Department of Mathematics

Course Profile

Course Number: MATH102	**Course Title: Calculus II**
Required / Elective: Required	**Prerequisites:** Math101
Catalog Description: Integration techniques; improper integrals. Infinite series, positive and alternating series, power series, Taylor and Maclaurin series. Polar coordinates. Vectors and motion in space, vector valued functions.	**Textbook / Required Material:** Thomas' Calculus Early Transcendentals 11th Edition / Weir, Hass, Giordano, Addison - Wesley Publishing Company, 2006
Course Structure / Schedule: (3+0+2) 4 / 7 ECTS	
Extended Description: Hyperbolic Functions. Basic Integration Formulas; Integration by Parts; Integration of Rational Functions by Partial Fractions; Trigonometric Integrals; Trigonometric Substitutions**;** Improper Integrals. Polar Coordinates; Graphing in Polar Coordinates; Areas and Length in Polar Coordinates; The Standard Polar Equations for Lines and Circles. Sequences. Infinite Series**;** Integral Test; Comparison Tests**;** Ratio and Root Tests; Alternating Series, Absolute and Conditional Convergence**;** Power Series; Taylor and Maclaurin Series; Convergence of Taylor Series; Error Estimates. Three-Dimensional Coordinate Systems; Vectors; The Dot Product; The Cross Product**;** Lines and Planes in Space; Vector Functions**.**	
Design content: None	**Computer usage:** No particular computer usage required

Course Outcomes: By the end of the course, the students should be able to:

1. prepare for sophomore-level topics in mathematical analysis (differential equations and linear algebra), and calculus-based subjects in science and engineering **[1, 2, 3, 7],**
2. have knowledge of the fundamental definitions and theorems of elementary calculus **[1,2,3,6,7]**,
3. complete routine derivations associated with calculus, recognize elementary applications of differential and integral calculus, and be literate in the language and notation of calculus **[2, 3]**
4. have the skills of appropriate level for modeling and solving complicated mathematical problems arising in various natural sciences as well as in electronic and computer sciences **[3].**

[1] Demonstrate the ability of solving problems by using techniques from calculus, linear algebra, differential equations, probability and statistics,

[2] Demonstrate knowledge of mathematics to construct, analyze and interpret mathematical models,

[3] Demonstrate the ability to apply mathematics to the solutions of problems,

[6] Have a basic knowledge of the main fields of mathematics, including analysis, algebra, differential equations, differential geometry,
[7] Have an ability to function both independently and as a member of a multidisciplinary team.

Recommended reading:

Calculus with analytic geometry / C.H. Edwards, Jr., David E. Penney. Englewood Cliffs, N.J., Prentice Hall, c1994. 4th ed.

Calculus with analytic geometry / Howard Anton ; in collaboration with Albert Herr. New York, Wiley, c1995. 5th ed.

Calculus with analytic geometry / Richard A. Silverman. Englewood Cliffs, N.J., Prentice-Hall, c1985.

Teaching methods: Lectures, tutorials, appropriate handouts which provide students with complex diagrams, graphs or formulas.

Assessment methods: Midterm exams, final exam

Student workload:

Pre-reading	.....8 hrs
Lectures	……45 hrs
Tutorials	……30 hrs
Preparatory reading	.....……..... 25 hrs
Problem solving	..... 40 hrs
Discussion	..... 20 hrs
Midterm and final exams	.....7 hrs
TOTAL	**…… 175 hrs …… to match 25x7 ECTS**

Prepared by: Banu Uzun	Revision Date: 08.02.2010