

Fundamentals of Algebra

Academic Year: (2020 / 2021)

Review date: 10/07/2020 10:54:06

Department assigned to the subject: Mathematics Department

Coordinating teacher: BRANDLE CERQUEIRA, CRISTINA

Type: Basic Core ECTS Credits : 6.0

Year : 1 Semester : 1

Branch of knowledge: Engineering and Architecture

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

None

OBJECTIVES

Students have shown that they know and understand:

1. the mathematical language and abstract-rigorous reasoning as well as to apply them to state and prove precise results in several areas in mathematics.
2. the fundamental results from mathematical logic, set theory and fundamentals of algebra.
3. the fundamental mathematical results supporting the theory and the development of programming languages and intelligent systems.

DESCRIPTION OF CONTENTS: PROGRAMME

1. Logic and mathematical proofs
2. Elementary set theory and functions
3. Integer numbers and modular arithmetic
4. Groups

LEARNING ACTIVITIES AND METHODOLOGY

1. THEORETICAL-PRACTICAL CLASSES, where the knowledge that the students must acquire is explained and developed. Students will have basic reference texts to facilitate the understanding of the classes and the development of follow up work. The teacher and the students will solve exercises and practical problems, previously suggested by the teacher.
2. TUTORING SESSIONS. Individualized attendance for students with a teacher for at least two hours a week.
3. STUDENT INDIVIDUAL OR GROUP WORK. Each student's individualized study, understanding of results and proofs, and exercise and problem-solving is fundamental in mathematics, both for learning and for self-evaluation of acquired competencies and skills.

ASSESSMENT SYSTEM

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

FINAL EXAM: It allows to assess the student's general understanding of the subject.

CONTINUOUS EVALUATION. It consists of two mid-term exams held along the course to assess the student's progression. Continuous evaluation also allows students themselves to modify their learning strategies, in case it is necessary.

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

BASIC BIBLIOGRAPHY

- Kenneth H Rosen Discrete Mathematics and Its Applications, McGraw-Hill Education, 2011 (7ed)
- Martin Liebeck A concise Introduction to Pure Mathematics, CRC Press, 2016 (4ed)
- Thomas W. Judson Abstract Algebra: theory and applications, orthogonal publishing, 2019

ADDITIONAL BIBLIOGRAPHY

- Bruce N. Cooperstein An Introduction to Groups, Rings, and Fields, Worldwide Center of Mathematics, 2012
- Fernando Q. Gouvêa A Guide to Groups, Rings, and Fields, Mathematical Association of America, 2012
- Susanna S. Epp Discrete Mathematics with Applications, Cenage Learning, 2011