DADI INSTITUTE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)

Approved by A.I.C.T.E & Permanently affiliated to JNTU GV

Accredited by NAAC with 'A' Grade and Inclusion u/s 2(f) & 12(B) of UGC Act

An ISO 9001:2015, ISO 14001:2015 & ISO 45001:2018 Certified Institute.

NH-16, Anakapalle – 531002, Visakhapatnam, A.P.

Website: www.diet.edu.in, 9963993229 E-mail:, principal@diet.edu.in

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

MINUTES OF BOARD OF STUDIES MEETING

Minutes of Boards of studies meeting in the Department of Electrical and Electronics Engineering, as per the orders of the Principal Lr.No. DIET(A)/BOS-EEE/2023-24/01 Dated: 19.12.2023. The Board of studies meeting was held on 29-12-2023 in hybrid mode at DIET campus and discussed the course structure and detailed syllabus for I Year B. Tech and M.Tech (Power & Industrial Drives) courses. The following members have attended the meeting.

Members Present:

S.No	Name of the member	Signature
1	Dr. A S L K Gopalamma, HoD,EEE, DIET	
2	Dr. K Srikumar, Principal, JNTU-GV, VZM	
3	Dr. G V Nagesh Kumar, Prof & HoD EEE, JNTU Pulivendula	
4	Dr. R Srinu Naik, Assoc Prof, Dept. of EE, AUCE(A)	
5	Sri. K V Rao, General Manager (Projects), RINL, VSKP	
6	Mrs. R Rongali Ramya ,Commodity Buyer, FORD Motors,Alumni DIET	

At the onset of the meeting, the Chairman of BOS, Dr. A S L K Gopalamma, welcomed all the members and introduced internal BOS members to external BOS members. The meeting began with a presentation of the curriculum of DR23 Electrical and Electronics Engineering by chairperson for I B.Tech, M.Tech I & II semesters. She then presented the syllabus of the all electrical subjects in I & II semesters for both UG & PG prepared by internal BOS members.

Agenda:

To approve the curriculum and syllabus of the I B.Tech, M.Tech I & II Semester Electrical and Electronics Engineering course structure DR23.

Points to be discussed:

1. Discussed the proposed course structure and finalized the course structure and syllabus for B.Tech and M.Tech I year w.e.f. 2023-24 onwards.
2. Discussed about UG Syllabus to incorporate experiential and participatory learning in line with Outcome based education.
3. Discussed to adopt project based learning topics in M.Tech (PID) Syllabus to enrich Industrial-Research oriented studies at PG level.

Resolutions:

After thorough discussions, the following points are resolved unanimously.

1. Approved the proposed course structure and finalized the course structure and syllabus for B.Tech and M.Tech I year w.e.f. 2023-24 onwards.
2. BoS Committee suggested minor modifications (mentioned in ANNEXURE –I) in UG Syllabus to incorporate experiential and participatory learning in line with Outcome based education.
3. Suggested to adopt project based learning topics in M.Tech (PID) Syllabus to enrich Industrial-Research oriented studies at PG level.
4. The Board authorized BOS Chairperson for any minor corrections / additions required in the framed course structure and syllabi.

BOS Chairperson

Head of the Department
Electrical & Electronics Engg.
Dadi Institute of Engg. Tech.
Anakapalle - 531 002

DADI INSTITUTE OF ENGINEERING &TECHNOLOGY (AUTONOMOUS)

Approved by A.I.C.T.E & Permanently affiliated to JNTU GV
Accredited by NAAC with 'A' Grade and Inclusion u/s 2(f) & 12(B) of UGC Act
An ISO 9001:2015, ISO 14001:2015 & ISO 45001:2018 Certified Institute.
NH-16, Anakapalle – 531002, Visakhapatnam, A.P.
Website: www.diet.edu.in, **9963993229 E-mail:**, principal@diet.edu.in

S.No.	Name of the person	Designation	Status of the person	Signature
1	Dr. A.S.L. K. Gopalamma	Associate Professor	Chairperson (HOD)	
2	Dr. Babitha Jain	Professor	Member –Faculty	
3	Mr.K.Vijay Kumar	Associate Professor	Member –Faculty	
4	Mr. A Krishna Nag	Associate Professor	Member –Faculty	
5	Mr.J.Deleep Kumar	Associate Professor	Member –Faculty	
6	Dr. S. Ramana Kumar Joga	Assistant Professor	Member –Faculty	
7	Mr. G.Jagadeesh	Assistant Professor	Member –Faculty	
8	Mr.B.V Veeranjaneyulu	Assistant Professor	Member –Faculty	
9	Mr. V. Sudhakar	Assistant Professor	Member –Faculty	
10	Mrs. K. Alfoni Jose	Assistant Professor	Member –Faculty	
11	Mr.K.Srinivas Rao	Assistant Professor	Member –Faculty	
12	Mr.B V Siva Prasad	Assistant Professor	Member –Faculty	
13	Mr. J Shiva	Assistant Professor	Member –Faculty	
14	Mrs. Ch.LakshmiPrasanna	Assistant Professor	Member –Faculty	
15	Mrs. P Sravana Lakshmi	Assistant Professor	Member –Faculty	
16	Mrs. M.Hemalatha	Assistant Professor	Member –Faculty	
17	Ms.B.Sowmya	Assistant Professor	Member –Faculty	

DADI INSTITUTE OF ENGINEERING &TECHNOLOGY
(AUTONOMOUS)

Approved by A.I.C.T.E & Permanently affiliated to JNTU GV
Accredited by NAAC with 'A' Grade and Inclusion u/s 2(f) & 12(B) of UGC Act
An ISO 9001:2015, ISO 14001:2015 & ISO 45001:2018 Certified Institute.
NH-16, Anakapalle - 531002, Visakhapatnam, A.P.
Website: www.diet.edu.in, **9963993229 E-mail:**, principal@diet.edu.in

18	Mrs. P. Jagruthi	Assistant Professor	Member –Faculty	
19	Mrs. B.Aiswarya	Assistant Professor	Member –Faculty	
20	Mrs. G.Swathi	Assistant Professor	Member –Faculty	

LBOS CHAIRPERSON

Head of the Department
Electrical & Electronics Engg.
Dadi Institute of Engg. Tech.
Anakapalle - 531 002

ANNEXURE-I
Department of Electrical and Electronics Engineering

Report on Minutes of Meeting of BoS Members

The first meeting of the Board of Studies of the Electrical & Electronics department was held on 29th December 2023 at 10 AM through hybrid mode at DIET campus.

Meeting Details:

Google Meet Link: meet.google.com/vgd-cesu-qpp

DIET EEE Dept_BOS Meeting

Friday, December 29, 2023 · 10:00 – 11:00am

Time zone: Asia/Kolkata

Google Meet joining info

Video call link: https://meet.google.com/vgd-cesu-qpp

Or dial: (US) +1 662-676-0132 PIN: 332 143 317#

The following points were discussed in the meeting & the minutes were recorded as below:

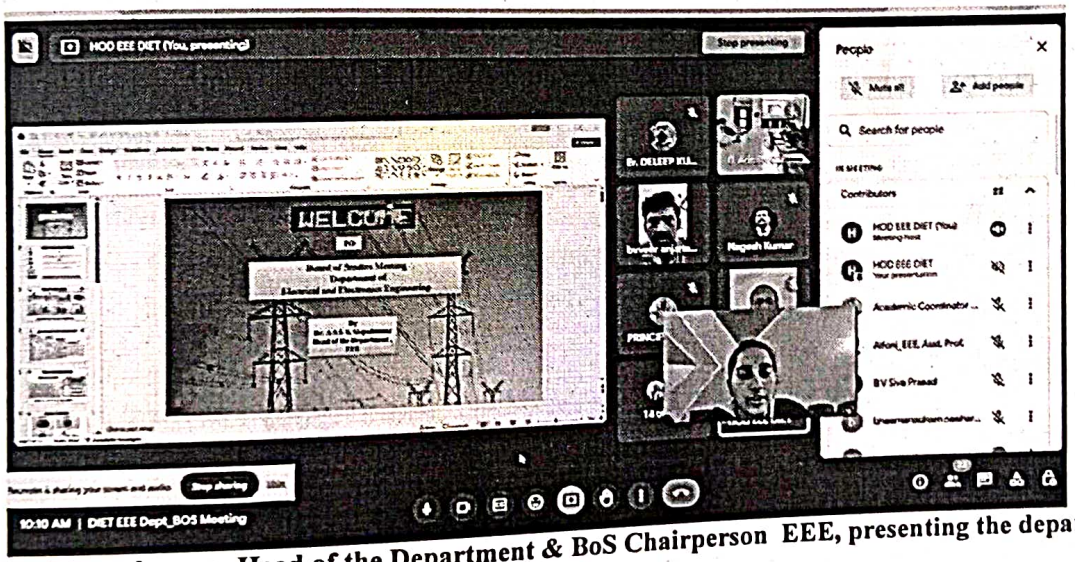
1. The meeting started with a welcome note by **Dr. A S L K Gopalamma, Head of the Department EEE,** extending a warm welcome to the Board of Studies (BoS) members.
2. The Head of the Department narrated the purpose of the BoS meeting and presented the process being followed in evolving the Department's Vision, Mission, Program Educational Objectives & Program Specific Outcomes.
3. The Head of the Department the Academic year wise progress of the department as follows:
    - Teaching Learning process, Industrial Trainings, Online courses & Internships
    - Performance in end semester examination with details of branch toppers
    - Placement & Higher studies details- Year wise
    - Student support systems such as feedback system, Student Mentoring, Co-Curricular & extra-curricular activities

- Faculty information & contributions in FDPs, Workshops, Industrial Visits
- Academic research & Academic- Industry interaction through MoUs
- Department Achievements

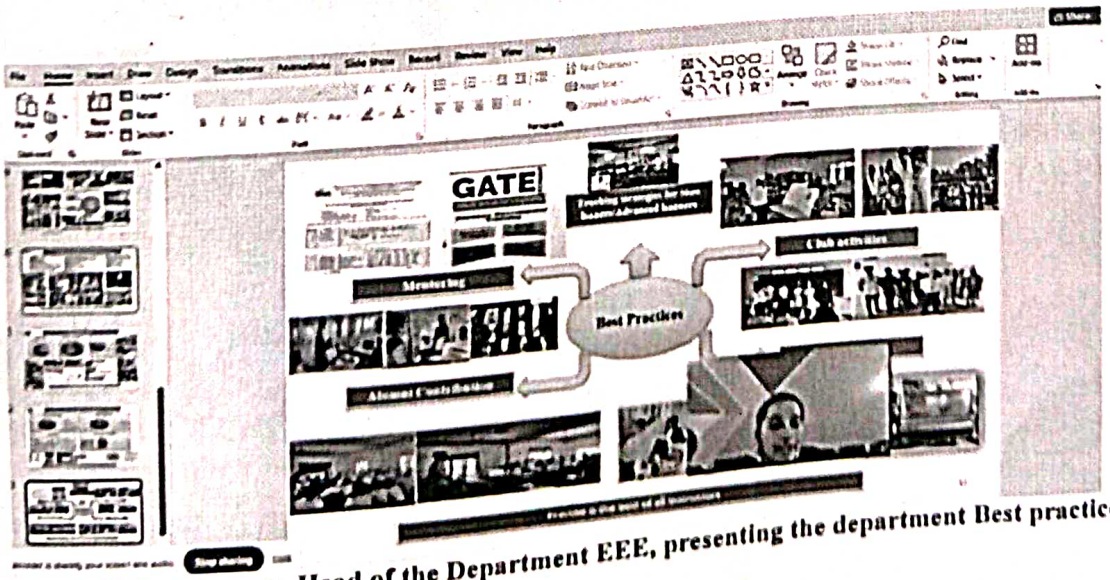
4. After the detailed presentation, the suggestions for improvement, operational planning was invited from the members.
5. Initially the members congratulated the progress of the department growth with the involvement of stakeholders.
6. HoD EEE presented the Course structure of B.Tech and M.Tech (Power & Industrial Drives) and invited for suggestions from BoS members.
7. **Dr.K Srikumar , Professor & Principal ,EEE of JNTU GV , VZM (University Nominee)** suggested to take advise from other an JNTU GV members to enrich the course structure and also advised to implement experiential learning and project based education without any deviations.
8. **Dr.G.V.Nagesh Kumar, Professor & HOD,EEE of JNTU Pulivendula** suggested the following points by presenting a presentation:
    - The progress of the department in all aspects is going on the right path and he suggested the points related to accreditation.
    - The collaborative learning using self-interest groups can be done with other department students which will help the students to get more exposure.
    - Discussed the importance of Design/project oriented hands on experience of experiments based on the societal needs and with industry experts.
9. **Sri K V Rao, General Manager, RINL,Visakhapatnam** suggested the following points:
    - Conduct Skill development programs for Teaching & Non-Teaching staff to enhance the practical skills.
    - The students should be identified right from the second year & should be given awareness about various schemes of the central government and start-ups.
    - Training the faculty members for current trends in industry
    - The students should be exposed to hands-on experience for solving problems in the laboratories by conducting the experiments.
10. **Dr. R. Srinu Naik, Assoc. Prof, Dept. of EEE AUCE(A)** suggested to improve research oriented studies followed by importance of AICTE Initiatives in curriculam.

11. Mrs. R. Ramya, Commodity Buyer, Ford Motors shared her vision and thoughts regarding industrial oriented Skill courses implementation like Industrial automation at campus to upgrade the student skill level..
12. Discussed the major topic of finding the gap in curriculum & identifying the scheme to bridge the gap between the Industry & the Academia.
13. The meeting was closed by extending a heartfelt thanks to all the BoS members by the Head of the department for their valuable suggestions shared by each member towards the progress of the department and assured that the suggestions will be implemented in the forthcoming semesters.

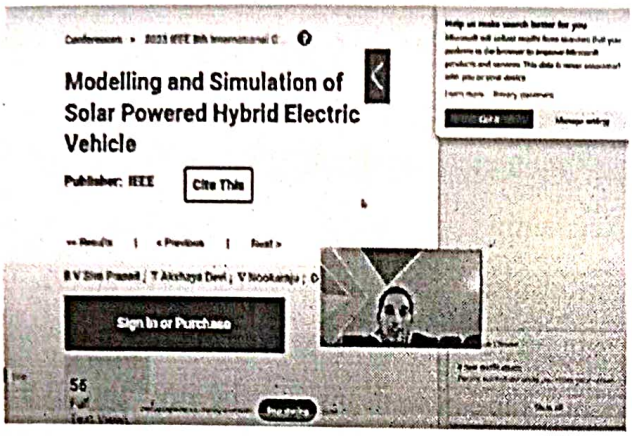
Finally, she thanked all the members for attending the first BoS meeting with a request to provide long term support for the prospective development of the department. She requested all the BoS members to authorize the BoS chairman for any minor corrections/additions required in the framed course structure and Syllabi. All the members accepted the request.

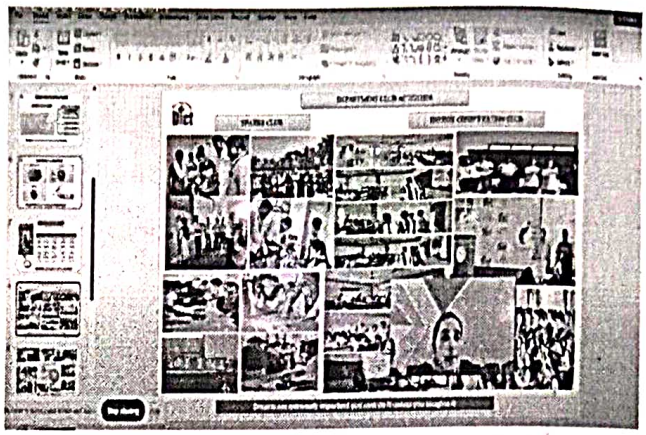


Dr. A S L K Gopalamma, Head of the Department & BoS Chairperson EEE, presenting the department profile

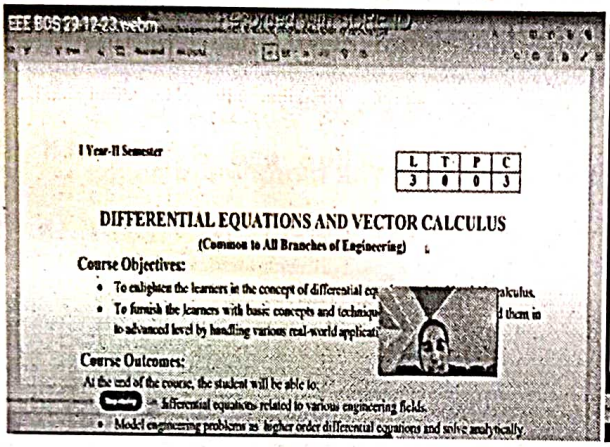


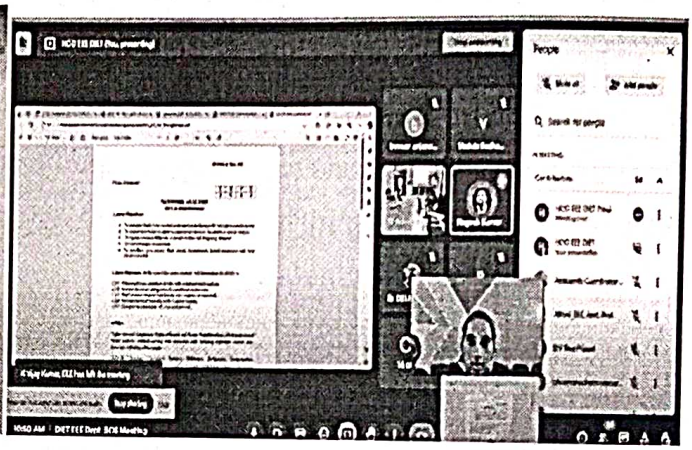
Dr. A S L K Gopalamma, Head of the Department EEE, presenting the department Best practices



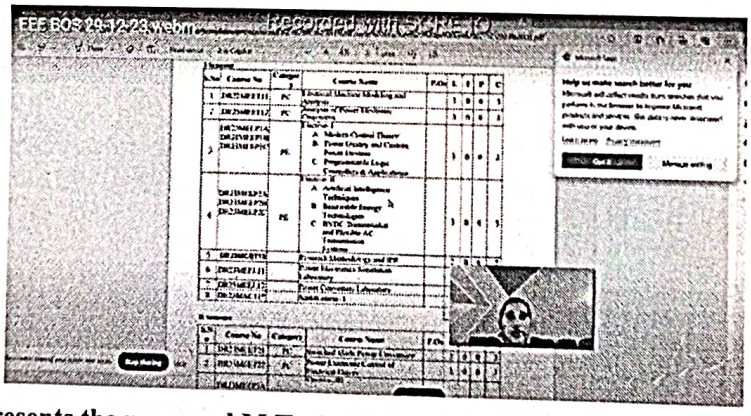


BoS Chairperson explains about the Dept R&D achievements





External BoS members interaction and suggested design oriented topics to incorporate in syllabus



BoS Chairperson presents the proposed M.Tech (Power and Industrial Drives) Course structure and Syllabus

BOS CHAIRPERSON
(Dr. A S L K Gopalamma)

Head of the Department
Electrical & Electronics Engg.
Dadi Institute of Engg. T
Anakapalle - 531 002

DADI INSTITUTE OF ENGINEERING &TECHNOLOGY
(AUTONOMOUS)

Approved by A.I.C.T.E & permanently affiliated to JNTU GV
Accredited by NAAC with 'A' Grade and Inclusion u/s 2(f) & 12(B) of UGC Act
An ISO 9001:2015, ISO 14001:2015 & ISO 45001:2018 Certified Institute.
NH-16, Anakapalle – 531002, Visakhapatnam, A.P.
Website: www.diet.edu.in, 9963993229 E-mail: principal@diet.edu.in

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

B. Tech (Regular-Full time) - DR23

Electrical and Electronics Engineering

(Effective for the students admitted into I year from the AcademicYear **2023-24** onwards)

DADI INSTITUTE OF ENGINEERING & TECHNOLOGY-ANAKAPALLE

Visakhapatnam - Andhra Pradesh, India

B.Tech. - COURSE STRUCTURE – DR23
(Applicable from the Academic Year 2023-24 onwards)

INDUCTION PROGRAMME

S.No.	Course Name	Category	L-T-P-C
1	Physical Activities -- Sports, Yoga and Meditation, Plantation	MC	0-0-6-0
2	Career Counseling	MC	2-0-2-0
3	Orientation to all branches -- career options, tools, etc.	MC	3-0-0-0
4	Orientation on admitted Branch -- corresponding labs, tools and platforms	EC	2-0-3-0
5	Proficiency Modules & Productivity Tools	ES	2-1-2-0
6	Assessment on basic aptitude and mathematical skills	MC	2-0-3-0
7	Remedial Training in Foundation Courses	MC	2-1-2-0
8	Human Values & Professional Ethics	MC	3-0-0-0
9	Communication Skills -- focus on Listening, Speaking, Reading, Writing skills	BS	2-1-2-0
10	Concepts of Programming	ES	2-0-2-0

B.TECH- ENGINEERING (Proposed)
ELECTRICAL AND ELECTRONICS ENGINEERING

I Year I Semester

S.No.	Course Code	Course Name	L	T	P	Credits
1.	DR23BST01	Linear Algebra & Calculus	3	0	0	3
2.	DR23BST04	Chemistry	3	0	0	3
3.	DR23EST07	Introduction to Programming	3	0	0	3
4.	DR23EST03	Engineering Graphics	1	0	4	3
5.	DR23EST04	Basic Electrical & Electronics Engineering	3	0	0	3
6.	DR23BSL04	Chemistry Lab	0	0	2	1
7.	DR23ESL07	Computer Programming Lab	0	0	3	1.5
8.	DR23ESL05	Electrical &Electronics Engineering Workshop	0	0	3	1.5
9.	DR23MCL02	NSS/NCC/Scouts &Guides/Community Service	0	0	1	0.5
		Total Credits				**19.5**

I Year II Semester

S.No.	Course Code	Course Name	L	T	P	Credits
1.	DR23BST02	Differential Equations and Vector Calculus	3	0	0	3
2.	DR23BST03	Engineering Physics	3	0	0	3
3.	DR23HST01	Communicative English	2	0	0	2
4.	DR23EST01	Basic Civil & Mechanical Engineering	3	0	0	3
5.	DR23EET02	Electrical Circuit Analysis-I	3	0	0	3
6.	DR23HSL01	Communicative English Lab	0	0	2	1
7.	DR23BSL03	Engineering Physics Lab	0	0	2	1
8.	DR23ESL06	IT workshop	0	0	2	1
9.	DR23ESL02	Engineering Workshop	0	0	3	1.5
10.	DR23EEL02	Electrical Circuits Lab	0	0	3	1.5
11.	DR23MCL01	Health and Wellness, Yoga and Sports	0	0	1	0.5
		Total Credits				**20.5**

Controller of Examination

Controller of Examinations
Dadi Institute of Engineering & Technology
Autonomous
Anakapalle - 531002

I Year-I Semester-(ECE,EEE,CIVIL)

I Year-II Semester-(CSE,CSD,CSM)

L	T	P	C
3	0	0	3

BASIC ELECTRICAL & ELECTRONICS ENGINEERING (DR23EST04)

(Common to All Branches of Engineering)

Course Objectives:

To expose to the field of electrical & electronics engineering, laws and principles of electrical/ electronic engineering and to acquire fundamental knowledge in the relevant field.

Course Outcomes: After the completion of the course students will be able to

CO1: Remember the fundamental laws, operating principles of motors, generators, MC and MI instruments.

CO2: Understand the problem-solving concepts associated to AC and DC circuits, construction and operation of AC and DC machines, measuring instruments; different power generation mechanisms, Electricity billing concept and important safety measures related to electrical operations.

CO3: Apply mathematical tools and fundamental concepts to derive various equations related to machines, circuits and measuring instruments; electricity bill calculations and layout representation of electrical power systems.

CO4: Analyze different electrical circuits, performance of machines and measuring instruments.

CO5: Evaluate different circuit configurations, Machine performance and Power systems operation.

PART A: BASIC ELECTRICAL ENGINEERING

UNIT-I: DC & AC Circuits

DC Circuits: Electrical circuit elements (R, L and C), Ohm's Law and its limitations, KCL & KVL, series, parallel, series-parallel circuits, Super Position theorem, Simple numerical problems.

AC Circuits: A.C. Fundamentals: Equation of AC Voltage and current, waveform, time period, frequency, amplitude, phase, phase difference, average value, RMS value, form factor, peak factor, Voltage and current relationship with phasor diagrams in R, L, and C circuits, Concept of Impedance, Active power, reactive power and apparent power, Concept of power factor (Simple Numerical problems).

UNIT- II: Machines and Measuring Instruments

Machines: Construction, principle and operation of (i) DC Motor, (ii) DC Generator, (iii) Single Phase Transformer, (iv) Three Phase Induction Motor and (v) Alternator, Applications of electrical machines.

Measuring Instruments: Construction and working principle of Permanent Magnet Moving Coil (PMMC), Moving Iron (MI) Instruments and Wheat Stone Bridge.

UNIT- III: Energy Resources, Electricity Bill & Safety Measures

Energy Resources: Conventional and non-conventional energy resources; Layout and operation of various Power Generation systems: Hydel, Nuclear, Solar & Wind power generation.

Electricity bill: Power rating of household appliances including air conditioners, PCs, Laptops, Printers, etc. Definition of –unitll used for consumption of electrical energy, two-part electricity tariff, calculation of electricity bill for domestic consumers.

Equipment Safety Measures: Working principle of Fuse and Miniature circuit breaker (MCB), merits and demerits. Personal safety measures: Electric Shock, Earthing and its types, Safety Precautions to avoid shock.

Textbooks:

1. Basic Electrical Engineering, D. C. Kulshreshtha, Tata McGraw Hill, 2019, First Edition
2. Power System Engineering, P.V. Gupta, M.L. Soni, U.S. Bhatnagar and A. Chakrabarti, Dhanpat Rai & Co, 2013
3. Fundamentals of Electrical Engineering, Rajendra Prasad, PHI publishers, 2014, Third Edition

Reference Books:

1. Basic Electrical Engineering, D. P. Kothari and I. J. Nagrath, Mc Graw Hill, 2019, Fourth Edition
2. Principles of Power Systems, V.K. Mehtha, S.Chand Technical Publishers, 2020
3. Basic Electrical Engineering, T. K. Nagsarkar and M. S. Sukhija, Oxford University Press, 2017
4. Basic Electrical and Electronics Engineering, S. K. Bhatacharya, Person Publications, 2018, Second Edition.

Web Resources:

1. https://nptel.ac.in/courses/108105053
2. https://nptel.ac.in/courses/108108076

PART B: BASIC ELECTRONICS ENGINEERING

Course Objective:

- To teach the fundamentals of semiconductor devices and its applications, principles of digital electronics.

UNIT- I: SEMICONDUCTOR DEVICES

Introduction - Evolution of electronics – Vacuum tubes to nano electronics - Characteristics of PN Junction Diode — Zener Effect — Zener Diode and its Characteristics. Bipolar Junction Transistor — CB, CE, CC Configurations and Characteristics — Elementary Treatment of Small Signal CE Amplifier.

UNIT- II : BASIC ELECTRONIC CIRCUITS AND INSTRUMENTTAION

Rectifiers and power supplies: Block diagram description of a dc power supply, working of a full wave bridge rectifier, capacitor filter (no analysis), working of simple zener voltage regulator. Amplifiers: Block diagram of Public Address system, Circuit diagram and working of common emitter (RC coupled) amplifier with its frequency response. Electronic Instrumentation: Block diagram of an electronic instrumentation system.

UNIT III: DIGITAL ELECTRONICS

Overview of Number Systems, Logic gates including Universal Gates, BCD codes, Excess-3 code, Gray code, Hamming code. Boolean Algebra, Basic Theorems and properties of Boolean Algebra, Truth Tables and Functionality of Logic Gates – NOT, OR, AND, NOR, NAND, XOR and XNOR. Simple combinational circuits–Half and Full Adders. Introduction to sequential circuits, Flip flops, Registers and counters (Elementary Treatment only)

Textbooks:

1. R. L. Boylestad & Louis Nashlesky, Electronic Devices & Circuit Theory, Pearson Education, 2021.
2. R. P. Jain, Modern Digital Electronics, 4th Edition, Tata Mc Graw Hill, 2009

Reference Books:

1. R. S. Sedha, A Textbook of Electronic Devices and Circuits, S. Chand & Co, 2010.
2. Santiram Kal, Basic Electronics- Devices, Circuits and IT Fundamentals, Prentice Hall, India, 2002.
3. R. T. Paynter, Introductory Electronic Devices & Circuits – Conventional Flow Version, Pearson Education,2009

I Year-I Semester-(ECE,EEE,CIVIL)

I Year-II Semester-(CSE,CSD,CSM)

L	T	P	C
0	0	3	1.5

ELECTRICAL & ELECTRONICS ENGINEERING WORKSHOP

(Common to All branches of Engineering)

Course Objectives:

To impart knowledge on the fundamental laws & theorems of electrical circuits, functions of electrical machines and energy calculations.

Course Outcomes:

CO1: Understand the Electrical circuit design concept; measurement of resistance, power, power factor; concept of wiring and operation of Electrical Machines and Transformer.

CO2: Apply the theoretical concepts and operating principles to derive mathematical models for circuits, Electrical machines and measuring instruments; calculations for the measurement of resistance, power and power factor.

CO3: Apply the theoretical concepts to obtain calculations for the measurement of resistance, power and power factor.

CO4: Analyse various characteristics of electrical circuits, electrical machines and measuring instruments.

CO5: Design suitable circuits and methodologies for the measurement of various electrical parameters; Household and commercial wiring.

Activities:

1. Familiarization of commonly used Electrical & Electronic Workshop Tools: Bread board, Solder, cables, relays, switches, connectors, fuses, Cutter, plier, screwdriver set, wire stripper, flux, knife/blade, soldering iron, de-soldering pump etc.
   - Provide some exercises so that hardware tools and instruments are learned to be used by the students.
2. Familiarization of Measuring Instruments like Voltmeters, Ammeters, multimeter, LCR-Q meter, Power Supplies, CRO, DSO, Function Generator, Frequency counter.
   - Provide some exercises so that measuring instruments are learned to be used by the students.
3. Components:
   - Familiarization/Identification of components (Resistors, Capacitors, Inductors, Diodes, transistors, IC's etc.) – Functionality, type, size, colour coding package, symbol, cost etc.
   - Testing of components like Resistor, Capacitor, Diode, Transistor, ICs etc. - Compare values of components like resistors, inductors, capacitors etc with the measured values by using instruments

PART A: ELECTRICAL ENGINEERING LAB

List of experiments:

1. Verification of KCL and KVL
2. Verification of Superposition theorem
3. Measurement of Resistance using Wheat stone bridge
4. Magnetization Characteristics of DC shunt Generator
5. Measurement of Power and Power factor using Single-phase wattmeter
6. Measurement of Earth Resistance using Megger
7. Calculation of Electrical Energy for Domestic Premises

Reference Books:

1. Basic Electrical Engineering, D. C. Kulshreshtha, Tata McGraw Hill, 2019, First Edition
2. Power System Engineering, P.V. Gupta, M.L. Soni, U.S. Bhatnagar and A. Chakrabarti, Dhanpat Rai & Co, 2013
3. Fundamentals of Electrical Engineering, Rajendra Prasad, PHI publishers, 2014, Third Edition

Note: Minimum Six Experiments to be performed.

PART B: ELECTRONICS ENGINEERING LAB

Course Objectives:

- To impart knowledge on the principles of digital electronics and fundamentals of electron devices & its applications.

Course Outcomes:

At the end of the course, the student will be able to:

CO1: Identify & testing of various electronic components.

CO2: Understand the usage of electronic measuring instruments.

CO3: Plot and discuss the characteristics of various electron devices.

CO4: Explain the operation of a digital circuit.

List of Experiments:

1. Plot V-I characteristics of PN Junction diode A) Forward bias B) Reverse bias.
2. Plot V – I characteristics of Zener Diode and its application as voltage Regulator.
3. Implementation of half wave and full wave rectifiers
4. Plot Input & Output characteristics of BJT in CE and CB configurations
5. Frequency response of CE amplifier.
6. Simulation of RC coupled amplifier with the design supplied
7. Verification of Truth Table of AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR gates using ICs.
8. Verification of Truth Tables of S-R, J-K& D flip flops using respective ICs.

Tools / Equipment Required: DC Power supplies, Multi meters, DC Ammeters, DC Voltmeters, AC Voltmeters, CROs, all the required active devices.

References:

1. R. L. Boylestad & Louis Nashlesky, Electronic Devices & Circuit Theory, Pearson Education, 2021.
2. R. P. Jain, Modern Digital Electronics, 4th Edition, Tata Mc Graw Hill, 2009
3. R. T. Paynter, Introductory Electronic Devices & Circuits – Conventional Flow Version, Pearson Education,2009.

Note: Minimum Six Experiments to be performed. All the experiments shall be implemented using both Hardware and Software.

I Year-II Semester

L	T	P	C
3	0	0	3

ELECTRICAL CIRCUIT ANALYSIS –I (DR23EET02)

Course Objectives:

To develop an understanding of the fundamental laws, elements of electrical circuits and toapply circuit analysis to DC and AC circuits.

Course Outcomes:

CO1: Remembering the basic electrical elements and different fundamental laws.
CO2: Understand the network reduction techniques, transformations, concept of self- inductance and mutual inductance, phasor diagrams, resonance and network theorems.
CO3: Apply the concepts to obtain various mathematical and graphical representations.
CO4: Analyse nodal and mesh networks, series and parallel circuits, steady state response, different circuit topologies (with R, L and C components).
CO5: Evaluation of Network theorems, electrical, magnetic and single-phase circuits.

UNIT-I INTRODUCTION TO ELECTRICAL CIRCUITS

Basic Concepts of passive elements of R, L, C and their V-I relations, Sources (dependent and independent), Kirchoff's laws, Network reduction techniques (series, parallel, series - parallel,star-to-delta and delta-to-star transformation), source transformation technique, nodal analysis and mesh analysis to DC networks with dependent and independent voltage and current sources, node and mesh analysis.

UNIT-II MAGNETIC CIRCUITS

Basic definition of MMF, flux and reluctance, analogy between electrical and magnetic circuits, Faraday's laws of electromagnetic induction – concept of self and mutual inductance, Dot convention – coefficient of coupling and composite magnetic circuit, analysis of series and parallel magnetic circuits.

UNIT-III SINGLE PHASE CIRCUITS

Characteristics of periodic functions, Average value, R.M.S. value, form factor, representation of a sine function, concept of phasor, phasor diagrams, node and mesh analysis. Steady state analysis of R, L and C circuits to sinusoidal excitations-response of pure resistance, inductance, capacitance, series RL circuit, series RC circuit, series RLC circuit, parallel RL circuit, parallelRC circuit.

UNIT- IV RESONANCE AND LOCUS DIAGRAMS

Series Resonance: Need of Resonance, Characteristics of a series resonant circuit, Q-factor, selectivity and bandwidth, expression for half power frequencies; Parallel resonance: Q-factor, selectivity and bandwidth; Locus diagram: RL, RC, RLC with R, L and C variables.

UNIT- V NETWORK THEOREMS (DC & AC EXCITATIONS)

Need and Selectivity of theorems, Superposition theorem, Thevenin's theorem, Norton's theorem, Maximum Power Transfer theorem, Reciprocity theorem, Millman's theorem and compensation theorem, Selectivity of theorem based on application.

Textbooks:

1. Engineering Circuits Analysis, Jack Kemmerly, William Hayt and Steven Durbin, Tata Mc Graw Hill Education, 2005, sixth edition.
2. Network Analysis, M. E. Van Valkenburg, Pearson Education, 2019, Revised Third Edition
3. Electrical Circuit Analysis, K.S.Suresh Kumar, Pearson Education.

Reference Books:

1. Fundamentals of Electrical Circuits, Charles K. Alexander and Mathew N.O. Sadiku, Mc Graw Hill Education (India), 2013, Fifth Edition
2. Electric Circuits (Schaum's outline Series), Mahmood Nahvi, Joseph Edminister, and K. Rao, Mc Graw Hill Education, 2017, Fifth Edition.
3. Electric Circuits, David A. Bell, Oxford University Press, 2009, Seventh Edition.
4. Introductory Circuit Analysis, Robert L Boylestad, Pearson Publications, 2023, Fourteenth Edition.
5. Circuit Theory: Analysis and Synthesis, A. Chakrabarti, Dhanpat Rai & Co., 2018, Seventh Revised Edition.

Web Resources:

1. https://onlinecourses.nptel.ac.in/noc23_ee81/preview
2. https://nptel.ac.in/courses/108104139
3. https://nptel.ac.in/courses/108106172
4. https://nptel.ac.in/courses/117106108

I Year-II Semester

L	T	P	C
0	0	3	1.5

ELECTRICAL CIRCUITS LAB (DR23EEL02)

Course Objectives:

To impart hands on experience in verification of circuit laws and theorems, measurement of circuit parameters, study of circuit characteristics. It also gives practical exposure to the usage of different circuits with different conditions.

Course Outcomes:

CO1: Understand the concepts of network theorems, node and mesh networks, series and parallel resonance and Locus diagrams.

CO2: Apply various theorems to compare practical results obtained with theoretical calculations.

CO3: Determine self, mutual inductances and coefficient of coupling values, parameters of choke coil.

CO4: Analyse different circuit characteristics with the help of fundamental laws and various configurations.

CO5: Create locus diagrams of RL, RC series circuits and examine series and parallel resonance.

List of Experiments:

1. Verification of Kirchhoff's circuit laws.
2. Verification of node and mesh analysis.
3. Verification of network reduction techniques.
4. Determination of cold and hot resistance of an electric lamp.
5. Determination of Parameters of a choke coil.
6. Determination of self, mutual inductances, and coefficient of coupling
7. Series and parallel resonance
8. Locus diagrams of R-L (L Variable) and R-C (C Variable) series circuits
9. Verification of Superposition theorem
10. Verification of Thevenin's and Norton's Theorems
11. Verification of Maximum power transfer theorem
12. Verification of Compensation theorem
13. Verification of Reciprocity and Millman's Theorems

Reference Books:

1. Engineering Circuits Analysis, Jack Kemmerly, William Hayt and Steven Durbin, Tata Mc Graw Hill Education, 2005, sixth edition.
2. Network Analysis, M. E. Van Valkenburg, Pearson Education, 2019, Revised Third Edition

I Year-II Semester

L	T	P	C
3	0	0	3

NETWORK ANALYSIS (DR23EET0[illegible])

(ECE & allied branches)

Course Objectives:

- To introduce basic laws, mesh & nodal analysis techniques for solving electrical circuits
- To impart knowledge on applying appropriate theorem for electrical circuit analysis
- To explain transient behavior of circuits in time and frequency domains
- To teach concepts of resonance
- To introduce open circuit, short circuit, transmission, hybrid parameters and their interrelationship.

Course Outcomes: At the end of this course students will demonstrate the ability to

CO1: Understand basic electrical circuits with nodal and mesh analysis.
CO2: Analyse the circuit using network simplification theorems.
CO3: Find Transient response and Steady state response of a network.
CO4: Analyse electrical networks in the Laplace domain.
CO5: Compute the parameters of a two-port network.

UNIT I

Types of circuit components, Types of Sources and Source Transformations, Mesh analysis and Nodal analysis, problem solving with resistances only including dependent sources also. Principal of Duality with examples.

Network Theorems: Thevenin's, Norton's, Milliman's, Reciprocity, Compensation, Substitution, Superposition, Max Power Transfer, Tellegens - problem solving using dependent sources also

UNIT II

Transients: First order differential equations, Definition of time constants, R-L circuit, R-C circuit with DC excitation, evaluating initial conditions procedure, second order differential equations, homogeneous, non-homogenous, problem-solving using R-L-C elements with DC excitation and AC excitation, Response as related to s-plane rotation of roots.

Laplace transform: introduction, Laplace transformation, basic theorems, problem solving using Laplace transform, partial fraction expansion, Heaviside's expansions, problem solving using Laplace transform.

UNIT III

Steady State Analysis of A.C Circuits: Impedance concept, phase angle, series R-L, R-C, R-L- C circuits problem solving. Complex impedance and phasor notation for R-L, R-C, R-L-C problem solving using mesh and nodal analysis, Star-Delta conversion, problem solving using Laplace transforms also.

UNIT IV

Resonance: Need and applications of resonance phenomenon, Definition of Q, Series resonance, Bandwidth of series resonance, Parallel resonance, general case-resistance present in both branches, anti-resonance at all frequencies.

Coupled Circuits: Coupled Circuits: Self-inductance, Mutual inductance, Coefficient of coupling, analysis of coupled circuits, Natural current, Dot rule of coupled circuits, conductively coupled equivalent circuits- problem solving.

UNIT V

Two-port Networks: Relationship of two port networks, Z-parameters, Y-parameters, Transmission line parameters, h- parameters, Relationships Between parameter Sets, Parallel & series connection of two port networks, cascading of two port networks, problem solving using dependent sources also.

Image and iterative impedances. Image and iterative transfer constants. Insertion loss. Attenuators and pads. Lattice network and its parameters. Impedance matching networks.

Textbooks:

1. Network Analysis – ME Van Valkenburg, Prentice Hall of India, revised 3rd Edition, 2019.
2. Engineering Circuit Analysis by William H. Hayt, Jack Kemmerly, Jamie Phillips, Steven M. Durbin, 9th Edition 2020.
3. Network lines and Fields by John. D. Ryder 2nd Edition, PHI

Reference Books:

1. D. Roy Choudhury, Networks and Systems, New Age International Publications, 2013.
2. Joseph Edminister and Mahmood Nahvi, Electric Circuits, Schaum's Outline Series, 7th Edition, Tata McGraw Hill Publishing Company, New Delhi, 2017
3. Fundamentals of Electric Circuits by Charles K. Alexander and Matthew N. O. Sadiku,McGraw-Hill Education

I Year-II Semester

L	T	P	C
0	0	3	1.5

NETWORK ANALYSIS AND SIMULATION LABORATORY(DR23EEL08)

(ECE & allied branches)

Course Objectives:

- To gain hands on experience in verifying Kirchoff's laws and network theorems
- To analyze transient behavior of circuits
- To study resonance characteristics
- To determine 2-port network parameters

Course Outcomes:

CO1: Verify Kirchoff's laws and network theorems.
CO2: Measure time constants of RL & RC circuits.
CO3: Analyze behavior of RLC circuit for different cases.
CO4: Design resonant circuit for given specifications.
CO5: Characterize and model the network in terms of all network parameters.

The following experiments need to be performed using both Hardware and simulation Software.

The experiments need to be simulated using software and the same need to be verified using the hardware.

1. Study of components of a circuit and Verification of KCL and KVL.
2. Verification of mesh and nodal analysis for AC circuits
3. Verification of Superposition, Thevenin's & Norton theorems for AC circuits
4. Verification of maximum power transfer theorem for AC circuits
5. Verification of Tellegen's theorem for two networks of the same topology.
6. Study of DC transients in RL, RC and RLC circuits
7. To study frequency response of various 1^{st} order RL & RC networks
8. To study the transient and steady state response of a 2^{nd} order circuit by varying its various parameters and studying their effects on responses
9. Find the Q Factor and Bandwidth of a Series and Parallel Resonance circuit.
10. Determination of open circuit (Z) and short circuit (Y) parameters
11. Determination of hybrid (H) and transmission (ABCD) parameters
12. To measure two port parameters of a twin-T network and study its frequency response.

Hardware Requirements:

Regulated Power supplies, Analog/Digital Function Generators, Digital Multimeters, Decade Resistance Boxes/Rheostats, Decade Capacitance Boxes, Ammeters (Analog or Digital),

Voltmeters (Analog or Digital), Active & Passive Electronic Components

Software requirements:

Multisim / Pspice /Equivalent simulation software tool, Computer Systems with required specifications

References:

1. Network Analysis – ME Van Valkenburg, Prentice Hall of India, revised 3rd Edition, 2019.
2. Engineering Circuit Analysis by William H. Hayt, Jack Kemmerly, Jamie Phillips, Steven M. Durbin, 9th Edition 2020.

DADI INSTITUTE OF ENGINEERING &TECHNOLOGY
(AUTONOMOUS)

Approved by A.I.C.T.E& permanently affiliated to JNTU GV
Accredited by NAAC with 'A' Grade and Inclusion u/s 2(f) & 12(B) of UGC Act
An ISO 9001:2015, ISO 14001:2015 & ISO 45001:2018 Certified Institute.
NH-16, Anakapalle – 531002, Visakhapatnam, A.P.
Website: www.diet.edu.in, 9963993229 E-mail: principal@diet.edu.in

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE STRUCTURE & SYLLABUS for M.Tech EEE

Power and Industrial Drives (P&ID)

Programme

(DR23 PG w.e.f 2023 Batch)

DADI INSTITUTE OF ENGINEERING & TECHNOLOGY-ANAKAPALLE

Visakhapatnam - Andhra Pradesh, India

COURSESTRUCTURE

I Semester

S.No	Course No	Category	Course Name	P.Os	L	T	P	C
1	DR23MEET11	PC	Electrical Machine Modeling and Analysis		3	0	0	3
2	DR23MEET12	PC	Analysis of Power Electronic Converters		3	0	0	3
3	DR23MEEP1A DR23MEEP1B DR23MEEP1C	PE	Elective–I A. Modern Control Theory B. Power Quality and Custom Power Devices C. Programmable Logic Controllers & Applications		3	0	0	3
4	DR23MEEP2A DR23MEEP2B DR23MEEP2C	PE	Elective–II A. Artificial Intelligence Techniques B. Renewable Energy Technologies C. HVDC Transmission and Flexible AC Transmission Systems		3	0	0	3
5	**DR23MCST13**		Research Methodology and IPR		2	0	0	2
6	DR23MEEL11		Power Electronics Simulation Laboratory		0	0	4	2
7	DR23MEEL12		Power Converters Laboratory		0	0	4	2
8	DR23MAC11*		AuditCourse–1		2	0	0	0
					16	0	8	18

II Semester

S.No	Course No	Category	Course Name	P.Os	L	T	P	C
1	DR23MEET21	PC	Switched Mode Power Conversion		3	0	0	3
2	DR23MEET22	PC	Power Electronic Control of Electrical Drives		3	0	0	3
3	DR23MEEP3A DR23MEEP3B DR23MEEP3C	PE	Elective–III A. Control & Integration of Renewable Energy Systems B. Hybrid Electric Vehicles C. Digital Control Systems		3	0	0	3
4	DR23MEEP4A DR23MEEP4B DR23MEEP4C	PE	Elective–IV A. Advanced Digital Signal Processing B. Applications of Power Converters C. Microcontrollers		3	0	0	3
5	DR23MEEL21		Electric Drives Simulation Laboratory		0	0	4	2
6	DR23EEL22		Electric Drives Laboratory		0	0	4	2
7	DR23MEES21		Mini Project with Seminar		2	0	0	0
8	DR23MAC11*		AuditCourse–2		14	0	12	18

III Semester

S.No	Course No	Category	Course Name	P.Os	L	T	P	C
1	DR23MEEP5A DR23MEEP5B DR23MEEP5C	PE	Program Elective–V A. Digital Signal Processing Controlled Drives B. Smart Grid Technologies C. Modeling & Simulation of Power Electronic Systems		3	0	0	3
2	DR23MEEO1A DR23MEEO1B DR23MEEO1C	OE	Open Elective A. Industrial Safety B. Energy Audit, Conservation & Management C. Composite Materials		3	0	0	3
3	DR23MEED31		Dissertation Phase-I **(to be continued and evaluated next semester)**		0	0	20	10
					6	0	20	16

IV Semester

S.No	Course No	Category	Course Name	T	P	C
1	DR23MEED41		Dissertation Phase-II **(continued from III semester)**	0	32	16
				0	32	16

Audit course 1&2 (In place of *)

A. English for Research Paper Writing
B. Disaster Management
C. Sanskrit for Technical Knowledge
D. Value Education
E. Constitution of India
F. Pedagogy Studies
G. Stress Management by Yoga
H. Personality Development through Life Enlightenment Skills.

Controller of Examinations
Dadi Institute of Engineering & Technology
Autonomous
Anakapalle - 531002