



Philadelphia University
Faculty of Science
Department of Basic Sciences and Mathematics
first semester, 2008/2009

Course Syllabus

Course Title: Linear Algebra 1	Course code:250241
Course Level: 1	Course prerequisite (s) and/or corequisite (s): None
Lecture Time: Sun .Tue and Thu 08:10-09:00	Credit hours:3 credit hours

Academic Staff

Specifics

Name	Rank	Office Number and Location	Office Hours	E-mail Address
Dr.Rahma aldaqa	Assist.Prof.	2-818	Sun09:00-10:00 11:00-12:00 Tue 09:00-10:00 11:00-12:00 Thu 09:00-10:00 11:00-12:00	Ral daqa@philadelphia.edu.jo

Course module description:

It includes the study of linear equations, matrix operations, vector space and subspace, eigenvalues and eigenvectors, rotation of coordinate axes-,diagonalization,general linear transformations, and inverse transformations.

Course module objectives:

- To enable the students to carry matrix operations.
- To understand eigenvectors and eigenvalues and systems of linear equations.
- To enable students to solve linear equations using matrices.
- To carry on Transformations and inverse transformations.

Course/ module components

- **Books (title , author (s), publisher, year of publication)**

Text Book

Title: Elementary Linear Algebra 9th Edition.

Author Howard Anton

Publisher: Wiley 2003

- **Support material (s) (vcs, acs, etc) .**
- **Study guide (s) (if applicable)**
- **Homework and laboratory guide (s) if (applicable) .**

Teaching methods:

Lectures, discussion groups, tutorials, problem solving, debates, etc.

Learning outcomes:

- Knowledge and understanding
Understanding of the concepts of vectors and linear algebra .
- Cognitive skills (thinking and analysis).
Applying the principles of systems of linear equations and matrices in some real world problems
- Communication skills (personal and academic).
Scientific thinking and applications develops communication skills
- Practical and subject specific skills (Transferable Skills).
Applying the concepts of linear algebra in simple experiments

Assessment instruments

- Short reports and/ or presentations, and/ or Short research projects.
- Quizzes.
- Home works.
- Final examination: 50 marks

<u>Allocation of Marks</u>	
Assessment Instruments	Mark
First examination	20%
Second examination	20%
Final examination: 50 marks	50%
Reports, research projects, Quizzes, Home works, Projects	10%
Total	100

Documentation and academic honesty

- Documentation style (with illustrative examples)
- Protection by copyright
- Avoiding plagiarism.

Course/module academic calendar

week	Basic and support material to be covered	Homework/reports and Their due dates
(1)	<u>CH01: System Of Linear Equations And Matrices</u> <ul style="list-style-type: none"> • Introduction to systems of linear equations • Matrices and matrix operations • Elementary matrices and a method for finding A^{-1} 	Homework sheet 1
(2)	<ul style="list-style-type: none"> • Diagonal, Triangular, and Symmetric Matrices • Gaussian elimination • Further results on systems of equations and invertibility 	Homework sheet1 due to
(3)	<u>Ch02: Determinants</u> <ul style="list-style-type: none"> • The Determinant Function • Evaluating Determinants by Row Reduction 	Homework sheet2
(4)	<ul style="list-style-type: none"> • Properties of the Determinant Function • Cofactor Expansion: Cramer's Rule 	Homework sheet2 due to
(5)	<u>CH05: General Vector Spaces</u> <ul style="list-style-type: none"> • Real vector spaces • Sub spaces 	Homework sheet3 due to
(6) First examination	<ul style="list-style-type: none"> • Linear independence • Basis and dimension 	Homework sheet4 due to
(7)	<ul style="list-style-type: none"> • Row Space, Column Space, and Null Space • Rank and Nullity 	Homework sheet5 due to
(8)	<u>Ch06: Inner Product Space</u> <ul style="list-style-type: none"> • Inner Products • Angle and Orthogonality in Inner Product Spaces 	Homework sheet6 due to
(9)	<ul style="list-style-type: none"> • Orthonormal Bases; Gram Schmidt process 	Homework sheet7
(10)	<ul style="list-style-type: none"> • Change of basis • Rotation of coordinate axes 	Homework sheet7 due to
(11) Second examination	<u>Ch07: Eigenvalues and Eigenvectors</u> <ul style="list-style-type: none"> • Eigenvalues and eigenvectors 	Homework sheet8
(12)	<ul style="list-style-type: none"> • Diagonalization • Powers of a matrix 	Homework sheet8 due to
(13)	<u>Ch08: Linear Transformations</u> <ul style="list-style-type: none"> • General Linear Transformations 	Homework sheet9
(14)	<ul style="list-style-type: none"> • Kernel and Range • Inverse Linear Transformations 	Homework sheet9 Due to
(15) Specimen examination (Optional)	<ul style="list-style-type: none"> • Matrices of Linear Transformations 	Homework sheet10 due to
(16) Final Examination	Review and Exercises	

Expected workload:

On average students need to spend 2 hours of study and preparation for each 50-minute lecture/tutorial.

Attendance policy:

Absence from lectures and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant college/faculty shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.

Module references:

- Linear Algebra and its applications by Howard Anton _Addison Wesley 2002.
- Linear Algebra by L.W.Jhonson&R.D.Riess&J.t.arnold- Addison Wesley 2007.
- Linear Algebra by Eric Carlen_ Freeman 2007
- Linear Algebra and its applications by Gilbert Strang _Belmont,CA 2006
- Linear Algebra and its applications by David C.Lay_ pearson/addisson wesly2006.

Journals:

- www.math.technion.ac.il
- [http://archives.math.utk.edu/topics/linear algebra.](http://archives.math.utk.edu/topics/linear%20algebra)
- www.elsevier.com/wps/find/journaldescription.cws-home
- www.ilasic.math.uregina.ca/iic/journal

Websites:

- www.numbertheory.org/book
- <http://ocw.mit.edu/ocwweb/mathematics>.....(video lectures).
- [http://en.wikipedia.org/wiki/Linear-algebra](http://en.wikipedia.org/wiki/Linear_algebra).....(several links and text books)