

# Noorul Islam Centre for Higher Education

(Deemed to be University u/s 3 of the UGC Act 1956)

Kumaracoil, Thuckalay, Kanyakumari District - 629 180

Accredited by NAAC with 'A' Grade

EI25 ME CONTROL AND INSTRUMENTATION ENGINEERING



## Student Performance and Learning Outcomes

## EI25 ME CONTROL AND INSTRUMENTATION ENGINEERING

Programme Outcome - PO	
PO-A	Apply the knowledge of mathematics, engineering fundamentals, instrumentation and control engineering to solve the problems pertaining to Control and Instrumentation Engineering.
PO-B	Identify, formulate, review and analyze complex instrumentation, control and automation engineering problems and attain conclusions using first principles of mathematics and engineering sciences.
PO-C	Design solutions and system components or processes for complex instrumentation, control and automation problems that fulfill the specified needs taking into account the public health and safety, cultural, societal, and environmental factors.
PO-D	Use research-based knowledge through literature survey and methods including design of experiments, analysis and interpretation of data, and synthesis of the information to arrive at significant conclusion.
PO-E	Form, select, and apply appropriate techniques, resources, and modern engineering and IT tools for Engineering activities including prediction and modeling of complex instrumentation, control and automation engineering activities and also understand their limitations.
PO-F	Assess societal, health, safety issues based on the reasoning received from the contextual knowledge and understand the consequent responsibilities of the Professional Instrumentation Engineer.
PO-G	Understand the impact of the professional engineering solutions in societal and environmental contexts, and exhibit the knowledge of, and the need for sustainable development.
PO-H	Apply the principles of Professional Ethics to adhere to the norms of the engineering practice and to discharge ethical responsibilities.
PO-I	Function actively and efficiently as an individual or a member/leader in diverse teams, and in multidisciplinary settings.
PO-J	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to understand and prepare reports and design documents; to make effective presentations and to frame and follow instructions.
PO-K	Demonstrate knowledge and understanding of the engineering and management principles and apply them to own work, as member / leader in teams and multidisciplinary environments after consideration of economic and financial factors.
PO-L	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning with a high level of enthusiasm and commitment, keeping pace with technological challenges in the broadest sense.

PROGRAM SPECIFIC OUTCOME(PSO)	
PSO 1	Identify, analyze, design and implement problems in diverse and multidisciplinary background emphasizing control and industrial automation, using modern tools.
PSO 2	Understand the impact of engineering solutions in societal, environmental context and manage the projects efficiently.
PSO3	Provide innovative control methodologies to core industrial problems

Sl.No	Subject Code	Subject Name
<b>SEMESTER II</b>		
1.	EI25A3	Advanced Topics in Instrumentation System
2.	EI2505	Industrial Data Communication
3.	EI2506	Digital Control System
4.	EI2509	Intelligent Control Techniques
5.	EI2507	Process Instrument Design
6.	EI2572	Instrumentation System Design Laboratory
<b>SEMESTER 1V</b>		
7.	EI25P5	Project Work phase-II

EI2505- Industrial Data Communication	
CO1	Identify network on the basis of various network parameters.
CO2	Assign IP address to the network and network component as per the networks.
CO3	Identify OSI-ISO and TCP/IP network models.
CO4	Select guided and unguided medium for various types of data transmission.
CO5	Troubleshoot problems in hardware/software employed in data communication circuit

EI2507 Process Instrument Design	
	At the end of the course, the student should have the:
CO1	Ability to design various signal conditioning circuits.
CO2	Ability to design different types of transmitters.
CO3	Ability to learn about orifice sizing and design of final control elements.
CO4	Ability to design different types of transmitters.
CO5	Ability to acquire knowledge of designing alarm and annunciation circuits.

EI2506- Digital Control System	
CO1	Able to obtain dynamic responses of linear systems and to determine their stability
CO2	Able to design feedback controller using design tools followed by simulation
CO3	Know about the techniques for relaxing the constraints or redesigning controllers in time domain or in frequency domain
CO4	Know about various non-linearities in control systems
CO5	Able to analyze the stability of systems through different techniques

EI25A3-Advanced Topics in Instrumentation System	
CO1	To provide an overview of the importance of environmental
CO2	To develop necessary skill-set to select appropriate sensors and develop the associated signal conditioning to monitor important instrumental parameters
CO3	To train the students on the best methods to transmit, store and analyze and interpret the data from the sensors
CO4	To provide a hands-on experience in electronic system design concept, in the point of view of sensor monitoring
CO5	To make the students understand all the processes involved in the industries, the various unit operations and be able to apply control schemes to these processes to get the output with desired specifications

EI2509-Intelligent Control Techniques	
CO1	Students completing this course will obtain a basic understanding of fuzzy logic systems and artificial neural networks, and will know how these techniques are applied to engineering problems, including control systems.
CO2	Students will understand the advantages and disadvantages of these methods relative to other control methods.
CO3	Students will understand the concept of genetic algorithm
CO4	Students will be able to design control systems using fuzzy logic and artificial neural networks.
CO5	Students will be aware of current research trends and issues.

EI2507 Process Instrument Design	
CO1	Ability to design various signal conditioning circuits.
CO2	Ability to design different types of transmitters.
CO3	Ability to learn about orifice sizing and design of final control elements.
CO4	Ability to design different types of transmitters.
CO5	Ability to acquire knowledge of designing alarm and annunciation circuits.

EI2572- Instrumentation System Design Laboratory	
CO1	To design flow, level measurements, controller.
CO2	To design bourdon gauge and transmitters.
CO3	To understand the design of controller and apply in real time applications.
CO4	To analyse and design the different types of transmitter, rotameter and RTD.
CO5	To design microprocessor based PID controller.

EE25P5- PROJECT WORK –PHASE II	
CO1	Demonstrate a sound technical knowledge of their selected project topic.
CO2	Undertake problem identification, formulation and solution.
CO3	Design engineering solutions to complex problems utilising a systems approach.
CO4	Conduct an engineering project
CO5	Demonstrate the knowledge, skills and attitudes of a professional engineer.