

# Mahindra École Centrale

Bahadurpally, Hyderabad 500043

## ACADEMIC REGULATIONS FOR FOUR-YEAR UNDERGRADUATE DEGREE PROGRAMS

(Applicable to students from the Academic Year 2017-18 and onwards)

### COURSE CATEGORIES

S. No.	Category	Description
1	CB - Chemistry and Biology	Courses in Chemistry and Biology.
2	PH - Physics	Courses in Physics
3	ES - Engineering Science	Courses in Engineering Sciences
4	CE - Civil Engineering	Courses related to Civil Engineering
5	CS - Computer Science	Courses in Computer Science and Technology
6	EE - Electrical Engineering	Courses of Electrical Engineering
7	ME - Mechanical Engineering	Courses in Mechanical Engineering
8	HS - Humanities and Social Sciences	Courses in Language, Culture, Philosophy, etc.
9	SE - Society & Enterprise	Includes projects and courses in Media, Industrial Engineering, Management, Finance, etc.
10	PR - Projects	Includes third year and final year projects

<b>Semester 1</b>						
	<b>Code</b>	<b>Course</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
1	ME 111	Engineering Mathematics - I	3	1	0	3
2	ME 112	Chemistry for Mechanical Engineering	3	1	0	3
3	ME 113	Communications Skills	3	1	0	3
4	ME 114	Engineering Mechanics and Strength of Materials	3	1	0	3
5	ME 115	Engineering Graphics	1	0	3	3
6	ME 116	Chemistry Lab	0	0	3	1
7	ME 117	Communications Lab	0	0	3	1
8	ME 118	Workshop Practice - I	1	0	3	2
9	ME 119	Media Project	1	0	3	2
10	HS 102	French Language & Culture I	0	2	0	0
						<b>21</b>

<b>Semester 2</b>						
	<b>Code</b>	<b>Course</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
1	ME-121	Engineering Mathematics - II	3	1	0	3
2	ME-122	Physics for Mechanical Engineers (Electromagnetics, Optics, Quantum Mechanics)	3	1	0	3
3	ME-123	Basic Environmental Science and Engineering	3	1	0	3
4	ME-124	Basic Electrical & Electronics Engineering	3	1	0	3
5	ME-125	Engineering Thermodynamics	3	1	0	3
6	ME-126	Physics Lab	0	0	3	1
7	ME-127	Basic Electrical & Electronics Lab	0	0	3	1
8	ME-128	Workshop Practice - II	1	0	3	2
9	HS 104	French Language & Culture II	0	2	0	0
						<b>19</b>

<b>Semester 3</b>						
	<b>Code</b>	<b>Course</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
1	MA 203	Mathematics – III	3	1	0	4
2	PH 202	Physics – II	3	1	2	5
3	ES 208	Mechanics	2	1	0	3
4	ES 209	Signals & Systems	2	1	2	4
5	ES 210	Data Structures	2	2	2	5
6	ME 201	Computer Aided Engineering Design	1	0	2	2
7	HS 206	French language & Culture – III	0	2	0	0
						<b>23</b>

<b>Semester 4</b>						
	<b>Code</b>	<b>Course</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
1	ES 211	Numerical Methods	3	0	2	4
2	ME 202	Transport Phenomena	3	1	0	4
3	ME 203	Manufacturing Processes I	3	1	0	4
4	ME 204	Mechanics of Solids	3	1	0	4
5	ME 205	Theory of Mechanisms and Machines	3	1	2	5
6	SE 203	Design Thinking	1	0	2	2
7	HS 208	French Language & Culture - IV	0	2	0	0
						<b>23</b>

Semester 5						
	Code	Course	L	T	P	Credits
1	MA 304	Mathematics - IV	3	1	0	4
2	ES 312	Introduction to Materials Sciences	2	0	2	3
3	ME 306	Manufacturing Processes II	2	1	4	5
4	ME 307	Applied Fluid Dynamics and Heat Transfer	3	1	0	4
5	ME 308	Design of Machine Elements	3	1	0	4
6	ME 309	Experimental Analysis	0	0	4	2
7	SE 304	Engineering Economics	2	1	0	3
8	HS-E1	HSS + Mgmt. - Elective - I	2	0	0	2
9	HS 310	French Language & Culture - V	0	2	0	0
						<b>27</b>

Semester 6						
	Code	Course	L	T	P	Credits
1	ME 310	Multiphysics	3	1	0	4
2	ME 311	Thermal Engineering	3	1	0	4
3	ME 312	Finite Element Methods	3	0	2	4
4	ME 313	Structural Dynamics and Acoustics	3	1	0	4
5	PR 301	Third Year Project	0	0	6	3
6	HS-E2	HSS + Mgmt. - Elective - II	2	0	0	2
7	E1	Elective - I	3	0	0	3
8	HS 312	French Language & Culture - VI	0	2	0	0
						<b>24</b>

<b>Semester 7</b>						
	<b>Code</b>	<b>Course</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
1	ME 414	Control Theory	3	0	0	3
2	ME 415	Industrial Engineering	3	0	0	3
3	HS 401	Professional Ethics	0	1	0	1
4	HS-E3	HSS + Mgmt. - Elective - III	2	0	0	2
5	E2	Elective - II	3	0	0	3
6	E3	Elective - III	3	0	0	3
7	PR 402	Year-4 Project	0	1	4	3
8	HS 414	French Language & Culture - VII	0	2	0	0
						<b>18</b>

<b>Semester 8</b>						
	<b>Code</b>	<b>Course</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
1	E4	Elective - IV	3	0	0	3
2	E5	Elective - V	3	0	0	3
3	PR 402	Year-4 Project	0	5	8	9
4	HS 416	French Language & Culture - VIII	0	2	0	0
						<b>15</b>

### List of Electives: Semesters 6, 7, & 8

S.No.	Code	Course	L	T	P	Credits
1	ME 450	Refrigeration & Air Conditioning	3	0	0	3
2	ME 451	Advanced Manufacturing	3	0	0	3
3	ME 452	Introduction to Operations Research	3	0	0	3
4	ME 453	Dynamics and Applications	3	0	0	3
5	ME 454	Theory of Mechanisms and Machines	3	0	0	3
6	ME 455	Turbomachinery	3	0	0	3
7	ME 456	Systems Engineering	3	0	0	3
8	ME 457	Advanced Mechanics of Materials	3	0	0	3
9	ME 458	Introduction to IC Engines	3	0	0	3
10	ME 459	Power Plant Engineering	3	0	0	3
11	ME 460	Alternative Energy Sources	3	0	0	3
12	ME 462	Composite Materials	3	0	0	3
13	ME 463	Engineering Alloys in Design	3	0	0	3
14	ME 465	Flight Dynamics	3	0	0	3
15	ME 466	Aircraft Design	3	0	0	3
16	ME 467	Introduction to Robotics	3	0	0	3
17	ME 468	Introduction to Combustion	3	0	0	3
18	ME 469	Computational Fluid Dynamics	3	0	0	3
19	ME 470	Robotics: Dynamics and Control	3	0	0	3
20	ME 471	Micro-scale Mechanics	3	0	0	3
21	ME 472	Theory of Elasticity	3	0	0	3

22	CB 304	Chemical & Bio Engineering	3	0	0	3
23	CE 312	Environmental Engineering	3	0	0	3
23	CE 470	Application of Soil Mechanics	3	0	0	3
24	CE 472	Introduction to Fracture Mechanics	3	0	0	3
25	CE 473	Introduction to Structural Health Monitoring	3	0	0	3
26	CS 313	Machine Learning	2	0	2	3
27	CS 452	Advanced Data Analytics	3	0	0	3
28	CS 456	Social Computing	3	0	0	3
29	CS 457	Deep Learning	3	0	0	3
30	CS 458	Information Retrieval and Natural Language Processing	3	0	0	3
31	CS 461	High Performance Computing	3	0	0	3
32	EE 451	Information Theory and Coding	3	0	0	3
33	EE 471	Digital Image Processing	3	0	0	3
34	EE 472	Computer Vision	3	0	0	3
35	EE 475	Biomedical Signal Processing	3	0	0	3
36	EE 476	Microwave Engineering	3	0	0	3
37	EE 477	Computational Electromagnetics	3	0	0	3
38	EE 480	Neuroscience and Anatomy	3	0	0	3
39	EE 481	Neural Networks and Sensors	3	0	0	3
40	EE 482	Signal Processing in Neural Systems	3	0	0	3
41	EE 483	Brain Modelling and ANNs	3	0	0	3
42	EE 485	IoT System Architecture and Design	3	0	0	3

43	EE 486	Sensors and Instrumentation	3	0	0	3
44	EE 487	High Performance Embedded Systems	3	0	0	3
45	MA 450	Numerical Linear Algebra	3	0	0	3
46	MA 451	Meshfree Methods	3	0	0	3
47	MA 452	Boundary Element Method and Boundary Integral Equations	3	0	0	3
48	MA 453	PDE Based Image Processing	3	0	0	3
49	MA 454	Topology and Operator Theory	3	0	0	3
50	MA 455	Infinite Dimensional Control Theory	3	0	0	3
51	MA 456	Bayesian Statistics	3	0	0	3
52	MA 457	Financial Mathematics	3	0	0	3
53	MA 458	Nonlinear Conservation Laws and Applications	3	0	0	3
54	PH 304	Physics IV	3	0	0	3
55	PH 451	Lasers: Principles and Applications	3	0	0	3



**List of HS Electives: Semesters 5, 6 & 7**

<b>S.No.</b>	<b>Code</b>	<b>Course</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
1	HS 500	Selections from World Literature	2	0	0	2
2	HS 501	Business Communication	2	0	0	2
3	HS 502	Visual Story Telling	2	0	0	2
4	HS 503	Introduction to Culture Studies	2	0	0	2
5	HS 504	Literature and Visual Arts	2	0	0	2
6	HS 505	Cinema and Philosophy	2	0	0	2
7	HS 506	The Humanities for a Critical Understanding of the World	2	0	0	2
8	HS 507	Academic Writing	2	0	0	2
9	HS 508	Urban Studies: Reading the City	2	0	0	2
10	HS 509	Contemporary Shakespeare: Readings and Adaptations	2	0	0	2
11	HS 510	Philosophical Arguments	2	0	0	2