

## INTRODUCTION

Hydrodynamic stability is one of the central problems in Fluid Mechanics. The course aims to enhance the understanding of teachers of science and engineering institutions with basic knowledge of linear hydrodynamic stability theory and its applications.

## COURSE OBJECTIVE

The objective of the course is to introduce the conceptual aspects of mathematical techniques in linear hydrodynamics stability through theory, modeling and tutorial sessions. The exposure gained in the course will be useful to the participants in introducing similar courses at their institutes and in pursuing research in related areas.

## COURSE OVERVIEW

Basic concept of hydrodynamic stability, Reynolds–Orr equation, Howard’s semicircle theorem, Rayleigh’s inflection point criterion, linear stability analysis, plane Poiseuille and pipe flow, plane Couette flow, Blasius boundary layer, Taylor–Couette instability, Rayleigh–Taylor instability, Kelvin–Helmholtz instability, Dean problem, stability of thin films, two phase flow, thermo–capillary flow.

## COURSE DURATION

The course duration is six days starting from 26--31 March 2018.

## RESOURCE PERSONS

The resource persons include experts from IIT Madras and from other reputed institutions.

## ELIGIBILITY & REGISTRATION

Teachers from AICTE approved engineering colleges are eligible to apply. Eligible teachers are requested to register for the course by submitting the filled in application along with the sponsorship certificate to the coordinator on or before **16<sup>th</sup> February 2018**. Faculty from **Mechanical, Civil, Electrical, Chemical, Aerospace, Mathematics and Physics** disciplines are welcome to participate. In particular, those who have good knowledge in Fluid Mechanics, Nonlinear Dynamics and related areas are encouraged to apply.

## REGISTRATION FEE

There is **no course fee** for the participants from AICTE approved engineering colleges. However, the shortlisted candidates after hearing from the coordinator need to pay a refundable deposit of Rs. 500/-. This amount shall be paid through a demand draft drawn in favour of *IIT Madras*, payable at Chennai. This deposit will be refunded in cash/DD to the course participants at the end of the course.

## TRAVEL SUPPORT

All course participants are eligible for 3-Tier AC train fare, for both onward and return journey, by the shortest route on submitting the copies of the original train tickets.

## BOARDING AND LODGING

Boarding and lodging facilities, on twin-sharing basis, will be provided to the interested participants at the Taramani Guest House, IIT Madras for the entire duration of the course.

## AICTE Sponsored QIP Short Term Course on

### *Introduction to Hydrodynamic Stability*

**26 – 31 March 2018**

## APPLICATION

Name (in BLOCK letters):

Designation:

Department:

Address of the College:

Academic Qualification:

Experience (in years):

Communication Address:

Office/Residence Phone:

Mobile:

E-mail:

Date:

**Signature of the Applicant**

## SPONSORSHIP CERTIFICATE

It is certified that Dr./Mr./Ms./Mrs.

.....  
is a faculty of our institute and is being sponsored hereby for attending the QIP short term course on "*Introduction to Hydrodynamic Stability*" to be conducted at IIT Madras during **26 – 31 March 2018**.

**Signature of Sponsoring Authority**  
(With date and seal)

Please scan the filled-in application and send the same by Email to [qiphydro@gmail.com](mailto:qiphydro@gmail.com) and also post the hard copy.

**Department of Mathematics, IIT Madras**

The Department of Mathematics, IIT Madras was set up in 1960. The department keeps in pace with the advances in technology, by providing its students with separate and state-of-the-art computer facilities for all students.

### Relevance of the course

Hydrodynamic stability is essential for the study of important physical phenomena such as transition to turbulence, formation of surface waves, thermal instability, etc. Moreover, the hydrodynamic stability theory is widely used to analyze the flow behavior in various engineering fields. The course will be helpful in improving participants' computational and teaching skills in the related areas.

### IMPORTANT DATES

Last date for applications: **16-02-2018**  
Intimation of selection: **23-02-2018**  
Confirmation by participants: **05-03-2018**

For further details, please contact:  
**Dr. Priyanka Shukla / Prof. R. Usha**  
Department of Mathematics  
Indian Institute of Technology Madras  
Chennai – 600 036  
Tel. : +91 - 44 –2257 4609 / 4611  
Fax : +91 - 44 - 2257 4602  
**E-mail: [qiphydro@gmail.com](mailto:qiphydro@gmail.com)**

## AICTE Sponsored QIP Short Term Course on

### *Introduction to Hydrodynamic Stability*

**26 – 31 March 2018**

### Coordinators

**Dr. Priyanka Shukla**  
**Prof. R. Usha**



### Organized by

**Department of Mathematics**  
**Indian Institute of Technology Madras**  
**Chennai - 600 036**

**URL: <https://mat.iitm.ac.in>**