SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

Department of Chemical Engineering	LP: CH18005 Rev. No: 00 Date: 8.7.2024
B.E/B.Tech/M.E/M.Tech : B.Tech Regulation: 2018A PG Specialisation : Chemical Engineering Sub. Code / Sub. Name : CH18005 Piping Design Unit : I Fundamentals of Process Plant Piping	

Unit Syllabus: Definitions, Piping Components their introduction, applications. Piping MOC, Budget, Codes and Standards, Fabrication and Installations of piping.

Objective: To introduce the piping components and their applications

Session No *	Topics to be covered	Ref	Teaching Aids
1	Introduction on Piping Components	T1 (A3 - A52)	PPT & BB
2	Definition of components in Piping	T1 (A53 - A122)	PPT & BB
3	Applications of Piping in Industry	T1 (A122 - A125)	PPT & BB
4	Piping - Management of Change	T1 (A127-128)	PPT & BB
5	Piping Codes	T1 (A179-A201)	PPT & BB
6	Piping Standards	T1 (A201-221)	PPT & BB
7	Fabrication in Piping	T1 (A281-A318)	PPT & BB
8	Piping with Installation design	T1 (A319-A327)	PPT & BB
9	Parameter study in Pipe Design	T1 (B202-203)	PPT & BB
Content beyond syllabus covered (if any): Software in Piping design			

* Session duration: 50 minutes

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COURSE DELIVERY PLAN - THEORY

Sub. Code / Sub. Name: CH18005 Piping Design

Unit : II Pipe Hydraulics and Sizing

Unit Syllabus: Pipe sizing based on velocity and pressure drop consideration cost, least annual cost approach, pipe drawing basics, development of piping general arrangement drawing, dimensions and drawing of piping.

Objective: To understand the concepts of Dimension and drawing in Piping

Session No *	Topics to be covered	Ref	Teaching Aids
10	Determining Velocity in Pipe Sizing	T1 (C79-C81)	PPT & BB
11	Calculation of Pipe sizing based Pressure Drop	T2 (680-686)	PPT & BB
12	Cost considerations in piping	T2 (1115-1125)	PPT & BB
13	Least annual cost approach	T2 (1126-1150)	PPT & BB
14	Basics in Pipe Drawing	T1 (A319-A320)	PPT & BB
15	Piping development techniques	T1 (B8-B16)	PPT & BB
16	General arrangement in pipe drawing	T1 (B17-B18)	PPT & BB
17	Piping with its dimensions	R1 (1-2)	PPT & BB
18	Drawing concepts in Piping	R1 (21-44)	PPT & BB
Content beyond syllabus covered (if any): Pressure losses in process piping			

* Session duration: 50 mins

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COURSE DELIVERY PLAN - THEORY

Sub. Code / Sub. Name: CH18005 Piping Design

Unit : III Plot Plan

Unit Syllabus: Development of plot plan for different types of fluid storage, equipment layout, process piping layout, utility piping layout. Stress analysis -Different types of stresses and its impact on piping, methods of calculation, dynamic analysis, and flexibility analysis

Objective: Study the development of plot plan and stress analysis in piping.

Session No *	Topics to be covered	Ref	Teaching Aids
19	Development of plot plan for different types of fluid storage	T2 (193-194) T2 (250-251)	PPT & BB
20	Equipment Layout in piping	T1 (B82-B87)	PPT & BB
21	Process piping layout	T1 (B75-B81)	PPT & BB
22	Piping layout with utility	T1 (B90-B92)	PPT & BB
23	Stress analysis with its types	T1 (B107-B113)	PPT & BB
24	Impact of stress in piping	T1 (B113-B125)	PPT & BB
25	Calculation of Stress in piping Design	T1 (B135-B146)	PPT & BB
26	Dynamic Analysis method of calculation	T1 (B194-B212)	PPT & BB
27	Static Analysis method of Calculation	T1 (B194-B212)	PPT & BB
Content beyond syllabus covered (if any):			

* Session duration: 50 mins

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COURSE DELIVERY PLAN - THEORY

Sub. Code / Sub. Name: CH18005 Piping Design

Unit : IV Piping Supports

Unit Syllabus: Classification of Pipe Supports, Selection Criteria for process plant piping supports, Pipe support design calculations

Objective: Study the piping supports and design calculations of pipe supports.

Session No *	Topics to be covered	Ref	Teaching Aids
28	Classification of pipe supports	T1 (B223-B228)	PPT & BB
29	Criteria for Process Plant piping Supports	T1 (B228-B237)	PPT & BB
30	Selection criteria for supports in piping	T2 (790-797)	PPT & BB
31	Piping supports	T1 (B215-B216)	PPT & BB
32	Design calculation concepts in piping	T2 (782-786)	PPT & BB
33	Design calculation on piping parameters	T2 (787-790)	PPT & BB
34	Design calculation on Piping supports	T1 (B220-B221)	PPT & BB
35	Problems on design calculations in supports	T1 (B237-B240)	PPT & BB
36	Solving the design based calculations on pipe design	T2 (798-810)	PPT & BB

Content beyond syllabus covered (if any): Pipe fittings design calculations

* Session duration: 50 mins

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COURSE DELIVERY PLAN - THEORY

Sub. Code / Sub. Name: CH18005 Piping Design

Unit : V Piping Instrumentation

Unit Syllabus: Final Control Elements; measuring devices, instrumentation symbols introduction to process flow diagram (PFD) and piping & instrumentation diagram (P&ID)

Objective: To understand the piping instrumentation and read the PFDs and P&IDs

Session No *	Topics to be covered	Ref	Teaching Aids
37	Final Control Elements	T2 (171-172)	PPT & BB
38	Measuring devices	T2 (52-64)	PPT & BB
39	Introduction to Process flow diagram	T2 (188-194)	PPT & BB
40	Instrumentation in process flow	T2 (194-202)	PPT & BB
41	Symbols used in Process flow diagram	T2 (505-506)	PPT & BB
42	Concepts on Process flow diagram	T2 (506-507)	PPT & BB
43	Representation of Piping Diagram	T2 (507-508)	PPT & BB
44	Piping & instrumentation diagram (P&ID)	T2 (509-511)	PPT & BB
45	Control valves	T2 (524-527)	PPT & BB

Content beyond syllabus covered (if any): Process Control flow sheet in chemical industries

* Session duration: 50 mins

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TEXTBOOKS:

1. M.L. Nayyar, "Piping Handbook, Seventh edition", Mc Graw-Hill, Inc., 2000.

2. Johan J McKetta ,"Piping Design Handbook", CRC Press, 1992.

REFERENCES:

1. Moe Toghraei, "Piping and Instrumentation Diagram Development", John Wiley & Sons Inc., 2019.

2. Ed Bausbacher, Roger Hunt, "Process Plant Layout and Piping Design", PTR Prentice hall, 1993.

3. Peter Smith, "Process Piping Design Handbook vol 1. The Fundamentals of Piping Design", Gulf Publishing Company, 2007.

	Prepared by	Approved by
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Designation	Assistant Professor	Professor and HOD
Date	8.7.2024	8/07/24
Remarks*		
Remarks*		

* If the same lesson plan is followed in the subsequent semester/year it should be mentioned and signed by the Faculty and the HOD