VIGNAN'S
Foundation for Science, Technology & Research
(Deemed to be University)
Estd. u/s 3 of UGC Act 1956

Department of Electrical and Electronics Engineering

Date: 08.05.2023

Minutes of Board of Studies Meeting

Board of Studies (BoS) meeting of B.Tech.,Electrical and Electronics Engineering programme was conducted on 29.04.2023 in virtual mode from 01.30 am to 4.00pm.

All the internal members of VFSTR attended the meeting in person while all the external members participated the meeting virtually with link:

Zoom Link:

https://us06web.zoom.us/j/81486134146?pwd=OWMwa2lNWjFETmYwNW5vam1SbzRZQT09

Agenda of the BoS Meeting:

1. Discuss about the VFSTR initiative to revise the regulation in line with NEP2020.
2. Inclusion of Laboratory in the existing Digital Electronics course offered to II B.Tech.
3. Introduction of a new course in basic engineering category in place of existing Basics of Electrical and Electronics Engineering for the B.Tech programmes with Biology background.
4. Finalization of the NPTEL courses offered as Electives.
5. Introduction of new Department elective "Machine Learning Techniques for Electrical Engineering"
6. Any other points with the permission of Chairperson.

The following members were present

Sl.	Name of the Faculty	Designation & Addresses	Position
1	Dr. Polamraju V.S. Sobhan	Assoc. Professor & HoD	Chairperson
3	Dr. M. Umamaheswara Rao	Asst. Professor	Member Secretary
	Dr. K. Mercy Rosalina	Professor	Member
4	Dr. G. Srinivasa Rao	Professor & Dean R&D	Member
5	Dr. M. Subba Rao	Assoc. Professor	Member
6	Dr. K. Balakrishna	Assoc. Professor	Member
7	Dr. A.R. Vijay Babu	Assoc. Professor	Member
8	Dr. Narasimharaju B. L	Professor Department of Electrical Engineering National Institute of Technology Warangal, 9448401052, 08702462247 blnraju@nitw.ac.in,	Member
9	Dr. Jithendranath J.	Senior Project Engineer, Hitachi Energy Technology Services Ltd Grid and Power Quality Solutions,Chennai +91-9949537586 jithendranath.j@hitachienergy.com	Member
10	Dr. B. Satish Babu	Sr. Staff Engineer, Infineon Technologies, Bangalore, 9958006750 satishbabu.bhogineni@infineon.com	Special Invitee
11	Dr. M. Sarada	Professor, Department of ECE, VFSTR	School Dean Nominee

In the beginning of the meeting the Chairperson of the BoS, Dr. Polamraju V.S. Sobhan, Associate Professor and Head, department of EEE welcomed all the members and briefed them about the progress of the Department.

The following are the views expressed by the external members

Dr. Narasimharaju B. L

- Appreciated introduction of a course on machine learning techniques for electrical engineering and He also suggested to include deep learning as a main course
- Approved the inclusion of laboratory for Digital Electronics course.
- Recommended to include basic mathematics concepts such as differentiation, integration and complex numbers for B.Tech programmes with Biology background.

Dr. Jithendranath J

- Suggested to introduce case studies related to electrical engineering in the courses such as Machine Learning, Soft Computing Techniques.
- Explained the need to encourage students to take up research honors.
- Recommended to include the experiments such as design of Code Converters, Comparator, in Digital Electronics course.
- Suggested to modify the existing BEEE course for B.Tech programmes with Biology background.

Dr. B. Satish Babu

- Appreciated introduction of a course on machine learning techniques for electrical engineering
- Proposed to include the experiments such as design of Sequence Detectors, in Digital Electronics course.
- Recommended to include concept of simultaneous equations for B.Tech programmes with Biology background.
- Proposed to increase the number of Department Elective courses in the areas – solar and wind energy systems, Battery management systems.

The following resolutions made after the discussion:

- **Approved the following laboratory experiments in Digital Electronics Course.**
  Design and Implementation of Basic Logic Gates, Adders: Half Adder, Full Adder, Ripple carry adder, Adder/Subtractor, BCD adder , · Subtractors: Half Subtractors,

Full Subtractors, Encoder & Decoder. Multiplexer & De-Multiplexer. Parity Circuits.
Code Converters. Comparator

Design and Implementation of Flip Flops: SR, JK, D, T., Registers, Counters,
Sequence Detectors.

- **Approved the following SWAYAM-NPTEL courses as Electives**

  DC Microgrid and Control Systems

  Digital Control in Switched Mode Power Converters and FPGA-based Prototyping

  Smart Grid: Basics to Advanced Technologies
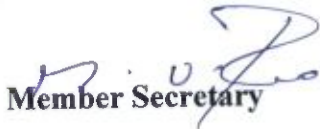
  Sustainable Power Generation Systems

  Deep Learning

 Data Science for Engineers

  C-Based VLSI Design

- **Approved new course "Fundamentals of Electrical and Electronics Engineering" in basic engineering category in place of existing BEEE (Basics of Electrical and Electronics Engineering for the B.Tech programmes with Biology background.**

- **Approved new Department Elective course "Machine Learning Techniques for Electrical Engineering.**

The Chair rendered the closing remarks by thanking all the external members and internal members for their participation.

Member Secretary

Chairperson

The following are the members present for the board of studies meeting held at Department of Electrical and Electronics Engineering on 29.04.2023

Sl. No.	Name of the Member	Designation	Signature
External Members:			
1.	Dr. Narasimharaju B. L	Professor **Department of Electrical Engineering National Institute of Technology, Warangal - 506004, Telangana, INDIA Phone: 9448401052, 08702462247 Email: blnraju@nitw.ac.in,** narasimharaju.bl@gmail.com	Participated the meeting virtually
2.	Dr. Jithendranath J.	*Senior Project Engineer,* Hitachi Energy Technology Services P Ltd · Grid and Power Quality Solutions 2/4 A Mount Tower Mount Poonamallee Road, Chennai – 600089, Tamil Nadu **Mobile:** +91-9949537586 **Email** :jithendranath.j@hitachienergy.com	
3	Dr. B. Satish Babu	Sr. Staff Engineer, Infineon Technologies, Bangalore, **Phone: 9958006750**	
Internal Members:			
1.	Dr. Polamraju V.S. Sobhan	Associate Professor & HoD, Dept. of EEE, VFSTR	
2.	Dr. G. Srinivasa Rao	Professor, Dept. of EEE, VFSTR	
3.	Dr. K. Mercy Rosalina	Professor, Dept. of EEE, VFSTR	
4.	Dr. M. Umamaheswara Rao	Asst. Professor, Dept. of EEE, VFSTR	
5.	Dr. M. Subba Rao	Associate Professor, Dept. of EEE, VFSTR	
6.	Dr. K. Balakrishna	Associate Professor, Dept. of EEE, VFSTR	
7.	Dr. A.R. Vijay Babu	Associate Professor, Dept. of EEE, VFSTR	

L	T	P	C
3	2	-	4

MODULE – 1
Supervised Learning

UNIT-01
Regression: Simple Linear Regression; Multiple Linear Regressions; Non - Linear Regression, **Classification:** K-Nearest Neighbors, Decision Trees, Logistic Regression: Univariate Logistic Regression: Multivariate Logistic Regression, *Naïve Bayes*.

UNIT-02:
Support Vector Machine (SVM): SVM - Maximal Margin Classifier; SVM - Soft Margin and Hard Margin Classifiers: Kernels.
Ensembles methods: Bagging & Boosting, AdaBoost; Gradient Boosting; Random Forests.

PRACTICES:
Case study 1: Estimating Solar Wind Energy Production.
Case study 2: Short-Term Load Forecasting

22EE205 DIGITAL ELECTRONIC CIRCUITS

Source: https://www.worldscientific.com/

Hours Per Week :

L	T	P	C
2	2	0	3

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- This course deals with the fundamentals of number systems, and Boolean expressions that are used to realize combinational and sequential circuits.
- Its objective is to minimize the logical expressions using Boolean postulates, to design various combinational and sequential circuits.
- To provide a sufficient number of applications/case studies to demonstrate the techniques used.

MODULE-1

UNIT-1   8L+8T+0P=16 Hours

FUNDAMENTALS OF DIGITAL SYSTEMS:
Concept of Number systems, Binary Arithmetic, One's and two's complements, Canonical and Standard

Chairperson

Proposed New Department Elective
MACHINE LEARNING TECHNIQUES FOR ELECTRICAL ENGINEERING

L	T	P	C
3	2	-	4

MODULE – 1
Supervised Learning

UNIT-01
Regression: Simple Linear Regression; Multiple Linear Regressions; Non - Linear Regression,
Classification: K-Nearest Neighbors, Decision Trees, Logistic Regression: Univariate Logistic Regression; Multivariate Logistic Regression, *Naive Bayes.*

UNIT-02:
Support Vector Machine (SVM): SVM - Maximal Margin Classifier; SVM - Soft Margin and Hard Margin Classifiers; Kernels.
Ensembles methods: Bagging & Boosting, AdaBoost; Gradient Boosting; Random Forests.

PRACTICES:
Case study 1: Estimating Solar Wind Energy Production.
Case study 2: Short-Term Load Forecasting.
Case study 3: Fault Detection in Power System.
Case study 4: Classification of Electrical Low Voltage Cable Degradation.
Case Study 5: Speed Control of DC Shunt Motor

MODULE -2
Unsupervised Learning

UNIT-01:
Curse of Dimensionality: *Feature selection, Dimensionality Reduction* - Principal Component Analysis (PCA); Singular Value Decomposition (SVD); t-Distributed Stochastic Neighbor Embedding (t-SNE).

UNIT-02:
Clustering: Introduction to Clustering; Different clustering methods (Distance, Density, Hierarchical); K Means Clustering; constructing a hierarchical cluster.

PRACTICES:
Case Study 1: Dimensionality reduction for monitoring electrical consumption of academic buildings.
Case Study 2: Compression of the original power system transient stability assessment dataset.
Case Study 3: Clustering of Electricity consumption behavior.
Case Study 4: Fault diagnosis in power transformer using Clustering Analysis

TEXT BOOKS:
1. Machine Learning, Tom Mitchell, McGraw Hill, 1997, ISBN: 978-0070428072
2. Python for Machine Learning, Sebastian Raschka and VahidMirjalili, ISBN: 978-1783555130
3. Hands-On Machine Learning with Scikit-Learn and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems, AurélienGéron, ISBN: 978-1491962299

REFERENCE BOOKS:
1. Pattern Recognition and Machine Learning, Christopher M. Bishop, ISBN: 978-0387310732
2. The Hundred-Page Machine Learning Book, AndriyBurkov, ISBN: 978-1999579500

**** --- FUNDAMENTALS OF ELECTRICAL AND ELECTRONICS ENGINEERING

L	T	P	C
2	-	2	3

PREREQUISITE KNOWLEDGE:
Basics of Physics

COURSE DESCRIPTION AND OBJECTIVES:
This course provides an insight into the functioning of basic electrical components like resistor, inductor and capacitor. It deals with the constructional and operational details of static machines. It also deals with the basic electronic components like P-N junction diode, Zener diode.

MODULE–I
UNIT-I
4 L-0T-0P   4Hrs

Trigonometric Functions: Introduction to basic trigonometric functions.
Vectors: Introduction to vectors and their representation, Vector addition, subtraction and Multiplication.
Phasors: Phasor representation of sinusoidal voltage and current signals, Conversion of Polar to Rectangular form and Vice versa. Phasor diagrams and their interpretation. Phasor addition, subtraction, and multiplication. Conversion between phasor and time-domain representations.
Differentiation, Integration, and Applications: Basic concepts of calculus, Differentiation: Rates of change, derivatives of basic functions, Integration: Finding areas under curves, indefinite and definite integrals.

UNIT-II
12 L-0T-16P   28Hrs

FUNDAMENTALS OF ELECTRIC CIRCUITS:
Terminal characteristics of Active Elements (Ideal voltage, current source) and passive elements (Resistor, Inductor and Capacitor), Ohm's Law and Kirchhoff's Laws, Series and parallel circuits, Voltage and current division, Power and energy calculations, calculating areas of waveforms, finding total charge, energy and Power, Introduction to circuit analysis techniques (Mesh and Nodal analysis).

PRACTICES:
- Verification of Ohm's law.
- Verification of Kirchhoff's current law.
- Verification of Kirchhoff's voltage law.
- Measurement of power and Energy in resistive circuit.

MODULE–II
UNIT- I
8L-0T-8P   16Hrs

ANALYSIS OF AC CIRCUITS and Transformer:
Generation of AC voltage, Frequency, Average value, R.M.S. value, Form factor, Peak factor for sinusoidal only; Analysis of single- phase ac circuits consisting of R, L, C, RL, RC (series and parallel), faradays law of electromagnetic induction, Principle of operation of single phase transformer, Constructional features, EMF equation (simple numerical problems).

SEMICONDUCTOR DEVICES:

Classification of semiconductors, P-N junction diode -operation and its characteristics, Half wave rectifier - operation, efficiency; Full wave rectifiers -types, operation, efficiency; Zener diode and its characteristics, Zener diode as Voltage regulator.

PRACTICES:
- Determination of R.M.S. Values of sinusoidal waveform.
- Verification of PN junction diode characteristics under both forward and reverse bias.
- Verification of Zener diode characteristics under reverse bias.
- Transformation ratio of a single phase transformer at different loads.
- Determination of impedance in complex AC circuits.

COURSE OUTCOMES:
Upon successful completion of this course, students will have to ability to:

CO No.	Course Outcomes	Blooms Level	Module No.	Mapping with POs
1	Solve the AC and DC circuits using different methods.	Apply	1,2	1,2,9,12
2	Analyze the resistive circuits with independent sources and find its solution.	Analyze	1,2	1,2,6,9
3	Examine the different electrical equipment.	Evaluate	2	1,2,9,12
4	Acquire the knowledge of semiconductor devices to create circuits.	Create	1	1,2,3,9,12

TEXT BOOKS:
1. V. K. Mehta, "Principles of Electrical Engineering and Electronics", S.Chand& Co., Publications, New Delhi, 2019.
2. D.P. Kothari, "Basic Electrical and Electronics Engineering", TMH, New Delhi, 2017.
3. Anthony Croft and Robert Davison, "Mathematics for Engineers: A Modern Interactive Approach," Pearson/Prentice Hall, 2008.

REFERENCE BOOKS:
1. Millman and Halkias, "Electronic Devices and Circuits", Mc Graw Hill, 2006.
2. A.K. Thereja and B.L.Thereja, "Electrical Technology", Vol.–II, S. Chand & Co., Publications, 2020.
3. U. Bakshi and A. Bakshi, "Basic Electrical Engineering", 1st edition, Technical Publications, Pune, Nov 2020.