MATH 283-1005 INTERMEDIATE CALCULUS III  
FALL SEMESTER (August 24 - December 5, 2015)

Instructor: Dr. A. Muleshkov, Associate Professor of Mathematics

Location: WRI C148  
Time: Tu Th 5:00 - 6:45 P. M.

Office: CDC-1020  
Office Phone: 895-0387 (Voice mail is available.)  
Office Hours: Monday and Wednesday 12:00 - 12:55 P. M.
Tuesday and Thursday 4:00 - 4:55 P. M.

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Textbook: James Stewart, Essential Calculus Early Transcendentals, 2nd Ed Edition (Chapters 11, 10, 12, some of 13)

Learning Outcomes: Operation with vectors and their application in 3D Analytic Geometry of points, straight lines, and planes; recognition and description of quadric surfaces; finding arc length, tangent, principal normal, bi-normal vectors and lines, osculating, normal, and rectifying planes, curvature and torsion for a given space line; finding velocity, speed, acceleration, tangential and normal components of the acceleration for a given space point motion; relative motion; domain, range, graph, level curve/surface, continuity, partial derivative, differential and differentiability, linearization, directional derivative, gradient, absolute and local extreme values, saddle points, etc. for an elementary and arbitrary function of two or more variables; evaluation of double and triple integrals for simple and convenient domains in Cartesian/polar/spherical/cylindrical/generalized/arbitrary coordinates and their application for finding area, surface area, volume, mass, center of mass, centroid, moments of statics, moments of inertia, etc. for a solid, lamina, wire, shell, rod, etc.; scalar and vector fields: work, curl, potential, divergence, flux, Stokes’ theorem, divergence theorem, Green’s theorem.

Prerequisite: MATH 182 (minimal grade C) (C’ is not enough.)

The final grade for the course is obtained from the total (max. 600 points) of the following:
-- weekly quizzes - 150 points  
-- midsemester exam - 140 points  
-- final exam (partially comprehensive) - 210 points  
-- instructor’s discretion - 40 points  
-- weekly homework - 60 points
There is going to be a recitation/discussion class taught by my graduate student Mr. Tan Nguyen every Friday. During his class, Mr. Tan Nguyen is going to solve problems, answer questions, collect and return homework, and administer quizzes. There will be a quiz (on the material covered in class during the previous week at the end of Friday’s recitation) or a test (on Friday) every week with a few exceptions, e.g. the last week. No calculators or other electronic devices, notes, or textbooks are allowed to be used during the examinations.

The homework (on my Web site) for a section is due at the beginning of the recitation on the first Monday after the section has been fully covered in class. All work must be shown to receive any credit. A solution that includes only the answer will receive 0 points. On the other hand, the answer always needs to be given.

This is a very serious course. Since MATH 283 is the 3rd and most difficult of the sequence MATH 181, MATH 182, and MATH 283, the student who studies MATH 283 needs to know the material of the first two courses as well as Precalculus, College Algebra, and Trigonometry very well. For example, it is impossible to study partial derivatives, gradients, etc. without good knowledge of derivatives, to study limits, continuity, and extreme values of functions of two or more variables without good knowledge of limits, continuity, and extreme values of functions of one variable, to study multiple integration without good knowledge of single integration. These are only a few examples of the relationship of MATH 283 with the previous two Calculus courses. Actually, mastery of integration techniques is most important for understanding the course. Students are encouraged to review them extensively from the beginning of the semester and seek Mr. Tan’s and my assistance if needed. The multidimensionality also makes MATH 283 much more difficult than MATH 181 and MATH 182.

Accordingly, students should plan to allow sufficient time. Regular attendance, prompt arrival, and taking elaborate notes are strongly recommended; students who do not maintain these good habits do not usually succeed in this difficult course. Knowledge of phone number of and keeping in touch with a classmate could be very helpful. Participation in a study group, e.g. “Dr. Muleshkov’s Students”, is even better.

In this class, the textbook is only a tool. Very often, methods that are stronger and/or easier than the ones given in the textbook are going to be presented in class. Handouts with the minimal number of formulas to be memorized are essential part of this course. Some of them are the result of several tens of years of effort and experience with students’ difficulties. Timely learning of the handouts could facilitate students' studies a lot.

Please keep this syllabus for future reference. If you have any questions or concerns about the issues raised here or other issues, please come to my office hours.

P. S. If you have a documented disability that may require assistance, you may need to contact Disability Services (DS) for coordination in your academic accommodations. Disability Services is located within Learning Enhancement Services (LES) in the Reynolds Student Services Complex (SSC), Room 137. The telephone number is 895-0866 / TDD 895-0652.