توصيف مقرر دراسي

جامعة : المنصورة

كلية : العلـــــــــوم

قسـم : الرياضيات

١ـ بيانات المقرر		
المستوى: الرابع	اسم المقرر : **Partial Differential Equations**	**كود المادة : Math 429**
عدد الوحدات الدراسية: ٣ ساعة معتمدة نظرى ٢: تمارين: ٢ عملى: ٠		**التخصص : رياضيات**

٢ـ هدف المقرر :	**For students undertaking this course, the aims are to:** - Analytical and numerical methods for solving partial differential equations(PDEs), - concepts and methods of Vector calculus. It builds on the first year core applied mathematics courses to develop more advanced ideas in differential and integral calculus.
٣ـ المستهدف من تدريس المقرر	
أـ المعلومات و المفاهيم :	**a- Knowledge and Understanding** **On completing this course, students will be able to:** a1-Develop knowledge and understanding on solving partial differential equation. a2-Understand functions of several variables, their partial differentiation, integration, and their geometrical interpretation. a3-understand Fourier series, Fourier sine series and Fourier cosine series of piecewise continuous functions.
بـ المهارات الذهنية :	**b- Intellectual Skills** **On completing this course, students will be able to:** b1-Classify second-order PDEs as elliptic, hyperbolic or parabolic. b2- Solve first order partial differential equations via the method of characteristics.
جـ المهارات المهنية الخاصة بالمقرر :	**c- Professional and Practical Skills** **On completing this course, students will be able to:** c1- Use Numerical Package such as maple or Matlab to solve PDEs.

c2-Choose appropriate boundary and initial conditions for PDEs. c3-Solve analytically, using the method of separation of variables, the heat and wave equations.	
d- General and Transferable Skills **On completing this course, students will be able to:** d1-Solve problems. d2-Work in a team. d3-Manage the time.	د- المهارات العامة :
1-Introduction to Partial differential equations – order –homogenous and non homogenous – degree-linear and nonlinear. 2-Heat equation, Wave equation and Laplace's equation in both one and higher dimensions. 3- Separation of Variables, boundary value problems, Fourier Series. 4- Fourier and Laplace Transform techniques. 5- Applications.	٤- محتوى المقرر :
1-Lectures 2- Tutorials	٥- أســـاليــب التعليـــــم و التعلـم
The same as normal students, only skeletal disabilities are allowed in the faculty of science.	٦- أساليب التعليم و التعلم للطلاب ذوى القدرات المحـدودة:
	٧- تقويـــــــم الطـــــلاب :
1- Oral Exam. to assess a1-a3,b1-b2,d1-d3 2- Final Exam to assess a1-a3,b1-b2,c1-c3 3- Mid-Term Exam to assess a1-a2,b1-b2,c1-c2	أ- الأساليب المستخدمة
1- Oral Exam week 16 2- Final Exam week 16 3- Mid-Term Exam week 7	ب- التوقيت
- Mid-Term Examination 10 - Final-Term Examination 80	ج- توزيع الدرجات

- Oral Examination 10	
- Practical Examination 0	
Total 100%	

٨ـ قائمة الكتب الدراسية و المراجع :	
أ- المذكرات	Available at the department.
ب- الكتب ملزمة	S. J. Farlow, *Partial Differential Equations for Scientists and Engineers*, Dover Publications 1993.
ج- كتب مقترحة	R. Haberman, Elementary Appled Partial Differential Equations, 4th ed., 2004.
دـ دوريــــات علميـــة أو نشرات	http://en.wikipedia.org/wiki/Differential_equation.

(أ) مصفوفة المعارف والمهارات المستهدفة من المقرر الدراسى

المحتويات للمقرر	اسبوع الدراسة	المعارف الرئيسية	مهارات ذهنية	مهارات مهنية	مهارات عامة
Introduction to Partial differential equations – order –homogenous and non homogenous – degree-linear and nonlinear.	1-3	a1	b1	c1	
Heat equation, Wave equation and Laplace's equation in both one and higher dimensions.	4-6	a2, a3	b2	c1, c2	d1,d2,d3
Separation of Variables, boundary value problems, Fourier Series.	7-9	a2, a3	b2	c1, c3	d1,d2,d3
Fourier and Laplace Transform techniques.	10-11	a2, a3	b2	c1, c2	d1,d2,d3
Applications.	12-13	a1,a2,a3	b1, b2	c1,c2,c3	d1,d2,d3

أستاذ المادة : أ.د. على شمندى

رئيس مجلس القسم العلمي : أ.د.مجدى الياس فارس