

# **V.S.B.ENGINEERING COLLEGE, KARUR.**

**(An Autonomous Institution)**

**Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai.**

**NH – 67, Covai Road, Karudayampalayam PO, Karur - 639 111.**



## **CURRICULUM REGULATIONS – 2023**

**Department of  
Mechanical Engineering**

**B.E. MECHANICAL ENGINEERING**  
**Regulations 2023**  
**For the students admitted from 2023 onwards**  
**CHOICE BASED CREDIT SYSTEM**  
**CURRICULUM FOR I – VIII SEMESTERS**  
**SEMESTER I**

S. No	Course Code	Course Title	Category	Internal/ External	Periods per Week			Total Contacts Period	Credits
					L	T	P		
1.	23IP101	Induction Programme	-	-	-	-	-	0	
<b>THEORY</b>									
2.	23HST101	Professional English -I	HSMC	40/60	3	0	0	3	3
3.	23MAT101	Matrices and Calculus	BSC	40/60	3	1	0	4	4
4.	23PHT101	Engineering Physics	BSC	40/60	3	0	0	3	3
5.	23CYT101	Engineering Chemistry	BSC	40/60	3	0	0	3	3
6.	23GET101	Introduction to Programming	ESC	40/60	3	0	0	3	3
7.	23GET102	தமிழர் மரபு /Heritage of Tamils	HSMC	40/60	1	0	0	1	1
<b>PRACTICALS</b>									
8.	23GEP101	Programming in C Laboratory	ESC	60/40	0	0	4	4	2
9.	23BSP101	Physics and Chemistry Laboratory	BSC	60/40	0	0	4	4	2
10.	23GEP102	English Laboratory <sup>s</sup>	EEC	100/-	0	0	2	2	1
<b>TOTAL</b>					<b>16</b>	<b>1</b>	<b>10</b>	<b>27</b>	<b>22</b>

**SEMESTER II**

S. No	Course Code	Course Title	Category	Internal / External	Periods per Week			Total Contact s Period	Credit s
					L	T	P		
<b>THEORY</b>									
1.	23HST201	Professional English- II	HSM C	40/60	2	0	0	2	2
2.	23MAT201	Computational Methods	BSC	40/60	3	1	0	4	4
3.	23PHT205	Material Science	BSC	40/60	3	0	0	3	3
4.	23BET203	Basic Electrical and Electronics Engineering	ESC	40/60	3	0	0	3	3
5.	23GET201	Engineering Graphics	ESC	40/60	2	0	4	6	4
6.	23GET202	தமிழரும் தொழில்நுட்பம் /Tamils and Technology	HSM C	40/60	1	0	0	1	1

7.		NCC Credit Course Level 1 <sup>#</sup>	-	-	2	0	0	2	3#
<b>PRACTICALS</b>									
8.	23GEP20 1	Engineering Practices Laboratory	ESC	60/40	0	0	4	4	2
9.	23BEP20 2	Basic Electrical and Electronics Engineering Laboratory	ESC	60/40	0	0	4	4	2
10.	23GEP20 2	Communication Laboratory / Foreign Language <sup>\$</sup>	EEC	60/40	0	0	4	4	2
<b>TOTAL</b>					<b>14</b>	<b>1</b>	<b>16</b>	<b>31</b>	<b>23</b>

### SEMESTER III

S. No	Course Code	Course Title	Category	Internal / External	Periods per Week			Total Contacts Period	Credits
					L	T	P		
<b>THEORY</b>									
1.	23MAT302	Transforms and Partial Differential Equations	BSC	40/60	3	1	0	4	4
2.	23MET301	Engineering Mechanics	ESC	40/60	3	0	0	3	3
3.	23MET302	Engineering Thermodynamics	PCC	40/60	3	0	0	3	3
4.	23CET01	Fluid Mechanics and Machinery	ESC	40/60	3	1	0	4	4
5.	23MET303	Engineering Materials and Metallurgy	PCC	40/60	3	0	0	3	3
6.	23MET304	Manufacturing Processes	PCC	40/60	3	0	0	3	3
<b>PRACTICALS</b>									
7	23MEP301	Computer Aided Machine Drawing	PCC	60/40	0	0	4	4	2
8.	23MEP302	Manufacturing Technology Laboratory	PCC	60/40	0	0	4	4	2
9.	23GEP301	Professional Development <sup>\$</sup>	EEC	100/-	0	0	2	2	1
<b>TOTAL</b>					<b>18</b>	<b>2</b>	<b>10</b>	<b>30</b>	<b>25</b>

### SEMESTER IV

S. No	Course Code	Course Title	Category	Internal / External	Periods per Week			Total Contacts Period	Credits
					L	T	P		
<b>THEORY</b>									
1.	23MET401	Theory of Machines	PCC	40/60	3	0	0	3	3
2.	23MET402	Thermal Engineering	PCC	40/60	3	0	0	3	3
3.	23MET403	Hydraulics and Pneumatics	PCC	40/60	3	0	0	3	3
4.	23MET404	Manufacturing Technology	PCC	40/60	3	0	0	3	3
5.	23CET02	Strength of Materials	PCC	40/60	3	0	0	3	3
6.	23GET401	Environmental Sciences and Engineering	BSC	40/60	2	0	0	2	2
7.		National Cadet Corps (NCC)**	-	-	3	0	0	3	3#
<b>PRACTICALS</b>									
8.	23CEP404	Strength of Materials and Fluid Machinery Laboratory	PCC	60/40	0	0	4	4	2
9.	23MEP401	Thermal Engineering Laboratory	PCC	60/40	0	0	4	4	2
<b>TOTAL</b>					<b>17</b>	<b>0</b>	<b>8</b>	<b>25</b>	<b>21</b>

### SEMESTER V

S. No	Course Code	Course Title	Category	Internal / External	Periods per Week			Total Contacts Period	Credits
					L	T	P		
<b>THEORY</b>									
1.	23MET501	Design of Machine Elements	PCC	40/60	4	0	0	4	4
2.	23MET502	Heat and Mass Transfer	PCC	40/60	3	1	0	4	4
3.		Professional Elective -I	PEC	40/60	3	0	0	3	3
4.		Professional Elective -II	PEC	40/60	3	0	0	3	3
5.		Professional Elective -III	PEC	40/60	3	0	0	3	3
6.		Mandatory Course-I <sup>&amp;</sup>	MC	-	3	0	0	3	0

PRACTICALS									
7	23MEP501	Dynamics Laboratory	PCC	60/40	0	0	4	4	2
8	23MEP502	Heat Transfer Laboratory	PCC	60/40	0	0	4	4	2
<b>TOTAL</b>					<b>19</b>	<b>1</b>	<b>8</b>	<b>28</b>	<b>21</b>

### SEMESTER VI

S. No	Course Code	Course Title	Category	Internal / External	Periods per Week			Total Contacts Period	Credits
					L	T	P		
<b>THEORY</b>									
1.	23MET601	Metrology and Measurements	PCC	40/60	3	0	0	3	3
2.		Professional Elective -IV	PEC	40/60	3	0	0	3	3
3.		Professional Elective -V	PEC	40/60	3	0	0	3	3
4.		Professional Elective –VI	PEC	40/60	3	0	0	3	3
5.		Professional Elective -VII	PEC	40/60	3	0	0	3	3
6.		Open Elective – I*	OEC	40/60	3	0	0	3	3
8.		Mandatory Course-II <sup>&amp;</sup>	MC	-	3	0	0	3	0
9.		NCC Credit Course Level 3 <sup>#</sup>	-	-	3	0	0	3	3 <sup>#</sup>
<b>PRACTICALS</b>									
10.	23MEP601	CAD/CAM Laboratory	PCC	60/40	0	0	4	4	2
11.	23MEP602	Metrology Laboratory	PCC	60/40	0	0	4	4	2
12.	23MEP603	Mini Project	PCC	60/40	0	0	4	4	2
<b>TOTAL</b>					<b>21</b>	<b>-</b>	<b>12</b>	<b>33</b>	<b>24</b>

### SEMESTER VII

S. No	Course Code	Course Title	Category	Internal / External	Periods per Week			Total Contacts Period	Credits
					L	T	P		
<b>THEORY</b>									
1.	23MET701	Mechatronics and IoT	PCC	40/60	3	0	0	3	3
2.	23MET702	Computer Integrated Manufacturing	PCC	40/60	3	0	0	3	3

3.	23GET701	Human Values and Ethics	HSMC	40/60	2	0	0	2	2
4.	23MGT701	Industrial Management	HSMC	40/60	3	0	0	3	3
5.		Open Elective – II**	OEC	40/60	3	0	0	3	3
<b>PRACTICALS</b>									
6.	23MEP701	Mechatronics Laboratory	PCC	60/40	0	0	4	4	2
7.	23MEP702	Project Work –I	EEC	60/40	0	0	8	8	0
<b>TOTAL</b>					<b>14</b>	<b>0</b>	<b>12</b>	<b>26</b>	<b>16</b>

### SEMESTER VIII

S. No	Course Code	Course Title	Category	Internal / External	Periods per Week			Total Contacts Period	Credits
					L	T	P		
1		Open Elective – III**	OEC	40/60	3	0	0	3	3
2		Open Elective – IV**	OEC	40/60	3	0	0	3	3
<b>PRACTICALS</b>									
3	23MEP801	Project Work –II	EEC	60/40	0	0	12	12	10
<b>TOTAL</b>					<b>6</b>	<b>0</b>	<b>12</b>	<b>18</b>	<b>16</b>

### MANDATORY COURSES I

S. No	Course Code	Course Title	Category	Internal / External	Periods per Week			Total Contacts Period	Credits
					L	T	P		
<b>THEORY</b>									
1.	23MCT001	Introduction to Women and Gender Studies	MC	40/60	3	0	0	3	0
2.	23MCT002	Elements of Literature	MC	40/60	3	0	0	3	0
3.	23MCT003	Film Appreciation	MC	40/60	3	0	0	3	0
4.	23MCT004	Disaster Management	MC	40/60	3	0	0	3	0
<b>TOTAL</b>					<b>12</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>0</b>

### MANDATORY COURSES II

S. No	Course Code	Course Title	Category	Internal / External	Periods per Week			Total Contacts Period	Credits
					L	T	P		
<b>THEORY</b>									
1.	23MCT006	Well Being with traditional practices (Yoga, Ayurveda	MC	40/60	3	0	0	3	0

		and Siddha)							
2.	23MCT007	History of Science and Technology in India	MC	40/60	3	0	0	3	0
3.	23MCT008	Political and Economic Thought for a Humane Society	MC	40/60	3	0	0	3	0
4.	23MCT009	State, Nation Building and Politics in India	MC	40/60	3	0	0	3	0
5.	23MCT010	Industrial Safety	MC	40/60	3	0	0	3	0
<b>TOTAL</b>					<b>15</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>0</b>

**PROFESSIONAL ELECTIVE COURSES: VERTICALS**

**VERTICAL 1: MODERN MOBILITY SYSTEMS**

S. No	Course Code	Course Title	Category	Internal / External	Periods per Week			Total Contacts Period	Credits
					L	T	P		
1	23MEE001	Automotive Materials, Components, Design and Testing	PEC	60/40	2	0	2	4	3
2	23MEE002	Conventional and Futuristic Vehicle Technology	PEC	40/60	3	0	0	3	3
3	23MEE003	Renewable Powered Off Highway Vehicles and Emission Control Technology	PEC	40/60	3	0	0	3	3
4	23MEE004	Vehicle Health Monitoring, Maintenance and Safety	PEC	40/60	3	0	0	3	3
5	23MEE005	CAE and CFD Approaching Future Mobility	PEC	60/40	2	0	2	4	3
6	23MEE006	Hybrid and Electric Vehicle Technology	PEC	40/60	3	0	0	3	3
7	23MEE007	Thermal Management of Batteries and Fuel Cells	PEC	40/60	3	0	0	3	3
<b>TOTAL</b>					<b>19</b>	<b>0</b>	<b>4</b>	<b>23</b>	<b>21</b>

## VERTICAL 2: PRODUCT AND PROCESS DEVELOPMENT

S. No	Course Code	Course Title	Category	Internal / External	Periods per Week			Total Contacts Period	Credits
					L	T	P		
1	23MEE008	Value Engineering	PEC	40/60	3	0	0	3	3
2	23MEE009	Additive Manufacturing	PEC	60/40	2	0	2	4	3
3	23MEE010	CAD/CAM	PEC	40/60	3	0	0	3	3
4	23MEE011	Design For X	PEC	40/60	3	0	0	3	3
5	23MEE012	Ergonomics in Design	PEC	40/60	3	0	0	3	3
6	23MEE013	New Product Development	PEC	40/60	3	0	0	3	3
7	23MEE014	Product Life Cycle Management	PEC	40/60	3	0	0	3	3
		<b>TOTAL</b>			<b>20</b>	<b>0</b>	<b>2</b>	<b>22</b>	<b>21</b>

## VERTICAL 3: ROBOTICS AND AUTOMATION

S. No	Course Code	Course Title	Category	Internal / External	Periods per Week			Total Contacts Period	Credits
					L	T	P		
1	23MEE015	Sensors and Instrumentation	PEC	40/60	3	0	0	3	3
2	23MEE016	Electrical Drives and Actuators	PEC	40/60	3	0	0	3	3
3	23MEE017	Embedded Systems and Programming	PEC	60/40	2	0	2	4	3
4	23MEE018	Robotics	PEC	40/60	3	0	0	3	3
5	23MEE019	Smart Mobility and Intelligent Vehicles	PEC	40/60	3	0	0	3	3
6	23MEE020	Haptics and Immersive Technologies	PEC	40/60	3	0	0	3	3
7	23MEE021	Drone Technologies	PEC	40/60	3	0	0	3	3
		<b>TOTAL</b>			<b>20</b>	<b>0</b>	<b>2</b>	<b>22</b>	<b>21</b>

#### VERTICAL 4: DIGITAL AND GREEN MANUFACTURING

S. No	Course Code	Course Title	Category	Internal / External	Periods per Week			Total Contacts Period	Credits
					L	T	P		
1	23MEE022	Digital Manufacturing and IoT	PEC	60/40	2	0	2	4	3
2	23MEE023	Lean Manufacturing	PEC	40/60	3	0	0	3	3
3	23MEE024	Modern Robotics	PEC	60/40	2	0	2	4	3
4	23MEE025	Green Manufacturing Design and Practices	PEC	40/60	3	0	0	3	3
5	23MEE026	Environment Sustainability and Impact Assessment	PEC	40/60	3	0	0	3	3
6	23MEE027	Energy Saving Machinery and Components	PEC	40/60	3	0	0	3	3
7	23MEE028	Green Supply Chain Management	PEC	40/60	3	0	0	3	3
		<b>TOTAL</b>			<b>19</b>	<b>0</b>	<b>4</b>	<b>23</b>	<b>21</b>

#### VERTICAL 5: PROCESS EQUIPMENT AND PIPING DESIGN

S. No	Course Code	Course Title	Category	Internal / External	Periods per Week			Total Contacts Period	Credits
					L	T	P		
1	23MEE029	Design of Pressure Vessels	PEC	40/60	3	0	0	3	3
2	23MEE030	Failure Analysis and NDT Techniques	PEC	60/40	2	0	2	4	3
3	23MEE031	Material Handling and Solid Processing Equipment	PEC	40/60	3	0	0	3	3
4	23MEE032	Rotating Machinery Design	PEC	40/60	3	0	0	3	3
5	23MEE033	Thermal and Fired Equipment Design	PEC	40/60	3	0	0	3	3
6	23MEE034	Industrial Layout Design and Safety	PEC	40/60	2	0	2	4	3
7	23MEE035	Design Codes and Standards	PEC	40/60	3	0	0	3	3

		<b>TOTAL</b>			<b>19</b>	<b>0</b>	<b>4</b>	<b>23</b>	<b>21</b>
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**VERTICAL 6: CLEAN AND GREEN ENERGY TECHNOLOGIES**

S. No	Course Code	Course Title	Category	Internal / External	Periods per Week			Total Contacts Period	Credits
					L	T	P		
1	23MEE036	Bioenergy Conversion Technologies	PEC	40/60	3	0	0	3	3
2	23MEE037	Carbon Footprint Estimation and Reduction Techniques	PEC	40/60	3	0	0	3	3
3	23MEE038	Energy Conservation in Industries	PEC	40/60	3	0	0	3	3
4	23MEE039	Energy Efficient Buildings	PEC	40/60	3	0	0	3	3
5	23MEE040	Energy Storage Devices	PEC	40/60	3	0	0	3	3
6	23MEE041	Renewable Energy Technologies	PEC	40/60	3	0	0	3	3
7	23MEE042	Equipment for Pollution Control	PEC	40/60	3	0	0	3	3
		<b>TOTAL</b>			<b>21</b>	<b>0</b>	<b>0</b>	<b>21</b>	<b>21</b>

**VERTICAL 7: COMPUTATIONAL ENGINEERING**

S. No	Course Code	Course Title	Category	Internal / External	Periods per Week			Total Contacts Period	Credits
					L	T	P		
1	23MEE043	Computational Solid Mechanics	PEC	40/60	3	0	0	3	3
2	23MEE044	Computational Fluid Dynamics and Heat transfer	PEC	40/60	3	0	0	3	3
3	23MEE045	Theory on Computation and Visualization	PEC	40/60	3	0	0	3	3
4	23MEE046	Computational Bio-Mechanics	PEC	40/60	3	0	0	3	3
5	23MEE047	Advanced Statistics and Data Analytics	PEC	40/60	3	0	0	3	3
6	23MEE048	CAD and CAE	PEC	60/40	2	0	2	4	3
7	23MEE049	Machine Learning for Intelligent	PEC	40/60	3	0	0	3	3

		Systems							
		<b>TOTAL</b>			<b>20</b>	<b>0</b>	<b>2</b>	<b>22</b>	<b>21</b>

### VERTICAL 8: DIVERSIFIED COURSES GROUP 1

S. No	Course Code	Course Title	Category	Internal / External	Periods per Week			Total Contacts Period	Credits
					L	T	P		
1	23MEE050	Automobile Engineering	PEC	40/60	3	0	0	3	3
2	23MEE051	Measurements and Controls	PEC	40/60	3	0	0	3	3
3	23MEE052	Design Concepts in Engineering	PEC	40/60	3	0	0	3	3
4	23MEE053	Composite Materials and Mechanics	PEC	40/60	3	0	0	3	3
5	23MEE054	Electrical Drives and Control	PEC	40/60	3	0	0	3	3
6	23MEE055	Power Plant Engineering	PEC	40/60	3	0	0	3	3
7	23MEE056	Refrigeration and Air Conditioning	PEC	40/60	3	0	0	3	3
8	23MEE057	Dynamics of Ground Vehicles	PEC	40/60	3	0	0	3	3
		<b>TOTAL</b>			<b>24</b>	<b>0</b>	<b>0</b>	<b>24</b>	<b>24</b>

### VERTICAL 9: DIVERSIFIED COURSES GROUP 2

S. No	Course Code	Course Title	Category	Internal / External	Periods per Week			Total Contacts Period	Credits
					L	T	P		
1	23MEE058	Turbo Machines	PEC	40/60	3	0	0	3	3
2	23MEE059	Non-traditional Machining Processes	PEC	40/60	3	0	0	3	3
3	23MEE060	Industrial safety	PEC	40/60	3	0	0	3	3
4	23MEE061	Design of Transmission System	PEC	40/60	3	0	0	3	3
5	23MEE062	Thermal Power Engineering	PEC	40/60	3	0	0	3	3
6	23MEE063	Design for Manufacturing	PEC	40/60	3	0	0	3	3
7	23MEE064	Power Generation Equipment Design	PEC	40/60	3	0	0	3	3

		<b>TOTAL</b>			<b>21</b>	<b>0</b>	<b>0</b>	<b>21</b>	<b>21</b>
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**VERTICAL 10: DIVERSIFIED COURSES GROUP 3**

S. No	Course Code	Course Title	Category	Internal / External	Periods per Week			Total Contacts Period	Credits
					L	T	P		
1	23MEE065	Advanced Vehicle Engineering	PEC	40/60	3	0	0	3	3
2	23MEE066	Advanced Internal Combustion Engineering	PEC	40/60	3	0	0	3	3
3	23MEE067	Casting and Welding Processes	PEC	40/60	3	0	0	3	3
4	23MEE068	Process Planning and Cost Estimation	PEC	40/60	3	0	0	3	3
5	23MEE069	Surface Engineering	PEC	40/60	3	0	0	3	3
6	23MEE070	Precision Manufacturing	PEC	40/60	3	0	0	3	3
7	23MEE071	Gas Dynamics and Jet Propulsion	PEC	40/60	3	0	0	3	3
8	23MEE072	Operational Research	PEC	40/60	3	0	0	3	3
		<b>TOTAL</b>			<b>24</b>	<b>0</b>	<b>0</b>	<b>24</b>	<b>24</b>

**OPEN ELECTIVES**

(Students shall choose the Open Elective Courses, such that the course contents are not similar to any other course contents/title under other course categories)

**OPEN ELECTIVE – I AND II**

S. No	Course Code	Course Title	Category	Internal / External	Periods per Week			Total Contacts Period	Credits
					L	T	P		
1.	23CSO001	Artificial Intelligence and Machine Learning Fundamentals	OEC	60/40	2	0	2	4	3
2.	23CSO002	IoT Concepts and Applications	OEC	60/40	2	0	2	4	3
3.	23CSO003	Data Science Fundamentals	OEC	60/40	2	0	2	4	3
4.	23CSO004	Augmented Reality/Virtual	OEC	60/40	2	0	2	4	3

		Reality							
		<b>TOTAL</b>			<b>8</b>	<b>0</b>	<b>8</b>	<b>16</b>	<b>12</b>

**OPEN ELECTIVE - III**

S. No	Course Code	Course Title	Category	Internal / External	Periods per Week			Total Contacts Period	Credits
					L	T	P		
1	23HSO001	English for Competitive Examinations	OEC	40/60	3	0	0	3	3
2	23CEO001	Lean Concepts, Tools And Practices	OEC	40/60	3	0	0	3	3
3	23MGO001	NGOs and Sustainable Development	OEC	40/60	3	0	0	3	3
4	23MGO002	Democracy and Good Governance	OEC	40/60	3	0	0	3	3
5	23MEO002	Reverse Engineering	OEC	40/60	3	0	0	3	3
6	23ECO002	Space Engineering	OEC	40/60	3	0	0	3	3
7	23MGO003	Quality Engineering	OEC	40/60	3	0	0	3	3
8	23CHO001	Fire Safety Engineering	OEC	40/60	3	0	0	3	3
9	23MEO006	Fundamentals of Aeronautical engineering	OEC	40/60	3	0	0	3	3
10	23CEO002	Remote Sensing Concepts	OEC	40/60	3	0	0	3	3
11	23CEO003	Urban Agriculture	OEC	40/60	3	0	0	3	3
12	23CEO004	Drinking Water Supply and Treatment	OEC	40/60	3	0	0	3	3
13	23CHO002	Nano Technology	OEC	40/60	3	0	0	3	3
14	23MEO007	Functional Materials	OEC	40/60	3	0	0	3	3
15	23BTO001	Traditional Indian Foods	OEC	40/60	3	0	0	3	3

16	23BTO002	Introduction to food processing	OEC	40/60	3	0	0	3	3
17	23BTO003	IPR for Pharma Industry	OEC	40/60	3	0	0	3	3
18	23CHO003	Basics of Textile Finishing	OEC	40/60	3	0	0	3	3
19	23CHO004	Industrial Engineering for Garment Industry	OEC	40/60	3	0	0	3	3
20	23CHO005	Basics of Textile Manufacture	OEC	40/60	3	0	0	3	3
21	23CHO006	Introduction to Petroleum Refining and Petrochemicals	OEC	40/60	3	0	0	3	3
22	23EEO005	Energy Conservation and Management	OEC	40/60	3	0	0	3	3
23	23CHO007	Basics of Plastics Processing	OEC	40/60	3	0	0	3	3
24	23ECO003	Signals and Systems	OEC	40/60	3	0	0	3	3
25	23CEO004	Fundamentals of Electronic Devices and Circuits	OEC	40/60	3	0	0	3	3
26	23MEO008	Foundation Skills in integrated product Development	OEC	40/60	3	0	0	3	3
27	23BMO002	Assistive Technology	OEC	40/60	3	0	0	3	3
28	23MAO001	Operations Research	OEC	40/60	3	0	0	3	3
29	23MAO002	Algebra and Number Theory	OEC	40/60	3	0	0	3	3
30	23MAO003	Linear Algebra	OEC	40/60	3	0	0	3	3
		<b>TOTAL</b>			<b>90</b>	<b>0</b>	<b>0</b>	<b>90</b>	<b>90</b>

**OPEN ELECTIVE - IV**

S. No	Course Code	Course Title	Category	Internal/External	Periods per Week			Total Contacts Period	Credits
					L	T	P		
1	23HSO002	Project Report Writing	OEC	40/60	3	0	0	3	3
2	23CEO008	Basics of Integrated Water	OEC	40/60	3	0	0	3	3

		Resources Management							
3	23MAO004	Advanced Numerical Methods	OEC	40/60	3	0	0	3	3
4	23MAO005	Random Processes	OEC	40/60	3	0	0	3	3
5	23MAO006	Queueing and Reliability Modelling	OEC	40/60	3	0	0	3	3
6	23MGO004	Production and operations Management for Entrepreneurs	OEC	40/60	3	0	0	3	3
7	23MGO005	Multivariate Data Analysis	OEC	40/60	3	0	0	3	3
8	23MEO012	Micro and Precision Engineering	OEC	40/60	3	0	0	3	3
9	23ECO005	Space Vehicles	OEC	40/60	3	0	0	3	3
10	23MGO006	Management Science	OEC	40/60	3	0	0	3	3
11	23BMO002	Industrial Hygiene	OEC	40/60	3	0	0	3	3
12	23CHO008	Chemical Process Safety	OEC	40/60	3	0	0	3	3
13	23EEO007	Electrical, Electronic and Magnetic materials	OEC	40/60	3	0	0	3	3
14	23CHO009	Nanomaterials and applications	OEC	40/60	3	0	0	3	3
15	23ECO006	Concepts in Mobile Robots	OEC	40/60	3	0	0	3	3
16	23MEO015	Marine Propulsion	OEC	40/60	3	0	0	3	3
17	23MEO016	Marine Merchant Vessels	OEC	40/60	3	0	0	3	3
18	23MEO017	Elements of Marine Engineering	OEC	40/60	3	0	0	3	3
19	23CEO005	Geographical Information System	OEC	40/60	3	0	0	3	3

20	23CEO006	Agriculture Entrepreneurship Development	OEC	40/60	3	0	0	3	3
21	23CEO010	Biodiversity Conservation	OEC	40/60	3	0	0	3	3
22	23EEO010	Energy Technology	OEC	40/60	3	0	0	3	3
23	23BTO004	Fundamentals of Food Engineering	OEC	40/60	3	0	0	3	3
24	23BTO005	Food safety and Quality Regulations	OEC	40/60	3	0	0	3	3
25	23BTO006	Nutraceuticals	OEC	40/60	3	0	0	3	3
26	23CHO010	Basics of Dyeing and Printing	OEC	40/60	3	0	0	3	3
27	23CHO011	Fibre Science	OEC	40/60	3	0	0	3	3
28	23CHO012	Garment Manufacturing Technology	OEC	40/60	3	0	0	3	3
29	23CHO013	Unit Operations in Petro Chemical Industries	OEC	40/60	3	0	0	3	3
30	23MEO018	Plastic Materials for Engineers	OEC	40/60	3	0	0	3	3
31	23MEO019	Properties and Testing of Plastics	OEC	40/60	3	0	0	3	3
32	23ECO008	VLSI Design	OEC	40/60	3	0	0	3	3
33	23ECO009	Wearable devices	OEC	40/60	3	0	0	3	3
34	23BMO004	Medical Informatics	OEC	40/60	3	0	0	3	3
		<b>TOTAL</b>			<b>102</b>	<b>0</b>	<b>0</b>	<b>102</b>	<b>102</b>

## SUMMARY

Name of the Programme										
S.No	Subject Area	Credits per Semester								Total Credits
		I	II	III	IV	V	VI	VII/VIII	VIII/VII	
1	HSMC	4	3					5		12
2	BSC	12	7	4	2					25
3	ESC	5	11	7						23
4	PCC			13	19	12	9	8		61
5	PEC					9	12			21
6	OEC						3	3	6	12
7	EEC	1	2	1					10	14
8	Non-Credit (Mandatory)		√		√	√	√			
<b>Total</b>		<b>22</b>	<b>23</b>	<b>25</b>	<b>21</b>	<b>21</b>	<b>24</b>	<b>16</b>	<b>16</b>	<b>168</b>

## VERTICALS FOR MINOR DEGREE

**(In addition to all the verticals of other programmes)**

<b>Vertical I Fintech and Block chain</b>	<b>Vertical II</b>	<b>Vertical III</b>	<b>Vertical IV</b>	<b>Vertical V</b>
<b>Fintech and BlockChain</b>	<b>Entrepreneurship</b>	<b>Public Administration</b>	<b>Business Data Analytics</b>	<b>Environment and Sustainability</b>
Financial Management	Foundations of Entrepreneurship	Principles of Public Administration	Statistics for Management	Sustainable infrastructure Development
Fundamentals of Investment	Team Building and Leadership Management for Business	Constitution of India	Data Mining for Business Intelligence	Sustainable Agriculture and Environmental Management
Banking, Financial Services and Insurance	Creativity and Innovation in Entrepreneurship	Public Personnel Administration	Human Resource Analytics	Sustainable Bio Materials
Introduction to Blockchain and its Applications	Principles of Marketing Management for Business	Administrative Theories	Marketing and Social Media Web Analytics	Materials for Energy Sustainability
Fintech Personal Finance and Payments	Human Resource Management for Entrepreneurs	Indian Administrative System	Operation and Supply Chain Analytics	Green Technology
Introduction to Fintech	Financing New Business Ventures	Public Policy Administration	Financial Analytics	Environmental Quality Monitoring and Analysis
-	-	-	-	Integrated Energy Planning for Sustainable Development
-	-	-	-	Energy Efficiency for Sustainable Development

### Vertical I: FINTECH AND BLOCKCHAIN

S. No	Course Code	Course Title	Category	Internal / External	Periods per Week			Total Contacts Period	Credits
					L	T	P		
1.	23CMG001	Financial Management	PEC	3	0	0	3	3	1
2.	23CMG002	Fundamentals of Investment	PEC	3	0	0	3	3	2
3.	23CMG003	Banking, Financial Services and Insurance	PEC	3	0	0	3	3	3

4.	23CMG004	Introduction to Blockchain and its Applications	PEC	3	0	0	3	3	4
5.	23CMG005	Fintech Personal Finance and Payments	PEC	3	0	0	3	3	5
6.	23CMG006	Introduction to Fintech	PEC	3	0	0	3	3	6
		<b>TOTAL</b>		<b>18</b>	<b>0</b>	<b>0</b>	<b>18</b>	<b>18</b>	<b>21</b>

### Vertical II: ENTREPRENERUSHIP

S. No	Course Code	Course Title	Category	Internal / External	Periods per Week			Total Contacts Period	Credits
					L	T	P		
1.	23CMG007	Foundations of Entrepreneurship	PEC	3	0	0	3	3	1
2.	23CMG008	Team Building and Leadership Management for Business	PEC	3	0	0	3	3	2
3.	23CMG009	Creativity and Innovation in Entrepreneurship	PEC	3	0	0	3	3	3
4.	23CMG010	Principles of Marketing Management for Business	PEC	3	0	0	3	3	4
5.	23CMG011	Human Resource Management for Entrepreneurs	PEC	3	0	0	3	3	5
6.	23CMG012	Financing New Business Ventures	PEC	3	0	0	3	3	6
		<b>TOTAL</b>		<b>18</b>	<b>0</b>	<b>0</b>	<b>18</b>	<b>18</b>	<b>21</b>

### Vertical III: PUBLIC ADMINISTRATION

S. No	Course Code	Course Title	Category	Internal / External	Periods per Week			Total Contacts Period	Credits
					L	T	P		
1.	23CMG013	Principles of Public Administration	PEC	3	0	0	3	3	1

2.	23CMG014	Constitution of India	PEC	3	0	0	3	3	2
3.	23CMG015	Public Personnel Administration	PEC	3	0	0	3	3	3
4.	23CMG016	Administrative Theories	PEC	3	0	0	3	3	4
5.	23CMG017	Indian Administrative System	PEC	3	0	0	3	3	5
6.	23CMG018	Public Policy Administration	PEC	3	0	0	3	3	6
		<b>TOTAL</b>		<b>18</b>	<b>0</b>	<b>0</b>	<b>18</b>	<b>18</b>	<b>21</b>

**Vertical IV: BUSINESS DATA ANALYTICS**

S. No	Course Code	Course Title	Category	Internal / External	Periods per Week			Total Contacts Period	Credits
					L	T	P		
1.	23CMG019	Statistics for Management	PEC	3	0	0	3	3	1
2.	23CMG020	Datamining for Business Intelligence	PEC	3	0	0	3	3	2
3.	23CMG021	Human Resource Analytics	PEC	3	0	0	3	3	3
4.	23CMG022	Marketing and Social Media Web Analytics	PEC	3	0	0	3	3	4
5.	23CMG023	Operation and Supply Chain Analytics	PEC	3	0	0	3	3	5
6.	23CMG024	Financial Analytics	PEC	3	0	0	3	3	6
		<b>TOTAL</b>		<b>18</b>	<b>0</b>	<b>0</b>	<b>18</b>	<b>18</b>	<b>21</b>

**Vertical V: ENVIRONMENT AND SUSTAINABILITY**

S. No	Course Code	Course Title	Category	Internal / External	Periods per Week			Total Contacts Period	Credits
					L	T	P		
1.	23CES001	Sustainable infrastructure Development	PEC	3	0	0	3	3	1
2.	23CES002	Sustainable Agriculture and Environmental Management	PEC	3	0	0	3	3	2

3.	23CES003	Sustainable Bio-Materials	PEC	3	0	0	3	3	3
4.	23CES004	Materials for Energy Sustainability	PEC	3	0	0	3	3	4
5.	23CES005	GreenTechnology	PEC	3	0	0	3	3	5
6.	23CES006	Environmental Quality Monitoring and Analysis	PEC	3	0	0	3	3	6
7.	23CES007	Integrated Energy Planning for Sustainable Development	PEC	3	0	0	3	3	7
8.	23CES008	Energy Efficiency for Sustainable Development	PEC	3	0	0	3	3	8
		<b>TOTAL</b>		<b>24</b>	<b>0</b>	<b>0</b>	<b>24</b>	<b>24</b>	<b>36</b>