Back

Title	Code	Local Credit	ECTS	Lecture (hour/week)	Practical (hour/week)	Laboratory (hour/week)
Mathematical Modelling in Chemical Engineering	KMM3532	3	4	3	0	0

Prerequisite	None
Semester	Spring
Course Language	English, Turkish
Level Of Course	First Cycle
Course Type	Required @ **Bachelor Programme in Chemical Engineering** (/index.php?r=program/view&id=36&aid=23) Required @ **Bachelor Programme in Chemical Engineering (English)** (/index.php?r=program/view&id=398&aid=23)
Course Category	Core Courses

Mode Of Delivery	Face-to-Face

Owner Academic Unit	Department of Chemical Engineering
Course Coordinator	**Belma Kın Özbek (/index.php?r=user/view&id=630&aid=23)**
Instructor(s)	**Belma Kın Özbek (/index.php?r=user/view&id=630&aid=23)**
Asistant(s)	

Course Objectives	1. Train students to acquire the knowledge and skill of analysing numerical methods for mathematical modelling 2. Provide the students with the necessary knowledge and skill to make calculations by using MATHCAD Package Program 3. Provide the students with the knowledge and skill of deriving the equations of mass, energy and component 4. Provide the students with the knowledge and skill of examples about mathematical modelling in chemical engineering and their solutions 5. Encourage the students to work individually by giving homeworks
Course Content	Evaluation of the Data in the Chemical Engineering / Linearisation Studies of the Nonlinear Equations / Mathematical Formulation of the Processes / Systems with Multiple Variables / Modelling of the Steady-State and Dynamic Systems / Modelling Studies and Solutions of the Models / Solutions of the Ordinary and Partial Differential Equations / Mathcade Package Program / Solution of the Equations by Using Mathcad Package Program / Modelling of the Complex Systems.
Recommended Or Required Reading	» 1. Process Modelling, Simulation and Control for Chemical Engineers, Luyben, L.M., 2nd ed., McGraw-Hill, 1990. 2. Modelling and Simulation in Chemical Engineering, Franks, G.E.R., Wiley, 1972. 3. Lecture Notes prepared by Belma Ozbek
Recommended Optional Program Components	None

Course Learning Outcomes

1. Students learn to produce solutions to problems about mathematical modelling in chemical engineering on the basis of scientific and practical reasoning.
2. Students learn to solve problems about mathematical modelling in chemical engineering by using numerical methods.
3. Students learn to solve ordinary and partial differential equations.
4. Students learn to solve problems about mathematical modelling in chemical engineering by using MATHCAD package program.
5. Students learn to communicate effectively in writing presentation.

Weekly Subjects and Related Preparation Studies

Week	Subjects	Related Preparation
1	Introduction to Mathematical Modelling	Lecture Notes
2	Linear and Nonlinear Equations	Lecture Notes
3	Calculation Techniques of the Roots of the Equations	Lecture Notes
4	Degree of Freedom Analysis	Lecture Notes
5	Numerical Integration	Lecture Notes
6	The Principles of the Mathematical Modelling and Solutions of the Models	Lecture Notes
7	Solutions of the Ordinary and Partial Differential Equations	Lecture Notes
8	Midterm 1	
9	Midterm I	Lecture Notes
10	Mass and Energy Balance, Component Equations, Evaporators	Lecture Notes
11	Modelling of the Reactors	Lecture Notes
12	Microscopic Equations	Lecture Notes
13	Gas-Liquid Systems (Midterm II)	Lecture Notes
14	Multiple Stage Process with Cross-Flow	Lecture Notes
15	Final	

Evaluation System

Activities	Number	Percentage of Grade
Attendance/Participation		
Laboratory		
Application		
Field Work		
Special Course Internship (Work Placement)		
Quizzes/Studio Critics	4	10
Homework Assignments	4	10

Presentations/Jury		
Project		
Seminar/Workshop		
Mid-Terms	2	40
Final	1	40
Percentage of In-Term Studies		60
Percentage of Final Examination		40
TOTAL		100

ECTS Workload Table

Activities	Number	Duration(Hour)	Total Workload
Course Hours	13	3	39
Laboratory			
Application			
Field Work			
Study Hours Out of Class	13	2	26
Special Course Internship (Work Placement)			
Homework Assignments	4	3	12
Quizzes/Studio Critics	4	3	12
Project	0	0	0
Presentations / Seminar			
Mid-Terms (Examination Duration + Examination Prep. Duration)	2	10	20
Final (Examination Duration + Examination Prep. Duration)	1	12	12
		Total Workload :	121
		Total Workload / 30(h) :	4.03
		ECTS Credit :	4

Extra Notes	None