



## **STTP Report on “Application of Revit-3D and AI/ML to Civil Engineering.”**

One-week short term training program on “Application of Revit-3D and AI/ML to Civil Engineering” under ISTE was organised by the Civil Engineering Department, VIVA Institute of Technology during 2<sup>nd</sup> January 2023 to 6<sup>th</sup> January 2023. There were 15 participants in the STTP. The participants were from Civil Engineering Discipline.

The STTP was inaugurated on 2<sup>nd</sup> January 2023, Monday at 10.00 am by HOD Civil Engineering, Prof. Lissy Jose in the presence of Guest Speaker Mr. Nilesh Bhatt. Prof. Lissy Jose welcomed the guest of the day and all the participants.

**Day 1 Session 1: 10.30 am to 12.30 pm**

**Session 2: 2pm to 4pm**

**Day 2 Session 3: 10 am to 12pm**

**Session 4: 2pm to 4pm**

**Session 1,2,3&4: Guest Speaker - Mr. Nilesh Bhatt.**

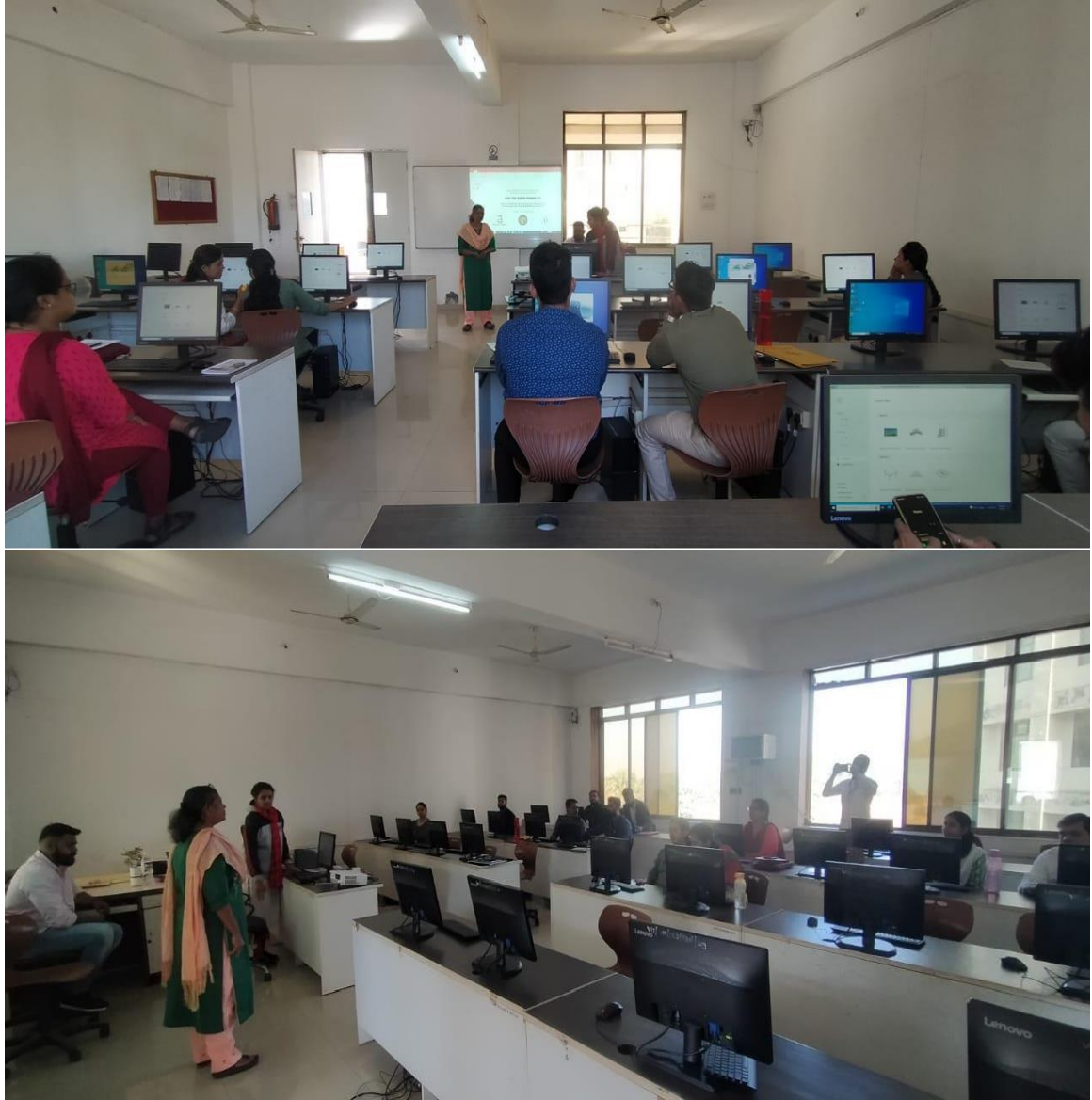
**Topic: Overview of Autodesk Revit-3D and Case Study Demonstration**

The session was on Revit 3D Modelling. Revit is a commercial building information modelling (BIM) software by the company Autodesk. It's generally used by architects, structural engineers, mechanical, electrical, and plumbing (MEP) engineers, designers, and contractors. In the 1<sup>st</sup> session, the speaker gave the demo of Autodesk Revit, how the software allows users to create, edit, and review 3D models in exceptional detail. A case study demonstration was carried out in the 2<sup>nd</sup> session additional to the overview of Revit 3D.

In the second day (3<sup>rd</sup> January), for the Session 3, hands-on Revit 3D was conducted and all the participants generated a 3D model of Residential Bungalow. In the 4<sup>th</sup> session Case Study with demonstration was given.



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**First Day of STTP on Revit 3D and Inauguration of STTP**



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**Day 3 Session 5:11 am**

**to 1 pmSession**

**6: 2pm to 4pm**

**Session 5&6: Guest Speaker - Ms. Sonia Dubey.**

**Topic: Fundamentals of Python Programming with case study-demonstration**

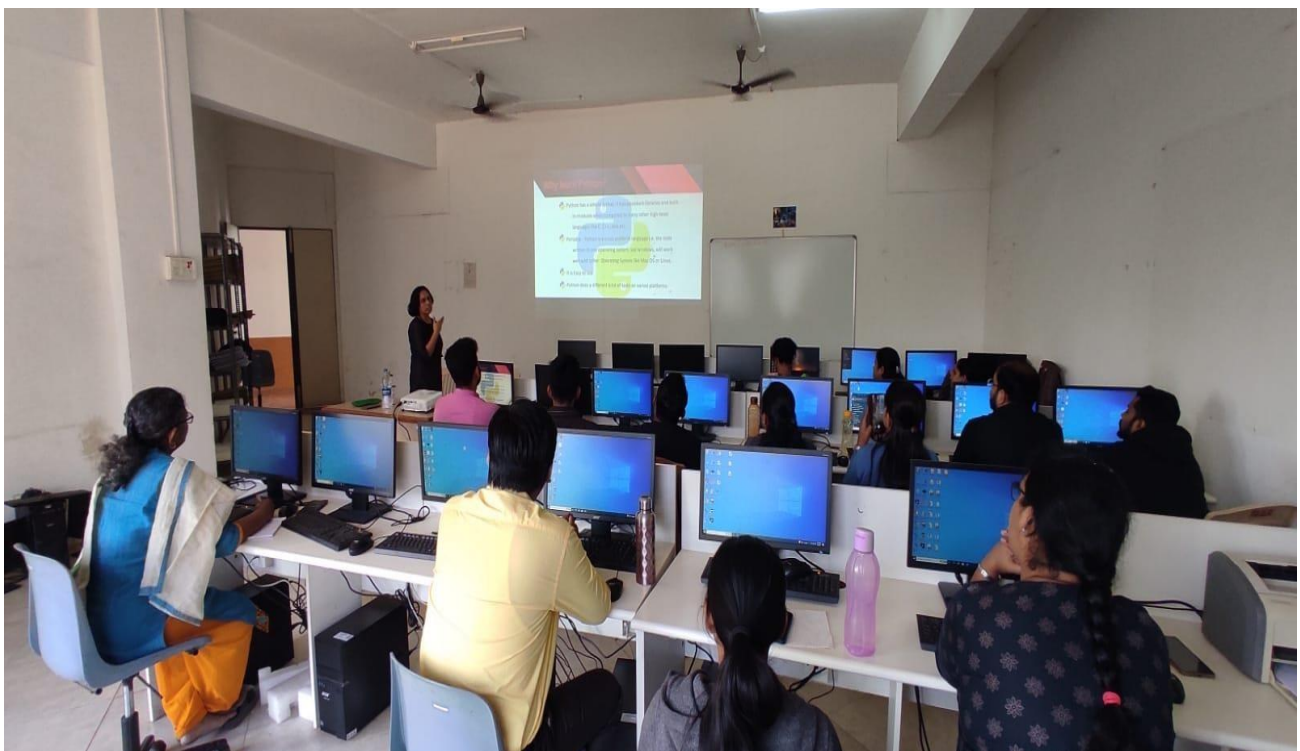
The 5<sup>th</sup> session was on Fundamentals of Python Programming. A basic Python curriculum can be broken down into 4 essential topics that include: Data types (int, float, strings) Compound data structures (lists, tuples, and dictionaries) Conditionals, loops, and functions. Object-oriented programming and using external libraries. In the morning session, the speaker gave the introduction to Python Programming, how the software



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allows developers to write reliable systems. Python is the major code language for AI and ML. The basic concepts of the programming language like Variables, Control Structures, Tools etc. were discussed in the session. A case study demonstration on earth quake analysis was conducted in the 6<sup>th</sup> session on the third day of STTP.



**3<sup>rd</sup> Day of STTP on Fundamentals of Python Programming**





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**Day 4 Session 7:10.30 am to 12.30 pm**

**Session 8: 2pm to 4pm**

**Day 5 Session 9: 10 am to 12pm**

**Session 10: 1pm to 2pm**

**Session 7,8,9&10: Guest Speaker - Dr. Harshali Patil.**

**Topic: Fundamentals of Artificial Intelligence & Machine Learning with Case-Study Demonstration**

The 7<sup>th</sup> session was on Fundamentals of AI/ML. Artificial Intelligence is an attempt to make a computer, a robot, or other piece of technology 'think' and process data in the same way as we humans do. AI therefore has to study how the human brain 'thinks', learns, and makes decisions when it tries to solve problems or execute a task. In the 9<sup>th</sup> session, the speaker gave the introduction to Artificial Intelligence and Machine Learning, what are the different types of Data, Data Analysis and Data Analytics, Sampling techniques, three categories of ML and Regression. In the 8<sup>th</sup> session we learned how to work on Data in AI/ML with a case study demonstration on Concrete Mix Design.

The 5<sup>th</sup> day, 9<sup>th</sup> session we revised the previous day learnings. A case study on Accident Safety was conducted and the Programming was developed for the related Data. We learned SVM(Support Vector Machine), Decision Tree Regression, and Random Forest, which can be used to classify gene expression data. RF can highly accurate, generalize better and are interpretable and SVM (called RF-SVM) to effectively predict gene expression data with very high dimensions.

In the 10<sup>th</sup> session the speaker explained about the methods of regularisation like Linear Regression, Lasso Model, Ridge Model, ElasticNet Regression and Logistic Regression. And the differences, accuracy of each model discussed. Overall, the session was fruitful and all were enjoyed to learn new things.



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**4<sup>th</sup> Day of STTP on Fundamentals of Artificial Intelligence and Machine Learning**



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**7<sup>th</sup> session of STTP on Fundamentals of Artificial Intelligence & Machine Learning**



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**5<sup>rd</sup> Day of STTP on Case Study Demonstration of AI/ML**





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The One-Week Short Term Training Program on “Application of Revit-3D and AI/ML to Civil Engineering” was concluded with the validity function.



**Validity Function of One-Week Short Term Training Program**