R.M.K. ENGINEERING COLLEGE
RSM Nagar, Kavaraipettai – 601 206

Department of Electronics and Instrumentation Engineering

Course Outcomes – ODD Semester 2018-19

S.No	Semester	Theory/Practical	Course Code / Course Name
1.	3	Theory	MA8353- Transforms and Partial Differential Equations
2.	3	Theory	EC8353- Electronic Devices and Circuits
3.	3	Theory	EE8351- Digital Logic Circuits
4.	3	Theory	EI8351- Electrical Measurements
5.	3	Theory	CS8392- Object Oriented Programming
6.	3	Theory	EI8352- Transducers Engineering
7.	3	Practical	EI8361- Measurements and Transducers Lab
8.	3	Practical	CS8383- Object Oriented Programming Laboratory
9.	5	Theory	EE6502-Microprocessors and Microcontrollers
10.	5	Theory	IC6501-Control Systems
11.	5	Theory	EE6503-Power Electronics
12.	5	Theory	EI6501-Analytical Instruments
13.	5	Theory	EI6502-Industrial Instrumentation – I
14.	5	Theory	CS6401-Operating Systems
15.	5	Practical	EE6612--Microprocessors and Microcontrollers Laboratory
16.	5	Practical	EI6511-Transducers and Measurements Laboratory
17.	5	Practical	GE6674-Communication and Soft Skills - Laboratory Based
18.	7	Theory	EI6701-Industrial Data Networks
19.	7	Theory	EI6702-Logic and Distributed Control System
20.	7	Theory	EC6601-VLSI Design
21.	7	Theory	EI6703-Fibre Optics and Laser Instruments
22.	7	Theory	EI6704-Biomedical Instrumentation
23.	7	Theory	EE6008-Microcontroller Based System Design
24.	7	Practical	EC6612-VLSI Lab
25.	7	Practical	EI6711-Instrumentation System Design Laboratory
26.	7	Practical	EI6712-Comprehension

THIRD SEMESTER

MA8353- Transforms and Partial Differential Equations

COs	Course Outcome : The students, after the completion of the course, are expected to ….
CO1	Understand how to solve the given standard partial differential equations.
CO2	Solve differential equations using Fourier series analysis which plays a vital role in engineering applications.
CO3	Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations.
CO4	Understand the mathematical principles on Fourier transforms would provide them the

	ability to formulate and solve some of the physical problems of engineering.
CO5	Construct z- transform and find inverse z-transform techniques for discrete time systems.
CO6	Use the effective mathematical tools for the solutions of difference equations by using Z transform techniques for discrete time systems.

EC8353- Electronic Devices and Circuits

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Explain the structure, characteristics and biasing of various PN junction diodes and its applications.
CO2	Explain the structure, characteristics and biasing of various types of transistors, thyristors and IGBT.
CO3	Analyze the BJT amplifier circuits using small signal and high frequency model.
CO4	Analyze the FET amplifier circuits using small signal and high frequency model.
CO5	Explain the differential amplifier and types of power amplifier and derive its efficiency.

EE8351- Digital Logic Circuits

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Explain the Concept of Number Systems
CO2	Construct the Combinational Logic Circuits
CO3	Develop the Synchronous Sequential Circuits
CO4	Develop the Asynchronous Sequential Circuits
CO5	Construct the Programmable Logic Devices
CO6	Develop VHDL programs for Digital Logic Circuits

EI8351- Electrical Measurements

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Classify the standard devices and galvanometers for the measurement of voltage and current
CO2	Construct the wattmeter and energy meter to measure power and energy
CO3	Construct instrumentation transformer to measure high values of current and voltage
CO4	Analyze the bridges for the measurement of low, medium and high resistance
CO5	Analyze the bridges for the measurement of inductance and capacitance measurement
CO6	Construct the potentiometers to measure AC and DC values of unknown voltage

CS8392- Object Oriented Programming

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Develop Java programs using OOP principles
CO2	Develop Java programs using the concepts of inheritance and interfaces
CO3	Build Java applications using exceptions and I/O streams
CO4	Develop Java applications with threads and generics classes
CO5	Develop interactive Java programs using swings
CO6	Develop an application based upon the concepts of Java.

EI8352- Transducers Engineering

COs	Course Outcome : The students, after the completion of the course, are expected to ….
CO1	Understand how physical quantities are measured and how they are converted to electrical or other forms.
CO2	Explain the static and dynamic characteristics of transducer, analysis of Zero, First and Second order transducer..
CO3	Explain the construction and operation of variable resistance transducer.
CO4	Demonstrate the knowledge of inductance and capacitance transducers.
CO5	Demonstrate the construction and operation of other transducers and sensors.
CO6	Understand smart traducer and its standard.

EI8361- Measurements and Transducers Lab

COs	Course Outcome : The students, after the completion of the course, are expected to ….
CO1	Understand the concepts of measurement, error and uncertainty.
CO2	Understand the static and dynamic characteristics of measuring instruments.
CO3	Gain knowledge about the principle of operation and characteristics of different types of resistance, capacitance and inductance transducers.
CO4	Acquire knowledge of analyzing different stages of signal conditioning units.
CO5	Ability to interpret the results and draw meaningful conclusions.
CO6	Ability to work as a member of a team while carrying out experiments.

CS8383- Object Oriented Programming Laboratory

COs	Course Outcome : The students, after the completion of the course, are expected to ….
CO1	Develop and implement Java programs for simple applications that make use of classes, packages and interfaces.
CO2	Develop and implement Java programs with array list
CO3	Develop and implement Java programs with exception handling and multithreading .
CO4	Design applications using file processing and generic programming
CO5	Design applications using event handling.

FIFTH SEMESTER

EE6502-Microprocessors and Microcontrollers

COs	Course Outcome : The students, after the completion of the course, are expected to ….
CO1	Explain the architecture and functionalities of 8085 Microprocessor.
CO2	Analyze Assembly level programming in real time applications using 8085.
CO3	Explain the architecture and functionalities of 8051 Microcontroller.
CO4	Configure the external peripherals interfacing with the 8085 microprocessor and 8051 microcontroller.
CO5	Develop skill in simple applications programming with 8051.
CO6	Compare the programming concepts of 8085 and 8051

IC6501-Control Systems

COs	Course Outcome : The students, after the completion of the course, are expected to ….
CO1	Understand the transfer function model for Physical systems

CO2	Illustrate adequate knowledge in the time response of systems and steady state error analysis.
CO3	Examine the frequency-domain response of closed loop system
CO4	Build a compensator system satisfying requirements
CO5	Analyse the stability of linear systems
CO6	Develop state models for linear time invariant system

EE6503-Power Electronics

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Outline of different types of power semiconductor devices and their switching characteristics.
CO2	Analyze single phase controlled converters and their performance parameters.
CO3	Examine three phase controlled converters and their performance parameters.
CO4	Develop basic topologies of DC - DC switching regulators.
CO5	Understand PWM based inverters and harmonic reduction techniques.
CO6	Explain the operation of AC to AC converters.

EI6501-Analytical Instruments

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Explain various techniques for Colorimeters spectrophotometers
CO2	Summarize Chromatography
CO3	Analyze different techniques to measure industrial gas and air pollution
CO4	Outline of pH Measurements
CO5	Illustrate Nuclear magnetic resonance and microscopic techniques
CO6	Analyse a suitable instrumentation system for various industries

EI6502-Industrial Instrumentation – I

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Demonstrate measurement techniques for force, torque and speed
CO2	Illustrate measurement techniques for acceleration, vibration and density
CO3	Select a suitable instrument for measuring pressure and vacuum
CO4	Summarize various temperature measurement techniques
CO5	Identify special techniques for high temperature measurements
CO6	Analyse a suitable instrumentation system for various industries

CS6401-Operating Systems

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Understand the basic concepts and functions of Operating Systems
CO2	Design various scheduling algorithms and apply principles of concurrency
CO3	Students will be able to apply deadlock prevention and avoidance algorithms
CO4	Ability to compare and contrast various memory management schemes
CO5	Design and implement a prototype file systems and I/O sub systems
CO6	Ability to perform administrative tasks on Linux Servers

EE6612--Microprocessors and Microcontrollers Laboratory

COs	Course Outcome : The students, after the completion of the course, are expected to ….
CO1	Develop the simple arithmetic operations using 8085 Microprocessors
CO2	Develop Programming with control instructions
CO3	Explain the interfacing techniques using 8085 Microprocessors
CO4	Develop simple programs using 8051 microcontrollers
CO5	Demonstrate basic instructions using 8051 microcontroller
CO6	Design and implementation of embedded system based projects

EI6511-Transducers and Measurements Laboratory

COs	Course Outcome : The students, after the completion of the course, are expected to ….
CO1	Examine the characteristics of potentiometric transducer, Strain gauge and Load cell.
CO2	Examine the characteristics of LVDT, Hall Effect transducer, LDR and Photoelectric tachometer
CO3	Analyse the characteristics and step response of temperature transducer
CO4	Experiment with balancing of DC bridges
CO5	Experiment with balancing of AC bridges
CO6	Examine the errors through calibration of various meters

GE6674-Communication and Soft Skills - Laboratory Based

COs	Course Outcome : The students, after the completion of the course, are expected to ….
CO1	Take part in international exams like IELTS and TOEFL
CO2	Develop writing skills
CO3	Experiment with speaking skills
CO4	Build leadership qualities
CO5	Interpret contextual knowledge clearly
CO6	Utilize mass media and technology effectively

SEVENTH SEMESTER

EI6701-Industrial Data Networks

COs	Course Outcome : The students, after the completion of the course, are expected to ….
CO1	Understand basic concepts of data networks
CO2	Explain basics of inter networking and serial communications
CO3	Summarize HART and Field buses
CO4	Illustrate MODBUS, PROFIBUS and other communication protocol
CO5	Interpret Industrial Ethernet
CO6	Explain Wireless communication

EI6702-Logic and Distributed Control System

COs	Course Outcome : The students, after the completion of the course, are expected to ….
CO1	Demonstrate Programmable Logic Controller and various programming languages
CO2	Outline various instructions in Programmable Logic Controller
CO3	Develop a logic for various industrial applications using PLC programming language
CO4	Explain computer control systems

CO5	Demonstrate Distributed Control Systems
CO6	Make use of interface techniques in Distributed Control System

EC6601-VLSI Design

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Examine basic CMOS circuits and properties of CMOS transistors and able to draw stick diagram and layout of CMOS circuits
CO2	Examine CMOS realization for combinational logic design and analyze the delay models for combinational circuits
CO3	Evaluate the power dissipation and low power design principles in CMOS circuits.
CO4	Develop sequential logic circuits and memory architecture and low power memory circuits
CO5	Construct different architectures for Arithmetic building blocks
CO6	Develop the techniques of chip design using programmable devices

EI6703-Fibre Optics and Laser Instruments

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Compare types of Optical fibers, optical sources and Detectors
CO2	Classify the industrial applications of optical fibers
CO3	Explain the various types of LASER
CO4	Relate the industrial applications of LASER
CO5	Interpret holography techniques
CO6	Compare the various medical applications of LASER

EI6704-Biomedical Instrumentation

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Explain the different physiological systems of human
CO2	Summarize various electrical and non electrical parameters measuring devices.
CO3	Illustrate non electrical parameters measurement methods
CO4	Classify the various recording methods used in medical field
CO5	Infer the graphical and imaging applications in biomedical system.
CO6	Summarize the life assisting and therapeutic devices

EE6008-Microcontroller Based System Design

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Explain the architecture of PIC microcontroller
CO2	Demonstrate use of interrupts and timers
CO3	Explain on the peripheral devices for data communication and transfer
CO4	Explain functional blocks of ARM processor
CO5	Illustrate the architecture of ARM processors

EC6612-VLSI Lab

COs	**Course Outcome : The students, after the completion of the course, are expected**

	to ….
CO1	Summarize HDL based design entry
CO2	Build simple counters, state machines, adders (min 8 bit) and multipliers
CO3	Develop hardware fusing and testing
CO4	Experiment with differential amplifier
CO5	Develop Layout generation
CO6	Analyse the static timing analysis

EI6711-Instrumentation System Design Laboratory

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Analyse Instrumentation amplifier, active filters, regulated power supply, V/I and I/V converters
CO2	Examine the signal conditioning circuit for Thermocouple, strain gauge and RTD
CO3	Analyse Control valve, orifice plate and rotameter.
CO4	Inspect PID controller
CO5	Summarize P & ID for industrial process
CO6	Illustrate Programmable Logic Controller for digital logic gates

EI6712-Comprehension

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Explain Engineering fundamentals
CO2	Apply mathematics to engineering problem
CO3	Apply Engineering fundamentals to complex circuits
CO4	Take part in discussion as a leader in diverse teams
CO5	Extend knowledge on communication and presentation skills
CO6	Develop managerial skills to establish start ups

Course Outcomes – EVEN Semester 2018-19

S.No	Semester	Theory/Practical	Course Code / Course Name
1.	4	Theory	MA8491- Numerical Methods
2.	4	Theory	EI8451- Electrical Machines
3.	4	Theory	EI8452- Industrial Instrumentation - I
4.	4	Theory	EE8451- Linear Integrated Circuits and Applications
5.	4	Theory	IC8451- Control Systems
6.	4	Theory	EC8395- Communication Engineering
7.	4	Practical	EI8461- Devices and Machines Laboratory
8.	4	Practical	EE8461- Linear and Digital Integrated Circuits Laboratory
9.	6	Theory	EI6601- Modern Electronic Instrumentation
10.	6	Theory	EI6602- Process Control
11.	6	Theory	EI6603-Industrial Instrumentation – II
12.	6	Theory	EC6651- Communication Engineering
13.	6	Theory	EE6602- Embedded Systems
14.	6	Theory	EI6002- Power Plant Instrumentation
15.	6	Practical	EI6611- Industrial Instrumentation lab
16.	6	Practical	EI6612- Process Control Lab
17.	8	Theory	MG6851- Principles of Management
18.	8	Theory	EI6801- Computer Control of Processes
19.	8	Theory	GE6757- Total Quality Management
20.	8	Practical	EI6811- Project Work

FOURTH SEMESTER

MA8491- Numerical Methods

COs	Course Outcome : The students, after the completion of the course, are expected to ….
CO1	Apply the concepts of algebraic and transcendental equations
CO2	Evaluate the eigenvalues of a matrix numerically
CO3	Construct an approximate interpolating polynomials for equal and unequal intervals.
CO4	Apply the numerical techniques of differentiation and integration for engineering problems.
CO5	Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.
CO6	Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications.

EI8451- Electrical Machines

COs	Course Outcome : The students, after the completion of the course, are expected to ….
CO1	Understand the working principles of DC machines as Generator and Motor, types, determination of their no-load/load characteristics, starting and methods of speed control of motors.
CO2	Acquire the basic knowledge of construction, working and operation of transformer

CO3	Analyse the construction and working of Synchronous machines
CO4	Understand the construction working starting and speed control of three phase induction motor
CO5	Understand the principle of operation of Single Induction machines

EI8452- Industrial Instrumentation – I

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Introduce the measurement techniques of force, torque and speed
CO2	Introduce the measurement techniques of acceleration, Vibration and density
CO3	Introduce the measurement techniques of Viscosity, Humidity and moisture.
CO4	Introduce the temperature measurement techniques
CO5	Introduce the pressure measurement techniques

EE8451- Linear Integrated Circuits and Applications

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Outline the fabrication process of IC
CO2	Illustrate the ideal and non ideal characteristics of op-amp
CO3	Explain various applications of op-amp.
CO4	Design the different types of oscillators and ADC,DAC
CO5	Illustrate various application ICs
CO6	Explain the working of special function ICs.

IC8451- Control Systems

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Analyze electromechanical systems by mathematical modeling.
CO2	Illustrate the time response of first and second order systems using standard test signals
CO3	Examine the frequency-domain response of closed loop system
CO4	Identify a compensator system satisfying requirements
CO5	Develop system equations in state-variable form (state variable models)
CO6	Analyze a control theory applications to AC motors

EC8395- Communication Engineering

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Identify and Understand analog communication techniques
CO2	Discuss about pulse modulation techniques.
CO3	Identify and Understand digital communication techniques
CO4	Understand the various source coding techniques and apply the suitable error control codes
CO5	Understand about spread spectrum techniques.
CO6	Understand about Multiple access techniques.

EI8461- Devices and Machines Laboratory

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**

CO1	Gain knowledge on the proper usage of various electronic equipment and simulation tools for design and analysis of electronic circuits.
CO2	Get hands-on experience in studying the characteristics of semiconductor devices.
CO3	Ability to analyze various electronic circuits such as voltage regulators, transistor amplifiers and oscillators.
CO4	Ability to make use of basic concepts to obtain the no load and load characteristics of D.C machines.
CO5	Analyze and draw conclusion from the characteristics obtained by conducting experiments on machines.
CO6	Ability to carry out the Experiments in batches to motivate the Team work.

EE8461- Linear and Digital Integrated Circuits Laboratory

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Ability to understand and implement Boolean Functions.
CO2	Ability to understand the importance of code conversion
CO3	Ability to Design and implement 4-bit shift registers.
CO4	Ability to acquire knowledge on Application of Op-Amp
CO5	Ability to Design and implement counters using specific counter IC

SIXTH SEMESTER

EI6601- Modern Electronic Instrumentation

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Demonstrate various electronic instruments for measurement of voltage
CO2	Illustrate various types of cathode ray oscilloscopes and their applications
CO3	Summarize different types of signal analysers
CO4	Explain different types of waveform generators
CO5	Examine a measurement system using VI programming techniques
CO6	Apply different types of modulation and multiplexing techniques in telemetry

EI6602- Process Control

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Analyze the dynamics of various processes such as level, pressure and temperature.
CO2	Develop the suitable controller for different processes.
CO3	Model actuators, control valves and compare their characteristics.
CO4	Analyze the evaluation criteria and tuning techniques of controllers.
CO5	Explain multivariable control and explain the concept of multi loop control techniques.
CO6	Apply the multi loop control technique to construct the controllers.

EI6603-Industrial Instrumentation – II

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Demonstrate variable head type flow meters
CO2	Illustrate quantity meters, air flow meters and mass flow meters
CO3	Explain electrical type flow meters
CO4	Identify techniques for level measurement

CO5	Explain different techniques for Viscosity, moisture and Humidity measurement
CO6	Analyze a suitable instrumentation system for various industries

EC6651- Communication Engineering

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Analyze different methods of analog communication and their significance
CO2	Illustrate Digital Communication methods for high bit rate transmission
CO3	Inspect the concepts of source and line coding techniques for enhancing rating of transmission of minimizing the errors in transmission
CO4	Understand MA Techniques in communication
CO5	Describe satellite communication systems for enhancing the number of users.
CO6	Describe various media for optical communication

EE6602- Embedded Systems

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Outline the essentials of function and Blocks of Embedded system
CO2	Explain the different communication network strategies of embedded systems
CO3	Demonstrate the different phases of embedded product development life cycle (EDLC)
CO4	Interpret the issues, modeling and computational models in Embedded design
CO5	Explain the basic concepts and compare the features of real time operating systems (RTOS)
CO6	Summarize the concepts of Embedded Systems in real time applications

EI6002- Power Plant Instrumentation

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Illustrate an overview on power generation through various methods
CO2	Explain the important power plant measurements and devices
CO3	Explain basic Boiler control techniques
CO4	Explain advanced Boiler control techniques
CO5	Understand the turbine control techniques

EI6611- Industrial Instrumentation lab

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Test for Discharge coefficient of orifice plate and Calibration of pressure gauge
CO2	Test for Torque, Viscosity and Vacuum pressure measurement
CO3	Experiment for level measurement using d/p transmitter and capacitance based
CO4	Experiment with UV – Visible and IR spectrophotometer
CO5	Experiment with pH and conductivity meter
CO6	Examine Pulse rate and ECG measurement

EI6612- Process Control Lab

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Experiment with Level Control and Pressure Control in Process Control Training

	Plant
CO2	Experiment with flow Control and Temperature Control in Process Control Training Plant
CO3	Infer characteristics Pneumatically Actuated Control Valve
CO4	Analyse PID Controller for mathematically described processes and implementation issues
CO5	Examine Multi-loop PI Controller for Three and four tank system
CO6	Make use of AC and DC drives

EIGHTH SEMESTER

MG6851- Principles of Management

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Explaining the basic principles, concepts, evolution of Management thinking, the role of managers and different types of organization.
CO2	Apply knowledge on Planning tools and techniques
CO3	Discuss the stages in decision making process and explain the types of strategies in order to make rational decisions
CO4	Illustrate the concepts of controlling and organizing of an organization.
CO5	Assess and compare different leadership styles and select appropriate style for an organization
CO6	Compile and demonstrate effective communication and explain various theories of motivation, innovation and creativity

EI6801- Computer Control of Processes

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Construct the discrete time systems in state variable form
CO2	Explain the system identification techniques
CO3	Make use of different types of algorithms for the design of direct discrete system
CO4	Explain the concept of Digital Feed forward Controllers, Internal Model Control and LQG Control
CO5	Illustrate the multi-loop regulatory control techniques
CO6	Explain the different types of multivariable regulatory controllers

GE6757- Total Quality Management

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Explain the customer care management systems
CO2	Apply the leadership qualities in management
CO3	Explain the Benchmark in manufacturing system
CO4	Execute the Quality Management principles using six sigma
CO5	Explain the ISO Auditing system

EI6811- Project Work

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Demonstrate a sound technical knowledge of their selected project topic
CO2	Identify the problem, formulation and solution
CO3	Design engineering solutions to complex problems utilising a systems approach

CO4	Develop an engineering project
CO5	Demonstrate the knowledge, skills and attitudes of a professional engineer
CO6	Improve the managerial skills to meet the industry

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1.	3	Theory	MA8353- Transforms and Partial Differential Equations
2.	3	Theory	EC8353- Electronic Devices and Circuits
3.	3	Theory	EE8351- Digital Logic Circuits
4.	3	Theory	EI8351- Electrical Measurements
5.	3	Theory	CS8392- Object Oriented Programming
6.	3	Theory	EI8352- Transducers Engineering
7.	3	Practical	EI8361- Measurements and Transducers Lab
8.	3	Practical	CS8383- Object Oriented Programming Laboratory
9.	5	Theory	EI8551- Analytical Instruments
10	5	Theory	EI8552- Industrial Instrumentation - II
11	5	Theory	EI8553- Process Control
12	5	Theory	EE8551- Microprocessors and Microcontrollers
13	5	Theory	EE8591- Digital Signal Processing
14	5	Theory	OCE551- Air Pollution and Control Engineering
15	5	Practical	EI8561- Industrial Instrumentation Laboratory
16	5	Practical	EE8681- Microprocessors and Microcontrollers Laboratory
17	7	Theory	EI6701-Industrial Data Networks
18	7	Theory	EI6702-Logic and Distributed Control System
19	7	Theory	EC6601-VLSI Design
20	7	Theory	EI6703-Fibre Optics and Laser Instruments
21	7	Theory	EI6704-Biomedical Instrumentation
22	7	Theory	EE6008-Microcontroller Based System Design
23	7	Practical	EC6612-VLSI Lab
24	7	Practical	EI6711-Instrumentation System Design Laboratory
25	7	Practical	EI6712-Comprehension

THIRD SEMESTER

MA8353- Transforms and Partial Differential Equations

COs	Course Outcome : The students, after the completion of the course, are expected to ….
CO1	Understand how to solve the given standard partial differential equations.
CO2	Solve differential equations using Fourier series analysis which plays a vital role in engineering applications.
CO3	Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations.
CO4	Understand the mathematical principles on Fourier transforms would provide them the ability to formulate and solve some of the physical problems of engineering.
CO5	Construct z- transform and find inverse z-transform techniques for discrete time systems.
CO6	Use the effective mathematical tools for the solutions of difference equations by using Z transform techniques for discrete time systems.

EC8353- Electronic Devices and Circuits

COs	Course Outcome : The students, after the completion of the course, are expected to ….

CO1	Explain the structure, characteristics and biasing of various PN junction diodes and its applications.
CO2	Explain the structure, characteristics and biasing of various types of transistors, thyristors and IGBT.
CO3	Analyze the BJT amplifier circuits using small signal and high frequency model.
CO4	Analyze the FET amplifier circuits using small signal and high frequency model.
CO5	Explain the differential amplifier and types of power amplifier and derive its efficiency.

EE8351- Digital Logic Circuits

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Explain the Concept of Number Systems
CO2	Construct the Combinational Logic Circuits
CO3	Develop the Synchronous Sequential Circuits
CO4	Develop the Asynchronous Sequential Circuits
CO5	Construct the Programmable Logic Devices
CO6	Develop VHDL programs for Digital Logic Circuits

EI8351- Electrical Measurements

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Classify the standard devices and galvanometers for the measurement of voltage and current
CO2	Construct the wattmeter and energy meter to measure power and energy
CO3	Construct instrumentation transformer to measure high values of current and voltage
CO4	Analyze the bridges for the measurement of low, medium and high resistance
CO5	Analyze the bridges for the measurement of inductance and capacitance measurement
CO6	Construct the potentiometers to measure AC and DC values of unknown voltage

CS8392- Object Oriented Programming

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Develop Java programs using OOP principles
CO2	Develop Java programs using the concepts of inheritance and interfaces
CO3	Build Java applications using exceptions and I/O streams
CO4	Develop Java applications with threads and generics classes
CO5	Develop interactive Java programs using swings
CO6	Develop an application based upon the concepts of Java.

EI8352- Transducers Engineering

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Understand how physical quantities are measured and how they are converted to electrical or other forms.
CO2	Explain the static and dynamic characteristics of transducer, analysis of Zero, First and Second order transducer..
CO3	Explain the construction and operation of variable resistance transducer.
CO4	Demonstrate the knowledge of inductance and capacitance transducers.

CO5	Demonstrate the construction and operation of other transducers and sensors.
CO6	Understand smart traducer and its standard.

EI8361- Measurements and Transducers Lab

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Understand the concepts of measurement, error and uncertainty.
CO2	Understand the static and dynamic characteristics of measuring instruments.
CO3	Gain knowledge about the principle of operation and characteristics of different types of resistance, capacitance and inductance transducers.
CO4	Acquire knowledge of analyzing different stages of signal conditioning units.
CO5	Ability to interpret the results and draw meaningful conclusions.
CO6	Ability to work as a member of a team while carrying out experiments.

CS8383- Object Oriented Programming Laboratory

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Develop and implement Java programs for simple applications that make use of classes, packages and interfaces.
CO2	Develop and implement Java programs with array list
CO3	Develop and implement Java programs with exception handling and multithreading .
CO4	Design applications using file processing and generic programming
CO5	Design applications using event handling.

FIFH SEMESTER

EI8551- Analytical Instruments

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Ability to understand the fundamental principles of selective analytical instruments used in medical diagnosis, quality assurance & control and research studies.
CO2	Ability to assess and suggest a suitable analytical method for a specific purpose, and evaluate sensitivity, important sources of interferences and errors, and also suggest alternative analytical methods for quality assurance.
CO3	Ability to critically evaluate the strengths and limitations of the various instrumental methods.
CO4	Ability to develop critical thinking for interpreting analytical data.
CO5	Ability to understand the working principle, types and applications of NMR and Mass spectroscopy
CO6	Illustrate the Microscopic, SEM and TEM techniques.

EI8552- Industrial Instrumentation - II

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Demonstrate variable head type flow meters
CO2	Illustrate quantity meters, air flow meters and mass flow meters
CO3	Explain electrical type flow meters
CO4	Identify techniques for level measurement
CO5	Explain various types of transmitters
CO6	Analyze a suitable instrumentation system for various industries

EI8553- Process Control

COs	Course Outcome : The students, after the completion of the course, are expected to ….
CO1	Ability to understand technical terms and nomenclature associated with Process control domain.
CO2	Ability to build models using first principles approach as well as analyze models.
CO3	Ability to understand final control elements
CO4	Ability to Design, tune and implement PID Controllers to achieve desired performance for various processes
CO5	Ability to Analyze Systems and design & implement control Schemes for various Processes.
CO6	Ability to Identify, formulate and solve problems in the Process Control Domain

EE8551- Microprocessors and Microcontrollers

COs	Course Outcome : The students, after the completion of the course, are expected to ….
CO1	Outline the functional blocks of 8085 microprocessor
CO2	Develop an assembly language program for 8085 microprocessor
CO3	Explain the architecture of 8051 microcontroller
CO4	Interpret the interrupt structure of 8085 and 8051
CO5	Illustrate how the different peripherals are interfaced with Microprocessor and microcontroller
CO6	Develop a program for automated system using 8051

EE8591- Digital Signal Processing

COs	Course Outcome : The students, after the completion of the course, are expected to ….
CO1	Classify the different types of signals and systems
CO2	Apply z-transform and inverse Z transform in discrete systems
CO3	Explain the sampling process of continuous time signal.
CO4	Apply Radix-2 (DIT) and (DIF) FFT Algorithm using Discrete Fourier Transform
CO5	Compare (IIR) filters and (FIR) filters.
CO6	Explain various architectures of Digital signal processors

OCE551- Air Pollution and Control Engineering

COs	Course Outcome : The students, after the completion of the course, are expected to ….
CO1	Understand the atmospheric process and pollutant transport mechanism
CO2	Apply modelling techniques and to determine the fate of air pollutant with respect to time and space
CO3	Prevent and control air pollution by suitable air pollution control measures
CO4	Control and Monitoring of gaseous contaminants in air pollution
CO5	Prevent, control and measure of Indoor air quality management

EI8561- Industrial Instrumentation Laboratory

COs	Course Outcome : The students, after the completion of the course, are expected to ….

CO1	Ability to experimentally measure industrial process parameters such as flow and level,
CO2	Ability to experimentally measure industrial process parameters such as temperature and pressure
CO3	Ability to experimentally measure industrial process parameters such as viscosity.
CO4	Ability to measure and analyze pH, conductivity
CO5	Ability to measure and analyze UV absorbance and transmittance.
CO6	Ability to measure and analyze physiological parameters such as BP, ECG and pulse rate.

EE8681- Microprocessors and Microcontrollers Laboratory

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Ability to understand and apply computing platform and software for engineering problems.
CO2	Ability to programming logics for code conversion
CO3	Ability to acquire knowledge on A/D and D/A.
CO4	Ability to understand basics of serial communication.
CO5	Ability to understand and impart knowledge in DC and AC motor interfacing.
CO6	Ability to understand basics of software simulators.

SEVENTH SEMESTER

EI6701-Industrial Data Networks

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Understand basic concepts of data networks
CO2	Explain basics of inter networking and serial communications
CO3	Summarize HART and Field buses
CO4	Illustrate MODBUS, PROFIBUS and other communication protocol
CO5	Interpret Industrial Ethernet
CO6	Explain Wireless communication

EI6702-Logic and Distributed Control System

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Demonstrate Programmable Logic Controller and various programming languages
CO2	Outline various instructions in Programmable Logic Controller
CO3	Develop a logic for various industrial applications using PLC programming language
CO4	Explain computer control systems
CO5	Demonstrate Distributed Control Systems
CO6	Make use of interface techniques in Distributed Control System

EC6601-VLSI Design

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Examine basic CMOS circuits and properties of CMOS transistors and able to draw

	stick diagram and layout of CMOS circuits
CO2	Examine CMOS realization for combinational logic design and analyze the delay models for combinational circuits
CO3	Evaluate the power dissipation and low power design principles in CMOS circuits.
CO4	Develop sequential logic circuits and memory architecture and low power memory circuits
CO5	Construct different architectures for Arithmetic building blocks
CO6	Develop the techniques of chip design using programmable devices

EI6703-Fibre Optics and Laser Instruments

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Compare types of Optical fibers, optical sources and Detectors
CO2	Classify the industrial applications of optical fibers
CO3	Explain the various types of LASER
CO4	Relate the industrial applications of LASER
CO5	Interpret holography techniques
CO6	Compare the various medical applications of LASER

EI6704-Biomedical Instrumentation

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Explain the different physiological systems of human
CO2	Summarize various electrical and non electrical parameters measuring devices.
CO3	Illustrate non electrical parameters measurement methods
CO4	Classify the various recording methods used in medical field
CO5	Infer the graphical and imaging applications in biomedical system.
CO6	Summarize the life assisting and therapeutic devices

EE6008-Microcontroller Based System Design

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Explain the architecture of PIC microcontroller
CO2	Demonstrate use of interrupts and timers
CO3	Explain on the peripheral devices for data communication and transfer
CO4	Explain functional blocks of ARM processor
CO5	Illustrate the architecture of ARM processors

EC6612-VLSI Lab

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Summarize HDL based design entry
CO2	Build simple counters, state machines, adders (min 8 bit) and multipliers
CO3	Develop hardware fusing and testing
CO4	Experiment with differential amplifier

CO5	Develop Layout generation
CO6	Analyse the static timing analysis

EI6711-Instrumentation System Design Laboratory

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Analyse Instrumentation amplifier, active filters, regulated power supply, V/I and I/V converters
CO2	Examine the signal conditioning circuit for Thermocouple, strain gauge and RTD
CO3	Analyse Control valve, orifice plate and rotameter.
CO4	Inspect PID controller
CO5	Summarize P & ID for industrial process
CO6	Illustrate Programmable Logic Controller for digital logic gates

EI6712-Comprehension

COs	**Course Outcome : The students, after the completion of the course, are expected to ….**
CO1	Explain Engineering fundamentals
CO2	Apply mathematics to engineering problem
CO3	Apply Engineering fundamentals to complex circuits
CO4	Take part in discussion as a leader in diverse teams
CO5	Extend knowledge on communication and presentation skills
CO6	Develop managerial skills to establish start ups