ADVANCED NUMERICAL ANALYSIS I

1	Course Title:	ADVANCED NUMERICAL ANALYSIS I	
2	Course Code:	MAT5405	
3	Type of Course:	Optional	
4	Level of Course:	Third Cycle	
5	Year of Study:	1	
6	Semester:	1	
7	ECTS Credits Allocated:	6.00	
8	Theoretical (hour/week):	3.00	
9	Practice (hour/week):	0.00	
10	Laboratory (hour/week):	0	
11	Prerequisites:	None	
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Dr. Ögr. Üyesi SETENAY DOĞAN	
15	Course Lecturers:		
16	Contact information of the Course Coordinator:	setenay@uludag.edu.tr 0224 2941763 U.Ü. Fen Edebiyat Fakültesi Matematik Bölümü Nilüfer BURSA	
17	Website:		
18	Objective of the Course:	The aim of the course is finding appropriate solutions for solving difficult mathematical problems and obtained some of the methods to find the best approach. Compare the results of extracting meaningful and useful results.	
19	Contribution of the Course to Professional Development:	teaches to find solutions to some problems that have no solutions or have difficult solutions by using appropriate serial solution methods.	
20	Learning Outcomes:		
		1	Learns numerical solution
		2	Knows numerical differentiation and numerical integration
		3	Knows methods of solution of systems of nonlinear equations
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21	Course Content:		

Course Content:

Week	Theoretical	Practice
1	Error analysis	
2	Difference equations	

3	Interpolation	
4	Newton and Lagrange interpolation methods	
5	Solutions of systems of linear algebraic equations	
6	Systems of nonlinear algebraic equations and solutions	
7	Matrix decomposition methods	
8	Newton Bairstow methods and applications	
9	Eigen value problems	
10	Midterm exam and general review	
11	Numerical solutions of eigenvalue problems	
12	Lanczos method and applications	
13	QR method	
14	Applications	

22	Textbooks, References and/or Other Materials:	Numerical Analysıs Richard L. Burden
23	Assesment	

TERM LEARNING ACTIVITIES	**NUMBER**	**WEIGHT**
Midterm Exam	1	40.00
Quiz	0	0.00
Home work-project	0	0.00
Final Exam	1	60.00
Total	2	100.00
Contribution of Term (Year) Learning Activities to Success Grade		40.00
Contribution of Final Exam to Success Grade		60.00
Total		100.00
Measurement and Evaluation Techniques Used in the Course		Relative evaluation system is applied.

24	**ECTS / WORK LOAD TABLE**

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	3.00	42.00
Practicals/Labs	0	0.00	0.00
Self study and preperation	14	6.00	84.00
Homeworks	0	0.00	0.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	20.00	20.00
Others	0	0.00	0.00
Final Exams	1	34.00	34.00
Total Work Load			180.00
Total work load/ 30 hr			6.00
ECTS Credit of the Course			6.00

25	CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS															
	PQ1	**PQ2**	**PQ3**	**PQ4**	**PQ5**	**PQ6**	**PQ7**	**PQ8**	**PQ9**	**PQ10**	**PQ11**	**PQ12**	**PQ13**	**PQ14**	**PQ15**	**PQ16**
ÖK1	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK2	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0

LO: Learning Objectives PQ: Program Qualifications

Contribution Level:	**1 very low**	**2 low**	**3 Medium**	**4 High**	**5 Very High**