



Form: Course Syllabus

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Issue Number and Date	2963/2022/24/3/2 5/12/2022
Number and Date of Revision or Modification	2/(10/12/2023)
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Number of Pages	06

1. Course Title	Mathematical Methods and Process Modeling
2. Course Number	0905768
3. Credit Hours (Theory, Practical)	(3,0)
3. Contact Hours (Theory, Practical)	(3,0)
4. Prerequisites/ Corequisites	
5. Program Title	M.Sc. in Chemical Engineering
6. Program Code	050
7. School/ Center	School of Engineering
8. Department	Department of Chemical Engineering
9. Course Level	Master
10. Year of Study and Semester (s)	
11. Other Department(s) Involved in Teaching the Course	
12. Main Learning Language	English
13. Learning Types	<input checked="" type="checkbox"/> Face to face learning <input type="checkbox"/> Blended <input type="checkbox"/> Fully online
14. Online Platforms(s)	<input type="checkbox"/> Moodle <input type="checkbox"/> Microsoft Teams
15. Issuing Date	
16. Revision Date	

17. Course Coordinator:

Name:	Contact hours:
Office number:	Phone number:
Email:	



18. Other Instructors:

Name:

Office number:

Phone number:

Email:

Contact hours:

Name:

Office number:

Phone number:

Email:

Contact hours:

19. Course Description:

As stated in the approved study plan.

Application of advanced mathematical techniques, including ordinary and partial differential equations, linear and nonlinear algebraic systems, and methods for solving boundary value problems. Development of dynamic and steady-state models for chemical and physical processes, incorporating transport phenomena, reaction engineering, and process control. Linearization, perturbation methods, and eigenvalue analysis applied to process modeling. Dimensional analysis for scaling and simplification of models. Parameter estimation, model validation, and sensitivity analysis. Use of computational tools and numerical methods for solving complex process models, including finite difference and finite element methods.

20. Program Intended Learning Outcomes: (To be used in designing the matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program)

- 1.
- 2.
- 3.
- 4.

21. Course Intended Learning Outcomes: (Upon completion of the course, the student will be able to achieve the following intended learning outcomes)

- 1.
- 2.
- 3.
- 4.

22. The matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program:

Program ILOs	ILO (1)	ILO (2)	ILO (3)	ILO (4)	ILO (5)
Course ILOs					
1					
2					
3					
4					
5					
6					



7						
8						

23. Topic Outline and Schedule:

Week	Lecture	Topic	ILo/s Linked to the Topic	Learning Types (Face to Face/ Blended/ Fully Online)	Platform Used	Synchronous / Asynchronous Lecturing	Evaluation Methods	Learning Resources
1	1.1							
	1.2							
	1.3							
2	2.1							
	2.2							
	2.3							
3	3.1							
	3.2							
	3.3							
4	4.1							
	4.2							
	4.3							
5	5.1							
	5.2							
	5.3							
6	6.1							
	6.2							
	6.3							
7	7.1							
	7.2							
	7.3							
8	8.1							
	8.2							
	8.3							
9	9.1							
	9.2							



	9.3							
10	10.1							
	10.2							
	10.3							
11	11.1							
	11.2							
	11.3							
12	12.1							
	12.2							
	12.3							
13	13.1							
	13.2							
	13.3							
14	14.1							
	14.2							
	14.3							
15	15.1							
	15.2							
	15.3							

24. Evaluation Methods:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	ILO/s Linked to the Evaluation activity	Period (Week)	Platform

25. Course Requirements:

(e.g.: students should have a computer, internet connection, webcam, account on a specific software/platform...etc.):



26. Course Policies:

- A- Attendance policies:
- B- Absences from exams and submitting assignments on time:
- C- Health and safety procedures:
- D- Honesty policy regarding cheating, plagiarism, misbehavior:
- E- Grading policy:
- F- Available university services that support achievement in the course:

27. References:

- A- Required book(s), assigned reading and audio-visuals:
- B- Recommended books, materials, and media:

28. Additional information:

Name of the Instructor or the Course Coordinator:	Signature:	Date:
.....
Name of the Head of Quality Assurance Committee/ Department	Signature:	Date:
.....
Name of the Head of Department	Signature:	Date:
.....
Name of the Head of Quality Assurance Committee/ School or Center	Signature:	Date:
.....
Name of the Dean or the Director	Signature:	Date:
.....