

Ministry of Higher Education and Scientific research



Department of Mathematics

College of Education

University of Salahaddin

Subject: Advanced Calculus

Course Book – (Year 2)

Lecturer's name: Suham Hamad Awla

Academic Year: 2022/2023

Course Book

1. Course name	Advanced Calculus					
2. Lecturer in charge	Suham Hamad Awla					
3. Department/ College	Mathematics/Education					
4. Contact	e-mail:suham.awla1@su.edu.krd Tel: (optional)07507612458					
5. Time (in hours) per week	Theory: 8 Discussion: 2					
6. Office hours	Sunday: Group A (10:30-12:00) Sunday: Group B (8:30-10:30) Wednesday: GroupA (8:30-10:00) Wednesday: GroupB (10:30-12:00)					
7. Course code						
8. Teacher's academic profile	2007-2011 BSc. Of Mathematics Department in College of Education at Salahaddin –University Hawler Erbil Kurdistan Region Iraq 2013-2015 MSc of the mathematic Department at Salahaddin University					
9. Keywords	Functions, Derivatives, Integrals and series					
10. Course overview:	<p>Advanced Calculus is often a student's first exposure to the world of pure mathematics. While this course has many applications, Advanced Calculus is mainly study of mathematical structure such as Real numbers, limit, continuity... etc.</p> <p>This semester is dedicated to study some important objects such as: Functions of several variable, Polar coordinates and multiple integral ... etc.</p> <p>The whole semester will be spent studying examples and theorems which depend on foundations of Calculus set theory.</p> <p>Students who successfully complete this course will:</p> <ul style="list-style-type: none"> • Partial Derivatives. • Directional derivatives. • Double integrals in rectangular and polar form. • Triple Integrals in rectangular cylindrical and spherical coordinates. • Green theorem and Stokes' theorem. • Infinite sequence and series. • power series and Taylor series. • vectors. 					
11. Course objective:	<table border="1"> <tr> <td>Advanced Calculus</td> <td>جیاکاری و تهاوکاری پیشکھوتوو</td> </tr> <tr> <td>This course is a natural continuation of a</td> <td>ئهم کۆرسه تهاوکاری کۆرسی (جیاکاری و تهاوکاری) یه له</td> </tr> </table>		Advanced Calculus	جیاکاری و تهاوکاری پیشکھوتوو	This course is a natural continuation of a	ئهم کۆرسه تهاوکاری کۆرسی (جیاکاری و تهاوکاری) یه له
Advanced Calculus	جیاکاری و تهاوکاری پیشکھوتوو					
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<p>previous course (Calculus) taught in first class, which is based in every field of applied sciences as instrument for the solution of problems of varies fields.</p> <p>The basic goal is to study the following:</p> <ul style="list-style-type: none"> • Sequences and series of real numbers. • Functions of several variables which include: limits, continuity, partial derivatives, and multiple integrals. • Line integrals, Green's Theorem and Stokes' Theorem. 	<p>پۆلى يەك، كە دامەزراوەى ھەموو بواریكى ماتماتیكى پراكتیكى [] یە وەكو ئامرازىك بۆ شىكارى كېشەكان لە بواری جۆراوجۆر. [] مەبەستى سەرەكیمان ئەمانى خوارەوہ لەخۆ دەگریت: • یەك بەدوای یەك و ریزكراوەكانى ژمارە راستیەكان. • نەخشەى چەند گۆراو كە ئەمانە لەخۆ دەگریت: ئامانج و بەردەوامى و داتاشراوى بەشى و تەواوگارى چەندى. • تەواوگارى ھیلی و سەلینراوى گرین و سەلینراوى ستۆك.</p>
<p>12. Student's obligation Tests will be closed book, closed notes: you cannot receive help on the tests from anyone except me. Home works are also to be pledged. We may deviate from this slightly during the semester and allow you to discuss questions with your classmates, but assume you are to work alone (and without answer guides!) unless you hear otherwise.</p> <p>Quizzes and written home assignments 5% Midterm exams 35% Final exam 60%</p>	
<p>13. Forms of teaching 1- green board. 2- Datashow.</p>	
<p>14. Assessment scheme 1-Examinations 40% (2-3 theoretical exam) 2- Final Exam. 60% (theoretical)</p>	
<p>15. Student learning outcome:</p>	
<p>16. Course Reading List and References:</p> <ol style="list-style-type: none"> 1. Calculus with analytic geometry, George F. Simmons, 1985, by Mc-Grawhill, Inc. 2. Calculus, Howard Anton, 1995, by Anton text books, Inc. 	

3. THOMAS' CALCULUS, Weir Hass, 2005, Pearson Education, Inc. 11th edition.

17. The Topics:		Lecturer's name
<u>Date</u>	<u>Subjects</u>	
Course 2		Suham Hamad Awla 10hours
Week 1	Line and Planes in Space	
Week 2	Vector Valued Functions	
Week 3	Directional Derivatives and Gradient Tangent Planes and Differentials Tangent Plane and Normal Lines	
Week 4	Extreme Values and Saddle Points	
Week 5	Lagrange Multipliers	
Week 6	Chapter Two: Multiple Integral Area, Moments and Centre of Mass	
Week 7	Polar Coordinates Double Integral in Polar Form Triple	
Week 8	Integral in Rectangular Coordinates	
Week 9	Triple Integral in Cylindrical and Spherical Coordinates	
Week 10	Substitutions in Double Integral (Jacobian) Line Integrals	
Week 11	Green's Theorem	
Week 12	Surface Integral	
Week 13	Stokes' Theorem	

