

# SANJIVANI COLLEGE OF ENGINEERING, KOPARGAON

## B. Tech Programme (Mechatronics Engineering)

Academic year 2022-23

Programme Structure

First Year

B. Tech Programme in Mechatronics Engineering												Programme code: MK	
First year : Semester-I (Curriculum 2020-2021)													
Cat	Abbriv.	Course Title	Teaching Scheme Hrs./Week			Credits L+T+P	Examination scheme & Marks						
			L	T	P		Theory			Practical			Total
							ISE	ESE	CIA*	OR	PR	TW	
BS	BS1001	Linear algebra and stochastic processes	4	1		5	30	50	20			25	125
BS	BS1002	Engg Physics	3			3	30	50	20				100
ES	ES1001	Computer fundamentals and programming	3			3	30	50	20				100
ES	ES1002	Engg mechanics	3			3	30	50	20				100
ES	ES1003	BME	2			2	30	50	20				100
IP	IP	Induction program #											-
BS	BS1102	Engg Physics lab			2	1						25	25
ES	ES1101	Computer fundamentals and programming Lab			2	1						25	25
ES	ES1102	Engg mechanics lab			2	1						25	25
ES	ES1103	Workshop			2	1						25	25
		<b>Total</b>	<b>15</b>	<b>1</b>	<b>8</b>	<b>20</b>	<b>150</b>	<b>250</b>	<b>100</b>	<b>0</b>	<b>0</b>	<b>125</b>	<b>625</b>

B. Tech Programme in Mechatronics Engineering												Programme code: MK	
First year : Semester-II (Curriculum 2020-2021)													
Cat	Abbriv.	Course Title	Teaching Scheme Hrs./Week			Credits L+P+T	Examination scheme & Marks						
			L	T	P		Theory			Practical			Total
							ISE	ESE	CIA*	OR	PR	TW	
BS	BS2003	Multivariate calculus	4	1		5	30	50	20			25	125
BS	BS2004	Engg chemistry	3			3	30	50	20				100
ES	ES2004	Basics of electrical and electronics	3			3	30	50	20				100
ES	ES2005	Engg graphics	3			3	30	50	20				100
HSMC	HS2001	Communication skills	2			3	30	50	20				100
HSMC	HS2102	Physical education and sports			2	1						50	50
MC	MC2001	Environmental sciences #	2			Pass/Fail							-
BS	BS2104	Engg chemistry Lab			2	1						25	25
ES	ES2104	Basics of electrical and electronics Lab			2	1						25	25
ES	ES2105	Engg graphics Lab			2	1						25	25
HSMC	HS2101	Communication skills lab			2	1						25	25
		<b>Total</b>	<b>17</b>	<b>1</b>	<b>10</b>	<b>22</b>	<b>150</b>	<b>250</b>	<b>100</b>	<b>0</b>	<b>0</b>	<b>175</b>	<b>675</b>

## Second Year

B. Tech Programme in Mechatronics Engineering												Programme code: MK	
Second year : Semester-III (Curriculum 2020-2021)													
Cat	Abbriv.	Course Title	Teaching scheme Hrs./Week			Credits L+T+P	Examination scheme & Marks						
			L	T	P		Theory			Practical			Total
							ISE	ESE	CIA*	OR	PR	TW	
PC	PC3001	Basic Concepts of Mechatronics	3			3	30	50	20				100
PC	PC3002	Analog and Digital Electronics	3			3	30	50	20				100
PC	PC3003	Strength of Materials	2	1		3	30	50	20				100
PC	PC3004	Electrical Machines	3			3	30	50	20				100
PC	PC3005	Programming in Python	2			2	15	25	10				50
HSMC	HS3003	Universal human values	3			3	30	50	20				100
MC	MC3002	Constitution of India #	2			Pass/Fail							0
PC	PC3101	Basic Mechatronics Lab			2	1					25		25
PC	PC3102	Analog and Digital Electronics			2	1					25		25
PC	PC3103	Strength of Materials Lab			2	1					25		25
PC	PC3104	Electrical Machines Lab			2	1						25	25
PC	PC3105	Programming in Python lab			2	1					25		25
PR	PR3101	Entrepreneurship Programme				1						25	25
		<b>Total</b>	<b>18</b>	<b>1</b>	<b>10</b>	<b>23</b>	<b>165</b>	<b>275</b>	<b>110</b>	<b>75</b>	<b>25</b>	<b>50</b>	<b>700</b>

B. Tech Programme in Mechatronics Engineering							Programme code: MK						
Second year : Semester-IV (Curriculum 2020-2021)													
Cat	Abbriv.	Course Title	Teaching scheme Hrs./Week			Credits L+P+T	Examination scheme & Marks						
			L	T	P		Theory			Practical			Total
							ISE	ESE	CIA*	OR	PR	TW	
PC	PC4006	Theory of machines	3			3	30	50	20				100
PC	PC4007	Microcontroller and embeded C programming	3			3	30	50	20				100
BS	BS4005	Microprocessors and system programming	3			3	30	50	20				100
PC	PC4008	Sensors and instrumentation	3			3	30	50	20				100
PC	PC4009	Mathematics- III	3	1		4	30	50	20				100
MC	MC4003	Innovations #	2			Pass/Fail							0
PC	PC4106	Theory of machines lab			2	1					50		50
PC	PC4107	Microcontroller and embeded C programming lab			2	1						25	25
PC	PC4108	Microprocessors and system programming lab			2	1					50		50
PC	PC4109	Sensors and instrumentation lab			2	1						25	25
PR	PR4103	CAPSTON Project				1					50		50
		Total	17	1	8	21	150	250	100	150	50	0	700

### Third Year

B.Tech. Programme in Mechatronics Engg.							Programme Code: MK						
Third Year: Semester-V (Curriculum:2020-2021)													
Cat	Abbriv.	Course Title	Teaching scheme/week			Credits	Examination scheme						
			L	T	P		Theory			Theory			Total
							ISE	ESE	CIA	OR	PR	TW	
PC	PC5010	Digital Signal Processing	3			3	30	50	20				100
PC	PC5011	Industrial Automation	4			4	30	50	20				100
PC	PC5012	Design of Machine Elements	3			3	30	50	20				100
PC	PC5013	Fluid Mechanics	3			3	30	50	20				100
PC	PC5014	Programing in JAVA	2			2	15	25	10				50
HSMC	HS5004	Industrial Management	2			2	15	25	10				50
MC	MC5004	Solid Modelling #	2			Pass/Fail							0
PC	PC5110	Digital Signal Processing Lab			2	1					25		25
PC	PC5111	Industrial Automation Lab			2	1					50		50
PC	PC5113	Fluid Mechanics & CAD lab			2	1						50	50
PC	PC5114	Programing in JAVA lab			2	1					25		25
PR	PR5103	IPR & Patents			2	1						50	50
		Total	19	0	10	22	150	250	100	75	25	100	700

B. Tech Programme in Mechatronics Engineering							Programme code: MK						
Third year : Semester-VI (Curriculum 2020-2021)													
Cat	Abbriv.	Course Title	Teaching scheme Hrs./Week			Credits L+P+T	Examination scheme & Marks						
			L	T	P		Theory			Practical			Total
							ISE	ESE	CIA*	OR	PR	TW	
PC	PC6015	Thermodynamics & Heat Transfer	3			3	30	50	20				100
PC	PC6016	Computer Network & Cyber Security	4			4	30	50	20				100
PC	PC6017	Control Engineering	3			3	30	50	20				100
PC	PC6018	Manufacturing Technologies	4			4	30	50	20				100
PE	PE600*	Professional Elective I	3			3	30	50	20				100
MC	MC6005	Finite element analysis #	2			Pass/ Fail							0
PC	PC6115	Thermodynamics & Heat Transfer Lab			2	1					25		25
PC	PC6117	Control Engineering Lab			2	1					25		25
PC	PC6118	Manufacturing Technologies Lab			2	1						50	50
PE	PE610*	Professional Elective I Lab			2	1						50	50
PR	PR6105	Mini Project based on Programming Skills			2	1					50		50
		Total	19	0	10	22	150	250	100	100	0	100	700

## Final Year

B. Tech Programme in Mechatronics Engineering											Programme code: MK		
Fourth year : Semester-VII (Curriculum 2020-2021)													
Cat	Abbriv.	Course Title	Teaching scheme Hrs./Week			Credits L+P+T	Examination scheme & Marks						
			L	T	P		Theory			Practical			Total
							ISE	ESE	CIA*	OR	PR	TW	
PC	PC7019	Robotics	3			3	30	50	20		-	-	100
PC	PC7020	Design of Mechatronics System	3			3	30	50	20				100
PC	PC7021	Computer Aided Manufacturing	3			3	30	50	20				100
PE	PE700*	Professional Elective II	3			3	30	50	20				100
PC	PC7119	Robotics Lab	0		2	1					25		25
PC	PC7020	Mechatronics System			2	1					25		25
PC	PC7121	Computer Aided Manufacturing Lab			2	1				25			25
PE	PE710*	Professional Elective II Lab			2	1				25			25
PR	PR7106	Project Work I			2	1				50			50
PR	PR7107	Mini Project or Internship ^				2				50			50
		<b>Total</b>	<b>12</b>	<b>0</b>	<b>10</b>	<b>19</b>	<b>120</b>	<b>200</b>	<b>80</b>	<b>150</b>	<b>50</b>	<b>0</b>	<b>600</b>

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Fourth year : Semester-VIII (Curriculum 2020-2021)													
Cat	Abbriv.	Course Title	Teaching scheme Hrs./Week			Credits L+P+T	Examination scheme & Marks						
			L	T	P		Theory			Practical			Total
							ISE	ESE	CIA*	OR	PR	TW	
OE	OE800*	Open Elective I	3			3	30	50	20	-			100
OE	OE800*	Open Elective II	3			3	30	50	20	-			100
PR	PR8108	Project Work II @	0		20	10				100		100	100
		<b>Total</b>	<b>6</b>	<b>0</b>	<b>20</b>	<b>16</b>	<b>60</b>	<b>100</b>	<b>40</b>	<b>100</b>	<b>0</b>	<b>100</b>	<b>300</b>

Professional Elective – I			Open Elective – I		
1	PE6001	Industry 4.0	1	OE8001	Virtual and Augmented Reality
2	PE6002	Automotive mechatronics	2	OE8002	Image Processing and Computer Vis
3	PE6003	Total quality management	3	OE8003	Wireless Network & Communication
Professional Elective – II			Open Elective – II		
1	PE7004	Drone technology	1	OE8004	Artificial Intelligence
2	PE7005	Rapid Prototyping (MTPE-702)	2	OE8005	Real Time System
3	PE7006	Machine Learning (MTPE-703)	3	OE8006	Artificial Neural Network

### Honors Courses – Industry 4.0 & Automotive Mechatronics

B. Tech Programme in Mechatronics Engineering											Programme code: MK		
Honours course: Industry 4.0 : Semester-V,VI,VII,VIII (Curriculum 2020-2021)													
Sem	Abbriv.	Course Title (Honours Courses: Industry 4.0	Teaching scheme			Credits L+P+T	Examination scheme & Marks						
			L	T	P		Theory			Practical			Total
							ISE	ESE	CIA*	OR	PR	TW	
V	HN5001	Cyber Physical Systems	4			4	30	50	20		-	-	100
VI	HN6002	DBMS & Information security for Industrial Automation	4			4	30	50	20				100
VI	HN6102	DBMS & Information security for Industrial Automation Lab			2	1					50		50
VII	HN7003	Industrial IoT & Internet of Services	4			4	30	50	20				100
VII	HN7103	Industrial IoT & Internet of Services Lab			2	1					50		50
VIII	HN8004	Smart Factory	4			4	30	50	20				100
		<b>Total</b>	<b>16</b>	<b>0</b>	<b>4</b>	<b>18</b>	<b>120</b>	<b>200</b>	<b>80</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>500</b>

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Honours course: Automotive Mechatronics : Semester-V,VI,VII,VIII (Curriculum 2020-2021)													
Sem	Abbriv.	Course Title (Honours Courses: Industry 4.0)	Teaching scheme			Credits L+P+T	Examination scheme & Marks						
			L	T	P		Theory			Practical			Total
							ISE	ESE	CIA*	OR	PR	TW	
V	HN5011	Automotive machines & Drives	4			4	30	50	20		-	-	100
V	HN5111	Automotive machines & Drives Lab			2	1						50	50
VI	HN6012	Automotive control systems	4			4	30	50	20				100
VII	HN7013	Battery & fuel cell technology	4			4	30	50	20				100
VII	HN7113	Battery & fuel cell technology Lab			2	1						50	50
VIII	HN8014	Hybrid vehicles & Vehicle dynamics	4			4	30	50	20				100
		<b>Total</b>	<b>16</b>	<b>0</b>	<b>4</b>	<b>18</b>	<b>120</b>	<b>200</b>	<b>80</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>500</b>

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