Universidad Zaragoza

Academic Year/course: 2021/22

30208 - Discrete mathematics

Syllabus Information

Academic Year: 2021/22
Subject: 30208 - Matemática discreta
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
326 - Escuela Universitaria Politécnica de Teruel
Degree: 439 - Bachelor's Degree in Informatics Engineering
443 - Bachelor's Degree in Informatics Engineering
ECTS: 6.0
Year: 1
Semester: Second semester
Subject Type: Basic Education
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 learning process designed for this course is based on the following items:

1. An active engagement of the student during the lectures.
2. An effective scheduling on the part of the student, studying the subject on a regular basis and trying to solve the proposed problems.
3. Previous preparation on the student's part of the material to be covered during the computer lab sessions.

4.2. Learning tasks

The course includes the following learning tasks:

1. Lectures.
2. Computer lab sessions.
3. Tutorials.

4.3. Syllabus

The course will address the following topics:

1. Logic

Connectives, truth tables, logical equivalence, tautologies, valid and invalid arguments, introduction to predicate logic.

2. Number theory

Principle of induction, Euclidean division, Euclidean algorithm, Bézout's identity, fundamental theorem of arithmetic, congruences, Chinese remainder theorem, modular binary exponentiation, Fermat's little theorem, Euler's theorem, RSA.

3. Combinatorics

Permutations, combinations, rule of sum, rule of product, binomial coefficients, pigeonhole principle, inclusion-exclusion principle, recurrence relations.

4. Graph theory

Basic concepts, Eulerian graphs, Hamiltonian graphs, matrix representations of graphs, isomorphisms of graphs, trees, Kruskal's algorithm, Prim's algorithm, Dijkstra's algorithm.

4.4. Course planning and calendar

Planning

The amount of time required to obtain the expected learning outcomes is estimated at 150 hours, distributed as follows:

- 45 hours of lectures (3 hours per week)
- 12 hours of computer lab sessions (6 sessions of 2 hours each)
- 90 hours of independent learning
- 3 hours of final written exam

Scheduling

The schedule of the face-to-face classroom sessions is set by the institution and can be found on its webpage. Dates for the assessment tests will be announced well in advance.

4.5. Bibliography and recommended resources

Teruel:
http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=30208&Identificador=12494
Zaragoza:
http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=30208&Identificador=12636