

توصيف مقرر دراسي

جامعة : المنصورة
كلية : العلوم
قسم : الرياضيات

١- بيانات المقرر		
المستوى: الثاني	اسم المقرر : Ordinary Differential Equations	كود المادة : Math 214
عدد الوحدات الدراسية: ٣ ساعة معتمدة نظري ٢: تمارين: ٢ عملي: ٠		التخصص: إحصاء وعلوم الحاسب

<p>For students undertaking this course, the aims are to:</p> <p>1- provide an overview of standard methods for the solution of single ordinary differential equations and systems of equations, with an introduction to some of the underlying theory and calculus of functions of more than one variable.</p>	٢- هدف المقرر :
٣- المستهدف من تدريس المقرر	
<p>a- Knowledge and Understanding</p> <p>On completing this course, students will be able to:</p> <p>a1 – be familiar with some of the standard methods for solution of first- and second-order ordinary differential equations</p> <p>a2 - be aware of the implications of existence and uniqueness theorems</p> <p>a3 - Understand continuity and differentiability of functions of two or more variables.</p> <p>a4- Understand the applications of differential equations</p>	أ- المعلومات و المفاهيم
<p>b- Intellectual Skills</p> <p>On completing this course, students will be able to:</p> <p>b1- Critically think and compare different approaches to the same problem</p> <p>b2- develop skills in the use of computer tools for solving differential equations and integration</p> <p>b3- Use logical and intellectual skills</p> <p>b4- apply the basic skills of continuity and differentiability of functions of two variables.</p>	ب- المهارات الذهنية:
<p>c-Professional and Practical Skills</p> <p>On completing this course, students will be able to:</p> <p>c1 - Classify the first and second order ODEs</p> <p>c2 - Solve linear ODEs using standard methods.</p> <p>c3- pursue further studies in more advanced branches of modern mathematics: functional analysis, topology, optimization and nonlinear analysis</p>	ج- المهارات المهنية الخاصة بالمقرر :
<p>d-General and Transferable Skills</p> <p>On completing this course, students will be able to:</p> <p>d1- Ability to work in team</p> <p>d2- Solving problems</p> <p>d3- Use Internet and library</p>	د- المهارات العامة:
<ul style="list-style-type: none"> • Definitions. First order differential eq. linear, separable, exact and homogenous • Second order differential eq.: reduction of order, constant coeff., 2nd -order linear eq. Euler's eq • Laplace transformation • Series solutions of 2nd-order linear differential eq. • Power series, solutions about an ordinary point • Equal roots of indicial eq. and roots differing by an integer • Introduction to systems of first-order eq. solutions of two linear first-order eq 	٤- محتوى المقرر:

1- Lectures (4H/W) 2- Tutorials (3H/w)	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 ذوي القدرات المحدودة
٧- تقويم الطلاب :	
1- Oral exam to assess b1-b3,d1-d3 2- Mid-Term Examination to assess a1, a2, b1,b2,c1 3- Final exam to assess a1-a4,b4, c1-c3	أ- الأساليب المستخدمة
1. Oral week 15 2. Mid-Term Exam week 7 3. Final exam week 15	ب- التوقيت
- Mid-Term Examination 10 % - Final-Term Examination 80% - Oral Examination 10% Total 100%	ج- توزيع الدرجات
٨- قائمة الكتب الدراسية و المراجع :	
Lectures notes available in the Dept	أ- المذكرات
- C. H Edwards, Elementary differential equations with boundary value problems, Pearson Prentice Hall, 2004	ب- الكتب ملزمة
1- W.E. Boyce & R.C. Di Prima, "Elementary Differential Equations and Boundary Value Problems", Wiley 2- M. Braun, "Differential Equations and their Applications", Springer-Verlag. 3- C.H. Edwards & D.E. Penney, "Elementary Differential Equations with Boundary Value Problems", Prentice Hall. 4- R.K. Nagle & E.B. Saff, & A.D. Snider, "Fundamentals of Differential Equations and Boundary Value Problems", Addison-Wesley.	ج- كتب مقترحة
http://www.sosmath.com/diffeq/diffeq.html	د- دوريات علمية أو نشرات

(أ) مصفوفة المعارف والمهارات المستهدفة من المقرر الدراسي

المحتويات للمقرر	اسبوع الدراسة	المعارف الرئيسية	مهارات ذهنية	مهارات مهنية	مهارات عامة
Definitions. First order differential eq.: linear, separable, exact and homogenous	1-2	a1, a4	b1,b2,b3	c1-c3	d2, d3
Second order differential eq.: reduction of order, constant coeff., 2nd -order linear eq. Euler's eq	3-4	a1,a2,a4	b1,b2,b3	c1-c3	d2, d3
Laplace transformation	5-6	a1, a4	b1,b2,b3	c1-c3	d2, d3
Series solutions of 2nd-order linear differential eq.	7-8	a1	b1,b2,b3	c1-c3	d1, d2,
Power series, solutions about an ordinary point	9-10	a1, a2	b2	c1-c3	d2,
Equal roots of indicial eq. and roots differing by an integer	11-12	a2, a3	b1,b2,b3	c1-c3	d1, d2
Introduction to systems of first-order eq. solutions of two linear first-order eq.	13-14	a1,a2,a3	b4	c1-c3	d1, d2

أستاذ المقرر: أ.د. علي شمندی

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