1. Curriculum for BTech - 2020 Batch

Course Number	Semester 1	Credits	Course Type
MA 1110	Calculus - I	1	Basic Sciences
MA 1220	Calculus - II	1	Basic Sciences
CY 1018	Environmental Chemistry	2	Basic Sciences
EP1108	Modern Physics	2	Basic Sciences
ID 1063	Intro to Programming	3	Basic Engineering Skills
LA 1760	Communication Skills	2	Soft Skills
EE 1101	Circuits and network analysis	3	Department core
EE 1100	Introduction to EE	1	Department core
	Total	**15**	
	Semester 2		
EE 1200	Electrical Circuits Lab	2	Department core / labs
EE 1201	Digital systems	3	Department core
EE 1203	Vector calculus	1	Basic Sciences
~~EE 1204~~	~~Engineering Electromagnetics~~	~~2~~	~~Department core~~
EE 1205	Signals and systems	3	Department core
ID 1050	Intro to AI&ML	1	Basic Engineering Skills
XX xxxx	Engineering elective	2	Basic Engineering Skills
MA 1150	Differential Equations	1	Basic Sciences
BT 1010	Introduction to Life Sciences	1	Basic Sciences
MA 2130	Complex variables	1	Basic Sciences
	Total	**15**	
	Semester 3		
EE 2100	Matrix Theory	3	Department core
EE 2101	Control Systems	3	Department core
XX xxxx	Engineering Elective	1	Basic Engineering Skills
EE 2102	Probability and Random Processes	3	Department core
EE 2104	Semiconductor Device Fundamentals	3	Department core
EE	Stream core (labs)	2	Stream core (labs)

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SS xxxx	Personality development	1	Soft skills
	Total	**16**	
Course No.	**Semester 4**	**Credits**	**Course Type**
LA xxxx	LA Electives	2	LA/CA
EE 2200	Electrical Machines	3	Department core
EE xxxx	Stream core	9	Stream core
EE xxxx	Stream core lab	2	Stream core (labs)
EE 1204	Engineering Electromagnetics	2	Department core
SS xxxx	Introduction to Entrepreneurship	1	Soft Skills
	Total	**19**	
	Semester 5		
XXxxxx	Free Elective	3	Free Electives
EE xxxx	Stream core	9	Stream core
EE xxxx	Stream core lab	2	Stream core (labs)
ID2230	Data Structures & Applications	3	Basic Engineering Skills
	Total	**17**	
	Semester 6		
EE xxxx	Department electives (Can be converted to Internship)	6	Department electives
FE xxxx	Free Elective	3	Free Electives
EE xxxx	Stream core	6	Stream core
EE xxxx	Stream core (labs)	2	Stream core (labs)
	Total	**17**	
	Semester 7		
EE xxxx	Department electives	6	Department electives
LAxxxx	LA/CA Electives	3	LA/CA
XX xxxx	Engineering Electives	3	Basic Engineering Skills
FE xxxx	Free Electives	2	Free Electives
SE xxxx	Science Electives	1	Basic Sciences
	Total	**15**	
	Semester 8		
EE xxxx	Department electives	3	Department electives

SE xxxx	Science Electives	3	Basic Sciences
XX xxxx	Engineering Electives	1	Basic Engineering Skills
LA/CA xxxx	LA/CA Electives	3	LA/CA
LA xxxx	Ethics and Values	1	LA/CA
FE xxxx	Free Electives	3	Free Electives
	Total	**14**	
	Total Credits	**128**	

Stream Core Baskets:

Student has to finish 24 credits of stream core courses, and 8 credits of stream core labs. Out of this, at least 6 course credits and 2 lab credits must be taken from each stream bucket.

Basket - Microelectronics and VLSI (at least 6 credits theory+ 2 credits lab)					
Course number	**Course name**	**Suggested semester**	**Semester**	**Credits**	**Prerequisites**
EE 2400	Analog Electronics*	Sem 4	even	3	SDF
EE 3400	Microprocessor and Computer Architecture	Sem 6	Even	2	DigSys
EE 3302	Electromagnetic Wave Propagation	Sem5/Sem7	odd	3	EngEM
EE 3301	Intro VLSI Design	Sem 5/Sem7	odd	2	DigSys, SDF, Analog Electronics
EE 3300	Analog Circuits*	Sem 5	odd	3	Analog Electronics
EE 3402	Intro to HDL	Sem 6	even	1	Intro to VLSI
EE 2301	Electronic devices and circuits lab*	Sem 3	odd	2	DigSys, SDF
EE 2401	Analog Lab	Sem 4	even	2	Analog Electronics
EE 3401	Microprocessor Lab	Sem 6	Even	1	Microprocessor
EE 3403	Digital IC Design	Sem4/Sem6		2	DigSys, SDF
	* indicates suggested courses				

Basket - Power Electronics and Power Systems (at least 6 credits theory + 2 credits lab)					
Course number	**Course name**	**Suggested semester**	**Semester**	**Credits**	**Prerequisites**
EE 3501	Power Electronics*	Sem 5	odd	3	Circuits
EE 2600	Power Systems*	Sem 4	even	3	Circuits

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EE 3500	Machines lab*	Sem 5	odd	2	Electrical Machines
EE 4502	Analysis and Design of Power Converters	Sem 7	Odd	3	Power Electronics, Power Systems
EE 3603	Drives for Electric Vehicles	Sem 6	Even	3	Power Systems, Power Electronics
EE 3601	Simulation of power electronic converters (Lab)	Sem 6	Even	1	Power Electronics
	* indicates suggested courses				

Basket - Communications and Signal Processing (at least 6 credits theory + 2 credits lab)					
Course number	**Course name**	**Suggested semester**	**Semester**	**Credits**	**Prerequisites**
EE 3700	Communication Systems*	Sem 5	odd	3	Prob, S&S, Matrix Theory
EE 2800	DSP*	Sem 4	even	3	Prob, S&S, Matrix Theory
EE 2802	Machine learning	Sem 4/Sem 5	both	3	Prob, Matrix Theory
EE 3800	Information theory	Sem 6	even	3	prob, commsys
EE 3701	Comm Lab*	Sem 5	odd	2	Comm systems
EE2801	DSP Lab	Sem 4	even	2	DSP
EE 3802	FPGA Lab	Sem 6	even	2	
EE3801	Wireless communication	Sem 6	even	3	Commsys, prob, sns, Matrix
EE4700	Communication networks	Sem 7	odd	3	Commsys, prob, Matrix
	* indicates suggested courses				

1. Student has to finish 24 credits of stream core courses, and 8 credits of stream core labs. Out of this, at least 2 credits of lab and 6 credits of theory must be taken from each stream bucket.
2. Stream core courses and labs can also be taken as department electives, if they have not been taken towards the 24 credit stream core requirement (or 8 credit lab requirement, respectively)
3. Extra stream core courses done in a semester will be counted towards completion of electives/stream core (resp) in subsequent semesters - **this option helps in semester long internship opportunity in the 6th semester**
4. Backloggers in stream core courses are free to choose some other courses from the respective baskets. They need not wait for the same course to be offered again - **this option enables faster clearance of backloggers in N+4 scenario**

5. Six credits of department core electives in the sixth semester can optionally be converted to a semester long internship in the sixth semester. The onus is on the student to distribute/complete the remaining 11 credits in the sixth semesters in the other semesters.
6. At most six credits of department core electives, from the last two semesters, can optionally be converted to project, i.e, 3 credits each in 7th and 8th semesters.
7. Maximum 4 credit of CA courses, and 6 credits of LA courses can be taken

Curriculum Analysis: Percentage of different categories

Category wise split	Credits	Percentage
Basic Sciences (11-12)	14	11%
Basic Engineering Skills (11-12)	14	11%
Department Core (55-60)	76	59%
Free Electives (9-10)	11	9%
LA/CA (7-8)	9	7%
Soft Skills (3)	4	3%
Total	128	100.00%

Department Core Split

Course Type	Percentage
Department core	27
Department core / labs	2
Stream core	24
Stream core (labs)	8
Department Electives	15
Total	**76**

Semester-Wise Distribution

Semester	Credits	Number of 3 credit core courses	Percentage of 3credit courses	Number of Lab credits
Semester 1	15	1	20%	0
Semester 2	17	2	35%	2
Semester 3	16	4	75%	2
Semester 4	17	4	75%	2
Semester 5	17	3	52%	2
Semester 6	17	2	35%	2
Semester 7	15	-	-	-
Semester 8	14	-	-	-
Total	128			10

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2. Courses to be offered by Dept. of EE to other departments

Other departments can include at most two of the following three courses under "**Basic Engineering Skills**" Category.

Course No.	Course name	Credits	Suggested Semester	Starting Date
EE1102	Basic Electrical Engineering	3	2	Jan. 2021
EE1202	Digital Circuits	3	3	Aug. 2021
EE1206	Linear Systems & Signal Processing	3	5	Aug. 2022
Following Course is offered only for AI department under "Department Core"				
EE2103/AI	Probability and Random Variables	3	2	Jan 2021

These courses have significant overlap (> 60%) with core courses in EE curriculum. Hence **regular EE students should not opt them under any "Elective" type**. However, following replacements are allowed for backloggers of BTech Electrical Engineering and Branch Changers coming into EE. This helps branch-changers in quickly catching up with missed courses in first semester.

1. EE1101-Circuit and Network Analysis can be replaced by EE1102-Basic Electrical Engineering
2. EE1201-Digital Systems can be replaced by EE1202-Digital Circuits
3. EE1205-Signals and Systems can be replaced by EE1206-Linear Systems and Signal Processing.
4. EE2102-Probability and Random Processes can be replaced by EE2103-Probability and Random Variables.

3. A) List of courses NOT allowed as Department Electives for EE BTech students

Course Code	Course Name
EE1102	Basic Electrical Engineering
EE1202	Digital Circuits
EE1206	Linear Systems & Signal Processing
EE2103	Probability and Random Variables
EE5817	Random Variables and Stochastic Processes
EE 5609	Matrix Theory

B) List of Electives conditionally allowed as Department Electives for EE Btech students

Courses	Title/Category	Restrictions
EE5837	Principles of Digital Communication	Only allowed if EE3700 is not taken
EE5807	Advanced Digital Signal Processing	Only allowed if EE2800 is not taken
EE5390, EE5847, EE6317	Information theory, channel coding, source coding	Only allowed if EE3800 is not taken
EE5600, EE5601, EE7390	Machine learning	Only allowed if EE2802 is not taken
EE5370	Wireless communications	Only allowed if EE3801 is not taken

4. Curriculum for Minor in Dept. of EE from Aug. 2020 Batch onwards

A student opting for minors in the Dept. of EE should obtain 12 credits as listed in the following Table. These 12 credits should be over and above any EE credits that he/she has obtained as a part of the parent department curriculum. If the student has already taken any of the compulsory courses as a part of his/her parent department curriculum, he/she can take courses for the equivalent credits from the basket consisting of all departmental core and stream core courses, provided the prerequisite courses are credited already. Minor students **should not take** Circuits and Network Analysis, Digital Systems and Signals and Systems as they overlap with compulsory courses.

Course No.	Course name	Credits
Compulsory Courses (9 Credits)		
EE1102	Basic Electrical Engineering	3
EE1201	Digital Circuits	3
EE1206	Linear Systems & Signal Processing	3
Elective (3 Credits)		
EE	Any course from Dept. Core/Stream Core Baskets	3

5. Curriculum for Double Major in the Dept. of EE from Aug. 2020 Batch onwards

A student opting for a double major in the Dept. of EE should obtain 24 credits as listed in the following Table. These 24 credits should be over and above any EE credits that he/she has obtained as a part of the parent department curriculum. If the student has already taken any of

the compulsory courses as a part of his/her parent department curriculum, he/she can take courses for the equivalent credits from the basket consisting of all departmental core and stream core courses, provided the prerequisite courses are credited already. Double Major students **should not take** Circuits and Network Analysis, Digital Systems and Signals and Systems as they overlap with compulsory courses.

Course No.	**Course name**	**Credits**
Compulsory Courses - 9 Credits		
EE1102	Basic Electrical Engineering	3
EE1201	Digital Circuits	3
EE1206	Linear Systems & Signal Processing	3
Elective - 15 Credits, of which at least 10 credits should be EE3 or above level courses		
EE	Any course from Dept. Core, Stream Core and Dept. Electives Baskets	15