

# Mahindra École Centrale

Bahadurpally, Hyderabad 500043

## ACADEMIC REGULATIONS FOR FOUR-YEAR UNDERGRADUATE DEGREE PROGRAMS

(Applicable to students from the Academic Year 2018-19 and onwards)

### COURSE CATEGORIES

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

<b>Semester 1</b>						
	<b>Code</b>	<b>Course</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
1	MA 101	Mathematics - I	4	1	0	5
2	CH 101	Chemistry - I	2	1	0	3
3	ES 101	Introduction to Electrical Engineering	2	1	2	4
4	ES 102	Engineering Drawing	0	0	3	1.5
5	ES 103	Earth and Environmental Sciences	2	0	0	2
6	ES 104	Thermodynamics	2	1	0	3
7	SE 101	Media Project	0	0	3	1.5
8	HS 101	English and Humanities - I	1	2	2	4
9	FL 101	French Language & Culture - I	0	2	0	0
						<b>24</b>

<b>Semester 2</b>						
	<b>Code</b>	<b>Course</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
1	MA 102	Mathematics - II	3	1	0	4
2	PH 101	Physics - I	2	1	2	4
3	CH 102	Chemistry - II	2	0	2	3
4	ES 105	Electronics	2	1	2	4
5	ES 106	Introduction to Computer Science	2	1	2	4
6	ES 107	Workshop Practice	0	0	2	0
7	SE 102	Introduction to Enterprises & Economy	2	1	0	3
8	HS 102	Professional Ethics	0	1	0	1
9	FL 102	French Language & Culture - II	0	2	0	0
						<b>23</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	3	1	0	4
5	ES 210	Data Structures	2	2	2	5
6	ME 201	Computer Aided Engineering Design	1	0	4	3
7	FL 203	French Language & Culture - III	0	2	0	0
						<b>24</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	0	0	3
4	ME 204	Mechanics of Solids	2	1	0	3
5	ME 205	Theory of Mechanisms and Machines	2	1	2	4
6	SE 203	Design Thinking	1	0	2	2
7	FL 204	French Language & Culture - IV	0	2	0	0
						<b>20</b>

<b>Semester 5</b>						
	<b>Code</b>	<b>Course</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
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	2	4
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	HS-E1	HSS + Mgmt. - Elective - I	2	0	0	2
8	FL 305	French Language & Culture - V	0	2	0	0
						<b>23</b>

<b>Semester 6</b>						
	<b>Code</b>	<b>Course</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
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	FL 306	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-E3	HSS + Mgmt. - Elective - III	2	0	0	2
4	E2	Elective - II	3	0	0	3
5	E3	Elective - III	3	0	0	3
6	PR 402	Year-4 Project	0	1	4	3
7	FL 407	French Language & Culture - VII	0	2	0	0
						<b>17</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 403	Year-4 Project	0	5	8	9
4	FL 408	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	CS 313	Machine Learning	2	0	2	3
25	CS 452	Advanced Data Analytics	3	0	0	3
26	CS 456	Social Computing	3	0	0	3
27	CS 457	Deep Learning	3	0	0	3
28	CS 458	Information Retrieval and Natural Language Processing	3	0	0	3
29	CS 461	High Performance Computing	3	0	0	3
30	EE 451	Information Theory and Coding	3	0	0	3
31	EE 471	Digital Image Processing	3	0	0	3
32	EE 472	Computer Vision	3	0	0	3
33	EE 475	Biomedical Signal Processing	3	0	0	3
34	EE 476	Microwave Engineering	3	0	0	3
35	EE 477	Computational Electromagnetics	3	0	0	3
36	EE 480	Neuroscience and Anatomy	3	0	0	3
37	EE 481	Neural Networks and Sensors	3	0	0	3
38	EE 482	Signal Processing in Neural Systems	3	0	0	3
39	EE 483	Brain Modelling and ANNs	3	0	0	3
40	EE 485	IoT System Architecture and Design	3	0	0	3
41	EE 486	Sensors and Instrumentation	3	0	0	3
42	EE 487	High Performance Embedded Systems	3	0	0	3
43	MA 450	Numerical Linear Algebra	3	0	0	3

44	MA 451	Meshfree Methods	3	0	0	3
45	MA 452	Boundary Element Method and Boundary Integral Equations	3	0	0	3
46	MA 453	PDE Based Image Processing	3	0	0	3
47	MA 454	Topology and Operator Theory	3	0	0	3
48	MA 455	Infinite Dimensional Control Theory	3	0	0	3
49	MA 456	Bayesian Statistics	3	0	0	3
50	MA 457	Financial Mathematics	3	0	0	3
51	MA 458	Nonlinear Conservation Laws and Applications	3	0	0	3
52	PH 304	Physics IV	3	0	0	3
53	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