To introduce the manipulator differential motion and control

UNIT I BASIC CONCEPTS

Brief history-Types of Robot–Technology-Robot classifications andSpecifications-Design and control issues- Various manipulators – Sensors -work cell – Programminglanguages.

UNIT II DIRECT AND INVERSE KINEMATICS

Mathematical representation of Robots - Positionand orientation – Homogeneoustransformation Various joints- Representation using the DenavitHattenberg parameters

UNIT III MANIPULATOR DIFFERENTIAL MOTION AND STATICS

Linear and angular velocities-Manipulator Jacobian-Prismatic and rotary joints–Inverse -Wrist and arm singularity - Static analysis –Force and moment Balance.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Ability to understand basic concept of robotics.
- To analyze Instrumentation systems and their applications to various
- To know about the differential motion add statics in robotics

TEXT BOOKS

1.R.K.Mittal and I.J.Nagrath, Robotics and Control, Tata McGraw Hill, New Delhi,4th Reprint, 2005.

REFERENCES

1.Ashitava Ghoshal, Robotics-Fundamental Concepts and Analysis', Oxford University Press, Sixth impression, 2010

18ITVC401 DATA VISUALIZATION TOOLS

COURSE OBJECTIVES

To enable the students to

- To Understand the concept of Basic Visualization Tools
- To Understand the concept of Basic Visualization Tools
- To learn about the concept Specializedof Visualization Tools

Module 1 - Basic Visualization Tools

- Bar Charts
- Histograms
- Pie Charts

Module 2 - Basic Visualization Tools Continued

- Scatter Plots
- Line Plots and Regression

Module 3 - Specialized Visualization Tools

- Word Clouds
- Radar Charts
- Waffle Charts
- Box Plots

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Implement the concept of Basic Visualization Tools
- Implement the concept of Basic Visualization Tools
- Analyze the concept Specializedof Visualization Tools

TEXT BOOKS

1. Data Visualization with R - Rob kabacoff PhD, Quantitative analysis center Wesleyan University.

REFERENCES

1. Data Visualization with R , The visual display of quantitative information, second edition.

18ITVC501 INTRODUCTION TO DATA SCIENCE

COURSE OBJECTIVES

To enable the students to

- To know the fundamental concepts of data science
- To learn various techniques for mining data streams
- To learn Event Modelling for different applications.

UNIT I INTRODUCTION TO DATA SCIENCE

Introduction to Data Science – Applications - Data Science Process – Exploratory Data analysis – Collection of data – Graphical presentation of data – Classification of data – Storage and retrieval of data.

UNIT II DATA MINING TECHNIQUES

Rule Induction - Neural Networks: Learning and Generalization - Competitive Learning - Principal Component Analysis and Neural Networks

UNIT III MINING DATA STREAMS

Introduction To Streams Concepts – Stream Data Model and Architecture - Stream Computing - Sampling Data in a Stream – Filtering Streams – Counting Distinct Elements in a Stream – Estimating Moments

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Work with big data platform and its analysis techniques.
- Design efficient algorithms for mining the data from large volumes.
- Model a framework for Human Activity Recognition

TEXT BOOKS

1. Michael Berthold, David J. Hand, “Intelligent Data Analysis”, Springer, 2007

REFERENCES

1. Bill Franks, “Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics”, John Wiley & sons, 2012.

18ITVC601CLOUD COMPUTING

ARCHITECTURE

COURSE OBJECTIVES

To enable the students to

- Course gives students an insight into the basics of cloud computing along with virtualization
- Understand the Overview Origins of Cloud computing basic
- Provide the students basic understanding about cloud and virtualization along with it how one can migrate over it.

Module-1

Cloud Computing Overview Origins of Cloud computing – Cloud components - Essential characteristics – On-demand selfservice, Broad network access, Location independent

Module-2

Cloud Insights Architectural influences – High-performance computing, Utility and Enterprise grid computing, Cloud scenarios – Benefits: scalability ,simplicity ,vendors ,security, Limitations – Sensitive information

Module-3

Cloud Architecture- Layers and Models Layers in cloud architecture, Software as a Service (SaaS), features of SaaS and benefits, Platform as a Service (PaaS), features of PaaS and benefits.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Course gives students an insight into the basics of cloud computing along with virtualization.
- Understand about cloud and virtualization along with it how one can migrate over it.
- Implement the students basic understanding about cloud and virtualization along with it how one can migrate over it.

TEXT BOOKS

1. Cloud computing a practical approach - Anthony T.Velte , Toby J. Velte Robert Elsenpeter,

TATA McGraw- Hill , New Delhi – 2010.

REFERENCES

1. Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online

18ITVC701 INTERNET OF THINGS

USING RASPBERRY PI

COURSE OBJECTIVES

To enable the students to

- Elucidates concepts related to Internet of Things
- The students will get handson experience in working with Raspberry Pi 3 and exploring IoT.
- To understand about the concept of RPi

UNIT I

Overview of IoT Understanding IoT fundamentals , IOT Architecture, protocols ,Various Platforms for IoT ,Real time Examples of IoT ,Overview of IoT components and IoT Communication Technologies

UNIT II

Getting started with Raspberry Pi Introduction to Raspberry Pi , Comparison of various Rpi Models Understanding SoC architecture and SoCs used in Raspberry Pi , Pin Description of Raspberry Pi , On-board components of Rpi, Projects using Raspberry Pi

UNIT III

Booting Up RPi Operating System and Linux Commands, Linux- Introduction, Architecture, File System,Raspbian O.S.- Introduction, Tools like Leafpad Editor, Installing Raspbian on Pi, First boot and Basic Configuration of Pi, Popular Linux Commands

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- completion of the course, the students will be able to understand the working of Raspberry Pi.
- features and how various components can be used with Pi.
- Implement the concept of RPi

TEXT BOOKS

1. The official raspberry Pi Projects Book https://www.raspberrypi.org/magpi-issues/Projects_Book_v1.pdf

REFERENCES

1. . Raspberry Pi Cookbook by Simon Monk http://www.stilson.net/documentation/raspberrypi/Raspberry%20Pi%20Cookbook.pdf

18ITVC801 BASICS OF OS & RTOS

COURSE OBJECTIVES

To enable the students to

- understanding of the techniques essential to the design and implementation of device drivers and kernel internals of embedded operating systems.
- Provides the students with an understanding of the aspects of the Realtime systems.
- Provide an understanding of the techniques essential to the design and implementation of real-time embedded systems.

Module 1

Embedded OS (Linux) Internals Linux internals: Process Management, File Management, Memory Management, I/O Management. Overview of POSIX APIs, Threads – Creation, Cancellation, POSIX Threads Inter Process Communication – Semaphore, Pipes, FIFO, Shared Memory Kernel: Structure, Kernel Module Programming

Module 2

Open source RTOS Basics of RTOS: Real-time concepts, Hard Real time and Soft Real-time, Differences between General Purpose OS & RTOS, Basic architecture of an RTOS

Module 3

VxWorks / Free RTOS VxWorks/ Free RTOS Scheduling and Task Management – Realtime scheduling, Task Creation, Intertask Communication, Pipes, Semaphore, Message Queue, Signals, Sockets, Interrupts

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Understand the Embedded Real Time software that is needed to run embedded systems
- Understand the open source RTOS and their usage
- Understand the VxWorks RTOS and realtime application programming with it.

TEXT BOOKS

1. Embedded Systems Architecture Programming and Design: Raj Kamal, Tata McGraw Hill.

REFERENCES

1. Real Time Concepts for Embedded Systems – Qing Li, Elsevier.

18PCEVC101 DEEP LEARNING FOR COMPUTER VISION

COURSE OBJECTIVES

To enable the students to

- Understand the concept of deep learning.
- Know the concept of recurrent neural networks
- Design the concept of neural network

Module 1

- Introduction to Image Formation, Capture and Representation
- Linear Filtering, Correlation, Convolution.
- Visual Features and Representations
- Scale Space and Scale Selection; SIFT, SURF; HoG, LBP, etc.
- Visual Matching
- Pyramid Matching; Optical Flow

Module 2

- Deep Learning Review:
- Learning, Multi-layer Perceptrons
- Backpropagation
- Convolutional Neural Networks (CNNs)
- Visualization and Understanding CNNs

Module 3

- Recurrent Neural Networks (RNNs)
- Attention Models
- Deep Generative Models
- Recent Trends:

TOTAL PERIODS 30

COURSE OUTCOMES

- understand the concept of deep learning.
- Know the concept of recurrent neural networks
- Design the concept of neural network

REFERENCE

- https://www.hindawi.com/

18PCOVC101 **PATENT WRITING AND PUBLISHING**

COURSE OBJECTIVE

To enable the students to

- formulate the research problems
- understand writing the patent and publishing the patent.

Unit-Introduction to formulating research problems **15**

Defining and formulating the research problem, selecting the problem, necessity of defining the problem, Importance of literature review in defining a problem, literature review-primary and secondary sources, reviews, monograph, research databases, web as a source, searching the web, critical literature review, identifying gap areas from literature and research database, development of working hypothesis

Unit II – Report writing and publications **15**

Significance of Report Writing, Different Steps in Writing Report, Layout of the Research Report-Types of Reports, Oral Presentation, Mechanics of Writing a Research Report, Precautions for Writing Research Reports, copy right, royalty, trade related aspects of intellectual property rights (TRIPS); scholarly publishing-IMRAD concept and design of research paper, citation and acknowledgement, plagiarism, reproducibility and accountability.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- identify research problems and literature review.
- patent report writing and designing the research papers.

TEXT BOOK

1. Trochim, W.M.K., 2005. Research Methods: the concise knowledge base, Atomic Dog Publishing. 270p.
2. Wadehra, B.L. 2000. Law relating to patents, trademarks, copyright designs and geographical indications. Universal Law Publishing.

18PCOVC201 **PLAGIARISM CHECKING**

COURSE OBJECTIVE

To enable the students to

- authorized by another person but represented as the student's own work, whether that material is paraphrased or copied in verbatim or near-verbatim form
- Submit someone's own previously written report without necessary acknowledgment.

Unit- I Research Ethics, IPR and Scholar Publishing **15**

Ethics-ethical issues, ethical committees (human & animal); IPR- intellectual property rights and patent law, commercialization, copy right, royalty, trade related aspects of intellectual property rights (TRIPS); scholarly publishing- IMRAD concept and design of research paper, citation and acknowledgement, plagiarism, reproducibility and accountability

Unit II – The Plagiarism **15**

Literature Review and Proper Use of E-Resources, Using Design thinking Methods to Avoid Plagiarism, Different forms of plagiarism, Writing Quality Academic Publications: Challenges to avoid plagiarism, Scientific Reading, Cite and Write, Report writing using popular word processing packages such as MS word, Open Office etc. Style Manuals and Bibliographies, Introduction to Reference Management Tools, Features and Functionalities of Anti-Plagiarism Software, Detection of Plagiarism by using Different Online Tools, Plagiarism Policies, Penalties and Consequences

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- given when using one of the following in your own research paper, i.e another person's idea, opinion, or theory.
- any pieces of information that are not common knowledge

TEXT BOOK

1. Wadehra, B.L. 2000. Law relating to patents, trademarks, copyright designs and geographical indications. Universal Law Publishing.

18PCOVC301 **NEED FOR LITERATURE SURVEY**

COURSE OBJECTIVE

To enable the students to

- describe how the proposed research is related to prior research in statistics Multimedia Packages
- show the originality and relevance of your research problem. Specifically, your research is different from other statisticians

Unit-I Introduction to Research 15

Motivation and objectives – Research methods vs. Methodology. Types of research – Descriptive vs. Analytical, Applied vs. Fundamental, Quantitative vs. Qualitative, Conceptual vs. Empirical, concept of applied and basic research process, criteria of good research, Defining and formulating the research problem, selecting the problem, necessity of defining the problem.

Unit II The Literature Review 15

What is a literature review and why is it necessary, An Outline for Preparing a Literature Review, Reading the literature, importance of literature review in defining a problem, literature review-primary and secondary sources, reviews, monograph, patents, research databases, web as a source, searching the web, critical literature review, identifying gap areas from literature and research database, Update your list of references, Presentation.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- an overview of the subject, issue, or theory under consideration, along with the objectives of the literature review,
- an explanation of how each work is similar to and how it varies from the others

TEXT BOOK & MANUALS

1. Garg, B.L., Karadia, R., Agarwal, F. and Agarwal, U.K., 2002. An introduction to Research Methodology, RBSA Publishers.
2. Kothari, C.R., 1990. Research Methodology: Methods and Techniques. New Age International.

18PEDVC01 ENERGY CONSERVATION AND EFFICIENCY

COURSE OBJECTIVES

To enable the students to

- Know familiar with the energy efficient devices.
- Know the various approaches to conserve energy.
- Understand how to approaches efficient energy management.

1. **Energy Conservation and Efficiency**

   Introduction , About Bureau of Energy Efficiency and it's Schemes, Energy Rating , consumption and energy efficient devices Energy Efficiency and its significance

2. **Energy Efficiency in Buildings and Energy Audit**

   ECBC and Tips for Energy Conservation, Definition, objective, types and methodology of Energy Audit

3. **Instrument for Energy Audit**

   Instruments for Energy Audit ,Case studies and Building survey

4. **Cost Benefit Analysis**

   Arithmetic Operator, Logical, Relational, Example for above operators.

5. **Energy and its use**

   Introduction, Types of Renewable Energy Sources ,Electric vehicle

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Differentiate the various energy efficient devices.
- Use of various methods Energy conserve methods.
- Approach the various Energy management techniques

TEXT BOOKS

1. Energy Conservation and Audit by Mr. Amit L. Nehete

REFERENCES

1. Energy Conservation Case studies in ceramic industry, sugar industry, fertilizer industry, cement industry. CII, Energy Management Cell etc

18PEDVC02 **ENERGY STORAGE**

COURSE OBJECTIVES

To enable the students to

- Know the need of energy storage.
- Know different form of energy storage system.
- Understand the concepts and application of energy storage.

1. **Introduction to Renewable Energy Systems and the Role of Energy Storage**
   History of energy storage from the perspective of the carbon cycle. Natural process of photosynthesis, Biomass, peat, and fossil carriers, and finish in the time of renewables.
2. **Energy Storage Classification**
   storage and energy storage systems, application and how they are classified according to physical, temporal and economic criteria
3. **Lead Acid Batteries**
   Electro-chemical energy storage the terms batteries and accumulators, electrodes, electrolyte Ion-conductive phase.
4. **Lithium Batteries**
   Electro-chemical energy storage the terms batteries and accumulators, electrodes, electrolyte Ion-conductive phase for lithium batteries.
5. **Chemical Energy Storage I**
   Chemical energy storage is the backbone of the conventional energy supply. Solid (wood & coal), fluent (crude oil) and gaseous (natural gas) energy carriers are different types of energy storage

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Select suitable energy storage system depending on necessity.
- Use relevant storage system for particular application.
- Differentiate the various storage system.

TEXT BOOKS

1 Energy Storage Systems and Components, Alfred Rufer

REFERENCES

1. Advanced Energy Storage Technologies and Their Applications Hailong Li(Eds.)

18PPEVC301 **ENVIRONMENTAL IMPACT ASSESSMENT**

COURSE OBJECTIVES

To enable the students to

- provide the indepth knowledge on Environment and Its impact on the surroundings when a major project is being carried out in a location.
- provide the basic knowledge on Environmental impact assessment (EIA) and its legal requirements
- know the implications of EIA in maintaining the global environmental management plan

UNIT I INTRODUCTION 10

Environmental Impact Assessment (EIA) - Environmental Impact Statement (EIS) -Environmental Risk Assessment(ERA) - Legal and Regulatory aspects in India – Types and limitations of EIA - Terms of Reference in EIA- Issues in EIA- national – cross sectoral - social and cultural.

UNIT II ENVIRNMENTAL ANALYSIS AND ASSESSMENT TECHNIQUES 10

Components - screening - setting - analysis - prediction of impacts - mitigation. Matrices - Networks - Checklists.Importance assessment techniques - cost benefit analysis - analysis of alternatives - methods for Prediction and assessment of impacts - air - water - soil - noise - biological - cultural - social - economic environments. Standards and guidelines for evaluation.

UNIT III ENVIRONMENTAL IMPACT ASSESSMENT EVALUATION 10

Trends in EIA practice and evaluation criteria - capacity building for quality assurance. Expert System in EIA - use of regulations and AQM.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- explain the basic things about Environmental Impact assessment and its relevance to the Legal and regulatory aspects.
- describe about the EIA and various assessment techniques and standard involved in decision making process.
- apply and practice the EIA management system. with the proper guideline and evaluation criteria

TEXT BOOKS

1. Petts, J., “Handbook of Environmental Impact Assessment”, Vol. I and II, Blackwell Science, London,1999.

REFERENCES

1. The World Bank Group, “Environmental Assessment Sourcebook”, Vol. I, II and III, the World Bank, Washington, 1998.

18PPSVC101 **FUNDAMENTALS OF ENVIRONMENTAL IMPACT ASSESSMENT**

COURSE OBJECTIVES

To enable the students to

- provide the indepth knowledge on Environment and Its impact on the surroundings when a major project is being carried out in a location.
- provide the basic knowledge on Environmental impact assessment (EIA) and its legal requirements
- know the implications of EIA in maintaining the global environmental management plan

UNIT I INTRODUCTION 10

Environmental Impact Assessment (EIA) - Environmental Impact Statement (EIS) -Environmental Risk Assessment(ERA) - Legal and Regulatory aspects in India – Types and limitations of EIA - Terms of Reference in EIA- Issues in EIA- national – cross sectoral - social and cultural.

UNIT II ENVIRNMENTAL ANALYSIS AND ASSESSMENT TECHNIQUES 10

Components - screening - setting - analysis - prediction of impacts - mitigation. Matrices - Networks – Check lists. Importance assessment techniques - cost benefit analysis - analysis of alternatives - methods for Prediction and assessment of impacts - air - water - soil - noise - biological - cultural - social - economic environments. Standards and guidelines for evaluation.

UNIT III ENVIRONMENTAL IMPACT ASSESSMENT EVALUATION 10

Trends in EIA practice and evaluation criteria - capacity building for quality assurance. Expert System in EIA - use of regulations and AQM.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- explain the basic things about Environmental Impact assessment and its relevance to the Legal and regulatory aspects.
- describe about the EIA and various assessment techniques and standard involved in decision making process.
- apply and practice the EIA management system. with the proper guideline and evaluation criteria

TEXT BOOKS

1. Petts, J., “Handbook of Environmental Impact Assessment”, Vol. I and II, Blackwell Science, London,1999.

REFERENCES

1. The World Bank Group, “Environmental Assessment Sourcebook”, Vol. I, II and III, the World Bank, Washington, 1998.

18PPSVC201 **ANALYSIS OF INVENTORY SYSTEMS**

COURSE OBJECTIVES

To enable the students to

- analyze the basic concepts of inventory theory.
- understand the different types of deterministic inventory models.
- develop probabilistic inventory models in several aspects.

UNIT I DETERMINISTIC INVENTORY SYSTEM 10

Introduction – Types of Inventory – Costs and factors of inventory – Basics of constrained and unconstrained optimization - Economic Order Quantity (EOQ) model with and without shortages – Economic Production Quantity (EPQ) model with and without shortages.

UNIT II EXTENSIONS OF DETERMINISTIC INVENTORY SYSTEM 10

Multi product Inventory system – Constraints of Inventory system – Inventory model with one and multiple Price Break – Inventory with variable Setup/or Ordering cost - Integrated Procurement Production (IPP) model - EOQ and EPQ model with various demand patterns.

UNIT III PROBABILISTIC INVENTORY SYSTEM 10

Inventory problem with uncertain demand – Forecasting demand - One period inventory problem – Probabilistic scheduling period - Uncertain received quantity model - Probabilistic order level system - Dynamic order quantity – Controllable lead time.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- State the objectives of inventory system and recognize their impact on cost and service.
- Use optimization techniques to minimize total inventory system cost in deterministic environment.
- Use inventory-theoretic models to design optimal supply chain management.

TEXT BOOKS

1. Nick T Thomopoulos, “Fundamentals of Production, Inventory and the Supply Chain” Atlantic Publishers, New Delhi, 2012.

REFERENCES

1. Max Muller, “Essentials of Inventory Management” Amacom, New York, 2011.

18PPSVC301 **ADVANCED GRAPH THEORY**

COURSE OBJECTIVES

To enable the students to

- familiarize the students in the field of distance in graphs and its applications.
- introduce types of digraphs and various matrix representations.
- expose the students to flows in networks.

UNIT I DISTANCE IN GRAPHS 10

The center of a graph - Distant vertices - Locating Numbers - Detour and Directed distance - Channel assignment

UNIT II DIRECTED GRAPHS 10

Types of digraphs - Digraphs and binary relations - Directed paths and connectivity - Euler digraphs - Trees withdirected edges - Fundamental circuits in digraphs - Matrices A,B and C of Digraph - Adjacency matrix of a Digraph.

UNIT III NETWORK FLOWS 10

Cut sets - Some properties of a cut set - All cut sets in a graph - Fundamental circuits and cuts sets - Connectivity andseparability Network flows - 1-Isomorphism - 2-Isomorphism.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Familiar with the concept of distance in graphs and its applications.
- Acquire the knowledge of types of digraphs and the matrix representations.
- Acquire the concept of Domination in graphs and applications.

TEXT BOOKS

1. Gary Chartrand, Ping Zhang, “Introduction to Graph Theory”, Tata McGraw-Hill Publishing company Limited, New Delhi, 2017.

REFERENCES

1. Narsingh Deo “Graph Theory with Applications to Engineering and Computer science”, Prentice-Hall of India Private Limited, New Delhi, 2016.

18 PSEVC101 **SAFETY ENGINEERING**

COURSE OBJECTIVES

To enable the students to

- gain knowledge on fire protection & service maintenance in building

Basic concepts of fire protection – Fire resistance- Introduction process of combustion- Design of fire resistance steel and concrete – Urban Planning -Introduction to lift design – Design of lift system – Introduction to system & flow system – life cycle cost and basics of building maintenance -Planning for Building Maintenance – Building inspection & Ad-hoc maintenance- Diagnosis of building by visual survey

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply knowledge on maintenance of building fire protection

TEXT BOOKS

1. S.C. Sharma, Industrial Safety, Khanna Book Publishing,2010

REFERENCES

1. H. P. Garg, Maintenance Engineering, S. Chand and Company,2015

18 PSEVC201 ENVIRONMENTAL SUSTAINABILITY OF CONTAMINATED SITES

COURSE OBJECTIVES

To enable the students to

- gain knowledge on laws , regulations & remediation

Introduction - Laws, Regulations and Remediation - Legal Concepts - Types of Law – Regulations – Federal - Laws/Regulations – History – Objectives - Remediation Process - Definition of hazardous waste - Waste Classification - Corrective Action -Risk Assessment - Steps in Human Health Risk Assessment - Data Collection and Evaluation - Exposure Assessment - Toxicity Assessment - Risk Characterization.

Risk Management - Risk Communication - Ecological Risk Assessment Remedial Options - Plume Containment - extraction wells- extraction trenches - injection wells/trenches - wells/barriers- Permeable Reactive Barriers

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply gained knowledge on environmental remediation of contaminated sites

TEXT BOOKS

1. LaGrega, M.D., Buckingham, P.L., Evans, J.C., Hazardous Waste Management, McGraw-Hill, 1994.Haas, C.N

REFERENCES

1. Vamos, R.J., Hazardous and Industrial Waste Treatment, Prentice Hall, Englewood Cliffs, NJ, 1995.

18 PSEVC301 OPTIMIZATION TECHNIQUES IN STRUCTURAL ENGINEERING

COURSE OBJECTIVES

To enable the students to

- understand the theory of optimization methods and algorithms developed for solving various types of optimization problems.

Introduction to Optimization: Introduction - Historical developments – Engineering applications of Optimization - Statement of an Optimization problem - Classification of Optimization problems - Optimization Techniques. Optimization by calculus: Introduction - Unconstrained functions of a single variable - Problems involving simple constraints - Unconstrained functions of several variables - treatment of equality constraints – Extension to multiple equality constraints - Optimization with inequality constraints - The generalized Newton-Raphson method.

Network Analysis: Introduction - Elementary graph theory - Network variables and problem types - Minimum-cost route - Network capacity problems - Modification of the directional sense of the network - Application of Optimization techniques to trusses, Beams and Frames.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- formulate optimization models for a wide range of civil engineering problems and able to solve them.

TEXT BOOKS

1. Optimization: Theory and Applications by S.S.Rao. New Age International (p) Ltd

REFERENCES

1. Numerical Optimization Techniques for Engineering Design with applications by G.N.Vanderplaats 2007.

18 PSEVC401 THE ART OF STRUCTURAL ENGINEERING: BRIDGES

COURSE OBJECTIVES

To enable the students to

- analyze bridges from three perspectives

Introduction to Structural Art - The Origins of Structural Art: British Metal Forms -John Roebling and the Brooklyn Bridge- Othmar Ammann and (some of) his Bridges of NYC- The Golden Gate Bridge - Robert Maillart and Reinforced Concrete Bridges - Origins of Prestressing: Freyssinet, Magnel, and Finsterwalder -New Bridge Forms: Christian Menn- The Politics and Art of Spanish Bridge Design

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- solve for the efficiency of structures using the appropriate formulas

TEXT BOOKS

1. Varghese P. C., Advanced Reinforced Concrete Design, PHI Learning

REFERENCES

1. Krishna Raju N., Advanced Reinforced Concrete Design, CBS Publishers

18BAVC401

EMOTIONAL INTELLIGENT IN MANAGEMENT

COURSE OBJECTIVES

to enable the students to

- Know the concepts of EQ & IQ
- Learn the method of stress management
- Learn the correlates of IE

COURSE CONTENT

Introduction to emotion- intelligence & wisdom- Correlates of emotional intelligence Concept, theory, measurement and applications of intelligence- motional intelligence: concept, theory and measurements- Correlates of emotional intelligence Emotional intelligence, culture, schooling and happiness -For enhancing emotional intelligence EQ mapping -Managing stress, suicide prevention, through emotional intelligence- spirituality and meditation- Application of emotional intelligence at family, school and workplace

TOTAL PERIODS 30

COURSE OUTCOMES

to the end this course, students will be able to

- Map the EQ of individual
- Manage stress and control emotions
- Apply EI in both official and document setup

TEXT BOOKS

1. NDaniel Goleman’s Books on Emotional Intelligence

REFERENCES

1. Primal Leadership: Unleashing the Power of Emotional Intelligence

18**BAVC301**

BLOCK CHAIN TECHNOLOGY

COURSE OBJECTIVES

to enable the students to

- To assess blockchain applications in a structured manner.
- To impart knowledge in block chain techniques and able to present the concepts clearly and structured.
- To get familiarity with future currencies and to create own crypto token.

COURSE CONTENT

unit I Basic Concepts Introduction - Decentralized society - Disturbed Database, Byzantine General problem - Fault tolerance, Hadoop Distributed File System, Distributed Hash Table, ASIC resistance, Turing Complete - P2P network - Private key - Public key - Cryptography - Hash Function - Digital Signature - ECDSA - Memory Hard Algorithm - Zero Knowledge Proof.

Unit II Block Chain Introduction - Advantage over conventional distributed database - Network and protocols - Block chain network - Mining - Mechanism - Life Cycle of Block chain - Distributed consensus - Merkle Patricia Tree - Gas Limit - Department of Business Administration Faculty of Arts 67 Transactions and Fee - Anonymity - Reward - Chain policy- Life of Block chain applications -Soft and Hard Fork - Private and Public blockchain.

Unit III Distributed Consensus Nakamoto consensus - Proof of work - Proof of Stake - Proof of Burn - Difficulty level - Sybil Attack - Energy Utilization and alternate - Fabric model - SDKs - Components of Fabric Model - Architecture of Hyperledger fabric.

Unit IV Cryptocurrency History - Distributed ledger - Bitcoin protocols - Mining strategy and rewards - Ethereum - construction - Truffle - DAO - dApps - Smart Contract - Boot strapping - GHOST Vulnerability - Attacks - Sidechain - Namecoin.

Unit V Cryptocurrency Regulations Stakeholders - Roots and Bitcoin - Legal As pects - Crypto currency exchange - Black market and Global economy. Applications : IoT - Medical Record Management system - Domain Name Service and future of Blockchain - Business applications and assessing blockchain projects.

OTAL PERIODS 30

OURSE OUTCOMES

t the end this course, students will be able to

- Understand the various technologies and its business use.
- Analyse the block chain applications in a structure manner.
- Explain the modern concepts of block chain technology systematically.

TEXT BOOKS

1. Paul Vigna and Michael J.Casey.

REFERENCES

1. The Age of Cryptocurrency, 2015.

18BAVC201

SMALL BUSINESS MANAGEMENT

COURSE OBJECTIVES

to enable the students

- To impart knowledge in project management tools and techniques practiced in a project.
- To provide exposure in the methods adopted in identifying a new project and to know the difference between pre-feasibility and feasibility study.
- To understand the role of entrepreneur in the Indian context and to expose to the importance of small scale industry.

COURSE CONTENT

Unit I Project Planning Definition of project – Classifications of projects – Importance – Scope – Project Identification – Idea generation and Screening – Project selection and Planning – Project Formulation – Project life cycle – Project Organisation – Roles and Responsibilities of project manager – Managing project team.

Unit II Project Feasibility and Project Finance and Evaluation Pre–feasibility study – Mar ket and Demand analysis – Feasibility Study: Technical – Commercial – Environmental – Socio economic – Managerial and Financial analysis – Detailed Project Report – Resource Survey – Selection of plant location – Project contracts

Unit III Introduction to Entrepreneur Definition – Concept – Classification and types of entrepreneurs – Entrepreneurial Traits – Need and Important – Roles and Responsibilities of Entrepreneurs in Indian business context – Entrepreneurial Motivation – Entrepreneurial Development Programme: Role and objectives of the programme – Contents

Unit IV Entrepreneurship Environment and Challenges Entrepreneurship environment: Social – Cultural – Political – Natural – Geographic – Technological – Economic Environment and its impact on Entrepreneurship – Factors affecting entrepreneurial growth – Globalization and its challenges – Steps to face global challenges – Strategies for the development of women entrepreneurs.

Unit V Small Business Management Small Enterprises – Definition – Classification – Characteristics – Ownership Structures – Steps involved in setting up a small business – Identifying and selecting a

good Business opportunity – Market potential analysis – Marketing methods: Pricing and Distribution methods.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Generate new methods to identify a project.
- Analyse the project organization structure.
- Critically evaluate the reasons for the sickness in small scale industry

TEXT BOOKS

1. Clifford, F. Gray and E.W.Larson. Project management

REFERENCES

1. Tata Mcgraw hill, New Delhi, 2007.

18BAVC101

INTRODUCTION TO BUSINESS ANALYTICS

COURSE OBJECTIVES

to enable the students to

- To understand the purpose of using business analysis tools within an organization, dataset for making a business decisions and R studio for data analysis.
- Know the business Applied artificial intelligence and Visual analysis
- Analyse the data and stature of the business

COURSE CONTENT

Unit I Introduction to Business Analytics and Big Data Business Analytics – Definition - Need – Scope - A categorization of Analytical Methods – Analytics in action – Big data – Business analytics in practice – types of data – modifying data in excel – creating Distributions from data– measures of location

Unit II Application of Business Analytics Machine Learning - Introduction and Concepts - Differentiating algorithmic and model based frameworks, Decision analytics. Descriptive analytics - Predictive analytics - Prescriptive analytics. Faculty of Arts Department of Business Administration

Unit III Decision support and Data Visualisation DSS- Executive and enterprise support- Automated decision support - Web analytics- Data mining -Applied artificial intelligence - Visual analysis: Data concepts – Data Dashboards - Data exploration & visualization - Scorecards

Unit IV Time Series and Forecasting Time series pattern – forecasting 18PPSVC101

determining the best forecasting model to use - building good spreadsheet model – What-If analysis – some useful excel functions for modeling – auditing spreadsheet model – a simple maximization problem.

Unit V Data Analysis using R R Studio: Introduction – R data types and objects, reading and writing data - Data structures in R - R programming fundamentals - Advantages and disadvantages

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Critically analyze the business problems especially solves business problems.
- Students can able to understand the applications of business analytics.
- They have get ideas on data visualization and time series analysis.

TEXT BOOKS

1. Sandhya Kuruganti. Business Analytics: Applications to Consumer Marketing,

REFERENCES

1. McGraw Hill, 2015

18CAVC101 ARDUINO PROGRAMMING

COURSE OBJECTIVES

To enable the students to

- understand about embedded system
- learn about Concept of digital and analog ports
- understand about basic concepts of arduino

UNIT I Introduction

Introduction to embedded system - Understanding Embedded System - Overview of basic electronics and digital electronics - Microcontroller vs. Microprocessor - Common features of Microcontroller - Comparison between the two - Different types of microcontrollers

UNIT II Getting Started with Arduino

Introduction to Arduino - Pin configuration and architecture - Device and platform features - Concept of digital and analog ports - Familiarizing with Arduino Interfacing Board - Introduction to Embedded C and Arduino platform

UNIT III Review of Basic Concepts

Arduino data types - Variables and constants – Operators - Control Statements - Arrays - Functions

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- design and implement Embedded system
- implement the Concept of digital and analog ports
- analyze about basic concepts of Arduino

TEXT BOOKS

1. Exploring Arduino: Tools and Techniques for Engineering Wizardry 1st Edition

REFERENCES

1. Beginning C for Arduino, Second Edition: Learn C Programming for the Arduino Paperback, July 2015

18CAVC201 PROGRAMING IN VISUAL BASIC

COURSE OBJECTIVES

To enable the students to

- understand about the concept of NET Framework
- be familiar with creating of database using VB.NET
- study about VB Language

UNIT I Introduction to VB.NET

Event Driven Programming, NET as better Programming Platform, NET Framework, NET Architecture, The Just-In-Time Compiler, NET Framework class library

UNIT II VB.NET Development Environment

Creating Applications, Building Projects, Using simple components, Running VB.NET applications

UNIT III Mastering VB Language

Data, Operators, Conditionals and Loops, Procedures, Error Handling, Classes and Objects.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- implement the concept of NET Framework
- implement creating of database using VB.NET.
- analyze the concept of VB Language

TEXT BOOKS

1. Introduction: Visual BASIC 6.0, Gary Haggard, Wade Hutchison, Christy Shibata, Steven Holzner, Lou Tylee, Bookboon (2012)

REFERENCES

1. Learn Visual Basic 6.0, Lou Tylee, Carfield

18GEVC101/201 GENDER EQUALITY AND HUMAN RIGHTS

COURSE OBJECTIVES

To enable the students to

- To search, analyse, and work with legally relevant information by using the juridical, comparative and other specific methods
- Learn how to work cooperatively in groups.
- enable them to engage in policy decisions to remove gender biases in all fields of life in the process of gender equality for nation building

MODULE 1: Gender theory and law

Approaches to gender and law, Gender theory, Conflict, integrationist and hermeneutic approaches, Feminist theory, Human rights of women and legal theory, Feminist jurisprudence, Legal and gender expertise

MODULE 2: Gender equality and human rights

Gender and human rights theory, History of human rights movements, Suffrage movements, International treaties and prohibition of gender-based discrimination, EU human rights law and gender

MODULE 3: Gender equality and labour law

Current challenges for Genderequality, Anti-gender movements, Biopolitics and legal instruments of body control. Sexual violence in conflict. Challenges to human rights of women, women and austerity.

TOTAL PERIODS 30

COURSE OUTCOMES

Students must gain knowledge on

- how to work with information (search, evaluate, use information, necessary for fulfilment of scientific and professional tasks, from various sources, including application of the systematic approach)
- professional activities in the international environment
- the removal of gender biases in all fields of life in the process of gender equality for nation building

TEXT BOOKS

1. CornellRW(1995)Gender.Cambridge,PolityPress.

2.GatensM(1991)ACritiqueoftheSex/GenderDistinctioninS.Gunew(ed.)AReaderinFeministKnowledge. London: Routledge.

REFERENCES

1. AndreaN(1989)FeministTheoryandPhilosophiesofMen.NewYork:Routledge.
2. AroraP(2011)GenderandPower. Delhi: Pacific Publication.

17GEVC201 **INDIAN CONSTITUTION AND ELECTION COMMISION**

COURSE OBJECTIVES

To enable the students to

- understand the most diversified legal document of India and philosophy behind it.
- thinking towards basic understanding of the Organs of Governance and its implications for engineers.
- learn about the role and function of election commission

MODULE 1 : INTRODUCTION ABOUT INDIAN CONSTITUTION (10)

Meaning of the constitution law and constitutionalism, Historical Background of the Constituent Assembly, Government of India Act of 1935 and Indian Independence Act of 1947,Enforcement of the Constitution, Indian Constitution and its Salient Features, The Preamble of the Constitution,

MODULE 2: ORGANS OF GOVERNANCE (10)

Organs of Governance: Parliament, Composition, Qualifications and Disqualifications, Powers and Functions, Executive, President, Governor, Council of Ministers, Judiciary, Appointment and Transfer of Judges, Qualifications, Powers and Functions

MODULE 3 : ELECTION COMMISSION (10)

Election Commission: Election Commission: Role and Functioning. Chief Election Commissioner and Election Commissioners. State Election Commission: Role and Functioning. Institute and Bodies for the welfare of SC/ST/OBC and women.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Identify and explore the basic features and modalities about Indian constitution
- Understand the various organs of Indian governance.
- Gain knowledge on election commission of India

TEXT BOOKS

1. Brij Kishore Sharma: Introduction to the Indian Constitution, 8th Edition, PHI LearningPvt. Ltd.
2. Shubham Singles, Charles E. Haries, and Et al : "Constitution of India and Professional Ethics" byCengage Learning India Private Limited, Latest Edition – 2018
3. Dr. S. N. Busi, Dr. B. R. Ambedkar framing of Indian Constitution, 1st Edition, 2015
4. M. P. Jain, Indian Constitution Law, 7th Edn., Lexis Nexis, 2014.

5. D.D. Basu, Introduction to the Constitution of India, Lexis Nexis, 2015

REFERENCES

1. M.Govindarajan, S.Natarajan, V.S.Senthilkumar, “Engineering Ethics”, Prentice –Hall of India Pvt. Ltd. New Delhi, 200
2. M.V.Pylee, “An Introduction to Constitution of India”, Vikas Publishing, 2002.
3. Subhash C. Kashyap: Our Constitution: An Introduction to India’s Constitution and constitutional Law,NBT,2018.

PAAVAI ENGINEERING COLLEGE(AUTONOMOUS)

ACADEMIC YEAR 2019 - 2020

VALUE ADDED COURSE

19AEVC301 UAV AND MAV OPERATIONS-INTRODUCTION

COURSE OBJECTIVES

To enable students to

- be put in for real time development projects
- solving various technical issues in the development

PROGRAMME CONTENT

1. Introduction to UAVs, History, classifications

2. Introduction to UAVs – Evolution and Classification

3. UAV operating principles

4. Selection of different UAVs for specific applications

5. Principal differences between Vehicles

6. Design Methodology, parameter selection

7. Propulsion systems selection, Material selection

TOTAL PERIODS 30

COURSE OUTCOMES

Upon successful completion of this course, students will be able to

- bridge the gap between theoretical concepts learned in college and industry practices
- indulge in and complete real time industrial projects

TEXT BOOK & MANUALS

- https://ptgmedia.pearsoncmg.com/images/9780789755988/samplepages/9780789755988.pdf

19AEVC401 **DESIGN OF UAV**

COURSE OBJECTIVES

To enable students to

- acquire the knowledge of designing uav
- develop their skill set in drone design

COURSE LAYOUT:

1: Introduction to fixed-wing UAVs ,Introduction to Design, Basic Design Parameters

Module2: Basic Design Parameters, Design Algorithm: Case Study, Design Algorithm: Mission Requirements

Module3: Design Algorithm: Feasible Design Parameters, Configuration Layout: Airfoil Selection, Configuration Layout: Planform Geometry selection

Module4: Weight and CG Estimation, Analytical Parameter Estimation, Analytical Parameter Estimation

Module5: Performance and Stability Analysis, Performance and Stability Analysis ,Performance and Stability Analysis

Module6: Simulation, Simulation, Detailed Sizing.

Module7: Estimation of inertial properties using 3D modeling, Prototype Fabrication.

Module8: Wind Tunnel Testing, Aerodynamic Characterization through Wind Tunnel Testing.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon successful completion of this course, students will be able to

- gain the knowledge about design of UAV
- construct the drone by themself

TEXT BOOK & MANUALS

- https://onlinecourses.nptel.ac.in/noc20_ae04/preview

19AEVC501 ADVANCED AIRCRAFT MAINTENANCE

COURSE OBJECTIVES

To enable students to

- acquire the knowledge of their relevant Advanced Aircraft Maintenance course
- develop their practical skills in maintenance

COURSE LAYOUT:

Module1: Introduction, Construction

Module2: Performance, Lubrication system, Induction system

Module3: Fuel system, Ignition System, Starting System

Module4: Propeller, Maintenance

Module5: Introduction, Inlet, Compressor

Module6: Combustion, Turbine, Exhaust

Module7: Fuel system, Lubrication system, Ignition System

Module8: Starting, Thrust Augmentation, Material, Maintenance

TOTAL PERIODS 30

COURSE OUTCOMES

Upon successful completion of this course, students will be able to

- gain the knowledge about Maintenance domain
- bridge the gap between theoretical concepts learned in college and industry practices

TEXT BOOK & MANUALS

- https://onlinecourses.nptel.ac.in/noc20_ae07/preview

19AEVC601 COMPUTER AIDED DESIGN CATIA-INTERMEDIATE

COURSE OBJECTIVE

To enable the students to

- gain strong ground on solid modeling techniques that would enhance the productivity in modeling
- develop the analysis process of mechanical components.

PART MODELING

Sketch based features-Pad, Multipad, Drafted filleted pad-Pocket, Multipocket, Drafted filleted pocket-Shafts, groove-Holes-Rib, Slots-Solid combine, Stiffner-Multi section solid, Multi section solid removal-Edit Geometry, Parent child relationship, -Drafts, Drafted reflected line, Variable angle draft-Shell feature, Affinity-Reference elements- Point, Axis, Planes,-Boolean operations- Assemble, Add, Remove, Intersect, Union trim, Remove lump

ASSEMBLY DESIGN

Introduction on assembly-Assembly approaches-Top down assembly, Bottom up assembly-Product structure tools-Component, Product, Part-Existing component, Existing component with positioning-Replace component, -Assembly constrains-Coincident, Contact constrain, Offset, Angular, parallel, Perpendicular, Fix-Fix together, Quick constrain, Change constrain, Reuse pattern-Assembly Features-Split, Hole, Pocket, Add, Remove-Symmetry in assembly

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- Learnt advanced solutions for conceptual design, 3D modelling, and documentation.
- Learnt to do product design, industrial design and styling (optimize form, fit, function and user experience), streamline 2D design, drafting, documentation with powerful tools for layout.

TEXT BOOK & MANUALS

- Jonathan M. Weaver, Nader G. Zamani CATIA V5 Tutorials Mechanism Design & Animation Release 20

19AEVC701 UAV AND MAV OPERATIONS-ADVANCED

COURSE OBJECTIVES

To enable students to

- be put in for real time development projects
- solving various technical issues in the development

PROGRAMME CONTENT

1. Introduction to Avionics and navigation systems, Autopilot system
2. Introduction to Electro optical payload and other sensor payloads
3. Electro optical payload and other sensor payloads
4. Fabrication Techniques
5. Flight Trails and error rectification
6. Advanced real time applications of UAVs
7. R&D Projects

TOTAL PERIODS 30

COURSE OUTCOMES

Upon successful completion of this course, students will be able to

- bridge the gap between theoretical concepts learned in college and industry practices
- indulge in and complete real time industrial projects

TEXT BOOK & MANUALS

https://ptgmedia.pearsoncmg.com/images/9780789755988/samplepages/9780789755988.pdf

19AEVC801 COMPUTER AIDED DESIGN AUTOCAD-INTERMEDIATE

COURSE OBJECTIVES

To enable the students

- gain strong ground on solid modeling techniques that would enhance the productivity in modeling
- understand the analysis of mechanical components

1..Working Effectively with AutoCAD

o Setting up the Interface

o Using the Keyboard Effectively

o Working in Multiple Drawings

o Using Grips Effectively

o Additional Layer Tools

2. Advanced Layouts

o Creating and Using Named Views

o Creating Additional Viewports

o Layer Overrides in Viewports

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of the course students will be able to

- Inspect and evaluate the surface imperfections using penetrant testing method.
- Inspect subsurface defects by magnetic particle.

TEXT BOOK & MANUALS

- https://images-na.ssl-images-amazon.com/images/I/C1BxaOC0-IS.pdf

19AIVC301 INTRODUCTORY AGROFORESTRY

COURSE OBJECTIVES

To enable the students to

- To learn distinction between agroforestry and social forestry
- To learn the election of tree crop species for agro-forestry.
- To understand about Agroforestry projects

Unit I

Agroforestry – definition, objectives and potential. Distinction between agroforestry and social forestry. Status of Indian forests and role in India farming systems. Agroforestry system, sub-system and practice:

Unit II

Agri-silviculture, silvipastoral, horti-silviculture, hortisilvipastoral, shifting cultivation, taungya, home gardens, alley cropping, intercropping, wind breaks, shelterbelts and energy plantations. Planning for agroforestry – constraints, diagnosis and design methodology, selection of tree crop species for agro-forestry.

Unit III

Agroforestry projects – national, overseas, MPTS – their management practices, economics of cultivation – nursery and planting (Acacia catechu, Dalbergiasissoo, Tectona, Populus, Morus, Grewia, Eucalyptus, Quercus spp. and bamboo, tamarind, neem etc.), Neem Azadirachta indica, Tamarind (Tamarindus indica) and melia dubia as per local prevalence

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Analyze MPTS – their management practices
- Demonstrate the nursery and planting
- Understand about melia dubia as per local prevalence

TEXT BOOKS

1. A. K. Patra, 2013. Agroforestry – Principles and Practices. New India publishing agency.

REFERENCES

1. A. P. Dwivedi, 1992. Agroforestry – Principles and Practices. Oxfird and IBH Publishing company.

19AIVC401 ELEMENTARY PLANT BIOCHEMISTRY

COURSE OBJECTIVES

To enable the students to

- To learn about classification of carbohydrates
- To understand the plant pigment structure and function
- To learn about plant enzyme and TCA cycle.

Unit I

Carbohydrates: Occurrence classification and structure, physical and chemical properties of carbohydrates, isomerism, optical activity, reducing property, reaction with acids and alkalis, ozone formation. Lipids: Classification, important fatty acids and triglycerides, essential fatty acids

Unit II

Physical and chemical control of oils, their rancidity, phospholipids, types and importance. Plant pigments – structure and function of chlorophyll and carotenoids, sterols, basic structure, role of brassino sterols in plants. Proteins: Classification, function and solubility, amino acids – classification and structure, essential amino acids, properties of amino acids, color reactions, amphoteric nature and isomerism; structure of proteins –primary, secondary tertiary and quaternary properties and reaction of proteins

Unit III

Enzymes: Classification and mechanism of action; factors affecting enzyme action, 48 co-factors and coenzymes. Vitamins and minerals as co-enzymes/co-factors. Carbohydrate metabolism – glycolysis and TCA-cycle; metabolism of lipids, fatty acid oxidation, biosynthesis of fatty acids, electron transport chain, bioenergetics of glucose and fatty acids.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Acquire knowledge in physical and chemical properties of carbohydrate
- Understand the reaction of proteins
- Gain idea about carbohydrate metabolism and glycolsis

TEXT BOOKS

1. Lehninger, Nelson, D. L. and Michael, M. C. 2004. Principles of Biochemistry. Freeman Publishers

REFERENCES

1. Sadashiv, S and Manickam, A. 1996. Biochemical methods for Agricultural sciences. New age Interantional publishers, New Delhi.

19AIVC501 INTRODUCTORY CROP PHYSIOLOGY

COURSE OBJECTIVES

To enable the students to

- To understand the water relations in plant
- To learn about different types of crop stress
- Acquire knowledge in Photosynthesis and CO2 fixation.

Unit I

Water Relations in Plants: Role of water in plant metabolism, osmosis, imbitions, diffusion, water potential and its components, measurement of water potential in plants, absorption of water, mechanism of absorption and ascent of sap. Stomata: Structure, distribution, classification, mechanism of opening and closing of stomata. Osmotic pressure, guttation, stem bleeding; transpiration methods and mechanism and factors affecting transpiration.

UNIT II

Drought: Different types of stresses; water, heat and cold tolerance; mechanism of tolerance. Plant Nutrition: Essentiality, mechanism of absorption and its role in plant metabolism.

UNIT III

Biological Nitrogen Fixation, Photosynthesis, structure and function of chloroplast, dark and light reactions, cyclic and non-cyclic electron transfer, CO2 fixation – C3, C4 and CAM metabolism, advantages of C4 pathway. Photorespiration and its implications, factors affecting photosynthesis. Mode of herbicide action, Secondary metabolites and plant defence.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Understand the mechanism of opening and closing of stomata.
- Analysis the mechanism of drought tolerance
- Acquire knowledge in factors affecting photosynthesis

TEXT BOOKS

1. Salisbulry. 2007. Plant Physiology. CBS. New Delhi.

REFERENCES

1. Edward E. Durna. 2014. Principles Of Horticultural Physiology. CABI, UK

19AIVC601 ECONOMICS AND MARKETING

COURSE OBJECTIVES

To enable the students to

- To understand the nature and scope of economics in agriculture
- Analysis the theory of demand and surplus
- Study the different types of marketing in agriculture /horticulture

Unit I

Nature and scope of economics, definition and concepts, divisions of economics, economic systems, approaches to the study of economics. Consumption – theory of consumer behaviour, laws of consumption, classification of goods. Wants – their characteristics and classification, utility and its measurement, cardinal and ordinal, law of diminishing marginal utility, law of equi-marginal utility, indifference curve and its properties, consumer equilibrium.

Unit II

Theory of demand, demand schedule and curve, market demand. Price, income and cross elasticities, Engel's law of family expenditure – consumer's surplus. Theory of firm, factors of production – land and its characteristics, labour and division of labour, theories of population.

Unit III

Marketing- definition – Marketing Process – Need for marketing – Role of 55 marketing — Marketing functions – Classification of markets – Identification of various marketing channels – Price spread – Marketing Efficiency –Integration – Constraints in marketing of horticultural/agricultural produce. Market intelligence.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Analysis law of diminishing marginal utility, law of equi-marginal utility, indifference

- Understand the . Price, income and cross elasticities, Engel's law of family expenditure
- Acquire knowledge in marketing process

TEXT BOOKS

1. H L Ahuja. S. Chand and Company Limited. Advanced Economic Theory. Micro Economic Analysis.

REFERENCES

1. Subba Reddy, S., Raghu ram, P., Neelakanta Sastry T.V., Bhavani Devi. I., 2010, Agricultural Economics, Oxford & IBH Publishing Co. Private Limited, New Delhi Willium J. Stanton. 1984. Fundamentals of Marketing. Tata McGraw-Hill Publication, New Delhi.

19AIVC701 HORTI-BUSINESS MANAGEMENT

COURSE OBJECTIVES

To enable the students to

- To understand about factors and product relationship
- To be familiar with planning ,organizational principles
- To study about Budgeting

UNIT 1

Farm management - definition, nature, characteristics and scope. Farm management principles and decision making, production function, technical relationships, cost concepts, curves and functions – factors, product, relationship – factors relationship, product relationship, optimum conditions, principles of opportunity cost-equi-marginal returns and comparative advantages, time value of money, economic of scale, returns to scale, cost of cultivation and production, break even analysis, decision making under risk and uncertainty. Farming systems and types.

..

UNIT 2

Planning – meaning, steps and methods of planning, types of plan, characteristics of effective plans. Organizations – forms of business organizations, organizational principles, division of labour. Unity of command, scalar pattern, job design, span of control responsibility, power authority and accountability.

UNIT 3

Budgeting as a tool for planning and control. Record keeping as a tool of control. Management and administration: meaning, definition, principles and functions. Functional areas of management – operations management – physical facilities, implementing the plan, scheduling the work, controlling production in terms of quantity and quality. Materials management – types of inventories, inventory costs, managing the inventories, economic order quantity (EOQ). Personnel management – recruitment, selection and training, job specialization. Marketing management – definitions, planning the marketing programmes, marketing mix and four P's. Financial management – financial statements and ratios, capital budgeting. Bank norms – Insurance.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Study the farm management principles and decision making

- Gain knowledge about forms of business organization
- Analyze the concept of management and administration

TEXT BOOKS

1. Heady Earl O and Herald R. Jenson,1954, Farm Management Economics. Prentice Hall, New Delhi S.S. Johl, J.R. Kapur ,2006, 2.Fundamentals of Farm Business Management. Kalyani Publishers, New Delhi

REFERENCES

1. Barry P J, Hopkins J A and Baker C B. Financial Management in Agriculture, 6th ed. Danville, IL Interstate Publishers

19AIVC801 FUNDAMENTALS OF FOOD AND NUTRITION

COURSE OBJECTIVES

To enable the students to

- Understand the food and nutrition for good health
- Acquire knowledge valus of protions and lipids
- Study the mineral nutrition ,vitamins function.

Unit I

Food and its function, physico-chemical properties of foods, food preparation techniques.Nutrition, relation of nutrition to good health. Energy: definition, determination of energy requirements, food energy and total energy needs of the body. Carbohydrates: functions, source, requirements, digestion, absorption and utilization.

UNIT II

Protein: functions, sources, requirements, digestion, absorption, essential and non-essential amino acids, quality of proteins, PER/NPR/NPU, supplementary value of proteins and deficiency. Lipids: functions, sources, requirements, digestion, absorption and utilization, saturated and unsaturated fatty acids, deficiency.

UNIT III

Mineral nutrition: macro and micro-minerals, function, utilization, requirements, sources, effects of deficiency. Vitamins (of water soluble and fatsoluble vitamins): functions, sources, effects of deficiency, requirements. Balanced diet: recommended dietary allowances for various age groups, common disorders associated due to malnutrition in population. Food Additives, adulterants and contaminants.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Gain knowledge food energy and total energy needs of the body.
- Understand the supplementary value of proteins and deficiency
- Analyze the disorders associated due to malnutrition in population.

TEXT BOOKS

1. Manay, N. Shakuntala and Shadaksharaswamy, M. Foods: Facts & Principles, New Age International (P) Limited Publishers, New Delhi.

REFERENCES

1. Mudambi, Sumati R. and Rajagopal, M.V. Fundamentals of Foods & Nutrition, Third Edition, New Age International (P) Limited Publishers, New Delhi.

19CEVC301 COST ESTIMATION IN CONSTRUCTION

COURSE OBJECTIVES

To enable the students to

- gain knowledge on building Estimation
- understand the concepts of preparation of BOQ
- learn the measurement procedures for buildings

Module I

Introduction to building cost estimation- Measurement procedures - Mensuration – Specifications- Rates – Labour, material, machine.

Module II

Finding quantities from construction drawing –Excavation - Ground work and Foundation - Superstructure- Walls, partitions, floors, roofs- Internal finishes - Doors and windows - Staircases

Module III

General approach to measurements of building services - External work- Bill of quantities – Abstract and BOQ

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply knowledge on calculation of building cost
- prepare BOQ and Abstract
- calculate quantities in building

TEXT BOOKS

1. Estimation and Costing book by M. Chakraborti ,M. Chakraborti publications, 2011

REFERENCES

1. Estimating and Costing in Civil Engineering (Theory and Practice) by B.N.Dutta - 28/Revised Edition 2020

19CEVC401 ADVANCED GEOTECHNICAL ENGINEERING

COURSE OBJECTIVES

To enable the students to

- gain knowledge on soil structure and properties
- understand the concepts of stress , strain mechanism of soil
- acquire knowledge on triaxial stress of soil

Module I

Introduction to continuum mechanics - Important constitutive relationship -3D to 2D idealization - Mathematical formulation of plane stress, plane strain -Mathematical formulation of axisymmetric conditions

Module II

Basics of shear strength -Stress representation - Shear strength granular soil-Shear strength cohesive soil

Module III

Stress path-triaxial test-drained -Stress path-triaxial test-undrained- Stress path-additional undrained case - Stress path-field cases

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply gained knowledge on finding properties of soil
- calculate the stress & strain path for both drained & undrained cases
- manipulate the stress path for triaxial cases

TEXT BOOKS

1. Das, B. M., Advanced Soil Mechanics, Taylor and Francis, 2nd Edition, 1997

REFERENCES

1. Wood, D.M., Soil Behavior and Critical State Soil Mechanics, Cambridge University Press, 1990.

19CEVC501 POLLUTANTS AND ITS TREATMENT

COURSE OBJECTIVES

To enable the students to

- gain knowledge on pollutants in air, land & water
- understand the concepts of water softening & distribution
- learn the concept of water distribution network design

Module I

Pollutants and their Effects - Air pollution –Land Pollution - Water Pollution - Water Quality-Criteria & Analysis - Water Requirements - Sources and Collection of Water - Overview of Purification and Pre-Treatment - Theory and Design of Sedimentation

Module II

Theory and Design of Filtration - Theory and Design of Disinfection - Water Softening and Specific Treatments- Storage and Distribution Reservoirs

Module III

Pumps and Pumping Requirements, Valves and Appurtenances - Hydraulic Considerations and Design - Distribution Network-Analysis and Design

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply field procedure on testing pollutants
- calculate the water distribution
- design and analysis the water distribution network

TEXT BOOKS

1. Water Supply Engineering by Dr. B.C. Punmia, Ashok Kr. Jain and Arun K Jain, 2005

REFERENCES

1. Water Supply and Sanitary Engineering by G. S. Birdie and J. S. Birdie, 2010

19CEVC601 FIRE AND SAFETY MAINTENANCE

COURSE OBJECTIVES

To enable the students to

- gain knowledge on fire protection & service maintenance in building
- understand the concepts lift design , Ad-hoc maintenance
- acquire knowledge on building inspection

Module I

Basic concepts of fire protection – Fire resistance- Introduction process of combustion- Design of fire resistance steel and concrete – Urban Planning

Module II

Introduction to lift design – Design of lift system – Introduction to system & flow system – life cycle cost and basics of building maintenance

Module III

Planning for Building Maintenance – Building inspection & Ad-hoc maintenance- Diagnosis of building by visual survey

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply knowledge on maintenance of building fire protection
- prepare lift design & know Ad-hoc maintenance service
- inspect the building and find the faults

TEXT BOOKS

1. Fire Protection Handbook (NATIONAL FIRE PROTECTION ASSOCIATION//FIRE PROTECTION HANDBOOK)

REFERENCES

1. Bureau of Indian Standards, " HAND BOOK OF FUNCTIONAL REQUIREMENTS OF BUILDINGS, (SP-41 & SP- 32)", BIS 1987 and 1989.

19CEVC701 **AUTOCAD SOFTWARE**

COURSE OBJECTIVES

To enable the students to

- gain knowledge on AUTOCAD software
- understand the AUTOCAD commands usage
- learn hands on training using AUTOCAD software

Module I

Starting with advanced sketching - Drawing Arc -Drawing Rectangles -Drawing Ellipses -Drawing Regular Polygon -Drawing Polylines -Placing Points -Drawing Infinite Lines -Writing a Single Line Text

Module II

Working with drawing aids –Introduction -Understanding the Concept and use of LAYERS -Advantages of Using Layers -Working with Layers- Creating New Layers -Making a Layer Current -Controlling the Display of Layers -Deleting Layers- Object Properties Changing the Colour

Module III

Working with blocks- The Concept of Blocks Advantages of Using Blocks- Drawing Objects for Blocks Converting Entities into a Block Inserting Blocks - Creating and Inserting Annotative Blocks Block Editor Adding Blocks in Tool Palettes Drag and Drop Method Modifying Existing Blocks in the Tool Palettes

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply gained knowledge on drawing plans
- apply the commands for different plans and elevation
- draw the plans 2D and reinforcement detailing using AutoCAD software

TEXT BOOKS

1. AUTOCAD MANUAL 2019 by Bentley

REFERENCES

1. Vamos, R.J., AUTOCAD Practice, Prentice Hall, Englewood Cliffs, NJ, 1995.

19CEVC801 ASPHALT AND ITS APPLICATIONS

COURSE OBJECTIVES

To enable the students to

- gain knowledge on type and properties of bitumen for good roads
- understand the quality , health & safety aspects of bitumen
- acquire knowledge on finding quality of bitumen

Module I

Bitumen market, generalities, the manufacture of bitumen, transport, uses of bitumen, main developments and alternatives

Module II

Constitution, structure and characterization of bitumen - specifications-rheology - Modifications of bitumen and applications (roads, roofing,…)

Module III

Health, Safety, Environment & Quality concerns regarding bitumen, and examples of research & innovation actions

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply the gained knowledge on application of bitumen
- manipulate quantity of bitumen for roads stretch
- find quality of bitumen

TEXT BOOKS

1. Advances in Asphalt materials by Shin-Che Huang Hervé Di Benedetto Woodhead Publishing, April 2015

REFERENCES

1. Bituminous Road Construction in India by Prithvi Singh Kandhal , Eatern Economy Edition , 2014

19CSVC301 MACHINE LEARNING WITH PYTHON

COURSE OBJECTIVES

To enable the students to

- To understand about Introduction to Machine Learning
- To understand about the concept of regression
- To learn various type of classification methods including SVM, Naive bayes, decision tree, and random forest

Module 1 Introduction to Machine Learning

Applications of Machine Learning

Supervised vs Unsupervised Learning

Python libraries suitable for Machine Learning

Module 2 Regression

Linear Regression

Non-linear Regression

Model evaluation methods

Module 3 Classification

K-Nearest Neighbour

Decision Trees

Logistic Regression

Support Vector Machines

Model Evaluation

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- AnalyzeIntroduction to Machine Learning
- Identify about the concept of regression
- Implement classification methods including SVM, Naive bayes, decision tree, and random forest

TEXT BOOKS

1. Python Machine Learning: Machine Learning and Deep Learning with Python, scikit-learn, and TensorFlow 2, 3rd Edition Paperback – December 12, 2019

REFERENCES

1. Machine Learning with R: Expert techniques for predictive modeling, 3rd Edition Paperback – Import, 15 April 2019

19CSVC401 DATA ANALYTICS WITH R

COURSE OBJECTIVES

To enable the students to

- Understanding concepts around Business Intelligence and Business Analytics
- Apply various supervised machine learning techniques
- Use various packages in R to create fancy plots

Module 1

Introduction to terms like Business Intelligence, Business Analytics, Data, Information, how information hierarchy can be improved/introduced, understanding Business Analytics and R, knowledge about the R language

Module 2

Community and ecosystem, understand the use of 'R' in the industry, compare R with other software in analytics, Install R and the packages useful for the course,

Module 3

Perform basic operations in R using command line, learn the use of IDE R Studio and Various GUI, use the 'R help' feature in R, knowledge about the worldwide R community collaboration.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Understand concepts around Business Intelligence and Business Analytics
- Apply various supervised machine learning techniques
- Use various packages in R to create fancy plots

TEXT BOOKS

1. James R. Evans, Data Analysis and Operations Management, and Director of the Total Quality Management.

REFERENCES

1.Data Analysis and Operations Management, and Director of the Total Quality Management.

19CSVC501 **SAP**

COURSE OBJECTIVES

To enable the students to

- Understand and use constants and variables.
- Understand and use Swift arrays.
- Understand basic gesture controls and motion detection.

MODULES

Human Resource Management (SAP HRM)

Human Resource (HR)

Production Planning (SAP PP)

Material Management (SAP MM)

Financial Supply Chain Management (SAP FSCM)

Sales and Distribution (SAP SD)

Project System (SAP PS)

Financial Accounting and Controlling (SAP FICO)

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Demonstrate constants and variables.
- Analyze and use Swift arrays.
- Implement basic gesture controls and motion detection.

TEXT BOOKS

1.SAP S/4HANA, An introduction written by

REFERENCES

1. SAP S/4HANA Finance: The Reference Guide to What's New Hardcover – Import, 1 March 2019

19CSVC601 IOS APP DEVELOPMENT

COURSE OBJECTIVES

To enable the students to

- To Understand the concept of Optimizing the app store listing
- To describe about App Store Optimization
- To become familiar with MVP APP

Unit - I

Idea validation and MVP, App monetization models, Optimizing the app store listing - Growth hacking techniques for app downloads, How to get press coverage for your app- How to get your app featured on the app store.

Unit - II

App Store Optimization (ASO) how to rank on the app store search engine, How to use paid advertising to get more customers, Improving your app store ratings and reviews, App analytics, Black hat vs. white hat techniques for app marketing, How to build a app showcase website.

Unit - III

Idea validation and MVP App monetization models Optimising the app store listing Growth hacking techniques for app downloads How to get press coverage for your app How to get your app featured on the app store App Store Optimisation (ASO) how to rank on the app store search engine

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Implement concept of Optimizing the app store listing
- Demonstrate about App Store Optimization
- Implement MVP APP

TEXT BOOKS

1. App Development with SwiftiOS 11 Edition

REFERENCES

1. Image Processing and Computer Vision in iOS (SpringerBriefs in Computer Science) 1st ed. 2020 Edition

19CSVC701 AMAZON WEB SERVICES

COURSE OBJECTIVES

To enable the students to

- To learn about the different services provided by AWS
- To learn about AWS security
- To understand about RDS

Module 1:

User management through Identity Access Management (IAM), Various access policies across AWS Services, AWS Cognito, AWS Security & Encryption: KMS, CloudHSM, Sheild, and WAF, API keys service access, Best practices for IAM, Access billing and create alerts on billing.

Module 2:

Start, stop and terminate an EC2 Instance, Security Groups, AMI, VPC, ENI, Public, and Private IP, Storage services, Instance Store, EBS and its types, SSDs and Provisioned IOPS, Hard Disk Drives, EFS, EBS vs EFS, Cost optimization.

Module 3:

Amazon RDS and its benefits, Read Replica, RDS IAM Authentication, Aurora: Aurora Serverless& Global Databases, DynamoDB, ElastiCache: Working, Redis vs Memcached, Amazon RedShift: Redshift Spectrum

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Implement the different services provided by AWS
- Demonstrate AWS security
- Analyzeabout RDS

TEXT BOOKS

1. AWS: The Ultimate Guide From Beginners To Advanced For The Amazon Web Services (2020 Edition) Paperback – December 21, 2019

REFERENCES

1.Data Analytics with R Paperback – 1 January 2019by Bharti Motwani

19CSVC801 ANDROID

COURSE OBJECTIVES

To enable the students to

- Understand introduced to Android programming and learn to develop Android applications
- Understand Android development tools, creating user interfaces, and utilizing location based services
- Understand able to write simple GUI applications, use built-in widgets and components

Module 1

Fundamentals • Basic Building blocks – Activities, Services, Broadcast Receivers & Content providers • UI Components- Views & notifications • Components for communication -Intents & Intent Filters • Android API levels(versions & version names)

Module 2

Application Structure • AndroidManifest.xml • uses-permission • Activity/services/receiver declarations • Resources & R.java • Layouts &Drawable Resources • Activities and Activity lifecycle

Module 3

Emulator • Launching emulator • Editing emulator settings • Emulator shortcuts • Logcat usage • Introduction to Android Device Monitor (ADM)

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Understand introduced to Android programming and learn to develop Android applications
- Understand Android development tools, creating user interfaces, and utilizing location based services
- Understand able to write simple GUI applications, use built-in widgets and components

TEXT BOOKS

1.Professional Android 4 Application Development

REFERENCES

1.Android Programming for Beginners, Sam’s Teach yourself Android Application Development (24 Hours)

19ECVC301

INDUSTRIAL APPLICATION BASED EMBEDDED SYSTEM

COURSE OBJECTIVE

To enable the students to

- study the application of embedded systems for industrial machines
- learn the design, monitor and control of machines

Unit I Embedded industrial automation **15**

Product Design and Development- End to end product development, Firmware, hardware application development, Process Automation

Unit II Factory Automation **15**

Condition monitoring, IoT gateway, Edge computing, Enable legacy machines for IoT, Industrial protocol simulator, Wireless application development.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- ability to design embedded system for industrial automation.
- ability to design embedded system for machines monitoring automation using IoT.

TEXT BOOK & MANUALS

- "Embedded system design: An introduction to process, tools and techniques" Arnold Berger 2001.
- https://www.winsystems.com/industrial-automation/

19ECVC401 **FEATURE ENHANCEMENT IN WEB TECHNOLOGY**

COURSE OBJECTIVE

To enable the students to

- design interactive web pages using Scripting languages.
- understand about JavaScript and XML

Unit-I-AJAX Services **15**

AJAX: Ajax Client Server Architecture-XML Http Request Object-Call Back Methods.

Unit II – Web Services **15**

Web Services: JAX-RPC-Concepts-Writing a Java Web Service-Writing a Java Web Service Client-Describing Web Services: WSDL- Representing Data Types: XML Schema-Communicating Object Data: SOAP Related Technologies-Software Installation-Storing Java Objects as Files

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- gain knowledge of client-side scripting, validation of forms and AJAX programming.
- gain knowledge of client-side scripting, validation of forms and web services

TEXT BOOK

1. Jeffrey C.Jackson, "Web Technologies--A Computer Science Perspective", Pearson Education, 2006

19ECVC501 **FEATURE ENHANCEMENT IN GPS TECHNOLOGY**

COURSE OBJECTIVE

To enable the students to

- understanding potential of GPS interoperability with GLONASS and GALILEO systems.
- understanding relative and autonomous positioning

Unit-I-GPS Modernization plans: **15**

Future developments in GPS, Introduction to GLONASS and GALILEO systems**.**

Unit II – GPS Applications: **15**

Geodetic control surveys, Cadastral surveys, Photogrammetric, Remote sensing, Engineering and monitoring. Military applications, Geographical Information System, Vehicle tracking and car navigation, LBS and special applications

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- recognize the use of leap seconds in GLONASS and GLONASS Time
- describe the differences between relative and autonomous GPS positioning, code phase carrier phase, DGPS and RTK

TEXT BOOK

1. P. R. Wolf, and C. D. Ghilani, 1997. Adjustment Computations: Statistics and Least Squares in Surveying and GIS, Publisher: John Wiley & Sons, New York (USA),

19ECVC601 FUNDAMENTALS OF MATLAB

COURSE OBJECTIVE

To enable the students to

- know the basic functions of MATLAB.
- plot the graph and simulate the simple circuits.

Unit I Basic Functions of MATLAB 15

Introduction to MATLAB, MATLAB Elements & Simple Programs and debugging concepts, Basic functions of MATLAB-IF Then Else, Case, Statement, for Loop, While loop.

Unit II Simulation and plotting graph 15

Plotting 2-D graph,3D graph, debugging commands, create Graphic User Interface (GUI), Simulate simple circuit.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students will be able

- to understand the basic functions of MATLAB functions
- to simulate the simple circuit and plotting the various graphs.

TEXT BOOK & MANUALS

1. " Getting started with MATLAB 7", Rudra Pratap, Oxford University Press, ISBN 10 0199731241, 2nd Edition.

2. " Introduction to MATLAB 7 for Engineering", William J. Palm, McGraw Hill, ISBN 0072922427, 3rd Edition.

19ECVC701 **SOFT SKILLS**

COURSE OBJECTIVE

To enable the students to

- develop interpersonal skills in order to maintain good relations at the workplace
- stress on the importance of group discussions and impart leadership and problem- solving skills

Unit I **Inter-personal Skills** **15**

Attitude, Negotiation skills, Social Conversation, Values and ethics, Managing stress, Interview Skills- Writing a resumé, Types of interviews, Self-grooming and body language, Interview preparation techniques, Frequently asked questions.

Unit II **Group Discussion Skills** **15**

Principles of group discussion, Purpose of group discussion, Preparation, Skills to be acquired — communication, leadership, problem-solving, Effective participation

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students will be able

- to acquaint with different types of interviews and help them acquire the necessary skills
- to practice leadership in small groups to acquaint with responsibilities in small groups

TEXT BOOK & MANUALS

1. Developing Reading Skills – Françoise Grellet, Cambridge University Press, Cambridge 2007,
2. Cambridge First Certificate: Listening and Speaking – Sue O' Connell with Lousie Hashemi, Cambridge University Press, Cambridge 2000.
3. Inspired to Write – Jean Withrow, Gay Brookers and Martha Cumings, Cambridge University Press, New York, 2004

19ECVC801 SOLVING REAL-TIME PROBLEM USING IOT

COURSE OBJECTIVE

To enable the students to

- understand the varies applications of the Internet of Things (IoT)
- know about Agriculture and Healthcare monitoring

Unit I Real World Applications of IoT 15

Introduction to Internet of Things (IoT), Applications of IoT-Smart home, wearables, Connected cars, Industrial internet, Smart Retail.

Unit II Agriculture and Healthcare monitoring 15

Sensing for soil moisture and nutrients, controlling water usage for plant growth and determining custom fertilizer-Connected healthcare system and smart medical devices and Applications.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students will be able

- to acquire the knowledge of IoT with various applications.
- to understand the various practical application of IoT.

TEXT BOOK & MANUALS

1. "Internet of Things Technologies and Applications for a New Age of Intelligence" Vlasios Tsiatsis Stamatis Karnouskos Jan Holler David Boyle Catherine Mulligan,2nd Edition, Elsevier Academic press.
2. http://www.gsma.com/newsroom/wp-content/uploads/15625-Connected-Living-Report.pdf
3. http://h30614.www3.hp.com/collateral/Barcelona2013/presentations/IT3112.pdf

19EEVC301 **BUSINESS SCOPE IN SOLAR ENERGY**

COURSE OBJECTIVES

To enable the students to

- To understand the essential components required for solar PV installation
- To ensure the quality of material in solar plant and handling
- To have an idea on selling the market products.

UNIT I FUNDAMENTALS OF SOLAR PV **10**

Solar PV Essentials - Different types of Solar Panels - Components of a Solar PV - Installation Systems – Solar Lighting and other application systems - Assessing site conditions.

UNIT II PV INSTALLATION **10**

Understanding installation requirements - Collecting material for installation - Ensuring quality of material and handling - Material usage procedure

UNIT III IMPLEMENTATION OF PV PANEL **10**

Assessing mounting - Installing the panel - Connecting the system - check for functioning - Completing the work.

TOTAL PERIODS **30**

COURSE OUTCOMES

At the end this course, students will be able to

- Understand the essential components required for solar PV installation
- Ensure the quality of material in solar plant and handling
- Have an idea on selling the market products.

TEXT BOOKS

1. Wind and Solar Power Systems, Mukund R. Patel, CRC Press, ISBN 0-8493-1605-7

REFERENCES

1. Solar Energy: Principles of Thermal Collection and Storage, Suhas Pandurang Sukhatme

19EEVC401 **MATLAB**

COURSE OBJECTIVES

To enable the students to

- Familiarization of the syntax, semantics, data-types and library functions of numerical computing languages such as MATLAB and/or SCILAB .
- Application of such languages for implementation/simulation and visualization of basic mathematical functions relevant to electronics applications.
- acquire knowledge on programming concepts

UNIT I INTRODUCTION TO MATLAB AND MATLAB SOFTWARE 10

Brief Introduction- Installation of MATLAB- Use of MATLAB- Key features- Introduction to MATLAB Software- MATLAB window- Command window- Workspace- Command history- Setting directory- Working with the MATLAB user interface- Basic commands- Assigning variables- Operations with variables- Working with script tools- Writing Script file- The MATLAB Editor.

UNIT II MATLAB SIMULINK 10

Introduction Of Simulink- Simulink Environment & Interface- Study of Library- Circuit Oriented Design- Equation Oriented Design- Model- Subsystem Design- Connect Call back to subsystem- Application

UNIT III MATLAB PROGRAMMING 10

MATLAB Programming- Writing programs with logic and flow control- Writing functions- Control statement Programming- Conditional Statement Programming- Examples.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Understand the need for simulation/implementation for the verification of mathematical functions.
- Understand the main features of the MATLAB/SCILAB program development environment to enable their usage in the higher learning.
- Implement simple mathematical functions/equations in numerical computing environment such as MATLAB/SCILAB.

TEXT BOOKS

1. MATLAB and Simulink Based Book, Electrical Engineering: Principles and Applications

REFERENCES

1. MATLAB and Simulink Based Book, Practical Electrical Engineering, 2nd edition

19EEVC501 INDUCTION MOTOR WINDING

COURSE OBJECTIVES

To enable the students to

- Understand the concept of induction motor
- Acquaire knowledge on coil preparation
- Gain details about insulation preparation

UNIT I SINGLE PHASE INDUCTION MOTOR 10

Working principle, different method of starting and running (capacitor start, permanent capacitor, capacitor start & run, shaded pole technique). FHP motors, Repulsion motor, stepper motor, Application of single phase motor. Single phase induction motor -

UNIT II COIL PREPARATION 10

Preparation of the core before winding - Manufacture of formers - Preparation of coils on different types of coil winding machines as applied - Cutting operations on various types of insulating materials used for slot liner, layer Separators, slot wedge, phase, separator etc. and shaping and binding of overhangs.

UNIT III **INSULATION PREPARATION**

Winding Extensive shop floor practice on actual winding, consisting of the following operations - Insertion of insulating materials in the slots, Insertion of coils and folding over the insulation and wedges driving, End connection inclusive of commutator if involved, Soldering / brazing of coil ends of the winding wire and lead cables and core, Overhang banding with cord, steel wire or semi cured polyester glass tape.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Describe the basics of concept of induction motor
- analyse on coil preparation
- demonstrate insulation preparation

TEXT BOOKS

1. Electrical Machines and Appliances , Government of Tamilnadu, First edition 2011

19EEV601 **PCB DESIGN AND COMPONENT TESTING**

COURSE OBJECTIVES

To enable the students to

- Develop the skills in PCB designing using PSPICE tool and testing & troubleshooting
- Design and test PCB layout and study the PCB manufacturing process
- Troubleshoot the errors in PCB design

UNIT I INTRODUCTION **10**

Introduction to Printed circuit Board: Fundamentals of circuit design- Introduction to Analog and digital circuit design-Definition and Evolution of PCB Printed Circuit Technology-Creating blank PCB.

UNIT II PSPICE TOOL **10**

Introduction to SPICE and PSPICE Environment -Schematic Entry Creating Library Components-Drawing Schematic-Flat Design-Hierarchical design Net listing-PCB designing of Basic analog electronic components, Power supplies, Different sensor modules, Embedded projects.

UNIT III POST DESIGNING AND FABRICATION PROCESS **10**

PCB Layout Design Prototype Designing-Design Rule Checking (DRC),Design Formanufacturing(DFM)-Printing-Etching-Drilling-Soldering&Desoldering-ComponentMounting-PCB Hardware testing-Checking Errors

TOTAL PERIODS **30**

COURSE OUTCOMES

At the end this course, students will be able to

- Know the concepts of circuit design and importance of PCB designing
- Understand the different component package types
- Familiarize with various EDA tools for identifying electronic components

TEXT BOOKS

1. PCB Design for Real-World EMI Control, R. Archambeault and James Drewniak

REFERENCES

1. Complete PCB Design Using OrCad Capture and Layout, Kraig Mitzner

19EEVC701 **COMPUTER APPLICATIONS IN POWER SYSTEM OPERATION AND PLANNING**

COURSE OBJECTIVES

To enable the students to

- Understanding how computers applications are used in power systems for operation, and planning
- know practical industrial applications of computers in power systems
- know the power system economic dispatch.

UNIT I BASICS OF POWER SYSTEM STRUCTURE 10

Basic Concepts of Computer Applications in Power Systems; Multi-Level structure Grouping of various computer based applications of power systems. Real Time Modeling and System Studies Power System State Estimation: Problem formulation, Mathematical formulation, Solution Approaches, Case Study, Complete System State Estimation, Bad Data Processing

UNIT II SECURITY SYSTEM 10

Decomposition techniques in Power System State Estimation. Large Scale State Estimation. Power System Security: Security Assessment and Analysis, Security Assessment Studies. Solution methods, Case Study and Simulation Example, Security Constrained Studies. Contingency Analysis and Network Outage Simulation. Solution methods

UNIT III POWER SYSTEM ECONOMIC DISPATCH 10

Economic Dispatch (ED) and Unit Commitment (UC). Mathematical formulation, Solution Approaches Security Constrained ED and UC Optimal Power Flow, Problem Formulation, Mathematical formulation, Solution Approaches

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- describe Planning and operations of the power system is understood.
- Explain Industrial applications of computers in power systems are studied.
- Enumerate power system economic dispatch are analysed.

TEXT BOOKS

1. Frauendorfer, K.Optimization in the Planning and Operation of Electric Power Systems, SpingerVerlag, 1992.

REFERENCES

1. Wood, A. J and Wollenberg, B. F, Power Generation Operation and Control, 2nd Edition John Wiley and Sons, 2003

19EEVC801 ENTREPRENUERSHIP AND SOCIAL RESPONSIBILITY

COURSE OBJECTIVES

To enable the students to

- provide knowledge about The Social Entrepreneurship
- develop "a Social entrepreneurial imagination and to bring out the practice of Social Entrepreneurship in India.
- Understand about the entrepreneurship process

UNIT I ENTREPRENEUR AND ENTREPRENEURSHIP 10

Meaning, definition: Entrepreneur, Entrepreneurship. Types of Entrepreneurs –Social entrepreneur, Serial entrepreneur, Life style entrepreneur. Types of Entrepreneurship –creative entrepreneurship, inclusive entrepreneurship, knowledge entrepreneurship. Entrepreneurial characteristics: Inspiration, creativity, direct action, courage and fortitude.

UNIT II SOCIAL ENTREPENEUR, SOCIAL ENTREPRENEURSHIP AND SOCIAL ENTER PRISES 10

Meaning, definition: Social entrepreneur, social entrepreneurship, social enterprises. Characteristics of Social Entrepreneurship - Explicitly formulated mission to create and sustain social value and to benefit the communities, high degree of economic risk and autonomy in activities related to producing goods and/or selling services, pursuit of new opportunities and exploration of hidden resources to serve that missions, quest for sustainable models, based on well elaborated feasibility study.

UNIT III THE SOCIAL ENTREPRENEURSHIP PROCESS 10

The Timmons Model of the Entrepreneurship Process, The PCDO (The People, Context, Deal, and opportunity)frame work, The Case Model, The Social Entrepreneurship Frame work. Sources of Social Entrepreneurship -Public Sector, Private Sector, Voluntary Sector.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- explain about the Social Entrepreneurship
- Social entrepreneurial imagination and to bring out the practice of Social Entrepreneurship in India.
- Describe the social entrepreneurship process

TEXT BOOKS

1. Robert A. Philips Margret Bonefiel Ritesh Sharma, Social entrepreneurship, the next big business opportunity Global Vision Publishing House, New Delhi, 2011

REFERENCES

1. S.S.Khanka, Entrepreneurship in India, perspective and practice, Akansha publishing house, New Delhi, 2009

19MEVC301 SURFACE COATINGS

COURSE OBJECTIVES

To enable the students to

- know the basics of coatings.
- know different materials used for coating.
- understand the concepts and application of surface coating.

1. **Coating**

   Properties and applications of the given materials used in surface coating preparation, solvent containing systems and enamels.

2. **Application of Coatings**

   Rod coating, Dip coating, Effects of given factors on bio-degradation. Premiered coatings occurring procedure of coatings and its application.

3. **Coating methods**

   Roll coating, Reverse roll coating, gravure roll coating, Premiered coatings like extrusion coaters Slide or cascade coaters, curtain coaters, cast Coating

4. **Adhesives**

   Interfacial contact, Surface tension wettability and spreading, Basic terminology-adhesive, adherent, substrate. Types of adhesives.

5. **Composition of adhesives**

   Composition of adhesives-backbone polymer, solvent thinner, catalyst, hardener, extension-filler, plasticizers, prevention process, resin kettle.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Select coating method for a given product.
- Use relevant coating for particular application.
- Use surface treatments with the substrates for adhesion.

TEXT BOOKS

1 Paints and surface coatings: Theory and Practice. Lambourne, R. and Strivens, T. A.

REFERENCES

1. Hand book of adhesives Skiest, I Van Nostrand Reinhold Company, Washington

COMPUTER AIDED DESIGN SOLIDWORKS

19MEVC401

COURSE OBJECTIVES

To enable the students to

- Use basic and advanced features of current CAD software.
- Understand how CAD technology can be leveraged in the design process.

INTRODUCTION TO CAD, CAE, PDM

Features of solid works, various tools available in Solid works for product design – Solid Works GUI – feature manager, design tree, Callouts, Handles, Confirmation corner, mouse buttons. Keyboard shortcuts, Command manager–File management.

SKETCHING

Sketching environment – Sketch entities – Inference line, Centerline line, Line, Circle, Arc, Ellipse, Rectangle, Slots, Polygon, Ellipse, Partial Ellipse, Spline, Spline tools, Points, Text, Construction geometry, Snap, grid – Sketch Relations– Blocks – Make block, Edit block, Insert block, Add/Remove Entities, Rebuild, Save, Explode.

INTRODUCTION TO PART MODELING

Reference geometry – Co–ordinates, Plane, Axis and Points – Modeling features – Extrude, Revolve, Swept and Loft– Relations –Adding Sketch Relation, Automatic relations – Creating extrude features — Creating revolve features–Creating helix and spiral – Creating loft features

PART MODELING – FEATURES

Fillets, Chamfers, Shell, Rib, Draft, Hole – Creating pattern – Linear pattern, Circular pattern, Sketch driven pattern, Curve driven pattern, Table driven pattern, Fill pattern, Mirror – Other tools – Inserting library feature, Measuring geometries, Materials, Mass properties, Selection manager, Multiple body concepts

ASSEMBLY MODELING

Introduction to assembly modeling & approaches – Top down and bottom up approach – Applying standard mates–Coincident, Parallel, Perpendicular, Tangent, Concentric, Lock, Distance, Angle – Top down design – Layout sketch, Work part in the context of an assembly

TOTAL PERIODS 30

COURSEOUTCOMES

Upon completion of this course the student will

- demonstrate competency with multiple drawing and modification commands in SolidWorks.
- create three-dimensional solid models.

TEXT BOOK & MANUALS

- https://files.solidworks.com/pdf/introsw.pdf

19MEVC501 PLANT DESIGN

COURSE OBJECTIVES

To enable the students to

- know the basics of plant design.
- know need of plant designing.
- design the plant for new industrial sector.

1. **Introduction**

   Basic considerations in engineering plant design, optimization and feasibility of plant design.

2. **Process design aspects**

   Selection of process-factors affecting process selection. Types of project design, Importance of Laboratory development pilot plant, safety factors, types of flow diagrams.

3. **Selection of process equipments**

   Standard versus special equipment-material of construction for process equipments, selection criteria, and specification sheets.

4. **Process auxiliaries and Process utilities**

   Piping design, layout, and supports for piping insulations. Pipe fittings, types of valves, selection of valves, process control and instrumentation control system design

5. **Plant location and layout**

   Factors affecting plant location, factors in planning layouts, principles of plant layout, use of scale models.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Identify the need of plant design for an industry.
- Apply the concepts for making plant designing for an industry.
- Represent the designing structure of the plant.

TEXT BOOKS

1. M.S. Peters and Timmerhaus, “Plant design and Economics for Chemical Engineers”, McGraw Hill 3rd Edition

REFERENCES

1. Industrial Engineering and Management by O. P. Khanna, Dhanpat Rai & Sons, 1985 7th Edition

19MEVC601 COMPUTER AIDED ANALYSIS HYPERMESH 0 0 2 1

COURSE OBJECTIVES

To enable the students to

- use basic and advanced features of Analysis
- understand how CAE technology can be leveraged in the analysis process.

HYPERMESH

Basic modeling, Geometry cleanup, Organizing the model with collectors, Extracting mid surfaces & simplifying, Selecting the user Profiles, Project, Numbering, Mask, Normals, Interactive surface meshing, Element density, Algorithms, Checking element quality. Introduction to solid meshing: Solid panels, Drag, spin, Line drag, element offset, linear solid.

OPTISTRUCT

Linear Static Analysis, Thermal Analysis, Modal Analysis, Harmonic Analysis, Inertia Relief Analysis.

OPTIMIZATION

Topology, optimization for solid problems, Optimization for stress problems

HYPERMORPH

morph volumes, Morph to geometry, freehand morph, morph options

TOTAL PERIODS 30

COURSEOUTCOMES

Upon completion of this course the student will

- demonstrate competency with multiple analysis
- apply industry standards in the preparation of mechanical analysis

TEXT BOOK & MANUALS

- https://imechanica.org/files/HM%20Advanced%20Training.pdf

COMPUTER AIDED DESIGN UNIGRAPHICS

19MEVC701

COURSE OBJECTIVE

To enable the students to

- gain strong ground on solid modeling techniques that would enhance the productivity in modeling
- understand the analysis of mechanical components.

INTRODUCTION

Introduction, Sketch, Curve, Curve Operations, Form Feature, Feature Operation, Transform

ASSEMBLY DESIGN

Assembly of Components, Exploded Views, Sequencing, Context Control, Cloning and Component arrays editing, Top Down Assembly.

DRAFTING AND DETAILING

Drawing sheets, Views, Dimensioning, Annotations, Symbols, Tabular note and Part list.

TOTALPERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- Learnt advanced solutions for conceptual design, 3D modeling, and documentation.
- Learnt to do product design, industrial design and styling (optimize form, fit, and function and user experience), streamline 2D design, drafting, documentation with powerful tools for layout.

TEXT BOOK & MANUALS

- https://web.mst.edu/~mleu/nx_manuals/nx10.pdf

19MEVC801 **UAV DESIGN** **0 0 2 1**

COURSE OBJECTIVES

To enable students to

- acquire the knowledge of designing uav
- develop their skill set in drone design

COURSE LAYOUT:

1: Introduction to fixed-wing UAVs ,Introduction to Design, Basic Design Parameters

Module2: Basic Design Parameters, Design Algorithm: Case Study, Design Algorithm: Mission Requirements

Module3: Design Algorithm: Feasible Design Parameters, Configuration Layout: Airfoil Selection, Configuration

Layout: Planform Geometry selection

Module4: Weight and CG Estimation, Analytical Parameter Estimation, Analytical Parameter Estimation

Module5: Performance and Stability Analysis, Performance and Stability Analysis ,Performance and Stability

Analysis

Module6: Simulation, Simulation, Detailed Sizing.

Module7: Estimation of inertial properties using 3D modeling, Prototype Fabrication.

Module8: Wind Tunnel Testing, Aerodynamic Characterization through Wind Tunnel Testing.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon successful completion of this course, students will be able to

- gain the knowledge about design of UAV
- construct the drone by themself

TEXT BOOK & MANUALS

- https://onlinecourses.nptel.ac.in/noc20_ae04/preview

19MTVC301 ROBOTIC PROCESS AUTOMATION

COURSE OBJECTIVES

To enable the students to

- know the basics of automation.
- know key elements of automation.
- apply the concepts of automation in industry.

1. **INTRODUCTION TO ROBOTIC PROCESS AUTOMATION**

   Introduction to RPA and Use cases – Automation Anywhere Enterprise Platform – Advanced features and capabilities.

2. **WEB CONTROL ROOM**

   Introduction - Features Panel - Dashboard (Home, Bots, Devices, Audit, Workload, Insights) - Features Panel – Activity (View Tasks in Progress and Scheduled Tasks) - Bots (View Bots Uploaded and Credentials)

3. **COATING METHODS**

   Roll coating, Reverse roll coating, gravure roll coating, Premiered coatings like extrusion coaters Slide or cascade coaters, curtain coaters, cast Coating

4. **BOT CREATOR**

   Introduction – Recorders – Smart Recorders – Web Recorders – Screen Recorders - Task Editor – Variables - Command Library – Loop Command – Excel Command – Database Command - String Operation Command

5. **META BOT AND BOT INSIGHT**

   Introduction – Meta Bot Designer – Meta Bot With AI Sense - Bot Insight - Transactional Analytics - Operational Analytics - Course Key Points.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Identify the need of automation in industry.
- Use basic key elements in appropriate place for automation.
- Design and make the industry in complete automation sector.

TEXT BOOKS

1. Learning Robotic Process Automation: Create Software robots and automate business processes with the leading RPA tool - UiPath: Create Software robots. with the leading RPA tool – UiPath Kindle Edition.

REFERENCES

1. Robotic Process Automation A Complete Guide - 2020 Edition Kindle Edition.

19MTVC401 DESIGN OF AUTOMOBILE COMPONENTS

COURSE OBJECTIVES

To enable the students to

- know the basics design procedure of Automobile parts.
- know various kind of commands and order used in particular software.
- write the program to various operations.

1. **BODY SYSTEMS**

   Complete Body-In-White, Floor Pans, Underbody Assemblies, Door/Hood/Deck Assemblies, Roof Panels

2. **CHASSIS SYSTEMS**

   Cross member Assemblies, Radiator Supports, Shock Towers, Engine Cradles, Front and Rear Sub-Frame Assemblies, Front and Rear Suspension Modules

3. **EXTERIOR SYSTEMS**

   Front and Rear Fascias , Energy Management Systems

4. **VEHICLE ENHANCEMENT PACKAGES**

   Ground Effects, Roof Racks, Running Boards.

5. **INTERIOR SYSTEMS**

   Door module, power closure system, Driver control, Latching system

TOTAL PERIODS 30

COURSE OUTCOMES At the end this course, students will be able to

- use the Pro-e software to design the various elements in the particular area.
- develop the various elements in the automobile structure and assemble to convert as single unit.
- Make different unit in the Automobile structure.

TEXT BOOKS

1. How to Draw Cars Like a Pro, 2nd Edition Thom Taylor and Lisa Hallett.

REFERENCES

1. A Century of Automotive Style Michael Lamm and Dave Holls.

19MTVC501 METHODS OF COATINGS

COURSE OBJECTIVES

To enable the students to

- know the basics of coatings.
- know different materials used for coating.
- understand the concepts and application of surface coating.

1. **COATING**

   Properties and applications of the given materials used in surface coating preparation, solvent containing systems and enamels.

2. **APPLICATION OF COATINGS**

   Rod coating, Dip coating, Effects of given factors on bio-degradation. Premiered coatings occurring procedure of coatings and its application.

3. **COATING METHODS**

   Roll coating, Reverse roll coating, gravure roll coating, Premiered coatings like extrusion coaters Slide or cascade coaters, curtain coaters, cast Coating

4. **ADHESIVES**

   Interfacial contact, Surface tension wettability and spreading, Basic terminology-adhesive, adherent, substrate. Types of adhesives.

5. **COMPOSITION OF ADHESIVES**

   Composition of adhesives-backbone polymer, solvent thinner, catalyst, hardener, extension-filler, plasticizers, prevention process, resin kettle.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Select coating method for a given product.
- Use relevant coating for particular application.
- Use surface treatments with the substrates for adhesion.

TEXT BOOKS

1. Paints and surface coatings: Theory and Practice. Lambourne, R. and Strivens, T. A.

REFERENCES

1. Hand book of adhesives Skiest, I Van Nostrand Reinhold Company, Washington

19MTVC601 ROLES OF ENERGY STORAGE DEVICES

COURSE OBJECTIVES

To enable the students to

- Know the need of energy storage.
- Know different form of energy storage system.
- Understand the concepts and application of energy storage.

1. **ROLE OF ENERGY STORAGE**

   Natural process of photosynthesis, Biomass, peat, and fossil carriers, and finish in the time of renewables.

2. **ENERGY STORAGE CLASSIFICATION**

   storage and energy storage systems, application and how they are classified according to physical, temporal and economic criteria

3. **LEAD ACID BATTERIES**

   Electro-chemical energy storage the terms batteries and accumulators, electrodes, electrolyte Ion-conductive phase.

4. **LITHIUM BATTERIES**

   Electro-chemical energy storage the terms batteries and accumulators, electrodes, electrolyte Ion-conductive phase for lithium batteries.

5. **ENERGY STORAGE I**

   Chemical energy storage is the backbone of the conventional energy supply. Solid (wood & coal), fluent (crude oil) and gaseous (natural gas) energy carriers are different types of energy storage

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Select suitable energy storage system depending on necessity.
- Use relevant storage system for particular application.
- Differentiate the various storage system.

TEXT BOOKS

1. Energy Storage Systems and Components, Alfred Rufer

REFERENCES

1. Advanced Energy Storage Technologies and Their Applications Hailong Li(Eds.)

19MTVC701 **NATURAL ENERGY RESOURCES**

COURSE OBJECTIVES

To enable the students to

- concepts of the renewable energy sources like wind, solar, Bio and other renewable energy resources.
- environmentally friend energy production and consumption.
- energy-efficient systems and products for various applications.

1. **INTRODUCTION**

   Energy needs of India, classification of energy sources, energy efficiency and energy security, importance of renewable energy resources.

2. **SOLAR ENERGY**

   Basic concepts, types of collectors, collection systems, photo voltaic (PV) technology: solar thermal effect, solar cells, characteristics of PV systems, equivalent circuit, and array design

3. **WIND ENERGY**

   Wind power systems, wind speed and power relation components, turbine types, turbine rating. Choice of generators and site selection

4. **BIO ENERGY**

   Bio-mass and bio-gas: principles of bioconversion, bio-gas digesters types, gas yield, and combustion characteristics

5. **OTHER RENEWABLE ENERGY RESOURCES**

   Geothermal energy, ocean thermal energy, wave energy, Tidal energy, waste to energy, heat to energy, Fuel cells: types and applications.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- provide environmentally friend energy production and consumption system.
- design energy-efficient systems and products for various applications

TEXT BOOKS

1. A.Duffie and W.A.Beckmann, Solar Engineering of Thermal Processes-John Wiley.

REFERENCES

1. David Hu. Hand Book of Industrial Energy Conservation, Van Nostrand Co., 1983.

COMPUTER AIDED DESIGN IN UNIGRAPHICS

19MTVC801

COURSE OBJECTIVE

To enable the students to

- gain strong ground on solid modelling techniques that would enhance the productivity in modelling.
- understand the analysis of mechanical components.
- familiar in sheet metal design and drafting.

1. INTRODUCTION

Introduction, Sketch, Curve, Curve Operations, Form Feature, Feature Operation, Transform

2. ASSEMBLY DESIGN

Assembly of Components, Exploded Views, Sequencing, Context Control, Cloning and Component arrays editing, Top Down Assembly.

3. DRAFTING AND DETAILING

Drawing sheets, Views, Dimensioning, Annotations, Symbols, Tabular note and Part list.

4. VISUALIZATION

Cut part by Sketch Plane - 3D Element visualization - 2D Element visualization - Diagnostics - Dimensional Constraints - Geometrical Constraints.

5. CONSTRAINTS

Constraint Creation - Contact Constraint - Fix together - Auto Constraint - Animate Constraint - Edit Multi Constraint.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- learnt advanced solutions for conceptual design, 3D modelling, and documentation.
- learnt to do product design, industrial design and styling (optimize form, fit, and function and user experience), streamline 2D design, drafting, documentation with powerful tools for layout.
- learnt the dimension and modelled components.

TEXT BOOKS

1. Emmett Ross, “CATIA V5: Tips and Tricks”, Create space Independent Pub; 1st edition, 2014.

REFERENCES

1. Michel Michaud, “CATIA Core Tools: Computer Aided Three-Dimensional Interactive Application”, McGraw-Hill Education, 2012.

18BMVC301 **WEB DESIGN**

COURSE OBJECTIVES

To enable the students to

- Define the principle of Web page design.
- Define the basics in web design
- Visualize the basic concept of HTML
- Visualize the working principle of multimedia
- To know about the basic concepts of CSS

Module-1 Web Design Principles

Basic principles involved in developing a web site, Planning process, Golden rules of web designing, Designing navigation bar, Page design, Home Page Layout, Design Concept.

Module-2 Basics in Web Design

Brief History of Internet, What is World Wide Web, Why create a web site, Web Standards, Audience requirement.

Module-3 Introduction to HTML

What is HTML, HTML Documents, Basic structure of an HTML document, Creating an HTML document, Mark up Tags, Heading-Paragraphs, Line Breaks, HTML Tags.

Module-4 Elements of HTML

Introduction to elements of HTML, Working with Text, Working with Lists, Tables and Frames, Working with Hyperlinks, Images and Multimedia, Working with Forms and controls.

Module-5 Introduction to Cascading Style Sheets

Concept of CSS, Creating Style Sheet, CSS Properties, CSS Styling(Background, Text Format, Controlling Fonts), Working with block elements and objects, Working with Lists and Tables

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Understand the planning process, page design and overall concept in principles of web design
- Comprehend and analyze various structure of an HTML document
- Apprehend the HTML formats in reference models
- Downloadable lectures, code and design assets for the entire project
- Comprehend and analyze various CSS properties.

TEXT BOOKS

- Kogent Learning Solutions Inc. HTML 5 in simple steps Dreamtech Press

REFERENCES

- Steven M. Schafer HTML, XHTML, and CSS Bible, 5ed Wiley India
- John Duckett Beginning HTML, XHTML, CSS, and JavaScript Wiley India
- Ian Pouncey, Richard York Beginning CSS: Cascading Style Sheets for Web Design Wiley India

18BMVC401 **IOT**

COURSE OBJECTIVES

To enable the students to

- To acquaint with the basic concepts of embedded system product development cycle and 3odeling.
- To introduce IoT architecture reference model
- To introduce IoT architecture standards for different use case under discussion.
- To introduce IoT Network and channel aware communication Topologies and Hierarchy
- To acquaint with the various security concepts in IoT architecture

Module-1 Embedded system product development cycle

Challenges in embedded system design, Processor general purpose, customized, application specific-Embedded product life cycle-waterfall, successive refinement, spiral models.

Module-2 Formalisms in System modeling

Requirement analysis, Architectures, Data flow graph, state models, sequence diagram UML /sysml.

Module-3 IoT Architecture Reference Model (ARM)

Evolution of IoT, Need for ARM, Event-driven Architectures, Service oriented Architecture. IoT Domain Model, Information Model, Functional Model - Communication Model, Security Model. Need for cloud in IoT. Open source clouds and interfaces.

Module-4 IoT Communication Architecture

IoT nodes, IoT Edge, 6LOWPAN, ipv4/ipv6, MQTT, CoAP, Application aware communication, Network and channel aware communication Topologies and Hierarchy.

Module-5 IoT Architecture standards

ETSI standard for IoT Architecture : Standards for IoT for Home, Energy, People, motion, City

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Comprehend and analyze various embedded product development life cycle.
- Ability to model the embedded product modules.
- Comprehend and analyze Evolution of IoT, Need for ARM, Event-driven Architectures, Service oriented Architecture
- Apprehend the various network and channel aware communication Topologies and Hierarchy
- Comprehend and analyze IoT architecture reference model.

TEXT BOOKS

- Alessandro Bassi, Martin Bauer, Martin Fiedler, Thorsten Kramp, Rob van Kranenburg, Sebastian Lange, Stefan Meissner, Enabling things to talk Designing IoT solutions with the IoT Architecture Reference Model, 2013, Springer Open, USA.

REFERENCES

- Wayne Wolf, Computers as components: Principles of Embedded Computing System Design, 2013, The Morgan Kaufmann Series in Computer Architecture and Design, Elsevier. Netherlands.
- IEEE Standards Association Working Group for an Architectural Framework for the Internet of Things (IoT) (P2413) - http://grouper.ieee.org/groups/2413/
- Internet of Things Architecture Final Architectural Reference Model for the IoT v3.0, http://www.iot-a.eu/public

18MDVC301 HYPERTEXT MARKUP LANGUAGE

COURSE OBJECTIVES

To enable the students to

- define the principle of Web page design.
- define the basics in web design
- visualize the basic concept of HTML
- apprehend and analyze the working of hyperlinks , Images and Multimedia, Working with Forms and controls
- visualize the basics of concept and properties of CSS

Module-1 Web Design Principles

Basic principles involved in developing a web site, Planning process, Golden rules of web designing, Designing navigation bar, Page design, Home Page Layout, Design Concept.

Module-2 Basics in Web Design

Brief History of Internet, What is World Wide Web, Why create a web site, Web Standards, Audience requirement.

Module-3 Introduction to HTML

What is HTML, HTML Documents, Basic structure of an HTML document, Creating an HTML document, Mark up Tags, Heading-Paragraphs, Line Breaks, HTML Tags.

Module-4 Elements of HTML

Introduction to elements of HTML, Working with Text, Working with Lists, Tables and Frames, Working with Hyperlinks, Images and Multimedia, Working with Forms and controls.

Module-5 Introduction to Cascading Style Sheets

Concept of CSS, Creating Style Sheet, CSS Properties, CSS Styling(Background, Text Format, Controlling Fonts), Working with block elements and objects, Working with Lists and Tables

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- understand the planning process, page design and overall concept in principles of web design
- apprehend the html formats in reference models
- apprehend the html documents & heading paragraphs
- understand the usage of hyperlinks ,images and multimedia
- comprehend and analyze various css properties.

TEXT BOOKS

1. Kogent Learning Solutions Inc. HTML 5 in simple steps Dreamtech Press

REFERENCES

1 Steven M. Schafer HTML, XHTML, and CSS Bible, 5ed Wiley India
2. John Duckett Beginning HTML, XHTML, CSS, and JavaScript Wiley India
3. Ian Pouncey, Richard York Beginning CSS: Cascading Style Sheets for Web Design Wiley India

18MDVC401 INTERNET CONNECTED OBJECT

COURSE OBJECTIVES

To enable the students to

- To acquaint with the basic concepts of embedded system product development cycle and modelling.
- To introduce IoT architecture reference model
- To introduce Network and channel aware communication Topologies and Hierarchy
- To introduce IoT architecture standards for different use case under discussion.
- To acquaint with the various security concepts in IoT architecture

Module-1 Embedded system product development cycle

Challenges in embedded system design, Processor general purpose, customized, application specific-Embedded product life cycle-waterfall, successive refinement, spiral models.

Module-2 Formalisms in System modeling

Requirement analysis, Architectures, Data flow graph, state models, sequence diagram UML /sysml.

Module-3 IoT Architecture Reference Model (ARM)

Evolution of IoT, Need for ARM, Event-driven Architectures, Service oriented Architecture. IoT Domain Model, Information Model, Functional Model - Communication Model, Security Model. Need for cloud in IoT. Open source clouds and interfaces.

Module-4 IoT Communication Architecture

IoT nodes, IoT Edge, 6LOWPAN, ipv4/ipv6, MQTT, CoAP, Application aware communication,

Module-5 IoT Standards

IOT Requirement of international standard (case study),IOT standards in practice,Operating platforms /systems

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- comprehend and analyze various embedded product development life cycle.
- ability to model the embedded product modules.
- analyze to model the architecture reference model
- ability to overcome application aware communication, network and channel aware communication topologies and hierarchy
- comprehend and analyze iot architecture reference model.

TEXT BOOKS

1. Alessandro Bassi, Martin Bauer, Martin Fiedler, Thorsten Kramp, Rob van Kranenburg, Sebastian Lange, Stefan Meissner, Enabling things to talk Designing IoT solutions with the IoT Architecture Reference Model, 2013, Springer Open, USA.

REFERENCES

1 Wayne Wolf, Computers as components: Principles of Embedded Computing System Design, 2013, The Morgan Kaufmann Series in Computer Architecture and Design, Elsevier. Netherlands.

2 IEEE Standards Association Working Group for an Architectural Framework for the Internet of Things (IoT) (P2413) - http://grouper.ieee.org/groups/2413/

3 Internet of Things Architecture Final Architectural Reference Model for the IoT v3.0, http://www.iot-a.eu/public

19CMVC301 **COATINGS AND PAINTS**

COURSE OBJECTIVES

To enable the students to gain knowledge on

- Chemistry of colloids
- Formulation of paints and machinery involved
- Powder coatings

Colloidal chemistry of coatings, surface chemistry of pigments, Pigment dispersion and wetting, flushing of pigments, effect of pigment volume concentration on paint properties, Paint additives, solvents, Basics of Paint formulations Machinery for grinding of pigments and extenders

Paint manufacturing machinery for pigment dispersion (Ball mill, Sand mill, Attritor mills, Drais mill, basket mill, kaddy mills, twin shaft dispenser, alpine mills, horizontal V/S vertical mils

Manufacture of Powder Coatings, dry distempers, cement paints, oil based distempers and paints, other stiff paints, putties, Manufacturing of alkyds, emulsions and hard resins, filtration of resins, paints, ultra filtration of ED resins, forming of hard resins, marking and labeling of packaged products.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Acquire the knowledge of colloidal chemistry.
- Understand paint formulations and machineries
- Learn types of coatings and their types

TEXT BOOKS

1. Paint and Surface Coatings Lambourne and Strivens

REFERENCES

1. Basics of Paints Technology V.C.Malshe

19CMVC501 PRESERVATION OF FOOD MATERIALS

COURSE OBJECTIVES

To enable the students to gain knowledge on

- the area of Food Preservation.
- methods involved in food handling and storage
- applications of Super critical technology

Methods of Food Handling and Storage: Nature of harvested crop, plant and animal; storage of raw materials and products using low temperature, refrigerated gas storage of foods, gas packed refrigerated foods, sub atmospheric storage, Gas atmospheric storage of meat, grains, seeds and flour, roots and tubers; freezing of raw and processed foods.retort pouch packing, Aseptic packaging.

Thermal Methods: Newer methods of thermal processing; batch and continuous; In container sterilization-canning; application of infra-red microwaves; ohmic heating; control of water activity; preservation by concentration and dehydration; osmotic methods

Non-Thermal Methods: Super Critical Technology for Preservation – Chemical preservatives, preservation by ionizing radiations, ultrasonics, high pressure, fermentation, curing, pickling, smoking, membrane technology. Hurdle technology,

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Outline the methods of preservation of food materials
- Demonstrate the process involved in food handling and storage
- Discuss the properties of food materials

TEXT BOOKS

1. Khetarpaul, Neelam, Food Processing and Preservation, Daya Publications, 2005.

REFERENCES

1. Rahman, M. Shafiur. Handbook of Food Preservation. Marcel and Dekker, 2006.

19CMVC701 PULP AND PAPER TECHNOLOGY

COURSE OBJECTIVES

To enable the students to gain knowledge on

- Papermaking science and technology
- Wood yard operations
- Paper machine

INTRODUCTION: Introduction Basic pulp and paper technology – Wood haves dry – Wood as a raw material

WOODYARD OPERATION :Woodyard operation – Mechanical pulping – Chemical pulping – Secondary fibre pulp processing.

PAPER MACHINE :Paper Machine wet and addition paper machine dry and operation – Paper machine – Wet and operation.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Acquire the knowledge of processing of paper making
- Understand processing techniques and raw materials involved in paper making
- Learn the machineries involved in paper making.

TEXT BOOKS

1. Pulp and paper chemistry and Technology Monica ER Monica, Goran Gellerstcdt Gunnar Hennksson De Gneyter 2009.

REFERENCES

1. Pulp and paper chemistry and Technology Monica ER Monica, Goran Gellerstcdt Gunnar Hennksson De Gneyter 2009.

19ITVC301 MACHINE LEARNING TECHNIQUES

COURSE OBJECTIVES

To enable the students to

- To understand about Introduction to Machine Learning
- To understand about the concept of regression
- To learn various type of classification methods including SVM, Naive bayes, decision tree, and random forest

Module 1 Introduction to Machine Learning

Applications of Machine Learning

Supervised vs Unsupervised Learning

Python libraries suitable for Machine Learning

Module 2 Regression

Linear Regression

Non-linear Regression

Model evaluation methods

Module 3 Classification

K-Nearest Neighbour

Decision Trees

Logistic Regression

Support Vector Machines

Model Evaluation

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- AnalyzeIntroduction to Machine Learning
- Identify about the concept of regression
- Implement classification methods including SVM, Naive bayes, decision tree, and random forest

TEXT BOOKS

1.Python Machine Learning: Machine Learning and Deep Learning with Python, scikit-learn, and TensorFlow 2, 3rd Edition Paperback – December 12, 2019

REFERENCES

1. Machine Learning with R: Expert techniques for predictive modeling, 3rd Edition Paperback – Import, 15 April 2019

19ITVC401 BUSINESS ANALYTICS

COURSE OBJECTIVES

To enable the students to

- Understanding concepts around Business Intelligence and Business Analytics
- Apply various supervised machine learning techniques
- Use various packages in R to create fancy plots

Module 1

Introduction to terms like Business Intelligence, Business Analytics, Data, Information, how information hierarchy can be improved/introduced, understanding Business Analytics and R, knowledge about the R language

Module 2

Community and ecosystem, understand the use of 'R' in the industry, compare R with other software in analytics, Install R and the packages useful for the course,

Module 3

perform basic operations in R using command line, learn the use of IDE R Studio and Various GUI, use the 'R help' feature in R, knowledge about the worldwide R community collaboration.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Understand concepts around Business Intelligence and Business Analytics
- Apply various supervised machine learning techniques
- Use various packages in R to create fancy plots

TEXT BOOKS

1. James R. Evans, Data Analysis and Operations Management, and Director of the Total Quality

Management.

REFERENCES

1.Data Analysis and Operations Management, and Director of the Total Quality Management.

19ITVC501 IOS DEVELOPMENT

COURSE OBJECTIVES

To enable the students to

- To Understand the concept of Optimizing the app store listing
- To describe about App Store Optimization
- To become familiar with MVP APP

Unit - I

Idea validation and MVP, App monetization models, Optimizing the app store listing - Growth hacking techniques for app downloads, How to get press coverage for your app- How to get your app featured on the app store.

Unit - II

App Store Optimization (ASO) how to rank on the app store search engine, How to use paid advertising to get more customers, Improving your app store ratings and reviews, App analytics, Black hat vs. white hat techniques for app marketing, How to build a app showcase website.

Unit - III

Idea validation and MVP App monetization models Optimising the app store listing Growth hacking techniques for app downloads How to get press coverage for your app How to get your app featured on the app store App Store Optimisation (ASO) how to rank on the app store search engine

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Implement concept of Optimizing the app store listing
- Demonstrate about App Store Optimization
- Implement MVP APP

TEXT BOOKS

1. App Development with SwiftiOS 11 Edition

REFERENCES

1.Image Processing and Computer Vision in iOS (SpringerBriefs in Computer Science) 1st ed. 2020

Edition

19ITVC501 SAP IN DATA PROCESSING

COURSE OBJECTIVES

To enable the students to

- Understand and use constants and variables.
- Understand and use Swift arrays.
- Understand basic gesture controls and motion detection.

MODULES

Human Resource Management (SAP HRM)

Human Resource (HR)

Production Planning (SAP PP)

Material Management (SAP MM)

Financial Supply Chain Management (SAP FSCM)

Sales and Distribution (SAP SD)

Project System (SAP PS)

Financial Accounting and Controlling (SAP FICO)

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Demonstrate constants and variables.
- Analyze and use Swift arrays.
- Implement basic gesture controls and motion detection.

TEXT BOOKS

1.SAP S/4HANA, An introduction written by

REFERENCES

2. SAP S/4HANA Finance: The Reference Guide to What's New Hardcover – Import, 1 March 2019

19ITVC701 AWS SERVICES

COURSE OBJECTIVES

To enable the students to

- To learn about the different services provided by AWS
- To learn about AWS security
- To understand about RDS

Module 1:

User management through Identity Access Management (IAM), Various access policies across AWS Services, AWS Cognito, AWS Security & Encryption: KMS, CloudHSM, Sheild, and WAF, API keys service access, Best practices for IAM, Access billing and create alerts on billing.

Module 2:

Start, stop and terminate an EC2 Instance, Security Groups, AMI, VPC, ENI, Public, and Private IP, Storage services, Instance Store, EBS and its types, SSDs and Provisioned IOPS, Hard Disk Drives, EFS, EBS vs EFS, Cost optimization.

Module 3:

Amazon RDS and its benefits, Read Replica, RDS IAM Authentication, Aurora: Aurora Serverless& Global Databases, DynamoDB, ElastiCache: Working, Redis vs Memcached, Amazon RedShift: Redshift Spectrum

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Implement the different services provided by AWS
- Demonstrate AWS security
- Analyzeabout RDS

TEXT BOOKS

1.AWS: The Ultimate Guide From Beginners To Advanced For The Amazon Web Services

(2020 Edition) Paperback – December 21, 2019

REFERENCES

1. Data Analytics with R Paperback – 1 January 2019by Bharti Motwani

19ITVC801 **ANDROID APP DEVELOPMENT**

COURSE OBJECTIVES

To enable the students to

- Understand introduced to Android programming and learn to develop Android applications
- Understand Android development tools, creating user interfaces, and utilizing location based services
- Understand able to write simple GUI applications, use built-in widgets and components

Module 1

Fundamentals • Basic Building blocks – Activities, Services, Broadcast Receivers & Content providers • UI Components- Views & notifications • Components for communication -Intents & Intent Filters • Android API levels(versions & version names)

Module 2

Application Structure • AndroidManifest.xml • uses-permission • Activity/services/receiver declarations • Resources & R.java • Layouts &Drawable Resources • Activities and Activity lifecycle

Module 3

Emulator • Launching emulator • Editing emulator settings • Emulator shortcuts • Logcat usage • Introduction to Android Device Monitor (ADM)

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Understand introduced to Android programming and learn to develop Android applications
- Understand Android development tools, creating user interfaces, and utilizing location based services
- Understand able to write simple GUI applications, use built-in widgets and components

TEXT BOOKS

1.Professional Android 4 Application Development

REFERENCES

1. Android Programming for Beginners, Sam’s Teach yourself Android Application Development (24 Hours)

19FTVC301 **AQUA FOOD TECHNOLOGY**

COURSE OBJECTIVES

To enable the students to

- outline the main international fisheries resources and their level of exploitation
- identify the fisheries resources produced from aquaculture, including fish and invertebrates
- To understand social aspects and environmental impact of aquaculture

Unit I

Overview importance's of coastal and freshwater aquaculture, global scenario, present status in India - prospects and scope.

Unit II

Selection of site: topography, water availability, soil conditions, design and layout, structure and construction. Preparation of ponds – different methods for the eradication of weed fishes, predators, aquatic insects and aquatic weeds.

Unit III

Selection of cultivable Species- Finfishes, Shellfishes and Seaweeds. Seed selection protocol and seed availability – wild source, hatchery source. Live feed culture – artemia, rotifer and microalgae. Water Quality Management.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- outline the social and economic importance of fish as a source of food
- To impart knowledge on macro and trace constituents and nutritive value of fish.
- To give a detailed insight into handling, fish preservation techniques and quality management systems for seafood

TEXT BOOKS

1. Bardach, John.E. 1997 Sustainable Aquaculture. John Wiley and Sons.

REFERENCES

1. Joachim W., Hertrampft and F.P Pascal, 2000 Handbook on Ingredients for Aquaculture feeds. Kluwer Academic Publishers, London.

19FTVC401 MODERN FOOD PROCESSING AND PRESERVATION TECHNIQUES

COURSE OBJECTIVES

To enable the students to

- Apply the techniques of objective and subjective methods of evaluating foods
- Know the basic concepts of food processing & recent trends in processed foods
- Understand the principles of the various Food Processing Methods

Unit I

Preservation and Processing Importance of preservation and processing of sea foods criteria for assessing freshness handling of fresh materials – on board handling, chilling methods, phenomena of rigor mortis, spoilage changes – causative factors

Unit II

Drying and irradiation Drying and dehydration – conventional and modern methods, relative merits and demerits. Quality changes during drying and storage – functional properties, sensory quality, nutritional value, quality indices, storage life.

Unit III

Freezing and cold storage – process of freezing, types, quality changes during processing and storage. Canning – procedures, quality changes during processing and storage – quality standards. Role of preservatives in processing.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- To encourage students to work in conjunction with relevant food industry to get a deeper insight into the subjects of Food Science and Technology
- To impart students a systematic approach to basic and applied aspects of food processing and technology
- To familiarize students with the various theoretical and practical aspects of food quality and its control.

TEXT BOOKS

1. Anon, 1979. Handling, Processing and Marketing of Tropical fish, Tropical Products Institute, London.

REFERENCES

1. Oliveira, F.A.R. and J.C Oliveira, 1999. Processing Foods: Quality Optimization and Process Assessment, CRC Press.

19PTVC301 IMPORTANCE OF MEDICINAL PLANTS AND ITS BIOCHEMICAL VALUES

COURSE OBJECTIVES

To enable the students to

- To learn about phytochemistry of medicinal plants
- Understand the concepts of phytochemistry
- biological activities of medicinal plants

Unit I

Extraction – purification of bio-active compounds from plants – cold & hot extraction – Soxhlet extraction – crude extracts purification by various solvents.

Unit II

Isolation of bioactive compounds – chromatographic techniques – thin layer chromatography – liquid chromatography – HPLC and UPLC.

Unit III

Structural analysis of bioactive compounds – IR spectroscopy – Mass spectrometry – NMR spectroscopy.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Able to appreciate the medicinal values of plants
- Familiarize the bio-active components present in the plants
- Know the various techniques involved in the phytochemistry

TEXT BOOKS

1. Godte V.M. 2000. Ayurvedic pharmacology and therapeutic uses of medicinal plants, Bharathiya Vidya Bhavan, Mumbai

REFERENCES

1. Majumdar, A. 2000. Home remedies in Ayurveda, Amar Granth Publications, New Delhi.

19PTVC401 BASIC CLINICAL LABORATORY TECHNIQUES

COURSE OBJECTIVES

To enable the students to

- To demonstrate the basic requirements of clinical laboratory, external quality assurance and internal quality assurance.
- To impart skills on sampling, laboratory analysis and disposal of wastes.
- To impart knowledge on standards and interpretation of diagnostic values.

Unit I

Specimen collection and handling, transportation of specimens, disposal of specimen after laboratory use. Composition of blood. Methods of estimation of Haemoglobin, PCV, total and differential count of WBC, platelet count, clotting, bleeding and prothrombin time.

Unit II

Blood Group - methods of grouping and Rh factor. Determination of proteins in serum and plasma. Determination of glucose, glycated hemo globin, triglycerides, cholesterol, lipoproteins.

Unit III

Examination of body fluids - ascitic fluid, pleural fluid, synovial fluid, pericardial fluid, CSF and amniotic fluid.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Understand the basic concepts of specimen collection, transportation and disposal of specimens.
- Apprehend the examination of body fluids such as ascitic fluid, pleural fluid, synovial fluid etc.
- Interpret the presence of abnormal constituents in urine, detection of occult blood and semen analysis.

TEXT BOOKS

1. Mayne. Clinical Chemistry in Diagnosis and Treatment. ELBS. 6th ed. 1994.

REFERENCES

1. Todd & Stanford. Clinical Diagnosis and Management by Laboratory Methods. 16th ed. 2016.

19PCEVC101 **FULL STACK DEVELOPMENT**

COURSE OBJECTIVES

To enable the students to

- know the concept of javascript development script.
- understand HTML/CSS suite.
- concept on node Js training.

Module 1: JavaScript Development Suite

- Fundamentals Of JavaScript
- JavaScript for Beginning Web Developers
- JavaScript for Absolute Beginners
- Fundamentals of jQuery
- Fundamentals of Ajax Development
- Create a node.js Real Time Chat Application
- Advanced JavaScript

Module 2:All-In-One HTML/HTML5 And CSS/CSS3 Suite

- All-In-One HTML/HTML5 And CSS/CSS3 Suite
- Applying Designs to WireFrames with HTML5 and CSS3
- Build Your Own HTML5 Video Player
- Building Responsive Websites with HTML5 and CSS3
- HTML5 and CSS3 Site Design
- HTML5 Mobile Game Development by Example – Educational Game
- HTML5 Mobile Game Development by Example -Veggies vs Zombies
- Make HTML5 Games with No Coding Required

Module 3: Node.Js Training

- Introduction and Foundation
- Node Projects
- Working with shrink-wrap to lock the node modules versions
- Working with asynchronous programming
- Building a HTTP Server with Node.JS using HTTP APIs
- File System
- Buffers, Streams, and Events
- Multi-Processing in NodeJS

- ExpressJS

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Know the ajax and development intro.
- Understand to work with HTML.
- Develop the project with help of node.Js.

REFERENCES

1. Full-stack react, type script and node,Build cloud-ready web applications using react-17 with hooks and graphQL.David choi.

19PCOVC101 **PROBLEM DEFINITION AND IDENTIFICATION**

COURSE OBJECTIVE

To enable the students to

- understand the problem and literature survey.
- identify and analyze each problems System Simulation.

Unit I **Problem Definition** **15**

Objectives, Motivation, Utility. Concept of theory, empiricism, deductive and inductive theory. Characteristics of scientific method – Understanding the language of research – Concept, Construct, Definition, Variable. Research Process.

Unit II **Problem Identification** **15**

Identify the problem maintaining the conditions around the problem-Select methods for assessment-Collect data - Review and analyze the data-hypothesized solution for an intervention

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- to analyze the problems through literature survey.
- to identify the problems and hypothesized solution for an intervention.

TEXT BOOK & MANUALS

1. Bergan, J. R. (1995). Evolution of a problem-solving model of consultation. Journal of Educational and Psychological Consultation, 6, 111-123.

2. Christ, T.J., & Arañas, Y.A. (2014). Best practices in problem analysis. In A. Thomas & J. Grimes (Eds.), Best Practices in School Psychology VI. Bethesda, MD: National Association of School Psychologists.

19PCOVC201 **PATENT WRITING AND PUBLISHING**

COURSE OBJECTIVE

To enable the students to

- formulate the research problems
- understand writing the patent and publishing the patent.

Unit-Introduction to formulating research problems **15**

Defining and formulating the research problem, selecting the problem, necessity of defining the problem, Importance of literature review in defining a problem, literature review-primary and secondary sources, reviews, monograph, research databases, web as a source, searching the web, critical literature review, identifying gap areas from literature and research database, development of working hypothesis

Unit II – Report writing and publications **15**

Significance of Report Writing, Different Steps in Writing Report, Layout of the Research Report-Types of Reports, Oral Presentation, Mechanics of Writing a Research Report, Precautions for Writing Research Reports, copy right, royalty, trade related aspects of intellectual property rights (TRIPS); scholarly publishing-IMRAD concept and design of research paper, citation and acknowledgement, plagiarism, reproducibility and accountability.

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- identify research problems and literature review.
- patent report writing and designing the research papers.

TEXT BOOK

1. Trochim, W.M.K., 2005. Research Methods: the concise knowledge base, Atomic Dog Publishing. 270p.
2. Wadehra, B.L. 2000. Law relating to patents, trademarks, copyright designs and geographical indications. Universal Law Publishing.

19PCOVC301 **ETHICAL AND PROFESSIONAL RESPONSIBILITY**

COURSE OBJECTIVE

To enable the students to

- know the social responsibilities and public relations
- learn the actual reality of how lawyers work out conflicts among the ethics of duty and the ethics of aspiration

Unit-I- ETHICAL AND PUBLIC RELATIONS **15**

Introduction to Social Responsibility & Ethics, Public Relations and Ethics of Speech, Public Relations and Libel, Public Relations and Harm Public Relations and Your Property, Ethic, Frameworks

Unit II – THE REQUIREMENT OF LOYALTY TO THE CLIENT **15**

Representing Multiple Parties Dealing with Each Other, The Duty of Loyalty, Conflict Between Client Interest and the Lawyer's Personal Interest, Representing the Insured and the Insurer, Special Problems of Government Lawyers

TOTAL PERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- gain knowledge of social responsibilities and public relations.
- gain knowledge of conflicts among the ethics of duty and aspiration.

TEXT BOOK

1. Organizational Ethics and the Good Life, Edwin M. Hartman, Oxford University Press, New York, 2016.

19PEDVC101 SOLAR POWER PLANT DESIGN

COURSE OBJECTIVES

To enable the students to

- know the basic concept power consumption.
- know the need of solar power plant design.
- understand the concept designing the solar power Plant and the elements needed for designing.

1. **Types of Solar Power Plant** (6)

   Grid Connected solar Power Plant, Grid interactive solar power plant, Net Metering Solar Power Plant, Off-Grid / Hybrid solar power , plant Schemes of solar power plant

2. **Selection of PV module technology** (6)

   Introduction, Crystalline technology, Thin film technology,Bi-facial technology,Comparison between PV module technology,Comparison between solar power plant energy out put

3. **Selection of PV module (cells and BOM) and sizing** (6)

   Types Crystalline module cells, Manufacturing process of PV cells, Comparison between mono crystalline Selection of PV cells, Selection of front and rear sheet, Selection of PV module glass

4. **Inverters Selection and Sizing (Grid Connection and Off Grid)** (6)

   Factors affecting plant location, factors in planning layouts, principles of plant layout, use of scale models.

5. **Connection of PV Module(Series and Parallel Circuit** (6)

   Series Circuits, Parallel Circuits, Combining Series & Parallel Circuits,PV module string connection Matching the PV Array ToThe Voltage Specifications of An Inverter, Matching the PVArray to the Inverter's Current Rating, Matching the PVArray to the Inverter's Power Rating Summary of Calculations for Matching Array and Inverter

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Identify the need of solar power plant over other sources.
- Apply the concepts for making plant designing for an industry and domestic appliances.
- Represent the designing structure of the plant.

TEXT BOOKS

1. Solar Power Systems Design: From the Sun into Electricity, Taleb Al-theanatEdition: 1st

Publisher: GIEEISBN: 978-0-9986916-0-2

REFERENCES

1. Power Generation, Operation and Control" by Wood A J and Wollenberg B F

19PEDVC201 CREO ADAVANCED

COURSE OBJECTIVE

To enable the students to

- gain strong ground on solid modeling techniques that would enhance the productivity in modeling and analysis of mechanical components.

INTRODUCTION

Introduction to CAD, CAE Features of Creo, Concepts:-Modeling ,Parametric , Associative , Feature based Creo Graphical User Interface - Feature manager design tree, , Handles, mouse buttons, keyboard shortcuts, Understanding the Windows Menu Hardware and Software requirements

SKETCHER WORKBENCH

Sketch Entities – Inference line, Centerline line, Line, Circle, Arc, Ellipse, Rectangle, Slots, Polygon, Parabola, Ellipse, Partial Ellipse, Spline, Spline tools, Spline on surface, Equation driven curve, Points, Text, Construction geometry, Snap, grid,

PART MODELING

Creating reference planes Creating Extrude features – Direction1, Direction2, From option, Thin feature, Applying draft, Selecting contours Creating Revolve features – Selecting Axis, Thin features, Selecting contours Creating Swept features-Selecting, Profile and Path, Orientation/twist type, Path Alignment, Guide Curves, Start/End tangency, Thin feature

ASSEMBLY DESIGN

Introduction to Assembly Modeling & Approaches – Top down and Bottom up approach Applying Standard Mates- Coincident, Parallel, Perpendicular, Tangent, Concentric, Lock, Distance, Angle.

DRAFTING AND DETAILING

Inserting Annotations - Datum Features, Geometric Tolerance, Surface Finish, Jog Leaders, Hole Callout, Datum Target, Dowel Pins, Area Hatch, Cosmetic Thread, Balloon, Centre Mark, Centre Lines, Layers, Working With Tables, Bill Of Materials, Hole Table, Sheets And Templates, Sheet Format.

TOTALPERIODS 30

COURSE OUTCOMES

Upon completion of this course, the students would have

- Learnt advanced solutions for conceptual design, 3D modelling, and documentation.
- Learnt to do product design, industrial design and styling (optimize form, fit, function and user experience), streamline 2D design, drafting, documentation with powerful tools for layout.

TEXT BOOK & MANUALS

- Sham Tickoo, Pro / Engineer PTC Creo Parametric 3.0 for Engineers and Designers,Dream tech press 2016

19PPSVC101 **ARTIFICIAL NEURAL NETWORKS**

COURSE OBJECTIVES

To enable the students to

- explore the architecture and learning principles of Neural Networks.
- develop the various hybrid algorithms involved in Neural Networks.
- provide adequate knowledge of application of Neural Networks to real time systems.

UNIT I **ARTIFICIAL NEURAL NETWORKS** **10**

Biological Neurons and Neural Networks, Basic Structures and Properties of Artificial NeuralNetworks, Basic Neuron Models-McCulloch-Pitts –Different Activation Functions,Singe Layer Perceptrons-Linear Seperability, Single Layer Perceptron Architecture-Learning rule, Algorithm, Applications.

UNIT II **BACK PROPAGATION NEURAL NETWORKS** **10**

Multi-Layer Perceptron -Architecture, activation functions, Learning, Back PropagationAlgorithm – Practical considerations - Limitations–Network Paralysis, Local Minima, Temporal Instability – Deep learning- introduction, Networks Classes .

UNIT III **NETWORK BASED ON COMPETITION** **10**

Fixed weight competitive Network-Maxnet, Mexican Hat andHamming Net, Counter Propagation Networks-Kohonen's self-organizing map – Training theKohonen layer – Training the Grossberg layer – Full counter propagation network .

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Apply the concept of neural networks in practical applications.
- Design, implement and analyze the performance of Back Propagation and Deep Neural Networks
- Solve real world problems using Associative Neural Network Techniques

TEXT BOOKS

1. Laurence Fausett, "Fundamentals of Neural Networks, Architecture, Algorithm and Applications", Prentice Hall, Third Edition, 2015.

REFERENCES

1. Jang J.S.R., Sun C.T and Mizutani E, "Neuro Fuzzy and Soft computing"- A Computational Approach to Learning and Machine Intelligence, PHI Learning Private Limited, Indian Reprint , 2014.

19PPSVC201 **NETWORK ROUTING ALGORITHMS**

COURSE OBJECTIVES

To enable the students to

- get familiarized with different protocols in internet routing and optical WDM networks
- get acquainted with the concepts of supporting protocols in Mobile-IP networks.
- differentiate the routing processes involved in mobile ad-hoc networks and wireless sensor networks from conventional networks.

UNIT I **ROUTING IN TELEPHONE NETWORKS AND INTERNET** **10**

General Classification of routing, Routing in telephone networks, Dynamic Non-hierarchical Routing (DNHR), Trunkstatus map routing (TSMR), Real-Time Network Routing (RTNR), Hierarchical routing.Exterior Routing Protocols: Exterior Gateway Protocol (EGP) and Border Gateway Protocol (BGP).

UNIT II **ROUTING IN OPTICAL WDM NETWORKS** **10**

Classification of RWA algorithms, RWA algorithms, Fairness and Admission Control, Distributed Control Protocols,Permanent Routing and Wavelength Requirements, Wavelength Rerouting- Benefits and Issues, Light path Migration, Rerouting Schemes, Algorithms- AG, MWPG.

UNIT III **ROUTING IN MOBILE - IP NETWORKS** **10**

Macro-mobility Protocols, Micro-mobility protocol: Tunnel based: Hierarchical Mobile IP, Intra domain Mobility Management, Routing based: Cellular IP, Handoff Wireless Access Internet Infrastructure (HAWAII).

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Identify various routing schemes and their applications to the real world circuit-switched networks
- Compute the blocking probability of various routing schemes.
- Explore the characteristics of mobile ad hoc networks

TEXT BOOKS

1. C.Siva Ram Murthy and B.S.Manoj, “Ad hoc Wireless Networks Architectures and protocols”, Pearson Education, Second Edition, 2007

REFERENCES

1. KazemSohraby, Daniel Minoli and TaiebZnati, “Wireless Sensor Networks”, A John Wiley & Sons Inc. Publication, First Edition, 2007.

19PPSVC301 SOFTWARE AND COGNITIVE RADIO SYSTEMS

COURSE OBJECTIVES

To enable the students to

- apply and implement the design methodologies in the wireless applications
- learn about software defined radio and cognitive radio systems.
- provide adequate knowledge of Cognitive Radio Systems

UNIT I SOFTWARE RADIO 10

Evolution- architecture perspectives- Software radio concepts-SDR front end technology: Transmitter specifications-Receiver specifications- operating frequency bands- receiver design considerations- transmitter design considerations- Candidate architecture for SDR- Multimode SDR architecture.

UNIT II COGNITIVE RADIO 10

Introduction to cognitive radios –economics of cognitive radio-spectrum awareness, spectrum subleasing, spectrum sharing- cognitive networks: motivation &requirements-foundation &related works in cognitive radio- cognitive radio implementation.

UNIT III COGNITIVE RADIO APPLICATIONS 10

Cognitive radios in wireless communication- Mobility management- location estimation & sensing- UWB Cognitive radio.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Design the architecture of Software and Cognitive Radio Systems
- Analyze the performance of Cognitive Radio Systems.
- Identify the applications of Cognitive Radio Systems

TEXT BOOKS

1. EkramHossain, DusitNiyato, Zhu Han, "Dynamic Spectrum Access and Management in Cognitive Radio Networks", Cambridge University Press, First Edition, 2009

REFERENCES

1. Linda Doyle, "Essentials of Cognitive Radio", Cambridge University Press, First Edition, 2009

19PSEVC101 MECHANICS OF MATERIALS I: FUNDAMENTALS OF STRESS & STRAIN AND AXIAL LOADING

COURSE OBJECTIVES

To enable the students to

- Understand the concepts of stress strain fundamentals of materials

Stress and Strain Fundamentals

General Analysis Approach -Internal Forces due to External Loads -Normal Stress/Shear Stress - Maximum Normal and Shear Stress on Inclined Planes for Uniaxial Loading -General State of Stress at a Point (3D) -Two-Dimensional (2D) or Plane Stress - Nominal (Engineering) Stress and True Stress - Normal Strain

Stress-Strain Diagrams, Material Properties, and Shear Stress and Strain

Tension Test and Stress-Strain Diagram - Internal Properties and Hooke's Law - 0.2% Offset Yield Stress - Strain Hardening/Permanent Set - Poisson's Ratio - Shear Stress/2D Pure Shear - Shear Strain

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Calculate of stress strain fundamentals of materials

TEXT BOOKS

1. Sastry S. S, Introductory Methods of Numerical Analysis, PHI publication ,2011

REFERENCES

1. Chandrupatla T. R. and Belegundu A.D., Introduction to Finite Elements in Engineering, PHI publication,2013

19PSEVC201 BIM FUNDAMENTALS FOR ENGINEERS

COURSE OBJECTIVES

To enable the students to

- learn BIM concepts in construction

Fundamental BIM Knowledge

Definition of BIM- From CAD to BIM- Necessity of BIM -BIM Benefits- LOD in BIM-Revit: View controls - pan, zoom, rotate, and arrange views- Visibility of elements -Section a 3D view - Retrieve information from schedules- Measure distance in BIM models

Modeling a BIM model

Revit: Use the Grid tool to place grid lines - Use the Level tool to define a vertical height -Use the Topo surface tool to create topographic surface- Use the Column tool to place a column- Use the Beam tool to place a beam -Use the Floor tool to create a floor- Use the Wall tool to create a wall -Use the Door tool to place a door-Use the Window tool to place a window- Use the Stair tool to create a stair - Use Ramp tool to create a parking ramp

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply BIM procedure in construction

TEXT BOOKS

1. Autodesk Revit 2015 BIM Management by ASCENT

REFERENCES

1. Residential Design Using Autodesk Revit 2016 Published May 18, 2015 By Daniel John Stine AIA, CSI, CDT

19PSEVC301 ADVANCED ENGINEERING SYSTEMS IN MOTION

COURSE OBJECTIVES

To enable the students to

- Understand the properties of engineering systems in motion

Velocities in Moving Reference Frames; Accelerations in Moving Reference Frames; The Earth as a Moving Frame

velocities expressed in Moving Frames of Reference - Solve for Velocities Expressed in Moving Frames of Reference - Accelerations expressed in Moving Frames of Reference- Solve for the Velocity and the Acceleration for Bodies Undergoing 3D Motion and Expressed in Moving Frames of Reference Equations of Motion for a Particle Moving Close to the Earth -Solve a Problem for the Motion of Particles Moving Close to the Earth

Translational and Rotational Transformations of Inertial Properties; Principal Axes and Principal Moments of Inertia

Translational Transformation of Inertial Properties - Rotational Transformation of Inertial Properties - Rotational Transformation of Inertial Properties (cont) -Define Principal Axes and Principal Moments of Inertia - Determine Principal Axes and Principal Moments of Inertia -Solve for Principal Axes and Principal Moments of Inertia with an Example

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Determine Principal Axes and Principal Moments of Inertia

TEXT BOOKS

1. Chopra A. K., Structural Dynamics and Introduction to Earthquake Engineering, Pearson Edition 2012

REFERENCES

1. Manish S, Finite Element Methods and Computational Structural Dynamics, PHI publication,2013

19PSEVC401 **QUANTITY SURVEYING**

COURSE OBJECTIVES

To enable the students to

- gain knowledge on building Estimation & understand the concepts of preparation of BOQ

Introduction to building cost estimation- Measurement procedures - Mensuration – Specifications- Rates – Labour, material, machine.Finding quantities from construction drawing –Excavation - Ground work and Foundation - Superstructure- Walls, partitions, floors, roofs- Internal finishes - Doors and windows – Staircases -General approach to measurements of building services - External work- Bill of quantities – Abstract and BOQ

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- apply knowledge on calculation of building cost

TEXT BOOKS

1. Estimation and Costing book by M. Chakraborti ,M. Chakraborti publications, 2011

REFERENCES

1. Estimating and Costing in Civil Engineering (Theory and Practice) by B.N.Dutta - 28/Revised Edition 2020

19BAVC101 CRM IN E- BANKING

COURSE OBJECTIVES

To enable the students to

- To develop an appreciation about the utility of E-Banking practices
- To understand the quality services of E-banking and various tools of E-banking
- To evaluate the challenges in CRM with E-Banking and security issues of online BankinG

COURSE CONTENT

Unit I Introduction to CRM Definitions – Need and importance of CRM in present scenario – CRM as a strategic marketing tool.

Unit II Significance of CRM in banking today Meaning and concept of E-Banking – Advantages customer information Database – objectives of E-Banking – Customer facilities through E-Banking tools.

Unit III CRM Practices Importance of CRM through E-Banking – internal facilities, costs, quality of service and cost of communication Faculty of Arts Department of Commerce

Unit IV E- Payment system Rupay – Rupay secure – IMPS – National unified USSD platform – (USSD) National Automated Clearing House (NACH) – National Financial Smith (NES) RTGS, NEFT. Innovative banking Payment system.

Unit V Security Issues in CRM and E- Banking Security and Privacy, Transactional difficulty, Technical issues and Level of Customer awareness.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Understand the important concepts in Customer Relationship Management
- Master over e-banking and data base services day today
- Evaluate the security issues in CRM and e-banking

TEXT BOOKS

1. Himani Sharma, 2011. Bankers Perspectives on E-Banking and Its Challenges, Evidence from North India.

REFERENCES

1. The IUP Journal of Bank Management.

19BAVC102 **SUSTAINABLE DEVELOPMENT**

COURSE OBJECTIVES

To enable the students to

- Understand the basic concept of sustainable management the environmental, social and economic dimensions.
- Know the history of the sustainable development idea.
- Be able to discuss the conflicts which are involved in the SD concept on the national as well as on the global scale.

COURSE CONTENT

Unit I Introduction Fundamentals of Environment Status of environment - Environmental, social and economical issues - Need for sustainability - Nine ways to achieve sustainability - Linkage between population, resources, development and environment.

Unit II Sustainable Concept Concept of sustainability - factors governing sustainable developmentlinkages among sustainable development - Environment and poverty - Determinants of sustainable development.

Unit III Sustainable Development Goals UN sustainable development goals -causes and potential consequences of climate change and their relationship to SDG. Environmental finance - Eco marketing - green advertisement - organic products - issues in marketing of organic products - Eco - tourism - Natural resource conservation and management.

Unit IV Organisational Social Responsibility Corporate / Organisation Social Responsibility - sustainability strategy development - management tools for sustainable development - sustainable / ethical investment accounts - sustainable product development and design - conflict between farming and the environment.

Unit V Organisations in SD Environmental impact assessment - participants in environmental management - approaches to environmental management - approaches to environmental management - emerging environmental issues - Role of international organisations, national and local governments, environmental organisation industry and commerce and non-government organisation.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Further develop the ability of students to integrate and make autonomous use of their knowledge to sustain the environment.
- Develop the students ability to deal with complex phenomena, issues and situations of sustainable development.
- Develop the students potential towards, sustain the environment for professional activities that demand considerable autonomy or for research and development work.

TEXT BOOKS

1. Jean - Yves Grosclaude and Rajendra K. Pachauri "Innovation for Sustainable Development", Sultan Chand & Sons, New Delhi, 2011.

REFERENCES

1. Sustainable Development 1965

19BAVC201 MACHINE LEARNING

COURSE OBJECTIVES

To enable the students to

- To understand the basic theory underlying machine learning.
- To understand a range of machine learning algorithms along with their strengths and weaknesses.
- To be able to apply machine learning algorithms to solve problems of moderate complexity.

COURSE CONTENT

UNIT 1 Introduction Learning Problems – Perspectives and Issues – Concept Learning – Version Spaces and Candidate Eliminations – Inductive bias – Decision Tree learning – Representation – Algorithm – Heuristic Space Search.

Unit 2 Neural Networks and Genetic Algorithms Department of Business Administration Faculty of Arts 65 Neural Network Representation – Problems – Perceptrons – Multilayer Networks and Back Propagation Algorithms – Advanced Topics – Genetic Algorithms – Hypothesis Space Search – Genetic Programming – Models of Evalution and Learning.

Unit 3 Bayesian and Computational Learning Bayes Theorem – Concept Learning – Maximum Likelihood – Minimum Description Length Principle – Bayes Optimal Classifier – Gibbs Algorithm – Naïve Bayes Classifier – BayesianBelief Network – EM Algorithm – Probability Learning – Sample Complexity – Finite and Infinite Hypothesis Spaces – Mistake Bound Model.

Unit 4 Instant Based Learning K- Nearest Neighbour Learning – Locally weighted Regression – Radial Bases Functions – Case Based Learning.

Unit 5 Advanced Learning Learning Sets of Rules – Sequential Covering Algorithm – Learning Rule Set – First Order Rules – Sets of First Order Rules – Induction on Inverted Deduction – Inverting Resolution – Analytical Learning – Perfect Domain Theories – Explanation Base Learning – FOCL Algorithm – Reinforcement Learning – Task – Q-Learning – Temporal Difference Learning. “Current Streams of Thought”.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Appreciate the importance of visualization in the data analytics solution
- Apply structured thinking to unstructured problems
- Develop an appreciation for what is involved in learning from data.

TEXT BOOKS

1. Ryszard, S., Michalski, J. G. Carbonell and Tom M. Mitchell, Machine Learning: An Artificial Intelligence Approach

REFERENCES

1. Volume 1, Elsevier. 2014

19BAVC202 E-GOVERNANCE AND CYBER LAW

COURSE OBJECTIVES

To enable the students to

- To introduce the cyber world and cyber law in general
- To enhance the understanding of problems arising out of online transactions and provoke them to find solutions
- To clarify the Intellectual Property issues in the cyber space and the growth and development of the law in this regard

COURSE CONTENT

Unit 1 Introduction to Web Technology Introduction, Computers and its Impact in Society, Overview of Computer and Web Technology, Need for Cyber Law, Cyber Jurisprudence at International and Indian Level – Faculty of Arts Department of Business Administration 62 Introduction to e-governance, techniques, e-governance in India, Challenges faced, Indian theory of Public administration

Unit 2 International Cyber Law Cyber Law - International Perspectives, UN & International Telecommunication Union (ITU) Initiatives, Council of Europe - Budapest Convention on Cybercrime, Asia-Pacific Economic Cooperation (APEC), Organization for Economic Co-operation and Development (OECD), World Bank, Commonwealth of Nations

Unit 3 Cyber Crimes & Legal Framework Concepts of Cyber Crimes & Legal Framework, Cyber Crimes against Individuals, Institution and State, Hacking, Digital Forgery, Cyber Stalking/Harassment, Cyber Pornography, Identity Theft & Fraud, Cyber terrorism, Cyber Defamation, Different offences under IT Act, 2000

Unit 4 Dispute in Cyberspace Dispute Resolution in Cyberspace 1.Concept of Jurisdiction 2. Indian Context of Jurisdiction and IT Act, 2000. 3. International Law and Jurisdictional Issues in Cyberspace. 4. Dispute Resolutions

Unit 5 Ethics and Business Moral & ethical dilemmas. Ethics and Business: A sense of business ethics. Ethics and International Business: Ethics Issues beyond borders. “Current Streams of Thought”. **TOTAL PERIODS 30**

COURSE OUTCOMES

At the end this course, students will be able to

- Understanding concepts related to cyber world and cyber law in general
- Problems arising out of online transactions and provoke them to find solutions
- Intellectual property issues in the cyber space and the growth and development of the law

TEXT BOOKS

1. SudhirNaib, The Information Technology Act

REFERENCES

1.2005: A Handbook, OUP, New York, (2011)

19CAVC101 PROGRAMMING IN RUBY

COURSE OBJECTIVES

To enable the students to

- obtain a working level of skills required for a Junior Developer
- practice attention to detail
- documentation skills

UNIT I Introduction

Pivotal Tracker Introduction - Build your Brand - Setup a Blog - Agile Intro - Git 101 / 102 - Learn Command Line homework

UNIT II Ruby

Mentorship Introduction - Pair Programming - Learn Ruby homework

UNIT III Control Statements

Numbers, Letters and Variables - Methods and Flow Control - Methods and Recursion – Arrays

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- understand a working level of skills required for a Junior Developer
- implement Practice attention to detail
- analyze Documentation skills

TEXT BOOKS

1. Beginning Ruby: From Novice to Professional (3rd Edition)

REFERENCES

1. Programming Ruby 1.9 & 2.0: The Pragmatic Programmers' Guide (4th Edition) by Dave Thomas

19CAVC201 JSP & SERVLET

COURSE OBJECTIVES

To enable the students to

- obtain a working level of skills required for a JSP
- practice attention to Servlet
- documentation of Framework

UNIT I JSP

Java Server Pages – JSP scripting elements & directives- Working with variables scopes-Error Pages -JSP tag libraries (JSTL).

UNIT II SERVLET

Servlet- Servlet overview –using Tomcat – Start Tomcat -Start Browser and request Servlet – Servlet API – Handling HTTP requests and responses- Session tracking – Cookies;

UNIT III FRAMEWORK

Advanced Frameworks -Understanding Struts – MVC framework – Struts control flow – Building model view controller component –Case studies – Current trends.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- understand a working level of skills required for a JSP
- implement Practice attention to detail
- analyze Documentation skills

TEXT BOOKS

1. Patrick Naughton and Herbert Schildt, Java 2: The complete Reference, Tata-McGraw Hill Publishing, 2nd Reprint, 2001.

REFERENCES

1. Paul Deitel and Harvey Deitel, “Java How to Program”, 9th Edition, Prentice Hal, 2012.

19GEVC101/201 **INDIAN CONSTITUTION AND HUMAN RIGHTS**

COURSE OBJECTIVES

To enable the students to

- assimilate and get familiarized with basic information about Indian constitution
- understand human rights/ values and its implications in their life..
- thinking towards basic understanding of the Organs of Governance and its implications for engineers.

MODULE 1: INTRODUCTION ABOUT INDIAN CONSTITUTION

History of Making of the Indian Constitution: History Drafting Committee, (Composition & Working) - Philosophy of the Indian Constitution: Preamble Salient Features.

MODULE 2 : CONSTITUTIONAL RIGHTS & DUTIES

Contours of Constitutional Rights & Duties: Fundamental Rights , Right to Equality, Right to Freedom, Right against Exploitation, Cultural and Educational Rights, Right to Constitutional Remedies, Directive Principles of State Policy, Fundamental Duties.

MODULE 3 : ORGANS OF GOVERNANCE

Organs of Governance: Parliament, Composition, Qualifications and Disqualifications, Powers and Functions, Executive, President, Governor, Council of Ministers, Appointment and Transfer of Judges, Qualifications.

TOTAL PERIODS 30

COURSE OUTCOMES

At the end this course, students will be able to

- Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics
- Discuss the intellectual origins of the framework of argument that informed the Conceptualization of social reforms leading to revolution in India.
- Understand the various organs of Indian governance.

TEXT BOOKS

1. Durga Das Basu (DD Basu): “Introduction to the Constitution on India”, (Students Edition.)

Prentice –Hall EEE, 19th / 20th Edn., (Latest Edition) or 2008.

2. Shubham Singles, Charles E. Haries, and Et al : “Constitution of India and Professional Ethics” byCengage Learning India Private Limited, Latest Edition – 2018
3. Dr. S. N. Busi, Dr. B. R. Ambedkar framing of Indian Constitution, 1st Edition, 2015
4. M. P. Jain, Indian Constitution Law, 7th Edn., Lexis Nexis, 2014.
5. D.D. Basu, Introduction to the Constitution of India, Lexis Nexis, 2015

REFERENCES

1.M.Govindarajan, S.Natarajan, V.S.Senthilkumar, “Engineering Ethics”, Prentice –Hall of India Pvt. Ltd. New Delhi, 200

2. M.V.Pylee, “An Introduction to Constitution of India”, Vikas Publishing, 2002.
3. Latest Publications of NHRC - Indian Institute of Human Rights, New Delhi.

19GEVC101/201 INTRODUCTION OF GENDER STUDIES

COURSE OBJECTIVES

To enable the students to

- introduce basic concepts relating to gender and to provide logical understanding of gender roles
- trace the evolution of gender studies from women's studies
- enable them to engage in policy decisions to remove gender biases in all fields of life in the process of gender equality for nation building

MODULE 1: Introduction

Sex and Gender, Types of Gender, Gender roles and Gender division of Labour, Gender stereotyping and Gender Discrimination

MODULE 2: Social Construction of Feminity

Bio-Social perspective of Gender, Gender as Attribution fact , Essentialism in the construction of feminity, Challenging cultural notions of feminity, media and feminine identities

MODULE 3: Women's studies and Gender studies

Evaluation and scope of women's studies, from women's to gender studies: A Paradigm shift, Women's studies VS Gender studies

TOTAL PERIODS 30

COURSE OUTCOMES

Students must gain knowledge on

- The concepts relating to gender and gains the logical understanding of gender roles
- Familiarize the evolution of gender studies from women's studies
- the removal of gender biases in all fields of life in the process of gender equality for nation building

TEXT BOOKS

1. Cornell R W (1995) Gender. Cambridge, Polity Press.

2. Gatens M (1991) A Critique of the Sex/Gender Distinction in S. Gunew (ed.) A Reader in FeministKnowledge. London: Routledge.

REFERENCES

1. Andrea N (1989) Feminist Theory and Philosophies of Men. New York: Routledge.
2. Arora P (2011) Gender and Power. Delhi: Pacific Publication.