

Math 2890 – Honors Topics in Calculus III

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Course Description: A supplemental Honors experience in mathematics to partner concurrently with MATH 2163 (Calculus III). This course adds a different intellectual dimension to the designated course(s). Prerequisite(s): Honors College participation and concurrent enrollment in a designated MATH course.

The “different intellectual dimension” that we will be pursuing involves a hands-on approach to the core concepts of multivariable calculus, including multivariable function, partial derivative, gradient, directional derivative, and double integral. These concepts are typically explored via two methods: algebraic manipulation of formulas and two-dimensional renderings of three-dimensional graphs. In this course, we'll take a conceptual, geometric approach to explore these concepts using three-dimensional models of the graphs of a multivariable function. Using these three-dimensional surfaces will enable us to focus on the geometric meaning of these concepts. Along the way, we'll answer such questions as:

- Given a surface and some rudimentary tools, how do you ...
 - ... construct, read, and interpret a contour plot (and what information does such a plot give you)?
 - ... measure the slope at a point in a particular direction?
 - ... measure the direction and magnitude of steepest ascent or descent from a particular point?
 - ... identify and classify the surface's critical points?
 - ... measure and compute the volume between the surface and the xy plane?

Required Textbook Package and Supplies: there are no required textbooks and materials for this course. Some assignments might require technological aspects (i.e. graphing a multivariable function with *Mathematica* or typing an assignment in LaTeX), so students with their own computers might wish to acquire the relevant software from the university's software distribution website. Acquiring personal copies of software is not necessary because all programs are available in computer labs across campus.

Evaluation: This course is graded in a pass / no pass format. Earning a passing grade is simple: (1) attend each class and actively participate each time, and (2) complete the associated assignment for each class period. Each student will be automatically granted 1 excused absence and 1 excused assignment to account for legitimate conflicts that arise. Missing more than this allotment will likely compromise a students' ability to pass this course. Please contact me if you have any questions about this.

Additional University Information:

MLSC (Math Learning Success Center): The MLSC is located on the 5th floor of the library here on the OSU-Stillwater campus. Tutors are available on a walk-in basis more than 50 hours per week during regular business hours (and even during select hours in the evenings and on weekends!). For more information (such as specific hours of operation), visit <http://math.okstate.edu/mlsc>.

Syllabus Attachment: OSU has compiled useful information that applies to all classes called the "syllabus attachment," which includes add/drop/withdrawal dates, university holidays, accommodations for students with disabilities, academic resources, and much more. You are responsible for reading this information. It is available at the bottom of this webpage (follow the link): <https://academicaffairs.okstate.edu/content/resources-faculty-staff>.

Incomplete Grade: The grade of 'I' is given to students who satisfactorily completed the majority of the course work but have been *unavoidably* prevented from completing the remaining work of the course. A condition that the students must repeat the course in order to remove the "I" is not permitted. The maximum time allowed for a student to remove an "I" is one calendar year.

Academic Integrity: The University has explicit rules governing academic integrity. Please consult the OSU Syllabus Attachment mentioned above. Working with another person or in study groups on problems can be helpful in learning the material. I encourage you to work together if you find it helpful. However, **all work you submit must be your own**. Academic dishonesty (cheating) will be dealt with as harshly as the university allows. Don't do it!

Special Accommodations for Students: If you have a qualified disability and need special accommodations, you should notify me and request verification of eligibility for accommodations from the Office of Student Disability Services.

The instructor reserves the right to make changes to this syllabus in order to accommodate the needs of the class. Any such changes will be announced via email.