

**Maulana Abul Kalam Azad University of Technology, West Bengal**  
(Formerly West Bengal University of Technology)

**Syllabus for B. Tech in Robotics**  
(Applicable from the academic session 2020-2021)

**Curriculum Structure**

<b>First Year First Semester</b>							
<b>Mandatory Induction Program- 3 weeks duration</b>							
Sl No.	Category	Subject Code	Subject Name	Total Number of contact hours			Credits
				L	T	P	
<b>Theory</b>							
1	Basic Science course	BS-PH101	Physics-I	3	1	0	4
2	Basic Science course	BS-M102	Mathematics –IB	3	1	0	4
3	Engineering Science Courses	ES-EE101	Basic Electrical Engineering	3	1	0	4
<i>Total Theory</i>				<b>9</b>	<b>3</b>	<b>0</b>	<b>12</b>
<b>Practical</b>							
1	Basic Science course	BS-PH191	Physics-I Laboratory	0	0	3	1.5
2	Engineering Science Courses	ES-EE191	Basic Electrical Engineering Laboratory	0	0	2	1
3	Engineering Science Courses	ES-ME192	Workshop/ Manufacturing Practices	1	0	4	3
<i>Total Practical</i>				<b>1</b>	<b>0</b>	<b>9</b>	<b>5.5</b>
<b>Total of First Semester</b>				<b>10</b>	<b>3</b>	<b>9</b>	<b>17.5</b>
<b>First Year Second Semester</b>							
Sl No.	Category	Subject Code	Subject Name	Total Number of contact hours			Credits
				L	T	P	
<b>Theory</b>							
1	Basic Science course	BS-CH201	Chemistry-I (Gr-A)	3	1	0	4
2	Basic Science course	BS-M202	Mathematics –IIB	3	1	0	4
3	Engineering Science Courses	ES-CS201	Programming for Problem Solving	3	0	0	3
4	Humanities and Social Sciences including Management courses	HM-HU201	English	2	0	0	2
<i>Total Theory</i>				<b>11</b>	<b>2</b>	<b>0</b>	<b>13</b>
<b>Practical</b>							
1	Basic Science course	BS-CH291	Chemistry-I Laboratory	0	0	3	1.5
2	Engineering Science Courses	ES-CS291	Programming for Problem Solving	0	0	4	2
3	Engineering Science Courses	ES-ME291	Engineering Graphics & Design (Gr-A)	1	0	4	3
4	Humanities and Social Sciences including Management courses	HM-HU291	Language Laboratory	0	0	2	1
<i>Total Practical</i>				<b>1</b>	<b>0</b>	<b>13</b>	<b>7.5</b>
<b>Total of Second Semester</b>				<b>12</b>	<b>2</b>	<b>13</b>	<b>20.5</b>

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<b>Second Year Third Semester</b>							
Sl. No.	Category	Subject Code	Subject Name	Total Number of contact hours			Credits
				L	T	P	
<b>Theory</b>							
1	Basic Science course	BS-M301	Numerical Methods & Optimization	3	1	0	4
2	Basic Science course	BS-BIO301	Biology	3	0	0	3
3	Engineering Science Courses	ES-ROB301	Thermodynamics	3	0	0	3
4	Engineering Science Courses	ES-ME301	Engineering Mechanics	3	1	0	4
5	Professional Core courses	PC-ROB301	Analog & Digital Electronics	3	1	0	3
6	Professional Core courses	PC-ROB302	Manufacturing Processes	4	0	0	3
<i>Total Theory</i>				<b>19</b>	<b>3</b>	<b>0</b>	<b>20</b>
<b>Practical</b>							
1	Professional Core courses	PC-ROB391	Analog & Digital Electronics Lab	0	0	3	1.5
2	Professional Core Courses	PC-ROB392	Practice of Manufacturing Processes	0	0	3	1
3	Professional Core courses	PC-ROB393	Machine Drawing Lab -I	0	0	3	1.5
<i>Total Practical</i>				<b>0</b>	<b>0</b>	<b>9</b>	<b>4</b>
<b>Total of Third Semester</b>				<b>19</b>	<b>3</b>	<b>9</b>	<b>24</b>
<b>Second Year Fourth Semester</b>							
Sl. No.	Category	Subject Code	Subject Name	Total Number of contact hours			Credits
				L	T	P	
<b>Theory</b>							
1	Engineering Science Courses	ES-ROB401	Materials Engineering	3	0	0	3
2	Professional Core courses	PC-ROB 401	Fluid Power & Control	3	1	0	4
3	Professional Core courses	PC-ROB 402	Strength of Materials	3	1	0	4
4	Professional Core courses	PC-EE 403	Electrical & Electronics Measurements	3	1	0	3
5	Professional Core courses	PC-EE401	Electric Machines	3	1	0	3
<i>Total Theory</i>				<b>15</b>	<b>4</b>	<b>0</b>	<b>17</b>
<b>Practical/Sessional</b>							
1	Professional Core courses	PC-ROB491	Robotics Laboratory I (Strength of Materials)	0	0	3	1.5
2	Mandatory courses	MC 481	Environmental Science	0	0	2	0
3	Professional Core courses	PC-EE491	Electric Machines Laboratory	0	0	2	1
4	Professional Core courses	PC-ROB491	Robotics Laboratory II (Fluid Power & Control)	0	0	3	1.5
5	Professional Core courses	PC-EE493	Electrical & Electronics Measurements lab	0	0	2	1
<i>Total Practical</i>				<b>0</b>	<b>0</b>	<b>12</b>	<b>5</b>
<b>Total of Fourth Semester</b>				<b>15</b>	<b>4</b>	<b>12</b>	<b>22</b>

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**Third Year Fifth Semester**

Sl No.	Category	Subject Code	Subject Name	Total Number of contact hours			Credits
				L	T	P	
<b>Theory</b>							
1	Professional Core courses	PC-ROB501	Design of Machine Elements	3	1	0	3
2	Professional Core courses	PC-EE501	Power Electronics	3	1	0	3
3	Professional Core courses	PC-ROB502	Kinematics & Theory of Machines	3	1	0	3
4	Humanities and Social Sciences including Management courses	HM-HU501	Humanities I	3	0	0	2
5	Professional Core courses	PC-EC501	Microprocessor & Microcontrollers	3	1	0	3
6	Mandatory courses	MC501	Essence of Indian Knowledge Tradition	2	-	-	0
<i>Total Theory</i>				<b>17</b>	<b>4</b>	<b>0</b>	<b>14</b>
<b>Practical/ Sessional</b>							
1	Professional Core courses	PC-ROB591	Robotics Laboratory III- Practice of Manufacturing Processes and Systems Laboratory	0	0	3	1.5
2	Professional Core courses	PC-ROB592	Machine Drawing II	0	0	3	1.5
3	Professional Core courses	PC-ROB593	Microprocessor & Microcontrollers Lab	0	0	3	1
4	Professional Core courses	PC-EE591	Power Electronics Laboratory	0	0	2	1
5	Project (Summer internship)	PW-ROB581	Project-I (30 hrs. Total)	0	0	2	1
<i>Total Practical</i>				<b>0</b>	<b>0</b>	<b>13</b>	<b>6</b>
<b>Total of Fifth Semester</b>				<b>17</b>	<b>4</b>	<b>13</b>	<b>20</b>

**Third Year Sixth Semester**

Sl.No.	Category	Subject Code	Subject Name	Total Number of contact hours			Credits
				L	T	P	
<b>Theory</b>							
1	Professional Core courses	PC-CS601	Artificial Intelligence & Machine Learning	4	0	2	3
2	Professional Core courses	PC-ROB602	Computer Vision	3	1	0	3
3	Professional Elective courses	PE-ROB601A/B /C/D	Elective-I/ Mechatronic Systems/Digital Signal Processing /Human Computer Interaction/ Pattern Recognition	3	0	0	3
4	Professional Elective courses	PE-ROB602A/B /C/D	Elective-II/ Bio-Medical Electronics/ Material Handling/ 3D Printing and Design/ CAD/CAM	3	0	0	3

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5	Humanities and Social Sciences including Management courses	HM-HU601	Humanities II (OR)	3	0	0	3
6	Mandatory courses	MC601	Constitution of India	2	-	-	0
<i>Total Theory</i>				<b>18</b>	<b>1</b>	<b>0</b>	<b>15</b>
<b>Practical/ Sessional</b>							
1	Professional Core courses	PC-ROB691	Computer Vision Lab	0	0	3	1
2	Professional Core courses	PC- CS691	Artificial Intelligence & Machine Learning Laboratory	0	0	2	1
3	Project (Summer internship)	PW- ROB681	Project-II (90 hrs. Total)	0	0	4	2
<i>Total Practical</i>				<b>0</b>	<b>0</b>	<b>9</b>	<b>4</b>
<b>Total of Sixth Semester</b>				<b>18</b>	<b>1</b>	<b>9</b>	<b>19</b>

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**Fourth Year Seventh Semester**

Sl No.	Category	Subject Code	Subject Name	Total Number of contact hours			Credits
				L	T	P	
<b>Theory</b>							
1	Professional Core courses	PC- ROB701	Automation in Manufacturing	3	0	0	3
2	Professional Core courses	PC- ROB702	Embedded System	3	0	0	3
3	Professional Elective courses	PE- ROB701A/B/C/D	Elective-III/ Speech and Natural Language Processing/ Neural Network and Fuzzy Logic Control/Wireless Sensor Networks/Industrial Automation & Control	3	0	0	3
4	Open Elective courses	OE-ROB 701A/B/C/D	Open Elective- I/ Industrial Pollution and Control / Entrepreneurship/ Object Oriented Programming/ Cyber Law & Intellectual Property Rights	3	0	0	3
5	Humanities and Social Sciences including Management courses	HM-HU701	Economics for Engineers	2	0	0	2
<i>Total Theory</i>				<b>14</b>	<b>0</b>	<b>0</b>	<b>14</b>
<b>Practical/ Sessional</b>							
1	Professional Core courses	PE- ROB791	Robotics laboratory IV- (Advanced Manufacturing Techniques)	0	0	3	1.5
2	Project	PW- ROB781	Project-III	0	0	6	3
<i>Total Practical</i>				<b>0</b>	<b>0</b>	<b>9</b>	<b>4.5</b>
<b>Total of Seventh Semester</b>				<b>14</b>	<b>0</b>	<b>9</b>	<b>18.5</b>

**Fourth Year Eighth Semester**

Sl No.	Category	Subject Code	Subject Name	Total Number of contact hours			Credits
				L	T	P	
<b>Theory</b>							
1	Professional Elective courses	PE- ROB801A/B/C	Elective IV/ Multi-agent Intelligent Systems/Internet of Things(IoT)/ Cloud Computing	3	0	0	3
2	Professional Elective courses	PE- ROB802A/B/C	Elective V/ Mobile Communication and Networks/ Antennas and Propagation/ Fiber Optic Communication	3	0	0	3
3	Open Elective courses	OE- ROB801A/B/C	Open Elective-II/ Big Data Analysis/Robotics/ Web Technology	3	0	0	3
4	Open Elective courses	OE- ROB802A/B/C	Open Elective- III/ Micro-Electronics and VLSI Design/ Microwave Integrated Circuits/ Nano Electronics	3	0	0	3
<i>Total Theory</i>				<b>12</b>	<b>0</b>	<b>0</b>	<b>12</b>

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<b>Practical/ Sessional</b>							
1	Project	PW- ROB881	Project-IV	0	0	10	5
2	Professional Core courses	PW- ROB882	Comprehensive viva	0	0	0	1.5
<i>Total Practical</i>				<b>0</b>	<b>0</b>	<b>10</b>	<b>6.5</b>
<b>Total of Eight Semester</b>				<b>12</b>	<b>0</b>	<b>10</b>	<b>18.5</b>
<b>Total</b>				117	17	84	<b>160</b>