# AYDIN ADNAN MENDERES UNIVERSITY
# COURSE INFORMATION FORM

| Course Title | Advanced Maths | | | | | | |
|---|---|---|---|---|---|---|---|
| Course Code | FEK525 | | Couse Level | Second Cycle (Master's Degree) | | | |
| ECTS Credit | 5 | Workload | 125 *(Hours)* | Theory | 3 | Practice | 0 | Laboratory | 0 |
| Objectives of the Course | The sequence Math 1001-1002 is the standard complete introduction to the concepts and methods of calculus. It is taken by all engineering students. The emphasis is on concepts, solving problems, theory and proofs. Students will develop their reading, writing and questioning skills in Mathematics. | | | | | | |
| Course Content | To be able to develop advanced math skills | | | | | | |
| Work Placement | N/A | | | | | | |
| Planned Learning Activities and Teaching Methods | Explanation (Presentation), Problem Solving | | | | | | |
| Name of Lecturer(s) | Lec. Mesut ÇAKIR | | | | | | |

## Assessment Methods and Criteria

| Method | Quantity | Percentage (%) |
|---|---|---|
| Midterm Examination | 1 | 40 |
| Final Examination | 1 | 60 |

## Recommended or Required Reading

| 1 | Thomas Calculus (12th Edition), George B. Thomas, Maurice D. Weir, Joel Hass, 2010 |
|---|---|

| Week | Weekly Detailed Course Contents | |
|---|---|---|
| 1 | Theoretical | Infinite series; Convergence tests for positive series; Power series, Taylor and Maclaurin series |
| 2 | Theoretical | Quadratic forms(Conic Sections) |
| 3 | Theoretical | Vectors and coordinate geometry in three dimensional space Analytic geometry in three dimensions, Plane, lines, and quadratic surfaces |
| 4 | Theoretical | Functions of several variables; Limits and continuity |
| 5 | Theoretical | Partial derivatives; Higher-order derivatives, The chain rule |
| 6 | Theoretical | Partial derivatives; Higher-order derivatives, The chain rule |
| 7 | Theoretical | Linear approximation; Gradients and directional derivatives, Implicit functions |
| 8 | Intermediate Exam | Mid-term |
| 9 | Theoretical | Extreme values; Extreme values of functions defined on restricted domains |
| 10 | Theoretical | Lagrange multipliers; Multiple integration; Double integrals, iteration of double integrals in Cartesian- Coordinates |
| 11 | Theoretical | Surface area using by double integrals; Double integrals in Polar Coordinates |
| 12 | Theoretical | Vector and scalar fields; Line integrals |
| 13 | Theoretical | Conservative fields |
| 14 | Theoretical | Surface integrals; Green s theorem, divergence theorem, and Stokes s theorem. |
| 15 | Theoretical | Surface integrals; Green s theorem, divergence theorem, and Stokes s theorem. |
| 16 | Final Exam | Final |

## Workload Calculation

| Activity | Quantity | Preparation | Duration | Total Workload |
|---|---|---|---|---|
| Lecture - Theory | 14 | 2 | 3 | 70 |
| Individual Work | 7 | 2 | 2 | 28 |
| Midterm Examination | 1 | 10 | 1 | 11 |
| Final Examination | 1 | 15 | 1 | 16 |
| | | | Total Workload (Hours) | 125 |
| | | | [Total Workload (Hours) / 25*] = **ECTS** | 5 |

*25 hour workload is accepted as 1 ECTS

**Learning Outcomes**

| | |
|---|---|
| 1 | Define the sequence of partial sum for an infinite series and relate the convergence of this sequence to the convergence of the series. Then find or estimate the sum. |
| 2 | Find the interval and radius of convergence for a given power series. |
| 3 | Understand and identify vectors in the plane and in the three dimensional space. |
| 4 | Find the total differential of a function of several variables and use it to approximate incremental change in the function. |
| 5 | Do simple manipulations involving gradient, divergence, and curl, and understand their geometrical/physical meaning |

**Programme Outcomes** *(Econometrics Master)*

| | |
|---|---|
| 1 | Understanding the concept of econometric |
| 2 | Ability to estimate econometric models |
| 3 | Test to the estimated reliability of the econometric model |
| 4 | Learning time series analysis |
| 5 | Recognition of financial assets and analysis that estimates the decisions of economic units |
| 6 | Be able to use econometric methods developed specifically for analysis of financial data |
| 7 | To be able to use computer programs needed in the field financial economics as well as information and communication technologies in advanced levels |
| 8 | Provision of the information that will be base for the econometric applications on money theories, theories of international trade and finance |
| 9 | Considering a scientific research,to be able to make a profound literature research, analysis,estimations and reporting findings in a scientific work |

**Contribution of Learning Outcomes to Programme Outcomes** *1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High*

| | L1 | L2 | L3 | L4 | L5 |
|---|---|---|---|---|---|
| P1 | 4 | 2 | 4 | 3 | 3 |
| P2 | 3 | 3 | 3 | 4 | 4 |
| P3 | 2 | 2 | 3 | 3 | 3 |
| P4 | 5 | 3 | 3 | 3 | 4 |
| P5 | 3 | 2 | 4 | 4 | 3 |
| P6 | 2 | 5 | 2 | 2 | 2 |
| P7 | 5 | 3 | 3 | 5 | 2 |
| P8 | 2 | 2 | 4 | 2 | 3 |
| P9 | 3 | 3 | 3 | 3 | 4 |