
CALCULUS II in Fall 2019 (MA2030)

Course Code	MA2030	Professor(s)	Alexandra Svoronou
Prerequisites	None	Office Number	PL107
Class Schedule	MWR: 13:45-15:05 in PL-1	Office Hours	Mo, Thu 3:20-4 pm or by appointmt
Credits	4	Email	asvoronou@aup.edu
Semester	Fall 2019	Office Tel. Ext.	650

Course Description

This is a continuation of MA 1030 Fundamentals of Calculus. Each student will gain an appreciation of the strengths and limitations of mathematical model building and, therefore, of the scientific method itself.

Main Topics

Approximations and Series

Differential equations of first and second degree

Functions of several variables

To use calculus in an effective way, students need skill in both symbolic manipulation and use of technology. Wolfram alpha, is an on line calculator, and will be used to explore problems.

Course objectives

The goal is to provide students with a clear understanding of the ideas of calculus as a solid foundation for subsequent courses in mathematics and other disciplines. The emphasis will be on the depth of understanding rather than breadth of coverage

Students will taste the beauty, the magic and as well as the power of mathematics and who knows maybe they could see that mathematics can be fun.

Course Learning Outcomes

Understand ideas related to sequences and series, Taylor series, differential equations and multivariable calculus

Be able to apply the concepts and techniques learnt to problems across the disciplines

Develop mathematical maturity (ability to use theorems, to make and prove conjectures) and improved problem solving skills

Familiarity with a mathematical software package

General Education

Yes.

Course Outline

Provisional Outline and Reading List

Approximations and Series: (~8 lectures)

Taylor Polynomials and Series

Convergence of series

Power series, Geometric series

Applications

The error in Taylor approximations

Required reading: “Single Calculus”, Hughes, Hallet, Gleason, McCallum et al., Chapter 9

“Calculus and its applications’, Goldstein, Chapter 9

- Test 1

Differential equations of first and second degree. (~13 lectures)

The emphasis is on qualitative solutions, modeling and interpretation

What is a Differential equation?

Slope fields

Separation of variables

Exponential growth and decay equations

Models of population growth

Linear Second-order Differential equation

Required reading : “Single Calculus”, Hughes, Chapter 10

“Calculus and its applications’, Goldstein, Chapter 10

- Test 2

Functions of several variables (~15 lectures):

Surface graphs

Contours, Tables

Planes

Limits, Continuity

Required reading: "Multivariable Calculus", Hughes, Chapter 11

Differentiating functions of several variables

Partial derivative, Directional derivative, Gradient,

The chain rule,

Second-order partial derivatives.

Applications and modeling

Required reading: "Multivariable Calculus", Hughes, Chapter 12,13

Optimisation

Local and Global extrema

Lagrange multiplier, Interpretation

Applications in finance and economics

Required reading: "Multivariable Calculus", Hughes, Chapter 14

- Test 3

Integrating functions of several variables:(if time permits)

Double integrals in Cartesian Applications

Required reading "Multivariable Calculus", Hughes, Chapter 15

Textbooks

This course doesn't have any textbook.

Attendance Policy

Students studying at The American University of Paris are expected to attend ALL scheduled classes, and in case of absence, should contact their professors to explain the situation. It is the student's responsibility to be aware of any specific attendance policy that a faculty member might have set in the course syllabus. The French Department, for example, has its own attendance policy, and students are responsible for compliance. Academic Affairs will excuse an absence for students' participation in study trips related to their courses.

Attendance at all exams is mandatory.

IN ALL CASES OF MISSED COURSE MEETINGS, THE RESPONSIBILITY FOR COMMUNICATION WITH THE PROFESSOR, AND FOR ARRANGING TO MAKE UP MISSED WORK, RESTS SOLELY WITH THE STUDENT.

Excused or unexcused absences six or more will fail the student. Unexcused absences can result in a low or failing participation grade. In the case of excessive absences, it is up to the professor or the department to decide if the student will receive an "F" for the course. An instructor may recommend that a student withdraw, if absences have made it impossible to continue in the course at a satisfactory level.

Students must be mindful of this policy when making their travel arrangements, and especially during the Drop/Add and Exam Periods.

Grading Policy

Assignment: 20%

Participation: 15%

Quiz: 30%

Final test: 35%

Other

Usage of phones and laptops is forbidden in this course.