جامعة : المنصورة

كـليـة : العلـــــوم

قســـم : الرياضيات

١- بيانات المقرر		
كود المادة : Math 211	اسم المقرر : Real analysis	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 the fundamental of mathematical analysis and stimulate the development of mathematical thinking. 2- Provide students with the basic theorems and definitions of convergent sequences and series. 3- Apply different tests of convergence of sequences and series.	
٣- المستهدف من تدريس المقرر	
أ- المعلومات و المفاهيم :	**a. Knowledge and Understanding** **On completing this course, students will be able to:** a1- understand the concept of function, and its role in mathematical analysis a2 – be aware of the relevant theories of mathematical analysis andtheir applications a3 – be aware of the basic concepts of convergent tests and their application. a4 – recognize different types of series such as power series and alternating series. a5 – understand the uniform convergence tests to a class of series.
ب- المهارات الذهنية :	**b. Intellectual Skills** **On completing this course, students will be able to:** b1 -apply mathematical logic in testing convergent series and sequences. b2- Distinguish between convergent and divergent sequences b3 – Analyze power series and Fourier series. b4 - develop analytic intuition and proof skills b5 - Compare between different type of convergent tests
ج- المهارات المهنية	**c. Professional and Practical Skills**

On completing this course, students will be able to: c1- Apply reasoning techniques of mathematical analysis in more advanced branches of mathematics such as functional analysis nonlinear analysis and topology c2- test the convergence of different type of series. c3- Prove theorems of convergence and divergence of series. c4- Apply Fourier series to a given function. c5- Use computer software to study the asymptotic behaiour of sequence.	**الخاصة بالمقرر :**
d. General and Transferable Skills **On completing this course, students will be able to:** d1. Think independently, set tasks and solve problems on a scientific basis. d2. use , efficiently, information and communication technology d3. Work effectively in groups.	**د- المهارات العامة:**
– Bounded sets, upper and lower limits of functions, sequences of real numbers, Limits of sequences – Convergence and diverhence of sequenc .Bounded and monotone sequences ,Cauchy sequences – Real series, convergent serie,the geometric series and the the harmonic series – Series with positive and negative terms. Alternating series test. – Series with non- negativeterms, the comparison,nth root and the Ratio tests – Absolute and conditional convergence , power series and radius of convergence – Convergence tests : Integral. Rabbe, logarithinic, – De Morgan and Gauss – Series of fulctions and uniform convergence, Virstrass, Dirchlet tests – Infinite product of series – Fourier series, sin , cos series	**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-a5,b1-b5,d1-d3 2- Final exam to assess a1-a5, b1-b5, c1-c5 3- Mid-Term Exam to assess a1-a3,b1-b3,c1-c3	**أ- الأساليب المستخدمة**

ب- التوقيت	1- Oral exam week 16 2- Final exam week 16 3-Mid-Term Exam week 7
ج- توزيع الدرجات	- Mid-Term Examination 10 % - Final-Term Examination 80% - Oral Examination 10% - Practical Examination 0% Total 100%
٨- قائمة الكتب الدراسية و المراجع :	
أ- المذكرات	- Avaliable in the Dept
ب- الكتب ملزمة	- Haggerty, Rod 'Fundamentals of Mathematical Analysis' Second Edition, Addison-Wesley 1993.
ج- كتب مقترحة	Martin Campbell-Kelly and William Aspray, Computer .A History of the information machine New York 1996 Trench, William F. Introduction to Real Analysis, Prentice Hall, 2003. Bartle, Robert G. and Sherbert, Donald R. Introduction to Real Analysis (3ed.), New York: John Wiley and Sons, 2000.
د- دوريـــــــــات علميـــــــة أو نشرات	http://www.mathcs.org/analysis/reals/ http://en.wikipedia.org/wiki/Real_analysis

(أ) مصفوفة المعارف والمهارات المستهدفة من المقرر الدراسى

المحتويات للمقرر	اسبوع الدراسة	المعارف الرئيسية	مهارات ذهنية	مهارات مهنية	مهارات عامة
Bounded sets, upper and lower limits of functions, sequences of real numbers, Limits of sequences	1-2	a1, a2	b1, b2	c1, c2	d1, d2
Convergence and diverhence of sequence .Bounded and monotone sequences ,Cauchy sequences	3	a3, a4	b1, b2, b3	c1, c2, c3	d1-d3
Real series, convergent serie,the geometric series and the the harmonic series	4-5	a2, a3, a4	b1, b2, b3, b4	c1, c2, c3	d1-d3
Series with positive and negative terms. Alternating series test.	6	a2, a3	b2, b3, b5	c1, c2, c3	d1-d3
Series with non- negativeterms, the comparison,nth root and the Ratio tests	7	a5	b1, b2, b3	c1-c5	d1, d2,
Absolute and conditional convergence , power series and radius of convergence	8	a5	b1, b4, b5	c3, c5	d1, d2,
Convergence tests : Integral. Rabbe, logarithinic,	9	a3, a4, a5	b4, b5	c2, c3, c5	d1, d2, d3
De Morgan and Gauss	10	a5	b3, b4	c2, c3, c5	d1, d2, d3
Series of fulctions and uniform convergence, Virstrass, Dirchlet tests	11	a5	b4, b5	c3, c5	d2, d3
Infinite product of series	12	a5	b4, b5	c3, c5	d2, d3
Fourier series, sin , cos series.	13-14	a4, a5		c3, c4, c5	d2, d3

أستاذ المادة : د. عاطف ابراهيم المهدى

رئيس مجلس القسم العلمي :ا.د. مجدى إلياس فارس