



<b>Form:</b> <b>Course Syllabus</b>	<b>Form Number</b>	EXC-01-02-02A
	<b>Issue Number and Date</b>	2963/2022/24/3/2 5/12/2022
	<b>Number and Date of Revision or Modification</b>	2/(10/12/2023)
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	<b>The Date of the Deans Council Approval Decision</b>	26/12/2023
	<b>Number of Pages</b>	06

<b>1.</b>	<b>Course Title</b>	Applied Machine Learning in Process Safety
<b>2.</b>	<b>Course Number</b>	0905703
<b>3.</b>	<b>Credit Hours (Theory, Practical)</b>	(3,0)
	<b>Contact Hours (Theory, Practical)</b>	(2,1)
<b>4.</b>	<b>Prerequisites/ Corequisites</b>	-
<b>5.</b>	<b>Program Title</b>	M.Sc. of Process Safety Engineering and Intelligent Systems
<b>6.</b>	<b>Program Code</b>	07
<b>7.</b>	<b>School/ Center</b>	School of Engineering
<b>8.</b>	<b>Department</b>	Department of Chemical Engineering
<b>9.</b>	<b>Course Level</b>	Master
<b>10.</b>	<b>Year of Study and Semester (s)</b>	
<b>11.</b>	<b>Other Department(s) Involved in Teaching the Course</b>	
<b>12.</b>	<b>Main Learning Language</b>	English
<b>13.</b>	<b>Learning Types</b>	<input checked="" type="checkbox"/> Face to face learning <input type="checkbox"/> Blended <input type="checkbox"/> Fully online
<b>14.</b>	<b>Online Platforms(s)</b>	<input type="checkbox"/> Moodle <input type="checkbox"/> Microsoft Teams
<b>15.</b>	<b>Issuing Date</b>	
<b>16.</b>	<b>Revision Date</b>	

**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.

This course introduces students to machine learning concepts and their applications within the field of process safety. Students will learn how to leverage data-driven techniques to predict, analyze, and mitigate safety risks in industrial processes. Emphasis will be on using real world data from chemical and industrial engineering processes to build predictive models, optimize safety protocols, and enhance operational reliability. Key topics include supervised and unsupervised learning, anomaly detection, predictive maintenance, and risk assessment using machine learning tools tailored to the needs of process safety engineering.

Additionally, the course includes an internal lab component where students will gain hands-on experience applying machine learning techniques to real-world industrial safety datasets. The lab will provide practical exposure to the process of developing, testing, and refining machine learning models to address safety challenges in process systems.

### 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:
.....	.....	.....