

Math 2471 – Calculus III

Semester: Fall 2019 CRN 19161

Meeting times: MWF 11:00 –11:50am, R 10:50-12:05pm

Room: MCS 220

Instructor: Dr. Danny Arrigo

Email: darrigo@uca.edu

Webpage: <http://www.danielarrigo.com/>

Office location: MCS 201

Office telephone No.: 450-5668

Office hours: MTWR2:00-4:00 pm, (unless there are meetings)

Textbook: Calculus – Early Transcendental 2th Ed., Person 2011

Author: Briggs, Cochran and Gillett

Calculator: TI 92, TI-92+, or Voyage 200 (could be helpful but not required)

Cellphones: Please turn **off** all cell phones before class!

Introductory Remarks

This course is the last in a three-semester calculus sequence. In the first two courses, you have learned to analyze and work with quantities that vary. You developed powerful techniques for studying the rate of change of variable quantities and for determining the accumulated growth of quantities *i.e.* differentiation and integration. These two together form the language which describe most of the theories in science and engineering. It would be no overstatement to assert that without calculus, few of the technical advances of the last three centuries would have occurred. In this last course in the sequence, the ideas from Calculus I and II are extended to 3 dimensions.

Course Description:

This course is a continuation of Calculus II and is required of all majors in mathematics, chemistry, and physics. Topics include vector valued functions, partial differentiation, multiple integrals, Green's theorem, and Stokes' theorem.

Lecture format. Prerequisite: C or better in MATH 1497. Fall, spring, summer.

Student Learning Outcomes:

Upon successful completion of this course the student will be able to

Compute partial derivatives

- Higher order partial derivatives
- Chain rule to evaluate partial derivatives
- Directional derivatives
- Optimization

Evaluate multiple integrals

- Iterated double integrals
- Iterated triple integrals
- Change the order of integration
- Set up integral in spherical and cylindrical coordinates

Evaluate Line Integrals

- Compute the gradient, divergence and curl of a vector field
- Formulate and evaluate line integrals
- Green's theorem

Course Outline:

Chapter 6.5 Length of curves

Chapter 11: Sections 5-9. *Vector Functions*. Vector functions and space curves, derivative and integral of vector functions, arc length and curvature, motion in space.

Chapter 12: Sections 1-8. *Functions of Several Variables*. Introduction to functions of several variables, limits and continuity, partial derivatives, tangent plane, differentials, chain rule, direction derivatives and the gradient vector, min/max. values.

Chapter 13: Sections 1-7. *Multiple Integration*. Double integrals, iterated integrals, change of variables: polar coordinates, applications, triple integrals, triple integrals in cylindrical and spherical coordinates, general change of variables in integration.

Chapter 14: Sections 1-8. *Vector Analysis*. Vector Fields, line integrals, fundamental theorem for line integrals, Green's Theorem, Curl and Divergence, Parametric surfaces and their areas, surface integrals, Divergence theorem and Stokes' theorem.

Grades

Your grade for this course will be determined by homework, 3 tests and a cumulative final examination. Homework is worth 10 points, each test is worth 20 points and the final 30 points.

Tentative test dates:

Tests: Sept. 26, Oct. 24, and Nov. 21. **Final:** Mon. Dec. 9, 2019 from 2-4 pm.

| Grade | | Grade Scale | |
|-----------|------------|-------------|----|
| Homework: | 10% | 90% - 100% | A |
| Tests: | 60% | 80% - 89% | B |
| Final: | <u>30%</u> | 70% - 79% | C |
| Total | 100% | 60% - 69% | D |
| | | 0% - 59% | F. |

Final Date to Withdraw - Nov. 8, 2019

Final date to officially withdraw from Aug. 22 – Dec. 13 classes from the university with a W grade unless already dropped for non-attendance. After this date, no withdrawals are permitted and no W grades are recorded.

Attendance

Attendance is highly recommended. If you are absent for approximately 10% without a valid excuse, where appropriate, you will be dropped from the course. It is a good idea to form small groups to work together in doing homework problems. You will learn from each other and your progress will be more rapid. However, joint work (or copying)

during tests and exams is forbidden – the University has an academic dishonesty policy that you can find in the student handbook. Severe penalties apply.

Academic Integrity: The University of Central Arkansas affirms its commitment to academic integrity and expects all members of the university community to accept shared responsibility for maintaining academic integrity. Students in this course are subject to the provisions of the university's Academic Integrity Policy, approved by the Board of Trustees as Board Policy No. 709 on February 10, 2010, and published in the Student Handbook. Penalties for academic misconduct in this course may include a failing grade on an assignment, a failing grade in the course, or any other course-related sanction the instructor determines to be appropriate. Continued enrollment in this course affirms a student's acceptance of this university policy.

Americans with Disabilities Act statement: The University of Central Arkansas adheres to the requirements of the Americans with Disabilities Act. If you need an accommodation under this Act due to a disability, please contact the UCA Office of Disability Services, 450-3613.

An Emergency Procedures Summary (EPS) for the building in which this class is held will be discussed during the first week of this course. EPS documents for most buildings on campus are available at <http://uca.edu/mysafety/bep/>. Every student should be familiar with emergency procedures for any campus building in which he/she spends time for classes or other purposes.

Title IX Disclosure: If a student discloses an act of sexual harassment, discrimination, assault, or other sexual misconduct to a faculty member (as it relates to “student-on-student” or “employee-on-student”), the faculty member cannot maintain complete confidentiality and is required to report the act and may be required to reveal the names of the parties involved. Any allegations made by a student may or may not trigger an investigation. Each situation differs and the obligation to conduct an investigation will depend on those specific set of circumstances. The determination to conduct an investigation will be made by the Title IX Coordinator. For further information, please visit: <https://uca.edu/titleix>.

*Disclosure of sexual misconduct by a third party who is not a student and/or employee is also required if the misconduct occurs when the third party is a participant in a university-sponsored program, event, or activity.

Departmental Policy

Use of cell phones (including texting), MP3 players, web browsers, ear buds/plugs is NOT ALLOWED during class time. Cell phones must be set to silent/vibrant mode while in class. Instructors may also disallow use of any other technology not relevant to the instruction. Use of any type of laptop during class time requires consent of the instructor.

Other Policies

Students should familiarize themselves with all policies listed in the UCA *Student Handbook*, such as the Sexual Harassment Policy and Academic Policies.