# Shri G. S. Institute of Technology and Science, Indore

## Minutes of Board of Studies of Electronics and Instrumentation Engineering

Date: 04/07/2023

A board of studies (BOS) meeting for Electronics and Instrumentation Engineering was held in the Department on 4th July 2023 at 3.30 PM in the hybrid mode. Few external members attended the meeting On-line on Google meet platform. Following members were present.

| | |
|---|---|
| 1. Dr. Dr. P. P. Bansod | Chairman (BOS) |
| 2. Mr. D. S. Ajnar | Member |
| 3. Mr. Rajesh Khatri | Member |
| 4. Mr. R. C. Gurjar | Member |
| 5. Dr. Gireesh Soni | Member |
| 6. Dr. R. B. Pachori | External Expert (IIT Indore) nominated by VC. |
| 7. Dr. Vaibhav Neema | Expert, Outside Parent University, IET DAVV Indore |
| 8. Mr. Anuj Upadhyay | Expert (Industry), M/S. Farm Electronics, Indore |
| 9. All contract faculty members' | Special invitee. |

Dr. Santosh Vishwakarma, Professor, IIT Indore and Dr. Bupendra Reniwal, Assistant Professor (IIT, Jodhpur) and Postgraduate Alumnus could not attend the meeting.

The deliberations of meeting are as under:

1. The PEOs and PSOs for UG course- B. Tech (Electronics and Instrumentation) were reframed and discussed in the meeting as recommended by NBA committee in the recent visit in Sep.2022.

2. The scheme for UG course was reframed as per requirements of National Education Policy (NEP). Exit policy with additional mandatory credits after 1st, 2nd, 3rd and 4th year were proposed. The student can exit after one year with Engineering Certificate, after two years with diploma, after three years with Vocational degree and after four years with Bachelor's with research. The scheme with NEP will be applicable from 2023-2024 sessions and is recommended to academic council for approval.

3. Changes in the COs of some subjects and their practical component were discussed in the meeting and recommended to Academic council for approval.

4. The Scheme and syllabus of P.G. course – M. Tech. (Microelectronics and VLSI Design) was discussed and as there were no changes, it is recommended to the Academic council for approval

The meeting ended with vote of thanks by Chairman, BOS.

17/7/2023

Signature of members of BOS members:

1. Dr. P. P. Bansod
2. Dr. R. B. Pachori
3. Dr. Vaibhav Neema
4. Mr. Anuj Upadhyay
5. Mr. D. S. Ajnar
6. Mr. Rajesh Khatri – 17/7/2023
7. Dr. R. C. Gurjar
8. Dr. Gireesh Soni

Encl.: (i) Updated Scheme and Syllabus of UG (As per NEP-2020)
(ii) Updated Scheme and Syllabus of PG
(iii) Approved statements of COs, PEOs and PSOs

# *Shri G.S. Institute of Technology & Science, Indore*

## Department of Computer Engineering

10/08/2023

**Minutes of Emergency Meeting of Board of Studies in Computer Engineering held on 10/08/23**

An emergency meeting of Board of Studies (BoS) in Computer Engineering was held on Thursday,10/08/2023 at 3 p.m.in hybrid online-offline mode due to requests received from HoD (Industrial & Production Engineering) and HoD (Electronics & Instrumentation Engg.).

Following members attended the meeting:

| | | |
|---|---|---|
| 1. | Dr. Vandan Tewari(Professor & Head, Department of Computer Engineering) | Chairperson |
| 2. | Dr. Aruna Tiwari, Professor, Department of Computer Engineering, IIT, Indore | Member, External Expert |
| 3. | Mr. V. R. Sathe, IT Cosultant | Member, External Expert |
| 4. | Prof. D.A. Mehta, Professor, Department of Computer Engineering | Member |
| 5. | Dr.UrjitaThakar, Professor, Department of Computer Engineering | Member |
| 6. | Dr. AnuradhaPurohit , Professor, Department of Computer Engineering | Member |
| 7. | Mr. Surendra Gupta, Associate Professor, Department of Computer Engineering | Member |
| 8. | Mr. Rajesh Dhakad, Associate Professor, Department of Computer Engineering | Member |
| 9. | Ms. Priyanka Bamne, Assistant Professor, Department of Computer Engineering | Member |
| 10. | Ms. Neha Mehra, Assistant Professor, Department of Computer Engineering | Member |

Dr. U.A. Deshpande (VNIT, Nagpur), Prof. D.C. Jinwala (SVNIT, Surat) and Sh. J.K. Khatwani (Principle Engineer, The Modern Data Company) could not join the meeting.

Discussions were held on two agenda items. Following are the deliberations:

**Item no 1: To revise the syllabus of CO23559: Object Oriented Programming offered to II B Tech. (IPE) students**

As per the note received from HoD and Chairman, BoS (IPE), the course CO23559: Object Oriented programing is to be shifted from IV sem. to III sem and its syllabus is to be redesigned looking to the current requirement of industry . Accordingly, the syllabus of this course was revised and the new syllabus is attached herewith. The new syllabus will be applicable to II B.Tech. students of IPE in academic session 2023-24.

(III sem) from

**Item no 2: To design syllabus for CO3_____: Artificial Intelligence, to be offered as elective to III B.Tech. students of E&I branch** (V sem)

As per the note received from HoD and Chairman, BoS (E&I), a new elective course CO3_____: Artificial Intelligence is to be introduced for III B.Tech (E&I) students and its syllabus is to be designed, looking to the current requirements of industry. The BoS, Computer Engineering has been requested for the same. Accordingly, the BoS accepted the request of E&I deptt. and designed the syllabus for the said subject. The approved syllabus is attached herewith.

(V sem) (V sem)

The newly introduced subject will be applicable to III B.Tech Students of E&I Engg. w.e.f. academic session 2023-24 i.e. to the students who have take admission in session 2021-22 and onwards in Ist year.

The meeting ended with vote of thanks to the Chair.

Signatures of members:-

1. Dr. Vandan Tewari (Chairperson)
2. Dr.Aruna Tiwari (External Expert)
3. Mr. V.R. Sathe (External Expert)
4. Prof. D A Mehta (Member)
5. Dr.UrjitaThakar (Member)
6. Dr.AnuradhaPurohit (Member)
7. Mr. Surendra Gupta (Member)
8. Mr. Rajesh Dhakad (Member)
9. Ms. Priyanka Bamne (Member)
10. Ms. Neha Mehra (Member)

# DEPARTMENTOF COMPUTER ENGINEERING

## CO3_____: Artificial Intelligence

| PERIOD PER WEEK | | | CREDITS | | | MAXIMUM MARKS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| T | P | TU | T | P | TU | THEORY | | PRACTICAL | | TOTAL MARKS |
| 3 | - | - | 3 | - | - | CW | END SEM | SW | END SEM | 100 |
| | | | | | | 30 | 70 | - | - | |

**Course Objective:-**
To enable students to learn basic concepts, theories, applications and techniques of artificial intelligence and machine learning.

**Course Outcomes: -**
CO1: Understand and describe the basics of Artificial Intelligence and Problem-solving.
CO2: Understand knowledge representation using logic and rules and reasoning.
CO3: Understand and describe the basics the machine learning and performance parameters.
CO4: Learn the principle and application of regression and SVM and practice the training using the said method.
CO5: Learn, classify and examine the process of decision trees and dimensionality reduction in Machine learning.

**Prerequisite: -** Nil

**Unit 1. Introduction to Artificial Intelligence (AI) and Problem-Solving Agent:**
AI Fundamentals: - Definition, Comparison between Human Intelligence and Artificial Intelligence, Types of AI techniques, Characteristics of AI applications, Intelligent Agents, Agents & Environment, Nature of Environment, Structure of Agents, Goal-Based Agents, Utility-Based agents, Problem-Solving, State Space Search and Heuristic Search Techniques.

**Unit 2. Knowledge and Reasoning:**
Representations and Mappings, Approaches to Knowledge Representation, issues, First Order Predicate logic, conversion to clause form, resolution, unification algorithm, forward and backward reasoning, Semantic Nets, Conceptual Dependency, frames and scripts, Statistical reasoning, Bayes Theorem and Rule-based system.

**Unit 3. Machine Learning (ML)**

Introduction to Machine Learning: Importance of Machine Learning, Types of Machine Learning, Training, validation and testing of machine learning model, Performance Measures: Confusion Matrix, Precision and Recall, Precision/Recall Tradeoff, The ROC Curve, R-squared.

**Unit 4. Regression & Support Vector Machines (SVM)**

Linear Regression, Cost function, Gradient Descent, Problem of overfitting, Bias-Variance tradeoff, and Logistic Regression. Support Vector Machines: Linear SVM Classification, Case Study 1 - Predicting Atrial Fibrillation using the ECG data.

**Unit 5. Decision Trees & Dimensionality Reduction**

Decision Trees: Decision Tree model, Measuring Purity and information gain, Learning process, Computational Complexity, Regularization, Regression tree, Random Forests and XGBoost. Dimensionality Reduction and Unsupervised learning: Principal component analysis, Clustering algorithms, Partition based, Hierarchical based, Divisive clustering, Optimization objective, Expectation-maximization algorithm–Case Study 2 – Defect detection in manufacturing with unsupervised learning.

**Text Books:**


- Rich & Knight, "Artificial Intelligence", 2nd Edition, Tata Mcgraw Hill.
- Stuart Russell and Peter Norvig, Artificial Intelligence - A Modern Approach, Third Edition, Prentice Hall Series, 2010.
- AurélienGéron, Machine Learning with Scikit-Learn & TensorFlow, O'Reilly USA, 2017.
- Tan, P. N., Steinbach, M., & Kumar, V. (2016). Introduction to data mining. Pearson Education India.


**Reference Books:**


- Andreas Muller and Sarah Guido, "Introduction to Machine Learning with Python: A Guide for Data Scientists", Shroff/O'Reilly, 2016
- Dan W Patterson, Introduction to Artificial Intelligence and Expert Systems, 1st Edition, PHI.,2015