Vehicle Automation

Academic Year: (2019 / 2020) **Review date: 20-04-2020**

Department assigned to the subject: Systems Engineering and Automation Department

Coordinating teacher: ARMINGOL MORENO, JOSE MARIA

Type: Electives ECTS Credits : 6.0

Year : 4 Semester :

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Industrial Automation I
Control Engineering

OBJECTIVES

By the end of this content area, students will be able to have:
1. coherent knowledge of their branch of engineering including some at the forefront of the branch in vehicle automation applications;
2. the ability to apply their knowledge and understanding of automation applications to identify, formulate and solve engineering problems using established methods in vehicle automation;
3. the ability to apply their knowledge and understanding to develop and realise designs of automation applications to meet defined and specified requirements (localization, control and communications);
4. workshop and instrumentation skills.
5. an understanding of applicable techniques and methods in automation applications, and of their limitations;
6. demonstrate awareness of the health, safety and legal issues and responsibilities of engineering practice, the impact of engineering solutions in a societal and environmental context, and commit to professional ethics, responsibilities and norms of engineering practice;

DESCRIPTION OF CONTENTS: PROGRAMME

1- Introduction.
2- Automotive embedded systems.
  2.1 - Safety features in cars
  2.2 - Advanced driver assistance systems
  2.3 - Intelligent vehicles
3- Rail embedded systems.
  3.1 - Railway installations
  3.2 - Rail signalling system
  3.3 - Maintenance
4- Aircraft embedded systems.
  4.1 - Flight control systems
  4.2 - Air navigation
  4.3 - Unmanned Air systems
5- Traffic Control Systems.
  5.1- Road, Railroad and Aerial Safety
  5.2 - Environmental impact

LEARNING ACTIVITIES AND METHODOLOGY

- Skillful classes, classes of resolution of doubts in reduced groups, individual presentations of the students, individual tutorials and personal work of the student; oriented to the theoretical knowledge acquisition (3 credits ECTS).

- Practices of laboratory and individual classes of problems in reduced groups, individual tutorials and personal work of the student; oriented to the acquisition of practical abilities related to the program of the subject (3 credits ECTS).

ASSESSMENT SYSTEM

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

Continuous evaluation based on works, participation in class and tests of evaluation of abilities and knowledge.

BASIC BIBLIOGRAPHY

- E. H. J. Pallett & Shawn Coyle Automatic Flight Control, Blackwell Science Ltd., 1993

- Editors: Eskandarian, Azim (Ed.) Handbook of Intelligent Vehicles, Springer, 2012

- LOPEZ PITA, ANDRES FERROCARRIL Y AVION EN EL SISTEMA DE TRANSPORTES EUROPEO, UPC, 2001

- Navet N. Automotive embedded systems handbook, CRC Press, 2009

ADDITIONAL BIBLIOGRAPHY

- Bishop, Richard Intelligent vehicle technology and trends, Artech House, 2005

- Bonnett, Clifford F. Practical railway engineering , Imperial College Press, 2005

- Chen, Yaobin; Li, Lingxi Advances in Intelligent Vehicles, Elsevier, 2014

- Lemke K. Embedded security in cars, Springer, 2006

- Roger W. Pratt Flight Control Systems, Loughborough University - Progress in Astronautics and Aeronautics Series, V-184 Published by AIAA, 2000

- Yaobin Chen, Lingxi Li Advances in Intelligent Vehicles, Elsevier, 2014

BASIC ELECTRONIC RESOURCES

- Yaobin Chen and Lingxi Li . Advances in Intelligent Vehicles : //http://www.sciencedirect.com/science/book/9780123971999