



(no subject)

1 message

Dr. VipIn Kumar <drvipnk.engineering@tmu.ac.in>
To: TMU Staff Nikhil Saxena <nikhil.computer@tmu.ac.in>

Tue, Jul 11, 2023 at 3:35 PM

Agenda Items:

1. Some Changes in the course matrix of fourth and eight semesters of B.Tech EE program for academic session 2022-23.
2. No change is required in the contents of Diploma EE syllabus for academic session 2022-23.
3. One new theory subject (Analog Electronics) and one new lab subject (Analog Electronics Lab) are introduced in B.Tech EE, fourth semester course matrix. One existing subject (Object oriented Programming using JAVA (ECS412)) of fourth semester is shifted to eight semester in program elective-V list in place of Electronic Circuits (EEC814).
4. Short term course on 'Modelling & Simulation of Renewable Energy Systems using MATLAB' is launched by the Department of Electrical Engineering for summer session in July 2023.
5. Any other matter with the permission of the chair.

8W2
27/07/23

Teerthanker Mahaveer University, Moradabad

Faculty of Engineering

Department of Electrical Engineering

Minutes of BoS Meeting

A meeting of Board of Studies was held in Principal's office, Faculty of Engineering on 12/07/2023. Following points were discussed regarding syllabus and scheme for existing B.Tech. and Diploma (Electrical Engineering) program, session 2023-24. Following members were present in meeting:

1. Prof. Sanjay Mathur, Professor & Head, ECE, GB Pant University of Ag & Technology, University (External Expert)
2. Prof. Shri Prakash Pandey, Professor, Department of Physics, FOE, TMU, Moradabad
3. Dr. Shubhendra Pratap Singh, HOD, EE, FOE, TMU, Moradabad
4. Dr. Diwaker Pathak, Assistant professor, EE, FOE, TMU, Moradabad
5. Dr. Garima Goswami, Associate professor, EE, FOE, TMU, Moradabad
6. Mr. Umesh Singh, Assistant professor, EE, FOE, TMU, Moradabad
7. Mr. Debanjan Roy, Assistant professor, EE, FOE, TMU, Moradabad

The following points were discussed in BoS:

1. Department of Electrical Engineering presented no change in existing syllabus of Diploma in Electrical Engineering up to the academic session 2022-23. BoS members were agreed on this point.
2. The Department of Electrical Engineering introduced a new subject "Analog Electronics (EEC419)" and a new lab course "Analog Electronics Lab (EEC469)" in place of existing subject i.e. Object oriented Programming using JAVA (ECS412) and its lab (ECS 461) in the fourth semester of B. Tech Electrical Engineering from session 2023-24. However, ECS412 has been removed from the syllabus.
3. Short-term, value added course on 'Modeling & Simulation of Renewable Energy Systems using MATLAB' was proposed by the Department of Electrical Engineering for summer internship in July 2023. BoS experts have approved the course content without any further modification. However, the external expert suggested that there is no need to present the syllabus of STC in BoS as this short term course is not the part of B. Tech curriculum. (Annexure-II).



4. According to National Education policy-2020 and guidelines of AICTE, New Delhi, the Department is in the process of restructuring the syllabus of B.Tech. and Diploma (Electrical Engineering) for the academic session 2023-24.

The meeting ended with vote of thanks.



Dr. Shubhendra Pratap Singh
HoD, Department of Electrical Engineering

Prof. R. K. Dwivedi
Principal, FOE



तीर्थकर महावीर विश्वविद्यालय
Teerthanker Mahaveer University
An Ultimate Destination for World Class Education



Faculty of Engineering
Attendance Sheet for BoS

Date: 12/07/2023

Department of Electrical Engineering
Attendance Sheet

| S. No. | External Expert/Chairperson/Faculty Name | Designation | Signature |
|--------|--|----------------------------------|-----------|
| 1 | Prof. Sanjay Mathur | External Expert | |
| 2 | Prof. Shri Prakash Pandey | Professor, Department of Physics | |
| 3 | Dr, Shubhendra Pratap Singh | HOD, EE | |
| 4 | Dr. Diwaker Pathak | Assistant Professor | |
| 5 | Mr. Pradeep Kumar Verma | Assistant Professor | |
| 6 | Mr. Umesh Singh | Assistant Professor | |
| 7 | Dr. Garima Goswami | Associate Professor | |
| 8 | Mr. Debanjan Roy | Assistant Professor | |
| 9 | Mr. Shashank Mishra | Assistant Professor | |
| 10 | Mr. Mayur Agarwal | Assistant Professor | |
| | | | |
| | | | |

About TMU

Teerthanker Mahaveer University also known as TMU is a private university in Moradabad (Brass City), Uttar Pradesh, India. Established in 2008 by the Government of Uttar Pradesh Act No.30 and approved by the University Grants Commission (UGC) under Section 2 (f) and 12 (B) of the UGC Act, 1956. NAAC A, ICAR, and various other regulatory authorities have accredited the University. The University offers career-oriented programmes at all levels, i.e., UG, PG, and doctoral degrees across diverse streams. With a vision to impart quality professional education to the students of an otherwise educationally backward city in all the major domains, the university came into existence in 2008. Currently, it offers over 150 programmes through its 14 on-campus colleges and 2 independent teaching departments. The university has also made collaborative arrangements with national and international institutions.

About Faculty of Engineering

Faculty of Engineering is AICTE approved institute of academic excellence in Engineering, Technology and Sciences. Its student centric approach focuses on hands-on training along with imparting sound theoretical knowledge to cater to the current needs of industries. The learning process is supported by unique skill enhancement programmes; value added courses and extensive practical lab work in line with the market trends. Our strong linkages with industries help the students to get professionally trained by getting exposed to latest industrial trends later to become competent engineers suitable for the industries. The faculty of engineering has nine academic departments with around hundred full time faculty members. It offers programmes at Bachelor, Post-Graduate and Doctoral level, covering major branches of engineering and sciences.

About the Electrical Engineering Department (EED), FOE

Electrical Engineering is established in 2009 to cater training and knowledge in the field of electrical technology to impart services to today's need. The well-equipped electrical labs provide an excellent opportunity to the students for developing in depth skills in electrical engineering. These laboratories help

students of engineering to assimilate adequate fundamentals of electrical engineering with regard to transmission, distribution and generation. Practical training is imparted to students in leading areas. Additionally, every student is guided to design the projects of electrical engineering having latest technology to make them experts in their field. In addition to regular academics, the students are also imparted knowledge about the modern technologies by means of technical visits. The Department offers 3-year Diploma, 4-year B. Tech & Ph.D. with various electives leading to sub-specialization in Electrical Engineering.

Patron

Prof. (Dr.) R. K. Dwivedi, Director, FoE

Convener

Dr. Shubhendra Pratap Singh, HOD, EED

Course Coordinators

Dr. Garima Goswami, EED

Dr. Diwaker Pathak, EED

Mr. Debanjan Roy, EED

Mr. Pradeep Kumar Verma, EED

Mr. Umesh Singh, EED

Mr. Shashank Mishra, EED

Mr. Mayur Agarwal, EED

Important Dates

Last date of Registration: June 30, 2023
Notification about Selection: July 02, 2023

Registration form should be sent to:

Department of Electrical Engineering
Faculty of Engineering,
Teerthanker Mahaveer University, Moradabad

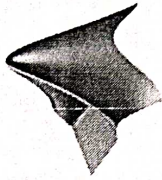
Email: drshubhendra.engineering@tmu.ac.in
pradeep.engineering@tmu.ac.in

M: 9870983533, 8527064683, 9693294594
Room No.: - 3141, FOE-TMU

Four Weeks
Short Term Course

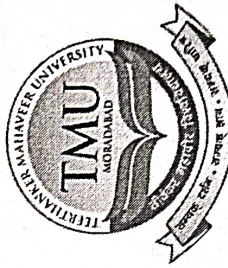
On

MODELING & SIMULATION OF RENEWABLE ENERGY SYSTEMS USING MATLAB



(MSRES-2023)

(July 03- July 30 2023)



Accredited with NAAC **A** Grade

12-B Status from UGC

Organized by

Department of Electrical Engineering

Faculty of Engineering

Teerthanker Mahaveer University

Moradabad

www.tmu.ac.in

Course Objectives

This short-term course "Modeling & Simulation of Renewable Energy Systems Using Matlab" is very useful and essential. MATLAB is a special purpose computer program optimized to perform engineering and scientific calculations. The MATLAB program implements the MATLAB language and provides an extensive library of predefined functions to make technical design and analysis easier and more efficient. This STC is introduced to perform system and algorithmic modeling of renewable energy (RE) systems in MATLAB/Simulink environment. It teaches attendees how to apply basic modeling techniques and tools to develop Simulink block diagrams of renewable energy systems. The objective of this course is to provide the participants how to use MATLAB for RE applications and to learn basics of Simulink to simulate the renewable energy system circuits under various environmental conditions.

Duration

40 Hours

Prerequisites

Basic knowledge of arithmetic and matrix operation. Knowledge of electrical circuits and networks.

Course content

Week-1

Introduction to MATLAB Software, Introduction to Mathematics in MATLAB, Working with Variables in MATLAB environment, Trigonometric Functions in MATLAB, Complex Numbers in MATLAB, Working with Vectors, Matrix in MATLAB, Introduction to engineering functions, Graphs and Plotting in MATLAB.

Week-2

Simulation of basic electric circuits (RL, RC, RLC), series and parallel combination of circuits, Measurement of voltages and currents in MATLAB/SIMULINK. Fundamentals and modelling of RE sources: PV cell modelling, Fuel cell modelling, wind turbine modelling, Modelling of hybrid energy sources.

Week-3

Introduction to MATLAB/SIMULINK related to Power electronics Application, modelling of AC-DC converters: Single-phase and three-phase uncontrolled/controlled rectifiers with different loading conditions.

Modelling of DC-DC Converters: Buck converter, Boost Converter, Buck-boost converter, Cuk converter, SEPIC converter.

Week-4

Design of MPPT algorithm for Solar PV in standalone system, Development of wind turbine. Modelling of RE systems: Modelling of motor drives: Speed control of DC motor, Speed control of induction motor, PMSM motor control.

The Summary of Course Content is:

Week-1

- L1: An Introduction to the course
- L2: An Introduction to MATLAB Software
- L3: Introduction to Mathematics in MATLAB
- L4: Working with Variables in MATLAB environment
- L5: Trigonometric Functions in MATLAB
- L6: Complex Numbers in MATLAB
- L7: Working with Vectors in MATLAB
- L8: Working with Matrices in MATLAB
- L9: Introduction to Engineering functions in MATLAB
- L10: Graphs and Plotting in MATLAB

Week-2

- L11: Modelling of resistive circuit
- L12: Modelling of RL circuit
- L14: Modelling of RC circuit
- L15: Modelling of series RLC circuit
- L16: Modelling of parallel RLC circuit
- L17: PV cell modelling
- L18: Fuel cell modelling
- L19: Wind turbine modelling
- L20: Modelling of hybrid energy sources

Week-3

- L21: Modelling of Single-phase uncontrolled rectifier
- L22: Modelling of Single-phase Controlled rectifier
- L23: Modelling of three-phase uncontrolled rectifier
- L24: Modelling of three-phase controlled rectifier
- L25: Analysis with different loading conditions

- L26: Modelling of DC-DC Buck converter
- L27: Modelling of DC-DC Boost converter
- L28: Modelling of DC-DC Buck-boost converter
- L29: Modelling of Cuk converter
- L30: Modelling of SEPIC converter

Week-4

- L31: MPPT controller for Solar PV application
- L32: Modelling of wind energy conversion system
- L33: Modelling of fuel cell-based energy conversion system
- L34: Integration of different renewable energy systems
- L35: Open loop speed control
- L36: Closed loop speed control
- L37: Speed control of DC motor
- L38: Speed control of induction motor using v/f control
- L39: Vector controlled induction motor control
- L40: PMSM motor control

Who should attend

Faculty members / research scholars / UG/PG students from academic institutes approved by the AICTE/UGC /MHRD and Scientists / Engineers working in private / Public/ Govt. organizations / industries etc. can attend the course.

Course Fee

| | |
|-----------------|--------|
| TMU Students | 2000 ₹ |
| NON TMU Student | 2500 ₹ |

Participants will be selected on first-come-first-served basis.

Certification

After completion of successful short-term course, participants will receive a certificate by Teerthanker Mahaveer University, Moradabad.

References

1. https://in.mathworks.com/help/physmod/sps/ref/ibuckboostconverter.html?searchHighlight=buck%20boost%20converter&s_tid=srchtitle_buck%20boost%20converter_1
2. Beginning MATLAB and Simulink by Sulaymon Eshkabilov

Four Weeks
Short Term Course

On
**MODELING & SIMULATION OF
RENEWABLE ENERGY SYSTEMS USING
MATLAB**



(MSRES-2023)

(July 03- July 30 2023)

Name: _____

Date of Birth: _____

Designation: _____

Organization: _____

Address for correspondence: _____

Phone: _____

E-mail: _____

Qualifications: _____

Experience: _____ Years

[Handwritten Signature]

(Signature of applicant)

Signature of Head of Department/School/Institute

REGISTRATION FORM

| | | |
|--|---|--|
| Course Code: EEC419 | B. Tech (Electrical)- Semester-IV Analog Electronics | L-3 T-1 P-0 C-4 |
| Course Outcomes: | On completion of the course, the students will be : | |
| CO1. | Understanding the concepts and types of feedback Amplifiers. | |
| CO2. | Understanding the concepts, types and applications of oscillators. | |
| CO3. | Understanding about the 555 timer and applications of 555 timer. | |
| CO4. | Analyzing various circuits using op amp like instrumentation amplifier, comparator, multivibrator, sample and hold circuit. | |
| CO5. | Creating the different types of converters using op amp. | |
| Course Content: | | |
| Unit-1: | Introduction to OPAMP: Ideal Op-Amp, non-idealities in an Op-Amp (Output offset voltage, input bias current, input offset current, slew rate, gain bandwidth product) Idealized analysis of Op-Amp circuits. Inverting and non-inverting amplifier, differential amplifier, instrumentation amplifier; Frequency response of OP-AMP. | 8 Hours |
| Unit-2: | Applications of OPAMP: Basic applications of op-amp: Summer, Differentiator and Integrator. Low Pass and High Pass Filters; V/I & I/V converters; Comparators; Multivibrator; Peak detectors, S/H circuits, D/A and A/D converters, Successive Approximation. | 8 Hours |
| Unit-3: | Feedback Amplifiers: Types of feedback, Effect of feedback on noise, distortion, gain, input and output impedance of the amplifiers, analysis of Voltage and Current feedback amplifiers. | 8 Hours |
| Unit-4: | Oscillators: Introduction of Oscillator, Barkhausen Criterion for oscillation in feedback oscillator, Analysis of RC Oscillators: Wein bridge, phase shift oscillator, Analysis of LC Oscillators: Colpitt's, Hartley, Quartz Crystal Construction , Electrical equivalent circuits of Crystal Oscillator circuits | 8 Hours |
| Unit-5: | Special ICs: 555 Timer circuit; Functional block; Characteristics & applications; 565-phase lock loop circuit functioning and applications | 8 Hours |
| Text Books: | 1. Ramakant A. Gayakward, "Op-amps and Linear Integrated Circuits", Pearson Education. 2. D. Roy Choudhary, Sheil B.Jani, "Linear Integrated Circuits", 11edition, New Age. | |
| Reference Books: | 1. J. Millman, C. C. Halkias, and Satyabratha Jit, Electronic Devices and Circuits, Tata McGraw Hill. * Latest editions of all the suggested books are recommended. | |
| Additional Electronics Reference Material | https://nptel.ac.in/courses/117/107/117107094/ https://www.youtube.com/watch?v=kiiA6WTCQn0 | |

82

| | | |
|--------------------------------------|---|--|
| Course Code: EEC469 | B. Tech (Electrical)- Semester-IV Analog Electronics (Lab) | L-0 T-0 P-2 C-1 |
| Course Outcomes: | On completion of the course, students will be: | |
| CO1. | Applying relevant information to supplement to the Electronic Circuit EC (EEC864) course. | |
| CO2. | Analysing and verifying the working of different types of Operational Amplifiers, ICs and the procedure of doing the experiment. | |
| CO3. | Creating the circuits, analyzing the circuits and troubleshoot the designed circuits. | |
| CO4. | Creating and recording the experimental data, analyzing the results, and preparing a formal laboratory report. | |
| CO5. | Creating the circuits with basic semiconductor devices (active & passive elements), measuring instruments & power supplies that serves many practical purposes. | |
| Experiments: | Note: Minimum eight experiments should be performed. | |
| Experiment-1: | To study the characteristics of Operational Amplifier (IC741). | |
| Experiment-2: | To generate the waveform using Operational Amplifier (IC741). | |
| Experiment-3: | To study the Operational Amplifier (IC741) as comparator. | |
| Experiment-4: | To study the Operational Amplifier (IC741) as differentiator. | |
| Experiment-5: | To study the Operational Amplifier (IC741) as integrator. | |
| Experiment-6: | To Implement the S/H circuit using Operational Amplifier (IC741). | |
| Experiment-7: | To study the DAC (ladder type) and ADC (successive approximation type). | |
| Experiment-8: | To study applications of Timer IC555 as Multivibrators (monostable and bistable). | |
| Experiment-9: | To study LM 380 as power amplifier. | |
| Experiment 10: | To implement the S/H circuit using Operational Amplifier (IC741). | |
| Experiment-11: | To implement PLL using IC555. | |
| Experiment-12: | To study the voltage Regulator-IC 723. | |

Evaluation Scheme of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

| PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (35 MARKS) | | | | ON THE DAY OF EXAM (15 MARKS) | | TOTAL INTERNAL (50 MARKS) |
|---|----------------------|-----------------|-----------------------|-------------------------------|-----------------|---------------------------|
| EXPERIMENT (5 MARKS) | FILE WORK (10 MARKS) | VIVA (10 MARKS) | ATTENDANCE (10 MARKS) | EXPERIMENT (5 MARKS) | VIVA (10 MARKS) | |

External Evaluation (50 marks)

The external evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

| EXPERIMENT (20 MARKS) | FILE WORK (10 MARKS) | VIVA (20 MARKS) | TOTAL EXTERNAL (50 MARKS) |
|-----------------------|----------------------|-----------------|---------------------------|
|-----------------------|----------------------|-----------------|---------------------------|

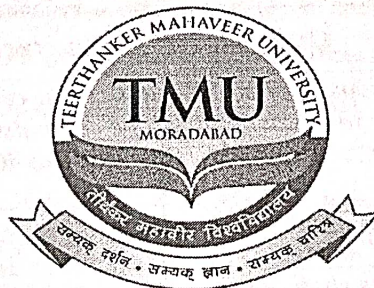
Study & Evaluation Scheme

of

Bachelor of Technology (Electrical Engineering)

[Applicable w.e.f. Academic Session - 2023-24 till revised]

[As per CBCS guidelines given by AICTE]



Accredited with NAAC **A** Grade

12-B Status from UGC

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TEERTHANKER MAHAVEER UNIVERSITY

N.H.-24, Delhi Road, Moradabad, Uttar Pradesh-244001

Website: www.tmu.ac.in



TEERTHANKER MAHAVEER UNIVERSITY
 (Established under Govt. of U.P. Act No. 30, 2008)
 Delhi Road, Bagarpur, Moradabad (U.P.)

| <u>Study & Evaluation Scheme</u> | |
|--|---------------------------------------|
| <u>SUMMARY</u> | |
| Institute Name | Faculty of Engineering |
| Programme | B.Tech. (Electrical Engineering) |
| Duration | Four-year full time (Eight Semesters) |
| Medium | English |
| Minimum Required Attendance | 75% |
| <u>Credits</u> | |
| Maximum Credits | 181 |
| Minimum Credits Required for Degree | 176 |

| Assessment: | | | | | |
|--|--------------|--------------|---------------|----------------------------|-------|
| Evaluation | | | Internal | External | Total |
| Theory | | | 40 | 60 | 100 |
| Practical/ Dissertations/ Project Reports/ Viva-Voce | | | 50 | 50 | 100 |
| Class Test-1 | Class Test-2 | Class Test-3 | Assignment(s) | Attendance & Participation | Total |
| Best two out of three | | | | | |
| 10 | 10 | 10 | 10 | 10 | 40 |
| Duration of Examination | | | External | Internal | |
| | | | 3 Hours | 1.5 Hours | |

To qualify the course a student is required to secure a minimum of 45% marks in aggregate including the semester end examination and teachers continuous evaluation (i.e. both internal and external). A candidate who secures less than 45% of marks in a course shall be deemed to have failed in that course. The student should have at least 45% marks in aggregate to clear the semester.

- # Provision for delivery of 25% content through online mode.
- # Policy regarding promoting the students from semester to semester & year to year. No specific condition to earn the credit for promoting the students from one semester to next semester.
- # Maximum no of years required to complete the program: $N+2$ (N =No of years for program)

| Question Paper Structure | |
|---------------------------------|---|
| 1 | The question paper shall consist of six questions. Out of which first question shall be of short answer type (not exceeding 50 words) and will be compulsory. Question no. 2 to 6 (from Unit-I to V) shall have explanatory answers (approximately 350 to 400 words) along with having an internal choice within each unit. |
| 2 | Question No. 1 shall contain 8 parts from all units of the syllabus with at least one question from each unit and students shall have to answer any five, each part will carry 2 marks. |
| 3 | The remaining five questions shall have internal choice within each unit; each question will carry 10 marks. |

| IMPORTANT NOTES: | |
|-------------------------|--|
| 1 | The purpose of examination should be to assess the Course Outcomes (CO) that will ultimately lead to of attainment of Programme Specific Outcomes (PSOs). A question paper must assess the following aspects of learning: Remember, Understand, Apply, Analyze, Evaluate & Create (reference to Bloom's Taxonomy). |
| 2 | Case Study is essential in every question paper (wherever it is being taught as a part of pedagogy) for evaluating higher-order learning. Not all the courses might have case teaching method used as pedagogy. |
| 3 | There shall be continuous evaluation of the student and there will be a provision of fortnight progress report. |

SW

Program Structure- B.Tech. (Electrical Engineering)

A. Introduction:

An undergraduate degree programme in Electrical Engineering aims to provide students with a solid foundation in the underlying principles of electrical engineering before students move forward and decide on a specialisation in an area of interest later in the course. The course will comprise of a range of learning modes- laboratory work tutorials, lectures, project work and individual research. On average, bachelors will take four years. Electrical Engineering seeks to understand the application of electricity, electronics and electromagnetism in the multitude of devices that we use. This means from the everyday appliance such as the kitchen blender, to circuit boards and space equipment. Students will look at the design and production of electrical and electronic systems.

Students will develop and gain various skills that are transferable within the engineering world and practical skills that are equally useful in plenty of other sectors. Problem-solving skills are honed, and their interpersonal and communication skills will also improve with the amount of team work that they will be required to do. Students will also learn how to better manage their time and resources and assess the risks involved in a certain project. Other useful skills that they will learn include design, leadership and organisational skills.

The institute emphasis on the following courses *balanced with core and elective courses*: The curriculum of B.Tech. Program emphasizes an intensive, flexible engineering education. Total 181 credits are allotted for the B.Tech. degree.

The programme structure and credits for B.Tech. are finalized based on the stakeholders' requirements and general structure of the programme. Minimum number of classroom contact teaching credits for the B.Tech. program will be 181 credits (one credit equals 1.0 hour) and Project/internship will be of 12 credits. However, the minimum number of the credits for award of B.Tech. degree will be 176 credits. Out of 169 credits of classroom contact teaching, 52 credits are to be allotted for Professional core courses (PCC), 16 credits are allotted to Basic Science Courses (BSC), 31 credits are allotted to Engineering Science Courses (ESC), 10 credits are allotted to (AECC) Ability Enhancement Compulsory Course, 06 credits are allotted to open elective courses (OEC), 24 credits are allotted to Professional Elective courses (PEC) and rest of 24 credits for Laboratory courses, 06 credits are allotted to (SEC) Skill Enhancement Course. Credits distribution is given below in tabular form:



| B.Tech. Electrical Engineering: Four-Year (8-Semester) CBCS Programme | | | |
|--|---|--|----------------------|
| Basic Structure: Distribution of Courses | | | |
| S. No. | Type of Course | Credit Hours | Total Credits |
| 1 | BSC - Basic Science Courses | 4 Courses of 4 Credits each (Total Credit Hrs. 4X4) | 16 |
| 2 | ESC - Engineering Science Courses | 7 Courses of 4 Credits each (Total Credit Hrs. 7X4) 1 Courses of 3 Credits each (Total Credit Hrs. 1X3) | 31 |
| 3 | PCC - Professional core courses | 4 Courses of 3 Credits each (Total Credit Hrs. 4X3) 10 Courses of 4 Credits each (Total Credit Hrs. 10X4) | 52 |
| 5 | PEC - Professional Elective courses | 5 Courses of 4 Credits each (Total Credit Hrs. 5X4) 1 Courses of 3 Credits each (Total Credit Hrs. 1X3) 1 Course of 1 Credits each (Total Credit Hrs. 1X1) | 24 |
| 6 | OEC - Open Elective courses | 2 Course of 3 Credits each (Total Credit Hrs.2X3) | 06 |
| 7 | SEC-Skill Enhancement Course | 6 Courses of 1 Credits each (Total Credit Hrs. 6X1) | 06 |
| 8 | LC - Laboratory course | 16 Courses of 1 Credits each (Total Credit Hrs. 16X1) 4 Courses of 2 Credits each (Total Credit Hrs. 4X2) | 24 |
| 9 | AECC-Ability Enhancement Compulsory Course | 1 Course of 3 Credits each (Total Credit Hrs.1X3) 2 Course of 2 Credits each (Total Credit Hrs.2X2) 1 Course of 3 Credits each (Total Credit Hrs.1X3) | 10 |
| 10 | PROJ-Skill based practical training & Industrial Training Report & Viva Voce for Dissertation | 1 Course of 5 Credits each (Total Credit Hrs. 1X5) 1 Course of 3 Credits each (Total Credit Hrs. 1X3) 2 Course of 2 Credits each (Total Credit Hrs. 2X2) | 12 |
| 11 | MOOC-Optional (credits will consider only in case a student fails to secure minimum required credits for the award of degree) | As per the approval of Hon'ble Vice Chancellor | - |
| Total Credits | | | 181 |

Contact hours include work related to Lecture, Tutorial and Practical (LTP), where our institution will have flexibility to decide course wise requirements.

B. Tech (Honours) Programme:

A new academic programme B.Tech. (Hons.) is introduced in order to facilitate the students to choose additionally the specialized courses of their choices and build their competence in a specialized area.

The features of the new programme, include:

1. B.Tech. Student in regular stream can opt for B.Tech. (Hons.), provided he/she passed in all courses with minimum aggregate 75% marks up to the end of second semester.
2. For B. Tech (Hons), Student needs to earn additional 24 credits (over and above the required minimum 180 credits) relevant to her/his discipline as recommended by the faculty advisor.
3. The students opting for this program have to take four additional courses of their specialization of a minimum of 2 credits each from 3rd to 8th semesters.
4. The faculty advisor will suggest the additional courses to be taken by the students based on their choice and level of their academic competence.

5. The list of such additional courses offered by the NPTEL will be approved by the Honorable Vice Chancellor in the beginning of the academic year to facilitate the registration process.
6. The student can also opt for post graduate level courses.
7. The students have to submit the NPTEL course completion certificate to exam division for considering as B.Tech. (Hons)
 - * Student should have to take permission of registration for the B.Tech. (Hons.) degree from Honourable Vice Chancellor in starting of third semester.

B. Choice Based Credit System (CBCS)

Choice Based Credit System (CBCS) is a versatile and flexible option for each student to achieve his/her target number of credits as specified by the AICTE/UGC and adopted by our University.

The following is the course module designed for the B.Tech. program:

- **Program Core Course (PCC):** Core courses of B.Tech. program will provide a holistic approach to engineering education, giving students an overview of the field, a basis to build and specialize upon. These core courses are the strong foundation to establish technical knowledge and provide broad multi-disciplined knowledge can be studied further in depth during the elective phase. The core courses will provide more practical-based knowledge, case-based lessons and collaborative learning models. It will train the students to analyze, decide, and lead-rather than merely know-while creating a common student experience that can foster deep understanding, develop decision-making ability and contribute to the society at large. A wide range of core courses provides groundwork in the basic engineering disciplines: Electrical Machines (Motors, Generators, and Transformers), Power Generation/Transmission/Distribution Systems etc. The integrated foundation is important for students because it will not only allow them to build upon existing skills, but they can also explore career options in a range of industries, and expand their understanding of various Technical fields. We offer core courses from semester III onwards during the B.Tech. program. There will be 3 and 4 credits for each core course offered.
- **Open Elective Course (OEC):** Open Elective is an interdisciplinary additional subject that is compulsory in a program. The score of Open Elective is counted in the overall aggregate marks under Choice Based Credit System (CBCS). Each Open Elective paper will be of 3 Credits in VII and VIII semesters. Each student has to take Open/Generic Electives from department other than the parent department. Core / Discipline Specific Electives will not be offered as Open Electives.
- **Ability Enhancement Compulsory Course (AECC):** This is a compulsory course that does not have any choice and will be 2, 3, 5 credits. Each student of B.Tech. Program has to compulsorily pass the Environmental Studies and acquire 3 credits respectively.
- **Skill Enhancement Course (SEC):** An Skill Enhancement Course is a credit course which is basically meant to enhance general ability of students in areas like soft skills, quantitative aptitude and reasoning ability - required for the overall development of a student and at the same time crucial for industry/corporate demands and requirements. The student possessing these skills will definitely develop acumen to perform well during the recruitment process of any premier organization and will have the desired confidence to face the interview. Moreover, these skills are also essential in day-to-day life of the corporate world. The aim is to nurture every student for making effective communication, developing aptitude and a general reasoning ability for a better performance, as desired in corporate world. There shall be four courses of Aptitude in Semester III, IV, V & VI semesters and two courses of Soft Skills in V & VI Semesters and will carry 2 credit, as compulsory for every student to pass these courses with minimum 45% marks.

- **Professional Elective courses (PEC):** The professional elective course is chosen to make students specialist or having specialized knowledge of a specific domain like Power system, Control system etc. It will be covered in three semesters (VI, VII & VIII) of Third and fourth years of the program relevant to chosen disciplines of core courses of the program. Each student will have to choose eight professional elective courses (PECs); 2 in Semester VI, 2 in Semester VII and 3 in Semester VIII respectively.

C. Program Outcomes for Engineering:

| | |
|---------|---|
| PO – 1 | Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems. |
| PO – 2 | Problem analysis& Solving: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. |
| PO – 3 | Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. |
| PO – 4 | Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions. |
| PO – 5 | Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations. |
| PO – 6 | Social Interaction & effective citizenship: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice. |
| PO – 7 | Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development. |
| PO – 8 | Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice. |
| PO – 9 | Attitude (Individual and team work): Function effectively as an individual, and as member or leader in diverse teams, and in multidisciplinary settings. |
| PO – 10 | Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clean instructions. |
| PO – 11 | Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments. |
| PO – 12 | Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. |
| PO-13 | Entrepreneurship: An Entrepreneurship cut across every sector of human life including the field of engineering, engineering entrepreneurship is the process of |

| | |
|-------|--|
| | harnessing the business opportunities in engineering and turning it into profitable commercially viable innovation. |
| PO-14 | Interpersonal skills: Interpersonal skills involve the ability to communicate and build relationships with others. Effective interpersonal skills can help the students during the job interview process and can have a positive impact on your career advancement. |
| PO-15 | Technology savvy/usage: Being technology savvy is essentially one's skill to be smart with technology. This skill reaches far beyond 'understanding' the concepts of how technology works and encompasses the 'utilization' of such modern technology for the purpose of enhancing productivity and efficiency. |

D. Programme Specific Outcomes (PSOs)

The learning and abilities or skills that a student would have developed by the end of four-year Bachelor of Technology in Electrical Engineering Program:

| | |
|---------|--|
| PSO – 1 | Understanding the basics of electrical systems that efficiently generate, transmit, distribute and utilize electrical power. |
| PSO – 2 | Applying various software tools to specify, design, implement and test analog & digital signal processing based electrical/electronic systems using the state of the art components. |
| PSO – 3 | Analysing and designing electrical machinery, electrical/electronic circuits, electrical/solid state drive systems, lighting systems. |
| PSO – 4 | Analysing, designing and implementing the state of art in electrical instrumentation, control and automation applications. |
| PSO – 5 | Analysing and Designing Solar System, Electrical vehicle, Internet of Things based applications. |
| PSO – 6 | Designing and implementing electrical, electronics & allied interdisciplinary projects to meet the demands of industry and to provide solutions to the real time problems. |

E. Pedagogy & Unique practices adopted:

“Pedagogy is the method and practice of teaching, especially for teaching an academic subject or theoretical concept”. In addition to conventional time-tested lecture method, the institute will emphasize on experiential learning.

- **Audio-Visual Based Learning:** These days technology has taken a front seat and classrooms are well equipped with equipment and gadgets. Video-based learning has become an indispensable part of learning. Similarly, students can learn various concepts through video lectures. In fact, many teachers give examples from movies during their discourses. Making students learn few important theoretical concepts through Audio visual Aids is a good idea and method. The learning becomes really interesting and easy as videos add life to concepts and make the learning engaging and effective. Therefore, our institute is promoting *Audio-Visual Based Learning* wherever possible.
- **Field / Live Projects:** The students, who take up experiential projects in companies, where senior executives with a stake in teaching guide them, drive the learning. All students are encouraged to do some live project other than their regular classes.
- **Industrial Visits:** Industrial visit are essential to give students hand-on exposure and experience of how things and processes work in industries. Our institute organizes such visits to enhance students' exposure to practical learning and work out for a report of such a visit relating to their specific topic, course or even domain.

- **MOOCs:** Students may earn credits by passing MOOCs as decided by the college. Graduate level programs may award Honors degree provided students earn pre-requisite credits through MOOCs.

University allows students to undertake additional subjects/course(s) (In-house offered by the university through collaborative efforts or courses in the open domain by various internationally recognized universities) and to earn additional credits on successful completion of the same. Each course will be approved in advance by the University following the standard procedure of approval and will be granted credits as per the approval.

Keeping this in mind, University proposed and allowed a maximum of two credits to be allocated for each MOOC courses. In the pilot phase it is proposed that a student undertaking and successfully completing a MOOC course through only NPTEL could be given 2 credits for each MOOC course.

For smooth functioning and monitoring of the scheme the following shall be the guidelines for MOOC courses, Add-on courses carried out by the College from time to time.

- a) This is recommended for every student to take at least one MOOC Course throughout the programme.
 - b) There shall be a MOOC co-ordination committee in the College with a faculty at the level of Professor heading the committee and all Heads of the Department being members of the Committee.
 - c) The Committee will list out courses to be offered during the semester, which could be requested by the department or the students and after deliberating on all courses finalize a list of courses to be offered with 2 credits defined for each course and the mode of credit consideration of the student. The complete process shall be obtained by the College before end of June and end of December for Odd and Even semester respectively of the year in which the course is being offered. In case of MOOC course, the approval will be valid only for the semester on offer.
 - d) Students will register for the course and the details of the students enrolling under the course along with the approval of the Vice Chancellor will be forwarded to the Examination department within fifteen days of start of the semester by the Coordinator MOOC through the Principal of the College.
 - e) After completion of MOOC course, Student will submit the photo copy of Completion certificate of MOOC Course to the Examination cell as proof.
 - f) Marks will be considered which is mentioned on Completion certificate of MOOC Course.
 - g) College will consider the credits only in case a student fails to secure minimum required credits then the additional subject(s) shall be counted for calculating the minimum credits required for the award of degree.
- **Special Guest Lectures (SGL) & Extra Mural Lectures (EML):** Some topics/concepts need extra attention and efforts as they either may be high in difficulty level or requires experts from specific industry/domain to make things/concepts clear for a better understanding from the perspective of the industry. Hence, to cater to the present needs of industry we organize such lectures, as part of lecture-series and invite prominent personalities from academia and industry from time to time to deliver their vital inputs and insights.
 - **Student Development Programs (SDP):** Harnessing and developing the right talent for the right industry an overall development of a student is required. Apart from the curriculum teaching various student development programs (training programs) relating to soft skills, interview skills, SAP, Advanced excel training etc. that may be required as per the need of the student and industry trends, are conducted across the whole program. Participation in such programs is solicited through volunteering and consensus.
 - **Industry focused programs:** Establishing collaborations with various industry partners to deliver the programme on sharing basis. The specific courses are to be delivered by industry experts to provide practice based insight to the students.

- **Special assistance program for slow learners & fast learners:** There is a provision of identify slow learners; develop the mechanism to correcting knowledge gap through result analysis of various class tests. Extra classes will be arranged for slow learners and facilitate them with required study material. There are some terms of advance topics what learning challenging it will be provided to the fast learners.
- **Induction program:** Every year 3 weeks induction program is organized for 1st year students to make them familiarize with the entire academic environment of university including Curriculum, Classrooms, Labs, Faculty/ Staff members, Academic calendar and various activities.
- **Mentoring scheme:** There is Mentor-Mentee system. One mentor lecture is provided per week in a class. Students can discuss their problems with mentor who is necessarily a teaching faculty. In this way, student's problems or issues can be identified and resolved.
- **Extra-curricular Activities:** organizing & participation in extracurricular activities will be mandatory to help students develop confidence & face audience boldly. It brings out their leadership qualities along with planning & organizing skills. Students undertake various cultural, sports and other competitive activities within and outside then campus. This helps them build their wholesome personality.
- **Career & Personal Counseling:** - Identifies the problem of student as early as possible and gives time to discuss their problems individually as well as with the parents. Counseling enables the students to focus on behavior and feelings with a goal to facilitate positive change. Its major role lies in giving: Advice, Help, Support, Tips, Assistance, and Guidance. Strategies: a) Once in a week the counselors meet the students in order to inquire about problems. b) Available 24x7 on SOS basis.
- **Participation in Workshops, Seminars & writing & Presenting Papers:** Departments plan to organize the workshops, Seminars & Guest lecturers time to time on their respective topics as per academic calendar. Students must have to attend these programs. This participation would be count in the marks of general Discipline & General Proficiency which is the part of course scheme as noncredit course.
- **Formation of Student Clubs, Membership & Organizing & Participating events:** Every department has the departmental clubs with the specific club name. The entire student's activity would be performed by the club. One faculty would be the coordinator of the student clubs & students would be the members with different responsibility.
- **Capability Enhancement & Development Schemes:** The Institute has these schemes to enhance the capability and holistic development of the students. Following measures/ initiatives are taken up from time to time for the same: Career Counseling, Soft skill development, Remedial Coaching, Bridge Course, Language Lab, Yoga and Meditation, Personal Counseling
- **Library Visit & Utilization of E-Learning Resources:** Student can visit the library from morning 10 AM to evening 8 PM. Library created its resources Database and provided Online Public Access Catalogue (OPAC) through which users can be accessed from any of the computer connected in the LAN can know the status of the book. Now we are in process to move from OPAC to KOHA.
 - a) Institute Library & Information is subscribing online e-books and e-journals databases (DELNET and EBSCO host E-databases) as per the requirement of the institute and fulfilling AICTE norms. IP based access is given to all computers connected on campus LAN to access e-journals.
 - b) For the effective utilisation of resources, Information Literacy training programs are conducted to the staff and students.
 - c) Wi-Fi enabled campus
 - d) Regular addition of latest books and journals
 - e) Well maintained e-library to access e-resources

Study & Evaluation Scheme
B.Tech. (Electrical Engineering)-Semester I

| S. No | Category | Course Code | Course | Periods | | | Credit | Evaluation Scheme | | |
|--------------|----------|-------------|-------------------------------------|-----------|----------|-----------|-----------|-------------------|------------|------------|
| | | | | L | T | P | | Internal | External | Total |
| 1 | BSC-1 | EAS116 | Engineering Mathematics-I | 3 | 1 | - | 4 | 40 | 60 | 100 |
| 2 | BSC-2 | EAS112/212 | Engineering Physics | 3 | 1 | - | 4 | 40 | 60 | 100 |
| | | EAS113/213 | Engineering Chemistry | | | | | | | |
| 3 | ESC-1 | EEE117/217 | Basic Electrical Engineering | 3 | 1 | - | 4 | 40 | 60 | 100 |
| | | EEC111/211 | Basic Electronics Engineering | | | | | | | |
| 4 | AECC-1 | TMU101 | Environmental Studies | 2 | 1 | - | 3 | 40 | 60 | 100 |
| 5 | AECC-2 | TGE103 | English Communication- I | 1 | - | 2 | 2 | 40 | 60 | 100 |
| 6 | LC-1 | EAS162/262 | Engineering Physics (Lab) | - | - | 2 | 1 | 50 | 50 | 100 |
| | | EAS163/263 | Engineering Chemistry (Lab) | | | | | | | |
| 7 | LC-2 | EEE161/261 | Basic Electrical Engineering (Lab) | - | - | 2 | 1 | 50 | 50 | 100 |
| | | EEC161/261 | Basic Electronics Engineering (Lab) | | | | | | | |
| 8 | LC-3 | EME161/261 | Engineering Drawing (Lab) | - | - | 4 | 2 | 50 | 50 | 100 |
| | | EME162/262 | Workshop Practice (Lab) | | | | | | | |
| 9 | DGP-1 | EGP111 | Discipline & General Proficiency | - | - | - | - | 100 | - | 100 |
| Total | | | | 12 | 4 | 10 | 21 | 450 | 450 | 900 |

CSV

Semester II

| S. No | Category | Course Code | Course | Periods | | | Credit | Evaluation Scheme | | |
|--------------|----------|-------------|--|-----------|----------|-----------|-----------|-------------------|------------|-------------|
| | | | | L | T | P | | Internal | External | Total |
| 1 | BSC-3 | EAS211 | Engineering Mathematics-II | 3 | 1 | - | 4 | 40 | 60 | 100 |
| 2 | BSC-4 | EAS212/112 | Engineering Physics | 3 | 1 | - | 4 | 40 | 60 | 100 |
| | | EAS213/113 | Engineering Chemistry | | | | | | | |
| 3 | ESC-2 | EEE217/117 | Basic Electrical Engineering | 3 | 1 | - | 4 | 40 | 60 | 100 |
| | | EEC211/111 | Basic Electronics Engineering | | | | | | | |
| 4 | ESC-3 | ECS212 | Computer System & Programming in C++ | 3 | - | - | 3 | 40 | 60 | 100 |
| 5 | AECC-3 | TGE203 | English Communication- II | 1 | - | 2 | 2 | 40 | 60 | 100 |
| 6 | LC-4 | EAS262/162 | Engineering Physics (Lab) | - | - | 2 | 1 | 50 | 50 | 100 |
| | | EAS263/163 | Engineering Chemistry (Lab) | | | | | | | |
| 7 | LC-5 | EEE261/161 | Basic Electrical Engineering (Lab) | - | - | 2 | 1 | 50 | 50 | 100 |
| | | EEC261/161 | Basic Electronics Engineering (Lab) | | | | | | | |
| 8 | LC-6 | ECS262 | Computer System & Programming in C++ (Lab) | - | - | 2 | 1 | 50 | 50 | 100 |
| 9 | LC-7 | EME261/161 | Engineering Drawing (Lab) | - | - | 4 | 2 | 50 | 50 | 100 |
| | | EME262/162 | Workshop Practice (Lab) | | | | | | | |
| 10 | DGP-2 | EGP211 | Discipline & General Proficiency | - | - | - | - | 100 | - | 100 |
| Total | | | | 13 | 3 | 12 | 22 | 500 | 500 | 1000 |

8/2

B.Tech. (Electrical Engineering)-Semester III

| S. No | Category | Course Code | Course | Periods | | | Evaluation Scheme | | | Total |
|--------------|----------|-------------|-------------------------------------|-----------|----------|----------|-------------------|------------|------------|------------|
| | | | | L | T | P | Credit | Internal | External | |
| 1 | PCC-1 | EEE311 | Electrical Machines – I | 3 | 1 | - | 4 | 40 | 60 | 100 |
| 2 | PCC-2 | EEE312 | Circuit Theory | 3 | 1 | - | 4 | 40 | 60 | 100 |
| 3 | ESC-4 | EEC311 | Engineering Electromagnetics | 3 | 1 | - | 4 | 40 | 60 | 100 |
| 4 | ESC-5 | EEC312 | Digital Logic & Circuits | 3 | 1 | - | 4 | 40 | 60 | 100 |
| 5 | ESC-6 | EEC315 | Signals & Systems | 3 | 1 | - | 4 | 40 | 60 | 100 |
| 6 | LC-8 | EEE361 | Electrical Machines – I (Lab) | - | - | 2 | 1 | 50 | 50 | 100 |
| 8 | LC-9 | EEC361 | Digital Logic & Circuits (Lab) | - | - | 2 | 1 | 50 | 50 | 100 |
| 9 | SEC-1 | TGC307 | Foundation in Quantitative Aptitude | - | - | 2 | 1 | 50 | 50 | 100 |
| 10 | DGP-3 | EGP311 | Discipline & General Proficiency | - | - | - | - | 100 | - | 100 |
| Total | | | | 15 | 5 | 6 | 23 | 450 | 450 | 900 |

Following additional Course for Lateral Entry Students with B.Sc./Polytechnic background to be taken in III semester and all should pass with minimum of 45% marks for obtaining the degree: credits will not be added

| | | | | | | | | | | |
|---|----|------------|---------------------------|---|---|---|---|----|----|-----|
| 1 | LC | EME161/261 | Engineering Drawing (Lab) | - | - | 4 | - | 50 | 50 | 100 |
| 2 | | TMU101 | Environmental Studies | 2 | 1 | - | - | 40 | 60 | 100 |

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B.Tech. (Electrical Engineering)-Semester IV

| S. No | Category | Course Code | Course | Periods | | | Evaluation Scheme | | | |
|--------------|----------|-------------|---|-----------|----------|-----------|-------------------|------------|------------|-------------|
| | | | | L | T | P | Credit | Internal | External | Total |
| 1 | PCC-3 | EEE411 | Electrical Machines – II | 3 | 1 | - | 4 | 40 | 60 | 100 |
| 2 | PCC-4 | EEE412 | Electrical Measurements and Measuring Instruments | 3 | - | - | 3 | 40 | 60 | 100 |
| 3 | PCC-5 | EEE413 | Network Analysis & Synthesis | 3 | 1 | - | 4 | 40 | 60 | 100 |
| 4 | ESC-7 | EEC419 | Analog Electronics | 3 | 1 | - | 4 | 40 | 60 | 100 |
| 5 | LC-10 | EEE461 | Electrical Machines – II (Lab) | - | - | 2 | 1 | 50 | 50 | 100 |
| 6 | LC-11 | EEE462 | Electrical Measurements and Measuring Instruments (Lab) | - | - | 2 | 1 | 50 | 50 | 100 |
| 7 | LC-12 | EEE463 | Network Analysis & Synthesis (Lab) | - | - | 2 | 1 | 50 | 50 | 100 |
| 8 | LC-13 | EEC469 | Analog Electronics Lab (Lab) | - | - | 2 | 1 | 50 | 50 | 100 |
| 9 | SEC-2 | TGC407 | Analytical Reasoning | - | - | 2 | 1 | 50 | 50 | 100 |
| 10 | DGP-4 | EGP411 | Discipline & General Proficiency | - | - | - | - | 100 | - | 100 |
| Total | | | | 12 | 3 | 10 | 20 | 510 | 490 | 1000 |

*Skill based Training/Internship of 4 weeks duration from a reputed Industry/organization after completion of 4th semester end-semester examination.

Following additional Courses for Lateral Entry Students with B.Sc./Polytechnic background to be taken in IV semester and all should pass with minimum of 45% marks for obtaining the degree: credits will not be added

| | | | | | | | | | | |
|---|----|------------|-------------------------|---|---|---|---|----|----|-----|
| 1 | LC | EME162/262 | Workshop Practice (Lab) | - | - | 4 | - | 50 | 50 | 100 |
|---|----|------------|-------------------------|---|---|---|---|----|----|-----|

SWZ

B.Tech. (Electrical Engineering)-Semester V

| S. No | Category | Course Code | Course | Periods | | | Evaluation Scheme | | | |
|-------|----------|-------------|---|-----------|----------|-----------|-------------------|------------|------------|-------------|
| | | | | L | T | P | Credit | Internal | External | Total |
| 1 | PCC-6 | EEE511 | Control Systems | 3 | 1 | - | 4 | 40 | 60 | 100 |
| 2 | PCC-7 | EEE512 | Power Electronics | 3 | 1 | - | 4 | 40 | 60 | 100 |
| 3 | PCC-8 | EEE513 | Power System Analysis-I | 3 | 1 | - | 4 | 40 | 60 | 100 |
| 4 | ESC-8 | EEC511 | Microprocessor & Applications | 3 | 1 | - | 4 | 40 | 60 | 100 |
| 5 | LC-14 | EEE561 | Control Systems (Lab) | - | - | 2 | 1 | 50 | 50 | 100 |
| 6 | LC-15 | EEE562 | Power Electronics (Lab) | - | - | 2 | 1 | 50 | 50 | 100 |
| 7 | LC-16 | EEC561 | Microprocessor & Applications (Lab) | - | - | 2 | 1 | 50 | 50 | 100 |
| 8 | PROJ-1 | EEE592 | Skill based Practical Training Presentation | - | - | - | 2 | 50 | 50 | 100 |
| 9 | SEC-3 | TGC507 | Modern Algebra and Data Management | - | - | 2 | 1 | 50 | 0 | 100 |
| 10 | SEC-4 | TGC502 | Self Management for Engineers | - | - | 2 | 1 | 50 | 50 | 100 |
| 11 | DGP-5 | EGP511 | Discipline & General Proficiency | - | - | - | - | 100 | - | 100 |
| | | | Total | 12 | 4 | 10 | 23 | 560 | 540 | 1100 |

MOOC Course:

| | | | | | | | | | | |
|---|--------|--------|----------------------------|---|---|---|---|---|-----|-----|
| 1 | MOOC-1 | MOOC01 | MOOC Program -I (Optional) | - | - | - | 2 | - | 100 | 100 |
|---|--------|--------|----------------------------|---|---|---|---|---|-----|-----|

52

B.Tech. (Electrical Engineering)-Semester VI

| No | Category | Course Code | Course | Periods | | | Evaluation Scheme | | | |
|----|----------|-------------|--|--------------------|----------|----------|-------------------|------------|------------|-------------|
| | | | | L | T | P | Credit | Internal | External | Total |
| 1 | PCC-9 | EEE611 | Electrical Drives & Controls | 3 | 1 | - | 4 | 40 | 60 | 100 |
| 2 | PCC-10 | EEE612 | Power System Analysis-II | 3 | 1 | - | 4 | 40 | 60 | 100 |
| 3 | PEC-1 | | Program Elective | 3 | 1 | - | 4 | 40 | 60 | 100 |
| 4 | PEC-2 | | | Program Elective-I | 3 | 1 | - | 4 | 40 | 60 |
| 5 | PCC-11 | EEE613 | Electric Vehicle | 3 | 1 | - | 4 | 40 | 60 | 100 |
| 6 | AECC-4 | EHM613 | Human values & Professional Ethics | 3 | - | - | 3 | 40 | 60 | 100 |
| 7 | LC-17 | EEE661 | Electrical Drives & Controls (Lab) | - | - | 2 | 1 | 50 | 50 | 100 |
| 8 | LC-18 | EEE665 | Modelling & Simulation using MATLAB-Simulink (Lab) | - | 1 | 2 | 2 | 50 | 50 | 100 |
| 9 | SEC-5 | TGC607 | Advance Algebra and Geometry | - | - | 2 | 1 | 50 | 50 | 100 |
| 10 | SEC-6 | TGC602 | Workplace Management for Engineers | - | - | 2 | 1 | 50 | 50 | 100 |
| 11 | DGP-6 | EGP611 | Discipline & General Proficiency | - | - | - | - | 100 | - | 100 |
| | | | Total | 18 | 6 | 8 | 28 | 540 | 560 | 1100 |

*Industrial Training of 6 weeks duration from a reputed Industry/organization after completion of 6th semester end-semester examination.

MOOC Course:

| | | | | | | | | | | |
|---|--------|--------|-----------------------------|---|---|---|---|---|-----|-----|
| 1 | MOOC-2 | MOOC02 | MOOC Program -II (Optional) | - | - | - | 2 | - | 100 | 100 |
|---|--------|--------|-----------------------------|---|---|---|---|---|-----|-----|

852

B.Tech. (Electrical Engineering)-Semester VII

| S. No | Category | Course Code | Course | Periods | | | Evaluation Scheme | | | |
|-------|----------|-------------|--|---------------------|------------|--------------|-------------------|----------------|----------------|-------------|
| | | | | L | T | P | Credit | Internal | External | Total |
| 1 | PCC-12 | EEE711 | Switchgear & Protection | 3 | - | - | 3 | 40 | 60 | 100 |
| 2 | PCC-13 | EEE712 | Energy Sources for Electric Vehicle | 3 | - | - | 3 | 40 | 60 | 100 |
| 3 | PEC-3 | | Program Elective-III | 3 | 1 | - | 4 | 40 | 60 | 100 |
| 4 | PEC-4 | | | Program Elective-IV | 3 | - | - | 3 | 40 | 60 |
| 5 | OEC-1 | | Open Elective-I | 3 | - | - | 3 | 40/50 | 60/50 | 100 |
| 6 | LC-19 | EEE761 | Switchgear & Protection (Lab) | - | - | 2 | 1 | 50 | 50 | 100 |
| 7 | LC-20 | EEC761 | Electronics Devices & Circuits (Lab) | - | - | 4 | 2 | 50 | 50 | 100 |
| | | EEC762 | Design and installation of Solar Photovoltaic System (Lab) | - | 1 | 2 | | | | |
| 8 | PROJ-2 | EEE792 | Industrial Training & Presentation | - | - | - | 2 | 50 | 50 | 100 |
| 9 | PROJ-3 | EEE798 | Project Work Phase-1 | 1 | - | 8 | 5 | 100 | - | 100 |
| 10 | DGP-7 | EGP711 | Discipline & General Proficiency | - | - | - | - | 100 | - | 100 |
| | | | Total | 16 | 1/2 | 14/12 | 26 | 550/560 | 450/440 | 1000 |

MOOC Course:

| | | | | | | | | | | |
|---|--------|--------|------------------------------|---|---|---|---|---|-----|-----|
| 1 | MOOC-3 | MOOC03 | MOOC Program -III (Optional) | - | - | - | 2 | - | 100 | 100 |
|---|--------|--------|------------------------------|---|---|---|---|---|-----|-----|

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B.Tech. (Electrical Engineering)-Semester VIII

| Sl. No. | Category | Course Code | Course | Periods | | | Evaluation Scheme | | | |
|--------------|----------|-------------|----------------------------------|---------------------|----------|-----------|-------------------|----------------|----------------|------------|
| | | | | L | T | P | Credit | Internal | External | Total |
| 1 | PCC-14 | EEE811 | Electric Power System Operation | 3 | - | - | 3 | 40 | 60 | 100 |
| 2 | PEC-5 | | Program Elective | 3 | 1 | - | 4 | 40 | 60 | 100 |
| 3 | PEC-6 | | | Program Elective-VI | 3 | 1 | - | 4 | 40 | 60 |
| 4 | PEC-7 | | Program Elective (Lab) | - | - | 2 | 1 | 50 | 50 | 100 |
| 5 | OEC-2 | | Open Elective | 3 | - | - | 3 | 40/50 | 60/50 | 100 |
| 6 | PROJ-4 | EEE898 | Project Work Phase -II | 1 | - | 4 | 3 | 50 | 50 | 100 |
| 7 | DGP-8 | EGP811 | Discipline & General Proficiency | - | - | - | - | 100 | - | 100 |
| Total | | | | 13 | 2 | 06 | 18 | 360/370 | 340/330 | 700 |

MOOC Course:

| | | | | | | | | | | |
|---|--------|--------|-----------------------------|---|---|---|---|---|-----|-----|
| 1 | MOOC-4 | MOOC04 | MOOC Program -IV (Optional) | - | - | - | 2 | - | 100 | 100 |
|---|--------|--------|-----------------------------|---|---|---|---|---|-----|-----|

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ELECTIVE COURSES OFFERED

| S.No | Code | Course | L | T | P | Credit |
|--|--------|---|---|---|---|--------|
| Semester VI - Program Elective I-(Any one) | | | | | | |
| Specialization: Signal Processing | | | | | | |
| 1 | EEC612 | Embedded System | 3 | 1 | 0 | 4 |
| 2 | EEC617 | Microcontroller Hardware, Programming & its Application (Arduino) | 3 | 1 | 0 | 4 |
| Semester VI - Program Elective II -(Any one) | | | | | | |
| Specialization: Soft Computing Techniques | | | | | | |
| 3 | EEE620 | Artificial Neural Network | 3 | 1 | 0 | 4 |
| 4 | EEE621 | Advanced Control System | 3 | 1 | 0 | 4 |
| 5 | ECS611 | Database Management System | 3 | 1 | 0 | 4 |
| 6 | ECS631 | Network security & cryptography | 3 | 1 | 0 | 4 |
| Semester VII- Program Elective III -(Any one) | | | | | | |
| Specialization: Power System Engineering | | | | | | |
| 7 | EEE713 | High Voltage Engineering | 3 | 1 | 0 | 4 |
| 8 | EEE714 | Power Generation Systems | 3 | 1 | 0 | 4 |
| 9 | EEE715 | Power Electronic Applications for EV Charging | 3 | 1 | 0 | 4 |
| Semester VII- Program Elective IV-(Any one) | | | | | | |
| Specialization: Industrial Management Theory | | | | | | |
| 10 | EHM731 | Principle of Management | 3 | 0 | 0 | 3 |
| 11 | EHM732 | Industrial Sociology | 3 | 0 | 0 | 3 |
| 12 | EHM733 | Organizational Behavior | 3 | 0 | 0 | 3 |
| 13 | EHM734 | Engineering and Managerial Economics | 3 | 0 | 0 | 3 |
| Semester VIII- Program Elective V-(Any one) | | | | | | |
| Specialization: Semiconducting Devices and power Transmission | | | | | | |
| 15 | EEE812 | FACTS Technology | 3 | 1 | 0 | 4 |
| 17 | EEE821 | EHV AC/DC Transmission | 3 | 1 | 0 | 4 |
| Semester VIII- Program Elective VI-(Any one) | | | | | | |
| Specialization: Industrial application | | | | | | |
| 18 | EHM831 | Machine learning & Data Analytics | 3 | 1 | 0 | 4 |
| 19 | EHM832 | Total Quality Management | 3 | 1 | 0 | 4 |
| 20 | EHM833 | Entrepreneurship | 3 | 1 | 0 | 4 |
| Semester VIII- Program Elective VII (Lab)-(Any one) | | | | | | |
| 21 | EEE861 | Power System Simulation (Lab) | 0 | 0 | 2 | 1 |
| 23 | EEE862 | Electric Vehicle (Lab) | 0 | 0 | 2 | 1 |

SWZ

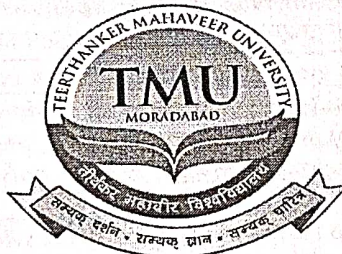
Study & Evaluation Scheme

of

Diploma in Electrical Engineering

[Applicable w.e.f. Academic Session - 2023-24 till revised]

[As per CBCS guidelines given by UGC]



Accredited with NAAC **A** Grade

12-B Status from UGC

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TEERTHANKER MAHAVEER UNIVERSITY

N.H.-24, Delhi Road, Moradabad, Uttar Pradesh-244001

Website: www.tmu.ac.in



TEERTHANKER MAHAVEER UNIVERSITY
(Established under Govt. of U.P. Act No. 30, 2008)
Delhi Road, Bagarpur, Moradabad (U.P.)

| <i>Study & Evaluation Scheme</i> | |
|--|---|
| SUMMARY | |
| <i>Institute Name</i> | Faculty of Engineering, T.M.U., Moradabad |
| <i>Program</i> | Diploma in Engineering (Electrical) |
| <i>Duration</i> | Three Years full time (Six Semesters) |
| <i>Medium</i> | English/Hindi |
| <i>Minimum Required Attendance</i> | 75% |
| Credits | |
| <i>Maximum Credits</i> | 167 |
| <i>Minimum Credits Required for Degree</i> | 163 |

| Assessment: | | | | | |
|---|---------------------|---------------------|----------------------|--|--------------|
| Evaluation | | | Internal | External | Total |
| Theory | | | 40 | 60 | 100 |
| Practical/ Dissertations/ Project reports/ Viva-Voce | | | 50 | 50 | 100 |
| Class Test-1 | Class Test-2 | Class Test-3 | Assignment(s) | Attendance & Participa tion | Total |
| Best two out of three | | | | | |
| 10 | 10 | 10 | 10 | 10 | 40 |
| Duration of Examination | | | External | Internal | |
| | | | 3 Hours | 1.5 Hours | |

To qualify the course a student is required to secure a minimum of 45% marks in aggregate including the semester end examination and teachers continuous evaluation. (i.e. both internal and external). A candidate who secures less than 45% of marks in a course shall be deemed to have failed in that course. The student should have at least 45% marks in aggregate to clear the semester.

| Question Paper Structure | |
|---------------------------------|---|
| 1 | The question paper shall consist of six questions. Out of which first question shall be of short answer type (not exceeding 50 words) and will be compulsory. Question no. 2 to 6 (from Unit-I to V) shall have explanatory answers (approximately 350 to 400 words) along with having an internal choice within each unit. |
| 2 | Question No. 1 shall contain 8 parts from all units of the syllabus with at least one question from each unit and students shall have to answer any five, each part will carry 2 marks. |
| 3 | The remaining five questions shall have internal choice within each unit; each question will carry 10 marks. |

| IMPORTANT NOTES: | |
|-------------------------|--|
| 1 | The purpose of examination should be to assess the Course Outcomes (CO) that will ultimately lead to of attainment of Program Specific Outcomes (PSOs). A question paper must assess the following aspects of learning: Remember, Understand, Apply, Analyze, Evaluate & Create (reference to Bloom's Taxonomy). |
| 2 | There shall be continuous evaluation of the student. |

Signature

Program Structure – Diploma in Engineering

A. Introduction:

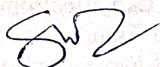
Diploma in Engineering is a backbone of all innovation to build the nation, by imparting quality skill development and training in emerging field. It achieve excellence in innovation simultaneously respond to the demand of the society by engaging in lifelong learning and earning. They usually involve in analyzing and providing solutions to real life situations.

Diploma in Engineering program has evergreen scope as it gives enormous job opportunities from local to international companies and secures life-long career. Today no technical innovation is possible without the help of core branches of Diploma in Engineering i.e. Civil, Computer, Electronics & Communication, Electrical and Mechanical. Curriculum for Diploma in engineering degree trains the students to work in the vast range of Engineering sectors. To develop understanding of scientific principles and analytical ability, its curriculum starts with courses in basic sciences. These are followed by courses in engineering sciences to offer a smooth transition from basic sciences to professional Diploma in Engineering courses. Teaching of subjects in Basic Sciences and Humanities incorporated to develop appreciation of the impact and scope of science and technology on society. Attention is also paid to develop communication skills in English language. In addition, the program consisted of six semesters not only includes teaching of core courses but also includes program elective, field work/project, value added and open elective courses. The University strives to cultivate among its students a strong desire and capacity for continuous learning as well as self-appraisal to develop sterling human & professional qualities and a strong sense of service to society through designed, curricular, co-curricular activities and congenial campus environment.

After completing their Diploma in Engineering, students hold lucrative opportunities in many renowned industries, some launch their own start-ups, while some appears for B. Tech. to pursue higher studies in the chosen specializations. Diploma in Engineering holders will have ample opportunities in industries like Telecommunication, Automobile and Electronics equipment manufacturing, production, construction in real states etc. It has application right from manufacturing plants, vehicles, ships, robots, heating and cooling systems, aircrafts, even in medical devices. Mechanical engineers are generally hired by manufacturing industries, defense, PWD and Telegraphs etc. Electronic and electrical engineers have opportunities in many industries, with the main areas being in electronics, IT, manufacturing, power, transport, construction, telecommunications, research and development, and petrochemicals. Civil engineers have abundant chances in construction of new set up and building in real state.

Each branch specific in Diploma in Engineering not only provides the environment of solutions to the problems faced by human being but also facilitates the universe with advance technology. Diploma in Engineering demands creativity, technical, analytical and problem-solving skills as whole sole interest to soar high in this career. Engineers are considered as creator and innovator of advancements in future. So be the part of Diploma in engineering society and be the creator and innovator!!!

Contact hours include work related to Lecture, Tutorial and Practical (LTP), where our institution will have flexibility to decide course wise requirements.



| Diploma: Three-Years (6-Semester) CBCS Program | | | |
|--|--|--|---------------|
| Basic Structure: Distribution of Courses | | | |
| S. No. | Type of Course | Credit Hours | Total Credits |
| 1 | Core Course (CC) | 8 Courses of 4 Credit each (Total Credit 8X4) 2 Courses of 2 Credit each (Total Credit 2X2) 6 Courses of 1 Credit each (Total Credit 6X1) | 42 |
| 2 | Discipline Specific Course (DSC) | 14 Courses of 4 Credit each (Total Credit 14X4) 6 Courses of 2 Credit each (Total Credit 6X2) 6 Courses of 1 Credit each (Total Credit 6X1) | 74 |
| 3 | Ability-Enhancement Compulsory Course (AECC) | 4 Courses of 3 Credit each (Total Credit 4X3) 2 Courses of 2 Credit each (Total Credit 2X2) | 16 |
| 4 | Generic Elective Course (GEC) | 2 Courses of 3 Credit each (Total Credit 2X3) | 6 |
| 5 | Discipline Specific Elective Course (DSEC) | 2 Course of 4 Credit each (Total Credit 2X4) | 8 |
| 6 | Value Added Course (VAC) | 1 Courses of 0 Credit each (Total Credit 1X0) | 0 |
| 7 | Skill Enhancement Course (SEC) | 4 Courses of 1 Credit each (Total Credit 4X1) 1 Courses of 3 Credit each (Total Credit 1X3) 1 Courses of 8 Credit each (Total Credit 1X8) 1 Courses of 6 Credit each (Total Credit 1X6) | 21 |
| Total Credits | | | 167 |

B. Choice Based Credit System (CBCS)

Choice Based Credit System (CBCS) is a versatile and flexible option for each student to achieve his target number of credits as specified by the UGC and adopted by our University.

The following is the course module designed for the Diploma in engineering program:

Core Course (CC): Core courses of Diploma program will provide a holistic approach to Diploma in Engineering, giving students an overview of the field, a basis to build and specialize upon. These core courses are the strong foundation to establish engineering knowledge and provide broad multi-disciplined knowledge can be studied further in depth during the elective phase.

The Core courses will provide more practical-based knowledge, case-based lessons and collaborative learning models. It will train the students to analyze, decide, and lead-rather than merely know-while creating a common student experience that can foster deep understanding, develop decision-making ability and contribute to the engineering and community at large.

A wide range of Core courses with four credits hours each provides groundwork in the engineering disciplines: Applied Physics, Applied Chemistry, Applied Mathematics, Applied Mechanics, Computer Fundamentals, Internet & MS office, Basic Civil & Electrical Engineering, & Basic of Electronics and Mechanical Engineering, Physics Lab, Chemistry Lab, Electrical Engineering Lab, Electronics Engineering Lab Information Technology Lab & Workshop Practice etc. The integrated foundation is important for students because it will not only allow them to build upon existing skills, but they can also explore career options in a range of industries, and expand their understanding of various business fields.

852

We offer 16 Core courses with different credits (4, 2 & 1 credits) during the Diploma Program.

Ability Enhancement Compulsory Course (AECC): As per the guidelines of Choice Based Credit System (CBCS) for all Universities, including the private Universities, the Ability Enhancement Compulsory Course (AECC) is a course designed to develop the ability of students in communication (especially English) and other related courses where they might find it difficult to communicate at a higher level in their prospective job at a later stage due to lack of practice and exposure in the language, etc. Students are motivated to learn the theories, fundamentals and tools of communication which can help them develop and sustain in the corporate environment and culture.

Generic Elective Course (GEC): Generic Elective is an interdisciplinary additional subject that is compulsory in the fifth and sixth semester of a program. The score of Generic Elective is counted in your overall aggregate marks under Choice Based Credit System (CBCS). Each Generic Elective paper will be of 3 credits and students will have the choice of taking 2 GECs, one in each Semester V & VI. Each student has to take Generic Electives from department other than the parent department. Discipline Specific Electives will not be offered as Generic Electives.

Discipline Specified Course (DSC): These are discipline specific course that do not have any choice and will be of different credits (4, 3, 2 & 1 credits) each. Each student of Diploma in engineering program has to compulsorily pass the discipline specific course.

A wide range of Discipline Specific courses with four credits hours each provides groundwork in the engineering disciplines: Electrical Circuit & Analysis, Electrical Design Drawing & Estimation, Transformers and Direct Current (DC) Machines, Electrical Machines, Control Systems, Power Electronics, Power System, Installation & Maintenance of Electrical Equipments, Utilization of Electrical Energy & Traction, Switchgear Protection & some of lab courses related to above specific courses etc.

Skill Enhancement Course (SEC): An Skill Enhancement Course is a credit course which is basically meant to enhance general ability of students in areas like soft skills, quantitative aptitude and reasoning ability - required for the overall development of a student and at the same time crucial for industry/corporate demands and requirements. The student possessing these skills will definitely develop acumen to perform well during the recruitment process of any premier organization and will have the desired confidence to face the interview. Moreover, these skills are also essential in day-to-day life of the corporate world. The aim is to nurture every student for making effective communication, developing aptitude and a general reasoning ability for a better performance, as desired in corporate world. There shall be four courses of Aptitude in Semester III, IV semesters and two courses of Soft Skills in III, IV Semesters and will carry 1 credit, as compulsory for every student to pass these courses with minimum 45% marks.

Discipline Specific Elective Course (DSEC): The discipline specific elective course is chosen to make students specialist or having specialized knowledge of a specific domain like Generation of Electrical

802

Power, Electrical Machine Design etc. It will be covered in two semesters (V & VI) of Third year of the program relevant to chosen disciplines of compulsory/core courses of the program. The student will have to choose any one elective out of the three DSEC offered HVAC/DC Transmission, Electrical Machine Design, Power Quality & FACTS, Generation of Electrical Power, Energy Management & High Voltage Engineering. Each student will have to choose two discipline specific elective courses (DSECs) in all chosen; 1 in Semester V and 1 in Semester VI respectively. Each DSEC will carry 4 credits.

C. Program Outcomes (POs)

The learning and abilities or skills that a student would have developed by the end of three-year Diploma:

| | |
|---------|--|
| PO - 1 | Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems. |
| PO - 2 | Problem analysis & Solving: Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences. |
| PO - 3 | Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development. |
| PO - 4 | Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clean instructions. |
| PO - 5 | Entrepreneurship: An Entrepreneurship cut across every sector of human life including the field of engineering, engineering entrepreneurship is the process of harnessing the business opportunities in engineering and turning it into profitable commercially viable innovation. |
| PO - 6 | Interpersonal skills: Interpersonal skills involve the ability to communicate and build relationships with others. Effective interpersonal skills can help the students during the job interview process and can have a positive impact on your career advancement. |
| PO - 7 | Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. |
| PO - 8 | Attitude (Individual and team work): Function effectively as an individual, and as member or leader in diverse teams, and in multidisciplinary settings. |
| PO - 9 | Technology savvy/usage: Being technology savvy is essentially one's skill to be smart with technology. This skill reaches far beyond 'understanding' the concepts of how technology works and encompasses the 'utilization' of such modern technology for the purpose of enhancing productivity and efficiency. |
| PO - 10 | Social Interaction & effective citizenship: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice. |

D. Program Specific Outcomes (PSOs)

The learning and abilities or skills that a student would have developed by the end of three-year Diploma in Engineering (Electrical):

| | |
|---------|---|
| PSO – 1 | Understanding and applying the knowledge gained from Mathematics, Basic Computing, Basic Sciences and Social Sciences. |
| PSO – 2 | Understanding and applying theories, techniques, tools & equipment related to Electrical circuit analysis, Electrical design & Drawing estimation, Transformers & DC Machines, Electrical Instruments & Measurement and Control Systems. |
| PSO – 3 | Understanding and applying theories, techniques, tools & equipment related to Power Electronics, Power systems, Installation & maintenance of electrical equipments, Utilization of electrical equipments and traction, Generation of electrical power, the concepts & the operation of Microprocessor & Microcontrollers (8085, 8086, 8255 & 8053) and Switchgear protections. |
| PSO – 4 | Designing and analyzing theories, techniques, tools & equipment related to Electrical circuit analysis, Electrical design & Drawing estimation, Transformers & DC Machines, Electrical Instruments & Measurement and Control System and laboratory skills for building, testing, operation and maintenance of electrical systems. |
| PSO – 5 | Demonstrating proficiency in use of software tools (Mat-lab & P-Spice) & hardware tools and analyzing electrical engineering problems/defects in machines, circuits, systems, equipments, power transmission & distribution of power, power electronics & switchgear etc. |
| PSO – 6 | Evaluating options, tools & techniques for solving problems of maintenance and defects in the area of electrical engineering. |

E. Pedagogy & Unique practices adopted: “Pedagogy is the method and practice of teaching, especially for teaching an academic subject or theoretical concept”. In addition to conventional time-tested lecture method, the institute will emphasize on experiential learning:

1. Audio-Visual Based Learning: These days technology has taken a front seat and classrooms are well equipped with equipment and gadgets. Video-based learning has become an indispensable part of learning. Similarly, students can learn various concepts through video lectures. In fact, many teachers give examples from movies during their discourses. Making students learn few important theoretical concepts through Audio visual Aids is a good idea and method. The learning becomes really interesting and easy as videos add life to concepts and make the learning engaging and effective. Therefore, our institute is promoting *Audio-Visual Based Learning* wherever possible.

2. Field / Live Projects: The students, who take up experiential projects in companies, where senior executives with a stake in teaching guide them, drive the learning. All students are encouraged to do some live project other than their regular classes.

3. Industrial Visits: Industrial visit are essential to give students hand-on exposure and experience of how things and processes work in industries. Our institute organizes such visits to enhance students’ exposure to practical learning and work out for a report of such a visit relating to their specific topic, course or even domain.

4. Special Guest Lectures (SGL) & Extra Mural Lectures (EML): Some topics/concepts need extra attention and efforts as they either may be high in difficulty level or requires experts from specific industry/domain to make things/concepts clear for a better understanding from the perspective of the industry. Hence, to cater to the present needs of industry we organize such lectures, as part of lecture-

series and invite prominent personalities from academia and industry from time to time to deliver their vital inputs and insights.

5. Student Development Programs (SDP): Harnessing and developing the right talent for the right industry an overall development of a student is required. Apart from the curriculum teaching various student development programs (training programs) relating to soft skills, interview skills, SAP, Advanced excel training etc. that may be required as per the need of the student and industry trends, are conducted across the whole program. Participation in such programs is solicited through volunteering and consensus.

6. Industry Focused programs: Establishing collaborations with various industry partners to deliver the program on sharing basis. The specific courses are to be delivered by industry experts to provide practice based insight to the students.

7. Special assistance program for slow learners & fast learners: There is a provision of identify slow learners; develop the mechanism to correcting knowledge gap through result analysis of various class tests. Extra classes will be arranged for slow learners and facilitate them with required study material. There are some terms of advance topics what learning challenging it will be provided to the fast learners.

8. Induction program: Every year 3 weeks induction program is organized for 1st year students to make them familiarize with the entire academic environment of university including Curriculum, Classrooms, Labs, Faculty/ Staff members, Academic calendar and various activities.

9. Mentoring scheme: There is Mentor-Mentee system. One mentor lecture is provided per week in a class. Students can discuss their problems with mentor who is necessarily a teaching faculty. In this way, student's problems or issues can be identified and resolved.

10. Competitive exam preparation: Students are provided with one class in every week for Competitive exams preparation.

11. Extracurricular Activities: Organizing & participation in extracurricular activities will be mandatory to help students develop confidence & face audience with care.

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Diploma in Electrical Engineering Curriculum

Diploma in Computer Science & Engineering Curriculum

Diploma–Semester I

| S.N | Category | Course Code | Course | Periods | | | Credit | Evaluation Scheme | | |
|--------------|----------|-------------------|--|-----------|----------|-----------|-----------|-------------------|------------|------------|
| | | | | L | T | P | | Internal | External | Total |
| 1 | CC-1 | DIP111 | Applied Mathematics–I | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 2 | CC-2 | DIP112/ DIP113 | Applied Physics/ Applied Chemistry | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 3 | CC-3 | DIP104/ DIP105 | Basics of Electrical & Civil Engineering / Basics of Electronics & Mechanical Engineering | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 4 | CC-4 | DIP131/ DIP107 | Computer Fundamentals, Internet & MS-Office/ Applied Mechanics | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 5 | AECC-1 | TGE104 | English Communication-I | 1 | 0 | 2 | 2 | 40 | 60 | 100 |
| 6 | CC-5 | DIP181/ DIP182 | Physics Lab/Chemistry Lab | 0 | 0 | 2 | 1 | 50 | 50 | 100 |
| 7 | CC-6 | DIP153/ DIP154 | Electrical Engineering Lab /Electronics Engineering Lab | 0 | 0 | 2 | 1 | 50 | 50 | 100 |
| 8 | CC-7 | DIP155/ DIP156 | Information Technology Lab / Applied Mechanics Lab | 0 | 0 | 2 | 1 | 50 | 50 | 100 |
| 9 | CC-8 | DIP187/ DIP188 | Workshop Practice / Engineering Drawing | 0 | 0 | 4 | 2 | 50 | 50 | 100 |
| Total | | | | 17 | 0 | 12 | 23 | 400 | 500 | 900 |

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Diploma in Computer Science & Engineering Curriculum

Diploma-Semester II

| S.N | Category | Course Code | Course | Periods | | | Cred t | Evaluation Scheme | | |
|--------------|----------|-------------------|--|-----------|----------|-----------|-----------|-------------------|------------|------------|
| | | | | L | T | P | | Internal | External | Tota |
| 1 | CC-9 | DIP201 | Applied Mathematics-II | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 2 | CC-10 | DIP203/ DIP202 | Applied Chemistry/ Applied Physics | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 3 | CC-11 | DIP205/ DIP204 | Basics of Electronics & Mechanical Engineering / Basics of Electrical & Civil Engineering | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 4 | CC-12 | DIP207/ DIP231 | Applied Mechanics / Computer Fundamentals, Internet & MS-Office | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 5 | AECC-2 | TGE204 | English Communication-II | 1 | 0 | 2 | 2 | 40 | 60 | 100 |
| 6 | CC-13 | DIP252/ DIP281 | Chemistry Lab/ Physics Lab | 0 | 0 | 2 | 1 | 50 | 50 | 100 |
| 7 | CC-14 | DIP254/ DIP253 | Electronics Engineering Lab / Electrical Engineering Lab | 0 | 0 | 2 | 1 | 50 | 50 | 100 |
| 8 | CC-15 | DIP256/ DIP255 | Applied Mechanics Lab / Information Technology Lab | 0 | 0 | 2 | 1 | 50 | 50 | 100 |
| 9 | CC-16 | DIP288/ DIP257 | Engineering Drawing / Workshop Practice | 0 | 0 | 4 | 2 | 50 | 50 | 100 |
| Total | | | | 17 | 0 | 12 | 23 | 400 | 500 | 900 |

82

Diploma in Electrical Engineering Curriculum

Diploma – Semester III

| S. N | Category | Course Code | Course | Periods | | | Credit | Evaluation Scheme | | |
|--------------|----------|-------------------|---|-----------|----------|-----------|-----------|-------------------|------------|-------------|
| | | | | L | T | P | | Internal | External | Total |
| 1 | DSC-1 | DEE301 | Electrical Circuits & Analysis | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 2 | DSC-2 | DEE302 | Electrical Design, Drawing & Estimation – I | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 3 | DSC-3 | DEE304 | Electrical & Electronics Engineering Materials | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 4 | DSC-4 | DEE306 | Transformers and Direct Current (DC) Machines | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 5 | AECC-3 | DIP308/ DIP403 | Environment studies | 4 | 0 | 0 | 4 | 50 | 50 | 100 |
| 6 | DSC-5 | DEE351 | Electrical Circuits Lab | 0 | 0 | 2 | 1 | 50 | 50 | 100 |
| 7 | DSC-6 | DEE352 | Electrical Design, Drawing & Estimation – I Lab | 0 | 0 | 2 | 1 | 50 | 50 | 100 |
| 8 | DSC-7 | DEE354 | Transformers and Direct Current (DC) Machines Lab | 0 | 0 | 2 | 1 | 50 | 50 | 100 |
| 9 | SEC-1 | DEE359 | Minor Project | 0 | 0 | 6 | 3 | 50 | 50 | 100 |
| 10 | SEC-2 | TDC302 | Elementary Arithmetic & Reasoning | 0 | 0 | 2 | 1 | 50 | 50 | 100 |
| 11 | SEC-3 | TDC301 | Soft Skills for Technical Supervisors | 0 | 0 | 2 | 1 | 50 | 50 | 100 |
| 12 | SEC-4 | DDGP301 | Discipline & General Proficiency | 0 | 0 | 0 | 0 | 100 | 0 | 100 |
| Total | | | | 20 | 0 | 16 | 28 | 610 | 590 | 1200 |

***Additional course VAC-1 for Lateral entry students with 10+2/Intermediate.**

| | | | | | | | | | | |
|---|-------|---------|------------------------------------|---|---|---|---|----|----|-----|
| 1 | VAC-1 | DIP359* | Concepts of Information System Lab | 0 | 0 | 2 | 0 | 50 | 50 | 100 |
|---|-------|---------|------------------------------------|---|---|---|---|----|----|-----|

82

Diploma in Electrical Engineering Curriculum

Diploma – Semester IV

| S. N | Category | Course Code | Course | Periods | | | Credit | Evaluation Scheme | | |
|--------------|----------|-------------|--|-----------|----------|-----------|-----------|-------------------|------------|-------------|
| | | | | L | T | P | | Internal | External | Total |
| 1 | DSC-8 | DEE401 | Electrical Instruments & Measurements | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 2 | DSC-9 | DEE402 | Electrical Machines | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 3 | DSC-10 | DEE403 | Control System | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 4 | DSC-11 | DEE404 | Electrical Design, Drawing & Estimation – II | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 5 | DSC-12 | DEE451 | Electrical Instruments & Measurements Lab | 0 | 0 | 4 | 2 | 50 | 50 | 100 |
| 6 | DSC-13 | DEE452 | Electrical Machines Lab | 0 | 0 | 4 | 2 | 50 | 50 | 100 |
| 7 | DSC-14 | DEE453 | Control System Lab | 0 | 0 | 2 | 1 | 50 | 50 | 100 |
| 8 | DSC-15 | DEE454 | Electrical Design, Drawing & Estimation – II Lab | 0 | 0 | 4 | 2 | 50 | 50 | 100 |
| 9 | SEC-5 | TDC402 | Progressive Algebra and Data Management | 0 | 0 | 2 | 1 | 50 | 50 | 100 |
| 10 | SEC-6 | TDC401 | Soft Skills for Work place for Technical Supervisors | 0 | 0 | 2 | 1 | 50 | 50 | 100 |
| 11 | SEC-7 | DDGP401 | Discipline & General Proficiency | 0 | 0 | 0 | 0 | 100 | 0 | 100 |
| Total | | | | 16 | 0 | 18 | 25 | 560 | 540 | 1100 |

* Student will go for Summer Internship for 6-8 week.

Signature

Diploma in Electrical Engineering Curriculum

Diploma - Semester V

| S. N | Category | Course Code | Course | Periods | | | Credit | Evaluation Scheme | | |
|--------------|----------|-------------|---|-----------|----------|-----------|-----------|-------------------|------------|-------------|
| | | | | L | T | P | | Internal | External | Total |
| 1 | DSC-16 | DEE501 | Power Electronics | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 2 | DSC-17 | DEE503 | Power Systems | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 3 | DSC-18 | DEE506 | Microprocessor & Applications | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 4 | AECC-4 | DIP505 | Human Values and Professional Ethics | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 5 | DSEC-1 | - | Discipline Specific Elective Course – I | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 6 | GEC-1 | - | Generic Elective Course – I | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 7 | DSC-19 | DEE551 | Power Electronics Lab | 0 | 0 | 4 | 2 | 50 | 50 | 100 |
| 8 | DSC-20 | DEE552 | Electrical Simulation Lab | 0 | 0 | 4 | 2 | 50 | 50 | 100 |
| 9 | DSC-21 | DEE553 | Microprocessor & Applications Lab | 0 | 0 | 2 | 1 | 50 | 50 | 100 |
| 10 | SEC-8 | DEE555 | Industrial Training (Evaluation) | 0 | 0 | 0 | 8 | 50 | 50 | 100 |
| 11 | SEC-9 | DDGP501 | Discipline & General Proficiency | 0 | 0 | 0 | 0 | 100 | 0 | 100 |
| Total | | | | 23 | 0 | 10 | 36 | 540 | 560 | 1100 |

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Diploma in Electrical Engineering Curriculum

Diploma - Semester VI

| S. N | Category | Course Code | Course | Periods | | | Credit | Evaluation Scheme | | |
|--------------|----------|-------------|---|-----------|----------|-----------|-----------|-------------------|------------|-------------|
| | | | | L | T | P | | Internal | External | Total |
| 1 | DSC-22 | DEE601 | Installation & Maintenance of Electrical Equipments | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 2 | DSC-23 | DEE603 | Utilization of Electrical Energy & Traction | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 3 | DSC-24 | DEE605 | Switch Gear & Protection | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 4 | AECC-5 | DIP605 | Entrepreneurship | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 5 | DSEC-2 | - | Discipline Specific Elective Course – II | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 6 | GEC-2 | - | Generic Elective Course –II | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 7 | DSC-25 | DEE651 | Installation & Maintenance of Electrical Equipments Lab | 0 | 0 | 2 | 1 | 50 | 50 | 100 |
| 8 | DSC-26 | DEE654 | Advance Simulation Lab | 0 | 0 | 4 | 2 | 50 | 50 | 100 |
| 9 | SEC-10 | DEE653 | Major Project | 0 | 0 | 12 | 6 | 50 | 50 | 100 |
| 10 | SEC-11 | DDGP601 | Discipline & General Proficiency | 0 | 0 | 0 | 0 | 100 | 0 | 100 |
| Total | | | | 23 | 0 | 18 | 32 | 490 | 510 | 1000 |

BS

Diploma in Electrical Engineering Curriculum
ELECTIVE COURSES OFFERED

Generic Elective Courses (GEC)

(Student can select any one generic elective offered by university)

| S. No | Code | Course | L | T | P | Credit |
|------------------------------|---------|---------------------------------|---|---|---|--------|
| Semester V (Any one) | | | | | | |
| 1 | DGEC501 | Non-Conventional Energy Sources | 3 | 0 | 0 | 3 |
| 2 | DGEC502 | Power Plant Engineering | 3 | 0 | 0 | 3 |
| Semester VI (Any one) | | | | | | |
| 1 | DGEC601 | Non-Conventional Energy Sources | 3 | 0 | 0 | 3 |
| 2 | DGEC602 | Power Plant Engineering | 3 | 0 | 0 | 3 |

Discipline Specific Elective Courses (DSEC)

| S. No. | Code | Course | L | T | P | Credit |
|------------------------------|--------|--------------------------------|---|---|---|--------|
| Semester V (Any One) | | | | | | |
| 1 | DEE509 | HVAC/DC Transmission | 4 | 0 | 0 | 4 |
| 2 | DEE510 | Electrical Machine Design | 4 | 0 | 0 | 4 |
| 3 | DEE511 | Power Quality & FACTS | 4 | 0 | 0 | 4 |
| Semester VI (Any One) | | | | | | |
| 1 | DEE604 | Generation of Electrical Power | 4 | 0 | 0 | 4 |
| 2 | DEE607 | Energy Management | 4 | 0 | 0 | 4 |
| 3 | DEE608 | High Voltage Engineering | 4 | 0 | 0 | 4 |

Note :

| L- Lecture | T- Tutorial | P- Practical | C- Credits |
|--------------|-------------|--------------|-------------------------------------|
| 1 L = 1 Hour | 1T = 1 Hour | 1P = 1 Hour | 1C = 1 Hour L or T 1C = 2 Hour P |

8/2