Math 2471 – Calculus III

Semester: Summer 2022 CRN 33244
Meeting times: M-F 11:20 –12:50pm
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 (not sure when I'll be there)
Office hours: M-R 2-4pm.
Textbook: Calculus – Early Transcendental 7th Ed., Person 2017
        Author: Larson and Edwards or really any book. Notes will also be
        available throughout the course.
Calculator: TI 92, TI-92+, or Voyage 200 (could be helpful but not required)

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

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

Course Outline: (According to Larson and Edwards book)
Chapter 12: Sections 1-4. *Vector Functions.* Vector functions and space curves, derivative and integral of vector functions, Tangent, Normal and Binormal vector, and motion in space.

Chapter 13: 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 14: 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 15: 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 will be assigned after each topic and will be collected on Tuesday's and Friday's. In total, homework will be worth 10 points. There will be 3 throughout the course and they are worth 20 points each. The final exam is worth 30 points.

Tentative test dates:
Tests: June 29, July 15, and July 26. **Final**: Friday July 29, 2022

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.

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.

University policy on Academic Integrity and Academic Misconduct
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.

Plagiarism
Plagiarism can be defined as the use of someone else's words without proper acknowledgement of that use. If you use someone else's words or the written words of the instructor in the assignment, you must put them in quotations and provide a reference for the source. Paraphrasing the words of others by only changing a few words is also considered plagiarism. For more information about plagiarism, please see UCA's statement on plagiarism at http://uca.edu/academicaffairs/files/2012/08/Plagiarism.pdf. Plagiarism is academic misconduct and will result in appropriate disciplinary action.

The 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 Disability Resource Center, 450-3613. If the instructor of this class needs to be informed of your disability in order to assist with any appropriate accommodations, please contact the instructor during the first week of classes.

Building Emergency Plan statement
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.

The 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 is encouraged to report the act to the Title IX coordinator, deputy coordinator, or employee with the authority to institute corrective measures on behalf of the University. An investigation of a formal complaint of Title IX Sexual Harassment will only be initiated when the Complainant (individual who suffers actual harm from the violation of the Title IX Sexual Harassment Policy) or the Title IX Coordinator signs a complaint. 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 encouraged 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.