|  |  |  |
| --- | --- | --- |
| **Identification** | **Subject****(code, title, credits)** | MATH 225 Mathematics for Economists and Business 1.5KU/3ECTS credits |
| **Department** | Economics and Management |
| **Program** | Undergraduate |
| **Term** | Spring, 2017 |
| **Instructor** | Zaur Abdullazade |
| **Website & E-mail:** | <http://math225.webs.com>, zaur@financier.com  |
| **Classroom/hours** | Friday 18:30-21:00, Room TBA, 41 Mehseti street(Neftchilar campus), Khazar University |
| **Office hours** | By appointment |
| **Prerequisites** | MATH 101 Calculus |
| **Language**  | English |
| **Compulsory/Elective** | Compulsory |
| **Required textbooks and course materials** | [SB] Simon, Carl P., and Lawrence Blume. *Mathematics for economists*. Vol. 7. New York: Norton, 1994. |
| **Course objectives**  | To allow the students use mathematical methods in solving different economic problems. |
| **Course outline** | A wide variety of economic problems can be solved using mathematical models. Equations and their graphs are used in studying costs, sales, revenues, profits, supply and demand. Numerous applications of mathematics will be given throughout the course. |
| **Learning outcomes** | Students successfully completing this course should be able to understand mathematical language of modern economics and be aware of various mathematical methods |
| **Teaching methods** | **Lecture**  | X |
| **Group discussion** | X |
| **Problem Solving** | X |
| **Homework assignments (5 H/W)** | X |
| **Simulation** |  |
| **Course paper** |  |
| **Others** |  |
| **Evaluation**  | **Methods** | **Date/deadlines** | **Percentage (%)** |
| **Midterm Exam** |  | 25 |
| **Case studies** |  |  |
| **Class attendance** |  | 5 |
| **Activity** |  | 5 |
| **Homework assignments (5 H/W)** | Dates due by(1st) 24.02.2017; (2nd) 31.03.2017;(3rd) 28.04.2017; (4th) 12.05.2017;(5th) 26.05.2017  | 10 |
| **Quizzes (3 quizzes)** | 10.03.201705.05.201726.05.2017 | 15 |
| **Presentation/Group Discussion** |  |  |
| **Final Exam** |  | 40 |
| **Others** |  |  |
| **Total**  |  | 100 |
| **Course evaluation process** | Grades will be based on a straight scale generated from points accumulated by a student during the semester. The breakdown of possible points is as follows: Quizzes - 15 points (5 points each), Midterm Exam – 25 points, Final Exam – 40 points, Home Assignment – 10 points, and Attendance +Activity – 10 points.The dates of the quizzes will be announced a week in advance in-class, and also the students will be notified about the upcoming quiz by e-mail. The questions of each quiz will consist from the questions on the topics fully covered before the quiz day.  |

|  |  |
| --- | --- |
| **Class attendance and activity** | * **Attendance Policy**

4% of final grade will be given for class attendance. Students should attend all classes. The proof of reason for unavoidable absence has to be provided by student. In this case, the absence will not be resulted with grade subtraction. Students should come to the classes on time. Late arrival more than 15 minutes will result in absence on the student’s attendance sheet. In case of late arrival, student has to inform the instructor in advance. **Important Note: If the student misses 25% of the all classes during the semester, he or she will not be allowed to participate in examination.*** **Class activity in this course:**

6% of the final grade will be given for class activity. It is required from students to contribute to the class discussion and actively participate in team works. The quality of contribution, and *not* the quantity of contribution will be the main factor for grading.  |
| **Academic dishonesty** | Students are expected to conduct themselves in a professional manner. Academic dishonesty such as plagiarism and cheating will not be tolerated. Therefore, students are expected to be honest and ethical in their academic work. Cases of academic dishonesty will be immediately reported to the Director’s office for disciplinary action.  |
| **Office hours** | The instructor will be available to consult with students regarding class related questions regularly by appointment. Meetings with students outside office hours should be scheduled in advance by sending an e-mail to the instructor.  |
| **Tentative Schedule** |
| **Week** | **Date/Day****(tentative)** | **Topics** | **Textbook/Assignments**  |
| 1 | 10.02.2017  | Introduction: Mathematical models in economics.Vocabulary of functions: Function, graph, domain, range, increasing and decreasing functions, minima and maxima.Linear functions, slope and intercepts. | 2.1-2.2 [SB] |
| 2 | 17.02.2017 | Derivatives, rules for computing derivatives. Differentiability and continuity, higher order derivatives. Using derivatives for graphing. | 2.3-2.7, 3.1-3.5 [SB] |
| 3 | 24.02.2017 | Applications to Economics: production function, cost function, revenue and profit. Demand and elasticity.  | 3.6 [SB] |
| 4 | 03.03.2017 | Exponential and logarithmic functions, the number *e*, derivatives of exp and log. Economic applications. | 5.1-5.6 [SB] |
| 5 | 10.03.2017 | **Quiz 1**.Review sessionSystems of linear equations, elementary methods of solution. Economic examples. | 6.1, 6.2, 7.1-7.3 [SB] |
| 6 | 17.03.2017 | Matrix Algebra and systems of linear equations. Matrix operations, inverse matrix, Economic examples. | 8.1- 8.7 [SB] |

|  |  |  |  |
| --- | --- | --- | --- |
| 7 | 31.03.2017 | Linear programming. The graphics of linear inequalities. Systems of linear inequalities. Region of feasible solutions. Corner-point method for linear programming problem. | Handout |
| 8 | 07.04.2017  | Class revision for Midterm exam |  |
| 9 | 14.04.2017 | **Midterm exam** |  |
| 10 | 21.04.2017 | Functions of several variables. Partial derivatives. Total derivative. Economic applications. Multivariable optimization. Unconstrained optimization. Local and global extrema. First order conditions. Hessian determinant and economic applications.  | 14.1-14.4 [SB]17.1-17.5 [SB] |
| 11 | 28.04.2017 | Introduction to integration. Indefinite integral. Definite integral, fundamental theorem of calculus, applications. Area under a curve. Application of definite integrals in economics. Consumer’s surplus, producer’s surplus. | A4.1-A4.3 [SB]  |
| 12 | 05.05.2017 | **Quiz 2**.Review Session.Mathematics of finance. Simple interest as arithmetic sequences; compound interest as geometric sequences.  | Handout17.1-17.5 [SB] |
| 13 | 12.05.2017 | Constrained optimization. First order conditions. Equality constraints. Maxima and minima of functions subject to constraints; Lagrange multipliers. Bordered Hessian determinant and economic applications. | 18.1-18.7 [SB] |
| 14 | 19.05.2017  | Continued - Equality constraints. Bordered Hessian determinant and economic applications. | 18.1-18.7 [SB] |
| 15 | 26.05.2017 | **Quiz 3** (take home due by 29.05.2017 at 7 PM).Review & pre-final class. |  |
| 16 | Will be announced(TBA) | **Final exam** |  |

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