Syllabus: Multidimensional Calculus (AE2B01MA3), Mathematics 2 (AE3B01MA2), Multidimensional Analysis (AE1B01MA2).

Lectures: Thursday, room T2:C4-363, 9:15-10:45.
Labs: Thursday, room T2:C3-51, 11:00-12:30.

Instructor: Dr. Paola Vivi, Ph.D, Department of Mathematics, Faculty of Electrical Engineering, Zikova 4, 2nd floor, room n.14. Office hours: Thursday 12:30-13.30, or by appointment. web-page:http://math.feld.cvut.cz/vivi/   e-mail:vivi@math.feld.cvut.cz

Suggested Text: J.Stewart, Calculus, Brooks-Cole, 1991
G.Thomas, R.Finney, Calculus and analytic geometry-part 2, Addison-Wesley, 1996
L. Gillman, R. H. McDowell, Calculus, W.W.Norton and Co., 1973
S. Lang, Calculus of several variables, Springer Verlag, 1987
http://math.feld.cvut.cz/vivi/ Lecture notes, Class 1-13.

Course description: This is an introductory course to differential and integral calculus in several variables. Basic relations between curve and surface integrals are studied. At the end, numerical series, function series and power series are introduced with application to Taylor and Fourier series.

Lectures will cover all the material needed to pass the exam. Attendance is not obligatory but highly recommended.

Labs are devoted to develop the necessary technical skills for problem solving. The student is required to actively participate in the solution of the posed problems in front of the class. During the labs of Week 6 and Week 11 a test (45 min., 3 questions) will also be handed out. Homeworks will be regularly assigned and their solution is highly recommended as preparation for the final exam. **Attendance is obligatory**: in order to take the final exam a certificate of attendance is required.

Exam. The exam is composed of written and oral part.
The written final exam will be in May-June, exact dates will be announced later, it will consist of six problems to be solved in 90 minutes for a total of 90 points.
The oral final exam is optional, it is used to improve the grade up to 10 points. Questions about theory will be asked (definitions, theorems, proofs).
In order to pass the exam you are required to obtain a minimum of 50 points in the written test, students with more than 60 points in the written part of the exam will be allowed to improve their grade with the oral part of the exam.
Grades are assigned as follows: F($<$49pts), E(50-59), D(60-69), C(70-79), B(80-89), A(90-100).

Content of lectures.
1. Functions of more variables: Limit, continuity.
2. Directional and partial derivative - gradient.
3. Derivative of a composition of functions, higher order derivatives.
4. Jacobian matrix. Local extrema.
5. Double and triple integral - Fubini's theorem and theorem on substitution.
6. Path integral and its applications.
7. Surface integral and its applications.
8. The Gauss, Green, and Stokes theorem. Potential of a vector field.
9. Basic convergence tests for series of numbers.
10. Series of functions, the Weirstrasse test.
11. Power series, radius of convergence.
12. Standard expansions of elementary functions. Taylor series.
13. Fourier series.