Mobile Networks

Academic Year: (2019 / 2020)   **Review date: 25/03/2019 12:24:39**

Department assigned to the subject:

Coordinating teacher: SOTO CAMPOS, IGNACIO

Type: Electives ECTS Credits : 3.0

Year : 1 Semester : 1

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

It is expected that students enrolled in this course have knowledge of packet-switched communications networks, TCP/IP protocol stack, as well as basic statistics and simulation.

OBJECTIVES

This course strengthens the acquisition of the basic competence CB6 and the specific competences CE1, CE2, CE3 and CE5. The course enables the acquisition of the following speciality competences:
- CS 2.1 The ability to analyse telematic networks, specifically robustness and reliability of networks based on the degree of connectivity
- CS 2.3 The ability to understand advanced topics in wireless communications, in particular those related with performance, connectivity, and location
- CS 2.9: Understand the impact of the user's mobility, the attachment point discovery and selection, and the strategies of terminal handoff, with a particular emphasis on its performance and optimization.

Students are expected to learn about the following:
- Knowledge and understanding of the users¿ and devices¿ mobility in a packet switched communications network.
- Knowledge of the state-of-the-art of the main approaches proposed to tackle the mobility problem, as well as of the basic tools required to face the design of a new solution (i.e., mobility models, performance assessment).

DESCRIPTION OF CONTENTS: PROGRAMME

The course covers the following topics:
- The problem of mobility in communication networks, cellular networks, network selection and heterogeneous networks.
- Survey of the classical IP mobility solutions as well as the new trends: flow mobility and distributed mobility management.
- Vehicular networks.
- Identity and location: geographic routing.
- DTN networks: opportunistic routing.
- Mobile ad hoc networks.
- Lab on IP mobility, using real software implementing Mobile IPv6 and Proxy Mobile IPv6

These topics are organized in 4 parts:
Part I: Introduction to mobility
Part II: Advanced IP mobility
Part III: Mobility and routing
Part IV: Performance evaluation

LEARNING ACTIVITIES AND METHODOLOGY

The activities followed during the course are:
- Lectures. Presentation of a summary of the main concepts. Discussion of the different topics acquired by the students during the self-learning phase, and resolution of the questions posed by the students.

- Case studies: classes in which students must analyse and solve case studies with the supervision of the professor.
- Labs

ASSESSMENT SYSTEM

% end-of-term-examination/test:	0
% of continuous assessment (assigments, laboratory, practicals…):	100

The course is organized in 4 parts. So, all the students have to prepare 4 assigments. The final session of each part will be devoted to presenting an assignment related to this part.
This assigments can be:
- to read and discuss some material provided by the teacher
- To review a research paper
- ...

BASIC BIBLIOGRAPHY

- Hesham Soliman Mobile IPv6: mobility in a wireless Internet, Addison-Wesley, 2004

ADDITIONAL BIBLIOGRAPHY

- Hassnaa Moustafa Vehicular networks : techniques, standards, and applications, CRC Press, 2009

- M. Olsson, S. Sultana, S. Rommer, L. Frid, C. Mulligan SAE and the Evolved Packet Core, Elsevier Academic Press, 2009

- Magnus Olsson, Catherine Mulligan EPC and 4G Packet Networks, Second Edition: Driving the Mobile Broadband Revolution, Academic Press, 2012

- Mieso K. Denko Mobile Opportunistic Networks: Architectures, Protocols and Applications, CRC Press, 2009

- Qing Li; Tatuya Jinmei; Keiichi Shima Mobile IPv6: protocols and implementation, Morgan Kaufmann, 2009

- Rajeev S. Koodli Mobile inter-networking with IPv6 : concepts, principles, and practices , John Wiley & Sons, 2007

- Rajev S. Koodli, Charles E. Perkins Mobile Inter-Networking with IPv6: concepts, principles, and practices, Wiley, 2007

- Rick Graziani IPv6 Fundamentals: A Straightforward Approach to Understanding IPv6, Ciscopress, 2013

- Silvia Hagen IPv6 Essentials, O'Reilly Media, 2014