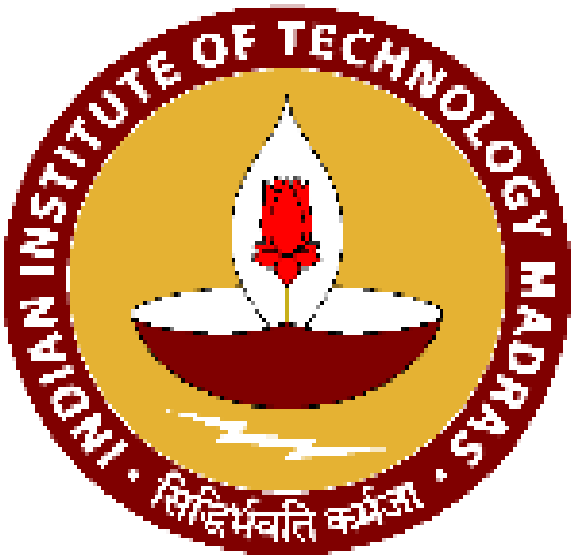

INDIAN INSTITUTE OF TECHNOLOGY MADRAS
CHENNAI 600 036

Curriculum for
B.Tech. Degree Programme
2015 Batch

INDIAN INSTITUTE OF TECHNOLOGY MADRAS

Curriculum for B.Tech. Degree Programme

2015 Batch

B.Tech. Degree Programme
2015 Batch
Category and Branch-wise credit requirements

Category	Engineering (E)	Professional (P) *Core + Elective*	Humanities (H)	Sciences (S) *Core + Elective*	Un-allotted credits	Total
AE	56	159 +27	27	84 + 9	72	**434**
CH	48	156 + 45	27	75 + 9	72	**432**
CE	46	155 + 30	27	75 + 9	90	**432**
CS	45	120 + 84	27	84	72	**432**
EE	48	118 + 65	27	66 + 18	88	**430**
ME	45	150 + 54	27	75 + 9	72	**432**
MM	45	165 + 27	27	66 + 18	86	**434**
NA	48	146 + 56	27	66 + 18	72	**433**
EP	45	142 + 63	27	75+9	72	**433**

AE - B.Tech. in Aerospace Engineering
2015 Batch

Semester 1

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	AM1100	Engineering Mechanics	3	1	0	0	6	10	E
2	CY1001	Chemistry I	3	1	0	0	6	10	S
3	MA1101	Functions of Several Variables	3	1	0	0	6	10	S
4	ME1120	Engineering Drawing	1	0	0	3	3	7	E
5	PH1010	Physics I	3	1	0	0	6	10	S
6	PH1030	Physics Lab I	0	0	0	3	1	4	S
7	GN1100	Life Skills	0	0	0	0	3	0	
8		NCC (NC1010)/ NSO (NS1020)/ NSO (NS1030)	0	0	0	0	2	0	
		Total Credits :						**51**	

Winter

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	WS1010	Workshop I	0	0	0	3	0	3	E

Semester 2

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	AS1300	Thermodynamics for Aerospace engg.	3	1	1	0	6	11	E
2	CS1100	Introduction to Programming	3	0	0	3	6	12	E
3	CY1002	Chemistry Lab	0	0	0	3	0	3	S
4	EE	Electrical Engineering Elective $	3	1	0	0	6	10	E
5	MA1102	Series and Matrices	3	1	0	0	6	10	S
6	PH1020	Physics II	3	1	0	0	6	10	S
7	ID1200	Ecology and Environment	0	0	0	0	2	0	
8		NCC (NC1010)/ NSO (NS1020)/ NSO (NS1030)	0	0	0	0	3	0	
		Total Credits :						**56**	

$ Students to choose between EE1100 and EE1101

Summer

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	WS1020	Workshop II	0	0	0	3	0	3	E

Semester 3

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	AS1020	Fluid Mechanics	3	1	1	0	6	11	P
2	AS2010	Basic Strength of Materials	3	1	1	0	6	11	P
3	AS2100	Basic Aerospace Engg. lab.	1	0	0	2	2	5	P
4	AS2101	Introduction to Aerospace Engg.	1	0	0	2	2	5	P
5	MA2010	Complex Variables	3	0	0	0	6	9	S
6	HSE1	Humanities I	3	0	0	0	6	9	H
		Total Credits :						**50**	

Semester 4

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	AS2030	Gas Dynamics	3	1	1	0	6	11	P
2	AS2050	Aerodynamics	3	1	1	0	6	11	P
3	AS2070	Aerospace Structural Mechanics	3	1	0	0	6	10	P
4	AS2080	Vibrations	3	1	0	0	6	10	P
5	AS2510	Low speed lab.	1	0	0	2	2	5	P
6	MA2020	Differential Equations	3	0	0	0	6	9	S
		Total Credits :						**56**	

Semester 5

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	AS2040	Flight Dynamics I	4	1	0	0	7	12	P
2	AS3020	Aerospace Structures	3	1	1	0	6	11	P
3	AS3270	Propulsion I	3	1	0	0	6	10	P
4	AS3510	Aero. Lab. I	1	0	0	2	2	5	P
5	AS2520	Propulsion Lab	0	0	0	3	0	3	P
6	MA	Math elective	3	0	0	0	6	9	S
		Total Credits :						**50***	

Semester 6

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	AS3050	Flight Dynamics II	4	1	0	0	7	12	P
2	AS3271	Propulsion II	3	1	0	0	6	10	P
3	AS3520	Aero. Lab. II	1	0	0	2	2	5	P
4	BT1010	Life sciences	3	0	0	0	6	9	S
5		Design elective ^	2	1	2	3	4	12	P
		Total Credits :						**48***	

^Restricted elective: students choose between AS5211 Design of Subsonic aircraft, AS5212 Design of Supersonic aircraft, AS5213 Design of UAVs and MAVs.

Summer

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
	AS3500	**Summer Internship**	0	0	0	0	20	**0**	

Semester 7

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	HSE2	Humanities II	3	0	0	0	6	9	H
		Total Credits :						**9***	

Semester 8

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	HSE3	Humanities III	3	0	0	0	6	9	H
2	HS3050	Professional Ethics	2	0	0	0	0	0	
		Total Credits :						**9***	

Semester	I	II	III	IV	V	VI	VII	VIII	Total
Credits	51	56+6	50	56	50*	48*	9*	9*	434

* Indicated credits are only for core program. In addition, students are required to take 99 elective credits during semesters V-VIII, with at least 27 of those credits in Aerospace Engg.

Remaining 72 can be from any dept. including aerospace engg. Electives can be taken in semesters V-VIII, subject to maximum of 60 credits per sem.
***Suggested elective credits*: 9 each in V & VI sem; 45 in VII sem. & 36 in VIII sem**
Project: An optional B.Tech project can be taken in any department in lieu of 27 elective credits. These 27 credits can be counted against 27 aerospace department elective credits mentioned above only if the project is done in the aerospace dept.

Category	Engineering (E)	Professional (P) Core+Elective	Humanities (H)	Sciences (S)	Un-allotted credits	Total
Credits	**56**	**159 + 27**	**27**	**93**	**72**	**434**

B.Tech (Honours): (Total credit requirement: 434 + 27 = **461)**

- ***Eligibility***: minimum CGPA of 8.5 at the end of 5th semester without U or W grade in any course. They need to maintain these conditions until graduation.
- ***Extra credit requirement***:
  - B.Tech. project (AS4600) worth 13 credits in VII semester + 14 credits in VIII semester over and above the regular B.Tech requirement.
  - 54 credits (instead of 27 for regular) out of 99 elective credits to be taken in Aero. Dept. at 5000 level or higher.

CH - B.Tech. in Chemical Engineering
2015 Batch

Semester 1

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	CY1001	Chemistry I	3	1	0	0	6	10	S
2	CY1002	Chemistry Laboratory I	0	0	0	3	0	3	S
3	MA1101	Functions of Several Variables	3	1	0	0	6	10	S
4	ME1100	Thermodynamics	3	1	0	0	6	10	E
5	PH1010	Physics I	3	1	0	0	6	10	S
6	PH1030	Physics Lab I	0	0	0	3	1	4	S
7	GN1100	Life Skills	0	0	0	0	3	0	
		NCC (NC1010)/ NSO (NS1020)/ NSO (NS1030)	0	0	0	0	2	0	
		Total Credits :						**47**	

Winter

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	WS1010	Workshop I	0	0	0	3	0	3	E

Semester 2

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	AM1100	Engineering Mechanics	3	1	0	0	6	10	E
2	MA1102	Series and Matrices	3	1	0	0	6	10	S
3	PH1020	Physics II	3	1	0	0	6	10	S
4	CS1100	Introduction to Programming	3	0	0	3	6	12	E
5	CH1020	Principles & Calculations in Chemical	3	1	0	0	6	10	P
6	ID1200	Ecology and Environment	0	0	0	0	2	0	
7		NCC (NC1010)/ NSO (NS1020)/ NSO (NS1030)	0	0	0	0	3	0	
		Total Credits :						**52**	

Summer

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	WS1020	Workshop II	0	0	0	3	0	3	E

Semester 3

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	CH2010	Chemical Engineering Thermodynamics	3	1	0	0	6	10	P
2	CH2012	Continuum Mechanics & Transport Phenomena	3	1	0	0	6	10	P
3	CH2013	Computational Programming & Process Simulation Lab	1	0	0	2	2	5	P
4	CH2061	Computational Techniques	3	1	0	0	6	10	P
5	MAE1	Maths Elective 1	3	0	0	0	6	9	S
6	HSE1	Humanities I	3	0	0	0	6	9	H
		Total Credits :						**53**	

Semester 4

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	CH2014	Fundamentals of Heat & Mass Transfer	3	1	0	0	6	10	P
2	CH2015	Fluid and Particle Mechanics	3	1	0	0	6	10	P
3	CH2016	Thermodynamics Lab	0	0	0	3	2	5	P
4	CY2010	Kinetics and Catalysis	3	0	0	0	6	9	S
5	EE1100	Basic Electrical Engineering	3	1	0	0	6	10	E
6	HSE2	Humanities 2	3	0	0	0	6	9	H
		Total						**53**	

Semester 5

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	BT1010	Life Sciences	3	0	0	0	6	9	S
2	CH3030	Applications of Mass Transfer	3	1	0	0	6	10	P
3	CH3010	Chemical Reaction Engineering	3	1	0	0	6	10	P
4	CH3510	Mom Transfer & MO Lab	0	0	0	3	2	5	P
5	CH3520	Heat and Mass Transfer Lab	0	0	0	3	2	5	P
6		Dept. Elective 1	3	0	0	0	6	9	P
		Total						**48**	

Semester 6

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	CH3052	Materials Science for Chemical Engineers	3	1	0	0	6	10	P
2	CH3050	Process Dynamics and Control	3	1	0	0	6	10	P
3	CH3521	Heat and Mass Transfer Lab 2	1	0	0	3	2	6	P
4	CH3021	CRE Lab	0	0	0	3	2	5	P
5		Dept. Elective 2	3	0	0	0	6	9	P
		Total						**40**	

Summer

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
	CH3500	**Summer Internship**	0	0	0	0	20	**0**	

Semester 7

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	CH4010	Process & Product Design	3	1	0	0	6	10	P
2	CH4050	Chemical Technology and Equipment Design	3	1	0	0	6	10	P
3	CH4030	Process Control Lab	0	0	0	3	2	5	P
4		Humanities 3	3	0	0	0	6	9	H
5		Dept. Elective 3	3	0	0	0	6	9	P
		Total						**43**	

Semester 8

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1		Dept. Elective 4	3	0	0	0	6	9	P
2		Dept. Elective 5	3	0	0	0	6	9	P
2	HS3050	Professional Ethics	2	0	0	0	0	0	
		Total						**18**	

Semester	I	II	III	IV	V	VI	VII	VIII	Total
Credits	47	52+6	53	53	48*	40*	43*	18*	360+72=432

* Indicated credits are only for core program including **five Department Electives**.

* In addition, students are required to take 72 elective credits (17%) during semesters V-VIII from any dept. including Chemical Engineering, subject to maximum of 60 credits per semester. **Suggested elective credits**: Additional 72 elective credits may be split as 9-18-9-36 credits in semesters V to VIII, respectively.

Category-wise Credit Distribution

Category	Engineering (E)	Professional (P) Core+Elective	Humanities (H)	Sciences (S)	Un-allotted credits	Total
Credits	48	156+45	27	75+9	72	432

B.Tech (Honours): (Total credit requirement: 432 + 27 = 459)

- ***Eligibility***: Minimum CGPA of 8.5 at the end of 4th semester without U or W grade in any course.
- **Extra credit requirement**: 27 credits total in VII & VIII semesters over and above the regular B.Tech requirement. (13+14 infeasible as specified in curriculum)
- **BTP is compulsory**, and is taken as 9 + 18 credits in VII and VIII semesters, respectively
- **27 credits of free electives have to be from CH5000+ (elective courses in the department)**
- Thus, professional credits for B.Tech. (Honours) program is 255 credits, of which 27 credits are as B.Tech Project.
- Category-wise Credit Distribution for B.Tech Honours Program:

Category	Engineering (E)	Professional (P) Core+Elective+Project	Humanities (H)	Sciences (S)	Un-allotted credits	Total
Credits	**48**	**156+72+27**	**27**	**75+9**	**45**	**459**

CE - B.Tech. in Civil Engineering
2015 Batch

Semester 1

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	MA1101	Functions of Several Variables	3	1	0	0	6	10	S
2	PH1010	Physics. I	3	1	0	0	6	10	S
3	PH1030	Physics Lab.1	0	0	0	3	1	4	S
4	CE1010	Introduction to Civil Engg	2	1	1	0	4	8	P
5	CS1100	Introduction to Programming	3	0	0	3	6	12	E
6	ME1120	Engg. Drawing	0	1	0	3	3	7	E
7	GN1100	Life Skills	0	0	0	0	3	0	
		NCC (NC1010)/ NSO (NS1020)/ NSO (NS1030)	0	0	0	0	2	0	
		Total Credits :						**51**	

Winter

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	WS1010	Workshop I	0	0	0	3	0	3	E

Semester 2

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	MA1102	Series and Matrices	3	1	0	0	6	10	S
2	PH1020	Physics. II	3	1	0	0	6	10	S
3	AM1100	Engg. Mechanics	3	1	0	0	6	10	E
4	CY1001	Chemistry I	3	1	0	0	6	10	S
5	CY1002	Chemistry Lab	0	0	0	3	0	3	S
6	CE2330	CE Materials and Construction	3	0	0	0	6	9	P
7	ID1200	Ecology and Environment	0	0	0	0	2	0	
8		NCC (NC1010)/ NSO (NS1020)/ NSO (NS1030)	0	0	0	0	3	0	
		Total Credits :						**52**	

Summer

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	WS1020	Workshop II	0	0	0	3	0	3	E

Semester 3

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1		Math. 3	3	0	0	0	6	9	S
2	CE2310	Mechanics of Materials	3	1	1	0	6	11	E
3	CE3010	Transportation Engineering - 1	3	0	0	0	6	9	P
4	CE2040	Hydraulic Engineering	3	1	1	0	6	11	P
5	CE2080	Surveying	2	1	0	3	4	10	P
6		**Total Credits**						**50**	

Semester 4

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	CE2020	Structural Analysis	3	1	1	0	6	11	P
2	CE2060	Geotechnical Engineering - 1	3	1	1	0	6	11	P
3	CE3020	Transportation Engineering - 2	3	0	0	0	6	9	P
4	CE3040	Environmental Engineering	3	1	0	0	6	10	P
5		Science Elective (Maths/Physics/Chemistry)	3	0	0	0	6	9	S
6		Humanities Elec. 1	3	0	0	0	6	9	H
		Total Credits						**59**	

Semester 5

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	BT1010	Life Sciences	3	0	0	0	6	9	S
2	CE3350	Geotechnical Engineering - 2	3	1	1	0	6	11	P
3	CE3030	Water Resources Engineering	4	0	0	0	8	12	P
4	CE3060	Basic RC Design	3	1	1	0	6	11	P
5	CE4030	Hydraulic & Environ. Engg. Lab	0	0	0	3	1	4	P
6	CE3410	Construction Material Lab	0	0	0	3	1	4	P
		Total Credits						**51**	

Semester 6

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	CE3050	Basic Steel Design	3	1	1	0	6	11	P
2	CE4010	Construction Project Mgmt.	3	1	0	0	6	10	P
3		Humanities Elec. 2	3	0	0	0	6	9	H
4		**Total Credits**	**9**	**2**	**1**	**3**	**19**	**30**	

Summer

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	CE3100	Structural Engg. Lab	0	0	0	3	1	4	P
2	CE3280	**Summer Internship**	0	0	0	0	20	**0**	

** To conduct CE3100 during Summer (6 days after the end semester of 6th semester courses)*

Semester 7

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1		Humanities Elec. 3	3	0	0	0	6	9	H
2		**Total Credits**	**3**	**0**	**0**	**0**	**6**	**9**	

Semester 8

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
2	HS3050	Professional Ethics	2	0	0	0	0	0	H
		Total						**9**	

Semester	I	II	III	IV	V	VI	VII	VIII	Total
Credits	51	52+6	50*	59*	51*	30*+4	9*	*	432

***Please note that the indicated credits are only for core program.**

- The students are required to take **120 credits of electives in semesters III-VIII, of which at least 30 credits should be in Civil Engg**. The remaining credits can be from any department including Civil Engineering
- Electives can be taken in semesters III-VIII, limiting to about 60 credits per semester.
- An optional B.Tech. project can be taken in lieu of 27 elective credits. Please note that such project credits will not be counted against the 18 Civil Engineering credits. Project can be taken in any department including Civil Engineering.

Category	Engineering (E)	Professional (P) Core+Elective	Humanities (H)	Sciences (S)	Un-allotted credits	Total
Credits	46	155 + 30	27	84	90	432

B.Tech (Honours): (Total credit requirement: 432 + 27 = **459)**

- *Eligibility*: minimum CGPA of 8.5 at the end of 5th sem without U or W grade in any course.
- The students are required to take **120 + 27 credits of electives in semesters III-VIII, of which at least 57 credits should be in Civil Engg**. The remaining credits can be from any department including Civil Engineering
- 27 elective credits to be taken in CE courses at 5000-level or higher.

- Honours student should carry out a B.Tech. project worth 13 credits in VII and 14 credits in VIII semester in department including Civil Engineering.

CS - B.Tech. in Computer Science & Engineering
2015 Batch

Semester 1

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	MA1101	Functions of Several Variables	3	1	0	0	6	10	S
2	PH1010	Physics. I	3	1	0	0	6	10	S
3	PH1030	Physics Lab.1	0	0	0	3	1	4	S
4	AM1100	Engineering Mechanics	3	1	0	0	6	10	E
5	CY1001	Chemistry 1	3	1	0	0	6	10	S
5	CS1100	Introduction to Programming	3	0	0	3	6	12	E
6	GN1100	Life Skills	0	0	0	0	3	0	
		NCC (NC1010)/ NSO (NS1020)/ NSO (NS1030)	0	0	0	0	2	0	
		Total Credits :						**56**	

Winter

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	WS1010	Workshop I	0	0	0	3	0	3	E

Semester 2

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	MA1102	Series and Matrices	3	1	0	0	6	10	S
2	PH1020	Physics. II	3	1	0	0	6	10	S
3	CS1200	Discrete Mathematics for CS	3	1	0	0	6	10	P
4	ME1120	Engineering Drawings	1	0	0	3	3	7	E
5	CY1002	Chemistry Lab	0	0	0	3	0	3	S
6	EE1100	Basic Electrical Engineering	3	1	0	0	6	10	E
7	ID1200	Ecology and Environment	0	0	0	0	2	0	
8		NCC (NC1010)/ NSO (NS1020)/ NSO (NS1030)	0	0	0	0	3	0	
		Total Credits :						**50**	

Summer

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	WS1020	Workshop II	0	0	0	3	0	3	E

Semester 3

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	MA2130	Basic Graph Theory	3	0	0	0	6	9	S
2		Humanities Elective 1	3	0	0	0	6	9	H
3	CS2700	Programming and Data Structures	3	1	0	0	6	10	P
4	CS2710	Programming and Data Structures Lab	0	0	0	3	3	6	P
5	CS2300	Foundations of Computer Systems Design	3	0	0	0	6	9	P
6	CS2310	Foundations of Computer Systems Design Lab	0	0	0	3	1	4	P
		Total Credits :						**47**	

Semester 4

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	CS2200	Languages, Machines, and Computations	3	1	0	0	6	10	P
2	CS2800	Design and Analysis of Algorithms	3	1	0	0	6	10	P
3	CS2600	Computer Organization and Architecture	3	1	0	0	6	10	P
4	CS2610	Computer Organization and Architecture Lab	0	0	0	3	3	6	P
5	CS2810	Object-Oriented Algorithms Implementation and Analysis Lab	1	0	0	2	3	6	P
6	MA2040	Probability, Stochastic Process and Statistics	3	0	0	0	6	9	S
		Total Credits :						**51**	

Semester 5

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	CS3100	Paradigms of Programming	3	0	0	0	6	9	P
2	CS3500	Operating Systems	3	0	0	6	6	15	P
3	CS3300	Compiler Design	3	0	0	6	6	15	P
4		**Total Credits :**						**39**	

Semester 6

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	BT1010	Life Sciences	3	0	0	0	6	9	S
		Total Credits :						**9**	

Summer

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
	CS3660	**Summer Internship**	0	0	0	0	20	**0**	

Semester 7

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1		Humanities Elective 2	3	0	0	0	6	9	H
		Total Credits :						**9**	

Semester 8

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	HS3050	Professional Ethics	2	0	0	0	0	0	H
2		Humanities Elective 3	3	0	0	0	6	9	H
		Total Credits :						**9**	

Semester	I	II	III	IV	V	VI	VII	VIII	Total
Credits	56	50+6	47*	51*	39*	9*	9*	9*	432

***Please note that the indicated credits are only for core program.**

Category	Engineering (E)	Professional (P) Core+Elective	Humanities (H)	Sciences (S)	Un-allotted credits	Total
Credits	45	120 + 84	27	84	72	432

Remarks

- B. Tech. (CSE) students should complete a total of 156 credits of electives out of which a minimum of 84 Credits must be completed through CSE Dept. Electives.
- Semesters marked with '*': students should take appropriate number of electives after consulting faculty advisor. The students are free to take the elective courses in different semesters, so that the total number of credit hours per semester does not normally exceed 60. B Tech final-year project is optional and may be carried out in the CSE Dept. or in any other Department at IIT Madras.
- If the project is completed in the CSE Dept, it will be considered as equivalent to 24 Department elective credits.

- If the project is completed outside the CSE Dept, it will be considered as equivalent to 27 free elective credits. CS1200 is equivalent to MA2060**:** Discrete Mathematics. CSE students are not allowed to credit MA2060 course as a free elective.

B.Tech (Honours): (Total credit requirement: 432 + 36 = **468)**

- ***Eligibility***: minimum CGPA of 8.5 at the end of 5th sem without U or W grade in any course.
- Students must complete an additional 36 credits of Department Electives with respect to the regular B.Tech. program.
- Semesters marked with '*': students should take appropriate number of electives in consultation with faculty advisor.
- Honors students may exceed the 60-credit limit per semester, after discussing with the faculty advisor.

EE - B.Tech. in Electrical Engineering
2015 Batch

Semester 1

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	MA1101	Functions of Several Variables	3	1	0	0	6	10	S
2	PH1010	Physics I	3	1	0	0	6	10	S
3	CY1001	Chemistry I	3	1	0	0	6	10	S
4	CS1100	Introduction to Programming	3	0	0	3	6	12	E
5	PH1030	Physics Lab I	0	0	0	3	1	4	S
6	CY1002	Chemistry Lab	0	0	0	3	0	3	S
7	GN1100	Life Skills	0	0	0	0	3	0	
		NCC (NC1010)/ NSO (NS1020)/ NSO (NS1030)	0	0	0	0	2	0	
		Total Credits :						**49**	

Winter

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	WS1010	Workshop I	0	0	0	3	0	3	E

Semester 2

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	MA1102	Series and Matrices	3	1	0	0	6	10	S
2	PH1020	Physics II	3	1	0	0	6	10	S
3	EE2001	Digital Systems & Lab	3	1	1	3	8	16	P
4	EE1101	Signals & Systems	3	1	0	0	6	10	E
5	HS	Humanities 1	3	0	0	0	6	9	H
6	ID1200	Ecology and Environment	0	0	0	0	2	0	
7		NCC (NC1010)/ NSO (NS1020)/ NSO (NS1030)	0	0	0	0	3	0	
		Total Credits :						**55**	

Summer

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	WS1020	Workshop II	0	0	0	3	0	3	E

Semester 3

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	EE2015	Electric Circuits & Networks	3	1	1	0	6	11	P
2	EE2016	Microprocessor Theory + Lab	2	0	0	3	7	12	P
3	EE2025	Engineering Electromagnetics	3	1	0	0	6	10	E
4	HS	Humanities 2	3	0	0	0	6	9	H
		Total Credits :	**11**	**2**	**1**	**3**	**25**	**42**	

Semester 4

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	EE2005	Electrical Machines & Lab	3	1	1	3	7	15	P
2	EE2019	Analog Systems & Lab	3	1	1	3	9	17	P
3	EE2004	Digital Signal Processing	3	1	1	0	6	11	P
4	EE3001	Solid State Devices	3	1	1	0	6	11	P
5	EE2703	Applied Programming Lab	0	0	0	3	3	6	P
		Total Credits :	**12**	**4**	**4**	**9**	**31**	**60**	

Semester 5

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	EE3004	Control Engg	3	1	1	0	6	11	P
2	EE3006	Principles of Measurement	2	0	0	3	3	8	P
3	BT1010	Life sciences	3	0	0	0	6	9	S
		Total Credits :	**8**	**1**	**1**	**3**	**9**	**28**	

Semester 6

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	ME3100	Basic Thermal Engineering	3	1	0	0	6	10	E
		Total Credits :						**10**	

Summer

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	EE3500	Summer internship	0	0	0	0	20	0	

Semester 7

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1		Humanities Elective 3	3	0	0	0	6	9	H
		Total Credits :						**9**	

Semester 8

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	HS3050	Professional Ethics	2	0	0	0	0	0	H
		Total Credits :						**0**	

Semester	I	II	III	IV	V	VI	VII	VIII	Total
Credits	49	55+6	42*	60	28*	10*	9*	0*	430

***Please note that the indicated credits are only for core program.**

Category	Engineering (E)	Professional (P) Core+Elective+Stream Elective	Humanities (H)	Sciences (S)	Un-allotted credits	Total
Credits	48	118+29+36	27	66+18	88	430

*** Indicated credits are only for core programme. In addition, 171 credits of electives have to be taken in semester III and semesters V-VIII,** of which

a) at least 9 credits should be from Mathematics and

b) at least 9 credits should be from Basic Science courses (Mathematics, Physics, Chemistry or Biological sciences)

c) at least 29 credits should be from Electrical Engineering courses (or equivalent). All elective lab courses will also be eligible.

d) at least 4 courses that together carry at least 36 credits should be taken from courses in the following EE Stream elective basket:

Odd semester:	Even semester:
EE2003 Computer Organization EE3002 Analog Circuits EE3003 Power Systems EE3005 Communication Systems EE3313 Device Modelling EE4502 Optics for Engineers EE5311 Digital IC Design EP3200 Photonics ID4100 Creative Engineering Project	EE3007 RF and Optical Communication EE3110 Probability Foundations for Electrical Engineers EE3203 Power Electronics EE3402 Sensing Techniques and Sensor Systems ID4100 Creative Engineering Project

For the course ID4100 Creative Engineering Project, the project must be on a topic that is core to Electrical Engineering."

^Courses in the stream elective basket other than those chosen to satisfy requirement in (d) above can also be taken as general EE electives to satisfy requirement in (c) above.

Remaining 88 credits can be from any dept. including Electrical Engineering. Electives can be taken subject to a maximum of 60 credits per semester.

Minimum number of credits in each category: S ≥ 84, E ≥ 45, H ≥ 27, P ≥ 180

Suggested:

III sem: 9 Maths elective and 9 Humanities elective credits
V sem: 22 Stream elective credits and 9 other elective credits
VI sem: 14 Stream elective credits, 9 BS elective credits, 9 other elective credits and 9 EE elective credits
VII and VIII sem: 20 EE elective credits and 70 other elective credits

Project: An optional B.Tech project can be taken in lieu of 27 elective credits. Project can be taken in any department including Electrical Engineering. If the project is done in Electrical Engineering department, credits may be counted against 27 of the 29 Electrical Engineering non-stream elective credits mentioned above.

BTech (honours): (Total credit requirement: 430 + 27 = **457)**

- ***Eligibility***: minimum CGPA of 8.5 at the end of 5th sem without U or W grade in any course. They need to maintain these conditions until graduation.
- ***Extra credit requirement***: B.Tech project worth 27 credits over and above the regular BTech requirement.
- 56 elective credits (instead of 29 for regular B.Tech) to be taken in Electrical department (or equivalent); 27 of those credits to be at the 5000 level or above.

ME - B.Tech. in Mechanical Engineering
2015 Batch

Semester 1

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	MA1101	Functions of several variables	3	1	0	0	6	10	S
2	PH1010	Physics 1	3	1	0	0	6	10	S
3	CS1100	Introduction to programming	3	0	0	3	6	12	E
4	ME1100	Thermodynamics	3	1	0	0	6	10	P
5	PH1030	Physics lab	0	0	0	4	0	4	S
6	CY1002	Chemistry lab	0	0	0	3	0	3	S
7	GN1100	Life Skills	0	0	0	0	3	0	
		NCC (NC1010)/NSO (NS1020)/NSO (NS1030)	0	0	0	0	2	0	
		Credits for semester 1						**49**	

Winter

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	WS1010	Workshop I	0	0	0	3	0	3	E

Semester 2

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	MA1102	Series and matrices	3	1	0	0	6	10	S
2	PH1020	Physics 2	3	1	0	0	6	10	S
3	CY1001	Chemistry	3	1	0	0	6	10	S
4	AM1100	Engineering Mechanics	3	1	0	0	6	10	E
5	ME1480	Engineering drawing	1	0	0	3	3	7	E
6	HS	Humanities elective 1	3	0	0	0	6	9	H
7	ID1200	Ecology and Environment	2	0	0	0	0	0	
8		NCC (NC1010)/NSO (NS1020)/NSO (NS1030)	0	0	0	0	3	0	
		Credits for semester 2						**56**	

Summer

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	WS1020	Workshop II	0	0	0	3	0	3	E

Semester 3

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	MA2020	Differential equations	3	0	0	0	6	9	S
2	EE1100	Basic electrical engineering	3	1	0	0	6	10	E
3	AM2200	Strength of materials	3	1	0	0	6	10	P
4	AM2530	Foundations of fluid mechanics	3	1	0	0	6	10	P
5	ME2220	Kinematics and dynamics of machinery	3	1	0	0	6	10	P
6	AM2540	Applied mechanics/ Fluid mechanics lab	0	0	0	3	0	3	P
		Credits for semester 3						**52**	

Semester 4

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	MA	Mathematics elective	3	0	0	0	6	9	S
2	ME2100	Applied thermal engineering	3	1	0	0	6	10	P
3	ME2260	Materials and design	3	1	0	0	6	10	P
4	ME2300	Manufacturing processes	3	1	0	0	6	10	P
5	ME2400	Measurements and instrumentation	3	0	0	2	6	11	P
6	HS	Humanities elective 2	3	0	0	0	6	9	H
		Credits for semester 4						**59**	

Semester 5

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	ME3170	Heat transfer	3	1	0	0	6	10	P
2	ME3103	Energy conversion systems	3	1	0	0	6	10	P
3	ME3201	Design of machine elements	3	1	0	0	6	10	P
4	ME3301	Manufacturing technology	3	1	0	0	6	10	P
5		Free elective 1	3	0	0	0	6	9	
6	ME3481	Mechanical engineering lab 1	0	0	0	3	0	3	P
7	ME3281	Machine drawing practice	1	0	0	3	3	7	P
		Credits for semester 5						**59**	

Semester 6

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1		Professional elective 1	3	0	0	0	6	9	P
2		Free elective 2	3	0	0	0	6	9	
3		Free elective 3	3	0	0	0	6	9	
4	BT1010	Life sciences	3	0	0	0	6	9	S
5	ME3302	Automation in manufacturing	3	1	0	0	6	10	P
6	ME3482	Mechanical engineering lab 2	0	0	0	3	0	3	P
7	ME3484	Mechanical engineering lab 3	0	0	0	3	0	3	P
		Credits for semester 6						**52**	
		Honours elective 1	3	0	0	0	6	9	
		Credits for semester 6 for honours						**61**	

Summer

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
	ME3500	**Summer Internship**	0	0	0	0	20	**0**	

Semester 7

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1		Professional elective 2	3	0	0	0	6	9	P
2		Professional elective 3	3	0	0	0	6	9	P
3		Professional or Free elective 4	3	0	0	0	6	9	P
4		Professional or Free elective 5	3	0	0	0	6	9	P
5		Professional or Free elective 6	3	0	0	0	6	9	P
6	HS	Humanities or Free elective 3	3	0	0	0	6	9	H
7	HS3050	Professional ethics	0	0	0	0	2	0	H
8		**Credits for semester 7**						**54**	
		Honours elective 2	3	0	0	0	6	9	
		Credits for semester 7 for honours						**63**	

Semester 8

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1		Professional or Free elective 4 or Project	3	0	0	0	6	9	
2		Professional or Free elective 5 or Project	3	0	0	0	6	9	
3		Professional or Free elective 6 or Project	3	0	0	0	6	9	
4		Free elective 7	3	0	0	0	6	9	
5		Free elective 8	3	0	0	0	6	9	
		Credits for semester 8						**45**	
		Honours elective 3	3	0	0	0	6	9	
		Credits for semester 8 for honours						**54**	

Note:

(1) Project in other department can be taken only in lieu of Free Electives
(2) Project in ME Department can be taken in lieu of free or departmental electives
(3) It may be noted that any combination of free electives should lead to 72 credits and not necessarily 8 courses

Semester	I	II	III	IV	V	VI	VII	VIII	Total
Credits	49	56+6	52	59	59	52	54	45	432

***Please note that the indicated credits are only for core program.**

Category	Engineering (E)	Professional (P) Core + elective	Humanities (H)	Sciences (S)	Un-allotted credits	Total
Credits	45	150 + 54	27	84	72	432

B.Tech. Curriculum (from July 2015)

Category	Minimum Credit Requirements (CTF)/BOG	ME
Basic Science (S)	84	84
Basic Eng. (E)	45	45
Profession (P)	180	204
Humanities (H)	27	27
Unallocated credits	96	72
Total	**432**	**432**

B.Tech. - Category wise credit Requirements

Category	ME	
	Electives	Total
Basic Science (S)	10	84
Basic Eng. (E)	0	45
Profession (P)	54	204
Humanities (H)	27	27
Unallocated credits	72	72
Total	**162**	**432**
Percentage	**37.5%**	

BTech (honours): (Total credit requirement: 432 + 27 = **459)**

- ***Eligibility***: minimum CGPA of 8.5 at the end of 5th sem without U or W grade in any course. They need to maintain these conditions until graduation.
- ***Extra credit requirement***: Additional 27 credits to be taken in VI-VIII from Mechanical department (or equivalent);

MM - B.Tech. in Metallurgical and Materials Engineering
2015 Batch

Semester 1

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	PH1010	Physics I	3	1	0	0	6	10	S
2	ME1100	Thermodynamics	3	1	0	0	6	10	E
3	MA1101	Functions of several variables	3	1	0	0	6	10	S
4	CS1100	Introduction to programming	3	0	3	0	6	12	E
5	PH1030	Physics Lab I	0	0	3	0	1	4	S
6	GN1100	Life Skills	0	0	0	0	3	0	
		NCC (NC1010)/NSO (NS1020)/NSO (NS1030)	0	0	0	0	2	0	
		Credits for semester 1						**46**	

Winter

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	WS1010	Workshop I	0	0	0	3	0	3	E

Semester 2

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	PH1020	Physics II	3	1	0	0	6	10	S
2	MA1102	Series and Matrices	3	1	0	0	6	10	S
3	CY1001	Chemistry I	3	1	0	0	6	10	S
4	AM1100	Engineering Mechanics	3	1	0	0	6	10	E
5	MM1001	Introduction to Metallurgical and Materials	1	0	2	0	2	5	P
6	ME1120	Engineering Drawing	0	1	3	0	3	7	E
7	ID1200	Ecology and Environment	2	0	0	0	0	0	
8		NCC (NC1010)/NSO (NS1020)/NSO (NS1030)	0	0	0	0	3	0	
		Credits for semester 2						**52**	

Summer

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	WS1020	Workshop II	0	0	0	3	0	3	E

Semester 3

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1		Elective under S category	3	0	0	0	6	9	S
2	HS****	Humanities Elective I	3	0	0	0	6	9	H
3	MM2013	Structure of Materials	3	0	0	0	6	9	P
4	MM2010	Principles of Physical Metallurgy	3	0	0	1	8	12	P
5	MM2015	Thermodynamics of Materials	3	1	0	0	6	10	P
6	CY1002	Chemistry Lab	0	0	3	0	0	3	S
		Credits for semester 2						**52**	

Semester 4

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	-	Elective under 'S' category	3	0	0	0	6	9	S
2	HS****	Humanities Elective II	3	0	0	0	6	9	H
3	MM2060	Phase Transformations	3	0	0	0	6	9	P
4	MM2041	Transport Phenomena in Materials	3	1	0	0	8	12	P
5	MM2020	Deformation and failure of Materials	3	0	1	0	8	12	P
		Credits for semester 4						**51**	

Semester 5

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	MM3030	Materials Characterization	3	0	0	0	6	9	P
2	MM3090	Environmental Degradation of Materials	3	0	1	0	8	12	P
3	MM2080	Principles of Extractive Metallurgy	4	0	0	0	8	12	P
4	MM3010	Physics of Materials	3	0	0	0	6	9	P
5	HS****	Humanities Elective III	3	0	0	0	6	9	H
6	MM3110	Computational Materials Engg Lab++	0	0	0	3	2	5	P
		Credits for semester 5						**56**	

Semester 6

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	MM3020	Ironmaking and Steelmaking	4	0	0	0	8	12	P
2	MM3070	Solidification Processing and Casting+	3	0	0	0	6	9	P
3	MM3041	Deformation Processing and Forming	3	0	0	0	6	9	P
4	BT1010	Life Sciences	3	0	0	0	6	9	S
5	MM3100	Characterization Lab	1	0	2	0	2	5	P
6	MM3015	Processing Lab	0	0	0	3	2	5	P
		Credits for semester 6						**49**	

\+ Solidification Processing and Casting is a core course for B.Tech (Hons.) and DD students. It is an elective course for B.Tech students.

++ Computational Materials Engg Lab is a core course for B.Tech (Hons.) and DD students. It is an elective course for B.Tech students.

Summer

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	MM4020	Summer Internship	0	0	0	0	20	**0**	

Semester 7

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	MM3330	Nonmetallic Materials	3	0	0	0	6	9	P
2	MM4110	B.Tech Project Phase I#	0	0	3	0	6	9	P
		Total						18	

B.Tech Project Phase I is optional for B.Tech. programme.

Semester 8

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	HS3050	Professional Ethics	2	0	0	0	0	0	-
2	MM4120	B.Tech Project Phase II@	0	0	6	0	12	18	P
3		**Total**						18	

@ B.Tech Project Phase I is pre-requisite for B.Tech Project Phase II which is optional for B.Tech programme

Semester	I	II	III	IV	V	VI	VII	VIII	Total
Credits	46	52+6	52	51*	56	49*	18*	18*	434

* Indicated credits are only for core program. In addition, B.Tech. Students not opting for project are required to take 27 credits of elective courses from "P" category and 86 credits of free elective courses. B.Tech students opting for project need to take 86 credits of free elective courses.

Category	Engineering (E)	Professional (P) Core+ Elective/Project	Humanities (H)	Sciences (S)	Un-allotted credits	Total
Credits	45	165 + 27	27	84	86	434

B.Tech. (Hon) Programme

Semester 7

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	MM3330	Nonmetallic Materials	3	0	0	0	6	9	P
2	MM4110	B.Tech Project Phase I#	0	0	3	0	6	9	P
		Total						18*	

B.Tech Project Phase I is compulsory for B.Tech. (Hon) programme.

Semester 8

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	HS3050	Professional Ethics	2	0	0	0	0	0	-
2	MM4120	B.Tech Project Phase II@	0	0	6	0	12	18	P
3		**Total**						18*	

@ B.Tech Project Phase I is pre-requisite for B.Tech Project Phase II which is compulsory for B.Tech. (Hon) programme.

1. Students can enroll elective credits subject to a maximum of 60 hours of work load per semester.
2. B. Tech (Hons) students need to take both the phase of B.Tech Project, 27 credits of elective courses from "P" category and 86 credits of free elective courses.
3. 27 elective credits over and above regular program. These credits ***have*** to be completed in VI, VII and VIII semesters.

Partial List of elective courses under category "P"

1. B.Tech students need to take 27 credits from this list.
2. B.Tech (hons.) students need to take 27 credits from this list apart from the two phases of B.Tech project.
3. All MM5XXX and higher series of courses are deemed as part of this list. Any other course approved by the Department can be added to this list.

S.No	Course No	Course Name	L	T	E	P	O	C
1	MM4110	B.Tech Project – Phase I	0	0	0	3	6	9
2	MM4120	B.Tech Project – Phase II $$	0	0	0	6	12	18
3	MM3050	Creep, Fatigue and Fracture Mechanics	3	0	0	0	6	9
4	MM3160	Electronic Materials	3	0	0	0	6	9
5	MMXXXX	Introduction to undergraduate research	0	0	0	3	6	9
6	MM3060	Joining of Materials	3	0	0	0	6	9
7	MM4070	Modern Materials	3	0	0	0	6	9
8	MM3200	Surface Modifications	3	0	0	0	6	9
9	MMXXXX	Particulate processing	3	0	0	0	6	9
10	MT4110	Computational Techniques in Materials Engg	3	0	0	0	6	9
11	MM4150	Defects and Failures in Manufacturing and Service	3	0	0	0	6	9
12	MM4050	Materials Selection and Design	3	0	0	0	6	9
13	MM3***	Metallurgical Plant Design	0	0	0	0	9	9
14	MM4010	Powder Metallurgy, Refractories and Ceramics	3	0	0	0	6	9
15	MM4130	Sintering Technology	3	0	0	0	6	9
16	MM4170	Magnetic Materials	3	0	0	0	6	9
17	MM3180	Advanced Materials & Processes	3	0	0	0	6	9

$$ For B.Tech Project – Phase II, B.Tech Project- Phase I is pre-requisite.

The core curriculum specified is identical for the first 6 semesters for all the above programmes. The credits for the S, H and E categories are also identical for all these programmes as given below.

Category	Credits	Remarks
S	84	18 credits are elective
H	27	All courses are elective
E	45	All courses are core
TOTAL (S+H+E)	156	

The remaining credit distribution is as follows:

Programme	Overall Credit Requirement (S+H+E+P+Free electives)	Credits under P category			**Elective credits under free electives**	Remarks
		Core	Elective	Total		
B.Tech	434	151	41	192	**86**	Project for 27 credits is under elective courses
B.Tech (Hons)	461	192	27	219	**86**	Project for 27 credits is included in core courses

Summary of specification of credits and hours for all the B.Tech programmes:

Semester	Theory courses specified in core curriculum	Practical (lab) courses specified in core curriculum	Hours specified in core curriculum	Credits specified in core curriculum	Programme
	5	1	60	**46**	B.Tech& B. Tech (Hons)
Winter-1	-	1	3	3	
2	5	2	55	52	
Summer-1	-	1	3	3	
3	5	1	52	52	
4	5	0	51	51	
5	4	1	47	**56**	
6	4	2	49	49	
7	2	0	11	9	B.Tech without project
	2	1	20	18	B.Tech with project & B.Tech (Hons)
8	1	0	2	0	B.Tech without project
	1	1	20	18	B.Tech with project & B.Tech (Hons)

NA - B.Tech. in Naval Architecture & Ocean Engineering
2015 Batch

Semester 1

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	MA1101	Functions of Several Variables	3	1	0	0	6	10	S
2	PH1010	Physics I	3	1	0	0	6	10	S
3	AM1100	Engineering Mechanics	3	1	0	0	6	10	E
4	CS1100	Introduction to Programming	3	0	0	3	6	12	E
5	ME1100	Thermodynamics	3	1	0	0	6	10	E
6	OE1101	Introduction to Ocean Engineering	2	0	0	0	4	6	P
7	GN1100	Life Skills	0	0	0	0	3	0	
8		NCC (NC1010)/NSO (NS1020)/NSO (NS1030)	0	0	0	0	2	0	
		Credits for semester 1	**17**	**4**	**0**	**3**	**39**	**58**	

Winter

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	WS1010	Workshop I	0	0	0	3	0	3	E

Semester 2

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	MA1102	Series and Matrices	3	1	0	0	6	10	S
2	PH1020	Physics II	3	1	0	0	6	10	S
3	PH1030	Physics Lab	0	0	0	3	1	4	S
4	CY1001	Chemistry I	3	1	0	0	6	10	S
5	CY1002	Chemistry Lab	0	0	0	3	0	3	S
6	HSxxxx	Humanities Elective - I	3	0	0	0	6	9	H
7	OE2010	Ship Theory	3	1	0	0	6	10	P
8	ID1200	Ecology and Environment	2	0	0	0	0	0	
9		NCC (NC1010)/NSO (NS1020)/NSO (NS1030)	0	0	0	0	3	0	
		Credits for semester 2	**17**	**4**	**0**	**6**	**33**	**56**	

Summer

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	WS1020	Workshop II	0	0	0	3	0	3	E

Semester 3

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	MA	Mathematics Elective-I	3	0	0	0	6	9	S
2	EE1100	Basic Electrical Engg.	3	1	0	0	6	10	E
3	HSxxxx	Humanities Elective - II	3	0	0	0	6	9	H
4	AM2530	Foundation of Fluid Mechanics	3	1	0	0	6	10	P
5	AM2200	Strength of Materials	3	1	0	0	6	10	P
6	OE2011	Ship Drawing and Calculations	1	3	0	3	3	10	P
7	OE2012	Marine Instrumentation Lab	0	0	0	2	0	2	P
		Credits for semester 3	**16**	**6**	**0**	**5**	**33**	**60**	

Semester 4

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	MA	Mathematics Elective - II	3	0	0	0	6	9	S
2	BT1010	Life Sciences	3	0	0	0	6	9	S
3	OE2014	Marine Engineering	3	1	0	0	6	10	P
4	OE2024	Analysis of Structures	3	1	0	0	6	10	P
5	OE2034	Ship Resistance and Propulsion	3	1	0	1	6	11	P
6	OE2044	Ship Hydrodynamics	3	1	0	0	6	10	P
		Credits for semester 4	**18**	**4**	**0**	**1**	**36**	**59**	

Semester 5

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	OE3015	Ship Structures	3	1	0	0	6	10	P
2	OE3025	Ocean Wave Hydrodynamics	3	0	0	1	6	10	P
3	OE3035	Ship Motion and Control	3	1	0	1	6	11	P
4	OE3045	Vibration of Marine Structures & Acoustics	3	1	0	0	6	10	P
5		Free Elective - I	3	0	0	0	6	9	F
6		Free Elective - II	3	0	0	0	6	9	F
		Credits for semester 5	**18**	**3**	**0**	**2**	**36**	**59**	

Semester 6

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	OExxxx	Professional Elective - I	3	1	0	0	6	10	P
2	OE3020	Ship Design	3	1	0	0	6	10	P
3		Free Elective - III	3	0	0	0	6	9	F
4		Free Elective - IV	3	0	0	0	6	9	F
5		Free Elective - V	3	0	0	0	6	9	F
		Credits for semester 6	**15**	**2**	**0**	**0**	**30**	**47**	
		Honours Elective 1	3	0	0	0	6	9	
		Totral credits for (Hons.) students	**18**	**2**	**0**	**0**	**36**	**56**	

Summer

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	OE3160	Shipyard Training (Summer)	0	0	0	0	6	6	P
		Total						6	

Semester 7

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	OExxxx	Professional Elective - II	3	0	0	0	6	9	P
2	OExxxx	Professional Elective - III	3	1	0	0	6	10	P
3		*Project or Professional Elective - IV	3	0	0	0	6	9	P
4		Free Elective - VI	3	0	0	0	6	9	F
5		Free Elective - VII	3	0	0	0	6	9	F
6	HS3050	Professional Ethics	2	0	0	0	0	0	
		Credits for semester 7	**17**	**1**	**0**	**0**	**30**	**46**	
		Honours Elective 2	3	0	0	0	6	9	
		Totral credits for (Hons.) students	**20**	**1**	**0**	**0**	**36**	**55**	

Semester 8

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	HSxxxx	Humanities Elective - III	3	0	0	0	6	9	H
2		*Project or Professional Elective - V	3	0	0	0	6	9	P
3		*Project or Professional Elective - VI	3	0	0	0	6	9	P
5		Free Elective - VIII	3	0	0	0	6	9	F
		Credits for semester 8	**12**	**0**	**0**	**0**	**24**	**36**	
		Honours Elective 3	3	0	0	0	6	9	
		Totral credits for (Hons.) students	**15**	**0**	**0**	**0**	**36**	**45**	

Semester	I	II	III	IV	V	VI	Summer	VII	VIII	Total
Credits	58	56+6	60	59	59	47	6	46	36	433

Students 72 FREE elective credits during semesters V-VIII from any department including ocean engineering. Electives can be taken in semesters V-VIII, subject to maximum of 60 credits per sem. Or as suggested

Project: An optional B.Tech project can be taken in lieu of 27 elective credits as mentioned in Sem VII and Sem VIII. These 27 elective credits have to be against ocean engineering elective courses. If the student starts a project in VII Sem and cannot successfully continue then he has to substitute the same with departmental elective credits of 9 credits in the semester VIII.

Category	Engineering (E)	Professional (P) Core+Elective+ Elective/Project	Humanities (H)	Sciences (S)	Un-allotted credits	Total
Credits	48	146+29+27	27	84	72	433

BTech (Honours): (Total credit requirement: 433 + 27 = **460)**

- **Eligibility**: minimum CGPA of 8.5 at the end of 5th sem without U or W grade in any course. They need to maintain these conditions until graduation.
- **BTech Project is mandatory**.
- **Extra credit requirement**: BTech extra up to 9 credits in VII semester + 18 credits in VIII sem over and above the regular BTech requirement. These 27 elective credits are to be taken in Ocean. Dept. at 5000 level or higher.

Semester and Category-wise Credit Distribution – B.Tech (NA&OE)

category	S1	Win	S2	Sum	S3	S4	S5	S6	Sum	S7	S8	Total	CTF
S	20		37		9	18						84	84
E	32	3		3	10							48	45
H			9		9						9	27	27
P	6		10		32	41	41	20	6	28	18	202	
Total	**58**	**3**	**56**	**3**	**60**	**59**	**41**	**20**	**6**	**28**	**27**	**361**	
Free Electives (**F) (suggested)**							18	27		18	9	72	72-96
Overall	**58**	**3**	**56**	**3**	**60**	**59**	**59**	**47**	**6**	**46**	**54**	**433**	**432**
EL & HS			9		18	9	18	37		46	36	173	172
Honors*								9		9	9	27	27

*** OE courses of 5000 & above**

LIST OF ELECTIVES

NOTE: More electives can be included from the list of courses offered by other departments

S.No	Course No	Course Name	L	T	E	P	O	C
	ELECTIVE (A) - Mathematics							
1	MA2010	Complex Variables	3	0	0	0	6	9
2	MA2030	Differential Equations	3	0	0	0	6	9
3	MA2040	Probability, Stochastic Process & Statisics	3	0	0	0	6	9
4	MA2060	Discrete Mathematics	3	0	0	0	6	9
5	MA2130	Basic Graph Theory	3	0	0	0	6	9
	ELECTIVE (E) – Professional / Free for NA&OE (BTech&DD)							
6	OE3130	Physical Modeling and Instrumentation	3	0	0	0	6	9
7	OE3190	Design of Ocean Structures	3	0	0	0	6	9
8	OE4300	Ocean Energy	3	0	0	0	6	9
9	OE4400	Drilling vessels and Support Crafts	3	0	0	0	6	9
10	OE4600	Advance ship Hydrodynamics	3	0	0	0	6	9
11	OE4xxx	Shipbuilding Material & Production Processes	3	0	0	0	6	9
12	OE5011	Marine Robotics	3	0	0	0	6	9
13	OE5080	Marine Instrumentation	3	0	0	0	6	9
14	OE5170	Ocean Acoustics	3	0	0	0	6	9
15	OE5230	Foundation of Offshore Structures	3	0	0	0	6	9
16	OE5310	Guidance and control of Marine Vehicles	3	0	0	0	6	9
17	OE5320	Nonlinear Problems in Ocean Engineering	3	0	0	0	6	9
18	OE5330	Advanced Marine Structures	3	0	0	0	6	9
19	OE5450	Numerical Techniques in Ocean Hydrodynamics	3	0	0	0	6	9
20	OE5500	FEM Applied to Ocean Engineering	3	0	0	0	6	9
21	OE5600	Advanced Wave Dynamics	3	0	0	0	6	9
22	OE5800	Coastal Engineering	3	0	0	0	6	9
23	OE6005	Reliability of Offshore Structures	3	0	0	0	6	9
24	OE6020	Mesh-free Methods Applied to Hydrodynamics	3	0	0	0	6	9
25	OE6200	Design of Offshore Structures	3	0	0	0	6	9
26	OE6300	Plated Structures and Shells	3	0	0	0	6	9
27	OE6500	Marine Corrosion & Control	3	0	0	0	6	9
28	OE6930	Modeling of Offshore and Coastal Processes	3	0	0	0	6	9
29	OE6960	Wave Simulation Measurement & Analysis	3	0	0	0	6	9
30	OE6980	Computer Aided Surface Development of Marine	3	0	0	0	6	9
31	OE6990	Advanced Marine Vehicles	3	0	0	0	6	9
32	PE6060	HSE Management in Petroleum and Offshore Engg	3	0	0	0	6	9

EP - B.Tech. in Engineering Physics
2015 Batch

Semester 1

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	MA1101	Functions of Several Variables	3	1	0	0	6	10	S
2	PH1010	Physics I	3	1	0	0	6	10	S
3	CY1001	Chemistry I	3	1	0	0	6	10	S
4	CS1100	Introduction to Programming	3	0	0	3	6	12	E
5	PH1080	Thermodynamics & Kinetic Theory	3	1	0	0	6	10	E
6	PH1030	Physics Lab	0	0	0	3	1	4	S
7	GN1100	Life Skills	0	0	0	0	3	0	
8		NCC (NC1010)/NSO (NS1020)/NSO (NS1030)	0	0	0	0	2	0	
		Credits for semester 1	**15**	**4**	**0**	**6**	**36**	**56**	

Winter

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	WS1010	Workshop I	0	0	0	3	0	3	E

Semester 2

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	MA1102	Series and Matrices	3	1	0	0	6	10	S
2	PH1020	Physics II	3	1	0	0	6	10	S
3	CY1051	Chemistry II	3	0	0	0	6	9	S
4	CY1002	Chemistry Lab	0	0	0	3	0	3	S
5	EE2001	Digital Systems & Lab	3	1	1	3	8	16	P
6	EE1101	Signals & Systems	3	1	0	0	6	10	E
7	ID1200	Ecology and Environment	2	0	0	0	0	0	
8		NCC (NC1010)/NSO (NS1020)/NSO (NS1030)	0	0	0	0	3	0	
		Credits for semester 2	**17**	**4**	**0**	**6**	**33**	**58**	

Summer

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	WS1020	Workshop II	0	0	0	3	0	3	E

Semester 3

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	MA	Math. 3-Elective	3	0	0	0	6	9	S
2	EE2015	Electric Circuits & Networks	3	1	1	0	6	11	P
3	EP2110	Intro Math Phys.	3	1	0	0	6	10	P
4	EP3110	Electromagnetics and Applications	3	0	0	0	6	9	P
5	EP2090	EP Lab 1	0	0	0	3	1	4	P
6	HS	H Elec. 1	3	0	0	0	6	9	H
		Total	**15**	**2**	**1**	**3**	**31**	**52**	

Semester 4

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	EE3001	Solid State Devices	3	1	1	0	6	11	P
2	EE2004	Digital Signal Processing	3	1	1	0	6	11	P
3	EE2019	Analog Systems & Lab	3	1	1	3	6+3	17	P
4	EP3190	EP Lab 2	0	0	0	6	2	8	P
5	ME1120	Engg. Drawing	0	1	0	3	3	7	E
6		**Total**	**11**	**4**	**3**	**12**	**25**	**54**	

Semester 5

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	EP2102	Classical Dynamics	3	0	0	0	6	9	P
2	EP2210	Quantum Mechanics	3	0	0	0	6	9	P
3	EP3290	EP Lab 3	0	0	0	3	1	4	P
4	HS	H. Elec. 2	3	0	0	0	6	9	H
5	EP/EE	P. Elec. 1	3	0	0	0	6	9	P
6		F. Elec 1	3	0	0	0	6	9	F
7		F Elec. 2	3	0	0	0	6	9	F
		Total	**18**	**0**	**0**	**3**	**37**	**58**	

Semester 6

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	BT1010	Life Sciences	3	0	0	0	6	9	S
2	EP3120	Statistical Physics	3	0	0	0	6	9	P
3	EP3220	Solid State Physics	3	0	0	0	6	9	P
4	EP3291	EP Lab 4	0	0	0	3	1	4	P
5	EP/EE	P Elec. 2	3	0	0	0	6	9	P
6		F. Elec 3	3	0	0	0	6	9	F
7		F Elec. 4	3	0	0	0	6	9	F
8	HS3050	Professional Ethics	2	0	0	0	0	0	
		Total	**18**	**0**	**0**	**3**	**37**	**58**	

Summer

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	EP3500	**Summer Internship**	0	0	0	0	20	**0**	

Semester 7

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	EP/EE	P. Elec. 3	3	0	0	0	6	9	P
2	EP/EE	P. Elec. 4	3	0	0	0	6	9	P
3	EP4140 or EP/EE	Project * or P. Elec. 5	3 0	0 0	0 0	0 0	6 9	9 9 *	P P
4		F Elec. 5	3	0	0	0	6	9	F
5		F Elec. 6	3	0	0	0	6	9	F
6	EP4040	Seminar	0	0	0	0	1	1	P
7	HS	H Elec. 3	3	0	0	0	6	9	H
		Total	**18**	**0**	**0**	**0**	**37**	**55**	

Semester 8

S.No	Course No	Course Name	L	T	E	P	O	C	Cat
1	EP4150 or EP/EE EP/EE	Project * or P. Elec. 5 P. Elec. 6	3 3 3	0 0 0	0 0 0	0 0 0	18 6 6	18* (or) 9 9	 P
2	EP/EE	P. Elec. 7	3	0	0	0	6	9	P
3	EP/EE	P. Elec. 8	3	0	0	0	6	9	P
3		F Elec. 7	3	0	0	0	6	9	F
4		F Elec. 8	3	0	0	0	6	9	F
		Total	**12**	**0**	**0**	**0**	**24**	**36**	

*** B.Tech. project (EP4140 & EP4150) is optional. In lieu of the project the students may be allowed to opt for three professional electives worth 27 Physics credits.**

Semester	I	II	III	IV	V	VI	VII	VIII	Total
Credits	56	58+6	52	54	58	58	55	36	433

Category	Engineering (E)	Professional (P) Core+Elective+Elective/Project	Humanities (H)	Sciences (S)	Un-allotted credits	Total
Credits	45	142+36+27	27	75+9	72	433

Total no. of S credits	75
Total no. of E credits	45
Total no. of P credits	205 [*142 core + 36 electives + 27 project /electives*]
Total no. of F elective credits	72
Total no. of H elective credits	27
Total no. of S elective credits	9

In the core part of the P category, the number of credits from the Physics department is 74 and that from the Electrical Engineering department is 69.

Students 72 FREE elective credits during semesters VI-VIII from any department including ocean engineering. Electives can be taken in semesters VI-VIII, subject to maximum of 60 credits per sem. Or as suggested

B.Tech. project is optional. In lieu of the project the students may be allowed to opt for 3 dept. electives worth 27 Physics credits.

BTech (Honours): (Total credit requirement: 432 + 27 = **459)**

- **Eligibility**: minimum CGPA of 8.5 at the end of 5th sem without U or W grade in any course. They need to maintain these conditions until graduation.
- **BTech Project is mandatory**.
- **Extra credit requirement**: 27 elective credits are to be taken in VI-VIII semester