



# KLS Vishwanathrao Deshpande Institute of Technology

(Accredited by NAAC with 'A' Grade)  
(Approved by AICTE, New Delhi. Affiliated to VTU, Belagavi)  
(Recognized Under Section 2(f) by UGC, New Delhi)  
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Department of Civil Engineering



## ADD ON Course List for AY 2024-25

Sl. No.	Name of the ADD ON Course	Semester
1	Application of Machine Learning (ML) in Civil Engineering	III
2	Recent Innovation in Civil Engineering	IV
3	Site Exploration and Investigation	V
4	3D Printing in Construction Technology	VI
5	Software - Marble (GIS), Scilab, Python 3.4, Open FOAM, Blender	VII
6	Sustainability and Research in Modern Civil Engineering	VIII

  
HOD  
HEAD

Dept of Civil Engg  
KLS V.D.I.T. Haliyal

  
DEAN ACADEMICS

  
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Vishwanathrao Deshpande Institute of Technology, Haliyal-581 329

**DEPARTMENT OF CIVIL ENGINEERING**  
**ADD ON COURSE SYLLABUS**

**B. E. CIVIL ENGINEERING**  
**Choice Based Credit System (CBCS) and Outcome Based Education (OBE)**  
**SEMESTER – III**  
**Academic Year: 2024-25**

**APPLICATION OF MACHINE LEARNING IN CIVIL ENGINEERING**

Teaching Hours/Week | 3 + 2 Lab

**Course Learning Objectives:** This course will enable students to:

1. Understand the definition of AI and ML
2. Comprehend the importance of algorithms and use software in AI and ML.
3. Develop prediction model for civil engineering problems using AI and ML

**Module - 1**

**Machine learning:** Introduction, Learning from Data, Artificial Neural Networks, Genetic Algorithms, Evolution of Neural Networks, Supervised Learning Network, Perceptron Network, Adaptive Linear Neuron, Back-Propagation Network, Radial Basis Function Network, Generalized Regression Neural Networks, Unsupervised Learning Networks, Kohonen Self-Organizing Feature Maps, Counter Propagation Network, Adaptive Resonance Theory Network, Special Networks, Working Principle of ANN, Types of Activation Function, ANN Architecture, Learning Process, Feed-Forward Back Propagation, Strengths of ANN, Weaknesses of ANN and Working of the Network.

**Module - 2**

**Programming using AI:** Introduction, use of Google colab, Visual code, Codeium and GitHub Co-pilot and MATLAB Code

**Module - 3**

**Applications in the Civil Engineering Domain:** Groundwater Level Forecasting, Water Consumption Modelling, Modelling Failure Trend in Urban Water Distribution, In the Field of Geotechnical Engineering, In the Field of Construction Engineering, In the Field of Coastal and Marine Engineering, In the Field of Structural Engineering, In the Field of Transportation Engineering, Soil Hydraulic Conductivity Modelling, Performance Evaluation and Genetic Programming in Sea Wave Height Forecasting

**Course Outcomes**

After the successful completion of the course the student will be able to

- CO1: Understand the meaning of AI and ML  
CO2: Write a python code using Codeium and GitHub co-pilot.  
CO3: Apply appropriate models to solve civil engineering problems

**Text Books**

- T1: Deka, P. C. (2019). A primer on machine learning applications in civil engineering. CRC Press.  
T2: Meshram, K. (2023). Machine Learning Applications in Civil Engineering. Elsevier.

**Reference Books**

- R1: Bishop, C. M., & Nasrabadi, N. M. (2006). Pattern recognition and machine learning. New York: springer.  
R2: Gowrishankar, S., & Veena, A. (2018). Introduction to Python programming. Chapman and Hall/CRC.

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**B. E (CIVIL ENGINEERING)  
ADD ON COURSE SYLLABUS**

**ADD ON COURSE FOR ODD SEM AY 2024-25**

Course Title	<b>Soil Exploration and Site Investigation</b>	CIE Marks	10
Teaching Hours/Week (L:T:P: S)	0:2:0:0	SEE Marks	-
Total Hours of Pedagogy	30	Semester	V
Credits	-	Exam Hours	1 hr

**Course objectives:**

This course will enable students to understand the analysis and design of concrete Bridges.

**Module-1**

Introduction soil exploration, Objectives and Importance of soil exploration. Stages and Methods of exploration – Test pits, Borings. **10 Hours**

**Module-2**

Methods of exploration – Geophysical methods, Sampling techniques, Undisturbed, disturbed and representative samples, Geophysical exploration and Bore hole log. **10 Hours**

**Module-3**

Stabilization of boreholes, Drainage and Dewatering methods. Estimation of depth of GWT (Hvorslev's method). **10 Hours**

**Course outcome (Course Skill Set)**

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

1. Appreciate basic concepts of soil mechanics as an integral part in the knowledge of Civil Engineering.
2. Understand introductory concepts of Geotechnical investigations required for civil engineering projects emphasizing in situ investigations
3. Understand drainage and dewatering methods and estimate depth of GWT.

**TEXT BOOKS / REFERENCES:**

- T1: Murthy V.N.S., Principles of Soil Mechanics and Foundation Engineering, UBS Publishers and Distributors, New Delhi.
- T2: T.W. Lambe and R.V. Whitman, Soil Mechanics-, John Wiley & Sons.
- T3: Punmia B C, Soil Mechanics and Foundation Engineering-(2017), 16th Edition, Laxmi Publications co., New Delhi.