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KUPPAM ENGINEERING COLLEGE

(Approved by AICTE, Permanent Affiliated to JNTUA, Accredited by NAAC, NBA & ISO 9001 : 2008 Certified)

(Recognised by UGC(f) & 12(b))

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KUPPAM - 517 425, Chittoor Dist., A.P. ☎: 08570 - 256966 (O), 256977 (F)

ELECTRICAL AUTOCAD (17EEVA01)

MODULE 1

Auto cad Interdictions Layer & Object Properties, Geometry Creation & Modifications, Isometric Views, Smart Dimensions, Fully Define Sketch and Blocks, 3D Parts, UCS, Boolean Operation, Solid Editing, Etc., Sketch Entities & Sketch Tools, Dimensions & Dimensions Styles, Creating & Editing Text.

MODULE 2

Inquiry Tools & Parametric Drafting, Sketch Visualization & Sketch Analysis, Surface Creation & Modification Tools, Block, W-Block, X-Attach, & X-Ref, Drafting Settings, Design Centre & Modification Tools, Equations, Design Table, & Configurations, Drafting Settings, Geometry & Dimensional Constraints.

MODULE 3

Plotting Drawings in AutoCAD, Plot Styles and Page Setups, Publishing to other File Types Template Drawings, Templates b. Customizing Templates Working with Blocks Working with Blocks, Inserting Blocks, Changing Blocks, Dynamic Blocks Building Dynamic Blocks, AutoCAD Sheet Sets, An Introduction to Sheet Sets, B. Build a Sheet Set c. Sheet Set Views, AutoCAD and A360 a. AutoCAD in the Cloud.


MODULE 4

Cartesian coordinate system, Students will learn about the Cartesian coordinate system. This system is defined with the help of a pair of perpendicular lines, a single unit of length for both axes, and an orientation for each axis. It is also called a rectangular coordinate system and an orthogonal coordinate system. Some other parts of the syllabus are: Developing different designs, Methods of developing title block, Setting up attributes, Set up layers of industry standards, Development of plans and elevations.

MODULE 5

The commands are used for passing information to the initial point of the task; the information is only communicated between running programs, Move and copy command, the distance method,


Program coordinator


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PV SOLAR PLANT DESIGN USING PV SYSTEM (17EEVA02)

MODULE 1

Solar PV Introduction, Renewable energy trend (global and local), Solar PV opportunities, PV markets & applications 1 Safety Basics, PV specific safety hazards & the Local Electric Code, OSHA (Occupational Safety & Health Administration), PV electrical shock, electrocution and arc flash, Ladder safety and angles, Fall protection 2 Electrical Basics, Electrical circuit components, Electrical test equipment, Utility systems, generation, transmission, distribution & electrical service, Using a digital Multi meter to test voltage, current and resistance, Measuring Voc, Isc and voltage and current under a load, Using a power meter to make an IV curve 3 Solar Energy Fundamentals, Making a sun path diagram, Reading sun path diagrams, Magnetic vs. true azimuth, PV shading principles, Shade analysis tools (Sol metric, Pathfinder, CAD & common sense), Shading ratios, 9am-3pm solar window & inter-row dist., Irradiance & irradiation measuring devices 4 PV Modules, Plotting Voc, Isc, Vmp, Imp and Pmp on the I-V curve, Testing current, voltage, power and energy, Making IV curves, Measuring Irradiance and temperature & the IV curve, Testing load on I-V curve without MPPT, PV & battery charging.

MODULE 2

Installing System Components, Turning on PV, inverters, chargers, storage & sources, Testing anti-islanding, Installing BOS, Programming power conditioning, Installing PV system components for different PV system types, Small off-grid PV system installation, Inexpensive phone charging direct coupled systems 6 PV System Materials, Choosing your own PV system, Students will try their skills at choosing PV, Inverters, Racking, etc., Finding materials on the internet, Finding the correct inverters for the local grid, making a materials list, Instructor will help and critique system, Lab: Shading Analysis with Sol metric Sun Eye, Lab: Irradiance Meter & IV Curve Trace 7 PV System Electrical Installations, Applying the Local Electric Code, Line drawing exercises, Performing PV series & parallel connections for different applications, Choosing and using conductors, ampacity, conductor sizing & OCPD requirements, MPV & BOS installation parameters, Settings for charging batteries with correct current, voltage & rates, Installing labelling, Installing grounding systems, Voltage drop & voltage rise testing, The process of installing a PV system according to code, Philippine Electric Code, Looking for code violations.

MODULE 3

System Mechanical Installation, Installing Roof, Ground, Pole, Trackers, BIPV Compare different types of PV integration, Installing for PV temperature and wind variables, Installing BIPV (building-integrated photovoltaic) applications, Installing materials for a harsh outdoor environment, Installing roofing & PV Estimating mechanical loads, Mechanical

installation/components, Mechanical installation for thermal, orientation & electrical performance, Installing to manufacturers' instructions & Local Electric Performance Analysis, Maintenance, Commissioning & Troubleshooting, Performance problems, Performance monitoring & parameters . Expected versus actual performance, Maintenance .Operation & Management (O&M) safety, Most common system failures, Maintenance planning to manufacturers' instructions, Dx & treatment of unhealthy PV systems Solar PV Net Metering, Net Metering rules & guide, DU Net-Metering application and guide, Grid connection standards and guide, Hands on PV Installation: Flat Roof Exercise, Racks, PV, Fasteners, and Hardware, Race Solar Mount Rails, Iron Ridge Rails, Tilt-up racking system, PV Module Installation with mid & end clamps, Grounding with WEEBS, Lugs, WEEB Lugs, Bonding Rails, PV Source Circuits to Combiner Box , Inverter Interconnection & Power to Grid, Testing AC & DC Voltage & Current with Digital Multi-meter.

MODULE 4

Fastening PV to roofing systems, Composition Asphalt Flashing, Tile Roofs (Flat Tile & Spanish Tile), Shake Roofs, Penetrations, Hardware, Galvanic Corrosion with Dissimilar Metals, Finding Rafters, Hangar Bolts/Pull out Strength Tests, Blocking, Rafter Spans Hands on roofing & PV, Composition Asphalt, Flat Tile & Barrel Tile Roofs, Methods for Finding Rafters, Removing Roofing Nails to Make Room for Flashing, Drilling Holes, Installing Hangar Bolts,

Waterproofing Gaskets, Caulking Tips, Pro Solar Racking, Iron Ridge Racking, Univac Clicks Racking, Grounding & Bonding, Rail Splicing, and Inverter Connection Hands on PV on Sloped Roofs with Micro inverters and AC modules, Micro inverter and AC module Installation, Micro inverter and AC module Grounding.

MODULE 5

Hands on Ground Mount PV Exercise, Pro Solar Ground Trace System, Installation According to Pro Solar Manufacturer's Instructions, 250 Watt PV Modules, Measuring Distances, Hooking up the System to Grounded & Transformer less Inverters, Discussion of Combine Fuse Calculations, Discussion of Conductor Sizing for PV Source Circuits & Output Circuits, Breakdown of Ground Mount, Colour coding and labelling of conductors Discussion at Panel board/Inverter Wall, Transformer less versus Transformer Based Inverters, Differences in Fuse Requirements, Differences in DC Disconnect Requirements, Exam preparation, NABCEP Practice Exams, Discussion: Mapping your future, Further study, licensing & certifications.


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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

PLC TRAINING PROGRAM ON ELECTRICAL PLATFORM (17EEVA03)

MODULE 1

Introduction to Logic Circuit: Logic Gates, Numbering System, Introduction to Plc Lab, Inter Facing Peripheral Chips: F.F., Registers, Tristate Buffers, Latches, Decoders, Memory, Configuration and Software Install, Monitoring and Simulation, Plc Construction: What Is A Plc, Why Preferring Plc, Plc Memories, Plc I/O, Plc Programming.

MODULE 2

Definition, Interlock Control Examples, Logic Design with Mitsubishi (Gx-Works2), Timers and Counters: Timers, Counters, Examples, Timers and Counters, Word and Branching Instruction: Data Handling Instruction, Arithmetic Instruction, Plc Internal Facilities, Logic Instruction, I/O Instruction, Program Control Instruction, Experiments Classification and Simple, Programming Exercises, Sensors, Switches, Solid State Relays, Sequential Process Control, Sequential Control, Sequential Control Examples, Application Examples of Sequential Industrial Problem

MODULE 3

Solving Interlock Problems, Traffic Control, Solving Basic Sequential Problems, Application Examples of Production Lines, Conveyor Control, Application Examples, Stepper Motor Control, Random Process Control: Random Control, Random Control Examples, Cnc Machine Control, Random Experiment: Elevator Control.


MODULE 4

Programming instructions arithmetic and logical, Load /and /or/out / and Read / Write, Compare / Add / Sub /And /Or – Blocks, Edge / trailing edge instructions, MOVE block application, Timer and Counter Blocks programming, Advanced instructions, File handling and Comment functions, Master control /set /reset function.

MODULE 5

Monitoring Arrays & Tags of User-Defined Data Types, Editing Ladder Logic Online, Troubleshooting Controller Problems, Monitoring GSV/SSV Instructions, Forcing I/O & Toggling Bits, Troubleshooting I/O Module Problems, CPU, I/O module replacements, Fault detection and error handling.


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CHALLENGES AND SOLUTIONS IN SWITCH MODE POWER SUPPLY

(18EEVA03)

MODULE 1

Basic Types of Switching Power Supplies, Designing various Switched Mode Power Supply components, Power Supplies with multiple output, Types Non-isolated dc-dc converters,

MODULE 2

Need of Transformer Isolations in high frequency Power conversion, Type's isolated dc-dc converters, Isolation in feedback loop.

MODULE 3

Types of Resonant converters, Series & parallel resonant converters, Class E resonant converters, Zero voltage switching resonant converter Zero Current switching resonant converter.

MODULE 4

Analyze control aspects of converter, Dynamic analysis of dc-dc converters; Fly back Converter, Forward Converter, Half-Bridge and Full Bridge Converters.

MODULE 5

Challenges and design of different types of controllers, PWM Controllers, Stability analysis using Bode Diagrams.


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INDUSTRIAL AUTOMATION-(18EEVA02)

MODULE 1

Describe the benefits of the given Industrial automation system, Describe functions of the given components of automation system, Compare the characteristics of the given type of automation systems, Describe applications of the given automation system, Study of use of various Sensors (Limit Switches, Potentiometer, Proximity, Color, and Photoelectric & Temperature Sensors) & Actuators.

MODULE 2

Electrical Control Circuit Designing, Relay Logic, Power and Control wiring, Programmable Logic Controller (PLC): Hardware Design, Concepts of Industrial Control Signals: 0- 10V & 4- 20 mA, Architecture of PLC, PLC Wiring and Control Panel Designing & Troubleshooting, Working with Field Devices.

MODULE 3

Programmable Logic Controller (PLC): Software, Application Software & Logic Development, Timer, Counter, Jump, Subroutine & Multi-Interlocking, PLC Programming using Ladder Logic & Functional Block Diagram (FBD), Programming & Troubleshooting, Alarm & Data Logging.

MODULE 4

Supervisory control and data acquisition (SCADA), HMI Screen Design & Interface with PLC, PLC & SCADA Interfacing, Structures and Faceplates creation, Remote Monitor & Control Process, Real Time trends & Historical trends, Data logging, OPC & ODBC, Industrial SCADA project, Auto/Manual Control using HMI, Control Application, PID Working Principle.

MODULE 5

PID Modes – On/Off, Manual mode, PID mode, Auto Tuning in PID, Study of various PID Parameters, Parameter Programming in PID, Monitoring/Controlling PID Parameters on HMI, Feed Back & Feed Forward Control Module-7 Motor Control Center (MCC) & VFD Drive, Architecture of VFD, Different motor Control techniques, Design of MCC & PCC,


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BATTERY AND ELECTRIC VEHICLE-(19EEVA01)

MODULE 1

Concepts of electric vehicles and their impact on environment, History of electric vehicles, Social and environmental importance of electric vehicles, Battery and its types.

MODULE 2

About Li-ion battery and its performance, Battery Management system(BMS) and key parameters, Battery packing and swapping.

MODULE 3

Power trains in E-Vehicles, Recent market trends in EV, Motor and Battery selection criteria, Vehicle range calculations, Vehicle Torque and power requirement calculations.

MODULE 4

Charging technology for EVs, Power electronics for Regenerative braking, Selection of energy storage technology.

MODULE 5

Introduction to hybrid vehicle design, Parallel hybrid, Series hybrid, Strategies in hybrid and electric vehicles.


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SIEMENS TRAINING ON ELECTRONICS HOME

(19EEVA02)

MODULE 1

Familiarization/Identification of electronic components with specification (Functionality, type, size, colour coding, package, symbol, cost etc. [Active, Passive, Electrical, Electronic, Electro-mechanical, Wires, Cables, Connectors, Fuses, Switches, Relays, Crystals, Displays, Fasteners, Heat sink etc.], Drawing of electronic circuit diagrams using BIS/IEEE symbols and introduction to EDA tools, Interpret data sheets of discrete components and IC's, Estimation and costing.

MODULE 2

Familiarization/Application of testing instruments and commonly used tools, Multimeter, Function generator, Power supply, CRO etc., Soldering iron, De-soldering pump, Pliers, Cutters, Wire strippers, Screw drivers, Tweezers, Crimping tool, Hot air soldering and desoldering station etc., Testing of electronic components [Resistor, Capacitor, Diode, Transistor, UJT and JFET using multimeter.

MODULE 3

Inter-connection methods and soldering practice, Bread board, Wrapping, Crimping, Soldering - types - selection of materials and safety precautions, soldering practice in connectors and general purpose PCB, Crimping, Printed circuit boards (PCB) Types, Single sided, Double sided, PTH, Processing methods, Design and fabrication of a single sided PCB for a simple circuit with manual etching (Ferric chloride) and drilling.

MODULE 4

Assembling of electronic circuit/system on general purpose PCB, test and show the functioning(Any Four circuits), Fixed voltage power supply with transformer, rectifier diode, capacitor filter, zener/IC regulator.

MODULE 5

LED blinking circuit using a stable multi-vibrator with transistor BC 107, Square wave generation using IC 555 timer in IC base, Sine wave generation using IC 741 OP-AMP in IC base.


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ETAP SOFTWARE-(19EEVA03)

MODULE 1

Introduction to ETAP Software, A simple guide to creating Single Line Diagrams in ETAP, Load Flow Analysis, Composite Network in ETAP, Short Circuit Analysis, Arc Flash Analysis.

MODULE 2

AC and DC Element Descriptions, Load modelling, Electrical systems modelling and fundamentals, Load flow (balanced and unbalanced) analysis, Load flow and cable sizing.

MODULE 3

Transformer sizing, Benefits of calculated short circuit currents, Introduction to fault current calculations in brief, Breaking and making currents, Per unit systems, Different typical values of positive, negative and zero phase sequence impedances.

MODULE 4

Manual calculations of Isc by MVA Method, Calculation of Isc by impedance method, Calculation of Isc by symmetrical components, Calculations as defined and recommended by IEC/ANSI standards, Fault-Levels, Switchgear/Fuse Rating, Typical cases for switchgear sizing, Relay co-ordination and Arc Flashing studies.

MODULE 5

Procedures, Data Collection, Plotting Time/Current Curves, Relay Coordination Intervals, Equipment damage curves for cables, transformers, System Modelling for Device Coordination Study, ETAP Star (Device Co-ordination/selectivity).

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POWER QUALITY-(19EEVA04)

MODULE 1

An Introduction to the following topics, Power quality, Power quality standards and monitoring, Power quality improvement in electrical system applications, Power quality measurement equipment, Power quality Monitoring.

MODULE 2

Passive Shunt compensation, Passive Series Compensation, Active Shunt Compensation, Active Series Compensation.

MODULE 3

Sources of sags and interruptions, Estimating voltage sag performance, Motor-starting sags.

MODULE 4

Harmonics Vs transients, Effect of harmonics, Harmonic distortion, Voltage and current distortion, Inter harmonics.

MODULE 5

Principles of regulating the voltage, Devices for voltage regulation, Capacitors for voltage regulation.

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