Course Description Form

1. Course Name:
Linear Algebra
2. **OPT5**
3. Semester / Year:
Semester/ First
4. Description Preparation Date:
2024
5. Available Attendance Forms:
Weekly- compulsory
6. Number of Credit Hours (Total) / Number of Units (Total) 3
7. Course administrator's name (mention all, if more than one name)
Name: Amaal Mohi Nassief Email: amalmuhi@uodiyala.edu.iq
8. Course Objectives
Course Objectives **This is an introductory course on linear algebra, one of the most important and basic areas of mathematics, with many real−life applications. The course introduces students to both the theory of vector spaces and linear transformations and the techniques such as row−reduction of matrices and diagonalisation, which can be applied to problems in areas such as engineering, economics, and mathematical biology. As well as mastering techniques, it is important that the students get to grips with the more abstract ideas of linear algebra, and learn to understand and write correct mathematical arguments. Taking an active approach to problem−solving is also important. The class will consist of a mixture of lectures, working on problems and class discussions. Each class will correspond to two or three sections of the recommended text, which students will be expected to read. There will be weekly assignments, which are a very important part of the learning process: actively engaging with the mathematics is crucial**
9. Teaching and Learning Strategies
. This course is an introduction to the theory of finite dimensional abstract vect spaces and linear transformations. Topics include: systems of linear equatio matrices, matrix algebra, determinants and inverses, linear combinations a

linear independence, abstract vector spaces, change of basis and coordinat inner product spaces, orthonormal bases. We also consider line transformations, isomorphisms, matrix representation of linear ma eigenvalues and eigenvectors, diagonalization and similarity. The applicatio include computer graphics, Markov chains, chemistry, linear regression, netwo flow, electrical circuits, and differential

B. The skill goals of the program

1. Thinking skill.
2. Conclusion and evaluation skill.
3. Analysis skill.

4.Observation skill

Teaching and Learning Methods

1. Giving lectures and using textbooks.
2. Solving problems related to the scientific subject.
3. Writing scientific reports and analyzing data.
4. Using e-learning in teaching according to the available capabilities.

Self-learning method.

Assessment methods

1. Conducting daily and monthly oral and written exams.
2. Writing scientific reports.

A. Affective and value goals

1. The student should make every effort to understand the principles of mathematics.
2. Support and express the views and discuss seriously.
3. The student should have self-confidence.

The student should participate in the mathematics activities.

D. General and Transferable Skills (other skills relevant to employability and personal development).

1. Conducting laboratory experiments related to the lesson tool to develop students' skills.

Conducting short tests to measure the level of understanding of the student.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Systems of Linear Equations and Matrices	Systems of linear equations	whiteboard	Quizzes, homework and final exams
2	3	Matrices a elementary r operations	Matrix Algebra	=	=
3	3	The inverse o square matrix		=	=
4	3	Determinants		=	=
5	3	Linear Combinations and Line Independence	Vectors in Euclidean space	=	=
6	3	Linear Combinations	Linear Independence	=	=
7	3	Abstract Vec Spaces	Definition of a vector space	=	=
8	3	Subspaces	Basis and dimension Coordinates and change of basis	=	=
9	3	Linear Transformatio	The null space and range of a linear transformation	=	=
10	3	Isomorphisms		=	=
11	3	Eigenvalues a eigenvectors	Diagonalization	=	=
12	3	Eigenvalues a eigenvectors	Diagonalize of Symmetric Matrices	=	=
13	3	The dot product Euclidean spac		=	=
14	3	Inner product spaces		=	=
15	3	Orthonormal bas and the Gram-Schmidt ts	process Orthogonal Complemen	=	=
11. Course Evaluation					

Homework Weekly homework, given out at one class and handed in at the class a week later 30% At each class Mid-term 1 Test on material from Chapters 1 – 3 (75 minutes) 15% Mid-term 2 Test on material from Chapters 4 – 5 (75 minutes) 15% Final exam Exam on all material (from Chapters 1 – 7) (2 hours) 40%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	An Introduction in linear Algebra
Main references (sources)	Calculus: Elementary Linear Algel by Ron Larson, 8th edition, Cenga Learning, 2017
Recommended books and references (scientific journals, reports…)	An Finite Mathematics Books.
Electronic References, Websites	https://elearn.memphis.edu/d2 common/dialogs/quickLink/qu kLink.d2l?ou=8539700&type=lt rcode=TBR-45437029&srcou=7405592