

University of Salahaddin-Hawler
College of Science
Department of Computer Science & Information Technology



Course Book

Linear Algebra

Undergraduate Degree in Computer Science
2nd Year Class
Academic year 2015-2016

Assistant Instructor

Sheelan K. Sharaza

M.Sc.degree in Applied Mathematics

Email: shelan2001@yahoo.com

Class hours: Sunday 8:30 am – 10:30 am Group-B-
Class hours: Sunday 10:30 am – 12:30 pm Group-A-
Office hours: Monday 11:30 am- 12:30 pm

Format

2 hrs/week of lecture,

Unit Value: 2 units

Course Length: 10 weeks =1 course

Course Description

Linear Algebra is a branch of mathematics that has numerous applications to engineering, Computer Science, and the physical Sciences. Linear algebra makes it possible to work with large arrays of data. It has many applications in many diverse fields, such as Computer Graphics and Cryptography.

Course Goals

The main purpose of the course is to introduce the concept and the basic ideas and techniques of linear algebra that will help the student to use the previous skills that they have gained in many upcoming courses like coding theory, compiler and automata theory.

Student Evaluation

Exam 1: 20 % marks.

Final exam: 30 % marks.

The examination schedule will be announced by the department.

Recommended references

1. Linear Algebra and its Applications (3rd Edition) by David C. Lay.
2. Contemporary Linear Algebra by Howard Anton and Robert C. Busby.
3. Introductory Linear Algebra (8th Edition) by Howard Anton and Chris Rorres.
4. Introduction to Linear Algebra (3rd Edition) by L. W. Johnson, R.D. Riess and J.T. Arnold.
5. Linear Algebra (3rd Edition) by S. H. Friedberg, A.J. Insel and L.E. Spence.
6. Introductory Linear Algebra with Applications (6th Edition) by B. Kolman.

Weekly Topics

Week 1&2 : Linear Systems: Cramer's Rule, Gaussian Elimination and Gaussian Jordan Elimination.

Week 3&4 : Basic characteristics of algebra structures: Binary operations, Group subgroups, Cyclic subgroups and semi groups, definition and examples.

Week 5 : Rings and fields, definition and examples.

Week 6 : Vector Spaces: Vector Spaces, Linear independence, definition and examples.

Week 7 : Bases and dimension, definition, examples and theorem.

Week 8 : Linear Transformations and Matrices: Definition and examples.

Week 9 : The kernel and Range of a linear Transformation.

Week 10 : Eigen values and Eigenvectors, definition and examples.

Final exam will be determined by the exam board of the college.

Notice that This syllabus may be subject to changes; we may take either longer or shorter time to finish them.