Syllabus: BE5B01MA2 - Calculus 2.

Lectures: Monday 12:45 - 14:15, Thursday 9:15 - 10:45, room T2:A4-204.
Labs: Thursday 11:00 - 12:30, room T2:A4-204.

Instructor: Dr. Paola Vivi, Ph.D, Department of Mathematics, Faculty of Electrical Engineering, Jugoslávských partyzánů 1580/3 (5th floor). 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, Labs, and Solved exercises.

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, Fourier series are introduced.

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. A weekly homework will be regularly assigned and its solution is highly recommended as preparation for the final exam. **Attendance is obligatory**: In order to obtain the certificate of attendance (needed for the final exam), students are required to actively participate in the laboratory class, hand in the assigned homework and obtain a sufficient score (at least 9 points out of 20) during lab tests. If the score obtained in a test is not sufficient, extra homework will be assigned and the test will be repeated at the end of the course.

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. Real plane, three dimensional analytic geometry, vector functions.
2. Functions of several variables: limits, continuity.
3. Directional and partial derivative, tangent plane, gradient.
4. Derivative of a composition of functions, higher order derivatives.
5. Local extremes, Lagrange multipliers.
6. Double integral, Fubini's Theorem. Polar coordinates.
7. Triple integrals. Cylindrical and spherical coordinates. Change of variables in multiple integrals.
8. Space curves. Line integrals.
9. Potential of a vector field. Fundamental Theorem for line integrals. Green's Theorem.
10. Parametric surfaces and their area. Surface integrals.
11. Curl and divergence. Gauss, and Stokes theorem and their applications.
12. Fourier series.
13. Sine and cosine Fourier series.