

# FACULTY OF **ENGINEERING**

DEGREE COURSE: **CIVIL AND ENVIRONMENTAL  
ENGINEERING B.S.**

**SUBJECT:** CALCULUS

**LECTURER:** ALESSIA BERTI

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## **OBJECTIVES**

The course aims at providing the fundamental mathematical analysis tools required to describe, formulate, analyze, interpret and possibly solve phenomena and problems that arise in natural (physical) and engineering sciences, from differential and integral calculus to series, in single and multiple variables.

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## **CONTENTS**

Part I: real and complex numbers, real functions, limits and continuity, differentiability, extrema, integral calculus, numerical series.

Part II: differential equations, multivariable functions (limits, continuity, differentiability and extrema), vector fields, line integrals, multiple integrals, surface integrals, series of functions, power and Taylor series, Fourier series.

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## **LEARNING OUTCOMES**

The student will

- master the language and the most important computation techniques of mathematical analysis,
- will be able to apply these skills to formulate, interpret and solve problems of several types.
- Particular attention will be paid so that the student will develop correct reasoning and problem solving abilities.

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## **ASSESSMENT**

Written exam: multiple choice and open questions

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## **RECOMMENDED TEXTBOOKS**

- Hass, Weir, Thomas. University Calculus, Early Transcendentals, Single Variable. Second Edition, Pearson (Addison Wesley).
- Hass, Weir, Thomas. University Calculus, Early Transcendentals, Multivariable. Second Edition, Pearson (Addison Wesley).

Electronic versions of the texts are available within MyMathLab ([www.mymathlab.com](http://www.mymathlab.com)), along with other material, or at CourseSmart.com (textbook rental site).

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