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

		First	Year First Semester				
	Mand	atory Indu	ction Program- 3 weeks dur	ation			
Sl No.	Category	Subject Code	Subject Name	Total Number of contact hours			Credits
				L	Т	Р	
Theory	1						1
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
		Total Th	heory	9	3	0	12
Practica	l						
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
		Total Pro	actical	1	0	9	5.5
			Total of First Semester	10	3	9	17.5
		First Y	Year Second Semester				
SI No.	Category	Subject	Subject Name	Total Number of contact hours			Credits
		Code	L	T	P	-	
Theory	1		11		I		
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
		Total Th	heory	11	2	0	13
Practica	l						·
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
		Total Pro	actical	1	0	13	7.5
			Total of Second Semester	12	2	13	20.5

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			nd Year Third Semester	Tota	l Numh	er of	
Sl. No.	Category	Subject	Subject Name	Total Number of contact hours			Credits
51. INO.		Code		L	Т	Р	
Theory	1	1					
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
Practica	 	Total T	neory	19	3	0	20
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
		Total P	ractical	0	0	9	4
			Total of Third Semester	19	3	9	24
						1	
		Secon	d Year Fourth Semester				
Sl. No.	Category	Subject	d Year Fourth Semester Subject Name	co	l Numb ntact ho	urs	Credit
	Category						Credit
		Subject		co	ntact ho	urs	Credit
	Engineering Science Courses	Subject		co	ntact ho	urs	Credit 3
Theory	Engineering Science Courses Professional Core courses	Subject Code	Subject Name	co L	ntact ho T	urs P	1
Theory 1	Engineering Science Courses Professional Core courses Professional Core courses	Subject Code ES-ROB401	Subject Name Materials Engineering Fluid Power & Control Strength of Materials	2001 L 3	ntact ho T	urs P 0	3
Theory12	Engineering Science Courses Professional Core courses Professional Core courses Professional Core courses	Subject Code ES-ROB401 PC-ROB 401	Subject Name Materials Engineering Fluid Power & Control	col L 3 3	ntact ho T 0 1	urs P 0 0	4
Theory 1 2 3	Engineering Science Courses Professional Core courses Professional Core courses Professional	Subject Code ES-ROB401 PC-ROB 401 PC-ROB 402 PC-EE 403 PC-EE401	Subject NameMaterials EngineeringFluid Power & ControlStrength of MaterialsElectrical & Electronics MeasurementsElectric Machines	col L 3 3 3 3 3 3 3 3 3 3 3 3 3	ntact ho T 0 1 1 1 1 1	urs P 0 0 0 0 0 0 0 0	3 4 4 3 3
Theory 1 2 3 4 5	Engineering Science Courses Professional Core courses Professional Core courses Professional Core courses Professional Core courses	Subject Code ES-ROB401 PC-ROB 401 PC-ROB 402 PC-EE 403	Subject NameMaterials EngineeringFluid Power & ControlStrength of MaterialsElectrical & Electronics MeasurementsElectric Machines	CO L 3 3 3 3 3	1 1 1	urs P 0 0 0 0 0 0	3 4 4 3
Theory 1 2 3 4 5	Engineering Science Courses Professional Core courses Professional Core courses Professional Core courses Professional Core courses	Subject Code ES-ROB401 PC-ROB 401 PC-ROB 402 PC-EE 403 PC-EE401	Subject Name Materials Engineering Fluid Power & Control Strength of Materials Electrical & Electronics Measurements Electric Machines <i>Theory</i>	col L 3 3 3 3 3 3 3 3 3 3 3 3 3	ntact ho T 0 1 1 1 1 1	urs P 0 0 0 0 0 0 0 0	3 4 4 3 3
Theory 1 2 3 4 5 Practica 1	Engineering Science Courses Professional Core courses Professional Core courses Professional Core courses Professional Core courses Al/Sessional Core courses	Subject Code ES-ROB401 PC-ROB 401 PC-ROB 402 PC-EE 403 PC-EE401 Total 1 PC-ROB491	Subject Name Materials Engineering Fluid Power & Control Strength of Materials Electrical & Electronics Measurements Electric Machines <i>'heory</i> Robotics Laboratory I (Strength of Materials)	col L 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 0	ntact ho T 0 1 1 1 4 0	urs P 0 0 0 0 0 0 3	3 4 4 3 3 17 1.5
Theory 1 2 3 4 5 Practica	Engineering Science Courses Professional Core courses Professional Core courses Professional Core courses Professional Core courses Al/Sessional Core courses Mandatory courses	Subject Code ES-ROB401 PC-ROB 401 PC-ROB 402 PC-EE 403 PC-EE401 <i>Total T</i>	Subject Name Materials Engineering Fluid Power & Control Strength of Materials Electrical & Electronics Measurements Electric Machines Theory Robotics Laboratory I	col L 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 15	ntact ho T 0 1 1 1 4	Urs P 0 0 0 0 0 0 0 0	3 4 4 3 3 17
Theory 1 2 3 4 5 Practica 1	Engineering Science Courses Professional Core courses Professional Core courses Professional Core courses Professional Core courses Al/Sessional Core courses Mandatory courses Professional Core courses	Subject Code Code ES-ROB401 PC-ROB 401 PC-ROB 402 PC-EE 403 PC-EE401 Total 1 PC-ROB491 MC 481 PC-EE491	Subject NameMaterials EngineeringFluid Power & ControlStrength of MaterialsElectrical & Electronics MeasurementsElectric Machines <i>heory</i> Robotics Laboratory I (Strength of Materials)Environmental ScienceElectric Machines Laboratory	col L 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 0	ntact ho T 0 1 1 1 4 0	urs P 0 0 0 0 0 0 3	3 4 4 3 3 17 1.5
Theory 1 2 3 4 5 Practica 1 2	Engineering Science Courses Professional Core courses Professional Core courses Professional Core courses Professional Core courses Al/Sessional Core courses Mandatory courses Professional Core courses Professional Core courses Professional Core courses	Subject Code Code ES-ROB401 PC-ROB 401 PC-ROB 402 PC-EE 403 PC-EE 403 PC-EE 401 Total 1 MC 481 PC-EE491 PC-ROB491	Subject NameMaterials EngineeringFluid Power & ControlStrength of MaterialsElectrical & Electronics MeasurementsElectric Machines <i>'heory</i> Robotics Laboratory I (Strength of Materials)Environmental ScienceElectric Machines LaboratoryRobotics Laboratory II (Fluid Power & Control)	col L 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 0 0 0 0 0	ntact ho T 0 1 1 1 4 0 0	Urs P 0 0 0 0 0 0 0 0 0 3 2	3 4 4 3 3 17 1.5 0
Theory 1 2 3 4 5 Practica 1 2 3	Engineering Science Courses Professional Core courses Professional Core courses Professional Core courses Professional Core courses Al/Sessional Core courses Mandatory courses Professional Core courses Professional Core courses	Subject Code Code ES-ROB401 PC-ROB 401 PC-ROB 402 PC-EE 403 PC-EE401 Total 1 PC-ROB491 MC 481 PC-EE491	Subject NameMaterials EngineeringFluid Power & ControlStrength of MaterialsElectrical & Electronics MeasurementsElectric Machines <i>heory</i> Robotics Laboratory I (Strength of Materials)Environmental ScienceElectric Machines LaboratoryRobotics Laboratory II (Strength of Materials)Environmental ScienceElectric Machines LaboratoryRobotics Laboratory II (Fluid Power & Control)Electrical & Electronics Measurements lab	col L 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ntact ho T 0 1 1 1 4 0 0 0	Urs P 0 0 0 0 0 0 0 0 0 2 2	3 4 4 3 3 17 1.5 0 1

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		Thir	d Year Fifth Semester				
Sl No.	Category	Subject	Subject Name	Total Number of contact hours			Credits
		Code		L	Т	P	
Theory	1	1			1		1
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
		Total Th	neory	17	4	0	14
Practical	/ Sessional	1				1	
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
		Total Pro	ictical	0	0	13	6
			Total of Fifth Semester	17	4	13	20
		Thire	l Year Sixth Semester				
					l Numb		Credits
Sl.No.	Category	Subject Code	Subject Name	L COI	ntact ho T	urs P	-
Theory		Cour		L	1	1	
T neor y	Professional Core						
1	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
		Total The	eory	18	1	0	15
			Practical/ Sessional				
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
	Total Practical			0	0	9	4
	Total of Sixth Semester				1	9	19

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		Fourth	Year Seventh Semester					
SI No				Total Number of				
SI No.	Category	Subject Code	Subject Name	contact hours		rs	Credits	
				L	Т	Р		
Theory								
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	
2	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	
		Total Theo	bry	14	0	0	14	
Practical	l/ Sessional							
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	
		Total Pract		0	0	9	4.5	
			Total of Seventh Semester	14	0	9	18.5	
		Fourth	Year Eighth Semester			-		
Sl No.	Catagory	Subject Code	Subject Neme		al Numb	Credits		
	Category		Subject Name	L	ntact ho T	P		
Theory					1 1	1		
	Professional Elective courses	PE- ROB801A/B/C	Elective IV/ Multi-agent Intelligent Systems/Internet of Things(IoT)/ Cloud Computing	3	0	0	3	
<u> </u>	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	
		OE-	Open Elective- III/ Micro- Electronics and VLSI Design/					
4	Open Elective courses	ROB802A/B/C	Microwave Integrated Circuits/ Nano Electronics	3	0	0	3	

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Prac	Practical/ Sessional								
1	Project	PW-ROB881	Project-IV	0	0	10	5		
2	Professional Core courses	PW-ROB882	Comprehensive viva	0	0	0	1.5		
		0	0	10	6.5				
	Total of Eight Semester1201018.5						18.5		
	Total				17	84	160		