

AM JABDUL KALAM  
TECHNOLOGICAL  
UNIVERSITY

# **CURRICULUM**

## **B.TECH (2019 SCHEME)**



## CURRICULUM I TO VIII: ELECTRICAL & ELECTRONICS ENGINEERING

Every course of B. Tech. Program 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  | 8          |
| 2      | Basic Science courses                                       | BSC  | 26         |
| 3      | Engineering Science Courses                                 | ESC  | 22         |
| 4      | Program Core Courses                                        | PCC  | 76         |
| 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          |
|        | <b>Total Mandatory Credits</b>                              |      | <b>162</b> |
| 10     | Value Added Course (Optional)                               | VAC  | 20         |

No semester shall have more than six 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:** Basic Electrical, Engineering Graphics, Programming, Workshop, Basic Electronics, Basic Civil, Engineering Mechanics, Mechanical Engineering, Thermodynamics, Design Engineering, Materials Engineering 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:** Sustainable Engineering, 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 **E C L 2 0 1**. The first two letter code refers to the department offering the course. EC stands for course in Electronics & Communication, 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 Table 1.

Table 1: Code for the courses

| Code | Description                                                                                                                                                        |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T    | Theory based courses (other the 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 (even number) or in both the semesters (zero). The middle number could be any digit. ECL 201 is a laboratory course offered in EC department for third semester, MAT 101 is a course in Mathematics offered in the first semester, EET 344 is a 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. 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 |
|-------|---------------------------------------|---------------|-------|---------------------------|---------------|
| 01    | Aeronautical Engg                     | AO            | 16    | Information Technology    | IT            |
| 02    | Applied Electronics & Instrumentation | AE            | 17    | Instrumentation & Control | IC            |
| 03    | Automobile                            | AU            | 18    | Mandatory Courses         | MC            |
| 04    | Biomedical Engg                       | BM            | 19    | Mathematics               | MA            |
| 05    | Biotechnology                         | BT            | 20    | Mechanical Engg           | ME            |
| 06    | Chemical Engg                         | CH            | 21    | Mechatronics              | MR            |
| 07    | Chemistry                             | CY            | 22    | Metallurgy                | MT            |
| 08    | Civil Engg                            | CE            | 23    | Mechanical (Auto)         | MU            |
| 09    | Computer Science                      | CS            | 24    | Mechanical(Prod)          | MP            |
| 10    | Electrical & Electronics              | EE            | 25    | Naval & Ship Building     | SB            |
| 11    | Electronics & Biomedical              | EB            | 26    | Physics                   | PH            |
| 12    | Electronics & Communication           | EC            | 27    | Polymer Engg              | PO            |
| 13    | Food Technology                       | FT            | 28    | Production Engg           | PE            |
| 14    | Humanities                            | HU            | 29    | Safety & Fire Engg        | FS            |
| 15    | Industrial Engg                       | IE            |       |                           |               |

**SEMESTER I**

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

\*Minimum hours per week

**Note:** To make up for the hours lost due to induction program, one extra hour may be allotted to each course

**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<br>1/2     | PHT 100    | ENGINEERING PHYSICS A                                  | 3-1-0 | 4            | 4         |
|              | CYT 100    | ENGINEERING CHEMISTRY                                  | 3-1-0 | 4            | 4         |
| C<br>1/2     | EST 100    | ENGINEERING MECHANICS                                  | 2-1-0 | 3            | 3         |
|              | EST 110    | ENGINEERING GRAPHICS                                   | 2-0-2 | 4            | 3         |
| D<br>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            | HUT 102    | PROFESSIONAL COMMUNICATION                             | 2-0-2 | 4            | --        |
| F            | EST 102    | PROGRAMMING IN C                                       | 2-1-2 | 5            | 4         |
| S<br>1/2     | PHL 120    | ENGINEERING PHYSICS LAB                                | 0-0-2 | 2            | 1         |
|              | CYL 120    | ENGINEERING CHEMISTRY LAB                              | 0-0-2 | 2            | 1         |
| T<br>1/2     | ESL 120    | CIVIL & MECHANICAL WORKSHOP                            | 0-0-2 | 2            | 1         |
|              | ESL 130    | ELECTRICAL & ELECTRONICS WORKSHOP                      | 0-0-2 | 2            | 1         |
| <b>TOTAL</b> |            |                                                        |       | <b>28/29</b> | <b>21</b> |

**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, METTULURGY, 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 aimed at. 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            | MAT201    | PARTIAL DIFFERENTIAL EQUATION AND COMPLEX ANALYSIS | 3-1-0 | 4            | 4            |
| B            | EET201    | CIRCUITS AND NETWORKS                              | 2-2-0 | 4            | 4            |
| C            | EET203    | MEASUREMENTS AND INSTRUMENTATION                   | 3-1-0 | 4            | 4            |
| D            | EET205    | ANALOG ELECTRONICS                                 | 3-1-0 | 4            | 4            |
| E<br>1/2     | EST200    | DESIGN & ENGINEERING                               | 2-0-0 | 2            | 2            |
|              | HUT200    | PROFESSIONAL ETHICS                                | 2-0-0 | 2            | 2            |
| F            | MCN201    | SUSTAINABLE ENGINEERING                            | 2-0-0 | 2            | --           |
| S            | EEL201    | CIRCUITS AND MEASUREMENTS LAB                      | 0-0-3 | 3            | 2            |
| T            | EEL203    | ANALOG ELECTRONICS LAB                             | 0-0-3 | 3            | 2            |
| R/M          | VAC       | REMEDIAL/MINOR COURSE                              | 3-1-0 | 4 *          | 4            |
| <b>TOTAL</b> |           |                                                    |       | <b>26/30</b> | <b>22/26</b> |

**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 shall 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 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            | EET202    | DC MACHINES AND TRANSFORMERS                        | 2-2-0 | 4            | 4            |
| C            | EET204    | ELECTROMAGNETIC THEORY                              | 3-1-0 | 4            | 4            |
| D            | EET206    | DIGITAL ELECTRONICS                                 | 3-1-0 | 4            | 4            |
| E<br>1/2     | EST200    | DESIGN & ENGINEERING                                | 2-0-0 | 2            | 2            |
|              | HUT200    | PROFESSIONAL ETHICS                                 | 2-0-0 | 2            | 2            |
| F            | MCN202    | CONSTITUTION OF INDIA                               | 2-0-0 | 2            | --           |
| S            | EEL202    | ELECTRICAL MACHINES LAB I                           | 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            |
| <b>TOTAL</b> |           |                                                     |       | <b>26/30</b> | <b>22/26</b> |

**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 doesnot opt for minor programme, he/she can be given remedial class.

**SEMESTER V**

| SLOT         | COURSE NO | COURSES                                  | L-T-P | HOURS        | CREDIT       |
|--------------|-----------|------------------------------------------|-------|--------------|--------------|
| A            | EET301    | POWER SYSTEMS I                          | 3-1-0 | 4            | 4            |
| B            | EET303    | MICROPROCESSORS AND MICROCONTROLLERS     | 3-1-0 | 4            | 4            |
| C            | EET305    | SIGNALS AND SYSTEMS                      | 3-1-0 | 4            | 4            |
| D            | EET307    | SYNCHRONOUS AND INDUCTION MACHINES       | 3-1-0 | 4            | 4            |
| E<br>1/2     | HUT300    | INDUSTRIAL ECONOMICS & FOREIGN TRADE     | 3-0-0 | 3            | 3            |
|              | HUT310    | MANAGEMENT FOR ENGINEERS                 | 3-0-0 | 3            | 3            |
| F            | MCN301    | DISASTER MANAGEMENT                      | 2-0-0 | 2            | --           |
| S            | EEL331    | MICROPROCESSORS AND MICROCONTROLLERS LAB | 0-0-3 | 3            | 2            |
| T            | EEL333    | ELECTRICAL MACHINES LAB II               | 0-0-3 | 3            | 2            |
| R/M/H        | VAC       | REMEDIAL/MINOR/HONOURS COURSE            | 3-1-0 | 4*           | 4            |
| <b>TOTAL</b> |           |                                          |       | <b>27/31</b> | <b>23/27</b> |

**NOTE:**

1. Industrial Economics & Foreign Trade and Management for Engineers shall be offered in both S5 and S6. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Industrial Economics & Foreign Trade in S5 and Management for Engineers in S6 and vice versa.
2. \*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            | EET302    | LINEAR CONTROL SYSTEMS               | 2-2-0 | 4            | 4            |
| B            | EET304    | POWER SYSTEMS II                     | 3-1-0 | 4            | 4            |
| C            | EET306    | POWER ELECTRONICS                    | 3-1-0 | 4            | 4            |
| D            | EETXXX    | PROGRAM ELECTIVE I                   | 2-1-0 | 3            | 3            |
| E<br>1/2     | HUT300    | INDUSTRIAL ECONOMICS & FOREIGN TRADE | 3-0-0 | 3            | 3            |
|              | HUT310    | MANAGEMENT FOR ENGINEERS             | 3-0-0 | 3            | 3            |
| F            | EET308    | COMPREHENSIVE COURSE WORK            | 1-0-0 | 1            | 1            |
| S            | EEL332    | POWER SYSTEMS LAB                    | 0-0-3 | 3            | 2            |
| T            | EEL334    | POWER ELECTRONICS LAB                | 0-0-3 | 3            | 2            |
| R/M/H        | VAC       | REMEDIAL/MINOR/HONOURS COURSE        | 3-1-0 | 4*           | 4            |
| <b>TOTAL</b> |           |                                      |       | <b>28/32</b> | <b>23/27</b> |

**PROGRAM ELECTIVE I**

| SLOT | COURSE NO | COURSES                     | L-T-P | HOURS | CREDIT |
|------|-----------|-----------------------------|-------|-------|--------|
| D    | EET312    | BIOMEDICAL INSTRUMENTATION  | 2-1-0 | 3     | 3      |
|      | EET322    | RENEWABLE ENERGY SYSTEMS    | 2-1-0 |       |        |
|      | EET332    | COMPUTER ORGANIZATION       | 2-1-0 |       |        |
|      | EET342    | HIGH VOLTAGE ENGINEERING    | 2-1-0 |       |        |
|      | EET352    | OBJECT ORIENTED PROGRAMMING | 2-1-0 |       |        |
|      | EET362    | MATERIAL SCIENCE            | 2-1-0 |       |        |
|      | EET372    | SOFT COMPUTING              | 2-1-0 |       |        |

**NOTE:**

1. Industrial Economics & Foreign Trade and Management for Engineers shall be offered in both S5 and S6. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Industrial Economics & Foreign Trade in S5 and Management for Engineers in S6 and vice versa.

2. \*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.
3. 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 any 5 core courses studied from semester 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 practising questions based on the core courses listed in the curriculum.



**SEMESTER VII**

| SLOT         | COURSE NO | COURSES                       | L-T-P | HOURS        | CREDIT       |
|--------------|-----------|-------------------------------|-------|--------------|--------------|
| A            | EET401    | ADVANCED CONTROL SYSTEMS      | 2-1-0 | 3            | 3            |
| B            | EETXXX    | PROGRAM ELECTIVE II           | 2-1-0 | 3            | 3            |
| C            | EETXXX    | OPEN ELECTIVE                 | 2-1-0 | 3            | 3            |
| D            | MCN401    | INDUSTRIAL SAFETY ENGINEERING | 2-1-0 | 3            | ---          |
| S            | EEL411    | CONTROL SYSTEMS LAB           | 0-0-3 | 3            | 2            |
| T            | EEQ413    | SEMINAR                       | 0-0-3 | 3            | 2            |
| U            | EED415    | PROJECT PHASE I               | 0-0-6 | 6            | 2            |
| R/M/H        | VAC       | REMEDIAL/MINOR/HONOURS COURSE | 3-1-0 | 4*           | 4            |
| <b>TOTAL</b> |           |                               |       | <b>24/28</b> | <b>15/19</b> |

**PROGRAM ELECTIVE II**

| SLOT | COURSE NO | COURSES                             | L-T-P | HOURS | CREDIT |
|------|-----------|-------------------------------------|-------|-------|--------|
| B    | EET413    | ELECTRIC DRIVES                     | 2-1-0 | 3     | 3      |
|      | EET423    | DIGITAL CONTROL SYSTEMS             | 2-1-0 |       |        |
|      | EET433    | MODERN OPERATING SYSTEMS            | 2-1-0 |       |        |
|      | EET443    | DATA STRUCTURES                     | 2-1-0 |       |        |
|      | EET453    | DIGITAL SIGNAL PROCESSING           | 2-1-0 |       |        |
|      | EET463    | ILLUMINATION TECHNOLOGY             | 2-1-0 |       |        |
|      | EET473    | DIGITAL PROTECTION OF POWER SYSTEMS | 2-1-0 |       |        |

**OPEN ELECTIVES**

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. For example the courses listed below are offered by the **Department of ELECTRICAL & ELECTRONICS ENGINEERING** for students of other undergraduate branches offered in the college 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 from their area of interest confined to the relevant discipline from technical publications including peer reviewed journals, conference, 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

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 object of Project Work I is to enable the student to take up investigative study in the broad field of Electrical & Electronics 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 guidance of a Supervisor. This is expected to provide a good initiation for the student(s) in R&D work. The assignment to 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 Seminar, as oral Presentation before the evaluation committee.

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

Guide :30

Interim evaluation by the evaluation committee :20

Final Seminar :30

The report evaluated by the evaluation committee :20

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



# **SEMESTER VIII**

| SLOT         | COURSE NO | COURSES                                 | L-T-P  | HOURS        | CREDIT       |
|--------------|-----------|-----------------------------------------|--------|--------------|--------------|
| A            | EET402    | ELECTRICAL SYSTEM DESIGN AND ESTIMATION | 2-1-0  | 3            | 3            |
| B            | EETXXX    | PROGRAM ELECTIVE III                    | 2-1-0  | 3            | 3            |
| C            | EETXXX    | PROGRAM ELECTIVE IV                     | 2-1-0  | 3            | 3            |
| D            | EETXXX    | PROGRAM ELECTIVE V                      | 2-1-0  | 3            | 3            |
| T            | EET404    | COMPREHENSIVE COURSE VIVA               | 1-0-0  | 1            | 1            |
| U            | EED416    | PROJECT PHASE II                        | 0-0-12 | 12           | 4            |
| R/M/H        | VAC       | REMEDIAL/MINOR/HONOURS COURSE           | 3-1-0  | 4*           | 4            |
| <b>TOTAL</b> |           |                                         |        | <b>25/29</b> | <b>17/21</b> |

## **PROGRAM ELECTIVE III**

| SLOT | COURSE NO | COURSES                              | L-T-P | HOURS | CREDIT |
|------|-----------|--------------------------------------|-------|-------|--------|
| B    | EET414    | ROBOTICS                             | 2-1-0 | 3     | 3      |
|      | EET424    | ENERGY MANAGEMENT                    | 2-1-0 |       |        |
|      | EET434    | SMART GRID TECHNOLOGIES              | 2-1-0 |       |        |
|      | EET444    | ELECTRICAL MACHINE DESIGN            | 2-1-0 |       |        |
|      | EET454    | SWITCHED MODE POWER CONVERTERS       | 2-1-0 |       |        |
|      | EET464    | COMPUTER AIDED POWER SYSTEM ANALYSIS | 2-1-0 |       |        |
|      | EET474    | MACHINE LEARNING                     | 2-1-0 |       |        |

## **PROGRAM ELECTIVE IV**

| SLOT | COURSE NO | COURSES                            | L-T-P | HOURS | CREDIT |
|------|-----------|------------------------------------|-------|-------|--------|
| C    | EET416    | NONLINEAR SYSTEMS                  | 2-1-0 | 3     | 3      |
|      | EET426    | SPECIAL ELECTRIC MACHINES          | 2-1-0 |       |        |
|      | EET436    | POWER QUALITY                      | 2-1-0 |       |        |
|      | EET446    | COMPUTER NETWORKS                  | 2-1-0 |       |        |
|      | EET456    | DESIGN OF POWER ELECTRONIC SYSTEMS | 2-1-0 |       |        |
|      | EET466    | HVDC & FACTS                       | 2-1-0 |       |        |
|      | EET476    | ADVANCED ELECTRONIC DESIGN         | 2-1-0 |       |        |

## PROGRAM ELECTIVE V

| SLOT | COURSE NO | COURSES                                | L-T-P | HOURS | CREDIT |
|------|-----------|----------------------------------------|-------|-------|--------|
| D    | EET418    | ELECTRIC AND HYBRID VEHICLES           | 2-1-0 | 3     | 3      |
|      | EET428    | INTERNET OF THINGS                     | 2-1-0 |       |        |
|      | EET438    | ENERGY STORAGE SYSTEMS                 | 2-1-0 |       |        |
|      | EET448    | ROBUST AND ADAPTIVE CONTROL            | 2-1-0 |       |        |
|      | EET458    | SOLAR PV SYSTEMS                       | 2-1-0 |       |        |
|      | EET468    | INDUSTRIAL INSTRUMENTATION &AUTOMATION | 2-1-0 |       |        |
|      | EET478    | BIG DATA ANALYTICS                     | 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). If a student does not opt for minor/honours programme, he/she can be given remedial class.
2. **Comprehensive Course Viva:** The comprehensive course viva 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 semester. The pass minimum for this course is 25. The course should be mapped with a faculty and classes shall be arranged for practising 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 object of Project Work II & Dissertation is to enable the student to extend further the investigative study taken up in Project 1, either fully theoretical/practical or involving both theoretical and practical work, under the guidance of a Supervisor 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 to normally include:
  - In depth study of the topic assigned in the light of the Report prepared under Phase I;
  - Review and finalization of the Approach to the Problem relating to the assigned topic;
  - Detailed Analysis/Modelling/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 a Committee

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

Guide : 30

Interim evaluation, 2 times in the semester by the evaluation committee : 50

Quality of the report evaluated by the above committee : 30

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

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 s/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. S/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 is 182 (162 + 20 credits from value added courses)

(iii) Out of the 20 Credits, 12 credits shall be earned by undergoing a minimum of three courses listed in the curriculum for minor, 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 by undergoing 2 MOOCs recommended by the Board of studies and approved by the Academic Council or through courses listed in the curriculum. 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.

(vi) The registration for minor program will commence from semester 3 and the all academic units offering minors in their discipline should prescribe set of such courses. The courses shall be grouped into maximum of 3 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. In any case, they should carry out a mini project based on the chosen area in S7 or S8. Students who have registered for **B.Tech Minor in ELECTRICAL & ELECTRONICS ENGINEERING** can opt to study the courses listed below:

| S<br>e<br>m<br>e<br>s<br>t<br>e<br>r | BASKET I   |                              |                       |                            | BASKET II  |                                                |                       |                            | BASKET III |                               |                       |                            |
|--------------------------------------|------------|------------------------------|-----------------------|----------------------------|------------|------------------------------------------------|-----------------------|----------------------------|------------|-------------------------------|-----------------------|----------------------------|
|                                      | Course No. | Course Name                  | H<br>O<br>U<br>R<br>S | C<br>R<br>E<br>D<br>I<br>T | Course No. | Course Name                                    | H<br>O<br>U<br>R<br>S | C<br>R<br>E<br>D<br>I<br>T | Course No. | Course Name                   | H<br>O<br>U<br>R<br>S | C<br>R<br>E<br>D<br>I<br>T |
| S3                                   | EET251     | ELECTRIC CIRCUITS            | 4                     | 4                          | EET 253    | INTRODUCTION TO POWER ENGINEERING              | 4                     | 4                          | EET 255    | DYNAMIC CIRCUITS AND SYSTEMS  | 4                     | 4                          |
| S4                                   | EET 252    | ELECTRICAL MACHINES          | 4                     | 4                          | EET 254    | ENERGY SYSTEMS                                 | 4                     | 4                          | EET 256    | PRINCIPLES OF INSTRUMENTATION | 4                     | 4                          |
| S5                                   | EET 351    | SOLID STATE POWER CONVERSION | 4                     | 4                          | EET 353    | SOLAR AND WIND ENERGY CONVERSION SYSTEMS       | 4                     | 4                          | EET 355    | CONTROL SYSTEMS               | 4                     | 4                          |
| S6                                   | EET 352    | POWER SEMICONDUCTOR DRIVES   | 4                     | 4                          | EET 354    | INSTRUMENTATION AND AUTOMATION OF POWER PLANTS | 4                     | 4                          | EET 356    | DIGITAL CONTROL               | 4                     | 4                          |
| S7                                   | EED 451    | MINIPROJECT                  | 4                     | 4                          | EED 451    | MINIPROJECT                                    | 4                     | 4                          | EED 451    | MINIPROJECT                   | 4                     | 4                          |

|    |         |             |   |   |         |             |   |   |         |             |   |   |
|----|---------|-------------|---|---|---------|-------------|---|---|---------|-------------|---|---|
| S8 | EED 452 | MINIPROJECT | 4 | 4 | EED 452 | MINIPROJECT | 4 | 4 | EED 452 | MINIPROJECT | 4 | 4 |
|----|---------|-------------|---|---|---------|-------------|---|---|---------|-------------|---|---|

#### Notes on Minor from Electrical Engineering Department:

Students have to credit additional 5 courses (20 credits) to receive minor in Electrical and Electronics Engineering. While choosing the minor basket, at least two courses in the selected basket should have contents different from the courses in the curriculum of the parent branch. (This is necessary in the case of related branches like Electronics and Communication, Electronics and Instrumentation, Applied Electronics and Instrumentation, Electronics and Biomedical, Computer Science and Engineering etc.) In case where the student chooses a basket with only two courses different from their parent curriculum, the remaining courses have to be selected from the approved MOOC courses. This restriction may be incorporated in the regulations/curriculum.

#### 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 class. KTU is providing this option for academically extra brilliant students to acquire Honours. Honours is intended for a student to gain expertise/specialise in an area inside his/her major B.Tech discipline and to enrich knowledge in emerging/advanced areas in the branch of engineering concerned. 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 one specified course cannot be earned during the course of the programme, Honours will not be awarded. The individual course credits earned, however, will be reflected in the consolidated grade card.

The courses shall be grouped into maximum of 3 groups, each group representing a particular specialization in the branch. The students shall select only the courses from same group 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 credits from value added courses).

- (iii) Out of the 20 Credits, 12 credits shall be earned by undergoing a minimum of three courses listed in the curriculum for honours, 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 through courses listed in the curriculum. 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 without any history of 'F' Grade.
- (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 3 groups, each group representing a particular specialization in the branch. The students shall select only the courses from same group in all semesters. It means that the specialization is to be fixed by the student and cannot be changed subsequently. 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 Honours in ELECTRICAL & ELECTRONICS ENGINEERING** can opt to study the courses listed below:

| S<br>e<br>m<br>e<br>s<br>t<br>e<br>r | GROUP I   |                                     |                       |                            | GROUP II  |                                       |                       |                            | GROUP III |                                        |                       |                            |
|--------------------------------------|-----------|-------------------------------------|-----------------------|----------------------------|-----------|---------------------------------------|-----------------------|----------------------------|-----------|----------------------------------------|-----------------------|----------------------------|
|                                      | Course No | Course Name                         | H<br>O<br>U<br>R<br>S | C<br>R<br>E<br>D<br>I<br>T | Course No | Course Name                           | H<br>O<br>U<br>R<br>S | C<br>R<br>E<br>D<br>I<br>T | Course No | Course Name                            | H<br>O<br>U<br>R<br>S | C<br>R<br>E<br>D<br>I<br>T |
| S4                                   | EET272    | NETWORK ANALYSIS AND SYNTHESIS      | 4                     | 4                          | EET 274   | NETWORK ANALYSIS AND SYNTHESIS        | 4                     | 4                          | EET 276   | NETWORK ANALYSIS AND SYNTHESIS         | 4                     | 4                          |
| S5                                   | EET373    | DIGITAL SIMULATION                  | 4                     | 4                          | EET 375   | DIGITAL SIMULATION                    | 4                     | 4                          | EET 377   | DIGITAL SIMULATION                     | 4                     | 4                          |
| S6                                   | EET374    | GENERALISED MACHINE THEORY          | 4                     | 4                          | EET 376   | ANALYSIS OF POWER ELECTRONIC CIRCUITS | 4                     | 4                          | EET 378   | OPERATION AND CONTROL OF POWER SYSTEMS | 4                     | 4                          |
| S7                                   | EET475    | OPERATION AND CONTROL OF GENERATORS | 4                     | 4                          | EET 477   | DYNAMICS OF POWER CONVERTERS          | 4                     | 4                          | EET 479   | CONTROL AND DYNAMICS OF MICROGRIDS     | 4                     | 4                          |
| S8                                   | EED476    | MINIPROJECT                         | 4                     | 4                          | EED 476   | MINIPROJECT                           | 4                     |                            | EED 476   | MINIPROJECT                            | 4                     | 4                          |

## INDUCTION PROGRAM

There will be three weeks induction program for first semester students. It is a unique three-week immersion Foundation Programme designed especially for the fresher's which includes a wide range of activities right from workshops, lectures and seminars to sports tournaments, social work 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 batchmates 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 it as concerned citizens of the world.
- **Physical Activities & Sports:** Engage students in sports and physical activity to ensure healthy physical and mental growth.

