

**ROBOTICS  
ENGINEERING**

**B.Tech. (Robotics and Automation)–2018 batch**

**PROGRAMME STRUCTURE**

<b>S. No.</b>	<b>Category</b>	<b>Credits</b>
1	Humanities and Social Sciences including Management courses	12
2	Basic Science Courses	26
3	Engineering Science courses including workshop, drawing, basics of electrical/mechanical/computer etc.	25
4	Professional Core Courses	51
5	Project work, seminar and internship in industry or appropriate work place/ academic and research institutions in India/abroad	12
6	Professional Elective courses relevant to chosen specialization/branch	18
7	Open subjects – Electives from other technical and /or emerging Courses	18
8	Mandatory Courses [Environmental Studies, Induction Program Indian Constitution, Value Education, etc.]	(non-credit)
	<b>Total</b>	<b>162</b>

**COURSE COMPONENTS**

**Table 1**

<b>Sl. No.</b>	<b>Course Code</b>	<b>Humanities and Social Sciences- 12 Credits</b>	<b>L:T:P</b>	<b>Credits</b>
		<b>Name of the Course</b>		
1	18EN1001	English	2:0:0	2
2	18EN1002	English Language Lab	0:0:2	1
3	18MS2001	Professional Ethics	3:0:0	3
4	18MS2002	Industrial Management	3:0:0	3
5	18MS2003	Entrepreneurship and IPR	3:0:0	3
		<b>Total Credits</b>		<b>12</b>

**Table 2**

<b>Sl. No.</b>	<b>Course Code</b>	<b>Basic Sciences – 26 credits</b>	<b>L:T:P</b>	<b>Credits</b>
		<b>Name of the Course</b>		
1.	18MA1003	Calculus and Differential Equations	3:1:0	4
2.	18MA1007	Linear Algebra, Transforms and Numerical Methods	3:1:0	4
3.	18MA2007	Probability and Statistics	3:1:0	4
4.	18PH1005	Engineering Physics - Semiconductors, Optics and Quantum Mechanics	3:1:0	4
5.	18CH1003	Engineering Chemistry	3:1:0	4
6.	18CH1002	Applied Chemistry Laboratory	0:0:3	1.5
7.	18PH1006	Engineering Physics - Semiconductors, Optics and Quantum Mechanics Lab	0:0:3	1.5
8.	18RO2001	Material Science	3:0:0	3
		<b>Total Credits</b>		<b>26</b>

**Table 3**

<b>Sl. No.</b>	<b>Course Code</b>	<b>Engineering Sciences &amp; Technical Arts – 25 credits</b>	<b>L:T:P</b>	<b>Credits</b>
----------------	--------------------	---	--------------	----------------

		Name of the Course		
1	18RO2002	Introduction to Mechanical Systems	3:0:0	3
2	18ME1002	Engineering Graphics (AutoCAD)	0:0:2	1
3	18EE1005	Electrical Workshop Practice	1:0:4	3
4	18CS1004	Programming for Problem Solving	3:0:0	3
5	18CS1002	Programming for Problem Solving Laboratory	0:0:4	2
6	18EC2032	Electron Devices and Circuits	3:0:0	3
7	18EC2030	Digital Electronics	3:0:0	3
8	18ME2032	Mechanics of Solids	3:0:0	3
9	18EE2001	Electric Circuit Analysis	3:1:0	4
		<b>Total Credits</b>		<b>25</b>

**Table 4**

Sl.No	Course Code	Program Core – 51 credits	L:T:P	Credits
		Name of the Course		
1.	18EE2021	Electrical Machines and Power Systems	3:0:0	3
2.	18RO2003	Automatic Control Systems	3:1:0	4
3.	18EC2033	Electron Devices and Circuits Laboratory	0:0:2	1
4.	18RO2004	Electrical Machines and Control Systems Laboratory	0:0:2	1
5.	18RO2005	Sensor Signal Conditioning Circuits	3:0:0	3
6.	18RO2006	Sensors and Protocols for Instrumentation	3:0:0	3
7.	18ME2031	Kinematics and Dynamics of Machinery	3:0:0	3
8.	18ME2028	Hydraulics and Pneumatics	3:0:0	3
9.	18ME2029	Hydraulics and Pneumatics Laboratory	0:0:2	1
10.	18RO2007	Sensor Signal Conditioning Circuits Laboratory	0:0:2	1
11.	18RO2008	Robot Kinematics and Dynamics	3:0:0	3
12.	18ME2030	Mechanics and Engineering Design Laboratory	0:0:2	1
13.	18EC2028	Microprocessor and Microcontroller	3:0:0	3
14.	18EC2029	Microprocessor and Microcontroller Laboratory	0:0:2	1
15.	18RO2009	Vision Systems	3:0:0	3
16.	18RO2010	Programmable Logic Controllers	3:0:0	3
17.	18RO2011	Automation System Design	3:0:0	3
18.	18RO2012	PLC and Robotics Laboratory	0:0:2	1
19.	18BM2014	Real Time Embedded Systems	3:0:0	3
20.	18RO2013	Totally Integrated Automation	3:0:0	3
21.	18RO2014	Totally Integrated Automation Laboratory	0:0:2	1
22.	18RO2015	Field and Service Robotics	3:0:0	3
		<b>Total Credits</b>		<b>51</b>

**Table 5**

Sl.No	Course Code	Project	Credits
		Name of the Course	
1	18RO2998	Project –Phase I	0:0:6:3
2	18RO2999	Project –Phase II	0:0:16:8
3	MP2953/ ISP2991	Mini Project / Internship	1
		<b>Total Credits</b>	<b>12</b>

**LIST OF PROFESSIONAL ELECTIVES**  
**B. Tech (Robotics and Automation) – 2018 Batch**

S. No.	Course Code	Course Title	Credits
1	19RO2001	Theory and Programming of CNC Machines	3:0:0
2	19RO2002	Autonomous Vehicles	3:0:0
3	19RO2003	Automotive Embedded Systems	3:0:0
4	19RO2004	Robotic Control System	3:0:0
5	19RO2005	Industrial Robotics and Material Handling Systems	3:0:0
6	19RO2006	Micro Robotics	3:0:0
7	19RO2007	Cognitive Robotics	3:0:0
8	19RO2008	Cloud Robotics	3:0:0
9	19RO2009	Medical Robotics	3:0:0
10	19RO2010	Machine Learning for Robotics	3:0:0
11	19RO2011	Robot Operating Systems	3:0:0
12	19RO2012	Artificial Intelligence in Robotics	3:0:0
13	19RO2013	Industrial Energy Management System	3:0:0
14	19RO2014	Robotics and Automation in Food Industry	3:0:0
15	19RO2015	Neural Networks and Fuzzy Systems	3:0:0

**SEMESTER-WISE CURRICULUM**

**Semester I (First year]**

Sl.No	Course Code	Name of the Course	Hours per week			Total Credits
			L	T	P	
1	18MA1003	Calculus and Differential Equations	3	1	0	4
2	18PH1005	Engineering Physics - Semiconductors, Optics and Quantum Mechanics	3	1	0	4
3	18PH1006	Engineering Physics - Semiconductors, Optics and Quantum Mechanics Lab	0	0	3	1.5
4	18EN1001	English	2	0	0	2
5	18EN1002	English Language Laboratory	0	0	2	1
6	18CS1004	Programming for Problem Solving	3	0	0	3
7	18CS1002	Programming for Problem Solving Laboratory	0	0	4	2
		<b>Total Credits</b>				<b>17.5</b>

**Semester II (First year]**

Sl.No	Course Code	Name of the Course	Hours per week			Total Credits
			L	T	P	
1	18MA1007	Linear Algebra, Transforms and Numerical Methods	3	1	0	4
2	18CH1003	Engineering Chemistry	3	1	0	4
3	18CH1002	Applied Chemistry Laboratory	0	0	3	1.5
4	18ME1002	Engineering Graphics (AutoCAD)	0	0	2	1
5	18EE1005	Electrical Workshop Practice	1	0	4	3
6	18RO2001	Material Science	3	0	0	3
7	18RO2002	Introduction to Mechanical Systems	3	0	0	3
8	18CH2001	Environmental Studies (Mandatory)	3	0	0	0

		<b>Total Credits</b>				<b>19.5</b>
--	--	----------------------	--	--	--	-------------

**Semester III (Second year]**

Sl.No	Course Code	Name of the Course	Hours per week			Total Credits
			L	T	P	
1	18MA2007	Probability and Statistics	3	1	0	4
2	18EE2001	Electric Circuit Analysis	3	1	0	4
3	18EC2032	Electron Devices and Circuits	3	0	0	3
4	18ME2032	Mechanics of Solids	3	0	0	3
5	18EE2021	Electric Machines and Power Systems	3	0	0	3
6	18EC2030	Digital Electronics	3	0	0	3
7	18EC2033	Electron Devices and Circuits Laboratory	0	0	2	1
8		Soft Skills (Mandatory)	0	0	0	0
		<b>Total Credits</b>				<b>21</b>

**Semester IV (Second year]**

Sl.No	Course Code	Name of the Course	Hours per week			Total Credits
			L	T	P	
1	18RO2003	Automatic Control Systems	3	1	0	4
2	18RO2005	Sensor Signal Conditioning Circuits	3	0	0	3
3	18ME2031	Kinematics and Dynamics of Machinery	3	0	0	3
4	18RO2006	Sensors and Protocols for Instrumentation	3	0	0	3
5	18RO2008	Robot Kinematics and Dynamics	3	0	0	3
6	18RO2004	Electrical Machines and Control Systems Laboratory	0	0	2	1
7	18ME2030	Mechanics and Engineering Design Laboratory	0	0	2	1
8	18RO2007	Sensor Signal Conditioning Circuits Laboratory	0	0	2	1
9	MP2953/ ISP2991	Mini Project / Internship	0	0	2	1
10	18MS2014	Constitution of India (Mandatory)	2	0	0	0
11		Industrial Training	0	0	0	0
		<b>Total Credits</b>				<b>20</b>

**Semester V (Third year)**

Sl.No	Course Code	Name of the Course	Hours per week			Total Credits
			L	T	P	
1	18ME2028	Hydraulics and Pneumatics	3	0	0	3
2	18EC2028	Microprocessors and Microcontrollers	3	0	0	3
3	18RO2010	Programmable Logic Controllers	3	0	0	3
4	18RO2011	Automation System Design	3	0	0	3
5		Program Elective 1	3	0	0	3
6		Open Elective 1	3	0	0	3
7	18MS20002	Industrial Management	3	0	0	3

8	18EC2029	Microprocessors and Microcontrollers Laboratory	0	0	2	1
9	18ME2029	Hydraulics and Pneumatics Laboratory	0	0	2	1
		<b>Total Credits</b>				<b>23</b>

**Semester VI (Third year]**

Sl.No	Course Code	Name of the Course	Hours per week			Total Credits
			L	T	P	
1	18RO2009	Vision Systems	3	0	0	3
2	18BM2014	Real Time Embedded Systems	3	0	0	3
3	18RO2013	Totally Integrated Automation	3	0	0	3
4	18RO2015	Field and Service Robotics	3	0	0	3
5		Program Elective 2	3	0	0	3
6		Open Elective 2	3	0	0	3
7	18RO2012	PLC and Robotics Laboratory	0	0	2	1
8	18RO2014	Totally Integrated Automation Laboratory	0	0	2	1
9	18MS2001	Professional Ethics	3	0	0	3
10		General Aptitude (Mandatory)	0	0	0	0
		<b>Total Credits</b>				<b>23</b>

**Semester VII (Fourth year]**

Sl.No	Course Code	Name of the Course	Hours per week			Total Credits
			L	T	P	
1		Program Elective – 3	3	0	0	3
2		Program Elective – 4	3	0	0	3
		Program Elective – 5	3	0	0	3
3		Open Elective 3	3	0	0	3
4		Open Elective 4	3	0	0	3
5	18RO2998	Project – Phase I	0	0	6	3
6	18MS2003	Entrepreneurship and IPR	3	0	0	3
7		<b>Total Credits</b>				<b>21</b>

**Semester VIII (Fourth year]**

Sl.No	Course Code	Name of the Course	Hours per week			Total Credits
			L	T	P	
1		Program Elective – 6	3	0	0	3
2		Open Elective 5	3	0	0	3
3		Open Elective 6	3	0	0	3
4	18RO2999	Project – Phase II	0	0	16	8
5		<b>Total Credits</b>				<b>17</b>