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

Department of Automation and Robotics
Structure & Syllabus
B. Tech (2025 Pattern)
w.e.f. Academic Year 2026-2027

Prof. Chandan M N	Dr. K. P. Moholkar	Dr. A. M. Badadhe
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 of Department:

- 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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Department of Automation and Robotics

Program Outcomes (POs)

Engineering Graduates will be able to:

PO1: Engineering Knowledge: Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems.

PO2: Problem Analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)

PO3: Design/Development of Solutions: Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)

PO4: Conduct Investigations of Complex Problems: Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions. (WK8).

PO5: Engineering Tool Usage: Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6)

PO6: The Engineer and The World: Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7).

PO7: Ethics: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)

PO8: Individual and Collaborative Team work: Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.

PO9: Communication: Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences

PO10: Project Management and Finance: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.

PO11: Life-Long Learning: Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. (WK8)

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Knowledge and Attitude Profile (WK)

WK1: A systematic, theory-based understanding of the natural sciences applicable to the discipline and awareness of relevant social sciences.

WK2: Conceptually-based mathematics, numerical analysis, data analysis, statistics and formal aspects of computer and information science to support detailed analysis and modelling applicable to the discipline.

WK3: A systematic, theory-based formulation of engineering fundamentals required in the engineering discipline.

WK4: Engineering specialist knowledge that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is at the forefront of the discipline.

WK5: Knowledge, including efficient resource use, environmental impacts, whole-life cost, reuse of resources, net zero carbon, and similar concepts, that supports engineering design and operations in a practice area.

WK6: Knowledge of engineering practice (technology) in the practice areas in the engineering discipline.

WK7: Knowledge of the role of engineering in society and identified issues in engineering practice in the discipline, such as the professional responsibility of an engineer to public safety and sustainable development.

WK8: Engagement with selected knowledge in the current research literature of the discipline, awareness of the power of critical thinking and creative approaches to evaluate emerging issues.

WK9: Ethics, inclusive behavior and conduct. Knowledge of professional ethics, responsibilities, and norms of engineering practice. Awareness of the need for diversity by reason of ethnicity, gender, age, physical ability etc. with mutual understanding and respect, and of inclusive attitudes.

Department of Automation and Robotics

Program Specific Outcomes (PSOs)

Upon successful completion of UG course in Automation and Robotics, the students will attain following Program Specific Outcomes:

PSO 1: To integrate principles of engineering in multidisciplinary approach to find out the solutions for complex engineering problems.

PSO 2: To design & develop the Automation & Robotics systems for various applications

PSO 3: 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

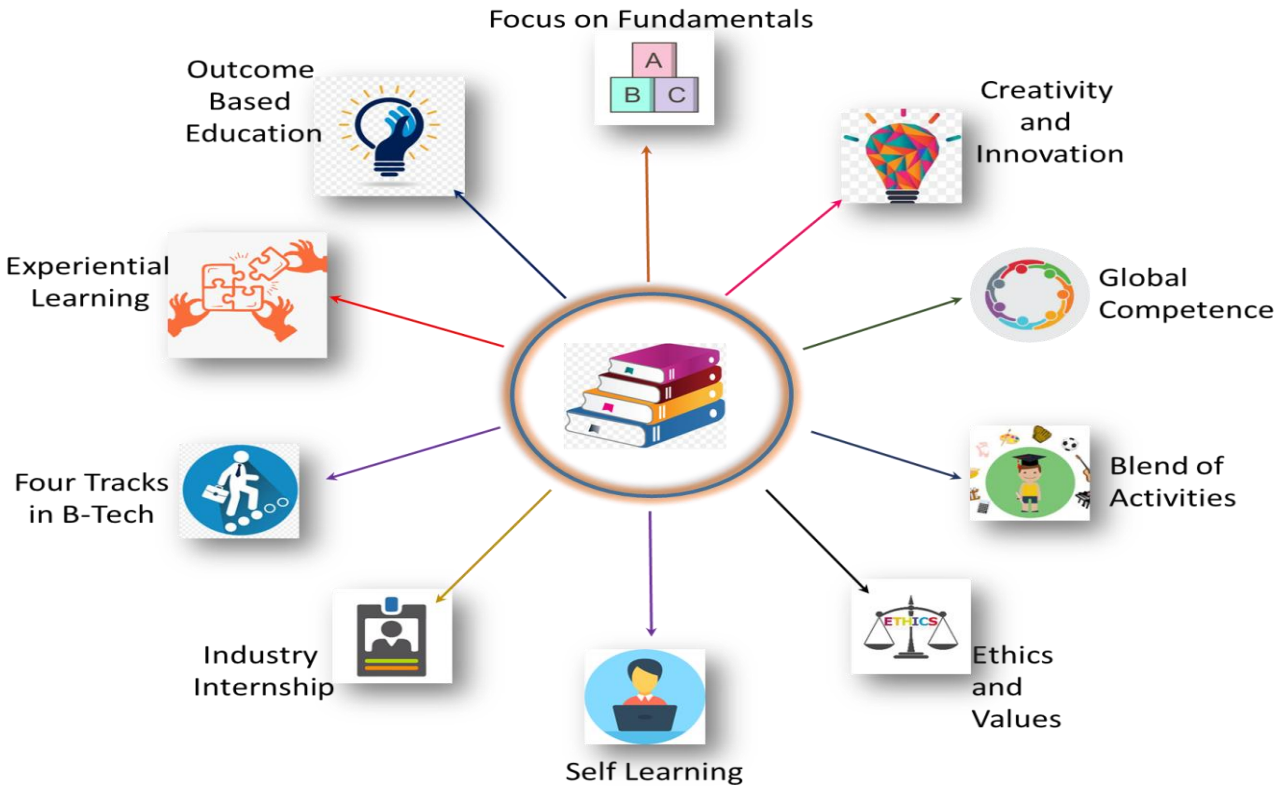
Curriculum of UG program for Automation and Robotics is designed in association with

Academic Experts

Industry/Corporate Experts

Distinguished Alumni

Features of **Automation and Robotics** curriculum are designed in association with the **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 behaviour, 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. **Two Tracks in B-Tech:**

   By offering various courses/electives, flexibility in choosing work in specified field as:

   I. Regular II. Internship and Training

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8. **Global Competence:**

   The curriculum provides a unique opportunity for students to learn and engage in open and effective interaction with people from diverse and interconnected world. The combination of foreign languages (German, Japanese, English) and international internships in the curriculum help the students to build a capacity to examine global and intercultural issues and to propose perspectives and views.

9. **Industry Induced Internship Program:**

   To support ever demanding industry requirements, the curriculum has included an industry internship with an objective to learn technologies pertaining to their discipline and enhance their technical knowledge with a support of the live platform of Industry.

10. **Motivation for Self-Learning:**

    The curriculum also offers a freedom to students to take the initiatives in their learning needs and set the goals with the help of online learning platforms like MOOCs, Swayam -NPTEL etc.

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Course Type Abbreviations

BSC: Basic Science Course
ESC: Engineering Science Course
PCC: Program Core Course
PEC: Program Elective Course
MDM: 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: Community Engagement Project
FP: Field Project
CC: Co-curricular Courses
PR: Project Work
IN: Internship

Assessment Type Abbreviations

TA1: Teacher's Assessment 1
TA2: Teacher's Assessment 2
MSE: Mid Semester Examination
ESE: End Semester Examination

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COURSE WISE CREDIT DISTRIBUTION

Sr. No.	Type of Course	No. of Courses	Total Credits	
			No	%
1	BSC: Basic Science Course	**07**	**20**	**12**
2	ESC: Engineering Science Course	**09**	**17**	**10.24**
3	PCC: Program Core Course	**15**	**47**	**28.31**
4	PEC: Program Elective Course	**03**	**12**	**7.23**
5	MDM: Multidisciplinary Minor	**06**	**14**	**8.43**
6	OE: Open Elective	**03**	**09**	**5.42**
7	VSEC: Vocational and Skill Enhancement Course	**07**	**14**	**8.43**
8	HSSM: Humanities Social Science and Management	**01**	**03**	**1.81**
9	AEC: Ability Enhancement Course	**02**	**03**	**1.81**
10	IKS: Indian Knowledge System	**01**	**02**	**1.20**
11	VEC: Value Education Course	**01**	**03**	**1.81**
12	CEP: Community Engagement Project	**02**	**02**	**1.20**
13	FP: Field Project	**-**	**-**	**-**
14	CC: Co-curricular Courses	**01**	**01**	**0.60**
15	PR: Project Work	**03**	**07**	**4.22**
16	IN: Internship	**01**	**12**	**7.23**
	Total	**62**	**166**	**100%**

SEMESTER-WISE CREDIT DISTRIBUTION

Sr. No.	Type of Course	No. of Credits / Semester								
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**Total**
1	BSC: Basic Science Course	08	08	04	-	-	-	-	-	**20**
2	ESC: Engineering Science Course	07	10	-	-	-	-	-	-	**17**
3	PCC: Program Core Course	-	-	12	11	14	08	02	-	**47**
4	PEC: Program Elective Course	-	-	-	-	-	04	08	-	**12**
5	MDM: Multidisciplinary Minor	-	-	02	04	-	04	04	-	**14**
6	OE: Open Elective	-	-	-	-	03	03	03	-	**09**
7	VSEC: Vocational and Skill Enhancement Course	02	03	04	03			02	-	**14**
8	HSSM: Humanities Social Science and Management	-	-	-	-	03	-	-	-	**03**
9	AEC: Ability Enhancement Course	03	00	-	-	-	-	-	-	**03**
10	IKS: Indian Knowledge System	02	-	-	-	-	-	-	-	**02**
11	VEC: Value Education Course	-	-	-	03	-	-	-	-	**03**
12	CEP: Community Engagement Project	-	01	-	-	01	-	-	-	**02**
13	FP: Field Project	-	-	-	-		-	-	-	**-**
14	CC: Co-curricular Courses	-	-	-	01		-	-	-	**01**
15	PR: Project Work	-	-	-	-	01	03	03	-	**07**
16	IN: Internship	-	-	-	-	-	-	-	12	**12**
	Total	22	22	22	22	22	22	22	12	166

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F.Y.B.Tech (Pattern 2025)

Structure for

1. Mechanical Engineering 2. Automation and Robotics Engineering

Academic Year -2025-2026 (Semester –I)

Course Category	Course Code	Course	Teaching Scheme						Examination Scheme			
			L	T	P	SL	TOTAL Hr	C	ISE	MSE	ESE	Total
BSC	ES1301T	Calculus	3	1	-	4	8	4	20	30	50	100
BSC	ES1307T/ ES1309T	Physics for Engineers/ Chemistry for Engineers	3	-	-	3	6	3	20	30	50	100
BSC	ES1307L/ ES1309L	Physics for Engineers Laboratory/ Chemistry for Engineers Laboratory	-	-	2	1	3	1	20	10	20	50
ESC	CS1301T	Introduction to Computer Programming and Data Structure	2	-	-	2	4	2	20	30	50	100
ESC	CS1301L	Introduction to Computer Programming and Data Structure Lab	-	-	4	2	6	2	20	10	20	50
ESC	EC1301T	Basic Electronics Engineering	2	-	-	2	4	2	20	30	50	100
ESC	EC1301L	Basic Electronics Engineering Laboratory	-	-	2	1	3	1	20	10	20	50
HSSM (AEC)	HS1302T/ HS1303T/ HS1304T/ HS1305T	Professional English Communication/ English Language Skills/ German Language Skills /Japanese Language Skills	2	-	-	2	4	2	20	30	50	100
HSSM (AEC)	HS1302L/ HS1303L/ HS1304L/ HS1305L	Professional English Communication Laboratory/ English Language Skills Laboratory/ German Language Skills Laboratory/ Japanese Language Skills Laboratory	-	-	2	1	3	1	20	10	20	50
HSSM (VSEC)	ME1301L	Workshop Practice	-	-	4	2	6	2	40	20	40	100
HSSM (IKS)	HS1307T	Indian Knowledge Systems	2	-	-	2	4	2	10	20	20	50
HSSM	HS1301	Induction Training	**Non-CreditCourse**									
Total			**14**	**1**	**14**	**22**	**51**	**22**	**230**	**230**	**390**	**850**

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F.Y.B.Tech (Pattern 2025) Structure for

1. Mechanical Engineering 2. Automation and Robotics

Academic Year -2025-2026 (Semester –II)

Course Category	Course Code	Course	Teaching Scheme					Credit	Examination Scheme			
			L	T	P	SL	TOTAL Hr	C	ISE	MSE	ESE	Total
BSC	ES1302T	Linear Algebra and Integral Transform	3	1	-	4	8	4	20	30	50	100
BSC	ES1309T/ ES1307T	Chemistry for Engineers / Physics for Engineers	3	-	-	3	6	3	20	30	50	100
BSC	ES1309L/ ES1307L	Chemistry for Engineers Laboratory/ Physics for Engineers Laboratory	-	-	2	1	3	1	20	10	20	50
ESC	CE1301T	Engineering Mechanics	3	-	-	3	6	3	20	30	50	100
ESC	CE1301L	Engineering Mechanics Laboratory	-	-	2	1	3	1	20	10	20	50
ESC	EE1301T	Introduction to Electrical Engineering	3	-	-	3	6	3	20	30	50	100
ESC	EE1301L	Introduction to Electrical Engineering Laboratory	-	-	2	1	3	1	20	10	20	50
HSSM (VSEC)	ME1302L	Engineering Drawing Laboratory	-	-	4	2	6	2	40	20	40	100
ESC	ES1310T	Biology for Engineers	2	-	-	2	4	2	20	30	50	100
HSSM	ES1311L	Community Engagement Project	-	-	2	1	3	1	20	10	20	50
HSSM (VSEC)	ES1312L	Introduction to Engineering and Engineering Products	-	-	2	1	3	1	20	10	20	50
HSSM	HS1306	Indian Constitution	**Non-Credit Course**									
Total			**14**	**1**	**14**	**22**	**51**	**22**	**240**	**220**	**390**	**850**

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Abbreviations

L	**:**	**Lecture**	**P**	**:**	**Practical**
T	**:**	**Tutorial**	**C**	**:**	**Credits**
SL	**:**	**Self-Learning**			
Hr	**:**	**Contact Hours**			
In Course Code T	**:**	**Theory**	**In Course Code L**	**:**	**Lab**
BSC	**:**	**Basic Science Course**			
ESC	**:**	**Engineering Science Course**			
HSSM	**:**	**Humanities Social Science and Management Course**			
AEC		**Ability Enhancement Course**			
VSEC	**:**	**Vocational Skill Enhancement Course**			
CEP	**:**	**Community Engagement Project**			
ISE	**:**	**In Semester Evaluation**			
MSE	**:**	**Mid Semester Evaluation**			
ESE	**:**	**End Semester Evaluation**			

While calculating the 'Hr' component from 'P', the 'SL' parameter is excluded from consideration
Continues Assessment: ISE (In-semester Examination), MSE (Mid Semester Examination) Summative Assessment: ESE (End Semester Examination)

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 have to earn additional 8 credits from the list of courses shown below.
3. These courses student have to complete within summer vacation after 1 st 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

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Mechanical Engineering

Sr. No.	Course code	Name	Credits
1.	**EX-ME1301**	Certified in 3D modeling Software	**2**
2.	**EX-ME1302**	Certified in Drafting Skills	**2**
3.	**EX-ME1303**	Welding Technology	**2**
4.	**EX-ME1304**	Hands on Training in any workshop (2 Weeks)	**2**
5.	**EX-ME1305**	Certified Programmer in C	**2**
6.	**EX-ME1306**	Certified Programmer in AutoCAD	**2**

Automation and Robotics Engineering

Sr. No.	Course code	Name	Credits
1.	**EX-AR1301**	Fundamentals of Automation System	**2**
2.	**EX-AR1302**	Fundamentals of Robotics	**2**
3.	**EX-AR1303**	Certification in Design and Simulation of Hydraulic/Pneumatic System	**2**
4.	**EX-AR1304**	Certified Programmer in C++	**2**
5.	**EX-AR1305**	Mini Project	**2**
6.	**EX-AR1306**	Internship at Industry	**2**

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S. Y. B. Tech (Automation and Robotics)
Semester -III Structure

SN	Course Category	Course Code	Course title	Teaching Scheme, Classroom Contact hr/week (Contact hr/semester)			Self-learning (Contact hr/semester)	Total Classroom Contact hr/week (Contact hr/ semester)	Credit	Examination scheme (Marks)				
										Continuous Assessment			Semester End Examination	Total Marks
				L	T	P	SL	Hr	C	TA1	MSE	TA2	ESE	
1	BSC	**ES2301T**	Differential Equation and Vector Calculus	3 (45)	1 (15)	0 (0)	- (60)	4 (120)	4	10	30	10	50	100
2	PCC	**AR2301T**	Electrical Machines and Control	2 (30)	0 (0)	0	- (30)	2 (60)	2	10	30	10	50	100
3	PCC	**AR2301L**	Electrical Machines and Control Laboratory	0 (0)	0 (0)	2 (20)	- (10)	2 (30)	1	10	10	10	20	50
4	PCC	**AR2302T**	Principles of Automation and Robotics	3 (45)	0 (0)	0	- (45)	3 (90)	3	10	30	10	50	100
5	PCC	**AR2302L**	Principles of Automation and Robotics Laboratory	0 (0)	0 (0)	2 (20)	- (10)	2 (30)	1	10	10	10	20	50
6	PCC	**AR2303T**	Manufacturing Technology and Metrology	2 (30)	0 (0)	0	- (30)	2 (60)	2	10	30	10	50	100
7	PCC	**AR2303L**	Manufacturing Technology and Metrology Laboratory	0 (0)	0 (0)	2 (20)	- (10)	2 (30)	1	10	10	10	20	50
8	PCC	**AR2304T**	Strength of Materials	2 (30)	1 (15)	0 (0)	- (45)	3 (90)	3	10	30	10	50	100
9	VSEC	**AR2305L**	Embedded Robotics Laboratory	0 (0)	0 (0)	2 (20)	- (0)	2 (10)	1	10	10	10	20	50
10	MDM (CEP)	**AR2306L**	Design Thinking and Innovation Laboratory	0 (0)	0 (0)	4 (40)	- (30)	4 (60)	2	20	20	20	40	100
11	MDM (VSEC)	**AR2307L**	Introduction to Python Programming & Data Science- I	0 (0)	0 (0)	4 (40)	- (30)	4 (60)	2	20	20	20	40	100
Total				**12**	**02**	**16**	**310**	**30**	**22**	**150**	**240**	**150**	**410**	**900**

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S. Y. B. Tech (Automation and Robotics)
Semester -IV Structure

SN	Course Category	Course Code	Course title	Teaching Scheme, Classroom Contact hr/week (Contact hr/semester)			Self-learning (Contact hr/semester)	Total Classroom Contact hr/week (Contact hr/ semester)	Credit	Examination scheme (Marks)				
										Continuous Assessment			Semester End Examination	Total Marks
				L	T	P	SL	Hr	C	TA1	MSE	TA2	ESE	
1	MDM	**AR2307T**	Probability & Statistics	3 (45)	1 (15)	0 (0)	- (60)	4 (120)	4	10	30	10	50	100
2	CC	**CCA2301L**	Co-Curricular Activity	0 (0)	0 (0)	2 (20)	- (30)	2 (30)	1	10	10	10	20	50
3	VEC	**HS2301T**	Universal Human Values & Professional Ethics	2 (30)	1 (15)	0 (0)	- (45)	3 (90)	3	20*	30*	20	30	100
4	VSEC	**AR2308L**	Product Design and Modelling Laboratory	0 (0)	0 (0)	2 (20)	- (10)	2 (30)	1	10	10	10	20	50
5	PCC	**AR2309T**	Automatic Control System	3 (45)	0 (0)	0 (0)	- (45)	3 (90)	3	10	30	10	50	100
6	PCC	**AR2309L**	Automatic Control System Laboratory	0 (0)	0 (0)	2 (20)	- (10)	2 (30)	1	10	10	10	20	50
7	PCC	**AR2310T**	Hydraulic and Pneumatic System	3 (45)	0 (0)	0 (0)	- (45)	3 (90)	3	10	30	10	50	100
8	PCC	**AR2310L**	Hydraulic and Pneumatic System Laboratory	0 (0)	0 (0)	2 (20)	- (10)	2 (30)	1	10	10	10	20	50
9	PCC	**AR2311T**	Sensor and Instrumentation	2 (30)	0 (0)	0 (0)	- (30)	2 (60)	2	10	30	10	50	100
10	PCC	**AR2311L**	Sensor and Instrumentation Laboratory	0 (0)	0 (0)	2 (20)	- (10)	2 (30)	1	10	10	10	20	50
11	PCC	**AR2312T**	Kinematics and Dynamics of Machines	2 (30)	0 (0)	0 (0)	- (30)	2 (60)	2	10	30	10	50	100
			Total	**15**	**02**	**10**	**325**	**27**	**22**	**120**	**230**	**120**	**380**	**850**

* No Pen Paper Exam

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(An Empowered Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)

T. Y. B. Tech (Automation and Robotics)
Semester -V Structure

SN	Course Category	Course Code	Course title	Teaching Scheme, Classroom Contact hr/week (Contact hr/semester)			Self-learning (Contact hr/semester)	Total Classroom Contact hr/week (Contact hr/ semester)	Credit	Examination scheme (Marks)				
										Continuous Assessment			Semester End Examination	Total Marks
				L	T	P	SL	Hr	C	TA1	MSE	TA2	ESE	
1	CEP	**AR3301L**	Engineering Innovation and Society – I (Capstone Project - I)	0 (0)	0 (0)	2 (20)	- (10)	2 (30)	1	10	10	10	20	50
2	OE	**OE I**	Open elective-1	3 (45)	0 (0)	0 (0)	- (45)	3 (90)	3	25			75	100
3	HSSM	**ES3301T**	Environmental Systems and Sustainability Engineering	3 (45)	0 (0)	0 (0)	- (45)	3 (90)	3	10	30	10	50	100
4	PCC	**AR3302T**	PLC and SCADA	3 (45)	0 (0)	0 (0)	- (45)	3 (90)	3	10	30	10	50	100
5	PCC	**AR3302L**	PLC and SCADA Laboratory	0 (0)	0 (0)	2 (20)	- (10)	2 (30)	1	10	10	10	20	50
6	PCC	**AR3303T**	Microcontrollers and Embedded Systems	3 (45)	0 (0)	0 (0)	- (45)	3 (90)	3	10	30	10	50	100
7	PCC	**AR3303L**	Microcontrollers and Embedded Systems Laboratory	0 (0)	0 (0)	2 (20)	- (10)	2 (30)	1	10	10	10	20	50
8	PCC	**AR3304T**	Design of Machine Elements and Transmission System	3 (45)	0 (0)	0 (0)	- (45)	3 (90)	3	10	30	10	50	100
9	PCC	**AR3305T**	Computer Integrated Manufacturing Systems	3 (45)	0 (0)	0 (0)	- (45)	3 (90)	3	10	30	10	50	100
10	PCC	**AR3306L**	Seminar and Technical Communication	0 (0)	0 (0)	2 (20)	- (10)	2 (30)	1	10	10	10	20	50
Total				**18**	**00**	**08**	**310**	**26**	**22**	**90**	**215**	**90**	**405**	**800**

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T. Y. B. Tech (Automation and Robotics)
Semester -VI Structure
Level 5.5: UG-Diploma/ Diploma-Eng

SN	Course Category	Course Code	Course title	Teaching Scheme, Classroom Contact hr/week (Contact hr/semester)			Self-learning (Contact hr/semester)	Total Classroom Contact hr/week (Contact hr/ semester)	Credit	Examination scheme (Marks)				
										Continuous Assessment			Semester End Examination	Total Marks
				L	T	P	SL	Hr	C	TA1	MSE	TA2	ESE	
1	MDM	**HS3301T**	Economics for Engineers: Markets, Policy and Development	3 (45)	0 (0)	0 (0)	- (45)	3 (90)	3	10	30	10	50	100
2	OE	**OE II**	Open Elective II	3 (45)	0 (0)	0 (0)	- (45)	3 (90)	3	10	30	10	50	100
3	CC (AEC)	**CCA3301L**	Workplace Communication and Analytical Skills	0 (0)	0 (0)	2 (20)	- (10)	2 (30)	1	10	10	10	20	50
4	CEP	**AR3308L**	Engineering Innovation and Society – II (Capstone Project -II)	0 (0)	0 (0)	6 (60)	- (30)	6 (90)	3	30	30	30	60	150
5	PCC	**AR3309T**	Robot Kinematics & Dynamics	3 (45)	0 (0)	0 (0)	- (45)	3 (90)	3	10	30	10	50	100
6	PCC	**AR3309L**	Robot Kinematics & Dynamics Laboratory	0 (0)	0 (0)	2 (20)	- (10)	2 (30)	1	10	10	10	20	50
7	PCC	**AR3310T**	Machine Vision System	3 (45)	0 (0)	0 (0)	- (45)	3 (90)	3	10	30	10	50	100
8	PCC	**AR3310L**	Machine Vision System Laboratory	0 (0)	0 (0)	2 (20)	- (10)	2 (30)	1	10	10	10	20	50
9	PEC	**AR3311T**	Professional Elective I	3 (45)	0 (0)	0 (0)	- (45)	3 (90)	3	10	30	10	50	100
10	PEC	**AR3311L**	Professional Elective I Laboratory	0 (0)	0 (0)	2 (20)	- (10)	2 (30)	1	10	10	10	20	50
Total				**15**	**00**	**14**	**295**	**29**	**22**	**120**	**220**	**120**	**390**	**850**

Professional Elective				
Elective	**Course Code**	**(Track-I)**	**Course Code**	**(Track -II)**
Professional Elective I	**AR3311T-A**	Artificial Intelligence and Machine Learning	**AR3311T-B**	Autonomous Robotics
Professional Elective I Laboratory	**AR3311L-A**	Artificial Intelligence and Machine Learning Laboratory	**AR3311L-B**	Autonomous Robotics Laboratory

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B. Tech (Automation and Robotics)
Semester –VII Structure
Level 5.5: UG-Diploma/ Diploma-Eng

SN	Course Category	Course Code	Course title	Teaching Scheme, Classroom Contact hr/week (Contact hr/semester)			Self-learning (Contact hr/semester	Total Classroom Contact hr/week (Contact hr/ semester)	Credit	Examination scheme (Marks)				
										Continuous Assessment			Semester End Examination	Total Marks
				L	T	P	SL	Hr	C	TA1	MSE	TA2	ESE	
1	MDM	**HS4301T**	Foundation of Management and Entrepreneurship	3 (45)	0 (0)	0 (0)	- (45)	3 (90)	3	10	30	10	50	100
2	CEP	**AR4301L**	Engineering Innovation and Society – III (Capstone Project -III)	0 (0)	0 (0)	6 (60)	- (30)	6 (90)	3	25	50	25	100	200
3	OE	**OE III**	Open Elective III	3 (45)	0 (0)	0 (0)	- (45)	3 (90)	3	10	30	10	50	100
4	PCC	**AR4302T**	Additive Manufacturing and Rapid Prototyping	3 (45)	0 (0)	0 (0)	- (45)	3 (90)	3	10	30	10	50	100
5	PCC	**AR4302L**	Rapid Prototyping Laboratory	0 (0)	0 (0)	2 (20)	- (10)	2 (30)	1	10	10	10	20	50
6	PCC	**AR4303T**	Professional Elective II	3 (45)	0 (0)	0 (0)	- (45)	3 (90)	3	10	30	10	50	100
7	PEC	**AR4303L**	Professional Elective II Laboratory	0 (0)	0 (0)	2 (20)	- (10)	3 (30)	1	10	10	10	20	50
8	PEC	**AR4304T**	Professional Elective III	3 (45)	0 (0)	0 (0)	- (45)	3 (90)	3	10	30	10	50	100
9	PEC	**AR4304L**	Professional Elective III Laboratory	0 (0)	0 (0)	2 (20)	- (10)	3 (30)	1	10	10	10	20	50
10	PCC (VSEC)	**AR4305T**	Object Oriented Programming Laboratory	0 (0)	0 (0)	2 (20)	- (10)	2 (30)	1	30	20	30	20	100
			Total	**13**	**00**	**14**	**265**	**29**	**22**	**135**	**250**	**135**	**430**	**950**

Professional Elective						
Elective	**Course Code**	**(Track-I)**	**Course Code**	**(Track -II)**	**Course Code**	**(Track -III)**
Professional Elective II	AR3303T-A	Digital Twin and Industry4.0	AR3303T-A	Design of Mechatronics System	AR3303T-C	Cognitive and Medical Robotics
Professional Elective II Laboratory	AR3303L-A	Digital Twin and Industry4.0 Laboratory	AR3303L-A	Design of Mechatronics System Laboratory	AR3303L-C	Cognitive and Medical Robotics Laboratory
Professional Elective III	AR3304T-A	Wireless Sensors Network for Robotics	AR3304T-A	Augmented Reality and virtual Reality for Robotics	AR3304T-C	Automation System Design
Professional Elective III Laboratory	AR3304L-A	Wireless Sensors Network for Robotics Laboratory	AR3304L-A	Augmented Reality and virtual Reality for Robotics Laboratory	AR3304L-C	Automation System Design Laboratory

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B. Tech (Automation and Robotics)
Semester –VIII Structure
Level 5.5: UG-Diploma/ Diploma-Eng

SN	Course Category	Course Code	Course title	Teaching Scheme, Classroom Contact hr/week (Contact hr/semester)			Self-learning (Contact hr/semester)	Total Classroom Contact hr/week (Contact hr/ semester)	Credit	Examination scheme (Marks)				
										Continuous Assessment			Semester End Examination	Total Marks
				L	T	P	SL	Hr	C	TA1	MSE	TA2	ESE	
1	IN	**AR4306**	Industrial Internship / Research Internship/ Start-up	-			0 (540)	24 540 #	12	300			200	500
Total				**--**	**--**	**25**	**336**	**360**	**12**	**300**			**200**	**500**

1 Credit = 45 hours of Work as per AICTE Internship Guideline

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Department of Automation and Robotics
B. Tech (Honor Course)
Smart Automation and Industry 4.0

SN	Course Category	Course Code	Course title	Teaching Scheme, Classroom Contact hr/week (Contact hr/semester)			Self-learning (Contact hr/semester)	Total Classroom Contact hr/week (Contact hr/ semester)	Credit	Examination scheme (Marks)				
										Continuous Assessment			Semester End Examination	Total Marks
				L	T	P	SL	Hr	C	TA1	MSE	TA2	ESE	
1	PCC	ARH2301T	Industry Internet of Things	3 (45)	0 (0)	0 (0)	- (45)	3 (90)	3	10	30	10	50	100
2	PCC	ARH2301L	Industry Internet of Things Laboratory	0 (0)	0 (0)	2 (20)	- (10)	2 (30)	1	10	10	10	20	50
3	PCC	ARH3301T	Industrial Data Analytics	3 (45)	1 (15)	0 (0)	- (60)	4 (120)	4	10	30	10	50	100
4	PCC	ARH3301L	Industrial Data Analytics Laboratory	0 (0)	0 (0)	2 (20)	- (10)	2 (30)	1	10	10	10	20	50
5	PCC	ARH3302T	Edge AI for Smart Manufacturing	3 (45)	0 (0)	0 (0)	- (45)	3 (90)	3	10	30	10	50	100
6	PCC	ARH4301T	Industrial Cybersecurity	3 (45)	0 (0)	0 (0)	- (45)	3 (90)	3	10	30	10	50	100
7	PCC	ARH4302L	Mini Project	0 (0)	0 (0)	6 (60)	- (30)	6 (90)	3	30	30	30	60	150
Total				**12**	**01**	**10**	**245**	**23**	**18**	**90**	**170**	**90**	**300**	**650**

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