**COURSE OUTLINE**

**for**

**Applied Linear Algebra**

**Course Code:** **No. of Credits:** **2**

**Instructor:** ***Dr. Ta Quoc Bao***

1. **COURSE OVERVIEW:**
2. **Course Objective**: The course provides the student with basic knowledge in linear algebra with applications, in particular the skill of solving linear systems of equations using Gauss elimination method.
3. **Prerequisite**:None
4. **Major Contents:** Systems of linear equations, Matrices in echelon form, Gaussian elimination method, Algebra of matrices, Determinants and their properties, Vector Spaces, Linear independence, Basis, Rank of a matrix, Linear transformation, Inner product spaces, Eigenvalues and Eigenvectors.
5. **Assessment**:

Assignment and Class Attendance: 20%

Midterm Test: 30%

Final Exam: 50%

1. Textbook

1. E. Kreyszig, Advanced Engineering Mathematics, 10th edition, John Wiley & Sons, 2011.
2. B. Kolman and David R. Hill, Elementary linear algebra with applications (9th edition)

**B. A DETAILED OUTLINE:**

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| **Name of Chapter** | **Descriptions** |
| Chapter 1. Introduction to linear equations and matrices | * 1. Introduction to linear systems and matrices   2. Gauss elimination   3. The algebra of matrices   4. Invese mattices   5. Transpose and symmetric matrices |
| Chapter 2. Determinants | * 1. The Determinant of a Matrix   2. Evaluation of a Determinant using Elementary Operations   3. Properties of Determinants   4. Cramer’s Rule |
| Chapter 3. Vector spaces | 3.1 Euclidean n-spaces  3.2 General vector spaces  3.3 Subspaces, span, null spaces  3.4 Linear independence  3.5 Basis and Dimension  3.6 Rank of a matrix |
| Chapter 4. Linear Transformation, Inner product spaces, Eigenvalues and eigenvectors | 4.1 Linear transformation  4.2 Inner product spaces  4.3 Eigenvalues and eigenvectors  4.4 Diagonalization |

**------ THE END ------**