

COURSE INFORMATION					
Course Title	Code	Semester	L+P Hour	Credits	ECTS
<b>Special Topics in Chemical Engineering I: Chemical Technologies</b>	CHBE 584	1	3 + 0	3	10

<b>Prerequisites</b>	-
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<b>Language of Instruction</b>	English
<b>Course Level</b>	Graduate Degree
<b>Course Type</b>	Technical Elective
<b>Course Coordinator</b>	Assoc. Prof. Erde Can
<b>Instructors</b>	Assoc. Prof. Erde Can
<b>Assistants</b>	-
<b>Goals</b>	The aim of this course is to provide students with an in-depth knowledge of recent and developing chemical technologies of Chemical Engineering and to acquire information in these areas via scientific research, evaluate and interpret the information
<b>Content</b>	Theoretical information on the recent and developing chemical technologies such as nanomaterials, self healing polymers, polymers and composites from renewable resources, biodegradable polymers and applications, fuel cell technologies, new catalyst systems. Presentations of recent research articles on these topics. Project.

Learning Outcomes	Program Learning Outcomes	Teaching Methods	Assessment Methods
1) Expanded and in-depth information of recent chemical technologies: nanomaterials, self healing polymers, polymers and composites from renewable resources, biodegradable polymers and applications, fuel cell technologies, new catalyst systems	2	1,2,7	A,B,C
2) Ability to access information and follow developments on recent chemical technologies and ability to acquire information on these areas via scientific research and evaluate and interpret the information	1,3	2,7	B,C
3) Examines and defines societal and environmental aspects of the recently developed chemical technologies such as the effect of the application of biodegradable and renewable	10	1,2,7	A,B,C

polymers and composites on environment and sustainability and the effect of biomaterials and tissue engineering on health etc..			
4) Ability to select current research articles on these chemical technologies and present these articles orally, and with the preparation of the Project report on a selected topic, ability to communicate efficiently in English both orally and in writing.	8	2,7	B,C

<b>Teaching Methods:</b>	1: Lecture, 2: Lecture with Discussion, 7: Seminar
<b>Assessment Methods:</b>	A: Testing, B: Selected article presentation: C: Project

COURSE CONTENT		
Week	Topics	Study Materials
1	Nanomaterials-I	Literature Search - Lecture Notes
2	Nanomaterials-II	Literature Search - Lecture Notes
3	Self healing materials-I	Literature Search - Lecture Notes
4	Self healing materials -II	Literature Search - Lecture Notes
5	Biomaterials - I	Literature Search - Lecture Notes
6	Biomaterials-II	Literature Search - Lecture Notes
7	Drug Release Systems-I	Literature Search - Lecture Notes
8	Drug Release Systems-II	Literature Search - Lecture Notes
9	Polymers and composites from renewable resources,	Literature

	biodegradable polymers and their applications - I	Search - Lecture Notes
10	Polymers and composites from renewable resources, biodegradable polymers and their applications - II	Literature Search - Lecture Notes
11	Fuel cell technologies - I	Literature Search - Lecture Notes
12	Fuel cell technologies - II	Literature Search - Lecture Notes
13	New catalyst systems - I	Literature Search - Lecture Notes
14	New catalyst systems - II	Literature Search - Lecture Notes

#### RECOMMENDED SOURCES

<b>Textbook</b>	Review articles (General concepts of the topic), research articles on recent chemical technologies
<b>Additional Resources</b>	

#### MATERIAL SHARING

<b>Documents</b>	Review and research articles
<b>Assignments</b>	-
<b>Exams</b>	-

#### ASSESSMENT

<b>IN-TERM STUDIES</b>	<b>NUMBER</b>	<b>PERCENTAGE</b>
Article presentations on each topic	7	100 (7x14,3)
<b>Total</b>		<b>100</b>
<b>Contribution of final examination and project to overall grade</b>	1+1	40 (20+20)
<b>Contribution of in-term studies to overall grade</b>		60
<b>Total</b>		<b>100</b>

<b>COURSE CATEGORY</b>	Expertise/Field Courses
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<b>COURSE'S CONTRIBUTION TO PROGRAM</b>						
No	Program Learning Outcomes	Contribution				
		1	2	3	4	5
1	Acquire expanded and in-depth information via performing scientific research in the field of Chemical Engineering, evaluate, interpret and implement knowledge.				X	
2	Be knowledgeable in the contemporary techniques and methods applied in Chemical Engineering and their respective constraints.					X
3	Be cognizant of the novel and developing applications of his/her profession, study and learn them as required.					X
4	Formulate Chemical Engineering problems, develop methods to solve them and implement innovative techniques in solutions					
5	Design and conduct analytical modeling and experimental research, analyze and interpret complex problems encountered in this process.					
6	Develop novel and/or original ideas and methods; conceive innovative solutions in systems, component and process design					
7	Complete information via processing limited or incomplete data by the use of scientific methods and implement it; integrate knowledge from different disciplines					
8	Communicate in at least one foreign language at the level of European Language Portfolio B2 orally and in writing.					X
9	Communicate stages and results of his/her studies in a systematic and clear manner orally or in writing in intra or interdisciplinary national and international settings.					
10	Defines societal and environmental aspects of Chemical Engineering applications			X		
11	Observe social, scientific and ethical values during collection, interpretation, and dissemination of data and in all professional activities.					
12	Lead multidisciplinary teams, develop solution methodologies for complex problems and take responsibility					

<b>ECTS ALLOCATED BASED ON STUDENT WORKLOAD BY THE COURSE DESCRIPTION</b>			
Activities	Quantity	Duration (Hour)	Total Workload (Hour)
Course Duration (14 x Total course hours)	14	3	42
Hours for off-the-classroom study (Pre-study, literature search, practice)	14	8	112
Project	1	60	60

Final examination	1	(38+2)	40
<b>Total Work Load</b>			254
<b>Total Work Load / 25 (h)</b>			10.2
<b>ECTS Credit of the Course</b>			10