

COURSE LEARNING OUTCOMES

DEPARTMENT: Mathematics

<p>COURSE #: 39200 COURSE TITLE: Linear Algebra and Vector Analysis for Engineers CATEGORY: TERM OFFERED: Fall, Spring PRE-REQUISITES: Math 20300</p> <p>HOURS/CREDITS: 3 hrs./ week; 3 credits. DATE EFFECTIVE: 8/28/12 COURSE COORDINATOR: Sergiy Merenkov</p>	<p>CATALOG DESCRIPTION <i>Matrix theory, linear equations, Gauss elimination, determinants, eigenvalues problems and first order systems of ordinary differential equations, vector field theory, theorems of Green, Stokes, and Gauss.</i></p> <p>Required Texts <i>Essential Calculus (Stewart) ISBN 0495014427</i> <i>Linear Algebra for Calculus ISBN 0534252486</i> <i>Both published by Thomson Brooks-Cole</i></p>
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COURSE LEARNING OUTCOMES

Please describe below all learning outcomes of the course, and indicate the letter(s) of the corresponding Departmental Learning Outcome(s) (see list at bottom) in the column at right.

After taking this course, the student should be able to:	Contributes to Departmental Learning Outcome(s):
1. solve linear systems and find matrix inverses, determinants, eigenvalues and eigenvectors;	a, b
2. relate characteristics of solutions of a linear system to determinant and rank of its associated matrices;	a, e2
3. use eigenvector methods to solve a system of first-order ordinary differential equations	a, b, c
4. construct precise descriptions of curves, surfaces, and solids using parametrizations or equations/inequalities;	a, b
5. compute work, flux, and mass integrals on curves, surfaces, and solids, respectively;	a, b
6. find lengths, areas, and volumes of curves, surfaces, and solids, respectively;	a, b, c
7. choose co-ordinate systems (polar, spherical, cylindrical, rectangular) appropriate to a given problem;	a, b, c
8. state and apply the theorems of Green, Stokes, and Gauss;	a, b, e1, e2
9. find and use potential functions, when appropriate, to find work integrals along curves; and	a, b, c
10. solve other problems appropriate for a course in linear algebra and vector analysis;	a, b, c, e1, e2

COURSE ASSESSMENT TOOLS

Please describe below all assessment tools that are used in the course.

You may also indicate the percentage that each assessment contributes to the final grade.

1. Final exam: 40%
2. In-class exams, quizzes, homework, attendance: 60%

DEPARTMENTAL LEARNING OUTCOMES (to be filled out by departmental mentor)

The mathematics department, in its varied courses, aims to teach students to

- a. perform numeric and symbolic computations
- b. construct and apply symbolic and graphical representations of functions
- c. model real-life problems mathematically
- d. use technology appropriately to analyze mathematical problems
- e. state (e1) and apply (e2) mathematical definitions and theorems
- f. prove fundamental theorems
- g. construct and present (generally in writing, but, occasionally, orally) a rigorous mathematical argument.