

Identification	Subject	CMS 452 - Numerical Software Applications	
	Department	School of Education	
	Program	Undergraduate	
	Term	Fall, 2018	
	Instructor	Shahsenov Izat	
	E-mail:	izat.shahsannov@khazar.org	
	Phone:	+994554077622	
	Classroom/hours	---	
	Office hours	by appointment	
Prerequisites	Not required		
Language	Azeri		
Compulsory/Elective	Mandatory		
Required textbooks and course materials	<p><i>Core textbooks:</i></p> <p>1. <b>An Introduction to Programming and Numerical Methods in Matlab</b> (S.R. Otto and J.P. Denier)</p> <p><i>Supplementary material:</i> Class Lecture Handouts and Additional Reading Materials</p>		
Course outline	<p>The course introduces students to the initial concepts of the Matlab programming and Numerical Methods:</p> <p>-Concepts of Programming -Numerical Methods -Non-linear solutions</p> <p>The whole course will be supported with the examples of application of these techniques on real cases.</p>		
Course objectives	The purpose of this course is to get familiar with basics of Matlab programming language and its application to solve numerical problems.		
Learning outcomes	<p><b>By the end of the course the students should be able:</b></p> <ul style="list-style-type: none"><li>▪ Work with Matlab programming language</li><li>▪ Data Interpretation</li><li>▪ Solve non-linear problems</li></ul>		
Teaching methods	Lecture		X
	Group discussion		X
	Experiential exercise		
	Simulation		
	Case analysis		X
	Course papers		X
	Others		
Evaluation	Methods	Date/deadlines	Percentage (%)
	Midterm Exam		30
	Case studies		
	Class Participation		5
	Assignment and quizzes		10
	Project		20
	Presentation/Group Discussion		

	<b>Final Exam</b>		35
	<b>Others</b>		
	<b>Total</b>		100

<b>Policy</b>	<ul style="list-style-type: none"> <li>▪ <b>Preparation for class</b>  The structure of this course makes your individual study and preparation outside the class extremely important. The lecture material will focus on the major points introduced in the text. Reading the assigned chapters and having some familiarity with them before class will greatly assist your understanding of the lecture. After the lecture, you should study your notes and work relevant problems and cases from the end of the chapter and sample exam questions.</li> <li>▪ <b>Withdrawal (pass/fail)</b>  A student is normally expected to achieve a mark of at least 60% to pass. In case of failure, he/she will be required to repeat the course the following term or year.</li> <li>▪ <b>Cheating/plagiarism</b>  Cheating or other plagiarism during the Quizzes, Mid-term and Final Examinations will lead to paper cancellation. In this case, the student will automatically get zero (0), without any considerations.</li> <li>▪ <b>Professional behavior guidelines</b>  The students shall behave in the way to create favorable academic and professional environment during the class hours. Unauthorized discussions and unethical behavior are strictly prohibited.</li> </ul>
---------------	---

--	--	--	--

#### Tentative Schedule

We ek	Date/Day (tentative)	Topics	Textbook/Assignments
1		Course Information: Matlab installation	<ul style="list-style-type: none"> <li>• Lecture Notes</li> </ul>
2		Vectors in MATLAB Initialising Vector Objects Manipulating Vectors and Dot Arithmetic	<ul style="list-style-type: none"> <li>• Lecture Notes</li> <li>• An Introduction to Programming and Numerical Methods in Matlab (S.R. Otto and J.P. Denier)</li> </ul>
3		Setting Up Mathematical Functions Some MATLAB Specific Commands	<ul style="list-style-type: none"> <li>• Lecture Notes</li> </ul>

		Looking at Variables and Their Sizes	<ul style="list-style-type: none"> <li>An Introduction to Programming and Numerical Methods in Matlab (S.R. Otto and J.P. Denier)</li> </ul>
4		Writing Scripts and Functions Creating Scripts and Functions Functions	<ul style="list-style-type: none"> <li>Lecture Notes</li> <li>An Introduction to Programming and Numerical Methods in Matlab (S.R. Otto and J.P. Denier)</li> </ul>
5		Plotting Simple Evaluating Polynomials and Plotting More on Plotting	<ul style="list-style-type: none"> <li>Lecture Notes</li> <li>An Introduction to Programming and Numerical Methods in Matlab (S.R. Otto and J.P. Denier)</li> </ul>
6		Matrices Initialising Matrices Within MATLAB Matrix Operations Operations on Elements of Matrices	<ul style="list-style-type: none"> <li>Lecture Notes</li> </ul>
7		System of Equations Kronecker method	<ul style="list-style-type: none"> <li>Lecture Notes</li> </ul>
8		Nonlinear Equations	<ul style="list-style-type: none"> <li>Lecture Notes</li> </ul>
9		<b>Mid-Term Exam</b>	
10		Solving Differential Equations Euler's Method and Crank–Nicolson Analytical Comparisons	<ul style="list-style-type: none"> <li>Lecture Notes</li> <li>An Introduction to Programming and Numerical Methods in Matlab (S.R. Otto and J.P. Denier)</li> </ul>
11		Simulations and Random Numbers Statistical quantities	<ul style="list-style-type: none"> <li>Lecture Notes</li> <li>An Introduction to Programming and Numerical Methods in Matlab (S.R. Otto and J.P. Denier).</li> </ul>
12		Data manipulation and interpretation	<ul style="list-style-type: none"> <li>Lecture Notes</li> </ul>
13		Numerical integration Statement of the problem	<ul style="list-style-type: none"> <li>Lecture Notes</li> </ul>
14		Matlab Simulink	<ul style="list-style-type: none"> <li>Lecture Notes</li> </ul>
15		Combination of MLP and CNN	<ul style="list-style-type: none"> <li>Lecture Notes</li> </ul>
	TBA	<b>Final Exam</b>	

This syllabus is a guide for the course and any modifications to it will be announced in advance.