Department of Mechatronics Engineering
School of Engineering
Faculty of Science, Technology and Architecture
Bachelor of Technology in Robotics and Artificial Intelligence
(2025-2026) onwards (160 Credits)

	First Semester	L	T	P	Cr		Second Semester	L	T	P	Cr
Code	Course Name	L	T	P	Cr	Code	Course Name	L	T	P	Cr
CHY1001	Engineering Chemistry & Lab	2	0	2	3	PHY1001	Engineering Physics & Lab	2	1	2	4
MAS1001	Calculus & Matrices	2	1	0	3	MAS1002	Computational Mathematics	2	1	0	3
ECE1002	Electronic Circuits	2	1	0	3	CHY1002	Environmental Studies	2	0	0	2
MEE1008	Basic Mechanical Engineering	3	0	0	3	EEE1001	Electrical Technology	2	0	0	2
CSCXXXX	Problem-Solving Using Computers	2	1	0	3	CIV1002	Engineering Material and Mechanics	2	1	0	3
DOA1001	Universal Human Values	1	0	0	1	MEE1038	Creativity & Innovation IDEA Lab	1	0	2	2
CSCXXXX	Problem-Solving Using Computers Lab	0	0	2	1	BIT1001	Biology for Engineers	2	0	0	2
LLC1011	Communication Skills	2	0	0	2	MEE1037	MATLAB for Engineer's lab	0	0	2	1
MEE1036	Engineering Graphics	0	0	2	1	DOA1002	Wellness and Community Services	1	0	0	1
	First Semester Credits				20		Second Semester Credits				20

	Third Semester	L	T	P	Cr		Fourth Semester	L	T	P	Cr
Code	Course Name	L	T	P	Cr	Code	Course Name	L	T	P	Cr
MBBXXX/ MEEXXXX	Principles of Management/ Engineering Economics	3	0	0	3	MASXXXX	Statistics & Probability	3	0	0	3
RAI2101	Embedded Controllers	3	1	0	4	MBBXXX/ MEEXXXX	Principles of Management/ Engineering Economics	3	0	0	3
RAI2102	Basics of AI and ML	3	1	0	4	RAI2203	Sensors and Actuators	3	1	0	4
RAI2103	Strength of Materials	3	0	0	3	RAIXXXX	Program Elective 1	3	0	0	3
RAI2104	Manufacturing Technology	3	1	0	4	RAI00XX	Open Elective 1	3	0	0	3
RAI2105	Robot Kinematics and Dynamics	3	1	0	4	XXXXXXX	Technical Report Writing	2	0	0	2
RAI2130	Embedded Controllers Lab	0	0	1	1	RAI2232	Sensors and Actuators Lab	0	0	1	1
RAI2131	AI and ML Lab	0	0	1	1	RAI2233	Integrated Electronics Lab	0	0	2	1
						RAI2271	Project Based Learning - 1	0	0	3	3
	Third Semester Credits				24		Fourth Semester Credits				23

	Fifth Semester	L	T	P	Cr		Sixth Semester	L	T	P	Cr
Code	Course Name	L	T	P	Cr	Code	Course Name	L	T	P	Cr
RAI3102	Deep Learning	3	1	0	4	RAI3201	Drives and Automation	3	1	0	4
RAI3103	Design of Machine Elements	3	0	0	3	RAI3202	Reinforcement Learning in Robotics	3	1	0	4

Code	Course Name	L	T	P	Cr	Code	Course Name	L	T	P	Cr
RAI3104	Modern Control Theory	3	0	0	3	RAIXXXX	Program Elective 4	3	0	0	3
RAI3105	Mobile Robots	3	1	0	4	RAIXXXX	Program Elective 5	3	0	0	3
RAIXXXX	Program Elective 2	3	0	0	3	RAIXXXX	Program Elective 6	3	0	0	3
RAIXXXX	Program Elective 3	3	0	0	3	RAIXXXX	Open Elective 2	3	0	0	3
RAI3131	Modeling and Simulation Lab	0	0	1	1	RAI3231	Drives and Automation Lab	0	0	1	1
RAI3132	Robotics Lab	0	0	1	1	RAI3232	Pneumatics and Hydraulics Lab	0	0	2	2
RAI3271	Project Based Learning - 2	0	0	3	3						
	Fifth Semester Credits				**25**		**Sixth Semester Credits**				**23**

	Seven Semester						Eight Semester				
Code	**Course Name**	**L**	**T**	**P**	**Cr**	**Code**	**Course Name**	**L**	**T**	**P**	**Cr**
RAIXXXX	Open Elective 3	3	0	0	3	RAI4170	Major Project	0	0	12	12
RAIXXXX	Open Elective 4	3	0	0	3						
RAIXXXX	Program Elective 7	3	0	0	3						
RAIXXXX	Program Elective 8	3	0	0	3						
RAIXXXX	Internship (Industry/ Research/ Industry Certification)	0	0	0	1						
	Seventh Semester Credits				**13**		**Eighth Semester Credits**				**12**

Program Elective 1 to Program Elective 8

List of Program Electives Courses

IV	V	VI	VII
PE1 • **RAI2240: Digital System design** • **RAI2241: Robot Gripper Design**	PE2 **RAI3140: Signals and Systems** **RAI3142: Smart Materials** PE3 **RAI3150: Cyber Physical System** **RAI3151: Digital Signal Processing**	PE 4 **RAI3242: Pneumatics and Hydraulics for Robots** **RAI3244: Collaborative Robots** PE5 **RAI3253: Ethics and Social implications in AI** **RAI3254: Intelligent Systems** PE6 **RAI3263: Production and Operations Management** **RAI3264: Machine vision**	PE 7 **RAI4143: Internet of Robotic things** **RAI4142: Robot Process Automation** PE8 **RAI4154: Industrial IOT** **RAI4155: AI in Industrial applications**

List of Open Electives Courses

Graded OE	Non-Graded OE
OE1 RAI0001: Fundamental of Robotics **OE2 RAI0002:** Automation in Industry **OE3 RAI0003:** Building Automation **OE4 RAI0004:** Sensor Technologies **OE5 RAI0005:** Smart Agriculture **OE6 RAI0006:** Manufacturing Process	

Faculty of Science, Technology and Architecture
Bachelor of Technology in Robotics and Artificial Intelligence (2025-2026) onwards
Minor Specialization/ Honors (160 +18 Credits) **

	First Semester	L	T	P	Cr		Code	Second Semester	L	T	P	Cr
Code	Course Name	L	T	P	Cr		Code	Course Name	L	T	P	Cr
CHY1001	Engineering Chemistry & Lab	2	0	2	3		PHY1001	Engineering Physics & Lab	2	1	2	4
MAS1001	Calculus & Matrices	2	1	0	3		MAS1002	Computational Mathematics	2	1	0	3
ECE1002	Electronic Circuits	2	1	0	3		CHY1002	Environmental Studies	2	0	0	2
MEE1008	Basic Mechanical Engineering	3	0	0	3		EEE1001	Electrical Technology	2	0	0	2
CSCXXXX	Problem-Solving Using Computers	2	1	0	3		CIV1002	Engineering Material and Mechanics	2	1	0	3
DOA1001	Universal Human Values	1	0	0	1		MEE1038	Creativity & Innovation IDEA Lab	1	0	2	2
CSCXXXX	Problem-Solving Using Computers Lab	0	0	2	1		BIT1001	Biology for Engineers	2	0	0	2
LLC1011	Communication Skills	2	0	0	2		MEE1037	MATLAB for Engineers lab	0	0	2	1
MEE1036	Engineering Graphics	0	0	2	1		DOA1002	Wellness and Community Services	1	0	0	1
	First Semester Credits				**20**			**Second Semester Credits**				**20**

	Third Semester							Fourth Semester				

Code	Course Name	L	T	P	Cr	Code	Course Name	L	T	P	Cr
MBBXXX/ MEEXXXX	Principles of Management/ Engineering Economics	3	0	0	3	MASXXXX	Statistics & Probability	3	0	0	3
RAI2101	Embedded Controllers	3	1	0	4	MBBXXX/ MEEXXXX	Principles of Management/ Engineering Economics	3	0	0	3
RAI2102	Basics of AI and ML	3	1	0	4	RAI2203	Sensors and Actuators	3	1	0	4
RAI2103	Strength of Materials	3	0	0	3	RAIXXXX	Program Elective 1	3	0	0	3
RAI2104	Manufacturing Technology	3	1	0	4	RAI00XX	Open Elective 1	3	0	0	3
RAI2105	Robot Kinematics and Dynamics	3	1	0	4	XXXXXXX	Technical Report Writing	2	0	0	2
RAI2130	Embedded Controllers Lab	0	0	1	1	RAI2232	Sensors and Actuators Lab	0	0	1	1
RAI2131	AI and ML Lab	0	0	1	1	RAI2233	Integrated Electronics Lab	0	0	2	1
						RAI2271	Project Based Learning - 1	0	0	3	3
	Third Semester Credits				**24**		**Fourth Semester Credits**				**23**

	Fifth Semester						Sixth Semester				
Code	Course Name	L	T	P	Cr	Code	Course Name	L	T	P	Cr
RAI3102	Deep Learning	3	1	0	4	RAI3201	Drives and Automation	3	1	0	4
RAI3103	Design of Machine Elements	3	0	0	3	RAI3202	Reinforcement Learning in Robotics	3	1	0	4
RAI3104	Modern Control Theory	3	0	0	3	RAIXXXX	Program Elective 4	3	0	0	3
RAI3105	Mobile Robots	3	1	0	4	RAIXXXX	Program Elective 5	3	0	0	3
RAIXXXX	Program Elective 2	3	0	0	3	RAIXXXX	Program Elective 6	3	0	0	3
RAIXXXX	Program Elective 3	3	0	0	3	RAIXXXX	Open Elective 2	3	0	0	3
RAI3131	Modeling and Simulation Lab	0	0	1	1	RAI3231	Drives and Automation Lab	0	0	1	1
RAI3132	Robotics Lab	0	0	1	1	RAI3232	Pneumatics and Hydraulics Lab	0	0	2	2
RAI3271	Project Based Learning - 2	0	0	3	3	RAIXXXX	*Minor Specialization -2/ Honors	3	0	0	3
RAIXXXX	*Minor Specialization - 1/ Honors	3	0	0	3						
	Fifth Semester Credits				**28**		**Sixth Semester Credits**				**26**

	Seven Semester						Eight Semester				
Code	Course Name	L	T	P	Cr	Code	Course Name	L	T	P	Cr
RAIXXXX	Open Elective	3	0	0	3	RAI4270	Major Project	0	0	12	12
RAIXXXX	Open Elective	3	0	0	3	RAI4271/ RAI4272	**Minor Specialization/ Honors (Research Project)	0	0	6	6
RAIXXXX	Program Elective 7	3	0	0	3						
RAIXXXX	Program Elective 8	3	0	0	3						
RAI4170	Internship (Industry/ Research/ Industry Certification)	0	0	1	1						
RAIXXXX	*Minor Specialization - 3 / Honors	3	0	0	3						
RAIXXXX	*Minor Specialization - 4 / Honors	3	0	0	3						
RAIXXXX	Open Elective	3	0	0	3						
	Seventh Semester Credits				**19**		**Eighth Semester Credits**				**18**

Program Elective 1 to Program Elective 8

List of Program Electives Courses

IV	V	VI	VII
PE1 • RAI2240: Digital System design • RAI2241: Robot Gripper Design	PE2 RAI3140: Signals and Systems RAI3142: Smart Materials PE3 RAI3150: Cyber Physical System RAI3151: Digital Signal Processing	PE 4 RAI3242: Pneumatics and Hydraulics for Robots RAI3244: Collaborative Robots PE5 RAI3253: Ethics and Social implications in AI RAI3254: Intelligent Systems PE6 RAI3263: Production and Operations Management RAI3264: Machine vision	PE 7 RAI4143: Internet of Robotic things RAI4142: Robot Process Automation PE8 RAI4154: Industrial IOT RAI4155: AI in Industrial applications

List of Open Electives Courses

Graded OE	Non-Graded OE
OE1 RAI0001: Fundamental of Robotics OE2 RAI0002: Automation in Industry OE3 RAI0003: Building Automation OE4 RAI0004: Sensor Technologies OE5 RAI0005: Smart Agriculture OE6 RAI0006: Manufacturing Process	

PROPOSED SPECIALIZATIONS

List of Program Electives for Minor Specialization in 3D Printing
V / VI / VII
RAI3190: Additive Manufacturing RAI3290: Software Skills for 3D Printing RAI4192: Product Design and Development RAI4171: Project Based Learning-3(Minor specialization)

List of Program Electives for Hons.
V / VI / VII
RAI3180: Data Analytics and Visualization RAI3281: Robot System Design RAI4182: Robot Safety & Maintenance RAI4183: Biomedical Robots

Program Elective 7 * Students pursuing a specialization may undertake a project relevant to their chosen field

Development Oriented Project
Design Oriented Project
Lab Oriented Project
Study Oriented Project

**Minor Specialization/ Honors (Research Project) : Students pursuing Minor Specialization/ Honors will undertake 18 Credit Project in VIII Sem, related to specialization.