Course Type	Course Code	Name of the Course	L	T	P	Credits
OE	CHO403	Process Intensification	3	0	0	9

Course Objective
The objectives of this course are to understand the methodologies for process intensification in chemical process industries
Learning Outcomes
At the end of the course, the student would be able to 1) Identify the scope for process intensification in chemical processes. 2) Implement methodologies of process intensification to solve process challenges.

Unit No.	Topics to be covered	Lecture Hours	Learning outcome
01	Introduction to process intensification – Brief history, advantages, and mechanisms involved	**02**	Students will be introduced and given an overview of process intensification (PI).
02	Mixing in intensified equipment; Compact and micro–heat exchangers.	**11**	Understand the principles of mixing and heat exchange in intensified vessels.
03	Reactors with enhanced performance – spinning disc reactors, microreactors, cavitation reactors, microwave reactors.	**12**	Comprehend the principles of different types of intensified reactors.
04	Intensification of separation processes; HiGee concept; Energy integration in distillation column – vapour recompression cycle, doubled wall distillation, Petlyuk column; Mass exchange network.	**12**	Realize the importance of process intensification separation processes.
05	Application of process intensification in process industries – case studies.	**05**	Identify the scope for the application of process intensification principles.

Textbooks:

1. Reay, D., Ramshaw, C., and Harvey, A., Process Intensification: Engineering for Efficiency, Sustainability and Flexibility, Butterworth–Heinemann.

2. Stankiewicz, A. and Moulijn, J. A., Re–engineering the Chemical Process Plant: Process Intensification, Marcel Dekker.

Reference Books:

1. Frerich J. Keil, Modeling of Process Intensification, Wiley-VCH.