Course guide
340361 - FUIN-C9X01 - Future Internet

Last modified: 17/05/2023

Unit in charge: Vilanova i la Geltrú School of Engineering
Teaching unit: 701 - DAC - Department of Computer Architecture.

Degree: BACHELOR'S DEGREE IN INFORMATICS ENGINEERING (Syllabus 2018). (Compulsory subject).

Academic year: 2023 **ECTS Credits:** 6.0 **Languages:** Catalan, English

LECTURER

Coordinating lecturer: JAVIER MASIP BRUIN

Others: JAVIER MASIP BRUIN

PRIOR SKILLS

Solid knowledge on network concepts

REQUIREMENTS

No explicit requisits

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
3. CETI2. Ability to select, design, develop, integrate, value, construct, tmanage, exploit and maintain technologies of machines, programming and nets, keeping suitable costs and quality parameters.
4. CETI4. Ability to select, design, deploy, integrate and manage network and communications infrastructure in an organization.

5. CETI6. Ability to design systems, applications and services based on network technologies, including internet, website, e-commerce, multimedia, interactive services and mobile computing.
6. CETI7. Ability to understand, implement and manage security and safety of computing systems.

Transversal:
1. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.
2. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.

TEACHING METHODOLOGY

Theoretical sessions will be handled at the assigned classroom using the multimedia equipment available. The professor will start sessions with the specific topic and will open the room for general discussion, introducing concepts, papers (previously reported) and other initiatives. Sessions must be dynamic, so requiring active participation form students.
Papers discussions will be dynamically assigned and timely allocated. Papers discussions at the second half of the semester will be handled by the students individually and discussed through a clustering process within students before definitive public presentation.

LEARNING OBJECTIVES OF THE SUBJECT

Analyze current network technologies, not only current ones, but also those yet in research phase. Acquiring solid knowledge in new Internet technologies, paying special attention in the new network paradigms expected for the coming future. The objective is to provide the student with a clear picture in the overall network concepts from real deployed technologies to unforeseen research innovations.

STUDY LOAD

Type	Hours	Percentage
Hours small group	30,0	20.00
Hours large group	30,0	20.00
Self study	90,0	60.00

Total learning time: 150 h

CONTENTS

1. Current network model: Refreshing concepts

Description:
1.1. Components and protocols
1.2. Switching technologies
1.3. Layering model
1.4. Internet evolution

Specific objectives:
Align concepts about current Internet technologies so the students gets the required background to gat introduced to innovative network paradigms

Related activities:
Activity 1: Class discussion

Full-or-part-time: 11h 36m
Theory classes: 1h
Practical classes: 2h
Laboratory classes: 2h
Self study : 6h 36m

2. New network paradigms: Weaknesses

Description:
2.1. Functionalities
2.2. New trends

Specific objectives:
Understanding main weaknesses introduced by the new needs required by current and emerging services and aplications offered to users. Knowledge on trends at the reserach level to deal with these weaknesses.

Related activities:
Activity 1: Paper discussion

Full-or-part-time: 10h 36m
Theory classes: 1h
Practical classes: 2h
Laboratory classes: 2h
Self study : 5h 36m

3. Reserach trends

Description:
3.1. Functions and properties
3.2. Trends in routing, addressing, cloud, data,...
3.3. Internet of things

Specific objectives:
Identify most relevant activities and topics in the research area as well as the starte of the art progress

Related activities:
Activity 1: Paper discussion

Full-or-part-time: 21h 48m
Theory classes: 2h
Practical classes: 4h
Laboratory classes: 2h
Self study : 13h 48m

(ENG) 4. Routing & addressing

Description:
4.1. Functions and properties
4.2. Protocols
4.3. The future

Related activities:
Activity 1: Paper discussion

Full-or-part-time: 13h 36m
Theory classes: 1h
Practical classes: 2h
Laboratory classes: 2h
Guided activities: 3h
Self study : 5h 36m

(ENG) 5. Network management

Description:
5.1. QoS and QoE
5.2. Mobility
5.3. Addressing
5.4. Multimedia
5.5. Security
5.6. Eficiency

Related activities:
Activity 1: Lab
Activity 2: Papers discussion

Full-or-part-time: 30h 48m
Theory classes: 3h
Practical classes: 6h
Laboratory classes: 5h
Self study : 16h 48m

(ENG) 6. Programmable networks

Description:
6.1. SDN
6.2. Data centers
6.3. Cloud networking

Related activities:
Activity 1. Papers discussion

Full-or-part-time: 20h 12m
Theory classes: 2h
Practical classes: 4h
Laboratory classes: 1h
Self study : 13h 12m

(ENG) 7. Literature overview

Description:
7.1. Research lines
7.2. Evolutionaty vs revolutionary design
7.3. Multilayer architecture
7.4. Green networking
7.5. The future

Related activities:
Activity 1: Papers presentation

Full-or-part-time: 37h 24m
Theory classes: 4h
Practical classes: 8h
Guided activities: 3h
Self study : 22h 24m

GRADING SYSTEM

Final Mark = 50% Presentation + 50% Discussion session

EXAMINATION RULES.

All evaluation activities are mandatory

BIBLIOGRAPHY

Basic:
- Kurose, James F.; Ross, Keith W. Redes de computadoras : un enfoque descendente [on line]. 7a ed. Madrid: Pearson, 2017 [Consultation: 19/02/2024]. Available on: https://www-ingebook-com.recursos.biblioteca.upc.edu/ib/NPcd/IB_BooksVis?cod_primaria=1000187&codigo_libro=6752. ISBN 9788490355282.