DEPARTMENT OF CIVIL ENGINEERING

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN – PART I			
Name of the programme and specialization	B.Tech. Civil Engineering		
Course Title	ADVANCED STEEL STRUCTURAL ELEMENTS		
Course Code	CEPC27	**No. of Credits**	4
Course Code of Pre-requisite subject(s)	CEPC24		
Session	July 2018	**Section (if, applicable)**	A
Name of Faculty	Dr.P. Jayabalan	**Department**	Civil Engineering
Email	pjeya@nitt.edu	**Telephone No.**	0431-2503157
Name of Course Coordinator(s) (if, applicable)	-		
E-mail		**Telephone No.**	
Course Type	☑ **Core course**	☐ **Elective course**	

Syllabus (approved in BoS)

Introduction to beam-column - behavior - strength interaction - design of beam column - beam - column subjected to combined forces - column bases - slab base - gusseted base - moment resistant base plate.

Welded plate girders – analysis and design using IS800-2007 - curtailment of flange plates – stiffeners – Introduction to hybrid girders - analysis and design of gantry girder.

Design of industrial building - roofing, cladding and wall material - structural components and framing - types of roof trusses - components - wind load estimation for different type of structures for various zones.

Approximate analysis of industrial bents/PEB - design of purlins and wall girts using Channel and Angle sections; cold formed steel purlin – Design of wind bracings – wind girders – gable columns Analysis and design of framed connections.

***Note**: Assignments include the design and drawings of various steel structures.*

COURSE OBJECTIVES

1. To study the behavior and design of member subjected to combined forces
2. To understand the analysis procedure and design of base plate subjected to different loading conditions
3. To study the design of Gantry girder, welded plate girder, stiffeners and connections
4. To calculate the wind forces on various types of structures
5. To understand the design of industrial buildings/bents/PEB
6. To understand the design of moment resisting connections used in steel frames

COURSE OUTCOMES (CO)

Course Outcomes	Aligned Programme Outcomes (PO)
1. Design eccentrically loaded compression members (Beam-Columns) and their base plates	a,b,c,d
2. Design welded plate girder and other components	a,b,c,d
3. Design Gantry girder for industrial structures	a,b,c,d
4. Calculate the wind load acting on various structures to be built in various locations	a,b,c,d,g
5. Design Industrial structures and their components such as girts, wind girders, bracings systems, purlins etc	a,b,c,d,g,k,f

COURSE PLAN – PART II

COURSE OVERVIEW

The course begins with the design of Beam-Column. The behaviour and strength interaction of beam-columns are taught to be in class. A general description is given about the plate girder behaviour in terms of elastic buckling of web in shear and bending, and web in tension field action. This is followed by some detailed worked examples on plate girders as per IS 800. Students are introduced to estimate the wind loads on structures and design of industrial structures. Finally, students are introduced to a moment connections accordance with IS 800.

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Contact Hours	Topic	Mode of Delivery
1	1	Introduction to Beam-Column	Lecture / PPT
2	2,3	Strength Interaction	Lecture / PPT
3	4,5	Design of Beam-Column	Lecture / PPT
4	6,7	Column bases	Lecture / PPT

5	8 to 14	Welded plate girders	Lecture / PPT
6	15 to 17	Gantry girder	Lecture / PPT
7	18 to 24	Wind load estimation	Lecture / PPT
8	25 to 33	Design of industrial building	Lecture / PPT
9	34 to 39	Approximate analysis of PEB	Lecture / PPT
10	40 to 45	Design of Framed Connections	Lecture / PPT

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assessment 1	Week 7	1 Hour	20
2	Assessment -2	Week 15	1 Hour	20
3	Assignment/Tutorials/Surprise Quiz (40% weightage)	-	-	10
CPA	Compensation Assessment*	Week 18	1 Hour	Corresponding Weightage
6	Final Assessment *	Week 19	3 Hours	50

*Minimum Pass mark has to be fixed as per Institute Policy.

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

- Feedback from students will be obtained through MIS.

COURSE POLICY (preferred mode of correspondence with students, policy on attendance, compensation assessment, academic honesty and plagiarism etc.)

MODE OF CORRESPONDENCE (email/ phone etc)

All the students are advised to attend the class regularly. All the correspondence (schedule of classes/ schedule of assessment/ course material/any other information regarding this course) will be intimated in the Class only.

ATTENDANCE

1. Attendance will be taken by the faculty in all the contact hours. Every student should maintain **minimum of 75 % physical attendance** in these contact hours.
2. **A maximum of 10% shall be allowed under On Duty (OD) category**
3. Students with **less than 65% of attendance** shall be prevented from writing the final assessment and shall be awarded **'V' grade.**

COMPENSATION ASSESSMENT

- If any student is not able to attend any of the internal assessments due to genuine reason, the student is permitted to attend compensatory assessment with 20% weightage.

ACADEMIC HONESTY & 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 programmes

ADDITIONAL INFORMATION

1. The faculty is available for consultation at times as per the intimation given by the faculty.
2. Queries (if required) to the course teacher shall only be emailed to the email id specified by the teacher(pjeya@nitt.edu)

FOR APPROVAL

Course Faculty _____ (P. JAYARAMAN) **CC-Chairperson** _____ 27/7/18 **HOD** _____