About IIPE:

The Indian Institute of Petroleum and Energy (IIPE), Vishakhapatnam, is an autonomous institute under the Ministry of Petroleum and Natural Gas, Govt. of India and is an Institution of National Importance. It is a research Institute emphasizing emerging areas in the hydrocarbons and energy sectors. It is committed to producing skilled human resources to meet the quantitative and qualitative gap in the industry and academia of these sectors.

About Department:

The Department of Humanities & Sciences (H&S) at IIPE aiming to form bridge between fundamental and practical knowledge. The department plays a pivotal role in the academic curriculum offering both core and elective courses for the UG (B.Tech.) and Doctoral (Ph.D.) programme. The department has been actively involved in setting up an advanced research for carrying out cutting-edge research. The discipline of mathematics focus the research areas Numerical Methods for Hyperbolic Conservation Laws, Sparse Representation Theory, etc.

Important Dates:

Start date of registration : 07-02-2024
Last date for registration : 28-02-2024

Registration details (including GST):

o Students (UG/PG)   : ₹ 354
o Research scholars   : ₹ 590
o Postdocs/Faculty/Others   : ₹ 1180

How to apply:

❖ Scan the QR Code or open through below link
   https://iipe.ac.in/ashcl/workshop/
❖ Participants will get E-Certificate.

Indian Institute of Petroleum & Energy
Visakhapatnam

Short course on

Applications of Scalar Hyperbolic Conservation Laws

01-05, March, 2024
Online mode

Patron	Convener	Speaker

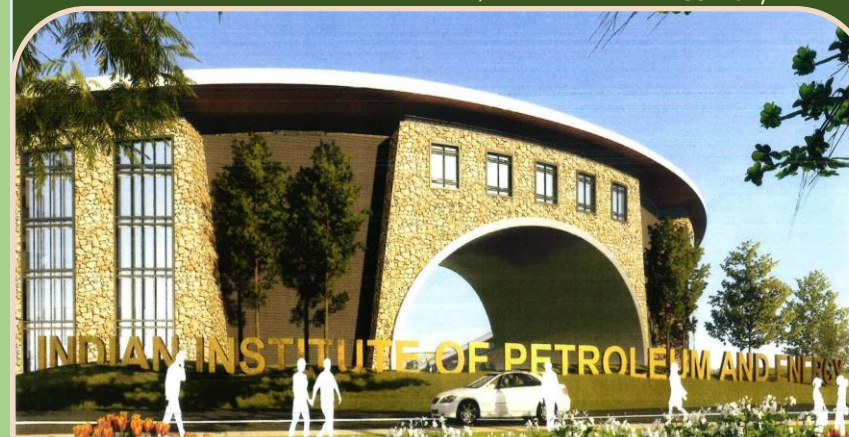**Prof. Shalivahan**
Director, IIPE

Dr. Samala Rathan
Assistant Professor, Mathematics, IIPE

Dr. Jan Friedrich
Aachen University, Germany

Course Objectives:

In this short course, we will cover some relevant applications of scalar conservation laws. We focus mainly on traffic flow models, but also introduce pedestrian models. We describe both the microscopic and macroscopic levels of modeling and explain the formal limit from one to the other. We also discuss in detail the solution concept of the macroscopic equations as well as numerical approximations. In a real world scenario, it is important to describe traffic flow not only on a single road, but on a complete road network. Therefore, we study the modeling and theory of traffic flow on networks. We will also provide insights into the theory and numerics of so-called nonlocal traffic flow models. In this very recent research area, classical traffic flow models are extended by introducing a nonlocal look-ahead dynamic to incorporate the traffic ahead, which brings new challenges to the theory of scalar conservation laws.

Topics to be covered:

o Scalar Conservation Laws
o Finite Volume Methods
o Traffic Flows Models
o LWR Model on Networks
o Micro- and Macroscopic Pedestrian Models

Who can participate:

This short course is mainly intended for undergraduate, post graduate students, research scholars, postdoctoral fellows, faculty of mathematics and allied areas.

Contact details:

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