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RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
(An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)

DEPARTMENT OF AUTOMATION AND ROBOTICS

Department of AUTOMATION and ROBOTICS
B. Tech Structure
(2023 Pattern)

Dr. A. M. Badadhe	Dr. Ram Joshi	Dr. R. K. Jain
BOS Chairman (A & R)	Dean Academics, RSCOE, Pune	Director, RSCOE, Pune

DEPARTMENT OF AUTOMATION AND ROBOTICS

Vision:

To become an ecosystem in the domain of Automation and Robotics that develops competent multidisciplinary professionals, researchers and entrepreneurs striving for technology led socio-economic development of the nation.

Mission:

- To impart high quality education through best of the teaching-leaning process by using industry ready curriculum.
- To establish centres of excellence in the area of Automation and Robotics where ideas, innovations and research will synergize.
- To align the practices and initiatives with high ethical standards to meet the needs of the society and at large the nation.

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Program Outcomes (POs)

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

2. 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.

3. 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.

4. 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.

5. 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.

6. 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.

7. 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.

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practices.

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

10. 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.

11. 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.

12. 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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Program Specific Outcomes (PSOs)

At the end of this program, students will be able to -

PSO1: To integrate principles of engineering in multidisciplinary approach to find out the solutions for complex engineering problems.

PSO2: To design & develop the Automation & Robotics systems for various applications

PSO3: To make a career in Automation & Robotics through industry, entrepreneurship, research and academia while contributing to the continuous development of individual, organisation, society and nation at large.

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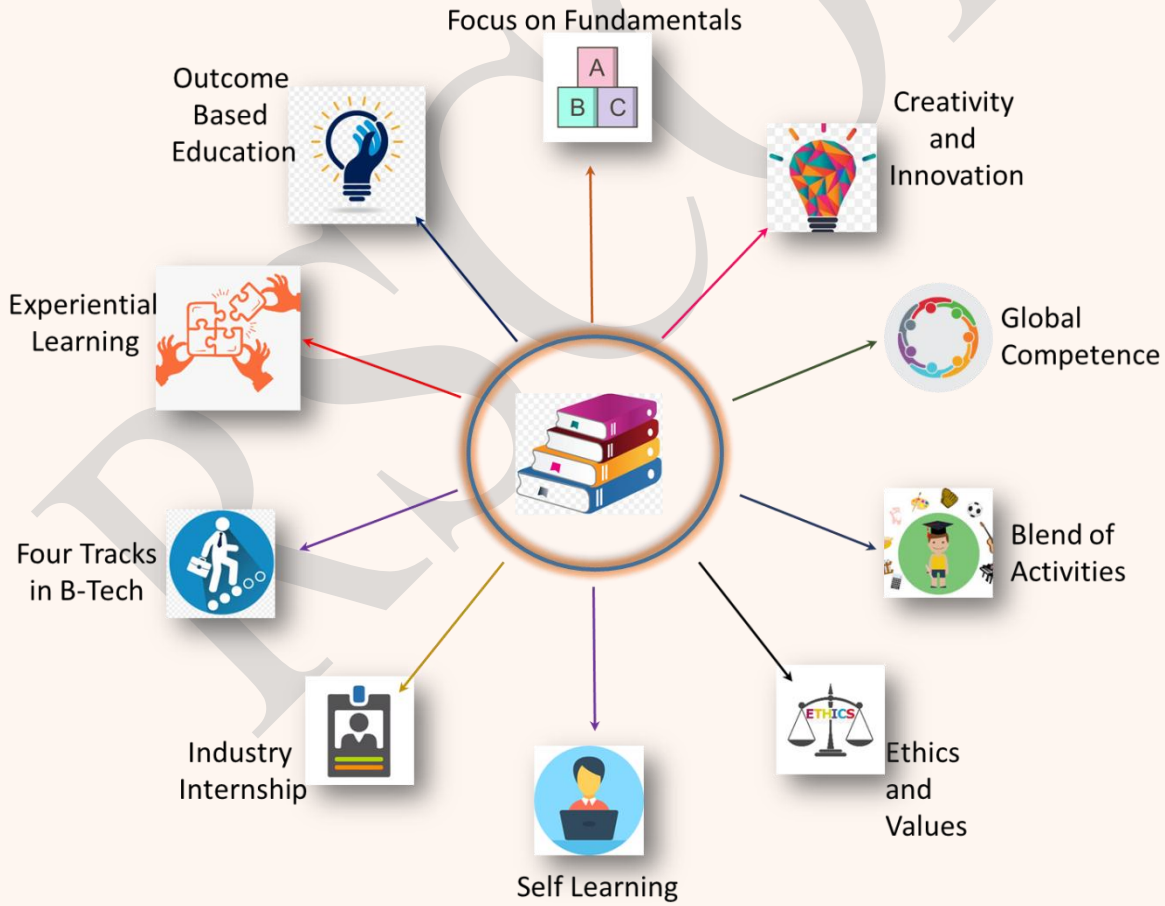
Highlights of the Syllabus

The Curriculum of UG Program of **AUTOMATION AND ROBOTICS** has been designed in association with **Experts from Academics, industries / Corporate & Distinguish Alumni.** Major features of the curriculum are presented in the following diagram.



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Unique Features of the Curriculum

1. **Curriculum centered at Outcome Based Education:**
   The new Curriculum is based on student-centered instruction models that focus on measuring student performance through outcomes. The outcomes include subject knowledge, industry required skills and attitudes.
2. **Emphasize on Fundamentals:**
   The nature of the new curriculum is rigorous and well prescribed so that the students can spend more time on preparation and self-study. The students have to learn core subjects, solve practical based assignments and must attempt periodical quizzes. This will benefit them to grasp and keep a strong hold on fundamentals of Engineering in the most effective way.
3. **Experiential Learning:**
   The curriculum emphasizes on hands-on sessions along with theoretical information. The new curriculum considers Problem Based Learning (PBL) as a teaching pedagogy and includes different subjects that encourage the students for hands on learning through virtual labs, mini-projects, etc. Accordingly, the curriculum maintains good balance between theory and laboratory credits.
4. **Promote Creativity and Innovation:**
   Along with experiential learning, the curriculum also motivates the students to inculcate creativity and innovation. Apart from conventional lab, the curriculum provides a freedom for students to perform industry assignments, pilot projects, innovative development, etc.
5. **Inculcating Ethics and Values:**
   To improvise student's behavior, the curriculum has included systematic courses on ethics and values. The moral principles can help students to make right decisions, lead their professional lives and become ethical citizen.
6. **Blend of Curricular and Extracurricular Activities**
   The curriculum also gives importance of different activities like co-curricular, extra-curricular, sports, culture, etc. This will help to do all round development of students in all possible ways.
7. **Four Tracks in B-Tech:**
   By offering various courses/electives, flexibility in choosing work in specified field as:
   I. Industry Internship
   II. Entrepreneur
   III. Higher Studies and Research
   IV. In house Project

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F. Y. B. Tech. Automation and Robotics
Academic Year -2024-2025 (Semester –I)
(Level 4.5- UG Certificate) -Semester – I

Course	Course Code	Course	Teaching Scheme				Credit	Examination Scheme				Total Marks	Ownership
			L	T	P	Hr	Cr	ISE	MSE	ESE	TW		
BSC	ES1201T	Engineering Mathematics-I	3	1	0	4	4	20	30	50	50	**150**	Mathematics
BSC	ES1207T	Chemistry for Engineers	3	0	0	3	3	20	30	50	-	**100**	Chemistry
BSC	ES1207L	Chemistry for Engineers Laboratory	0	0	2	2	1	ISCE: 30		20	-	**50**	Chemistry
ESC	ME1201L	Workshop Practice	0	0	4	4	2	ISCE: 60		40	-	**100**	Mechanical
HSSM (AEC)	HS1202T/ HS1203T/ HS1204T/ HS1205T	Professional English Communication /English Language skills /German/ Japanese	2	0	0	2	2	20	30	50	-	**100**	Humanities
HSSM (AEC)	HS1202L/ HS1203L/ HS1204L/ HS1205L	Professional English Communication /English Language skills /German/ Japanese	0	0	2	2	1	ISCE: 30		20	-	**50**	Humanities
ESC	EC1201T	Basic Electronics Engineering	2	0	0	2	2	20	30	50	-	**100**	E&TC
ESC	EC1201L	Basic Electronics Engineering Laboratory	0	0	2	2	1	ISCE: 30		20	-	**50**	E&TC
ESC	CS1201L	Introduction to Computer Programming	1	0	0	1	1	-		50	-	**50**	Computer and IT
ESC	CS1201T	Introduction to Computer Programming Laboratory	0	0	2	2	1	ISCE: 30		20	-	**50**	Computer and IT
HSSM (VSEC)	ES1208L	Introduction to Engineering and Engineering Products	-	-	2	2	1	ISCE: 50			-	**50**	Humanities
HSSM (IKS)	HS1207T	Indian Knowledge Systems	2	0	0	2	2	50	-	-	50	**100**	Respective Department
CC	AR1203	Co-curricular Courses	0	0	2	2	1	ISCE: 50		-	-	**50**	Respective Department
HSSM	HS1201	Induction Training	**Non-credit course**										
Total			**13**	**01**	**16**	**30**	**22**					**1000**	

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F. Y. B. Tech. Automation and Robotics

Academic Year -2024-2025 (Semester –II)

(Level 4.5- UG Certificate) -Semester – II

Course	Course Code	Course	Teaching Scheme				Credit	Examination Scheme				Total Marks	Ownership
			L	T	P	Hr	Cr	ISE	MSE	ESE	TW		
BSC	ES1202T	Engineering Mathematics- II	3	1	0	4	4	20	30	50	50	150	Mathematics
BSC	ES1206T	Physics for Engineers	3	0	0	3	3	20	30	50	-	100	Physics
BSC	ES1206L	Physics for Engineers Laboratory	0	0	2	2	1	ISCE: 30		20	-	50	Physics
ESC	ME1202L	Engineering Drawing Laboratory	0	0	4	4	2	ISCE: 50		50	-	100	Mechanical
ESC	EE1201T	Introduction to Electrical Engineering	3	0	0	3	3	20	30	50	-	100	Electrical
ESC	EE1201L	Introduction to Electrical Engineering Laboratory	0	0	2	2	1	ISCE: 30		20	-	50	Electrical
ESC	CE1201T	Engineering Mechanics	3	0	0	3	3	20	30	50	-	100	Civil
ESC	CE1201L	Engineering Mechanics Laboratory	0	0	2	2	1	ISCE: 30		20	-	50	Civil
ESC	CS1202T	Fundamentals of Data Structure	1	0	0	1	1	ISCE: 50			-	50	Computer and IT
ESC	CS1202L	Fundamentals of Data Structure Laboratory	0	0	2	2	1	ISCE: 30		20	-	50	Computer and IT
CEP	ES1209L	Community Engagement Project	0	0	4	4	2	ISCE: 50		50	-	100	Engineering Science and Humanities
HSSM	HS1206	Indian Constitution	Non-credit course										
Total			13	01	16	30	22					900	

Abbreviations:
L – Lecture, **T** – Tutorial, **P** – Practical, **Hr** – Hours, **C** – Credits, **ISE** – In Semester Evaluation, **MSE** – Mid Semester Evaluation, **ESE** – End Semester Evaluation

Notes:
For Theory courses: There shall be MSE, ISE and ESE. The ESE is a separate head of passing.
For Lab courses: There shall be continuous assessment (ISCE consists of ISE and MSE). The ESE is a separate head of passing.
For Tutorial: Assessment shall be ISE of the respective course.

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List of Exit Courses after completion of Semester I and II

1. Exit option is available for students those who have earned the total 44 credits at the End of Second Semester.
2. Student who wants to avail the exit option after first year has to earn additional 8 credits from the list of courses shown below.
3. These courses student have to complete within summer vacation after 1st Year.
4. After fulfillment as mentioned in 1 to 3 above, Students can earn **U.G Certificate** and same will be issued by the Institute.

Sr. No.	Course code	Name	Credits
1.	**EX-AR1201**	Fundamentals of Automation System	**2**
2.	**EX- AR1202**	Fundamentals of Robotics	**2**
3.	**EX- AR1203**	Certification in Design and Simulation of Hydraulic/Pneumatic System	**2**
4.	**EX- AR1204**	Certified Programmer in C++	**2**
5.	**EX- AR1205**	Mini Project	**2**
6.	**EX- AR1206**	Internship at Industry (4 Weeks)	**2**

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Course Type Abbreviations

BSC: Basic Science Course

ESC: Engineering Science Course

PCC: Programme Core Course

PEC: Programme Elective Course

MD M: Multidisciplinary Minor

OE: Open Elective

VSEC: Vocational and Skill Enhancement Course

HSSM: Humanities Social Science and Management

AEC: Ability Enhancement Course

IKS: Indian Knowledge System

VEC: Value Education Course

CEP: Comm. Engg. Project

FP: Field Project

CC: Co-curricular Courses

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S. Y. B. Tech (Automation and Robotics)

Academic Year -2024-2025 (Semester –III)

Proposed Structure Semester -III

(Level 5 - UG-Diploma/ Diploma-Eng) -Semester III

Course	Course Code	Course	Teaching Scheme				Credit	Examination Scheme				Total Marks	Ownership
			L	T	P	Hr	Cr	ISE	MSE	ESE	TW		
BSC	ES2202T	Engineering Mathematics -III	3	0	0	3	3	20	30	50	-	100	Mathematics
PCC	AR2201T	Manufacturing Technology and Metrology	3	0	0	3	3	20	30	50	-	100	A & R
PCC	AR2201L	Manufacturing Technology and Metrology Laboratory	0	0	2	2	1	ISCE: 30		20	-	50	A & R
PCC	AR2202T	Electrical Machines and Control	3	0	0	3	3	20	30	50	-	100	A & R
PCC	AR2202L	Electrical Machines and Control Laboratory	0	0	2	2	1	ISCE: 30		20	-	50	A & R
PCC	AR2203T	Principles of Automation and Robotics	3	0	0	3	3	20	30	50	-	100	A & R
PCC	AR2203L	Principles of Automation and Robotics Laboratory	0	0	2	2	1	ISCE: 30		20	-	50	A & R
PCC	AR2204T	Innovation and Entrepreneurship	2	-	-	2	2	20	30	50	-	100	A & R
PCC	AR2205T	Industrial Psychology	2	-	-	2	2	20	30	50	-	100	A & R
HSSM	HS2201T	Universal Human Values	2	-	-	2	2	20	30	50	-	100	Humanities
VEC	AR2206L	Introduction to Python Programming & Data Science- I	-	-	2	2	1	ISCE: 30		20	-	50	A & R
Total			**18**	**-**	**08**	**26**	**22**					**900**	

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S. Y. B. Tech (Automation and Robotics)
Academic Year -2024-2025 (Semester –IV)
Proposed Structure Semester -IV
(Level 5 - UG-Diploma/ Diploma-Eng) -Semester IV

Course	Course Code	Course	Teaching Scheme				Credit	Examination Scheme				Total Marks	Ownership
			L	T	P	Hr	Cr	ISE	MSE	ESE	TW		
PCC	AR2207T	Sensors and Instrumentation	3	0	0	3	3	20	30	50	-	100	A & R
Skill Course (VSEC)	AR2207L	Sensors and Instrumentation Laboratory	0	0	2	2	1	ISCE: 30		20	-	50	A & R
PCC	AR2208T	Hydraulic and Pneumatic Systems	3	0	0	3	3	20	30	50	-	100	A & R
Skill Course (VSEC)	AR2208L	Hydraulic and Pneumatic Systems Laboratory	0	0	2	2	1	ISCE: 30		20	-	50	A & R
PCC	AR2209T	Automatic Control System	3	0	0	3	3	20	30	50	-	100	A & R
PCC	AR2209L	Automatic Control System Laboratory	0	0	2	2	1	ISCE: 30		20	-	50	A & R
PCC	AR2210L	Product Development and Modeling	-	-	2	2	1	ISCE: 30		20	-	50	A & R
HSSM	ES3201T	Environmental Science and Engineering	2	-	-	2	2	20	30	50	-	100	Humanities
MDM	ARM2201T	Multi-Disciplinary Minor -I	3	0	0	3	3	20	30	50	-	100	A & R
HSSM (AEC)	HS5201	Soft skills	-	-	2	2	1	ISCE: 30		20	-	50	Humanities
HSSM	HS3202T	Economics	2	-	-	2	2	20	30	50	-	100	Humanities
CC	AR2211L	Co-Curricular Course	-	-	2	2	1	ISCE: 50			-	50	A & R
Total			**16**	**-**	**12**	**28**	**22**					**900**	

Abbreviations:
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Notes:
For Theory courses: There shall be MSE, ISE and ESE. The ESE is a separate head of passing.
For Lab courses: There shall be continuous assessment (ISCE consists of ISE and MSE). The ESE is a separate head of passing.
For Tutorial: Assessment shall be ISE of the respective course.

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List of Exit Courses after completion of Semester III and IV

1. Exit option is available for students those who have earned the total 88 credits at the End of fourth Semester.
2. Student who wants to avail the exit option after second year has to earn additional 8 credits from the list of courses shown below.
3. These courses student have to complete within summer vacation after 2nd Year.
4. After fulfillment as mentioned in 1 to 3 above, Students can earn UG-Diploma/ Diploma-Eng and same will be issued by the Institute.

Sr. No.	Course code	Name	Credits
1.	EX-AR2201	Certification of PLC and SCADA Software	2
2.	EX- AR2202	Programming with Python	2
3.	EX- AR2203	Certification on 3D Modeling Software	2
4.	EX- AR2204	Certification on Robotics System Simulation	2
5.	EX- AR2205	Minor Project on Embedded System/Mechatronics System	2
6.	EX- AR2206	Internship in Automation Industry (4 Weeks)	2

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T. Y. B. Tech (Automation and Robotics)
Academic Year -2025-2026 (Semester –V)
Proposed Structure Semester -V
(Level 5.5 - B. Voc./ B.Sc. Engg) -Semester V

Course	Course Code	Course	Teaching Scheme				Credit	Examination Scheme				Total Marks	Ownership
			L	T	P	Hr	Cr	ISE	MSE	ESE	TW		
PCC	**AR3201T**	Computer Integrated Manufacturing Systems	3	0	0	3	3	20	30	50	-	**100**	A & R
PCC	**AR3202T**	Design of Machine Elements and Transmission System	3	0	0	3	3	20	30	50	-	**100**	A & R
PCC	**AR3203T**	PLC and SCADA	3	0	0	3	3	20	30	50	-	**100**	A & R
PCC	**AR3203L**	PLC and SCADA Laboratory	0	0	2	2	1	ISCE: 30		20	-	**50**	A & R
PEC	**AR3204T**	Professional Elective- I	3	0	0	3	3	20	30	50	-	**100**	A & R
PEC	**AR3204L**	Professional Elective- I Laboratory	0	0	2	2	1	ISCE: 30		20	-	**50**	A & R
MDM	**ARM3201T**	Multi-Disciplinary Minor -II	3	0	0	3	3	20	30	50	-	**100**	A & R
MDM	**ARM3201L**	Multi-Disciplinary Minor –II Lab	-	-	2	2	1	ISCE: 30		20	-	**50**	A & R
OE		Open Elective-I	3	0	0	3	3	20	30	50	-	**100**	Other Department
CC	**AR3205L**	Co-Curricular Course	-	-	2	2	1	ISCE: 50			-	**50**	A & R
Total			**18**	**-**	**8**	**26**	**22**					**800**	

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T. Y. B. Tech (Automation and Robotics)
Academic Year -2025-2026 (Semester –VI)
Proposed Structure Semester -VI
(Level 5.5 - B. Voc./ B.Sc. Engg) -Semester VI

Course	Course Code	Course	Teaching Scheme				Credit	Examination Scheme				Total Marks	Ownership
			L	T	P	Hr	Cr	ISE	MSE	ESE	TW		
PCC	**AR3206T**	Robotics Kinematics and Dynamics	3	0	0	3	3	20	30	50	-	**100**	A & R
PCC	**AR3206L**	Robotics Kinematics and Dynamics Laboratory	0	0	2	2	1	ISCE: 30		20	-	**50**	A & R
PEC	**AR3207T**	Professional Elective- II	3	0	0	3	3	20	30	50	-	**100**	A & R
PEC	**AR3207L**	Professional Elective- II Laboratory	0	0	2	2	1	ISCE: 30		20	-	**50**	A & R
PEC	**AR3208T**	Professional Elective- III	3	0	0	3	3	20	30	50	-	**100**	A & R
PEC	**AR3208L**	Professional Elective- III Laboratory	-	-	2	2	1	ISCE: 30		20	-	**50**	A & R
MDM	**ARM3202T**	Multi-Disciplinary Minor -III	3	0	0	3	3	20	30	50	-	**100**	A & R
OE		Open Elective- II	3	0	0	3	3	20	30	50	-	**100**	Other Department
HSSM (VSEC)	**AR3209L**	Object Oriented Programming	-	1	2	3	2	ISCE: 30		20	50	**100**	A & R
Project	**AR3210L**	Engineering Innovation and Society-I	-	-	4	4	2	ISCE: 50		50	-	**100**	A & R
Total			**15**	**01**	**12**	**28**	**22**					**850**	

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For Lab courses: There shall be continuous assessment (ISCE consists of ISE and MSE). The ESE is a separate head of passing.
For Tutorial: Assessment shall be ISE of the respective course.

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List of Exit Courses after completion of Semester V and VI

1. Exit option is available for students those who have earned the total 132 credits at the End of sixth Semester.
2. Student who wants to avail the exit option after third year has to earn additional 8 credits from the list of courses shown below.
3. These courses student have to complete within summer vacation after 3rd Year.
4. After fulfillment as mentioned in 1 to 3 above, Students can earn **B.Voc./ B.Sc. Engg** and same will be issued by the Institute.

Sr. No.	Course code	Name	Credits
1.	**EX-AR3201**	Certification on Fundamentals of Industry 4.0	**2**
2.	**EX- AR3202**	Certification on Augmented Reality and Virtual Reality Simulation Software	**2**
3.	**EX- AR3203**	Certification on AI & ML	**2**
4.	**EX- AR3204**	Internship at Industry on 3D Printing	**2**
5.	**EX- AR3205**	Certification Program on Automation System for suitable Industrial application	**2**
6.	**EX- AR3206**	Major Project on Implementation on IIOT	**2**

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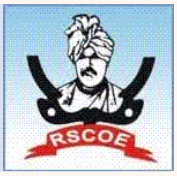

B. Tech (Automation and Robotics)
Academic Year -2026-2027 (Semester –VII)
Proposed Structure Semester -VII
(Level 6 – B. Tech) -Semester VII

Course	Course Code	Course	Teaching Scheme				Credit	Examination Scheme				Total Marks	Ownership
			L	T	P	Hr	Cr	ISE	MSE	ESE	TW		
PCC	**AR4201T**	Additive Manufacturing	3	0	0	3	3	20	30	50	-	**100**	A & R
PCC	**AR4202T**	Robotic Applications	3	0	0	3	3	20	30	50	-	**100**	A & R
PCC	**AR4203T**	Microcontrollers and Embedded Systems	3	0	0	3	3	20	30	50	-	**100**	A & R
PCC	**AR4203L**	Microcontrollers and Embedded Systems Laboratory	0	0	2	2	1	ISCE: 30		20	-	**50**	A & R
PEC	**AR4204T**	Professional Elective- IV	3	0	0	3	3	20	30	50	-	**100**	A & R
PEC	**AR4204L**	Professional Elective- IV Laboratory	-	-	2	2	1	ISCE: 30		20	-	**50**	A & R
MDM	**ARM4201T**	Multi-Disciplinary Minor -IV	3	0	0	3	3	20	30	50	-	**100**	A & R
MDM	**ARM4201L**	Multi-Disciplinary Minor –IV Laboratory	-	-	2	2	1	ISCE: 30		20	-	**50**	A & R
Project	**AR4205L**	Engineering Innovation and Society-II	-	-	8	8	4	ISCE: 100		100	-	**200**	A & R
Total			**15**	**0**	**14**	**29**	**22**					**850**	

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B. Tech (Automation and Robotics)
Academic Year -2026-2027 (Semester –VIII)
Proposed Structure Semester -VIII
(Level 6 – B. Tech) -Semester VIII

Track I – Regular Track

Course	Course Code	Course	Teaching Scheme				Credit	Examination Scheme				Total Marks	Ownership
			L	T	P	Hr	Cr	ISE	MSE	ESE	TW		
PCC	**AR4206T**	Advance Manufacturing Techniques	3	0	0	3	3	20	30	50	-	**100**	A & R
PCC	**AR4206L**	Advance Manufacturing Techniques Laboratory	0	0	2	2	1	ISCE: 30		20	-	**50**	A & R
PCC	**AR4207T**	Mobile Robotics	3	0	0	3	3	20	30	50	-	**100**	A & R
PCC	**AR4207L**	Mobile Robotics Laboratory	-	-	2	2	1	ISCE: 30		20	-	**50**	A & R
PCC	**AR4208T**	Skill Based Course	3	0	0	3	3	20	30	50	-	**100**	A & R
PCC	**AR4208L**	Skill Based Course Laboratory	-	-	2	2	1	ISCE: 30		20	-	**50**	A & R
VSEC	**AR4209T**	SWAYAM Professional Elective Course	2	-	-	2	2	-	-	-	-	**100**	A & R
Project	**AR4210L**	Comprehensive Evaluation	-	-	4	4	2	ISCE: 100			-	**100**	A & R
Total			**11**	**0**	**10**	**21**	**16**					**650**	

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B. Tech (Automation and Robotics)

Academic Year -2026-2027 (Semester –VIII)

Proposed Structure Semester -VIII

(Level 6 – B. Tech) -Semester VIII

Track II – Internship and Training

Course	Course Code	Course	Teaching Scheme				Credit	Examination Scheme				Total Marks	Ownership
			L	T	P	Hr	Cr	ISE	MSE	ESE	TW		
Internship	**AR4111L**	Industry Internship Program	-	-	24	24	12	ISCE: 200		250	-	**450**	A & R
VSEC	**AR4209T**	SWAYAM Professional Elective Course	2	-	-	2	2	-	-	-	-	**100**	A & R
Project	**AR4210L**	Comprehensive Evaluation	-	-	4	4	2	ISCE: 100			-	**100**	A & R
Total			**2**	**0**	**28**	**30**	**16**					**650**	

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PROFESSIONAL ELECTIVES

Elective	Automation (Track-I)	Robotics (Track -II)
Professional Elective- I	Artificial Intelligence and Machine Learning	Autonomous Robotics
Professional Elective- II	Integrated Automation	Wireless Sensors Network for Robotics
Professional Elective- III	Micro-Electro Mechanical systems (MEMS)	Cognitive Robotics
Professional Elective- IV	Design of Mechatronics System	Augmented Reality and virtual Reality for Robotics

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RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
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Department of Automation and Robotics
Open Elective (Offered to other department)
Structure (Effective from 2024-25)

Course Code	Course	Teaching Scheme				Credit	Examination Scheme			Total Marks
		L	T	P	Hr	Cr	ISE	MSE	ESE	
T. Y. Sem V										
ARO3201T	Applications of R-IoT	3	-	-	3	3	20	30	50	100
T. Y. Sem VI										
ARO3202T	Industry 4.0	3	-	-	3	3	20	30	50	100
Total		**6**	**-**	**-**	**6**	**6**				**20**

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TATHAWADE, PUNE-33
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Department of Automation and Robotics
Multidisciplinary Minor (offered to other Departments)
Multidisciplinary Minor in Industrial Automation and Robotics
Structure (Effective from 2024-25)

Course Code	Course	Teaching Scheme				Credit	Examination Scheme			Total Marks
		L	T	P	Hr	Cr	ISE	MSE	ESE	
S. Y. Sem IV										
ARM2201T	Industrial Sensors and its applications	3	-	-	3	3	20	30	50	100
T. Y. Sem V										
ARM3201T	Robotics and its applications	3	-	-	3	3	20	30	50	100
ARM3201L	Robotics and its applications Laboratory	-	-	2	2	1	ISCE: 30		20	50
T. Y. Sem VI										
ARM3202T	Essentials of Industrial Automation	3	-	-	3	3	20	30	50	100
B. Tech. Sem VII										
ARM4201T	Fundamentals of PLC and SCADA	3	-	-	3	3	20	30	50	100
ARM4201L	Fundamentals of PLC and SCADA Laboratory	-	-	2	2	1	ISCE: 30		20	50
Total		**12**	**-**	**4**	**16**	**14**				**500**

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TATHAWADE, PUNE-33
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Department of Automation and Robotics
Minor in Emerging Area
RPA and Data Science
Structure (Effective from 2024-25)

Course Code	Course	Teaching Scheme				Credit	Examination Scheme			Total Marks
		L	T	P	Hr	C	ISE	MSE	ESE	
S. Y. Sem IV										
ARH2201T	Robotic Process Automation	3	-	-	3	3	20	30	50	100
ARH2201L	Robotic Process Automation Laboratory	-	-	2	2	1	ISCE: 30		20	50
T. Y. Sem V										
ARH3201T	Data Science	3	-	-	3	3	20	30	50	100
ARH3201L	Data Science Laboratory	-	-	2	2	1	ISCE: 30		20	50
T. Y. Sem VI										
ARH3202T	Industrial Internet of Things	3	1	-	3	4	20	30	50	100
B. Tech. Sem VII										
ARH4201T	Industry 5.0	3	-	-	3	3	20	30	50	100
ARH4202L	Mini Project	-	-	6	6	3	ISCE: 50		50	100
Total		**12**	**1**	**10**	**22**	**18**				**600**

Eligibility for admission to the UG Bachelor's Degree with Double Minor: Minimum CGPA/CPI of 7.5 or minimum 75% after second semester for UG Bachelor's Degree

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Department of Automation and Robotics
Honors with Research
Structure (Effective from 2024-25)

Course Code	Course	Teaching Scheme				Credit	Examination Scheme			Total Marks
		L	T	P	Hr	C	ISE	MSE	ESE	
B. Tech. Sem VII										
CSR4101T	Research Specific core course (Online NPTEL course)	4	-	-	4	4	20	30	50	100
CSR4102T	Design Thinking and Innovation (online/offline)	4	-	-	4	4	20	30	50	100
CSR4103L	Research Project Stage I	-	-	4	4	2	ISCE: 50		50	100
B.Tech. Sem VIII										
CSR4104L	Comprehensive Evaluation	-	-	4	4	2	ISCE: 100			100
CSR4105L	Research Project Stage II	-	-	12	6	6	ISCE: 100		100	200
Total		**6**	**2**	**20**	**22**	**18**				**600**

Eligibility for admission to the UG Bachelor's Degree with Research: Minimum CGPA/CPI of 7.5 or minimum 75% after sixth semester for UG Bachelor's Degree

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Notes:
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For Tutorial: Assessment shall be ISE of the respective course.

Note: For Evaluation of Online NPTEL course ISE Marks will be marks obtained by students in the assignments given by NPTEL, MSE will be the marks obtained in NPTEL certification.

Students who will secure NPTEL certification will be only eligible for ESE of the same course which will be conducted at institute.

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