

COURSE SYLLABUS
MH 408-61 Calculus of Higher Dimension (online)

Instructor: Dr. James Cook
Semester: Fall 2020
Office: BG 130
Contact: (205) 652-3826 jcook@uwa.edu
Office Hours: Monday-Friday 10:00-12:00.

Final Exam Date and Time: 12-6-2020, 9:00pm-12:00am CDT

Course Description: Vector calculus, parametric equations, polar and spherical coordinates, analytic geometry, differential calculus of functions of several variables, and multiple integration (including line integrals, Green's Theorem, and Stoke's Theorem). Introduction to differential forms and the Generalized Stokes' Theorem. Problem solving techniques in engineering and science.

Prerequisite: "C" or Higher in MH 122 or appropriate standardized test score.

Credit Hours: 4 credit hours.

Course Objectives: Enable students to understand the following topics:

1. Analyze geometry via vector techniques
2. Use non-Cartesian coordinates
3. Optimization of multivariate functions
4. Interpretation and calculation of multiple integrals
5. The characterization of conservative vector fields
6. Properties of line or surface integrals of vector fields
7. Greene's, Stokes' and Gauss' Theorems
8. Differential Forms for Euclidean Space.

Course Materials: The following is recommended:

1. Printer for printing assignments delivered in pdf form,
2. Some method to create multiple page pdf scans of your work,
3. Lecture Notes by your instructor posted in Course Content,
4. Have on hand a good Calculus reference text (e.g. Stewart, Thomas, Anton, Salas Hille and Etgen, Rogawaski, or Thomas, there are dozens of reasonable choices, you mostly want this to look up integrals or differentiation techniques which are prerequisite to this course)

Course Outcomes: The learner will be able to

- Use vector algebra, parametric spaces and level-sets to model curves and surfaces.
- Use non-Cartesian coordinates to simplify problems with manifest symmetry.
- Take partial derivatives of functions of several variables.
- Calculate multiple integrals.
- Calculate line or surface integrals of vector fields.
- Apply Greene's, Stokes and the Divergence Theorem to solve appropriate physical or mathematical problems.
- Perform basic calculations involving differential forms

Evaluation and Grading Policy:

❖ **Assignments:**

- Tests 1,2,3,4 = 4(120pts)=480pts,
- Final = 240pts,
- Missions = 130pts,
- Math Battles 50pts,
- Weekly Zoom Review Participation 100pts.

- ❖ **There are 9 Missions, each problem in these Missions is worth 1pt, there were be at least 130 problems assigned.**
- ❖ **Math Battles** are as indicated, there is one before each test

Further details about the scheduling of the above items is provided in the Course Planner which is posted in Blackboard under Course Content. Letter grades follow: let x denote the total points earned in the course:

- A** if $x \geq 900$,
- B** if $800 \leq x \leq 899$,
- C** if $700 \leq x \leq 799$,
- D** if $600 \leq x \leq 699$,
- F** if $x < 600$.

Rescheduling of Examinations:

Students may request to reschedule one or two of their final examinations if they have three or four exams on the same day. The student must submit a formal written request to reschedule an exam at least two weeks before the first day of final exams. The request must be made to the dean of the college in which the course(s) is taught.

Student Conferences:

Any student making a failing grade during the semester is urged to make a conference with the instructor.

Disability: The University of West Alabama strives to make its programs accessible to qualified persons defined as disabled under Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act. Students who have special needs that require accommodation are responsible for notifying instructors in each course in which they are enrolled and appropriate staff members, who in turn will refer the student to the ADA Compliance Coordinator. Following verification of the student's status, the ADA Compliance Coordinator will work with the instructor or staff member in implementing an appropriate plan for accommodation of the student's needs. Support documentation of special needs from a physician or other qualified professional will be required if deemed necessary. For additional information, students should contact the Student Success Center, Foust Hall Room 7, (205) 652-3651, or the Office of Student Life, Webb Hall, Room 311, (205) 652-3581.

Honesty/Integrity: The UWA Academic Dishonesty policy stated in the *General Catalogue* and the student handbook will be followed in this course.

Content/Schedule Change: The instructional schedule reflects expected class progress in course subject matter and is considered tentative. The schedule is subject to change in content and scope at the instructor's discretion. The instructor will make corrections as needed and will announce changes in the class.