Universidad de Navarra

Programming and numerical methods (GEA)

Teaching guide 2026-27

PRESENTATION

SUMMARY: The aim of this course is to introduce the student to the concepts of computer programming and fundamentals of numerical methods. These techniques will help the student tackle and solve problems commonly encountered in the technical and professional world. The theory and practice developed in this course will allow the student to analyze and synthesize different problems and help him in the decision making process.

- **Titulación**: Grado estudios de arquitectura
- **Módulo/Materia**: Menciones / Gestión del Proyecto Técnico
- **ECTS**: 4.5
- **Curso, semestre**: 5º, First Semester
- **Carácter**: Elective
- **Profesorado**: Rufino Goñi (Profesor Titular)
- **Idioma**: English
- **Aula, Horario**: Aula 5, Tuedays from 9:00 a.m. to 12:00 noon

LEARNING OUTCOMES (Competencies)

BASIC COMPETENCES

BC02: Students must know how to apply their knowledge professionally to their job or career and have the skills that usually demonstrated by writing and supporting their arguments, and problem-solving within their area of study.

BC04: Students are able to convey information, ideas, problems and solutions to specialist and non-specialist audiences.

BC05: Students have developed the learning skills necessary to undertake further studies with a high degree of autonomy.

GENERAL COMPETENCES

GC04: Understand the structural, construction and engineering design problems associated with building design as well as the techniques for solving them.

SPECIFIC COMPETENCES

SC17: Ability to conceive, calculate, design, integrate into buildings and urban complexes, and execute building structures (T).

SC67: Use of English, level B2, to a sufficient level for the scientific and academic terminology typically used in architecture.

EDUCATIONAL ACTIVITIES

EDUCATIONAL ACTIVITIES	**Total number of hours: 112.5**

AF1	Attendance and participation in theoretical classes	X	25 hours
AF2	Attendance and participation in practical classes	X	20 hours
AF3	Dedication to individual and/or group assignments	X	15 hours
AF5	Participation in seminaries	X	10 hours
AF6	Personal study and work	X	42.5 hours

Assessment & Grading *(Evaluación y Calificación)*

- **Attendance & Participation** *(Asistencia y participación)*
  - *Attendance is mandatory. (La asistencia es obligatoria)*
- **Final Group Project & Presentation** *(Trabajo final por parejas y exposición)*
  - *Pair project with a final presentation in the last class. (Proyecto en parejas con presentación final en la última clase)*

PROGRAM

PART 1: Programming basics

INTRODUCTION

- How a Computer Works
- ASCII
- What is Programming
- Types of Languages

VARIABLES. TYPES

- Numeric Variables
- Alphanumeric Variables

CONTROL STRUCTURES 1. CONDITIONALS

CONTROL STRUCTURES 2. LOOPS

CONTROL STRUCTURES 3. COMBINATION OF LOOPS AND CONDITIONALS

FUNCTIONS AND SUBROUTINES

LIBRARIES

Universidad de Navarra

INTRODUCTION TO OBJECT-ORIENTED PROGRAMMING

PART 2: Advance Excel with VBA

BIBLIOGRAFY

Bibliography:

Class notes.

Excel 2016 Bible. John Walkenbach. Wiley, 2015

Excel 2019 Bible. Michael Alexander, Dick Kusleika (previously by John Walkenbach) Wiley, 2018. Find it in the Library

Excel VBA programming for dummies. John Walkenbach. Wiley, 2013. Find it in the Library

Excel 2010: curso práctico. Teaching Soft Group (Madrid), 2011. Find it in the Library

Numerical analysis. R. Burder, J. Faires. Brooks, 2001. Find it in the Library

Tutorials and Information in Internet :

www.excel-easy.com

www.excelmadeeasy.com

www.exceltotal.com

To translate function names from English to Spanish

https://www.perfectxl.com/excel-glossary/what-is-excel-function/translations-english-spanish/

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