

**Course Outcomes: Students should be able to**  
**Second Year Instrumentation & Control Engineering (SE) (Curriculum 2015 Pattern)**

**Semester-I**

<b>Subject</b>	<b>Basic Instrumentation</b>
<b>Subject Code</b>	SE204(206262)
<b>Course Outcome (COs)</b>	
SE 204.1	Students will gain the knowledge of instruments & its Characteristics
SE 204.2	Students will gain the basic principle of analog Instruments
SE 204.3	Students will gain the basic knowledge designing AC & DC bridges
SE 204.4	Students will gain the basic knowledge of recording devices, CRO. And Various measurement using CRO
SE 204.5	Student will gain the knowledge of ultrasonic distance meter, single phase meter, digital thermometer etc
SE 204.6	Student will gain the knowledge of X-Y recorder ,their types and its application

<b>Subject</b>	<b>Network Theory</b>
<b>Subject Code</b>	SE201(206264)
<b>Course Outcome (COs)</b>	
SE 201.1	Will able to articulate in working of various components of a circuit.
SE 201.2	Will be familiar with ac and dc circuits solving.
SE 201.3	Will be ready with the most important concepts like mesh and nodal analysis.
SE 201.4	Ability to Solve Circuits using Tree, Node, Branch, Cut set, Tie Set Methods.
SE 201.5	Ability to measure Three phase voltages and current, active, reactive powers
SE 201.6	Ability to Express given Electrical Circuit in terms of A,B,C,D and Z,Y Parameter Model and Solve the circuits.

<b>Subject</b>	<b>Linear Integrated Circuits</b>
<b>Subject Code</b>	SE205(206263)
<b>Course Outcome (COs)</b>	
SE 205.1	Fundamental knowledge gain of an Op-Amp.
SE 205.2	Develop ability to understand and design of feedback amplifier circuits.
SE 205.3	Develop ability to design and implementation of linear applications of Op-Amp circuits.
SE 205.4	Develop ability to design and implementation of non-linear applications of Op-Amp circuits.
SE 205.5	Develop ability to understand and design of timer and voltage regulator circuits.
SE 205.6	Develop ability to understand and design of active filters using Op-Amp.

<b>Subject</b>	<b>Sensors &amp; Transducers -I</b>
<b>Subject Code</b>	SE203(206261)
<b>Course Outcome (COs)</b>	
SE 203.1	Identify, formulate and solve a problem of Instrumentation and Control Engineering
SE 203.2	Ability to design and conduct experiments for measurement.
SE 203.3	Demonstrate an understanding of sensors and transducers.
SE 203.4	Ability to design and conduct experiments for force & Torque measurement
SE 203.5	Demonstrate an understanding of Pressure sensors
SE 203.6	Demonstrate an understanding of Temperature sensors

<b>Subject</b>	<b>Mathamatics-III</b>
<b>Subject Code</b>	SE206(207006)
<b>Course Outcome (COs)</b>	
SE206.1	Solve higher order linear differential equation using appropriate techniques for modeling and analysing electrical
SE206.2	Solve problems related to Laplace transform, Fourier transform, Z -Transform and applications to Signal processing
SE206.3	Perform vector differentiation and integration, analyse the vector fields and apply to Electro-Magnetic fields
SE206.4	Analyse conformal mappings, transformations and perform contour integration of complex functions in the study of
SE206.5	Develop ability to understand Line, Surface and Volume integrals, Work-done, Green's Lemma, Gauss's Divergence
SE206.6	Develop ability to understand Functions of Complex variables, Analytic functions, Cauchy-Riemann equations,

<b>Semester-II</b>
--------------------

<b>Subject</b>	<b>Digital Technique</b>
<b>Subject Code</b>	SE207(206270)
<b>Course Outcome (COs)</b>	
SE207.1	Students will demonstrate the knowledge of operation of logic gates, Boolean algebra including algebraic manipulation/simplification, and application of DeMorgan's theorems.
SE207.2	The Student will gain the knowledge of different logic family and their Interfacing.
SE207.3	Able to design Multiplexer, Demultiplexer Decoder, Encoder
SE207.4	Students will be able to analyze and design of digital combinational circuits ,half adder, full adder, Flip flop, Counter,
SE207.5	Students will be able to analyze and design of digital combinational circuits PLA, PLD, CPLD, and Microprocessor
SE207.6	Students will demonstrate knowledge of the nomenclature and technology in the area of memory devices: ROM, RAM, and PROM, memory devices: ROM, RAM, and PROM.

<b>Subject</b>	<b>Automatic Control System</b>
<b>Subject Code</b>	SE208(206268)
<b>Course Outcome (COs)</b>	
SE208.1	Classify the control systems.
SE208.2	Develop mathematical models of control systems.
SE208.3	Analyse the Linear time invariant system in time and frequency domain.
SE208.4	Get familiar with modern control theory.

<b>Subject</b>	<b>Sensors &amp; Transducers-II</b>
<b>Subject Code</b>	SE209(206267)
<b>Course Outcome (COs)</b>	
SE209.1	Identify, formulate and solve a problem of Instrumentation and Control Engineering
SE209.2	Ability to design and conduct experiments for measurement.
SE209.3	Demonstrate an understanding of sensors and transducers
SE209.4	The Student will gain the knowledge of different detectors & Sensors
SE209.5	The Student will gain the knowledge of different sensor & Signal conditioning device
SE209.6	The Student will gain the knowledge of different signal conditioning circuit for RTD, Thermocouple ,LVDT

	<b>Electronics Instrumentation</b>
<b>Subject</b>	SE210(206269)
<b>Subject Code</b>	
<b>Course Outcome (COs)</b>	
SE210.1	Be able to analyse the operation of different types of measuring instruments like True-RMS Meter, DMM, RLC-Q meter, Distortion Factor Meter, Universal Counter and know the working of measuring instruments.
SE210.2	Be able to analyse the operation of different types of signal generating instruments like Arbitrary Waveform Generator, Ramp wave Generator, Pulse Generator. Know the working of signal generating instruments.
SE210.3	Know the complete internal structure of ADCs and DACs. Perform the experiments, analysis on ADC and DAC ICs.
SE210.4	In the LCR circuit student can determine experimentally the unknown inductance, capacitance and resistance and Q and D factor with the instruments with which he can know the different options and strengths of the instruments.
SE210.5	Further to know the knowledge in the field of integrated circuit technology and its applications like PLL, VCO, Analog MUX/DEMUX, VTF and FTV.
SE210.6	Students can understand and Analyse the types of modulations, Demonstrate about various blocks in Transmitters and Receivers, Analyse all Modulation techniques in time and frequency domains.

	<b>Industrial Drives</b>
<b>Subject</b>	
<b>Subject Code</b>	SE211(206271)
<b>Course Outcome (COs)</b>	
SE211.1	Understand construction, working, characteristics, triggering and commutation of different power devices.
SE211.2	Understand Principle, Working, and Classification of converters, choppers and inverters.
SE211.3	Understand Principle, Construction, Working, Characteristics and Applications of DC motors.
SE211.4	Understand Principle, Construction, Working, Characteristics and Applications of AC motors.
SE211.5	Understand speed control techniques for different DC motors.
SE211.6	Understand speed control techniques for different AC motors.

	<b>Soft Skills</b>
<b>Subject</b>	SE 212 (206272)
<b>Subject Code</b>	
<b><i>Course Outcome (COs)</i></b>	
SE212.1	Capable of effectively monitoring, analyzing, and adjusting their own communication behavior.
SE212.2	Communicate appropriately and effectively within groups.
SE212.3	Demonstrate the ability to effectively deliver formal presentations before a variety of live audiences
SE212.4	Assist in learning technical aspects of communication for better performance in extra-curricular activities, recruitment process and prospective jobs.
SE212.5	Knowledge of other skills like time management, stress management skill.
SE212.6	Encourages students to become highly interactive with colleagues and to value both that process and to seek positive.

<b>Course Outcomes: Students should be able to</b>	
<b>Third Year Instrumentation &amp; Control Engineering (TE) (Curriculum 2015 Pattern)</b>	
<b>Semester-I</b>	
<b>Subject</b>	<b>Instrumental Method for Chemical Analysis</b>
	TE 302 (302042)
<b>Subject Code</b>	
<b>Course Outcome (COs)</b>	
TE 302.1	Subject will provide a thorough knowledge of various units used in chemical analysis & electro analytical methods like potentiometry, voltametry, filter photometer & Spectrophotometry
TE 302.2	Subject will make students aware of IR sources, IR detectors as well as types of Photometers along with AC & DC arc excitation, Floirimeter Mass Spectrometry
TE 302.3	Students will be able to understand principle & constructional details of mass analyzers, gas chromatography, liquid chromatography & ionization methods.
TE 302.4	Subject will explain the concept of X- ray spectrometry, Bragg's law, principle of Abbe's differential refract meter along with different types of counters

	<b>Industrial Organisation and Management</b>
<b>Subject</b>	TE 303 (306265)
<b>Subject Code</b>	
<b>Course Outcome (COs)</b>	
TE 303.1	Students will have clear understanding of managerial functions and knowledge on international aspect of management.
TE 303.2	Ability to apply concept of management & strategic planning for organization.
TE 303.3	Students will learn about various management technique for developing strategy & performance analysis techniques.
TE 303.4	Ability to apply the tools and techniques of quality management to manufacturing and services processes.
TE 303.5	Ability to develop industry-institute interaction.
TE 303.6	Ability to understand production planning, purchase, storage and handling of material.

	<b>Embedded System Design</b>
<b>Subject</b>	TE 309 (306261)
<b>Subject Code</b>	
<b>Course Outcome (COs)</b>	
TE 309.1	Students will be able to understand the architectural and functional details of 8051 & AVR microcontroller.
TE 309.2	Students will be able to program the 8051 & AVR microcontroller in assembly and C.
TE 309.3	Students will be familiar with communication of 8051 & AVR microcontroller with other microcontrollers or personal
TE 309.4	Students will be able to design and interface external devices like LED/LCD Displays, Sensors, Motors, Relays, etc.
TE 309.5	Students will be possess a reasonable level of competence in the design, construct and implement an application of
TE 309.6	Students will be able to developed an awareness and understanding of the crucial part that embedded system plays in

	<b>Control Systems Design</b>
<b>Subject</b>	TE 304 (306263)
<b>Subject Code</b>	
<b>Course Outcome (COs)</b>	
TE 304.1	Analyze the system in time and frequency domain.
TE 304.2	Design the compensator for required specifications using classical mathematical tools.
TE 304.3	Tune the PID controllers using classical approach.
TE 304.4	Design the controllers using direct synthesis approach.
TE 304.5	Design the state feedback controllers and observers.
TE 304.6	Analyze the controller performance using performance indices.



	<b>Control System Components</b>
<b>Subject</b>	TE 306 (306263)
<b>Subject Code</b>	
<b>Course Outcome (COs)</b>	
TE 306.1	Student will be demonstrating knowledge in electrical field.
TE 306.2	Ability to use of switches relays & contactors for various process control applications.
TE 306.3	Ability to sequencing & interlocking of motors in wiring diagram.
TE 306.4	Ability to develop the hydraulic and pneumatic system circuits for various applications.
TE 306.5	Students will be capable of applying the knowledge of hazardous area & intrinsic safety for industrial area.

<b>Subject</b>	<b>Seminar</b>
<b>Subject Code</b>	ME 313 (302053)
<b>Course Outcome (COs)</b>	
TE 313.1	Establish motivation for any topic of interest and develop a thought process for technical presentation.
TE 313.2	Organize a detailed literature survey and build a document with respect to technical publications.
TE 313.3	Analysis and comprehension of proof-of-concept and related data.
TE 313.4	Effective presentation and improve soft skills.
TE 313.5	Make use of new and recent technology (e.g. Latex) for creating technical reports

## Semester-II

<b>Subject</b>	<b>Process Loop Components</b>
	TE 307(306269)
<b>Subject Code</b>	
<b>Course Outcome (COs)</b>	
TE 307.1	The graduates will become familiar with fundamentals of process control loops with standard symbols used in process
TE 307.2	The graduates will learn process characteristics and ability to understand and analyze process control engineering
TE 307.3	The graduates will able to know the need of transmitters and converters in process control.
TE 307.4	The graduates will understand the continuous & discontinues control actions with tuning methods of PID controller.
TE 307.5	The graduates will learn and developed the PLC ladder programming which is very useful in automatic process
TE 307.6	The graduates will able to design of control value for gas, vapors and liquid services.
TE 307.7	The graduates will be able to make safety scheme for industrial process control.

<b>Subject</b>	<b>Biomedical Instrumentation</b>
<b>Subject Code</b>	<b>TE 308 (306272)</b>
<b>Course Outcome (COs)</b>	
<b>TE 308.1</b>	The students will be able to identify various bio-potential and their specifications in terms of amplitude and frequency.
<b>TE 308.2</b>	The students will be able to understand principle and working of various biomedical instruments for diagnosis
<b>TE 308.3</b>	Ability to design and conduct experiments, including making measurements and interpreting experimental data from living systems and addressing the problems associated with the interaction between living systems and non-living
<b>TE 308.4</b>	Biomedical engineering education must allow engineers to analyze a problem from both an engineering and biological
<b>TE 308.5</b>	Ability to make measurements on and interpret data from living system.

<b>Subject</b>	<b>Digital Signal Processing</b>
<b>Subject Code</b>	TE 401 (306268)
<b>Course Outcome (COs)</b>	
TE 401.1	Graduate will demonstrate knowledge of different Signal & system in Digital Signal Processing.
TE 401.2	Students will be able to analyze the Sampling theorem & Frequency response characteristics
TE 401.3	Students will be able to analyze discrete-time Fourier series (DTFS) & IDFT.

TE 401.4	Students will be able to analyze the Decimation in frequency IFFT using DIT and DIF algorithms
TE 401.5	Students will be able to analyze the Finite Impulse Response (FIR) Digital Filters
TE 401.6	Students will be able to analyze the Infinite Impulse Response (IIR) Digital Filters

<b>Subject</b>	<b>Unit Operations &amp; Power Plant Instrumentation</b>
<b>Subject Code</b>	TE 310 (306270)
<b>Course Outcome (COs)</b>	
TE 310.1	Knowledge and understanding of various unit operation involved in process plant instrumentation
TE 310.2	Ability to design and analyze different types of devices used in industry.
TE 310.3	Knowledge of renewable, nonrenewable energy sources and their availability in world.
TE 310.4	An ability to understand different power generation plants for generation of electricity
TE 310.5	Ability to understand turbine instrumentation & control, its start-up, shut-down process.
TE 310.6	An ability to understand pollution, site selection, performance, handling and safety of various power plants.

<b>Subject</b>	<b>Instrument and System Design</b>
<b>Subject Code</b>	TE 311 (306271)
<b>Course Outcome (COs)</b>	
TE 311.1	Students will be able to learn and understand basic electronics system design and related standards.
TE 311.2	Students will be able learn and understand concept of grounding, shielding, EMI/EMC and ESD effects.
TE 311.3	Students will be able to learn and understand analog system design and application based ICs for analog system
TE 311.4	Students will be able to learn and understand digital system design and application based ICs for digital system design.
TE 311.5	Students will be able to learn and understand some basics of PCB technology and design techniques of PCB design.
TE 311.6	Students will be able to learn and understand some basics of system performance and documentation.

**Course Outcomes: Students should be able to**

**Final Year Instrumentation & Control Engineering (BE) (Curriculum 2012 Pattern)**

**Semester-I**

<b>Subject</b>	<b>Project Engineering &amp; Management</b>
<b>Subject Code</b>	BE401 (4020401)
<b>Course Outcome (COs)</b>	
BE401.1	Knowledge of basic mathematics and fundamental engineering involved in project engineering and management.
BE401.2	An ability to identify, formulate and solve engineering problems related to project engineering and management.
BE401.3	An ability to identify knowledge of project engineering and management is essential for successful completion of any
BE401.4	An ability to carry out self-learning in advanced software related to project engineering and management

<b>Subject</b>	<b>Environmental Instrumentation</b>
<b>Subject Code</b>	BE402 (406265)
<b>Course Outcome (COs)</b>	
BE 402.1	Knowledge of basic mathematics and fundamental engineering involved in Environmental instrumentation.
BE 402.2	An ability to identify, formulate and solve engineering problems related to different waste water flow monitoring
BE 402.3	An ability to identify knowledge to understand the sedimentation and get familiar with instrumentation in ground
BE 402.4	An ability to carry out self-learning in advanced methodologies of environmental Instrumentation.
BE 402.5	Students are familiar with various sampling methods used in Environment.
BE 402.6	An ability to understand the Virtual Instrumentation for Environment.

<b>Subject</b>	<b>Digital Control</b>
<b>Subject Code</b>	BE 403(406263)
<b>Course Outcome (COs)</b>	
BE403.1	Need of discrete time control systems and modelling of DTCS, Able to model the continuous time system using
BE403.2	Able to design Discrete PID and its use. Satiability analysis in discrete domain for satisfactory operations and performance evaluation of systems and to meet the system requirement.
BE403.3	Able to understand several issues related to one system that handles multiple tasks. Fundamental analysis of system using state space method. Understand the use of control system to multiple input and multiple output systems.
BE403.4	Control system design using state space approach. Able to design systems that handle multiple tasks.
BE403.5	Analysis of MIMO system using state space.
BE403.6	Optimization of controller according to physical and economical needs of systems.

<b>Subject</b>	<b>Building Automation-I</b>
<b>Subject Code</b>	<b>BE404A (406264)</b>
<b>Course Outcome (COs)</b>	
<b>BE 404A.1</b>	The student will gain the basic knowledge of Intelligent building and Role of different stakeholders in BAS design.
<b>BE 404A.2</b>	The Student will gain the basic knowledge of Comfort parameters for human being and various sensors mounting in
<b>BE 404A.3</b>	The student will gain the basic knowledge of Air handling unit and its application.
<b>BE 404A.4</b>	The student will gain the basic knowledge of Terminal Unit and Variable Air Volume, CRAC, VRV System, Chilled water system & Hot water system, BAS design.
<b>BE 404A.5</b>	The student will gain the basic knowledge chilled water system, single duct, dual duct air conditioning system
<b>BE 404A.6</b>	The student will gain the basic knowledge of Building automation system, Building management system

<b>Subject</b>	<b>Process Instrumentation- I</b>
<b>Subject Code</b>	<b>BE 405(406261)</b>
<b>Course Outcome (COs)</b>	
BE 405.1	Ability to gain knowledge of processes, classification and selection of process variables for efficient control.
BE 405.2	Students will be able to analyze the temperature, pressure, flow and level loops and solve scaling problems.
BE 405.3	Students will be able to design and tune feedback controller and multi-loop controller on laboratory prototype systems as well as to perform simulation using MATLAB Simulink Toolbox.
BE 405.4	CO4 To understand, design & simulation of multi-loop controller. Ability to perform analysis of nonlinear elements
BE 405.5	Ability to understand the effect of interaction, pairing of variables, design of decoupler and controller for
BE 405.6	Ability to gain knowledge of processes, classification and selection of process variables for efficient control.

<b>Subject</b>	<b>Project Stage- I</b>
<b>Subject Code</b>	<b>BE 406(406266)</b>
<b>Course Outcome (COs)</b>	
BE 406.1	Identify, formulate and solve problems related to Instrumentation engineering.
BE 406.2	Work in a group as a part of multidisciplinary team with professional responsibility
BE 406.3	Design a system, component or process to meet desired needs within realistic constraints.
BE 406.4	Review literature and finalize problem statement.
BE 406.5	Plan activity schedule and implementation in a given time span.
BE 406.6	Prepare and present technical report.
BE 406.7	Apply modern design and analysis tools.

<b>Semester-II</b>
--------------------

<b>Subject</b>	<b>Process Instrumentation- II</b>
<b>Subject Code</b>	BE407 (406267)
<b>Course Outcome (COs)</b>	
BE 407.1	Understand the purpose of process modeling and develop fundamental and empirical models for dynamic processes. Implement dynamic models and perform simulations & analysis using computational tools.
BE 407.2	Understand how process dynamics and control are related to materials and systems of unit operations.
BE 407.3	Demonstrate the understanding of the theory of heat exchanger design for two stream heat exchangers.
BE 407.4	Ability to gain knowledge of Boiler dynamics, mass & energy balance of Distillation column control, continuous and
BE 407.5	Ability to design appropriate controller and its tuning for above mentioned processes.

<b>Subject</b>	<b>Industrial Automation</b>
<b>Subject Code</b>	408(406268)
<b>Course Outcome (COs)</b>	
BE408.1	An ability to understand basics of industrial automation, Plant wise control systems and automation strategy.
BE408.2	An ability to be well verse with Standard Communication Protocols.
BE408.3	The Student will gain the basic knowledge the basics and fundamentals of Programmable Logic Controller
BE408.4	The student will gain the basic knowledge of advanced application of PLC & SCADA & their Interfacing
BE408.5	The student will gain the basic knowledge Distributed Control System
BE408.6	An ability to understand Process safety and Safety Management Systems

<b>Subject</b>	<b>Instrumentation in Agriculture and Food</b>
<b>Subject Code</b>	BE406(406270)
<b>Course Outcome (COs)</b>	

BE409 .1	Knowledge of basic mathematics and fundamental engineering involved in agriculture instrumentation.
BE409 .2	An ability to identify, formulate and solve engineering problems related to different process industry.
BE409 .3	An ability to identify knowledge to understand the irrigation systems & application of SCADA in DAM parameters.
BE409 .4	An ability to identify knowledge to understand instrumentation weather stations.
BE409 .5	To provide the basic knowledge to carry out self-learning in advanced methodologies in Processing Industry.
BE409 .6	An ability to carry out self-learning in advanced Automation in Food Industry

<b>Subject</b>	<b>Building Automation- II</b>
<b>Subject Code</b>	406269
<b>Course Outcome (COs)</b>	
BE 410.1	The student will gain about basics of Fire Alarm System and its classifications.
BE 410.2	The student will gain the knowledge of the Fire Alarm Detection system and its requirement.
BE 410.3	The student will gain the standards of Fire Alarm System.
BE 410.4	The student will gain the basics of Fire Suppression System and types of devices used for fire suppression.
BE 410.5	The student will gain how access control system works in smart building.
BE 410.6	The student will gain basics of CCTV, intrusion and guard tour system in Building Automation.

<b>Subject</b>	<b>Project Work</b>
<b>Subject Code</b>	BE 411 (406271)
<b>Course Outcome (COs)</b>	
BE 411.1	Identify, formulate and solve problems related to Instrumentation engineering.
BE 411.2	Work in a group as a part of multidisciplinary team with professional responsibility
BE 411.3	Design a system, component or process to meet desired needs within realistic constraints.
BE 411.4	Review literature and finalize problem statement.
BE 411.5	Plan activity schedule and implementation in a given time span.
BE 411.6	Prepare and present technical report.
BE 411.7	Apply modern design and analysis tools.



**First Year Instrumentation & Control Engineering (ME) (Curriculum 2017 Pattern)**  
**Semester-I**

**Course Outcomes: Students should be able to**

<b>Subject</b>	<b>Transducer Design</b>
<b>Subject Code</b>	ME606(506102)
<b>Course Outcome (COs)</b>	
<b>ME CO.1</b>	To review and understand different sensors and transducers studies.
<b>ME CO.2</b>	To get knowledge of advanced sensors like Gas, Chemical Sensors, MEMS, Smart Sensors, Nano sensors, Bio
<b>ME CO.3</b>	To understand special applications of all above mentioned sensors.

**Semester-I**

<b>Subject</b>	<b>Advanced Power Electronics</b>
<b>Subject Code</b>	ME-I: 506105-D
<b>Course Outcome (COs)</b>	
<b>ME CO.1</b>	Students will gain the knowledge of modern rectifiers and converters.
<b>ME CO.2</b>	Students will understand the applications of industrial drives for AC and DC motors.
<b>ME CO.3</b>	Students will gain the basic knowledge of multilevel inverters.
<b>ME CO.4</b>	Students will gain the basic knowledge of resonant converters and power supplies.
<b>ME CO.5</b>	Student will understand different renewable energy sources and energy conversion system.
<b>ME CO.6</b>	Students will be able to understand power conditioning and power transmission system.

**Semester-I**

<b>Subject</b>	<b>Research Methodology</b>
----------------	-----------------------------

<b>Subject Code</b>	ME-I: 506104
<b>Course Outcome (COs)</b>	
<b>ME CO.1</b>	Carry out Literature Survey
<b>ME CO.2</b>	Identify appropriate topics for research work in process instrumentation
<b>ME CO.3</b>	Select and define appropriate research problem and parameters
<b>ME CO.4</b>	Design the use of major experimental methods for research in process instrumentation
<b>ME CO.5</b>	Demonstrate own contribution to the body of knowledge
<b>ME CO.6</b>	Become aware of the ethics in research, academic integrity and plagiarism
<b>ME CO.7</b>	Write a research report and thesis

### Semester-I

<b>Subject</b>	<b>Mathematical Methods in Instrumentation</b>
<b>Subject Code</b>	ME-I: 506101
<b>Course Outcome (COs)</b>	
<b>ME CO.1</b>	Students will be able to understand the basic of vector spaces and transformation
<b>ME CO.2</b>	Able to understand the Basic concept of Probability and its application
<b>ME CO.3</b>	Students will be able to understand the basic Mathematical expectations and its application in reaserch

### Semester-I

<b>Subject</b>	<b>Industrial Automation</b>
<b>Subject Code</b>	ME-I(506103)
<b>Course Outcome (COs)</b>	
ME-II .1	Ability to perform advanced PLC programming and its application to different systems.
ME-II .2	Ability to understand the concept of DCS and designing, analysis and application to different systems.
ME-II .3	Design and Interfacing of PLC to SCADA/DCS and Design, Installation, calibration, commissioning, of HART
ME-II .4	Design ,analysis and application of Process Safety Systems.


**Semester-II**

<b>Subject</b>	<b>Embedded System Design</b>
<b>Subject Code</b>	506108
<b>Course Outcome (COs)</b>	
<b>ME CO.1</b>	Students will understand the architectural and functional details and basic programming techniques of AVR
<b>ME CO.2</b>	Students will understand the architectural and functional details and basic programming techniques of ARM
<b>ME CO.3</b>	Students will be able to understand different communication protocols used in embedded system.
<b>ME CO.4</b>	Students will be able to design different embedded applications in instrumentation using basic microcontrollers.
<b>ME CO.5</b>	Students will be able to design different complete embedded system application in areas of digital consumer electronics, automotives and networking / communication using basic microcontrollers.

**Semester-II**

<b>Subject</b>	<b>Soft Computing-B</b>
<b>Subject Code</b>	ME-I: 506110
<b>Course Outcome (COs)</b>	
<b>ME CO.1</b>	Describe the soft computing phenomena that motivate the students in designing algorithms
<b>ME CO.2</b>	Apply soft computing algorithms for optimization
<b>ME CO.3</b>	Select the appropriate strategy or optimal solution based on soft computing algorithms

**Semester-II**

<b>Subject</b>	<b>Control System</b>
<b>Subject Code</b>	ME-I: 506109
<b>Course Outcome (COs)</b>	
<b>ME CO.1</b>	To learn and understand nonlinear control systems.
<b>ME CO.2</b>	To understand stability analysis techniques for nonlinear control systems.
<b>ME CO.3</b>	To understand design different control strategies used for nonlinear system control.

**Semester-II**

<b>Subject</b>	<b>Process Dynamics and Control</b>
<b>Subject Code</b>	ME-I(506107)
<b>Course Outcome (COs)</b>	
ME-II .1	Design, development and analysis of Process Models for dynamic processes.
ME-II .2	To understand, design, simulation and analysis of multi-loop controller.
ME-II .3	Design, analysis of Adaptive control and Advanced Controllers.
ME-II .4	Ability to understand the effect of interaction, design of decoupler and controller for multivariable systems and monitor

**Course Outcomes: Students should be able to**

**Second Year Instrumentation & Control Engineering (ME) (Curriculum 2017 Pattern)**

**Semester-III**

<b>Subject</b>	<b>Advanced Signal Processings</b>
<b>Subject Code</b>	ME606(606101)
<b>Course Outcome (COs)</b>	
<b>ME CO.1</b>	Able to design FIR and IIR filters.
<b>ME CO.2</b>	Able to design multi rate signal processing for various applications
<b>ME CO.3</b>	Able to apply various adaptive filtering techniques and homomorphic signal processing according to types of signals.
<b>ME CO.4</b>	Understand the fundamentals of frequency domain applications such as spectral density, period grams.
<b>ME CO.5</b>	Understand the innovations in stationary random processes.

**Semester-III**

<b>Subject</b>	<b>Fundamentals of Disaster Management</b>
<b>Subject Code</b>	ME606(606103-C)
<b>Course Outcome (COs)</b>	
<b>ME CO.1</b>	Able to define disaster and its type
<b>ME CO.2</b>	Able to make analysis of Earthquakes, Floods and Cyclones.
<b>ME CO.3</b>	Able to analyse and know the effects of Human Induced Disasters
<b>ME CO.4</b>	To know the management concepts in disaster and recovery of disaster.
<b>ME CO.5</b>	To know the disaster in India and their effects on people.

<b>Semester-III</b>	
<b>Subject</b>	<b>Building Automation</b>
<b>Subject Code</b>	ME-II(606102)
<b><i>Course Outcome (COs)</i></b>	
ME-II .1	Students will gain the basic knowledge of fire alarm system & FAS Standard
ME-II .2	To design access control system for any one application
ME-II .3	Ability to understand the HVAC System and its Components
ME-II .4	Ability to understand the HVAC System and its Components
ME-II .5	Students will gain the basic knowledge of Integrated building management system and energy saving concept
ME-II .6	Ability to understand the Project Lifecycle Management