60930 - Radar, radionavegation and satellite systems

Información del Plan Docente

Academic Year   2016/17

Academic center   110 - Escuela de Ingeniería y Arquitectura

Degree   533 - Master's Degree in Telecommunications Engineering

ECTS   5.0

Course   1

Period   Second semester

Subject Type   Compulsory

Module   ---

1.Basic info

1.1.Recommendations to take this course

1.2.Activities and key dates for the course

2.Initiation

2.1.Learning outcomes that define the subject

2.2.Introduction

3.Context and competences

3.1.Goals

3.2.Context and meaning of the subject in the degree

3.3.Competences

3.4.Importance of learning outcomes

4.Evaluation

5.Activities and resources

5.1.General methodological presentation

Lectures : Oral presentation about the main subjects

Exercises : Individidual or group resolution of suggested exercicies

Laboratory assignments : on-site activity in laboratory facilities.

Group assignment : non on-site activity.

Academic tutoring.

Evaluation . Based on a final test, laboratory work and the results of the group assignment.

5.2.Learning activities

Lectures : 38 hours presenting the basic contents of the course

Exercises : 8 hours

Laboratory assignments : 2 sessions of 2 hours each

Group assignments : each group of students, under the supervision of a teacher, will be asigned a case study related to radar systems.

5.3.Program

UNIT 1. Introduction and required background

UNIT 2. Satellite communication systems

- Basics of Orbital Mechanics and Geodesic

- Satellite subsystems and spatial enviroment

- Channel and Link Calculation

- Communication techniques in satellite communication systems: physical layer and multiple access.

UNIT 3. Radio Localization Systems

- Coordinate and projection systems in radio localization systems. Mathematical methods for positioning stimation.

- Directional and hyperbolic Radionavigation systems: terrestial systems

- GNSS systems

UNIT 4. Radar Systems

- Introduction to Radar systems.

60930 - Radar, radionavegation and satellite systems

- Basics of Radar: pulsed and continuous wave radar

- Enviorement interference. CFAR systems

- Advanced techniques

5.4.Planning and scheduling

The schedule for lecture and laboratory sessions and the evaluation dates will be provided by the university before the beginning of the semester.

5.5.Bibliography and recomended resources

The students will have access to a collection of lecture notes prepared by the teachers, which will cover all the contents of this course.

- Skolnik, Merrill I.. Introduction to radar systems / Merrill I. Skolnik . - 2nd ed., international ed. Aukland [etc.] : McGraw-Hill, 1981
- Levanon, Nadav. Radar principles / Nadav Levanon New York [etc.] : John Wiley & Sons, cop. 1988
- Edde, Byron. Radar : Principles, technology, applications / Byron Edde Englewood Cliffs : Prentice-Hall, cop. 1993
- Principles of modern radar / edited by Jerry L. Eaves and Edward K. Reedy New York : Van Nostrand Reinhold, cop. 1987
- Maral, Gérard. Satellite communications systems : systems, techniques and technology / Gérard Maral, Michel Bousquet . 4th ed., repr. with corr. Chichester (England) : John Wiley & Sons, 2007
- Gordon, G.D.. Principles of communications satellites / G.D. Gordon, W.L. Morgan New York: Wiley, 1993
- Roddy, J.D. Satellite Communications /] D. Roddy. . - 4th ed. Editorial McGraw Hill, 2006
- Evans, B.G.. Satellite Communications systems / B.G. Evans. - 3rd ed. The Institution of Engineering and Technology (IET), London, United Kingdom.
- Ippolito, Louis J.. Satellite Communications Systems Engineering / Louis J. Ippolito, Jr. JohnWiley & Sons Ltd, 2008
- Forsell, J. Borje. Radionavigation systems /] Börje Forsell Artech House, 2008
- Understanding GPS : principles and applications / Elliot D. Kaplan, editor Boston [etc.] : Artech House, cop. 1996
- Gleason, S.. GNSS Applications and Methods / S. Gleason, D. Gebre-Eqziabher Artech House, 2009
- Hofmann-Wellenhof, B.. GNSS - Global Navigation Satellite Systems: GPS, GLONASS, Galileo, and more / B. Hofmann-Wellenhof, H. Lichtenegger Springer Verlag, 2007
- Grewal, M.S.. Global Navigation Satellite Systems, Inertial Navigation, and Integration / M. S Grewal, A. P. Andrews, C. G. Bartone. - 3rd ed. Wiley-Interscience, 2013