



ACHARYA INSTITUTE OF TECHNOLOGY

Department of Mechatronics Engineering

Bengaluru-560107

DEPARTMENT	MT	SEMESTER	3	COURSE CODE	17MT35	COURSE ID	C205
COURSE TITLE	Analog and Digital Electronics						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C205.1	1. Have knowledge of Analog & Digital Electronic Circuits.						
C205.2	2. Understand the characteristics & operation of Electronic Circuits.						
C205.3	3. Formulate the relations for Voltage Gain, Frequency of Various Electronics Circuits.						
C205.4	4. Design the Electronics Systems for Required Specifications.						

DEPARTMENT	MT	SEMESTER	3	COURSE CODE	17MT36	COURSE ID	C206
COURSE TITLE	COMPUTER ORGANISATION						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C202.1	to describe of architectural concepts of computer and machine instructions. different addressing						
C202.2	analyze the memory subsystems, various I/O devices and interfacing circuits.						
DEPARTMENT	MT	SEMESTER	3	COURSE CODE	15MTL37	COURSE ID	C207
COURSE TITLE	MECHANICAL LAB-01						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C203.1	Demonstrate how to conduct/operate material testing experiments. Demonstrate milling and shaper operation.						
C203.2	Perform machining operations on lathe to produce the model. Taper turning calculation and gear setting for thread cutting.						
C203.3	Determine the mechanical properties of given materials such as Young's modulus, rigidity modulus, Bulk modulus, ultimate strength by conducting tensile, compression, torsion, and bending experiments.						
C203.4	Determine hardness, and toughness of given material by conducting hardness and impact test						
C203.5							
DEPARTMENT	MT	SEMESTER	3	COURSE CODE	15MTL38	COURSE ID	C208
COURSE TITLE	Analog And Digital Electronics Lab						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C203.1	Demonstrate the operation of wave shaping networks, amplifiers & clippers.						



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C203.2	Analyze the performance of 555 timers as monostable & astable multivibrators.
C203.3	Design the oscillator & multivibrators for desired frequency.
C203.4	construct the combinational & sequential circuits for real time applications

COURSE OUTCOMES

DEPARTMENT	MT	SEMESTER	4	COURSE CODE	15MT42	COURSE ID	C212
COURSE TITLE	Fluid Mechanics and Machines						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C202.1	Describe concept of turbomachines, fluid at statics and motion.						
C202.2	Measurement of fluid flow through pipe and open channel.						
C202.3	Determine the properties of fluid and their effect. Determine the performance of hydraulic turbines & steam turbines.						
C202.4	Analyze kinematics and dynamics of fluid flow.						
C202.5	Classification of fluid types, fluid flow, and turbomachines. Dimensional analysis of turbomachines.						
DEPARTMENT	MT	SEMESTER	4	COURSE CODE	17MT43	COURSE ID	C213
COURSE TITLE	Microcontroller						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C203.1	Describe the architecture of 8051 Microcontroller, microprocessor and internal memory organization, types of memory architecture , Concept of Addressing modes and Assembly and C instruction set .als.						
C203.2	Apply various instruction set of assembly and C language for different software and hardware applications .						
C203.3	Calculate time delays ,baud rates and analyze Timer . Counter operation and Transmission of data serially for different modes of operation						
C203.4	Design the hardware interface between microcontroller, memories of different sizes and external peripherals.						
DEPARTMENT	MT	SEMESTER	4	COURSE CODE	17MT44	COURSE ID	C214
COURSE TITLE	Manufacturing Technology						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C204.1	Understand the principles and techniques of casting, forging, rolling & drawing.						
C204.2	Apply the knowledge of metal working process						
C204.3	To express the different techniques of joining processes for metal & non metals.						
C204.4	Understanding and applying knowledge to execute CNC machining programs.						
DEPARTMENT	MT	SEMESTER	4	COURSE CODE	15MT45	COURSE ID	C215



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COURSE TITLE	Theory of Machines
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS
C205.1	Describe the concepts of Link, Kinematic pairs, Degrees of freedom, Mobility of Mechanisms, Inversion, Machine, Gear terminology, law of gearing, Types of cams, Types of followers, Displacement, Velocity and, Acceleration time curve for cam profiles, Effect of Gyroscopic Couple on Ship, Plane Disc, Aircraft, Stability of Two Wheelers, Types of governors.
C205.2	Determine mobility, power loss due to friction in various machine elements, balancing mass and its position, stability of a governor
C205.3	Calculate stability of a governor and effect of gyroscopic couple on plane disk, Aircraft, stability of two wheelers and ship.
C205.4	Construct of different types of cam profiles for a given data

DEPARTMENT	MT	SEMESTER	4	COURSE CODE	17MT46	COURSE ID	C21
COURSE TITLE	Instrumentation and Measurements						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C202.1	apply knowledge of Instrumentation to measure Strain, Pressure, Force, Displacement, and Level.						
C202.2	Use their skill set to measure resistance, Capacitance and Inductance using various bridge control circuits.						
C202.3	Choose various transducers to measure different physical quantities.						
C202.4	Analyze the Static and Dynamic Characteristics and Various Measurement instruments.						
DEPARTMENT	MT	SEMESTER	4	COURSE CODE	15MTL47	COURSE ID	C21
COURSE TITLE	Mechanical Lab - II						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C203.1	Select the type of turbine required with reference to available head of water and discharge.						
C203.2	Determine the coefficient of discharge of flow measuring devices and performance of turbi						
C203.3	Design pneumatic circuit for various industrial applications.						
C203.4	Apply principles of fluid mechanics, machines, and pneumatics.						
C203.5							
DEPARTMENT	MT	SEMESTER	4	COURSE CODE	17MTL48	COURSE ID	C21
COURSE TITLE	Microcontroller Lab						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C203.1	develop an interface between 8051 and external peripherals for various applications using C Assembly Programming						
C203.2	Design microcontroller based circuits for real time applications						
C203.3	Develop a microcontroller program for industrial applications						



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DEPARTMENT	MT	SEMESTER	5	COURSE CODE	15MT51	COURSE ID	C301
COURSE TITLE	Design of machine elements						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C311.1	Illustrate the design phases, selection of materials, effect of stresses, stress concentration, Factor of safety, Codes and Standards and Theories of failure.						
C311.2	Determine the stress in the machine elements like power screws, shafts, keys, couplings, joints, gears and bearings.						
C311.3	Calculate the geometry, stresses in machine elements like clamps and crank pin under various loading conditions.						
C311.4	Design the Keys, Couplings, Joints, Transmission shafts, Spur and helical Gears: and Journal Bearings.						
C311.5							
DEPARTMENT	MT	SEMESTER	5	COURSE CODE	15MT52	COURSE ID	C302
COURSE TITLE	VIRTUAL INSTRUMENTATION						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C312.1	.Understand the structured Lab VIEW programming concepts in developing Virtual Instrumentation.						
C312.2	Build applications employed in various debugging techniques, simulating and analyzing the data and use general purpose interface bus and Serial communication Interface.						
C312.3	Create applications that use plug in DAQ boards and built in analysis functions to process the data.						
C312.4	Design and analyze various applications on Real time monitoring using DAQ boards						
DEPARTMENT	MT	SEMESTER	5	COURSE CODE	15MT53	COURSE ID	C313
COURSE TITLE	Hydraulics and Pneumatics						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C313.1	have knowledge of Hydraulic and pneumatic system						
C313.2	understand the basics of control components of hydraulic system						
C303.3	understand different applications of hydraulics						
C303.4	design the hydraulic circuits for specific applications and analyze the hydraulic circuits.						
DEPARTMENT	MT	SEMESTER	5	COURSE CODE	15MT54	COURSE ID	C304
COURSE TITLE	Micro and Smart Systems Technology						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C304.1	Demonstrate the working methodology of smart materials, microsystems, electronics circuitry in MEMS devices.						



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C304.2	Illustrate the process of silicon wafer preparation, thin film deposition techniques, lithography, etching, bulk & surface micromachining involved in MEMS fabrication.
C304.3	Examine the behaviour of piezoresistive & piezoelectric materials required to fabricate pressure sensor & vibration control structures.
C304.4	Measure the performance of pressure sensor & vibration control structure in real time applications.

COURSE OUTCOMES

DEPARTMENT	MT	SEMESTER	5	COURSE CODE	15MT55	COURSE ID	C305
COURSE TITLE	Wireless Networks & Communication						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C305	Analyze the concepts of Different wireless communication systems, wireless networks and technologies.						
C305	Explain the working principles of WBAN, LAN, WPAN, WMAN, WWAN and different wireless technologies.						
C305	Illustrate the concepts of adhoc networks, mobile adhoc, Vanets and Mesh networks.						
C305	Explain Different issues in designing various Wireless networks and wireless communication						
DEPARTMENT	MT	SEMESTER	5	COURSE CODE	15MT551	COURSE ID	C306
COURSE TITLE	Wireless networks						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C306.1	Describe the architecture of wireless communication systems and network, wireless switching technology, SNR, channel capacity, wireless networks and technologies.						
C306.2	Illustrate the concepts of adhoc networks, mobile ad hocs, Cellular networks, WLL, WSN, Vanets and Mesh networks.						
C306.3	Classify the types of wireless networks and explain the Architecture of WBAN, LAN, WPAN, WMAN, WWAN and different wireless technologies and its design issues and properties.						
DEPARTMENT	MT	SEMESTER	5	COURSE CODE	15MTL57	COURSE ID	C307
COURSE TITLE	VIRTUAL INSTRUMENTATION LAB						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C307	Develop LabVIEW programming which employs simulating and analyzing the data for real time automation						
C307	Engage in designing, implementing, analyzing and demonstrating an application using tools available in LabVIEW through an open ended experiment.						



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C307		Design applications that use plug in DAQ boards and built in analysis functions to process the data.					
DEPARTMENT	MT	SEMESTER	5	COURSE CODE	15MTL58	COURSE ID	C308
COURSE TITLE		MICRO & SMART SYSTEMS TECHNOLOGY LABORATORY					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C308		Analyse the behavior of Mechanical Components for various kinds of loads.					
C308		Analyse the behavior of Pressure Sensor for various kinds of Pressures applied.					

COURSE OUTCOMES

DEPARTMENT	MT	SEMESTER	6	COURSE CODE	15MT61	COURSE ID	C311
COURSE TITLE		PLC AND SCADA					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C301.1		Demonstrate the concepts of basic programming skills of PLC using logical instructions					
C301.2		Apply the architecture process involved in programmable logic controller and basic programming skills of PLC using logical instructions					
C301.3		Examine the various operation involved in the PLC input/output module and SCADA system					
C301.4		Construct the ladder diagram for PLC using logical instructions, timer and counters, Data Handling instructions and Build the SCADA System for Real time industrial process.					
DEPARTMENT	MT	SEMESTER	6	COURSE CODE	15MT62	COURSE ID	C312
COURSE TITLE		Embedded Systems (ARM)					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C302.1		Compare the concepts of RISC/CISC processor, ARM processor, memory management, and interrupt handlers.					
C302.2		Classify the ARM instruction set and register functions to write and optimize the basic arithmetic and logical programs					
C302.3		Classify the memory organization to understand the software performance and to allocate the memory for storing the results.					
C302.4		Illustrate the assembly code and C code programs for bit manipulation, conditional execution and interrupt handling.					
DEPARTMENT	MT	SEMESTER	6	COURSE CODE	15MT63	COURSE ID	C313
COURSE TITLE		Power Electronics					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C303.1		Have a knowledge of semiconductors devices, thyristors, AC voltage controllers choppers and inverters					



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C303.2	Understand the characteristics and working principle of thyristors, AC voltage controllers, choppers and inverters.						
C303.3	Apply control techniques to meet desired switching objectives.						
DEPARTMENT	MT	SEMESTER	6	COURSE CODE	15MT64	COURSE ID	C314
COURSE TITLE	Computer Aided Machine Drawing						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C304.1	understanding the concepts of sections of solids, orthographic views, threads, fasteners, couplings, joints and assembly drawing						
C304.2	apply the concepts of sections of solids, orthographic views for development of product or component						
C304.3	Make use of computer aided modeling tool to create machine parts and to do assembly operation						
C304.4	design threads, fasteners, couplings and joints for engineering application						
C314.5							

DEPARTMENT	MT	SEMESTER	6	COURSE CODE	15MT652	COURSE ID	C315
COURSE TITLE	Rapid Prototyping						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C315	Understanding of rapid prototyping techniques.						
C315	Explain advantages, techniques and construction of selective laser sintering, Fusion deposition Modeling, Solid Ground Curing.						
C315	Explain 3D printers, rapid tooling, software tools and their errors.						
C315	Analyze the working principle of rapid prototyping and manufacturing processes such as selective laser sintering, Fusion deposition Modeling, Solid Ground Curing, 3D printers, rapid tooling and types of softwares						
C315							
DEPARTMENT	MT	SEMESTER	6	COURSE CODE	15MT661	COURSE ID	C316
COURSE TITLE	Robotics and Automation						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C316.1	Have the knowledge of Joints, Links, Sensors, Control units, Actuators. and elements of Automation						
C316.2	Describe motions and control system of Robots						
C316.3	Have Knowledge of Basics of Automation						
C316.4	Understand Material Handling and storage applications in Automation						
DEPARTMENT	MT	SEMESTER	6	COURSE CODE	15MTL67	COURSE ID	C317
COURSE TITLE	PLC AND SCADA LAB						



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COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C307.1		Develop the logical instructions involved in Development of programmable logic controller for various operations					
C307.2		Construct the Ladder Logic for various operation using PLC and SCADA for industrial Environment					
C307.3		Design the SCADA System for the Industrial Environment.					
DEPARTMENT	MT	SEMESTER	6	COURSE CODE	15MTL68	COURSE ID	C308
COURSE TITLE		Power Electronics Lab					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C308.1		List and describe various power semiconductor devices, power converters and its applications.					
C308.2		Explain the characteristics of power semiconductor devices and operation of various power converters for different loads.					
C308.3		Apply the concept of power electronic converters to control different loads and compute their performance parameters					

COURSE OUTCOMES

DEPARTMENT	MT	SEMESTER	7	COURSE CODE	15MT71	COURSE ID	C401
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COURSE TITLE	Industrial Robotics						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C401.1	have knowledge of Robotics, automation, robotics motion, sensors and control, machine vision, robotic programming and roles of robots in industry						
C401.2	understand the basics of Kinematics and Dynamics of robot motion						
C401.3	understand the working methodology of robotics and automation, motion and control, machine vision and programming, application of robots in industry.						
C401.4	write the program for robot for various applications						
DEPARTMENT	MT	SEMESTER	7	COURSE CODE	15MT72	COURSE ID	C402
COURSE TITLE	Thermal Engineering						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C402.1	Understand the concepts of system, energy interaction, laws of thermodynamics, and modes of heat transfer.						
C402.2	Applications of laws of thermodynamics to open and closed system and laws of heat transfer to different shapes and types of boundary conditions. Determine energy change of a system, energy interaction in terms of work and heat between system and surrounding.						
C402.4	Develop and apply thermal resistance concepts. Apply boundary conditions to solve heat transfer problems.						
C402.4	Analyze the thermodynamic performance, heat transfer and temperature distribution. Dimensional analysis of convective heat transfer and physical significance of dimensional numbers.						
DEPARTMENT	MT	SEMESTER	7	COURSE CODE	15MT73	COURSE ID	C403
COURSE TITLE	Signal Process						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C303.1	have knowledge of signal, system, transformation, filter design.						
C403.2	understand the difference between time domain, frequency domain, analog and digital filters.						
C403.3	transform the signals from one domain to another using transformation techniques.						
C403.4	design analog and digital filters for specific applications.						
DEPARTMENT	MT	SEMESTER	7	COURSE CODE	15MT743	COURSE ID	C404
COURSE TITLE	Real Time Systems						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C404.1	Describe the concepts of real time system, types of real time system, processor and controllers.						
C404.2	Analyze the advantages of RTS and can apply in various applications.						
C404.4	Understand the different methodologies of operating system.						
C404.4	Use the scheduling strategies, interrupt mechanism and memory management for various application.						



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DEPARTMENT	MT	SEMESTER	7	COURSE CODE	15MT755	COURSE ID	C405
COURSE TITLE	Digital Image Processing						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C315	Describe the concept of image processing, sampling, quantization, enhancement and restoration of image.						
C415	Apply the methods of image transforms and enhancement techniques to the image processing						
C415	Apply the noise removal techniques for the restoration of original images.						
C415	Describe the process of colour image processing using different restoration techniques.						
C415							
DEPARTMENT	MT	SEMESTER	7	COURSE CODE	15MTL76	COURSE ID	C406
COURSE TITLE	Robotics Laboratory						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C406.1	Understand the importance of Robot system in Industrial Process in Virtual Environments						
C406.2	Understand the importance of Robot system in Industrial Process in Virtual Environments						
DEPARTMENT	MT	SEMESTER	7	COURSE CODE	15MTL77	COURSE ID	C407
COURSE TITLE	Signal Process Lab						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C407.1	have knowledge of Scientific Programming using Matlab.						
C407.2	understand the programming in Matlab software and hardware						
C407.3	use DSP board for real time applications						
DEPARTMENT	MT	SEMESTER	7	COURSE CODE	15MTL78	COURSE ID	C408
COURSE TITLE	Project Phase – I Seminar						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C408.1							
C408.2							
C408.3							
C408.4							

COURSE OUTCOMES



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DEPARTMENT	MT	SEMESTER	8	COURSE CODE	15MT81	COURSE ID	C411
COURSE TITLE	AUTOMOTIVE ELECTRONICS AND HYBRID VEHICLES						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C411.1	Understanding of Engine Parameters and a critical awareness of current problems within the automotive electronics domain using Various Measurement Technology.						
C411.2	Apply the fundamental Concepts of automotive electronics on various Engine parts, Sensor, Actuator, Communication and Measurement System.						
C411.3	Determine the extent and nature of electronic circuitry in automotive systems including monitoring and control circuits for engines, transmissions, brakes, steering, suspension						
C411.4	Analyze climate control, instrumentation and radios and accessories involved in the Automotive Industry.						
DEPARTMENT	MT	SEMESTER	8	COURSE CODE	15MT82	COURSE ID	C412
COURSE TITLE	Communication Systems						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C412.1	have Knowledge Of different modulation techniques, analog and digital modulation and demodulation, different waveform code techniques and spread spectrum.						
C412.2	understand the concept of generation of modulated and demodulated signals, encoding, decoding and multiplexing, de-multiplexing of signals.						
DEPARTMENT	MT	SEMESTER	8	COURSE CODE	15MT83	COURSE ID	C413
COURSE TITLE	Artificial Intelligence						
COURSE OUTCOME NO	COURSE OUTCOME STATEMENTS						
C413.1	Demonstrate the effects of Orbits, Trajectories, Orbital parameters & Perturbations on Satellites.						
C413.2	Illustrate the characteristics of Eclipses, Satellite Subsystems, Satellite Tracking & Earth stations.						
C413.5	Analyze the working of Multiple Access Techniques in Establishing effective Communication.						
C413.4	Analyze the performance of Satellites in the areas of communication, Remote Sensing, Navigation & Weather Forecasting.						