جامعة : المنصورة

كـليـة : العلـــــوم

قســـم : الرياضيات

١- بيانات المقرر		
كود المادة : Math 215	**اسم المقرر : Linear Algebra 1**	**المستوى: الثانى**
التخصص : رياضيات	**عدد الوحدات الدراسية: ٣ ساعة معتمدة نظرى ٢: تمارين: ٢ عملى: ٠**	

٢- هدف المقرر :	**For students undertaking this course, the aims are to:** 1- Provide students with basic concepts of linear algebra; namely, Algebra of matrices, vector spaces, linear transformations and operators and their properties.
٣- المستهدف من تدريس المقرر	
أ- المعلومات و المفاهيم :	**a- Knowledge and Understanding** **On completing the course students will be able to:** a1- understand basic definitions and theories of the course a2- Learn the fundamental operations on matrices and calculate the determinant and the inverse of a matrix a3–be aware of the systems of homogeneous and nonhomogeneous linear equations. a4 - use standard methods to find bases of the vector spaces;
ب- المهارات الذهنية :	**b- Intellectual Skills:** **On completing the course students will be able to:** b1 - find real eigenvalues and eigenvectors of linear operators in 3- dimensional space; b2- convert symmetric matrices corresponding to linear operators in 3-dimensional space with real eigenvalues to a diagonal form b3- compute matrices for linear operators with regard to given bases b4- develop logical thinking
ج- المهارات المهنية الخاصة بالمقرر :	**c-Professional and Practical Skills** **On completing the course students will be able to:** c1- Handing-in of homework and attendance at tutorials described in the second Year

Handbook. c2 - Solve some simple problems in n- dimensional space c3 - Learn how can one transfer the applied mathematics problems to matrices form and solve it.	
d-General and Transferable Skills : **On completing the course students will be able to:** d1- Use Internet and Library to get information d2- Work in a group d3- solve simple algebraic	**د- المهارات العامة :**
• What is a field and examples of the well-known field • Matrices defined over a field, operations on matrices, Echelon form • Algebra of square matrices, inverted matrix, and system of linear equations. • What is a vector space, subspaces, intersection and addition of subspaces. • Linear combination, dependently and independently set of vectors, Basis and Dimension of a vector space. • Linear transformations and its properties and linear operators and its properties. • Transformations from a basis to another. • Eigen values and eigen vectors. • Similar matrices and diagonalization for square matrices. • Applications	**٤- محتوى المقرر :**
1- lectures 2- tutorials **3-** use information technology	**٥- أساليب التعليم و التعلم:**
The same as normal students, only skeletal disabilities are allowed in the faculty of science.	**٦- أساليب التعليم و التعلم للطلاب ذوى القدرات المحدودة**
	٧- تقويم الطلاب :
1- Oral exam to assess a1-a4,b1-b4,d1-d3 2- Final exam to assess a1-a4,b1-b4,c1-c3 3- Mid-Term Exam to assess a1-a4,b1-b4,c1-c3	**أ- الأساليب المستخدمة**
1- Oral week 16 2- Final exam week 16 3- Mid-Term Exam week 7	**ب- التوقيت**

ج- توزيع الدرجات	- Mid-Term Examination 10 % - Final-Term Examination 80% - Oral Examination 10% Total 100%
٨- قائمة الكتب الدراسية و المراجع :	
أ- المذكرات	- Department notes in this course
ب- الكتب ملزمة	- H. Anton, Elementary Linear Algebra, Wiley 1994
ج- كتب مقترحة	1- J.B. Fraleigh & R.A. Beauregard, Linear Algebra, Addison-Wesley 1995 2- R.B.J.T. Allenby, Linear Algebra, Butterworth Heinemann, 1997
د- دوريات علمية أو نشرات	http://joshua.smcvt.edu/linearalgebra/ http://www.math.unl.edu/~tshores1/linalgtext.html

(أ) مصفوفة المعارف والمهارات المستهدفة من المقرر الدراسى

المحتويات للمقرر	اسبوع الدراسة	المعارف الرئيسية	مهارات ذهنية	مهارات مهنية	مهارات عامة
What is a field and examples of the well-known field	1	a1, a4		c1	d1, d2
Matrices defined over a field, operations on matrices, Echelon form	2	a1, a2		c1	d1- d3
Algebra of square matrices, inverted matrix, and system of linear equations.	3	a1,a2, a3	b2	c1-c3	d1- d3
What is a vector space, subspaces, intersection and addition of subspaces.	4	a3, a4	b2, b3	c1	d1, d2,
Linear combination, dependently and independently set of vectors, Basis and Dimension of a vector space.	5	a1-a4	b2, b3	c1, c2	d1, d2,
Linear transformations and its properties and linear operators and its proprties.	6	a1, a2	b2, b3	c1, c2	d1, d2
Transformation from basis to another basis	7-8	a1-a4	b1-b4	c1-c3	d2, d3
Eigenvalues and eigenvectors.	10-11	a3, a4	b3	c2, c3	d2, d3

Similar matrices and diagonalization for square matrices.	12-13	a3, a4	b1, b2,	c1-c3	d1- d3
Applications	14	a3, a4	b1, b3	c1-c3	d1, d3

أستاذ المادة : د. صالح المهدى

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