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MTH 193
Studies in Vectors

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Dean's Review:

Dean's Signature: _____Date Reviewed: ___/___/_____

MTH 193
Studies in Vectors
COURSE OUTLINE

Prerequisites:
Corequisite of MTH 163, or equivalent.

Course Description:
Introduces vectors in two and three space as well as solving systems of equations using matrices.
Vectors will be studied in a geometric sense as well as an algebraic sense. This course is designed
to prepare students to use vectors and matrices in physics as well as engineering classes.

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Course Outcomes

At the completion of this course, the student should be able to:
1. Graph vectors and perform basic vector operations using trigonometry.
2. Perform basic vector operations algebraically.
3. Calculate both the dot product and the cross product and interpret their meaning.
4. Calculate the angle between given vectors.
5. Find scalar projections.
6. Apply the use of vectors in real-world situations.
7. Perform basic matrix arithmetic.
8. Solve systems of equations using matrices, including infinitely many solutions.
9. Identify when systems of equations are inconsistent.
10. Evaluate determinants and apply them.

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Required Materials:

None

Textbook:

None

The following supplementary materials are available:

None

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Topical Description:

1. **Vector arithmetic**
2. **Translations**
3. **Magnitude**
4. **Dot product**
5. **Cross product**
6. **Scalar projections**
7. **Matrix arithmetic**
8. **Determinants**
9. **Matrix inverses**
10. **Solutions of systems of equations**
11. **Special attention will be paid to engineering applications, including trigonometry.**

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Notes to Instructors
(List information about optional topics, departmental exams, etc)

1. Grades can be made up of homework, tests, projects, and a final exam.
2. Final exam must be worth at least 25% of the final grade.