Indian Institute of Technology Delhi

TEQIP-III Sponsored Short-Term Course

Machine Learning in Civil and Mechanical Sciences: Theory and Applications

IIT Delhi Sonipat Campus, Haryana 8th – 10th February 2019

About IIT Delhi

IIT Delhi is one of the oldest technological institutes in India. The institute has nearly 35 academic units that imparts knowledge on Engineering, Science, Design, Social Science, among others. IIT Delhi has been instrumental in providing solutions to the technological and societal problems through its academic and research activities. IIT Delhi has been consistently placed among top academic universities around the globe, and as per the recent QS University ranking, the institute stands at 64th in the list of Engineering and Technology domain. The institute has been expanding its infrastructure and the extended campus of IIT Delhi at Sonipat in Haryana is now functional. Situated at a distance of around 60 kms from IIT Delhi, the Innovation Centre for Education(ICE), spread over 10 acres, is being created as a modern eco-friendly 'Gurukul' to consolidate and enhance teaching-learning/pedagogical research activities and conduct the same more effectively for a greater impact on the educational landscape.

Scope of the Course

The aim of the course is to introduce the relevance of machine learning in a wide range of academic and industrial problems relevant to civil, chemical and material science applications. This will be achieved through lectures and hands-on sessions, which will include the basics of widely used algorithms for linear and non-linear regressions such as elastic net, principal component regression support vector machine and artificial neural networks.

Learning Outcomes

- Appreciate the role of machine learning in engineering disciplines
- Use data mining to predict hidden trends
- Make appropriate decisions employing data-based modelling
- Gain hands-on experience on open source packages for machine learning algorithms

Course Contents

Data Analysis; Probability Distributions – Discrete and Continuous; Estimation and Hypothesis Testing. Linear Regression and its Derivatives – Partial Least Squares, PCA, Lasso Ridge and Elastic Net; Estimation and Inference; Non-Linear Regression, Support Vector Machine, Artificial Neural Networks, Gaussian Process Modelling; Classification and Clustering; Engineering Applications and Hands-on sessions.

Important Dates

The last date for the receipt of duly filled registration form is **31/12/2018** and the selected candidates will be intimated latest by **01/01/2019**.

Course Faculty

The following faculty members will deliver lecture during the course

Dr. N.M. Anoop Krishnan, Department of Civil Engineering, IIT Delhi
Dr. Manoj M., Department of Civil Engineering, IIT Delhi
Dr. Hariprasad K., Department of Chemical Engineering, IIT Delhi

Target Audience

The course is designed for faculty members in **TEQIP-III institutes**. Selection of 30 candidates will be done on a first-come, first-served basis after shortlisting candidates based on their background and interest in the subject.

Accommodation

Boarding and lodging will be arranged for the selected candidates, as per TEQIP-III norms, in Sonipat campus on twin-sharing basis. All rooms are air-conditioned and equipped with basic amenities. Participants who need onsite accommodation are requested to indicate the same in the application form.

Travel

TA will be provided for the participants from their hometown to IIT Delhi Sonipat Campus up to a maximum of the 3rd a/c train fare.

Organising Team

Prof. N. M. Anoop Krishnan & Prof. Manoj M. (Course Coordinators)	**Prof. Hariprasad Kodamana (Course Coordinator)**
Department of Civil Engineering Indian Institute of Technology Delhi Hauz Khas, New Delhi – 110016 Ph: 011-2659-1219 Email: manojm@civil.iitd.ac.in Ph: 011-2659-1223 Email: krishnan@civil.iitd.ac.in	Department of Chemical Engineering Indian Institute of Technology Delhi Hauz Khas, New Delhi – 110016 Ph: 011-265961024 Email: kodamana@chemical.iitd.ac.in

Registration

Interested candidates are requested to fill the particulars requested in the registration form attached with the brochure. The soft copy of the **completed registration form should be sent by email** to teqip3.iitd@gmail.com with the title of the course "**Machine Learning in Civil and Mechanical Sciences: Theory and Applications**" as the subject.

For further information related to the course or for accommodation enquiries, please contact us at teqip3.iitd@gmail.com.

TEQIP-III

<div style="text-align:center;">

INDIAN INSTITUTE OF TECHNOLOGY DELHI
TEQIP -III

</div>

<div style="text-align:center;">

PARTICIPANT REGISTRATION FORM

</div>

Machine Learning in Civil and Mechanical Sciences: Theory and Applications

1. **Name: Prof./Dr./Mr./Ms:** _____

2. **Designation:** _____

3. **Department:** _____

4. **University/Institute:** _____

5. **Address:** _____

   _____

6. **Email ID:** _____

7. **Mobile/Phone:** _____

8. **Accommodation Needed:** Yes ☐ No ☐

   Place: ………………

   Date: ……………….

<div style="text-align:right;">

Signature of the Applicant

</div>

<div style="text-align:right;">

Signature of the Head of the Institution with Seal

</div>