

ChE-340

The engineering of chemical reactions

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Cursus	Sem.	Type
Chemical Engineering	BA5	Obl.

Language of teaching	English
Credits	3
Session	Winter
Semester	Fall
Exam	During the semester
Workload	90h
Weeks	14
Hours	3 weekly
Courses	2 weekly
Exercises	1 weekly
Number of positions	

Summary

This course applies concepts from chemical kinetics and mass and energy balances to address practical chemical engineering problems, with a strong focus on industrial applications. Students develop the ability to analyze and design reactors frequently encountered in industry.

Content

- Derivation of differential, algebraic, and integrative models for batch reactors, continuously stirred reactors (CSTRs), plug flow reactors (PFRs), and packed bed reactors (PBRs), as well a membrane and semibatch reactors.
- Modeling multiple reactors in series.
- Effect of reaction kinetics and fluent phase on reactor performance.
- Multiple and complex reaction systems.

Learning Prerequisites**Required courses**

Introduction to Chemical Engineering (ChE-201), Introduction to Transport Phenomena (ChE-204), Chemical Thermodynamics (CH-241), Chemical Kinetics (CH-342)

Learning Outcomes

By the end of the course, the student must be able to:

- Compute reactor size required for a given conversion.
- Compute reactor space time.
- Compare performance of different reactors.
- Assess / Evaluate effects of temperature and pressure on performance.
- Design reactor configuration for a given process.

Resources**Ressources en bibliothèque**

- [Elements of chemical reaction engineering / Fogler](#)

- [Chemical reaction engineering / Levenspiel](#)

Notes/Handbook

Elements of Chemical Reaction Engineering, H. Scott Fogler
Chemical Reaction Engineering, O. Levenspiel