SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

DEPARTMENT OF CHEMICAL ENGINEERING		LP: VD18303
		Rev. No: 00
B.E/B.Tech/M.E/M.Tech : CHEMICAL ENGINEERING	Regulation: 2018A	Date: 29/12/2023
Sub. Code / Sub. Name : **VD18303 – MATLAB/ASPEN**		
Unit : 1		

Unit Syllabus: Introduction to MATLAB software, Basic Mathematics, Data files and Data types, Operations using matrix, Plots – visualizing vector and matrix, Programming in MATLAB – Loops, M file.

Objective: To understand the use of MATLAB in developing simulation problems.

Session No *	Topics to be covered	Ref	Teaching Aids
1	Introduction to MATLAB software	R1-Ch 1; pg 1-4	PPT/ BB
2	Introduction to MATLAB software	R1-Ch 1; pg 5-9	PPT/ BB
3	Basic Mathematics, Data files and Data types	R1-Ch 1; pg 34	PPT/ BB
4	Operations using matrix, Plots – visualizing vector and matrix	R1-Appendix B, pg 253-254	PPT/ BB
5	Programming in MATLAB– Loops, M file	R1-Ch 1; pg 31-36	PPT/ BB
6	Programming in MATLAB– Loops, M file	R1-Ch 1; pg 37-41	PPT/ BB

Content beyond syllabus covered (if any): –

* Session duration: 50 minutes

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Sub. Code / Sub. Name: : VD18303 – MATLAB/ASPEN

Unit : II

Unit Syllabus: Algebraic equations - Single variable, Multivariable equations. Numerical solution to equations. Solving Ordinary differential equations.

Objective: To solve the numerical and ordinary differential equations using MATLAB software tool.

Session No *	Topics to be covered	Ref	Teaching Aids
7	Algebraic equations - Single variable	R4-Ch 2; pg 5-24	PPT/ BB
8	Multivariable equations	R1-Ch 6; pg 223-282	PPT/ BB
9	Numerical solution to equations.	R1-Ch 11; pg 423-446	PPT/ BB
10	Numerical solution to equations.	R1-Ch 11; pg 423-446	PPT/ BB
11	Solving Ordinary differential equations.	R 4-Ch 8; pg 114-117	PPT/ BB
12	Solving Ordinary differential equations.	R 4-Ch 8; pg 117-122	PPT/ BB

Content beyond syllabus covered (if any): -

* Session duration: 50 mins

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Sub. Code / Sub. Name: : **VD18303 – MATLAB/ASPEN**

Unit : III

Unit Syllabus: Introduction to Aspen Plus, Simulation of unit operation blocks – Mixer, Splitter, Decanter, Flash drum, Heat Exchanger, Distillation.

Objective: To understand the use of Aspen Plus simulation software of different unit operations.

Session No *	Topics to be covered	Ref	Teaching Aids
13	Introduction to Aspen Plus	R 3-Ch 1; pg 1-19	PPT/ BB
14	Introduction to Aspen Plus	R 3-Ch 2; pg 21-35	PPT/ BB
15	Simulation of unit operation blocks – Mixer, Splitter	R 3-Ch 3; pg -37-38	PPT/ BB
16	Simulation of unit operation blocks – Decanter, Flash drum	R 3-Ch 7; pg -93-101	PPT/ BB
17	Simulation of unit operation blocks - Heat Exchanger	R 3-Ch 9; pg -111-118	PPT/ BB
18	Simulation of unit operation blocks - Distillation	R 3 – Ch 11, pg 145-170	PPT/ BB

Content beyond syllabus covered (if any): Demo videos would be shown.

* Session duration: 50 mins

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Sub. Code / Sub. Name: : VD18303 – MATLAB/ASPEN

Unit : IV

Unit Syllabus: Simulation of unit process blocks – PFR, CSTR, Batch Reactor, and Reactive Distillation.

Objective: To understand the use of Aspen Plus simulation software of different unit operations.

Session No *	Topics to be covered	Ref	Teaching Aids
19	Simulation of unit process blocks – PFR	R 3 – Ch 10, pg 123-124; 135	PPT/ BB
20	Simulation of unit process blocks - CSTR	R 3 – Ch 10, pg 125; 134	PPT/ BB
21	Simulation of unit process blocks - CSTR	R 3 – Ch 10, pg 126-127; 134	PPT/ BB
22	Simulation of unit process blocks - Batch Reactor	R 3 – Ch 10, pg 128-130	PPT/ BB
23	Simulation of unit process blocks - Reactive Distillation	R 3 – Ch 11, pg 157-164	PPT/ BB
24	Simulation of unit process blocks - Reactive Distillation	R 3 – Ch 11, pg 164-172	PPT/ BB

Content beyond syllabus covered (if any): Demo videos would be shown.

* Session duration: 50 mins

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Sub. Code / Sub. Name: : VD18303 – MATLAB/ASPEN

Unit : V

Unit Syllabus: Simulation of flowsheet; Design specification and sensitivity analysis.

Objective: To analyze the design specification and sensitivity analysis of software results.

Session No *	Topics to be covered	Ref	Teaching Aids
25	Simulation of flowsheet for unit operations	R 3 – Ch 12, pg 175-177	PPT/ BB
26	Simulation of flowsheet for unit operations	R 3 – Ch 12, pg 178-181	PPT/ BB
27	Design specification of Heat Exchanger	R 3 – Ch 9, pg 118	PPT/ BB
28	Design specification of Heat Exchanger	R 3 – Ch 9, pg 119-120	PPT/ BB
29	Sensitivity analysis	R 3 – Ch 5, pg 63	PPT/ BB
30	Sensitivity analysis	R 3 – Ch 5, pg 64-65	PPT/ BB

Content beyond syllabus covered (if any): Demo videos would be shown.

* Session duration: 50 mins

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REFERENCES:

1. Fausett L.V. (2007) Applied Numerical Analysis Using MATLAB, Second Edition, Pearson Education.

2. Chapra S.C. and Canale R.P. (2006) Numerical Methods for Engineers, Fifth Edition, McGraw Hill Publishers.

3. Schefflan R. (2011), Teach Yourself the Basics of Aspen Plus, John Wiley and Sons.

4. Finlayson B. A. (2006) Introduction to Chemical Engineering Computing, John Wiley and Sons.

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Designation	ASSOCIATE PROFESSOR	PROFESSOR AND HEAD
Date	29.12.2023	2/01/2024
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