Next Generation Technologies and Services

ECTS: 6

Contact hours: 30 T + 30 PL

Total work hours: 162

Teacher

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Teaching tipology: T/PL

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Course Presentation

This advanced course in the area of information communications technologies and services provides to the students skills about designing and developing of next generation services supported on emerging technologies. For that purpose, throughout the course, the student is exposed to the most recent and relevant technologies, services, protocols and techniques, developed in the area. The students will be able to create, design and implement innovative solutions as well as present and defend them publicly.

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Goals

Dominance of concepts and architectures that support the next generation services;

Knowledge about emergent technologies, next generation networks and their applications;

Ability to define/create next generation services;

Knowledge about Quality of Service (QoS) and Quality of Experience (QoE) concepts and architectures;

Ability to identify and characterize applications that require QoS/QoE;

Ability to characterize and to define ICTs solutions accordingly to their QoS/QoE necessities and to the existent technologies;

Ability to propose and prototype new and innovative ICT solutions;

Ability to learn in new situations and contexts;

Ability to present the work carried out and to support the choices made.

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PROGRAM

Concepts about Next Generation Services;

Next Generation Networks;

Emergent Technologies;

Quality of Service (QoS);

Quality of Experience (QoE);

Next generation services: applications, architectures and technologies;

Development of Next Generation Solutions.

Teaching methodology

Theoretical classes
- 2h per week
- Presentation of the program contents;
- Small presentations made by students and discussion about the state of work.

Laboratorial classes
- 2h per week;
- ICT solution: proposal, definition, prototiping and presentation;
- Project support.

Important dates (to be confirmed in course evaluation map)
Theoretical and Pratical work publication (03/10/2016);
Pratical/project proposal presentation and validation(17/10/2016);
Theoretical work proposal presentation and validation (17/10/2016);
Theoretical work delivery(31/10/2015);
Pratical/project work delivery(20/12/2016);
Pratical/project presentation(09/01/2017 and 10/01/2017).

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Assessment

Periodic assessment

Project (P): 55% (minimum 10/20) - workgroups of 3 students;
A scientific article with the proposal of a next generation technology or service (A): 45% (minimum 10/20) – Individual work;

Public presentation and discussion;

Project presentations will occur during the classes of 19th, 20th December 2016;
Final score: F=0,45*A+0,55*P

Exams

TP: Theoretical and Practical exam in laboratory
Final score: TP

BIBLIOGRAPHY

Main

Teacher slides (course site)
Notes (course site)

- Unit and Ubiquitous Internet of Things, Huansheng Ning, CRC Press, ISBN 9781466561663
- Rafal Stankiewicz, Piotr Cholda, and Andrzej Jajszczyk, "QoX: What is It Really?", IEEE Communications Magazine (2011) Volume: 49, Issue: April, Publisher: IEEE, Pages: 148-158 , April 2011.
- Anand R. Prasad, John F Buford, K. Vijay Gurbani, "Future Internet Services and Service Architectures", ISBN-13: 978-8792329592, The River Publishers Series in Communications, June 2011
- Anand R. Prasad, John F. Buford, Vijay K. Gurbani, "Advances in Next Generation Services and Service Architectures", ISBN: 9788792329554, The River Publishers Series in Communications, April 2011
- Thomas Plevyak, Veli Sahin, "Next Generation Telecommunications Networks, Services, and Management" ISBN-13: 978-0470575284, IEEE Press Series on Network Management, April 2010;
- Adrian Farrel, "Network Quality of Service Know It All" Morgan Kaufmann Series, ISBN 978-0-12-374597-2, 2009
- Vinod Joseph, Brett Chapman, "Deploying QoS for Cisco IP and Next Generation Networks: The Definitive Guide", ISBN 978-0-12-374461-6, 2009
- XiPeng Xiao, "Technical, Commercial and Regulatory Challenges of QoS: An Internet Service Model Perspective "by, Morgan Kaufmann Series in Networking Series , ISBN: 978-0-12-373693-2 , September 2008

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Additional

GUOBIN, J., SHEN,. J. C, Multimedia Networking , Hindawi Publishers, 2007

SIMPSON, W., Video Over IP: A Practical Guide to Technology and Applications (Focal Press Media Technology Professional Series), Elsevier, 2006

ITU-T e ITU-R, Normas sobre a avaliação da qualidade em serviços multimédia

IETF, RFCs relacionadas com a temática de QoS e protocolos para comunicações multimédia

A. Meddeb, "Internet QoS: Pieces of the Puzzle," IEEE Commun. Mag., vol. 48, no. 2, pp. 86–94, Jan. 2010.