

Programming

Academic Year: (2016 / 2017)

Review date: 27-04-2016

Department assigned to the subject: Computer Science and Engineering Department

Coordinating teacher: GUTIERREZ SANCHEZ, GERMAN

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)

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OBJECTIVES

General Description:

This course provides an overview of fundamental topics in Computer Engineering and Computer Programming. Students will learn the basis of hardware architecture, software engineering and algorithm development. Additionally, the use of MATLAB in the lab sessions will provide the students with a high-level technical computing language and an interactive environment for algorithm development, data visualization, data analysis, and numeric computation.

Learning Objectives:

1. Identify and explain the fundamental topics in the field of Computer Engineering and Computer Programming that facilitate students the capabilities to learn new methods and theories in the field of Aerospace Engineering.
2. Recognize and describe the latest Information and Communication Technologies (ICT) that allow students to develop effectively their academic and professional career in the field of Aerospace Engineering.
3. Select and apply computer programming (e.g., algorithm development, data visualization, data analysis, etc.) to solve problems that may arise in the field of Aeronautical Engineering.
4. Use of the knowledge and acquired skills to adapt to the changes that technology development bring in the tools necessary for the practice of the profession and that are commonly used in the field of Aerospace Engineering.

DESCRIPTION OF CONTENTS: PROGRAMME

UNIT 1 INTRODUCTION TO PROGRAMMING

- 1.1 Data Types and Basic Instructions
- 1.2 Structured Programming.
- 1.3 Vectors, Matrices, Arrays
- 1.4 Conditional Structures
- 1.5 Iterative Structures (Loops)
- 1.6 Functions
- 1.7 Records
 - 1.7.1 Cell Arrays (Matlab)
- 1.8 Files
- 1.9 Search and Sort
- 1.10 Language C
 - 1.10.1 Introduction to Language C
 - 1.10.2 Declaration of Variables
 - 1.10.3 Data Types
 - 1.10.4 Structs
 - 1.10.5 Pointers

UNIT 2 INTRODUCTION TO COMPUTER SCIENCE

- 2.1 Information Technology
- 2.2 Software
- 2.3 Data Structures (databases)
- 2.4 Operating Systems
- 2.5 Hardware
- 2.6 Telecommunications

LEARNING ACTIVITIES AND METHODOLOGY

The learning activities in lectures and labs sessions are split in the following:

- lectures (50% of classroom learning activities)
- lab sessions (50% of classroom learning activities)

The student must aware the his/her work out of the classroom is also part of his/her learning activities for the subject, and this work is at least half of the work to do in the subject.

ASSESSMENT SYSTEM

We follow a continuous assessment system in which the students can obtain the 100% of their final grading as follows:

- 1) 50% comes from tests questions and problems to solve in more than one mid-term exams, and
- 2) 50% comes from a final exam.

NOTE: Students not following the continuous assesment can have access to a final exam with a maximum grade of 60%.

Additionally, students will also have the opportunity to take an extraordinary exam graded as follows:

A. If the student followed the continuous assessment, the extraordinary exam will have the same value as the ordinary final exam (i.e., 50%), and the final grade will be the sum of the continuous assessment grade and the extraordinary exam.

B. If the student did not follow the continuous assessment she/he will have access to an extraordinary exam worth 100% of the total grade.

NOTE. Students can choose A. or B. grading before taking the extraordinary exam.

% end-of-term-examination:	50
% of continuous assessment (assigments, laboratory, practicals...):	50

BASIC BIBLIOGRAPHY

- Alan Clements Principles of Computer Hardware, Online resource Centre.
- Behrouz Forouzan and Firouz Mosharraf Foundations of Computer Science , Cengage.
- Bernard Sklar Digital Communications. Fundamentes and Applications, PTR Prentice Hall.
- Bernard Sklar Digital Communications. Fundamentes and Applications, PTR Prentice Hall.
- C. Godart, F. Charoy Databases for Software Engineering, The BCS Practitioners Series.
- Dezso Sima, Terence Fountain, Peter Kacsuk Advanced Computer Arquitectures, Pearson Addison Wesley.
- Edward Yourdon Modern Structured Analysis, Prentice Hall International Editions.
- Hwei Hsu Analog and digital communications, PhD. Schaum's outline series.
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- ITL Education Solutions Limited Introduction to Information Technology, Pearson Education India.
- M. Morris Mano Computer System Arquitecture, Prentice Hall International Editions.
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- Ravi Sethi Programming languages, concepts and constructs, Addison-Wesley.

- V. Rajaraman Introduction To Information Technology, Prentice-Hall of India Pvt.Ltd.
- William Stallings Computer Organization and Arquitecture, Macmillan Publishing.