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Design of steel structures

By Prof. Damodar Maity | IIT Kharagpur

Learners enrolled: 4515

The course deals with design of steel structures using “Limit State Design Method”. The design methodology is based on the latest Indian Standard Code of Practice for general construction (IS 800:2007). The subject covers all the necessary components such as material specifications, connections and elementary design of structural members for designing industrial steel structures. The course provides material specifications and design considerations. It provides relevant material properties of different types of steel. It deals with two types of connections namely welded and bolted connections. The advantages and limitations of these two methods of connections are also spelt out. Eccentric connections due to different plane of loading for both bolt and weld are discussed. The course also comprises of analysis and design procedure of steel members under axial tension. Design of compression members, built-up compression members along with the batten and lacing systems are explained in in this course. It deals with the design procedures of flexural members having laterally supported and laterally unsupported beams. It comprises of design of various types of column bases which transfers different kind of loads from super structures to underneath soil. Design of gantry girder with reference to industrial applications is also demonstrated.

INTENDED AUDIENCE:

PRE-REQUISITES: Nil

INDUSTRY SUPPORT:


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TATA Steel, SAIL, HSC, EPH, Jindal Steel & Power, NBCC, PITES Limited, STUP Consultancy, MN Dastur Co. Ltd., TRF Ltd., Thyssenkrupp, WBHDC Ltd, PWD, CPWD etc.

Summary

Course Status :	Completed
Course Type :	Core
Duration :	12 weeks
Category :	<ul style="list-style-type: none"> ◦ Civil Engineering ◦ Structural Design
Credit Points :	3
Level :	Undergraduate
Start Date :	26 Jul 2021
End Date :	15 Oct 2021
Enrollment Ends :	09 Aug 2021
Exam Date :	24 Oct 2021 IST

Note: This exam date is subjected to change based on seat availability. You can check final exam date on your hall ticket.

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Course layout

Week 1: Introduction: Material Overview

Week 2: Introduction: Design Overview

Week 3: Bolted Connections

Week 4: Welded Connections

Week 5: Eccentric Connections

Week 6: Failure and Strength Calculations of Tension Members

Week 7: Design of Tension Members

Week 8: Design of Compression Members

Week 9: Design of Lacing and Batten Systems

Week 10: Design of laterally supported Beams

Week 11: Design of l



d Beams

Week 12: Design of C (https://swayam.gov.in/)



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Books and references

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1. Design of Steel Structures: Dr. Subramanian Narayanan - Oxford Publication

2. Limit State Design of Steel Structures: S. K. Duggal –Tata McGraw Hill.

Instructor bio



Prof. Damodar Maity

IIT Kharagpur

Prof. Damodar Maity did his graduation and post-graduation from Jadavpur University, Kolkata and Ph. D. from IIT Kharagpur. He has worked in Research Engineers Pvt. Ltd. as System Analyst for two years on the development of Software STAAD.Pro which includes steel design. He has served as faculty member in IIT Guwahati for seven years. He is currently Professor in the Department of Civil Engineering, IIT Kharagpur. His research works concentrated mainly in computational mechanics which includes structural health monitoring, earthquake analysis of dams, vibration control of highrise buildings etc. He has published more than 70 technical papers in various journals of National and International repute. Many of his papers have become top downloaded articles. Prof. Maity organized several training courses for teachers of Engineering Colleges as well as engineers of Government organizations like PWD, CPWD, NF Railway, NEC etc. He is member of Technical Advisory Committee of National Disaster Management Authority, Government of India. Prof. Maity is author of a text book titled, Computer Analysis of Frame Structures, published by IK International Pvt. Ltd. He has developed a video course in Design of Steel Structures in working stress method and a web course in Finite Element Analysis under NPTEL.

Course certificate

The course is free to enroll and learn from. But if you want a certificate, you have to register and write the proctored exam conducted by us in person at any of the designated exam centres.

The exam is optional for a fee of Rs 1000/- (Rupees one thousand only).

Date and Time of Exams: **24 October 2021** Morning session 9am to 12 noon; Afternoon Session 2pm to 5pm.

Registration url: Announcements will be made when the registration form is open for registrations.

The online registration form has to be filled and the certification exam fee needs to be paid. More details will be made available when the exam registration form is published. If there are any changes, it will be mentioned then.

Please check the form for more details on the cities where the exams will be held, the conditions you agree to when you fill the form etc.

CRITERIA TO GET A CERTIFICATE

Average assignment score = 25% of average of best 8 assignments out of the total 12 assignments given in the course.

Exam score = 75% of the proctored certification exam score out of 100

Final score = Average assignment score + Exam score

YOU WILL BE ELIGIBLE FOR A SWAYAM MOOC CERTIFICATE ONLY IF AVERAGE ASSIGNMENT SCORE $\geq 10/25$ AND EXAM SCORE $\geq 30/75$. If one of the 2 criteria is not met, you will not get the certificate even if the Final score $\geq 40/100$.

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Certificate will have your name, photograph and the score in the final exam with the breakup. It will have the logos of NPTEL and IIT Kharagpur. It will be e-verifiable at nptel.ac.in/noc (<http://nptel.ac.in/noc>).

Only the e-certificate will be made available. Hard copies will not be dispatched.

Once again, thanks for your interest in our online courses and certification. Happy learning.

- NPTEL team



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Initiative by : Ministry of Education (Govt of India)



NPTEL Online Certification

(Funded by the MoE, Govt. of India)



This certificate is awarded to
SAAMBAVI ESWARI V
for successfully completing the course

Design of Steel Structures

with a consolidated score of **52** %

Online Assignments	22.35/25	Proctored Exam	30/75
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Total number of candidates certified in this course: **99**

Jul-Oct 2022
(12 week course)


Prof. Debjani Chakraborty
Coordinator, NPTEL
IIT Kharagpur



Indian Institute of Technology Kharagpur



Roll No: NPTEL22CE66S64211487

To validate the certificate



No. of credits recommended: 3 or 4



NPTEL Online Certification

(Funded by the MoE, Govt. of India)



This certificate is awarded to
JEEVA PRASATH K
for successfully completing the course

Design of Steel Structures

with a consolidated score of **57** %

Online Assignments	22.35/25	Proctored Exam	34.5/75
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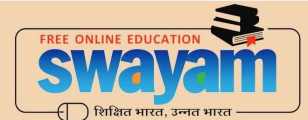
Total number of candidates certified in this course: **99**

Jul-Oct 2022
(12 week course)


Prof. Debjani Chakraborty
Coordinator, NPTEL
IIT Kharagpur



Indian Institute of Technology Kharagpur



Roll No: NPTEL22CE66S54211219

To validate the certificate



No. of credits recommended: 3 or 4