Integral University, Lucknow

Effective from Session: 2012-13							
Course Code	DEE-603	**Title of the Course**	ELECTRICAL DESIGN DRAWING AND ESTIMATING -II	**L**	**T**	**P**	**C**
Year	THIRD	**Semester**	SIXTH	**3**	**1**	**3**	**-**
Pre-Requisite		**Co-requisite**					
Course Objectives	To instill students about the importance of engineering drawing so students can understand the installation plan and can take different projects in their professional life.						

Course Outcomes	
CO1	Marketing survey for price comparison and selection of best quality material.
CO2	Different method of earthling according to IE rules for the safety of instruments and human being.
CO3	Estimation of wiring installation for commercial and industrial buildings.
CO4	Estimation of costs and Main components of overhead line and underground distribution lines.
CO5	Costing calculation of material for small substations.

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
Unit-I	Principles of estimating and costing	Purpose of estimating and costing, essential of estimating and costing-market survey, price list and net prices, preparation of lists of materials, calculation of material and labor cost, contingencies, overhead charges , profit and total cost.	8	1
Unit-II	Earthling	Need of earthling of electrical installation, advantages and disadvantages, effect of improper earthling, points to be earthed as per I.E. rules. Methods of earthling –plate and pipe earthling, determination of size of earth wire and earth plates for different capacities of electrical installations.	8	2
Unit-III	Estimation of internal wiring installation	Estimation of wiring installation for commercial and industrial building such as multistoried, hotels, hospitals, school, colleges, public library, etc. Power distribution scheme, lists of material with specification, estimation of costs. Estimation of power wiring; I.S. specification and I.E. rules determination of size of cables, conductors, distribution board, main switch and starters for power circuit, estimation and cost of material.	8	3
Unit-IV	Estimation of overhead and underground distribution lines	Main components of overhead lines, specification of material for O.H. lines, cost of material and work for overhead and underground lines up to 11 KV only. Estimation of service connection; service connection , their types and their estimation.	8	4
Unit-V	Estimation of small substation	Estimation of small substation: Main equipment and auxiliaries installed on the substation. Estimation of material required for the small distribution substation. Costing of material and work of above substations.	8	5

References Books:

Electrical Engineering Drawing and Estimation: K.B. Raina & S.K. Bhattacharharya.

e-Learning Source:

https://nptel.ac.in/

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4
CO1	2	2	3	2	2	-	2	-	2	-	-	-	-	2
CO2	1	-	2	2	3	-	1	-	2	-	-	-	-	2
CO3	1	2	-	1	-	2	2	-	2	2	-	-	-	3
CO4	-	2	-	-	3	-	3	-	-	-	-	-	-	2
CO5	1	3	2	3	-	-	3	-	-	-	-	-	-	2

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	Sign & Seal of HoD

Integral University, Lucknow

Effective from Session: 2012-13							
Course Code	DEE-604	**Title of the Course**	MICROPROCESSOR DEVELOPMENT SYSTEM	**L**	**T**	**P**	**C**
Year	THIRD	**Semester**	SIXTH	**3**	**1**	**3**	**-**
Pre-Requisite		**Co-requisite**					
Course Objectives	Study of hierarchical development of microprocessor system and simple programming.						

Course Outcomes	
CO1	Study the concept of memory mapping with the use of address line and explain the Microprocessor's internal architecture and its operation within the area of performance
CO2	Apply knowledge and demonstrate programming proficiency using the various addressing modes and data transfer instructions of the Microprocessor.
CO3	Design Electronic circuitry to the Microprocessor I/O ports in order to interface the processor to external devices.
CO4	Analyze assembly language programs; select appropriate assemble into machine a cross Assembler utility of a Microprocessor.
CO5	Compare accepted standards and guidelines to select appropriate Microprocessor (8085 & 8086) and Microcontroller to meet specified performance requirements.

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
Unit-I	Introduction to Microprocessor	Introduction to Microprocessor, Evolution of Microprocessors, Memory map & Addresses, Address bus, Data Bus, Control Bus, Bus Structure, Memory Word Size, The 8085 Microprocessor Unit, Architecture & Description.	8	1
Unit-II	Pin Diagram of 8085	Pin Diagram of 8085, Addressing Modes of 8085, Data Transfer operations, Arithmetic operations, Logic Operations, Branch operation, Writing assembly language programs, Programming techniques: looping, counting and indexing, Additional data transfer and 16 bit arithmetic instruction, Arithmetic operations related to memory, Logic operation: rotate, compare, counter and time delays.	8	2
Unit-III	Timing Diagram	Timing Diagram: Opcode Fetch, Memory Read Cycle, Memory Write Cycle, I/O Read & I/O Write. 8085 Interrupts: 8085 Vectored interrupts, Restart as Software instructions, RIM, SIM.	8	3
Unit-IV	Simple Programs	Programs: 8-bit Addition, 16-bit Addition, 8-bit Subtraction, 16-bit subtraction, Subtraction with carry, Multiplication & Division.	8	4
Unit-V	Programmable peripheral interface	8255 Programmable peripheral interface: Block Diagram, Control Word, BSR Mode, Zero Mode. Introduction to 8086 microprocessor: Architecture of 8086, Flag Register of 8086, Register Organization, Introduction to Microcontroller.	8	5

References Books:

1. Microprocessor Architecture Programming & Application with 8085: R.S. Gaonkar.
2. Microprocessor & Application: B. Ram.

e-Learning Source:

https://nptel.ac.in/

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4
CO1	-	-	-	-	-	-	-	-	1	-	-	-	-	-
CO2	-	-	-	-	-	-	-	-	2	-	-	-	-	-
CO3	-	-	-	-	-	-	-	-	1	-	-	-	-	-
CO4	-	-	-	-	-	-	-	-	2	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	1	-	-	-	-	-

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	Sign & Seal of HoD

Integral University, Lucknow

Effective from Session: 2012-13							
Course Code	DEE-605	**Title of the Course**	POWER ELECTRONICS - II	**L**	**T**	**P**	**C**
Year	THIRD	**Semester**	SIXTH	**3**	**1**	**3**	**-**
Pre-Requisite		**Co-requisite**					
Course Objectives	Knowledge of power electronics devices and components, their uses in converters.						

Course Outcomes	
CO1	Concept of power electronics and thyristor family.
CO2	Study and characteristics of high power switching devices.
CO3	Analysis of uncontrolled rectifier for different types of loads.
CO4	Analysis of different types of controlled rectifier for various combinations of loads.

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
Unit-I	Choppers	Introduction: DC-to-DC Converter. Principle of chopper operation: constant frequency system, variable frequency system. Types of chopper circuit: first quadrant or type A, second quadrant or type B, two quadrant or type C Chopper, two quadrant or type D chopper, voltage commutated thyristor chopper circuits. .	8	1
Unit-II	Inverters	Introduction: Single phase voltage source inverter: single phase half bridge inverter, single phase full bridge inverter Force commutation thyristor inverter: modified Mc Murray half bridge inverter, modified Mc Murray full bridge inverter Three phase inverter: 180,120 degree mode, introduction to current source inverter, series inverter, parallel inverter.	8	2
Unit-III	Cycloconverters	Introduction, Single phase to single phase circuit step up cycloconverter: mid point cycloconverters, bridge type cycloconverters Single phase to single phase circuit step down cycloconverters: mid point cycloconverters, bridge type cycloconverters.	8	3
Unit-IV	Electrical drive-I	DC drives, introduction, basic performance equation of DC motors: separately excited DC motor., DC series Motor, DC shunt motor Single phase DC drives: single phase half wave converter drives, single phase semi converter drives, single phase full wave converter drives, single phase dual converter drives Chopper drives: motoring control, regenerative braking control.	8	4
Unit-V	Electrical drives-II	AC drives: Introduction Induction motor drives: Analysis and performance, Speed control of Three Phase Induction Motor: Stator Voltage control, Stator Frequency control, Stator Frequency and voltage control, Static Rotor resistance control, Slip energy recovery control.	8	4

References Books:

1 Industrial Electronics: D.C. Gupta.

2 Industrial Electronics and Control: Bhattacharya.

3 Power Electronics: P.S. Bhimbra.

e-Learning Source:

https://nptel.ac.in/

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4
CO1	-	2	-	-	-	3	-	-	-	-	-	-	-	-
CO2	-	-	2	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	1	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	2	-	-	-	-	-	-	-	-	-

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	Sign & Seal of HoD

Integral University, Lucknow

Effective from Session: 2015-16							
Course Code	DEE-606	**Title of the Course**	CONTROL SYSTEM	**L**	**T**	**P**	**C**
Year	THIRD	**Semester**	SIXTH	**3**	**1**	**-**	**-**
Pre-Requisite		**Co-requisite**					
Course Objectives	To analyze the stability of the system by using different techniques.						

Course Outcomes	
CO1	Identify open and closed loop control system.
CO2	Formulate mathematical model for physical systems.
CO3	Simplify representation of complex systems using reduction techniques.
CO4	Analyze the system response and stability in both time-domain and frequency domain.
CO5	Use standard test signals to identify performance characteristics of second-order systems.

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
Unit-I	Control system: functional elements and components	Terminology , functional block diagram of open loop and closed loop control system (with examples), effect of feedback on system performance, servomechanism, modeling of a control system components- dc and ac tachometers, ac and dc servomotor.	8	1
Unit-II	Block diagram and transfer function	Transfer function of physical system, block diagram algebra, block diagram reduction technique, signal flow graphs, rules for drawing signal graphs, mason gain formula, drawing signal flow graph from given block diagram. Order and type of control systems.	8	2
Unit-III	Stability analysis of control system	Basic concept and definition of stability, location of root of characteristic equation, Routh Hurwitz stability criterion, application of Routh- Hurwitz criterion.	8	3
Unit-IV	Time response analysis	Transient and steady-state response, standard test signal, time response specifications of second order system, root locus technique, procedure for drawing root locus diagram.	8	4
Unit-V	Frequency response analysis	Frequency response specification, Polar plot, Bode plot, procedure for drawing Bode plot and determination of gain margin, phase margin and stability.	8	5

References Books:

1 B.S.Manke "linear control systems" khanna publishers, Delhi, Eight Edition: 2005.

2 S Hasan Saeed "Automatic Control System".

.

e-Learning Source:

https://nptel.ac.in/

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4
CO1	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO2	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO3	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO4	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	3	-	-	-	-

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	Sign & Seal of HoD

Integral University, Lucknow

Effective from Session: 2010-11							
Course Code	DIM-601	**Title of the Course**	INDUSTRIAL MANAGEMENT AND ENTREPRENEURSHIP DEVELOPMENT	**L**	**T**	**P**	**C**
Year	III	**Semester**	VI	**3**	**1**	**0**	**40**
Pre-Requisite	10^{th}	**Co-requisite**					
Course Objectives	The course Industrial Management and Entrepreneurship Development prepares Diploma in Automobile Engineering students with essential management and entrepreneurial skills. It covers key management principles like planning, organizing, and control, while enhancing leadership, communication, and motivation techniques. Students learn human resource development, industrial relations, labor welfare, and financial management, including wage administration and costing. Material management concepts such as inventory control and procurement are addressed, alongside industrial laws like the Factory Act and taxation policies. The course also highlights entrepreneurship, project report preparation, and intellectual property rights, equipping students for leadership roles and entrepreneurial opportunities in the automobile industry.						

Course Outcomes	
CO1	The course will increase the skills in the students like communication skills, presentation, Human skills, Leadership skills, Managerial skills etc. after the completion of the course.
CO2	Increase students' capabilities and confidence to handle administrative, managerial and financial activities.
CO3	The course will assist in developing intellectual skills like creative thinking, Decision making, Leadership, Brain Storming, Motivation, etc.
CO4	The course will introduce skills in the students like team work, leadership skills, communication skills, body languages, positive attitude, etc.
CO5	This course is designed to develop understanding of various functions of management, role of workers and engineers and providing knowledge ab

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
UNIT-I	Principles Of Management	Definition of management, Administration organisation, Functions management, Planning, Organizing, Co- ordination and control, Structure and function of industrial organisations, Leadership- Need for leadership, Factors to be considered for accomplishing effective leadership, Communication -Importance, Processes, Barriers to communication, Making communication, Effective, formal and informal communication, Motivation - Factors determining motivation, Positive and negative motivation, Methods for improving motivation, Incentives, Pay promotion and rewards, Controlling - Just in time, Total quality management, Quality circle, Zero defect concept. Concept of Stress Management.	**08**	**CO1**
UNIT-II	Human Resource Development And Human And Industrial Relations	Introduction, Staff development and career development, Training strategies and methods. Human relations and performance in organisation, Understand self and others for effective behaviour, Industrial relation and disputes, Characteristics of group behaviour and Trade unionism, Mob psychology, Labour welfare, Workers participation in management.	**08**	**CO2**
UNIT-III	Personnel And Financial Management	Responsibilities of human resource management - Policies and functions, Selection - Mode of selection - Procedure- training of workers, Job evaluation and Merit rating - Objectives and importance wage and salary administration - Classification of wage, Payment schemes, Components of wage, Wage fixation. Fixed and working capital - resource of capital, Shares, types preference and equity shares, Debenture types, Public deposits, Factory costing, Direct cost, Indirect cost, Factory over head, Fixation of selling price of product, Depreciation- Causes, Methods.	**08**	**CO3**
UNIT-IV	Material Management, Labour, Industrial And Tax Laws	Objective of a good stock control system - ABC analysis of inventory, Procurement and consumption cycle, Reorder level, Lead time, Economic order quantity, Purchasing procedure, Stock keeping, Bin card. Importance and necessity of industrial legislation, Types of labour laws and dispute, Factory Act 1948, Payment of Wages Act 1947, Employee State Insurance Act 1948, Various types of taxes - Production Tax, Local Tax, Trade tax, Excise duty, Income Tax.	**08**	**CO4**

Integral University, Lucknow

UNIT-V	Entrepreneurship Development And Intellectual Property Rights :	Concept of entrepreneurship, need of entrepreneurship in context of prevailing employment conditions of the country. Successful entrepreneurship and training for entrepreneurship development. Idea of project report preparation. Introduction to IPR (Patents, Copy Right, Trade Mark), Protection of undisclosed information, Concept and history of patents, Indian and International Patents Acts and Rules, Patentable and No patentable invention including product versus Process.	**08**	**CO5**

References Books:

Industrial Management And Entrepreneurship Development by Dr. Mohd. Shuaib Siddiqui

e-Learning Source:

https://www.youtube.com/watch?v=kqY4m059zFk&list=PLY8pCdWSlXrSNy8EBIQ9vclPRtd0qmpNo

https://www.youtube.com/watch?v=Jq_BeC-gMEk&list=PL0x1u9aMwXImXW1J5Z7wfH2uwQW9ZgK83

PO-PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1
CO1	-	-	-	-	1	-	-	-	1	-	-	-	-
CO2	-	-	3	-	1	-	-	-	1	-	-	-	-
CO3	-	3	-	-	-	-	-	-	1	1	-	-	-
CO4	-	-	-	-	-	-	-	-	-	1	-	-	-
CO5	2	2	-	2	-	-	-	2	-	1	-	-	-
CO6	-	1	-	3	-	-	-	3	-	-	2	-	-

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Integral University, Lucknow

Effective from Session: 2012-13							
Course Code	DEE-652	**Title of the Course**	POWER ELECTRONICS-II LAB	**L**	**T**	**P**	**C**
Year	THIRD	**Semester**	SIXTH	**-**	**-**	**3**	**-**
Pre-Requisite		**Co-requisite**					
Course Objectives	Knowledge of power electronics devices and components, their uses in converters.						

Course Outcomes	
CO1	Operation of chopper in voltage commutated mode.
CO2	Application of MOSFET and IGBT for PWM inverter.
CO3	Different types of faults and trouble shooting in inverter.
CO4	Study and verification of three phase AC voltage controller for resistive load.

Experiment No.	Experiment	Contact Hrs.	Mapped CO
Experiment-1	Study of voltage commutated chopper.	3	1
Experiment-2	Study of a Bedford inverter.	3	2
Experiment-3	Study of a single phase PWM inverter using MOSFET and IGBT.	3	2
Experiment-4	To understand the function of inverter trainer.	3	2
Experiment-5	To study the inverter circuit.	3	2
Experiment-6	To study the different faults and their troubleshooting in inverter circuit.	3	3
Experiment-7	To understand the function of inverter in presence of main supply and understand the charging of battery.	3	2
Experiment-8	Study of three phase half wave AC voltage controller with R load.	3	4
Experiment-9	Study of three phase full wave AC voltage controller with R load.	3	4
Experiment-10	Study of the application of SCR as a lamp flasher.	3	3
Experiment-11	Study the application of TRIAC as a lamp Dimmer.	3	3

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4
CO1	-	2	-	-	-	-	-	2	-	-	-	-	-	-
CO2	-	-	-	1	-	-	-	-	-	2	-	-	-	-
CO3	-	-	-	-	2	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	3	-	-	-	-	-	-	-	-

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Integral University, Lucknow

Effective from Session: 2012-13							
Course Code	DEE-653	**Title of the Course**	ELECTRICAL DRAWING WORK LAB	**L**	**T**	**P**	**C**
Year	THIRD	**Semester**	SIXTH	**-**	**-**	**3**	**-**
Pre-Requisite		**Co-requisite**					
Course Objectives	To instill students about the importance of engineering drawing so students can understand the installation plan and can take different projects in their professional life.						

Course Outcomes	
CO1	Knowledge of specific difference between earthing of commercial and industrial buildings and equipments.
CO2	Develop the drawing skill of AC machines.
CO3	Impart the knowledge of drawing and control of electrical installation.
CO4	Imparting knowledge of safety before any installation to avoid hazards of electricity.

Experiment No.	Experiment	Contact Hrs.	Mapped CO
Experiment-1	Earthing.	3	1
Experiment-2	Commercial and industrial building.	3	2
Experiment-3	Stays, line crossings, line earthling , end pole and terminal pole, junction poles/towers and transposition pole / tower.	3	2
Experiment-4	Power wiring layout and circuit.	3	2
Experiment-5	Service connection domestic , industrial And agriculture.	3	2
Experiment-6	Substation layout and bus bar arrangement.	3	2
Experiment-7	Machine drawing induction and synchronous Machine.	3	2
Experiment-8	Winding of induction motor.	3	3
Experiment-9	Winding of synchronous machine 3 phase.	3	3
Experiment-10	Reading and interpreting practical Drawing of wire installation and control.	3	3

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4
CO1	2	2	3	1	-	-	3	-	1	-	-	-	-	-
CO2	-	1	1	3	3	-	2	-	2	-	-	-	-	-
CO3	-	2	3	-	3	-	-	-	-	-	-	-	-	-
CO4	1	2	3	-	-	-	2	-	2	-	-	-	-	-

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	Sign & Seal of HoD

Integral University, Lucknow

Effective from Session: 2012-13							
Course Code	DEE-654	**Title of the Course**	MICROPROCESSOR DEVELOPMENT LAB	**L**	**T**	**P**	**C**
Year	THIRD	**Semester**	SIXTH	**-**	**-**	**3**	**-**
Pre-Requisite		**Co-requisite**					
Course Objectives	Study of hierarchical development of microprocessor system and simple programming.						

Course Outcomes	
CO1	Identify relevant information for programming with the Microprocessor.
CO2	Set up programming strategies and select proper mnemonics and run their program on the training boards.
CO3	Practice different types of programming keeping in mind technical issues and evaluate possible causes of discrepancy in practical experimental observations.
CO4	Develop testing and experimental procedures on Microprocessor and analyze their operation under different cases.

Experiment No.	Experiment	Contact Hrs.	Mapped CO
Experiment-1	Assembly language program: programming of simple problems.	3	1
Experiment-2	Simple programming problems using 8085, 8086 microprocessor kit to gain competence in the use of 8085 instruction set.	3	2
Experiment-3	Simple programming problems using 8085, 8086 microprocessor kit to gain competence in the use of Support chip or 8085.	3	2
Experiment-4	Interfacing ADC/DAC chips IS 8085.	3	2
Experiment-5	Interfacing of display devices(seven segments).	3	2
Experiment-6	Measurement of physical quantities like temperature, strain.	3	2
Experiment-7	Speed control of stepper motor.	3	2
Experiment-8	Programming of 8051 controller.	3	3

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4
CO1	-	-	-	-	-	-	-	-	1	-	-	-	-	-
CO2	-	-	-	-	-	-	-	-	1	-	-	-	-	-
CO3	-	-	-	-	-	-	-	-	1	-	-	-	-	-
CO4	-	-	-	-	-	-	-	-	1	-	-	-	-	-

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**