

**AICTE QIP  
SHORT TERM TRAINING PROGRAMME**

*On*

**Advanced Steel Design**

**25-30 Jan 2021**

**Coordinators:**

**Prof. S. Chandrasekaran  
(drsekaran@iitm.ac.in)**

*Sponsored by*

**All India Council for Technical Education**



*Organized by*

**Department of Ocean Engineering  
Indian Institute of Technology Madras**

## BACKGROUND

The proposed short-term course is designed to enhance and strengthen the basic knowledge on detailed design methods for steel structures, in compliance with Indian and International codes. Detailed numerical modelling for preliminary analysis and design of steel members under special loads like fire, impact loads, ice loads and blast loads will be discussed. This course also covers topics on stability analysis of steel structures and supported by Matlab programs

## COURSE CONTENTS

- Introduction to various geometric forms of structures- Loads on engineering structures- Failure analysis of members in 2d and 3d stress states-Comparison of failure theories- Material properties of structural steel under normal and high temperature - Design methods and code compliance.
- Plastic behaviour of structures- shape factor- Moment curvature relationships- upper and lower bound theorems-estimate of collapse loads- plastic design
- Stability analysis of beam-column under axial tension and compression- Beam-column with elastic support- stability analysis of frames using stiffness approach- Stability functions- Matlab programs
- Unsymmetric bending- curved beams with small and large initial curvature- Crane hooks- Matlab programs
- Column design phenomenon- lateral buckling- torsional buckling- stiffeners- Beam-column design- Open sections- lateral and torsional buckling of open sections
- Blast loads - impact loads- ice-infested loads on structures- fire loads- fire-resistant design

## COURSE MATERIAL

Each registered participant will be provided with a set of comprehensive lecture notes.

## FACULTY

1. **Dr. Srinivasan Chandrasekaran**  
Indian Institute of Technology, Madras.
2. **Dr. Rupen Gowswami**  
Indian Institute of Technology, Madras.
3. **Dr. Satish Kumar**  
Indian Institute of Technology, Madras.
4. **Dr. Lakshmi Priya**  
Indian Institute of Technology, Madras.
5. **Dr. Gaurav**  
Indian Institute of Technology, Gandhinagar
6. **Prof. Mohammed Mubarak**  
University Teknologi Petronas, Malaysia
7. **Prof. Narasimalu Srikanth**  
Energy Research Institute at NTU, Singapore

## COURSE DURATION & VENUE

The course is of one-week (six days) duration from 25<sup>th</sup> Jan 2021 to 30<sup>th</sup> Jan 2021

**Lectures will be delivered in online mode only.**

### Text books

1. Srinivasan Chandrasekaran and A.K.Jain. 2016. Ocean structures: Construction, Materials, and Operations, CRC Press, Florida, ISBN: 978-149-87-9742-9.
2. Srinivasan Chandrasekaran. 2015b. Advanced Marine structures, CRC Press, Florida (USA), ISBN 978-149-87-3968-9.
3. Srinivasan Chandrasekaran. 2018. Advanced structural analysis with Matlab. CRC Press, USA, ISBN:978-0-367-02645-5
4. Srinivasan Chandrasekaran and Gaurav Srivastava. 2018. Design aids of offshore structures under special environmental loads including fire resistance, Springer, Singapore. ISBN: 978-981-10-7607-7
5. Srinivasan Chandrasekaran. 2019. Advanced steel design of structures, CRC Press, Florida, ISBN: 978-036-72-3290-0
6. ASCE. 2010. Design of blast-resistant buildings in petrochemical facilities, Task Committee on Blast-resistant design- Design Handbook by ASCE, Virginia, ISBN:978-0-7844-1088-2.

**Textbooks, listed from (1) to (5) can be obtained at author-discounted price. Please write to the course coordinator at [drsekaran@iitm.ac.in](mailto:drsekaran@iitm.ac.in) for pre-booking the order, in advance.**

Register through the following google form

<https://forms.gle/TaS8FqWAK7VRcHb79>

or



Alternatively, email the filled in registration form to the coordinator.

### SPONSORSHIP

Prof./Dr./Mr./Ms./Mrs./\_\_\_\_\_ is an employee of our institute and his/her application is hereby sponsored. The applicant will be permitted to attend the short-term course “----- --” at IIT Madras during -----, if selected.

Date: \_\_\_\_\_  
Signature of Sponsoring Authority  
Designation: \_\_\_\_\_  
Official Seal: \_\_\_\_\_

\_\_\_\_\_  
Signature of the Applicant

### ELIGIBILITY

The course is open to faculty with background in Civil, Structural, Appl. Mech, Aerospace, Naval arch, Mechanical, Metallurgy and other allied branches from engineering colleges approved by AICTE. **No course fee** is charged for participants sponsored by AICTE approved institutions.

### IMPORTANT DATES

Last date for receiving application : 15-01-2021  
Intimation of selection (by email) : 20-01-2021  
Confirmation of participation (by email) : 22-01-2021

QIP STTP details, application and updates:

Center for Continuing Education, IITM:

<http://www.cce.iitm.ac.in/>

Course coordinator: Prof. S. Chandrasekaran

[drsekaran@iitm.ac.in](mailto:drsekaran@iitm.ac.in)

Tel: +91-044-22574821

### Course coordinators Profile:

Prof. Srinivasan Chandrasekaran is well-known academician with a teaching and research experience of about 30 years. He has authored about 17 text books, and 170 journal papers in the domain of structural engineering. His NPTEL courses are very popular and has benefitted more than about 50,000 participants, in both India and abroad. Lectures of the short course will be delivered by both National and International domain experts in the field. Extensive support for Matlab program with computer codes and solved examples will be discussed. Kindly avail this opportunity and register as soon as possible, since the number of registration is limited.

More details of the coordinator can be seen at

<http://www.drsekaran.com>

<http://www.drsekaran.com>

Google scholar:

<https://scholar.google.co.in/citations?user=LsBjvFEAAA&hl=en>

Web of Science Researcher ID: ABC-9313-2020