

Vivekanand Education Society Institute of Technology

Department Of Automation & Robotics Engineering

Academic year 2023 -2024

Vision of the Department

To contribute towards creating interdisciplinary engineers in the field of Automation and Robotics who strive towards applying their knowledge for the progress of the society.

Mission of the Department

- 1) To impart knowledge and skills to engineering students to compete at National and International level in the field of Automation and Robotics.
- 2) To create an environment that promotes research ideas for solving societal problems/issues/challenges.
- 3) To inspire young (budding) engineers to apply knowledge of Automation and Robotics to take up career and work towards making our country self-reliant.

Program Educational Objectives (PEO)

To introduce students to various aspects of basic and applied research so as to gain proficiency in the field of design and development of Automation & Robotics systems.

2. To provide students in-depth knowledge of various domains of Automation & Robotics to successfully apply them to solve industrial and societal issues.
3. To arouse intellectual curiosity among students by providing solid foundation in concepts of science and engineering for innovative solutions of real life problems.
4. To educate students on professional issues along with qualities like leadership, ethics, planning and management to become successful entrepreneurs.

Program Specific Outcomes (PSO)

PSO1) Apply the concepts of measurement using various sensors/transducers along with

associated signal processing for controlling machines or processors using automation tools like PLC, DCS with proper planning and documentation.

PSO2) Apply the concept of automatic and robotic control including measurement, feedback and feedforward regulation for the operation of continuous and discrete systems using mathematics as basis of modelling and design.

PSO3) Apply the concepts of basic science and engineering to design and implement various automatic and robotic systems.

Program Outcomes (PO)

Engineering Graduates will be able to:

PO1) Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2) Problem Analysis: identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3) Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4) Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5) Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6) The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7) Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need

for sustainable development.

PO8) Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9) Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10) Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11) Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12) Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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Department Of Automation & Robotics Engineering

Academic year 2023-2024

Name of Course : Components of automation and Robotics system Lab

Year & Semester : 2nd Year & Semester IV (with Effect from 2023-2024)

Lab : 2 Lectures / Week

Faculty in-charge : Dr. Mrs.Kadambari Sharma/Mrs Madhumati Khuspe

Email: kadambari.sharma@ves.ac.in

LAB OBJECTIVE :

- 1) To make students understand the construction, working principle and application of various transducers used for flow measurement, strain measurement, pressure and vacuum measurement, force, torque and power measurement
- 2) To study electro-chemical sensors and transducers used for density and viscosity measurement
- 3) To impart knowledge of different control system components like Hydraulic, Pneumatic and Electrical and their comparison
- 4) To make the students to learn different process components and auxiliary process control components.

Course Outcome:

The students will be able to:

- 1) Explain working principle of strain gauges, pressure transducers.
- 2) Learn Basic fundamentals of flow transducers identify types of flow and use different transducers for flow measurement.
- 3) Explain the terminologies of electrochemical, density, humidity, pH measurement sensors, and their applications in industry.
- 4) Study, select and implement various pneumatic, hydraulic and electro-pneumatic system components and circuits .
- 5) Apply knowledge to classify, select and use various Transmitters, control valves and their accessories .

6) Describe the Need of Auxiliary process control components and study their industrial usage.

		Semester- IV,											
Course Name	Course Code	Program Outcomes											
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CARs Lab	ARL403.1	3	1	3	2	-	1	3	-	-	-	-	3
	ARL403.2	3	2	3	1	1	2	3	-	-	-	-	3
	ARL403.3	-	-	3	2	1	3	3	-	-	-	-	3
	ARL403.4	-	-	-	1	-	-	-	-	-	-	-	3
	ARL403.5	-	-	-	-	-	1	-	-	-	-	-	1
	ARL403.6	1	-	-	-	-	1	-	-	-	-	-	1

CO – PSO Mapping :

Course Code	Program Specific Outcome		
	PSO1	PSO2	PSO3
ARL403.1	2	3	2
ARL403.2	2	3	2
ARL403.3	2	3	2
ARL403.4	1	-	-
ARL403.5	-	1	-
ARL403.6	1	1	-

Note:

Correlation levels 1, 2 or 3 as defined below:

1. Slight (Low)

2. Moderate (Medium)

3. Substantial (High)

If there is no correlation, “-”

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Academic year 2023 -2024

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Expt No.	Title	CO Mapping	Date of experiment	Date of submission	Signature
1	Study and plot characteristics of Strain gauge	CO1			
2	Study measurement of pressure using bellows, diaphragm, bourdon tube	CO1			
3	Measurement of flow using rotameter	CO2			
4	Study and characterization of pH meter	CO3			
5	Study of various pneumatic control system components	CO4			
6	Study operation and calibration of level transmitter	CO5			

7	Study operation and calibration of pressure transmitter	CO5			
8	Study of cut section of control valve	CO5			
9	Calibration of I to P converter	CO5			
10	Study different types and operation of control valve	CO6			

Faculty Incharge