

INDIAN INSTITUTE OF TECHNOLOGY INDORE

Discipline of Physics

Organizes

One-week Workshop under QIP

Statistical Methods in Physical Sciences and Engineering

December 7-12, 2020

Sponsored by Quality Improvement Programme (QIP), AICTE / MHRD



ABOUT IIT INDORE

Indian Institute of Technology Indore, located in Madhya Pradesh, is an institute of national importance established by the Government of India in 2009. Recently IIT Indore is ranked 55 in the THE world university ranking-2020 and ranked 10 by MHRD as per NIRF 2020. The faculty members of the Discipline of Physics are engaged in the research frontiers from keV to TeV energies, including some of the interdisciplinary research activities. The Discipline has attracted bright students across the country for PhD and undergraduate research. Interested people are encouraged to contact the concerned faculty members for collaborative research. The Discipline is actively engaged in organizing various research activities, more details, please visit: <http://physics.iiti.ac.in/>

COURSE OBJECTIVES

Statistical data analysis and handling of errors are integral parts of research in all the areas of Science and Engineering. This course is not formally taught in any university, but everybody needs it at a later part of academic career. The proposed course will be of practical use to anyone in research and teaching. In particular, it will benefit the teachers maximally, as they deal with laboratory courses at all levels. It is a need for researchers in their everyday

REGISTRATION FEE

- There is **no registration fee**.
- Faculty members from AICTE sponsored colleges should send their filled registration forms duly signed by the institute/department head (with seal) to the email address given below.
- PhD students should send their registration through their supervisors/HoD with official seal.

Early registration is recommended due to limited number of participants. No. of participants is limited to 100 with priority to AICTE college faculty members.

Registration deadline: 30 November 2020

CERTIFICATE

Participants who successfully complete the course with full attendance will be awarded with an e-certificate.

Online Registration Link:

<https://docs.google.com/forms/d/1Wc2gLTgkXRwrHQc910Exo-j4ejigR3N8IBXwIRjzG9Q/edit>

COURSE FACULTY

- Dr. Raghunath Sahoo (IIT Indore)
- Dr. Dipankar Das (IIT Indore)
- Dr. Aruna Kumar Nayak (IoP, Bhubaneswar)

COURSE MODULE

Module I: Statistical Distributions: Discrete and Continuous statistical distributions and applications in Science and Engineering

Module II: Data Reduction and Error Analysis: Central limit theorem, rejection of data, weighted averages, combination of errors, propagation of errors, statistical and systematic errors, how to report and use uncertainties, statistical distribution of random uncertainties

Module III: Estimation and Least Squares: Properties of estimators, basic estimators, maximum likelihood, method of moments, least squares, the straight line fit, fitting binned data, chi square distribution and errors, linear least squares and matrices, non-linear least squares, kinematic fitting. Covariance and Correlations

Module IV: Probability and Confidence: Probability and confidence levels, student's t-distribution

Module V: Taking Decisions: Hypothesis Testing, interpreting experiments, goodness of fit, the two samples problem, analysis methods for several samples

Module VI: Monte Carlo Methods: Random number generation, Markov chain, applications of Monte Carlo calculations in various physical systems.

TARGET PARTICIPANTS

This course is tailor made for the faculty members and researchers from all the disciplines of Science, Engineering and R&D industries. The course will enhance the understanding of basic concepts of distribution functions used to perform data analysis, theoretical model building, handling of errors in experimental data, test of hypothesis etc.

ACCOMMODATION & TRAVEL

This QIP Course will be on online mode. Google Meet link will be provided to the shortlisted registered participants by email before the course starts.

COURSE COORDINATOR:

Dr. Raghunath Sahoo

Discipline of Physics

Indian Institute of Technology Indore

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1.	Name of the Participant:	
2.	Designation:	
3.	Academic Qualification:	
4.	Name of the Institution/Organization:	
5.	Address for Communication:	
6.	Phone:	
7.	Email:	
Place:		Date:
Signature of Participant:		
Approval /Permission from the AICTE Institution/Organization: We approve the above application as participant for the above short course, which is being organized by IIT Indore during 7-12 December 2020.		
Authorized Signature		Institute/Organization seal

Note: To confirm the participation in advance, scan copy of the filled form can be emailed to: smpseqip@gmail.com