ELECTRICAL AND COMPUTER ENGINEERING

CURRICULUM FROM SEMESTERS I TO VIII

Every course of B. Tech. Programme shall be placed in one of the nine categories as listed in table below.

Sl. No	Category	Code	Credits
1	Humanities and Social Sciences including Management courses	HMC	5
2	Basic Science courses	BSC	26
3	Engineering Science Courses	ESC	22
4	Program Core Courses	PCC	79
5	Program Elective Courses	PEC	15
6	Open Elective Courses	OEC	3
7	Project work and Seminar	PWS	10
8	Mandatory Non-credit Courses (P/F) with grade	MNC	--
9	Mandatory Student Activities (P/F)	MSA	2
	Total Mandatory Credits		**162**
10	Value Added Course (Optional)	VAC	20

No semester shall have more than five lecture-based courses and two laboratory and/or drawing/seminar/project courses in the curriculum. Semester-wise credit distribution shall be as below:

Sem	1	2	3	4	5	6	7	8	Total
Credits	17	21	22	22	23	23	15	17	160
Activity Points	50				50				---
Credits for Activity	2								2
G.Total									162

Basic Science Courses: Maths, Physics, Chemistry, Biology for Engineers, Life Science etc

Engineering Science Courses: Engineering Graphics, Programming in C, Basics of Electrical and Electronics Engineering, Basics of Civil and Mechanical Engineering,

Engineering Mechanics, Thermodynamics, Design Engineering, Materials Engineering, Workshops etc.

Humanities and Social Sciences including Management courses: English, Humanities, Professional Ethics, Management, Finance & Accounting, Life Skills, Professional Communication, Economics etc

Mandatory Non-credit Courses: Environmental Science, Constitution of India/Essence of Indian Knowledge Tradition, Industrial Safety Engineering, Disaster Management etc.

Course Code and Course Number

Each course is denoted by a unique code consisting of three alphabets followed by three numerals like **CSL 201.** The first two letter code refers to the department offering the course. CS stands for course in Computer Science & Engineering, course code MA refers to a course in Mathematics, course code ES refers to a course in Engineering Science etc. Third letter stands for the nature of the course as indicated in the following table.

Code	Description
T	Theory based courses (other than lecture hours, these courses can have tutorial and practical hours, e.g., L-T-P structures 3-0-0, 3-1-2, 3-0-2 etc.)
L	Laboratory based courses (where performance is evaluated primarily on the basis of practical or laboratory work with LTP structures like 0-0-3, 1-0-3, 0-1-3 etc.)
N	Non-credit courses
D	Project based courses (Major-, Mini- Projects)
Q	Seminar courses

Course Number is a three digit number and the first digit refers to the Academic year in which the course is normally offered, i.e. 1, 2, 3, or 4 for the B. Tech. Programme of four year duration. Of the other two digits, the last digit identifies whether the course is offered normally in the odd (odd number), even (non-zero even number) or in both the semesters (zero). The middle number could be any digit. CSL 201 is a laboratory course offered in Computer Science and Engineering department for third semester, MAT 101 is a course in Mathematics offered in the first semester, EET 344 is a theory course in Electrical Engineering offered in the sixth semester, PHT 110 is a course in Physics offered both the first and second semesters, EST 102 is a course in Basic Engineering offered by one or many departments in the second semester. These course numbers are to be given in the curriculum and syllabi.

Departments

Each course is offered by a Department and their two-letter course prefix is given in Table 2

Table 2: Departments and their codes

SL NO	Department	Course Prefix	SL NO	Department	Course Prefix
1	Aeronautical Engg	AO	20	Food Technology	FT
2	Applied Electronics & Instrumentation	AE	21	Humanities	HU
3	Artificial Intelligence	AI	22	Industrial Engg	IE
4	Artificial Intelligence & Data Science	AD	23	Information Technology	IT
5	Automobile	AU	24	Instrumentation & Control	IC
6	Biomedical Engg	BM	25	Mandatory Courses	MC
7	Biotechnology	BT	26	Mathematics	MA
8	Chemical Engg	CH	27	Mechanical Engg	ME
9	Chemistry	CY	28	Mechatronics	MR
10	Civil Engg	CE	29	Metallurgy	MT
11	Computer Science	CS	30	Mechanical (Auto)	MU
12	Computer Science (Artificial Intelligence)	CA	31	Mechanical (Prod)	MP
13	Computer Science (Artificial Intelligence & Machine Learning)	CM	32	Naval & Ship Building	SB
14	Computer Science (Data Science)	CD	33	Physics	PH
15	Computer Science Cyber Security	CC	34	Polymer Engg	PO
16	Electronics & Biomedical	EB	35	Production Engg	PE
17	Electronics & Communication	EC	36	Robotics and Automation	RA
18	Electrical and Computer Engineering	EO	37	Safety & Fire Engg	FS
19	Electrical & Electronics	EE			

SEMESTER I

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MAT 101	LINEAR ALGEBRA AND CALCULUS	3-1-0	4	4
B 1/2	PHT 100	ENGINEERING PHYSICS A	3-1-0	4	4
	CYT 100	ENGINEERING CHEMISTRY	3-1-0	4	4
C 1/2	EST 100	ENGINEERING MECHANICS	2-1-0	3	3
	EST 110	ENGINEERING GRAPHICS	2-0-2	4	3
D 1/2	EST 120	BASICS OF CIVIL & MECHANICAL ENGINEERING	4-0-0	4	4
	EST 130	BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING	4-0-0	4	4
E	HUN 101	LIFE SKILLS	2-0-2	4	--
S 1/2	PHL 120	ENGINEERING PHYSICS LAB	0-0-2	2	1
	CYL 120	ENGINEERING CHEMISTRY LAB	0-0-2	2	1
T 1/2	ESL 120	CIVIL & MECHANICAL WORKSHOP	0-0-2	2	1
	ESL 130	ELECTRICAL & ELECTRONICS WORKSHOP	0-0-2	2	1
TOTAL				23/24	17

SEMESTER II

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MAT 102	VECTOR CALCULUS DIFFERENTIAL EQUATIONS AND TRANSFORMS	3-1-0	4	4
B 1/2	PHT 100	ENGINEERING PHYSICS A	3-1-0	4	4
	CYT 100	ENGINEERING CHEMISTRY	3-1-0	4	4
C 1/2	EST 100	ENGINEERING MECHANICS	2-1-0	3	3
	EST 110	ENGINEERING GRAPHICS	2-0-2	4	3
D 1/2	EST 120	BASICS OF CIVIL & MECHANICAL ENGINEERING	4-0-0	4	4
	EST 130	BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING	4-0-0	4	4
E	HUN 102	PROFESSIONAL COMMUNICATION	2-0-2	4	--
F	EST 102	PROGRAMMING IN C	2-1-2	5	4
S 1/2	PHL 120	ENGINEERING PHYSICS LAB	0-0-2	2	1
	CYL 120	ENGINEERING CHEMISTRY LAB	0-0-2	2	1
T 1/2	ESL 120	CIVIL & MECHANICAL WORKSHOP	0-0-2	2	1
	ESL 130	ELECTRICAL & ELECTRONICS WORKSHOP	0-0-2	2	1
TOTAL				28/29	21

NOTE:

1. Engineering Physics A and Engineering Chemistry shall be offered in both semesters. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Engineering Physics A in S1 and Engineering Chemistry in S2 & vice versa. Students opting for Engineering Physics A in a semester should attend Physics Lab in the same semester and students opting for Engineering Chemistry in one semester should attend Engineering Chemistry Lab in the same semester

2. Engineering Mechanics and Engineering Graphics shall be offered in both semesters. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Engineering Mechanics in S1 and Engineering Graphics in S2 & vice versa.

3. Basics of Civil & Mechanical Engineering and Basics of Electrical & Electronics Engineering shall be offered in both semesters. Basics of Civil & Mechanical Engineering contain equal weightage for Civil Engineering and Mechanical Engineering. Slot for the course is D with CIE marks of 25 each and ESE marks of 50 each. Students belonging to branches of AEI, EI, BME, ECE, EEE, ICE, CSE, IT, RA can choose this course in S1.

   Basics of Electrical & Electronics Engineering contain equal weightage for Electrical Engineering and Electronics Engineering. Slot for the course is D with CIE marks of 25 each and ESE marks of 50 each. Students belonging to AERO, AUTO, CE, FSE, IE, ME, MECHATRONICS, PE, METALLURGY, BT, BCE, CHEM, FT, POLY can choose this course in S1. Students having Basics of Civil & Mechanical Engineering in one semester should attend Civil & Mechanical Workshop in the same semester and students having Basics of Electrical & Electronics Engineering in a semester should attend Electrical & Electronics Workshop in the same semester.

4. LIFE SKILLS

   Life skills are those competencies that provide the means for an individual to be resourceful and positive while taking on life's vicissitudes. Development of one's personality by being aware of the self, connecting with others, reflecting on the abstract and the concrete, leading and generating change, and staying rooted in time-tested values and principles is being aimedat. This course is designed to enhance the employability and maximize the potential of the students by introducing them to the principles that underlie personal and professional success,and help them acquire the skills needed to apply these principles in their lives and careers.

5. PROFESSIONAL COMMUNICATION

   Objective is to develop in the under-graduate students of engineering a level of competence in English required for independent and effective communication for their professional needs. Coverage: Listening, Barriers to listening, Steps to overcome them, Purposive listening

practice, Use of technology in the professional world. Speaking, Fluency & accuracy in speech, Positive thinking, Improving self-expression, Tonal variations, Group discussion practice, Reading, Speed reading practice, Use of extensive readers, Analytical and critical reading practice, Writing Professional Correspondence, Formal and informal letters, Tone in formal writing, Introduction to reports. Study Skills, Use of dictionary, thesaurus etc., Importance of contents page, cover & back pages, Bibliography, Language Lab.

SEMESTER III

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MAT203	DISCRETE MATHEMATICAL STRUCTURES	3-1-0	4	4
B	EET201	CIRCUITS AND NETWORKS	2-2-0	4	4
C	CST201	DATA STRUCTURES	3-1-0	4	4
D	CST205	OBJECT ORIENTED PROGRAMMING USING JAVA	3-1-0	3	2
E	EST 200	DESIGN & ENGINEERING	2-0-0	2	2
1/2	HUT 200	PROFESSIONAL ETHICS	2-0-0	2	2
F	MCN 201	SUSTAINABLE ENGINEERING	2-0-0	2	--
S	CSL 201	DATA STRUCTURES LAB	0-0-3	3	2
T	CSL203	OBJECT ORIENTED PROGRAMMING LAB (IN JAVA)	0-0-3	3	2
R/M	VAC	REMEDIAL/MINOR COURSE	3-1-0	4	4
		TOTAL		26*	22/26
* Excluding Hours to be engaged for Remedial/Minor course.					

SEMESTER IV

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MAT 204	PROBABILITY, RANDOM PROCESSES AND NUMERICAL METHODS	3-1-0	4	4
B	CST 202	COMPUTER ORGANISATION AND ARCHITECTURE	3-1-0	4	4
C	CST 206	OPERATING SYSTEMS	3-1-0	4	4
D	EET 206	DIGITAL ELECTRONICS	3-1-0	4	4
E (1/2)	EST 200	DESIGN & ENGINEERING	2-0-0	2	2
	HUT 200	PROFESSIONAL ETHICS	2-0-0	2	2
F	MCN 202	CONSTITUTION OF INDIA	2-0-0	2	--
S	CSL 204	OPERATING SYSTEMS LAB	0-0-3	3	2
T	EEL204	DIGITAL ELECTRONICS LAB	0-0-3	3	2
R/M/H	VAC	Remedial/Minor/Honours course	3-1-0	4	4
		TOTAL		**26***	**22/26**
* Excluding Hours to be engaged for Remedial/Minor/Honours course.					

NOTE:

1. Design & Engineering and Professional Ethics shall be offered in both S3 and S4. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Design & Engineering in S3 and Professional Ethics in S4 & vice versa.

2. *All Institutions should keep 4 hours exclusively for Remedial class/Minor course (Thursdays from 3 to 5 PM and Fridays from 2 to 4 PM). If a student does not opt for minor programme, he/she can be given remedial class.

SEMESTER V

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	EOT 301	INSTRUMENTATION SYSTEMS	3-1-0	4	4
B	EET 303	MICROPROCESSORS AND EMBEDDED SYSTEMS	3-1-0	4	4
C	CST 204	DATABASE MANAGEMENT SYSTEMS	3-1-0	4	4
D	EOT 307	COMPUTER COMMUNICATION & NETWORK SECURITY	3-1-0	4	4
E	CST 309	MANAGEMENT OF SOFTWARE SYSTEMS	3-0-0	3	3
F	MCN 301	DISASTER MANAGEMENT	2-0-0	2	--
S	EOL301	NETWORKING LAB	0-0-4	4	2
T	EOL303	MEASUREMENTS AND INSTRUMENTATION LAB	0-0-4	4	2
R/M/H	VAC	Remedial/Minor/Honours course*	2-0-0	4	4
TOTAL				29*	23/27
* Excluding Hours to be engaged for Remedial/Minor/Honours course.					

NOTE:

1. *All Institutions should keep 4 hours exclusively for Remedial class/Minor/ Honours course (Tuesdays from 3 to 5 PM and Wednesdays from 3 to 5 PM). If a student does not opt for minor/Honours programme, he/she can be given remedial class.

SEMESTER VI

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	EOT302	POWER ELECTRONICS AND DRIVES	3-1-0	4	4
B	EOT304	INTERNET OF THINGS	3-1-0	4	4
C	EOT306	ELECTRICAL MACHINES	3-1-0	4	4
D	EOT--	PROGRAM ELECTIVE I	2-1-0	3	3
E	HUT 300	INDUSTRIAL ECONOMICS & FOREIGN TRADE	3-0-0	3	3
F	EOT 308	COMPREHENSIVE COURSE WORK	1-0-0	1	1
S	EOL302	EMBEDDED SYSTEMS AND IOT LAB	0-0-3	3	2
T	EOL304	ELECTRICAL MACHINES LAB	0-0-3	3	2
R/M/H	VAC	Remedial/Minor/Honours course*	3-1-0	4	4
TOTAL				25*	**23/27**
* Excluding Hours to be engaged for Remedial/Minor/Honours course.					

PROGRAM ELECTIVE I

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
D	CST 312	FOUNDATIONS OFMACHINE LEARNING	2-1-0		
	EOT 312	INTRODUCTION TO SIGNAL PROCESSING	2-1-0		
	CST 332	FOUNDATIONS OF SECURITY IN COMPUTING	2-1-0		
	EET312	BIOMEDICAL INSTRUMENTATION	2-1-0	3	3
	EET322	RENEWABLE ENERGY SYSTEMS	2-1-0		
	CST 362	PROGRAMMING INPYTHON	2-1-0		
	EET 372	SOFT COMPUTING	2-1-0		

COURSES TO BE CONSIDERED FOR COMPREHENSIVE COURSE WORK

I DISCRETE MATHEMATICAL STRUCTURES
ii DATA STRUCTURES
iii OPERATING SYSTEMS
iv COMPUTER ORGANIZATION AND ARCHITECTURE
v CIRCUIT THEORY
vi DIGITAL ELECTRONICS

NOTE:

1. *All Institutions should keep 4 hours exclusively for Remedial class/Minor/ Honours course (Tuesdays from 3 to 5 PM and Wednesdays from 2 to 4 PM). If a student does not opt for minor/Honours programme, he/she can be given remedial class.

2. Comprehensive Course Work: The comprehensive course work in the sixth semester of study shall have a written test of 50 marks. The written examination will be of objective type similar to the GATE examination and will be conducted by the University. Syllabus for comprehensive examination shall be prepared by the respective BoS choosing the above listed 6 core courses studied from semesters 3 to 5. The pass minimum for this course is 25. The course should be mapped with a faculty and classes shall be arranged for practicing questions based on the core courses listed in the curriculum.

3. The pass minimum for this course is 25. The course should be mapped with a faculty and classes shall be arranged for practicing questions based on the core courses listed in the curriculum.

SEMESTER VII

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	EOT 401	CONTROL SYSTEMS	2-1-0	3	3
B	EOT ---	PROGRAM ELECTIVE II	2-1-0	3	3
C	EOT ---	OPEN ELECTIVE	2-1-0	3	3
D	MCN 401	INDUSTRIAL SAFETY ENGINEERING	2-1-0	3	---
S	EOL401	ELECTRICAL CAD	0-0-3	3	2
T	EOQ 413	SEMINAR	0-0-3	3	2
U	EOD 415	PROJECT PHASE I	0-0-6	6	2
R/M/H	VAC	Remedial/Minor/ Honours course*	3-1-0	4	4
		TOTAL		**24***	**15/19**
* Excluding Hours to be engaged for Remedial/Minor/Honours course.					

PROGRAM ELECTIVE II

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
B	CST 413	MACHINE LEARNING	2-1-0	3	3
	EET 423	DIGITAL CONTROL SYSTEMS	2-1-0		
	EET 424	ENERGY MANAGEMENT	2-1-0		
	EOT 413	REAL TIME OPERATING SYSTEMS	2-1-0		
	EET 453	DIGITAL SIGNAL PROCESSING	2-1-0		
	CST 463	WEB PROGRAMMING	2-1-0		
	EET 413	ELECTRIC DRIVES	2-1-0		

OPEN ELECTIVE

The open elective is offered in semester 7. Each program should specify the courses (maximum 5) they would like to offer as electives for other programs. The courses listed below are offered by the Department of **ELECTRICAL & ELECTRONICS ENGINEERING** for students of other undergraduate branches except Computer Science & Engineering and Information Technology, offered in the colleges under KTU.

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
C	EET415	CONTROL SYSTEMS ENGINEERING	2-1-0	3	3
	EET425	INTRODUCTION TO POWER PROCESSING	2-1-0		
	EET435	RENEWABLE ENERGY SYSTEMS	2-1-0		
	EET445	ELECTRIC VEHICLES	2-1-0		
	EET455	ENERGY MANAGEMENT	2-1-0		

NOTE:

1. All Institutions should keep 4 hours exclusively for Remedial class/Minor/ Honours course (Mondays from 10 to 12 and Wednesdays from 10 to 12 Noon). If a student does not opt for minor/Honours programme, he/she can be given remedial class.

2. Seminar: To encourage and motivate the students to read and collect recent and reliable information about their area of interest confined to the relevant discipline, from technical publications including peer reviewed journals, conferences, books, project reports etc., prepare a report based on a central theme and present it before a peer audience. Each student shall present the seminar for about 20 minutes duration on the selected topic. The report and the presentation shall be evaluated by a team of faculty members comprising Academic coordinator for that program, seminar coordinator and seminar guide based on style of presentation, technical content, adequacy of references, depth of knowledge and overall quality of the report.
Total marks: 100, only CIE, minimum required to pass 50

Attendance	10
Seminar Guide	20
Technical Content of the Report	30
Presentation	40

3. Project Phase-I: A Project topic must be selected either from research literature or the students themselves may propose suitable topics in consultation with their guides. The objective of Project Work Phase-I is to enable the student to take up investigative study in the broad field of Computer Science and Engineering, either fully theoretical/ practical or involving both theoretical and practical work to be assigned by the Department on a group of three/four students, under the mentoring of a Project Guide(s). This is expected to provide a good initiation for the student(s) in R&D work. The assignment shall normally include:

> Survey and study of published literature on the assigned topic;
> Preparing an Action Plan for conducting the investigation, including team work;
> Working out a preliminary Approach to the Problem relating to the assigned topic;
> Block level design documentation
> Conducting preliminary Analysis/ Modelling/ Simulation/ Experiment/ Design/ Feasibility;

➢ Preparing a Written Report on the Study conducted for presentation to the Department;

➢ Final project presentation before the concerned departmental committee.

Total marks: 100, only CIE, minimum required to pass 50

Project Guide(s)	30
Interim evaluation by the evaluation committee	20
Final project presentation	30
Final evaluation by the evaluation committee	20

The evaluation committee comprises HoD or a senior faculty member, Project coordinator and project guide(s).

SEMESTER VIII

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	EOT402	POWER SYSTEM ENGINEERING	2-1-0	3	3
B	EOT ---	PROGRAM ELECTIVE III	2-1-0	3	3
C	EOT ---	PROGRAM ELECTIVE IV	2-1-0	3	3
D	EOT ---	PROGRAM ELECTIVE V	2-1-0	3	3
T	EOT 404	COMPREHENSIVE COURSE VIVA	1-0-0	1	1
U	EOD 416	PROJECT PHASE II	0-0-12	12	4
R/M/H	VAC	Remedial/Minor/Honours course	3-1-0	4	4
		TOTAL		25*	17/21
		* Excluding Hours to be engaged for Remedial/Minor/Honours course.			

PROGRAM ELECTIVE III

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
B	CST 414	DEEP LEARNING	2-1-0	3	3
	CST 424	PROGRAMMING PARADIGMS	2-1-0		
	CST 434	CRYPTOGRAPHY	2-1-0		
	EOT 414	MECHATRONICS	2-1-0		
	EET 444	ELECTRICAL MACHINE DESIGN	2-1-0		
	EET 434	SMART GRID TECHNOLOGIES	2-1-0		

PROGRAM ELECTIVE IV

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
C	EET 414	ROBOTICS	2-1-0	3	3
	EET 418	ELECTRIC AND HYBRID VEHICLES	2-1-0		
	CST 438	IMAGE PROCESSING TECHNIQUE	2-1-0		
	EET 416	NONLINEAR SYSTEMS	2-1-0		
	EET 426	SPECIAL ELECTRIC MACHINES	2-1-0		
	CST 466	DATA MINING	2-1-0		

PROGRAM ELECTIVE V

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
D	EET 438	ENERGY STORAGE SYSTEMS	2-1-0		
	CST 428	BLOCK CHAIN TECHNOLOGIES	2-1-0		
	EET 478	BIG DATA ANALYTICS	2-1-0	3	3
	EET 458	SOLAR PV SYSTEMS	2-1-0		
	CST 458	SOFTWARE TESTING	2-1-0		
	CST 468	BIOINFORMATICS	2-1-0		

NOTE:

1. *All Institutions should keep 4 hours exclusively for Remedial class/Minor/ Honours course (Mondays from 10 to 12 and Wednesdays from 10 to 12 PM). If a student does not opt for minor/Honours programme, he/she can be given remedial class.

2. Comprehensive Viva Voce: The comprehensive viva voce in the eighth semester of study shall have a viva voce for 50 marks. The viva voce shall be conducted based on the core subjects studied from third to eighth semester. The viva voce will be conducted by the same three member committee assigned for final project phase II evaluation towards the end of the semesters. The pass minimum for this course is 25. The course should be mapped with a faculty and classes shall be arranged for practicing questions based on the core courses listed in the curriculum. The mark will be treated as internal and should be uploaded along with internal marks of other courses.

3. **Project Phase II:** The objective of Project Work Phase II & Dissertation is to enable the student to extend further the investigative study taken up in Project Phase I, either fully theoretical/practical or involving both theoretical and practical work, under the mentoring of a Project Guide from the Department alone or jointly with a Supervisor drawn from R&D laboratory/Industry. This is expected to provide a good training for the student(s) in R&D work and technical leadership. The assignment shall normally include:

- ➢ In depth study of the topic assigned in the light of the Report prepared in Phase I;
- ➢ Review and finalization of the Approach to the Problem relating to the assigned topic;
- ➢ Detailed Analysis/Modeling/Simulation/Design/Problem Solving/Experiment as needed;
- ➢ Final development of product/process, testing, results, conclusions and future directions;
- ➢ Preparing a paper for Conference presentation/Publication in Journals, if possible;
- ➢ Preparing a Dissertation in the standard format for being evaluated by the Department;
- ➢ Final Presentation before the concerned evaluation committee

Total marks: 150, only CIE, minimum required to pass 75

Project Guide   30

Interim evaluation, twice in the semester by the evaluation committee   70

Quality of the report evaluated by the above committee   10

(The evaluation committee comprises HoD or a senior faculty member, Project coordinator and project guide).

Final evaluation by a three member committee   40

(The final evaluation committee comprises Project coordinator, expert from Industry/ research Institute and a senior faculty from a sister department. The same committee will conduct comprehensive course viva for 50 marks).

MINOR

Minor is an additional credential a student may earn if she/he does 20 credits worth of additional learning in a discipline other than her/his major discipline of B.Tech. degree. The objective is to permit a student to customize their Engineering degree to suit their specific interests. Upon completion of an Engineering Minor, a student will be better equipped to perform interdisciplinary research and will be better employable. Engineering Minors allow a student to gain interdisciplinary experience and exposure to concepts and perspectives that may not be a part of their major degree programs.

The academic units offering minors in their discipline will prescribe the set of courses and/or other activities like projects necessary for earning a minor in that discipline. A specialist basket of 3-6 courses is identified for each Minor. Each basket may rest on one or more

foundation courses. A basket may have sequences within it, i.e., advanced courses may rest on basic courses in the basket. She/he accumulates credits by registering for the required courses, and if the requirements for a particular minor are met within the time limit for the course, the minor will be awarded. This will be mentioned in the Degree Certificate as "Bachelor of Technology in xxx with Minor in yyy". The fact will also be reflected in the consolidated grade card, along with the list of courses taken. If one specified course cannot be earned during the course of the programme, that minor will not be awarded. The individual course credits earned, however, will be reflected in the consolidated grade card.

(i) The curriculum/syllabus committee/BoS shall prepare syllabus for courses to be included in the curriculum from third to eight semesters for all branches. The minor courses shall be identified by M slot courses.

(ii) Registration is permitted for Minor at the beginning of third semester. Total credits required to award B.tech with Minor is 182 (162 + 20)

(iii) Out of the 20 Credits, 12 credits shall be earned by undergoing a minimum of three courses, of which one course shall be a mini project based on the chosen area. They can do miniproject either in S7 or in S8. The remaining 8 credits could be acquired through 2 MOOCs recommended by the Board of Studies and approved by the Academic Council or 2 courses from the minor baskets listed here. The classes for Minor shall be conducted along with regular classes and no extra time shall be required for conducting the courses.

(iv) There won't be any supplementary examination for the courses chosen for Minor.

(v) On completion of the program, "Bachelor of Technology in xxx with Minor in yyy" will be awarded if the registrant earn 20 credits form the minor courses.

(vi) The registration for minor program will commence from semester 3 and all the academic units offering minors in their discipline should prescribe set of such courses. The courses shall be grouped into maximum of 5 baskets. The basket of courses may have sequences within it, i.e., advanced courses may rest on basic courses in the basket. Reshuffling of courses between various baskets will not be allowed. There is option to skip any two courses listed here and to opt for equivalent MOOC courses approved by the Academic Council. In any case, they should carry out a mini project based on the chosen area in S7 or S8. For example: Students who have registered **for B.Tech Minor in Electrical and Computer Engineering** can opt to study the courses listed below:

SEMESTER	MINOR BASKETS											
	BASKET-1				BASKET-2				BASKET-3			
	Specialization – **Dynamic Systems**				Specialization - **Machine Learning**				Specialization - **Electrical Vehicle Technology**			
	COURSE NO	COURSE NAME	HOURS	CREDIT	COURSE NO	COURSE NAME	HOURS	CREDIT	COURSE NO	COURSE NAME	HOURS	CREDIT
S3	EET 285	DYNAMIC CIRCUITS AND SYSTEMS	4	4	EOT 283	BASICS OF MACHINE LEARNING	4	4	EOT 285	ELECTRICAL MACHINE FUNDAMENTALS	4	4
S4	EET 286	PRINCIPLES OF INSTRUMENTATION	4	4	EOT 284	MATHEMATICS FOR MACHINE LEARNING	4	4	EOT 286	DRIVES AND CONTROL	4	4
S5	EET 385	CONTROL SYSTEMS	4	4	EOT 383	MACHINE LEARNING PROGRAMMING	4	4	EOT 385	MACHINES & DRIVES SIMULATION PRACTICES	4	4
S6	EET 386	DIGITAL CONTROL	4	4	EOT 384	DEEP LEARNING	4	4	EOT 386	ELECTRIC VEHICLES	4	4
S7	EOD 481	MINIPROJECT	4	4	EOD 481	MINIPROJECT	4	4	EOD 481	MINIPROJECT	4	4
S8	EOD 482	MINIPROJECT	4	4	EOD 482	MINIPROJECT	4	4	EOD 482	MINIPROJECT	4	4

Note-1: Name of the specialization shall be mentioned in the Minor Degree to be awarded

Note-2: Any B.Tech students from Electrical & Electronics Engg programme can register for the courses in the minor baskets II and III.

Note-3: Any B.Tech students from Computer Science/IT streams can register for the courses in the minor baskets I and III.
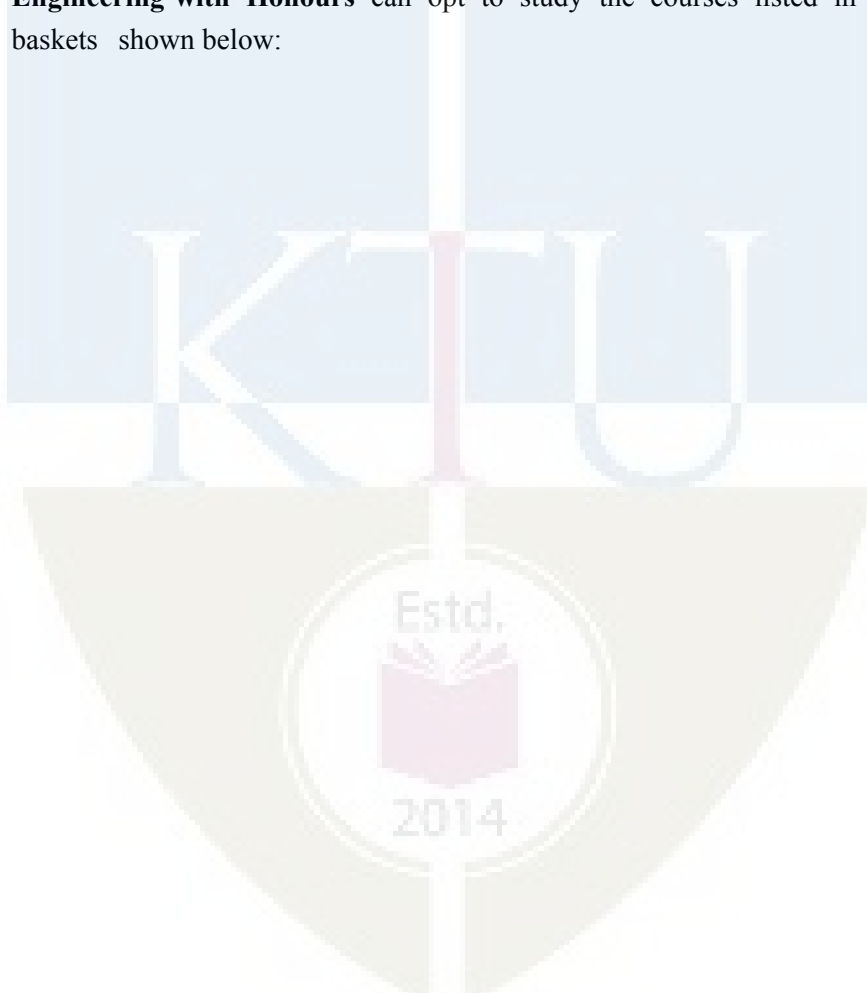
HONOURS

Honours is an additional credential a student may earn if she/he opts for the extra 20 credits needed for this in her/his own discipline. Honours is not indicative of a class. The University is providing this option for academically extra brilliant students to acquire Honours. Honours is intended for a student to *gain expertise*/get *specialized* in an area inside his/her major B.Tech discipline and to enrich knowledge in emerging/advanced areas in the concerned branch of engineering. It is particularly suited for students aiming to pursue higher studies. Upon completion of Honours, a student will be better equipped to perform research in her/his branch of engineering. On successful accumulation of credits at the end of the programme, this will be mentioned in the Degree Certificate as "Bachelor of Technology in xxx, with Honours." The fact will also be reflected in the consolidated grade card, along with the list of courses taken. If a student is not earning credits for any one of the specified course for getting Honours, she/he is not entitled to get Honours. The individual course credits earned, however, will be reflected in the consolidated grade card.

The courses shall be grouped into maximum of 3 baskets, each basket representing a particular specialization in the branch. The students shall select only the courses from same basket in all semesters. It means that the specialization is to be fixed by the student and cannot be changed subsequently. The internal evaluation, examination and grading shall be exactly as for other mandatory courses. The Honours courses shall be identified by H slot courses.

(i) The curriculum/syllabus committee/BoS shall prepare syllabus for courses to be included in the curriculum from fourth to eight semesters for all branches. The Honours courses shall be identified by H slot courses.

(ii) Registration is permitted for Honours at the beginning of fourth semester. Total credits required is 182 (162 + 20).

(iii) Out of the 20 Credits, 12 credits shall be earned by undergoing a minimum of three courses, of which one course shall be a mini project based on the chosen area. The remaining 8 credits could be acquired through 2 MOOCs recommended by the Board of studies and approved by the Academic Council or 2 courses from the same basket as the above 3 courses. The classes for Honours shall be conducted along with regular classes and no extra time shall be required for conducting the courses. The students should earn a grade of 'C' or better for all courses under Honours.

(iv) There won't be any supplementary examination for the courses chosen for Honours.

(v) On successful accumulation of credits at the end of the programme, "Bachelor of Technology in xxx, with Honours" will be awarded if overall CGPA is greater than

or equal to 8.5, earned a grade of 'C' or better for all courses chosen for Honours and there is no history of 'F' Grade in the entire span of the BTech Course.

(vi)   The registration for Honours program will commence from semester 4 and the all academic units offering Honours in their discipline should prescribe set of such courses. The courses shall be grouped into maximum of 5 baskets, each basket representing a particular specialization in the branch. The students shall select only the courses from same basket in all semesters. It means that the specialization is to be fixed by the student and cannot be changed subsequently. There is option to skip any two courses listed here if required, and to opt for equivalent MOOC courses approved by the Academic Council. In any case, they should carry out a mini project based on the chosen area in S8. For example: Students who have registered for **B.Tech in Electrical and Computer Engineering with Honours** can opt to study the courses listed in one of the baskets shown below:

	Honours BASKETS												
S E M E S T E R	**GROUP-1**				**GROUP-2**				**GROUP-3**				
	Specialization – **Cyber Security**				Specialization - **Machine Learning**				Specialization – **Smart Grids**				
	COURSE NO	**COURSE NAME**	**HOURS**	**CREDIT**	**COURSE NO**	**COURSE NAME**	**HOURS**	**CREDIT**	**COURSE NO**	**COURSE NAME**	**HOURS**	**CREDIT**
S4	EET 292	NETWORK ANALYSIS AND SYNTHESIS	4	4	EET 292	NETWORK ANALYSIS AND SYNTHESIS	4	4	EET 292	NETWORK ANALYSIS AND SYNTHESIS	4	4
S5	EET 393	DIGITAL SIMULATION	4	4	EET 393	DIGITAL SIMULATION	4	4	EET 393	DIGITAL SIMULATION	4	4
S6	CST 394	NETWORK SECURITY	4	4	CST 294	COMPUTATIONAL FUNDAMENTALS FOR MACHINE LEARNING	4	4	EOT 398	DISTRIBUTED GENERATION AND SMART GRID	4	4
S7	CST 495	CYBER FORENSICS	4	4	CST 395	NEURAL NETWORKS AND DEEP LEARNING	4	4	EOT 495	OPERATION AND CONROL OF AC/DC SMART GRIDS	4	4
S8	EOD 496	MINIPROJECT	4	4	EOD 496	MINIPROJECT	4	4	EOD 496	MINIPROJECT	4	4
Note: Name of the specialization shall be mentioned in the Honours Degree to be awarded													

INDUCTION PROGRAM

There will be three weeks induction program for first semester students. It is a unique three-week immersion Foundation Programme designed specifically for the fresher's which includes a wide range of activities right from workshops, lectures and seminars to sports tournaments, social works and much more. The programme is designed to mould students into well-rounded individuals, aware and sensitized to local and global conditions and foster their creativity, inculcate values and ethics, and help students to discover their passion. Foundation Programme also serves as a platform for the fresher's to interact with their batch-mates and seniors and start working as a team with them. The program is structured around the following five themes:

The programme is designed keeping in mind the following objectives:
- **Values and Ethics**: Focus on fostering a strong sense of ethical judgment and moral fortitude.
- **Creativity**: Provide channels to exhibit and develop individual creativity by expressing themselves through art, craft, music, singing, media, dramatics, and other creative activities.
- **Leadership, Communication and Teamwork**: Develop a culture of teamwork and group communication.
- **Social Awareness**: Nurture a deeper understanding of the local and global world and our place in at as concerned citizens of the world.
- **Physical Activities & Sports**: Engage students in sports and physical activity to ensure healthy physical and mental growth.