NAU NORTHERN ARIZONA UNIVERSITY

**Course Title: MAT 137 Calculus II**

**Term: Winter 2023**

**Instructor: TBA**

**Course Credit: 4**

**Mode of Instruction: Online**

## Course Description:

This course will introduce the concepts, techniques, and applications of integration, differential equations, Taylor polynomials, infinite series. Focusing on the fundamental concepts, essential functions and formulas of calculus, we also cover the topics of functions, limits and derivatives, sequences, power series, vector calculus and geometry. By the end of the course, students will be able to use single variable calculus methods for solving physical and geometric problems.

## Course Prerequisites:

MAT 136 Calculus I

## Learning Outcomes:

By the end of the course, the student should be able to:

A. Gain a further understanding of fundamental concepts, essential functions and formulas of calculus;

B. Illustrate the utility of learning multivariable calculus to solve problems in engineering and the sciences;

C. Enhance the ability in analyzing sequences and their convergence, and determine power series and their intervals of convergence;

D. Compute limits and derivatives of vector valued functions;

E. Solve problems using integration on different applications.

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**Course Material:**

Briggs, Cochran and Gillett: ***Calculus for Scientists and Engineers: Early Transcendentals***, 1st Edition.

**Evaluation:**

- Assignments [20%]
- Quizzes [20%]
- Mid-term Exam [25%]
- Final Exam [35%]

**Description of the Evaluation tasks:**

Assignment/ Essay/ ... : During the term, students will be required to finish several evaluation tasks within due date. All the tasks are linked with specific course topics/outcomes and will adequately assess students' competence and learning outcomes. Students are encouraged to meet with instructor about these tasks at any point.

Mid-term/ Final Exams/ Quiz/... : There may be periodic quizzes given at the beginning of lecture sessions; the feedback from these quizzes will monitor the progress of the learners and help to set learning priorities. There will be mid-term exam/ final exam for the course. They are the basic criteria for the evaluation of students' learning outcomes and final grade.

**Grading Policy:**

Students are supposed to finish each online lecture. Prior to each class, students should finish the required readings. During the class time, students are encouraged to make use of all relevant online course resources and communicate with the instructor. Students' grades are accumulated based on the cumulative evaluations.

Students' letter grade will be assigned according to the following scale:

| | | |
|---|---|---|
| A+ 90-100 | A 85-89 | A- 80-84 |
| B+ 77-79 | B 73-76 | B- 70-72 |
| C+ 67-69 | C 63-66 | C- 60-62 |
| D+ 57-59 | D 53-56 | D- 50-52 |
| F < 50 | | |

**Academic Integrity:**

Students must strictly adhere to the university's academic integrity rule; and all essays, exams and any other form of academic assignments must adhere to these rules. Any form of plagiarism, cheating, or misappropriation of materials will be considered a violation of academic integrity and will be punishable by the university.

**Withdrawal from the Course(s):**

Students will be able to apply for a transfer or withdrawal within 3 days of the starting date of the course. If a withdrawal is applied for within 3 working days, the tuition fee will be fully refunded. After 3 days, the tuition fee will not be refunded. If a withdrawal is applied for in the first two weeks, it will be recorded as W (Withdraw) on the course transcript. After this initial two-week period, the class will be recorded as F (Fail).

**Tentative Schedule:**

**Week 1**

| | |
|---|---|
| 1 | Functions |
| 2 | Limits |
| 3 | Derivatives |
| 4 | Applications of the Derivative |
| 5 | Integration<br>**Assignment 1** |

| | |
|---|---|
| **Week 2** | |
| 6 | Applications of Integration |
| 7 | Integration Techniques |
| 8 | Differential Equations |
| 9 | Sequences and Infinite Series |
| 10 | Sequences and Infinite Series (Cont.)<br>**Quiz 1** |
| **Week 3** | |
| 11 | Power Series |
| 12 | **Mid-term Exam** |
| 13 | Power Series (Cont.) |
| 14 | Parametric and Polar Curves |
| 15 | Vectors and Vector-Valued Functions<br>**Assignment 2** |
| **Week 4** | |
| 16 | Three-Dimensional Coordinate System |
| 17 | Equations of Lines and Plan |
| 18 | Vector Calculus |
| 19 | Vector Fields |
| 20 | Functions of Several Variables<br>**Quiz 2** |
| **Week 5** | |
| 21 | Functions of Several Variables (Cont.) |
| 22 | Multiple Integration |
| 23 | Algebra, Geometry and Trigonometry Formulas |
| 24 | Final Exam Review |
| 25 | **Final Exam** |