Course Name: Linear Algebra I
Course Number: MTH 341
Course Credits: 3 credits (3 hours per week, lecture)
Course Catalog Description: Matrix algebra, determinants, systems of linear equations, subspaces, an introductory study of eigenvalues and eigenvectors.
PREREQUISITES: MTH 254 [C-] or MTH 254H [C-]

Class Time: MWF 13:00-13:50 (Spring 2016)
Class Location: StAg 160
Course Instructor: Mary Flahive
Contact Information: flahive@math.oregonstate.edu
Office: Kidder 060
Office Hours: M2, W11, F2 . Other hours are possible by appointment.

Student Learning Outcomes: The successful student in MTH 341 will be able to:
(a) Use Gaussian elimination to determine the solution set of a system of linear equations, and describe the solution set.
(b) Perform matrix operations, including finding the inverse or showing no inverse exists for a square matrix.
(c) Calculate determinants of square matrices and apply properties of determinants to draw conclusions about solution sets of linear equations and invertibility of matrices.
(d) Find and use the matrix representation of a linear transformation associated to the standard basis in Euclidean space \( \mathbb{R}^n \).
(e) Use the definition to determine whether a subset of \( \mathbb{R}^n \) is a subspace.
(f) Determine if a collection of vectors is linearly independent or dependent, and find the span of a set of vectors.
(g) Use the rank-nullity theorem to draw conclusions about solution sets to linear systems and the invertibility status of square matrices.
(h) Determine a basis for and the dimension of a given subspace, including the null space and column space of a matrix and the eigenspaces of square matrices.

Learning Resources: Required Textbook: Elementary Linear Algebra by Kenneth Kuttler, Chapters 4, 5, 6, 8, 9, 10, 12. Your classnotes are also an important resource since you are responsible for all material presented in class, regardless of whether the material is discussed in the textbook.

Course Content: (with approximate amount of time)
(a) Solving systems of linear equations by Gaussian Elimination. (1 week)
(b) Matrix operations, invertibility. (1.5 weeks)
(c) Determinants. (0.5 week)
(d) Definition of linear transformation and its connection with matrices. (1 week)
(e) Subspaces of \( \mathbb{R}^n \), linear independence, span, basis, and dimension. (1.5 weeks)
(f) Row space, column space, null space, rank-nullity theorem. (1.5 weeks)
(g) Eigenvalues and eigenvectors. (2 weeks)

Evaluation of student performance: Your course grade will be based on your performance on weekly problem sets, occasional short quizzes, one midterm (on Wednesday, May 4) and a comprehensive final (date and time as determined by the registrar.)

Grading: Your course grade will be determined by the following weights
Midterm 25 %
Short quizzes and problem sets 40 %
Final 35 %
**Statement Regarding Students with Disabilities:** Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval please contact DAS immediately at 541-737-4098 or at [DAS](#). DAS notifies students and faculty members of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details of the implementation of individual accommodations.

**Link to Statement of Expectations for Student Conduct:** [Expected Conduct](#)