



**Philadelphia University**  
**Faculty of Science**  
**Department of Basic Sciences and Mathematics**  
**Second Semester 2008/2009**

<b>Course Syllabus</b>			
<b>Course Title</b>	Calculus II	<b>Course Code</b>	250102
<b>Course Level</b>	"1"	<b>Course Prerequisite</b>	210101
<b>Lecture Time</b>	Sun., Tue., Thu. 11:10-12:00	<b>Credit Hours</b>	"3"

<b>Academic Staff Specific</b>				
<b>Name</b>	Dr. Hussien Albadawi	<b>Office Hours</b>	Sun.	10:00 – 11:00
<b>Rank</b>	Assistant . Prof.		Mon	011:15 – 12:30
<b>Office Number</b>	"819"		Tue.	12:00 – 13:00
<b>Location</b>	Faculty of Science		Wed.	011:15 – 12:30
<b>E – mail</b>	<a href="mailto:Hbadawi@philadelphia.edu.jo">Hbadawi@philadelphia.edu.jo</a>		Thu.	10:00 – 11:00

**Course Description:**

This course deals with the following main topics: techniques of integration and improper integrals, applications of differentiation and integration, conic sections, polar coordinates, and infinite series.

**Course Objectives:**

1. Learn the concept of inverse functions and related techniques.
2. Understand the concept of integration and its related topics such as techniques of integration and improper integrals.
3. Studying the behavior of sequences and series.
4. Understanding the concept of polar coordinates.

**Course components (Text Book):**

**Title** : **Calculus One and Several Variables.**  
**Author** : **Salas and others.**  
**Publisher** : **John Wiley & Sons, Inc.**  
**Edition** : **10<sup>th</sup> Edition.**  
**Year** : **2007**  
**ISBN** : **978-0471-69804-3**

**Teaching methods:**

1. To learn it is imperative for the student to take an active interest in his or her own education. To learn mathematics the student must read, think, and write in an analytical manner and this takes practice. Such practice is by working exercises. When troubles arise, and they will, the student must ask questions. Questions may be posed to the instructor or to other students in a variety of ways; online office hours, or in class.
2. Homework will be assigned each week; not to be collected or graded by the instructor. In addition, at the end of a chapter, challenge problems will be assigned for "work-hard" students.
3. Learn the students how to:
  - a. Understand and apply the concept of integration and find volumes and areas.
  - b. Differentiate and integrate various kinds of one single variable functions.
  - c. Describe and sketch graphs of functions in polar coordinates.
  - d. Study the behavior of sequences and series.

## **Learning outcomes:**

- **Knowledge and understanding**
  1. Integrate various kinds of functions by using the rules of integration, the substitution, and integration by parts ...etc.
  2. Relate the concepts of integration and apply some consequences to solve mathematical problems.
  3. Apply the convergence tests for series.
  4. Use the definition to identify the conic sections, then draw a sketch of the curve of the given conic.
  5. Use the techniques of computing limits to define the improper integral.
  
- **Cognitive skills (thinking and analysis).**

**To identify and solve problems. Work with given information and handle mathematical calculations based on mathematical formulas.**
  
- **Communication skills (personal and academic).**

**Encourage the students to be self starters (creativity, decisiveness, initiative) and to finish the mathematical problems properly (flexibility, adaptability). Also to improve general performance of students through the interaction with each other in solving different Mathematical problems.**
  
- **Practical and subject specific skills (Transferable Skills).**

**Gaining knowledge and experience of working with many mathematical problems.**

## **Assessment instruments**

<b>Allocation of Marks</b>	
<b>Assessment Instruments</b>	<b>Mark</b>
First Examination	20
Second Examination	20
Homeworks and Quizzes	10
Final Examination	50
<b>Total</b>	<b>100</b>

## **Expected workload:**

On average students need to spend, at least, 9 hours of study and preparation per week for this course.

## **Attendance policy:**

Absence from lectures shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant college/faculty shall not be allowed to take the final examination and shall receive a mark of zero

## **Module references:**

**Title** : **Calculus**  
**Author** : **Howard Anton**  
**Publisher** : **Wiley**  
**Edition** : **8<sup>th</sup> Edition.**  
**Year** : **2008**  
**ISBN** : **0-471-59495-4**

## Course academic calendar

<u>Week</u>	<u>Basic and support material to be covered</u>
(1)	<b>Introduction:</b> 1. Introduction. 2. Hyperbolic Functions. 3. Integral tables
(2)	<b>Integration:</b> 1. Integration by parts. 2. Powers of sin, cos. 3. Product of sin, cos.
(3)	4. Powers of tan, sec. 4. Product of tan, sec. 5. Applications
(4)	6. Trigonometric substitutions. 7. Partial fractions.
(5)	8. Some rationalizing substitutions 9. More on Area and Volume.
(6) <b>First examination</b>	<b>L'Hôpital's Rule</b> 10. Improper integral 11. The indeterminate form $0/0$ .
(7)	12. The indeterminate form $\infty / \infty$ . 13. Other indeterminate forms.
(8)	<b>Conic Sections:</b> 1. The parabola. 2. The hyperbola. 3. The ellipse
(9)	<b>Polar Coordinates:</b> 1. Polar coordinates. 2. Graphing in polar coordinates. 3. Conic sections in polar.
(10)	4. Parametric forms. 5. Area in polar coordinates.
(11) <b>Second examination</b>	6. Surface area. 7. Line integral.
(12)	<b>Infinite Series:</b> 1. Sequences. 2. Limit of a sequence. 3. Infinite series.
(13)	4. The integral test. 5. The comparison test. 6. The root test. 7. The ratio test.
(14)	8. Alternating series. 9. Power series. 10. Taylor series.
(15)	11. Maclurin series. 12. Differentiation of power series. 13. Integration of power series.
(16) <b>Final Examination</b>	Review