Guía docente
220044 - OIP - Optimización de Procesos Industriales

Última modificación: 19/04/2023

Unidad responsable: Escuela Superior de Ingenierías Industrial, Aeroespacial y Audiovisual de Terrassa
Unidad que imparte: 707 - ESAII - Departamento de Ingeniería de Sistemas, Automática e Informática Industrial.

Titulación: GRADO EN INGENIERÍA EN TECNOLOGÍAS AEROESPACIALES (Plan 2010). (Asignatura optativa).
GRADO EN INGENIERÍA EN TECNOLOGÍAS INDUSTRIALES (Plan 2010). (Asignatura optativa).
GRADO EN INGENIERÍA EN VEHÍCULOS AEROESPACIALES (Plan 2010). (Asignatura optativa).

Curso: 2023 **Créditos ECTS:** 3.0 **Idiomas:** Inglés

PROFESORADO

Profesorado responsable: ANTONIO GUASCH PETIT

Otros: VICENÇ PUIG CAYUELA - JAUME FIGUERAS JOVE

METODOLOGÍAS DOCENTES

The course is developed by the use of:

- Lecture sessions.
- Problem-solving classes (case studies and exercises).
- Self-study which includes exercises and activities.
- A project

OBJETIVOS DE APRENDIZAJE DE LA ASIGNATURA

Optimization is the art and science of allocating scarce resources to the best possible effect. Optimization techniques are called into play every day in industrial planning problems, industrial design, resource allocation, scheduling, decision-making, etc. For example: how does an airliner know how to route its planes and schedule its crews at minimum cost; while meeting constraints on airplane flight hours between maintenance and maximum flight time for crews? Another example could be how to schedule body cars into a painting line such as the planned production can be achieved?

The main goals of this course will be:

1. recognize problems that can be tackled using the tools of applied optimization,
2. formulate optimization problems correctly and appropriately,
3. solve optimization problems, primarily by selecting and applying the correct solvers.

These abilities will be especially useful as the world becomes more complex and computer-focused.

HORAS TOTALES DE DEDICACIÓN DEL ESTUDIANTADO

Tipo	Horas	Porcentaje
Horas grupo grande	30,0	40.00
Horas aprendizaje autónomo	45,0	60.00

Dedicación total: 75 h

CONTENIDOS

Introduction to Optimization of Industrial Processes

Descripción:
Optimization application areas. Introduction to methods, models and tools for the optimization of industrial processes.

Dedicación: 15h
Grupo grande/Teoría: 5h
Aprendizaje autónomo: 10h

Introduction to the AMPL mathematical programming language

Descripción:
AMPL (A Mathematical Programming Language) is an algebraic modeling language to describe and solve high-complexity problems for large-scale mathematical computing (i.e., large-scale optimization and scheduling-type problems). The AMPL basic programming structures will be analyzed using optimization problems.

Dedicación: 25h
Grupo grande/Teoría: 10h
Aprendizaje autónomo: 15h

Modeling and optimitzation of industrial processes

Descripción:
Explores a variety of models for the solution of airline, supply chain, transportation and manufacturing optimization problems.

Dedicación: 35h
Grupo grande/Teoría: 15h
Aprendizaje autónomo: 20h

SISTEMA DE CALIFICACIÓN

The final grade depends on the following evaluation criteria

Nfinal = 0.4*Ex + 0.35*Pr + 0.25*Cl

- Ex: individual and group exercises
- Pr: group project
- Cl: participation in class activities

BIBLIOGRAFÍA

Básica:
- Bazargan, Massoud. Airline operations and scheduling [en línea]. 2nd ed. London: Routledge, 2016 [Consulta: 10/06/2022]. Disponible a: https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?pq-origsite=primo&docID=554559. ISBN 9786612657580.

Complementaria:
- Shapiro, Jeremy F. Modeling the supply chain. 2nd ed. Belmont: Thomson Brooks/Cole, 2007. ISBN 049512611X.