Discrete Mathematics

Academic Year: (2022 / 2023) **Review date: 30/05/2022 12:58:41**

Department assigned to the subject: Mathematics Department

Coordinating teacher: SALAS MARTINEZ, JESUS

Type: Basic Core ECTS Credits : 6.0

Year : 1 Semester : 2

Branch of knowledge: Engineering and Architecture

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Calculus (First year / First semester)
Linear Algebra (First year / First semester)

LEARNING OUTCOMES

¿ Know and apply sets, algebraic structures and binary relations.
¿ Propose and solve combinatorial and counting problems using basic and advanced methods such as generating functions and recurrence relations.
¿ Know and apply graph and tree theories to real problems.

DESCRIPTION OF CONTENTS: PROGRAMME

1. Basic set theory.
2. Basic and advanced combinatorics.
3. Graph theory.
4. Algorithms in graph theory.
5. Equivalence relations and application in modulcar arithmetic.
6. Order relations and mathematical induction.
7. Lattices and Boolean algebras.

LEARNING ACTIVITIES AND METHODOLOGY

* THEORETICAL-PRACTICAL CLASSES: 2 ECTS. Concepts and knowledge to be acquired are presented in these sessions. Students are provided with lecture notes and can find basic reference bibliography to facilitate class understanding and posterior personal work. Exercises are solved by students for self-assessment and achievement of necessary skill. During the practical sessions, students are presented with exercises that are discussed and solved.
* INDIVIDUAL AND GROUP WORK: 2.5 ECTS. Students' personal work.
* CONTINUOUS ASSESSMENTS. 1 ECTS. Knowledge, skills and abilities, gradually acquired, are globally assessed. They serve as self-assessment of progress to adapt learning strategies if necessary.
* TUTORING SESSIONS. Sessions to clarify theoretical or practical issues encountered by students on an individual or in-group basis.
* FINAL EXAM: 0.5 ECTS. Knowledge, skills and abilities acquired over the course of the academic semester are globally assessed.

ASSESSMENT SYSTEM

% end-of-term-examination/test:	60
% of continuous assessment (assigments, laboratory, practicals…):	40

We follow a continuous-assessment system (40%) plus a final exam (60%):

a) The continuous-assessment part consists in two mid-term exams that will be held in regular class hours, according to the current regulations. These mid-term tests allow the students to modify their own learning strategies, if necessary.

% end-of-term-examination/test:	60
% of continuous assessment (assigments, laboratory, practicals…):	40

b) The final exam will be held at the end of the semester, and allows to assess globally the knowledge of the course topics, skills, and capabilities adquired by the students.

There is an resit exam in June for those students who did not obtain the required end-of-semester mark. This resit exam has a maximum mark of 10, and the June final mark is given by max(RE, 0.6 RE + 0.4 CA), where RE (resp. CA) is the resit-exam (resp. continuous-assessment) mark.

BASIC BIBLIOGRAPHY

- F. García Merayo Matemática Discreta, Paraninfo, 2015

- J. Matousek and J. Nesetril Invitation to Discrete Mathematics, Oxford, 2004

- K.H. Rosen Discrete Mathematics and Its Applications, McGraw-Hill, 7th edition, 2012

ADDITIONAL BIBLIOGRAPHY

- N.L. Biggs Discrete Mathematics, Oxford University Press, 2002

- R.P. Grimaldi Discrete and Combinatorial Mathematics: An Applied Introduction, Addison Wesley, 2003