Universidad de Navarra

Optimization for Business Analytics II

Guía docente 2025-26

PRESENTACIÓN

Short description: Optimization is about minimizing or maximizing a certain function or goal that is applied in many different domains, including Banking, Finance, MArketing, Production, Science, Engineering, etc. In this subject we will focus on different algorithms part of modern optimization. Modern optimization deals with metaheuristics, related with computational methods that iteratively improve an original solution or population of solutions to optimize a problem. We will face these algorithms using R.

- **Titulación**: ADEb+Data Analytics., ECOb+Data Analytics.
- **Módulo/Materia**: Módulo 7: Optativas. Materia 7.2: Optativas Específicas.
- **ECTS**: 3
- **Curso, semestre**:3º, first semester.
- **Carácter**: Elective, belonging to the profile of Data Analytics.
- **Profesorado**: D. Ignacio Rodríguez Carreño, irodriguezc@unav.es
- **Idioma**: English.
- **Aula, Horario**: Classroom M4 Amigos Building. Thursdays from 10 to 12 h. https://mese.webuntis.com/WebUntis/index.do?school=universidad%20de%20navarra#/basic/timetable?selectedTab=3

RESULTADOS DE APRENDIZAJE (Competencias)

- SSOP1: Accessing and managing massive data.
- SSOP2: Understanding programming languages potentially used to solve economic and/or business problems.
- SSOP3: Working with visual elements that provide insights and an understanding into complex concepts and components of economic and/or business problems.
- SSOP4: Identify patterns and trends and gather useful information from massive data in economics and/or business.
- SSOP5. Effective communication of results to a professional audience in economics and/or business

PROGRAMA

1. Introduction and motivation.
2. R Basics
3. Blind Search
4. Local Search
5. Population based Search.
6. Multi-Objective Optimization
7. Applications

ACTIVIDADES FORMATIVAS

Classes. There will be theoretical classes showing the concepts and computer practices with the programming language and tools chosen.

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Attendance. Attendance is compulsory and will have to attend the 80% of the classes to get the **10%** of the final grade.

Final project. The students will have to do a final project by pairs that will be **20%** of the subject. Students will write their own machine learning code. Students will record a short video presentation (5 minutes) about their project.

Midterm exam. The students will have to do a midterm exam in computers lab that will be the **20%** of the subject.

Final exam. The students will have to do a final exam in computers lab that will be the **50%** of the subject. The students will have to get a 5/10 in order to average with the rest of the assesments

EVALUACIÓN

Ordinary evaluation:

SE1. Attendance. It will have a value of **10%** of the final grade of the ordinary evaluation.

SE2. Project. It will consist of carrying out a project of the subject that includes group work that will include a video with a presentation on it (**20%)**

SE3. Exams. There will be a midterm and a final exam that will worth **20 and 50%** of the final grade, respectively.

Extraordinary evaluation:

For the extraordinary evaluation, the Project will account for the **30%** and the final exam will account for the **70%** of the grade.

HORARIOS DE ATENCIÓN

Dr. Ignacio Rodríguez Carreño (irodriguezc@unav.es)

- Office 2080. Amigos Building. Second floor- corridor.
- Office hours: Wednesdays from 15 to 18 h.

BIBLIOGRAFÍA

- Modern Optimization in R. Paulo Cortez. Ed. Springer. Find it in the library