DEPARTMENT OF BUSINESS AND ECONOMICS
COURSE SYLLABUS

Course Details				
Code		**Academic Year**		**Semester**
BE030		2021-2022		
Title		**T**	**A**	**L**	**ECTS**
Advanced Mathematics		3	1	0	10

Language	English			
Level	**Master**		**Doctorate**	**X**
Department / Program	PhD in Business and Economics			
Forms of Teaching and Learning	Face-to-Face			
Course Type	**Compulsory**		**Elective**	**X**
Objectives	The aim of this course is to provide the fundamental mathematical tools necessary to take PhD level economics courses. Topics covered in this course include: Single variable calculus, linear algebra, differential calculus, integral calculus, matrix algebra, probability, set theory, unconstrained optimization, constrained maximization, ordinary differential equation, continuous time optimization. Emphasis will be placed on economic applications.			
Content	The least upper bound property in R, equivalents and consequences. Metric spaces. Completeness, compactness, connectedness. Functions,continuity. Sequences and series of functions. Contraction mapping theorem and applications to calculus: Inverse and implicit function theorems.			
Prerequisites				
Coordinator				
Lecturer(s)				
Assistant(s)				
Work Placement				

Recommended or Required Reading	
Books / Lecture Notes	**Elementary Classical Analysis; Marsden & Hoffman, Freeman 1974. QA300.M37.1993**
Other Sources	Lecture Notes

Additional Course Material	
Documents	**Lecture Notes and Books**
Assignments	Assignments
Exams	Midterm and Final

Course Composition		
Social Sciences		%100

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COURSE SYLLABUS

Educational Sciences		%
Natural Sciences		%
Health Sciences		%
Expert Knowledge		%

Assessment

Activity	Count	Percentage (%)
Midterm Exam		30
Quiz		
Assignments		30
Attendance		
Recitations		
Projects		
Final Exam		40
	Total	**100**

ECTS Points and Work Load

Activity	Count	Duration	Work Load (Hours)
Lectures	14	3	42
Self-Study	14	2	28
Assignments	12	5	60
Presentation / Seminar Preparation			
Midterm Exam	1	60	60
Recitations			
Laboratory			
Projects			
Final Exam	1	90	90
		Total Work Load	**280**
		ECTS Points (Total Work Load / 28)	**10**

Course Learning Outcomes

1	Read definitions, theorems, proofs
2	Produce "own" proofs in simpler cases.
3	Comprehend the structure of real numbers and the Euclidean space.
4	Comprehend the topology of the Euclidean space.
5	Comprehend the notion and use the inverse and implicit function theorems.

Weekly Content

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1	Real Line and Euclidean n-Space
2	Topology of R^n
3	Topology of R^n
4	Compact Sets
5	Connected Sets
6	Continuous Mapping
7	Inverse and Implicit Function Theorem
8	Uniform Convergence
9	Midterm
10	Differentiable Mapping
11	Fubini's Theorem
12	The Change of Variables Formula
13	Fourier Analysis
14	Fourier Analysis
15	Overview

Contribution of Learning Outcomes to Program Objectives (1-5)

CLO	P1	P2	P3
1	4	3	5
2	4	5	5
3	3	3	4
4	5	4	4
5	3	4	4

Contribution Level	1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High
Compiled by:	
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