

Academic Year/course: 2021/22

27027 - Stochastic Optimisation

Syllabus Information

Academic Year: 2021/22

Subject: 27027 - Stochastic Optimisation

Faculty / School: 100 - Facultad de Ciencias

Degree: 453 - Degree in Mathematics

ECTS: 6.0

Year: 4

Semester: First semester

Subject Type: Optional

Module:

1. General information

2. Learning goals

3. Assessment (1st and 2nd call)

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The methodology followed in this course is oriented towards the achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as lectures, problem-solving sessions and laboratory sessions.

4.2. Learning tasks

This course is organized as follows:

- **Lectures.** They consist on the 35% of the sessions. Lecture slides and other important materials will be posted on Moodle; please check it regularly.
- **Problem-solving sessions.** They consist on the 50% of the sessions.
- **Laboratory sessions.** They consist on the 15% of the classes.

The teaching activities and assessment tasks will take place in a face-to-face mode, except in the case that, due to the health situation, the dispositions emitted by the competent authorities and by the University of Zaragoza compel to take them to a greater or lesser extent in a telematic form.

4.3. Syllabus

This course addresses the following topics:

- **Topic 1:** Decision analysis.
- **Topic 2:** Dynamic programming.
- **Topic 3:** Markov chains.
- **Topic 4:** Queuing theory.
- **Topic 5:** Simulation.

4.4. Course planning and calendar

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course will be provided on the first day of class, or please refer to the Faculty of Sciences website and Moodle.

4.5. Bibliography and recommended resources

- A.O. Allen. Probability, statistics, and queueing theory : with computer science applications. Academic Press, New York, 2nd edition, 1990.
- U.N. Bhat. Elements of Applied Stochastic Processes. John Wiley and Sons, New York, 2nd edition, 1984.
- D. Gross, J.F. Shortle, J.M. Thompson, C.M. Harris. Fundamentals of queueing theory. John Wiley and Sons, 4th edition, 2008.
- D.P. Heyman, M.J. Sobel. Stochastic Models in Operations Research, vol. I. Dover Publications, INC, Mineola, NY, 1982.
- F.S. Hillier, G.J. Lieberman. Introducción a la Investigación de Operaciones. McGrawHill, México, octava edición, 2006.
- L. Kleinrock. Queueing Systems, vol. 1: Theory. John Wiley and Sons, New York, 1975.
- L. Kleinrock. Queueing Systems, vol. 2: Computer Applications. John Wiley and Sons, New York, 1975.
- V.G. Kulkarni. Modeling, Analysis, Design and Control of Stochastic Systems. Springer, New York, 1999.
- A.M. Law, W.D. Kelton. Simulation Modeling and Analysis. McGrawHill, Boston, 3rd edition, 2000.
- A. Ravindran, D.T. Phillips, J.J. Solberg. Operations Research. Principles and Practice. John Wiley and Sons, New York, 2nd edition, 1987.
- K.S. Trivedi. Probability and Statistics with Reliability, Queuing and Computer Science Applications. John Wiley and Sons, 2nd edition, 2002.
- W.L. Winston. Operations Research. Thomsom Brooks/Cole, Belmont, CA, 4th edition, 2004.

<http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=27027>