

Course Syllabi

1. INDU-00035 MODELATION OF CHEMICAL PROCESS

2. Instructor:

- Silvia Alexandra Peña Gonzalez

3. Bibliography

- Modeling and Simulation for Engineers and Scientists, M. Nuruzzaman, 2005
- Process Control: Modeling, Design, and Simulation, B. Wayne Bequette, 2009
- MATLAB and Simulink for Engineers, Agam Kumar Tyagi, 2012

4. Specific Course Information

- a. This subject seeks to enable students to acquire basic concepts about process simulation systems, to establish simulation types and models, to pose simulation problems for their resolution and optimization through mathematical models and algorithms. It contributes to the discharge profile at the following points: 3. Use specialized computer packages, effectively for solving problems of operations and chemical processes and plant design. 5. Simulate process 6. Control experiments and processes in the field of chemical engineering, considering transport phenomena, unitary operations, chemical processes, and operational research, to obtain relevant information and meet previously defined objectives. 14. Act with professional ethics, considering the social and economic impact of their professional practice, in the regulatory areas related to quality, health and safety and the environment.

b. Corequisites:

- INGE-00024 Design - calculus plants ind.

c. Prerequisites:

- INDU-00036 Op III ionic exchange
- INDU-00037 Ope III wetting-drying

5. Learning Objectives of the Course

- a. To provide students of the Chemical Engineering career with the ability to optimize chemical processes through computational simulation, analyzing different possible scenarios to establish risks and failures of processes, their effects and prevention. - Knowledge of basic concepts and process simulation systems - Model different chemical processes from different state variables, input variables and different parameters for their resolution and optimization. - Identify set different mathematical models to simulate the change of a state variable over time - Diagram processes in Simulink to identify the stability of a system

b. Learning Outcomes

1. Learn about basic concepts and process simulation systems and establish simulation types and models.
2. Plant problems and simulation models for resolution and optimization; through numerical methods and algorithms.
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4. Plant problems and simulation models for resolution and optimization; through numerical methods and algorithms.
5. Analyze the risk and failure of processes, their effects and prevention.
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7. Learn about basic concepts and process simulation systems and establish simulation types and models.
8. Plant problems and simulation models for resolution and optimization; through numerical methods and algorithms.
9. Analyze the risk and failure of processes, their effects and prevention.

6. Course Topics

1. Introduction
2. Modelation of process
3. Algebraic equations
4. Linear solution of order ode models
5. Laplace transformations
6. Transfer functions for first order systems
7. Analysis of transfer functions in higher order systems
8. Block diagrams
9. Status of space and decision-making