

Course code: Course Title	Course Structure			Pre-Requisite
SE417: Robotics	L	T	P	NIL
	3	1	0	

Course Objective: To study Robot anatomy arm geometry, robot sensing and range proximity, manipulation and its programming language.

S. NO	Course Outcomes (CO)
CO1	Analyze and understand robot arm kinematics, dynamics, and trajectory planning
CO2	Apply control techniques such as computed torque, sequencing, and adaptive control.
CO3	Analyze robot sensing techniques, imaging geometry, and vision-based segmentation.
CO4	Analyze and apply robot programming languages, task planning, and intelligence techniques.

S.No.	Contents	Contact Hours
UNIT 1	Robot Anatomy Arm Geometry-Direct & Inverse Kinematics Problem, Arm Dynamics, D Alembert Equations of Motion, Synthesis of elements with movalulity constraints, manipulations-trajectory planning, joint interpolated trajectories.	12
UNIT 2	Control of Robot Manipulation-computed torque technique sequencing & adaptive control, resolved motion control Moluie Robots.	10
UNIT 3	Robot sensing-Range & Proximity & Higher-Level vision, illumination techniques, Imaging Geometry, Segmentation Recognition & Interpretation.	10
UNIT 4	Robot Programming Language Characteristics of Robot Level & Task Level languages. Robot intelligence-State Space search, Robot learning, Robot Task Planning, Knowledge Engineering.	10
	TOTAL	42

REFERENCES

S.No.	Name of Books/Authors/Publishers	Year of Publication / Reprint
1.	K. S. Fu, R. C. Gonzalez, and C. S. G. Lee, "Robotics: Control, Sensing, Vision & Intelligence", McGraw-Hill.	1997
2.	Mikell P. Groover, Mitchel Weiss, Roger N Nagel, Nicholas G Odrey and Ashish Dutta, "Industrial Robotics: Technology Programming and Applications", McGraw Hill, 2 nd Edition.	2017
3.	Andrew C. Straugaard, Jr., "Robotics and AI: An Introduction to Applied Machine Intelligence", PHI.	1987
4.	S. Sitharama Iyengar, Alberto Elefes, "Autonomous Mobile Robots: Control, Planning and Architecture", IEEE Computer Society Press.	2013