Calculus 2402A Fall 2019
Calculus with Analysis for Statistics

Description: Functions of multiple variables and their differential calculus. The gradient and the Hessian. Constrained and unconstrained optimization of scalar-valued functions of many variables: Lagrange multipliers. Multidimensional Taylor series. Integrating scalar-valued functions of several variables: Jacobian transformations. Pointwise and uniform convergence. Power series.

Instructor: Khoa Nguyen, MC 282, 519-661-2111 x88799, knguyen@uwo.ca

Office Hours: Thursday 1:00pm-2:00pm

Lectures: MWF 1:30pm-2:30pm in SH 3345.

Website: Course announcements, material and information will be posted on https://owl.uwo.ca

Pre-requisite: Calculus 1301A/B or 1501A/B or Applied Mathematics 1413, in each case with a minimum mark of 55%.
It is your responsibility to ensure that the course prerequisite has been successfully completed or that special permission from the Dean has been obtained. Unless you have either the prerequisites for this course or written special permission from your Dean to enroll in it, you will be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

Anti-requisite: Calculus 2302A/B, Calculus 2502A/B or the former Applied Mathematics 290a.

Required Text: James Stewart (2016), *Multivariable Calculus, 8th Edition,* Brooks-Cole, ISBN 978-1-305-26664-3.
Learning Outcomes
By the end of the course the student will be able to
- Understand limit, continuity and differentiability of a function of several variables.
- Use the chain rule for functions of several variables.
- Compute the gradient and directional derivatives of a function of several variables.
- Compute the Hessian and use it to obtain maxima and minima of a function of several variables.
- Compute the Taylor series of a function of several variables.
- Use Lagrange multiplier to maximizing or minimizing a function of several variables subject to constraints on the variables.
- Evaluate double integrals, triple integrals in Cartesian coordinates.
- Evaluate double integrals, triple integral in different coordinate systems.
- Change variables in multiple integrals by using the Jacobian.
- Distinguish the difference between pointwise convergence and uniform convergence and understand why uniform convergence is important in series computation.

Attendance: Attendance is not mandatory but highly recommended. All material in the lecture up to the end of the course can be considered testable. In addition, extra material covered in lectures can be asked in quizzes, tests and exams.

Evaluation: Students will be evaluated on the basis of four quizzes, and a final examination. The final grade will be based on a weight of 40% for the quizzes and 60% for the final exam.

Quizzes: There will four equally weighted quizzes (in class). Quiz 1: September 20, Quiz 2: October 4, Quiz 3: October 25, Quiz 4: November 15. Quizzes will take place during the lecture hours. There will be no make-up quizzes. See below for the policy on missed evaluations.

Calculators: Only non-programmable calculator may be used for all evaluations. No other electronic devices such as PDAs, cell phones, etc., will be allowed.

Course Content with Approximate Timing:
Multivariable Calculus: Total 10 weeks
• Differential Calculus: 3 weeks
• Optimization: 2 weeks
• Multidimensional Taylor series: 1 week
• Multiple Integrals: 4 weeks
Real Analysis: Total 2 weeks
• Convergence of infinite series: 1 week
• Convergence of functions: 0.5 week
• Point-wise and uniform convergence of power series: 0.5 week.
Medical Issues: If a student is unable to meet a course requirement due to illness or other serious circumstances, the student must provide valid medical or other supporting documentation to the Dean's office as soon as possible and contact his or her instructor immediately. It is the student's responsibility to make alternative arrangements with his or her instructor once the accommodation has been approved and the instructor has been informed. In the event of a missed final exam, a "Recommendation of Special Examination" form must be obtained from the Dean's Office immediately.
A student requiring academic accommodation due to illness, should use the Student Medical Certificate when visiting an off-campus medical facility. Or, request a Record's Release Form (located in the Dean's Office) for visits to Student Health Services.
Missed Evaluations: If you have a conflict, please contact me with appropriate written documentation, if at all possible prior to the evaluation. **There will be no make-up quizzes**, but if adequate documentation is received, the course quiz grade of the missing quiz will be pro-rated based on the overall performance.

Plagiarism and Scholastic Offences: Students must write their own essays and assignments in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major academic offence (see Scholastic Offence Policy in the Western Academic Calendar).
Scholastic offences are taken seriously, and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following website:
https://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf

Accessibility Statement: Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 for any specific question regarding an accommodation.
The policy on Accommodation for Students with Disabilities can be found here:
https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic%20Accommodation_disabilities.pdf

The website for **Registrarial Services** is http://www.registrar.uwo.ca

Mental Health Statement: Student who are in emotional/mental distress should refer to Mental Health@ Western http://www.uwo.ca/uwocom/mentalhealth/ for a complete list of options about how to obtain help.