



NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

DEPARTMENT OF CIVIL ENGINEERING

COURSE PLAN – PART I			
Name of the programme and specialization	M. Tech – Structural Engineering		
Course Title	Advanced design of metal structures		
Course Code	CE668	No. of Credits	3
Course Code of Pre-requisite subject(s)			
Session	July 2021	Section (if, applicable)	-
Name of Faculty	Dr. Mashudha Sulthana	Department	Civil Engineering
Email	smash@nitt.edu	Telephone No.	+91 - 9962000772
Name of Course Coordinator(s) (if, applicable)	-		
E-mail	-	Telephone No.	
Course Type	<input type="checkbox"/> Core course <input checked="" type="checkbox"/> Elective course		
Syllabus (approved in Senate)			
<p>Steel metallurgy – mechanical properties – section classification - limit state method of design for structural steel – plastic analysis and design</p> <p>Estimation of wind loads – structural systems for multi-story and industrial buildings - moment resisting frame, concentrically and eccentrically braced frame – pre-engineered building systems – moment resisting and haunched connections</p> <p>Composite construction – shear connector – behavior and design of steel concrete composite slabs, beams and columns</p> <p>Fatigue behavior and design – S-N curve approach – design category classification – design for variable repeated loading - fatigue assessment</p> <p>Cold formed steel design – buckling and post-buckling behavior of members – effective width method and direct strength method for design of cold-formed steel beams, columns, beam-columns</p>			
COURSE OBJECTIVES			

<ol style="list-style-type: none"> 1. To compute wind load on structures and deflection of beams. 2. To understand design of stacks. 3. To get familiarized with cold formed steel sections and different types of connections. 4. To get exposed to design of compression and tension members. 5. To design members subjected to torsion and understand plastic analysis of structures. 	
COURSE OUTCOMES (CO)	
Course Outcomes	Aligned Programme Outcomes (PO)
By the end of this course the students	
1. To compute wind load on structures and deflection of beams	1 2 4 9 10 11 12
2. To understand design of stacks	1 2 4 9 10 11 12
3. To get familiarized with cold formed steel sections and different types of connections	1 2 4 9 10 11 12
4. To get exposed to design of compression and tension members	1 2 4 9 10 11 12
5. To design members subjected to torsion and understand plastic analysis of structures	1 2 4 9 10 11 12

COURSE PLAN – PART II			
COURSE OVERVIEW			
This course gives a broad overview of concepts involved in the metal design of structures. The students are introduced to the design basis for industrial structures like pre-engineered buildings and stacks, where wind load estimation is critical. Latest design methods for cold-formed steel structures are taught. Three lecture classes are dedicated every week.			
COURSE TEACHING AND LEARNING ACTIVITIES			
S.No.	Week/Contact Hours	Topic	Mode of Delivery (for all lectures)
1	1 st week – 2 hours	Steel metallurgy – mechanical properties	<ul style="list-style-type: none"> • PPT + Notability app in Ipad (through MS teams) • Lectures notes are shared after class • Recording links are shared
2	2 nd week – 3 hours	section classification – LSM design	
3	3 rd week – 3 hours	Plastic Analysis and Design of structures	
4	4 th week – 3 hours	Estimation of wind load – Structural systems	
5	5 th week – 3 hours	pre-engineered building systems – moment resisting and haunched connections	
6	6 th week – 3 hours	Composite construction – shear connector – behavior and design of steel concrete composite slabs, beams	

7	7 th week – 2 hours	behavior and design of steel concrete composite columns		
8	8 th week – 1 hour	Fatigue behavior and design (First assessment week)		
9	9 th week – 0 hours	Break for online classes		
10	10 th week – 3 hours	S-N curve approach – design category classification		
11	11 th week – 3 hours	design for variable repeated loading - fatigue assessment		
12	12 th week – 1 hour	Cold formed steel design – buckling and post-buckling behavior of members (Second assessment)		
13	13 th week – 3 hours	effective width method		
14	14 th week – 3 hours	direct strength method for design of cold-formed steel		
15	15 th week – 3 hours	Seminar on selected topics and viva		Presentation by students

COURSE ASSESSMENT METHODS

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assignment (5 nos.) (Handwritten and scanned)	As and when topics are completed	Weekends	10
2	Cycle test - 1 (Handwritten and scanned)	Last week of Oct.	1 hour	25
3	Cycle test - 2 (Handwritten and scanned)	Last week of Nov	1 hour	25
4	End semester exam (Handwritten and scanned)	Third week of Dec	2 hours	30
5	Student seminar	At the end of the semester	20 mins	10

COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)

First feedback will be collected from students through the class representative (at the second week of October) to improve the online teaching methods. Also, at the end of the semester for course evaluation as per institute norms.

COURSE POLICY (preferred mode of correspondence with students, compensation assessment policy to be specified)

MODE OF CORRESPONDENCE (email/ phone etc)

Apart from interactions with the students in the class, the students can also contact the concerned faculty member as given below:

Dr. Mashudha Sulthana

Email: smash@nitt.edu

Mob: +91 9962000772 (Call / SMS / WhatsApp)

COMPENSATION ASSESSMENT POLICY

1. Supplementary quizzes are conducted to students for genuine reasons (particularly to compensate online technical issues) for 25 marks as per the institute schedule.

ATTENDANCE POLICY (A uniform attendance policy as specified below shall be followed)

- **At least 75% attendance in each course is mandatory.**
- **A maximum of 10% shall be allowed under On Duty (OD) category.**
- Students with **less than 65% of attendance** shall be prevented from writing the final assessment and **shall be awarded 'V' grade.**

MINIMUM PASS MARK POLICY


The Passing minimum mark : As per Institute norms.

ACADEMIC DISHONESTY & PLAGIARISM

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.

The above policy against academic dishonesty shall be applicable for all the programs.

FOR APPROVAL


Course Faculty


CC-Chairperson


HOD 