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Architecture of the internet

Academic Year: (2020 / 2021)   **Review date: 03-07-2020**

Department assigned to the subject:

Coordinating teacher: GARCIA MARTINEZ, ALBERTO

Type: Electives ECTS Credits : 3.0

Year : 1 Semester : 2

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Knowledge on the TCP/IP architecture and routing protocols (fundamentals of distance vector and link state protocols)

OBJECTIVES

- General knowledge about the complex problema of data transport and network interconnection, integrating business model and technology.
- Be able to use logic and mathematic tools to cope with the problems associated to the convergence of routing protocols: stability, convergence costs, traffic engineering
- Integration of business models aspects to gain a holistic vision of the routing problem.
- Use cases:
   - Topology and routing in the Internet inter-domain
   - Topology and routing in datacenters
- Critical attitude in relation to current technologies.
- Ability to access, understand, present and generate technical literature related with the course
- Ability to communicate orally in an effective way

DESCRIPTION OF CONTENTS: PROGRAMME

- 	Reading, writing and presenting research articles related with communication networks
- 	Review on routing. Loop-freeness in routing protocols. Convergence in routing protocols
- 	Multipath architectures. Multipath routing protocols
- 	Interdomain routing in the Internet: BGP (Border Gateway Protocol). Commercial relationships in the provision of Internet connectivity.
- 	Stability of protocols supporting policies
- 	Convergence dynamics
- 	Traffic engineering in the Internet

LEARNING ACTIVITIES AND METHODOLOGY

- Self-learning, guided by the teachers
- Classes
- Debate sessions
- Presentation of articles by the students. First, there will be a round of presentations to provide feedback to the students (not evaluated), and then the final presentation.
- Problems solved by the students

ASSESSMENT SYSTEM

% end-of-term-examination: 0

% of continuous assessment (assigments, laboratory, practicals…):   100

- Presentation: the teachers will propose the students some articles related with the topics covered by the course, and the students will present the main results of these articles. The presentation will be performed individually. This part will have the largest weight in the final qualification.
- Short exams about the topics presented in class

% end-of-term-examination: 0

% of continuous assessment (assigments, laboratory, practicals…):   100

- Participation in class.
- Student's personal work.

Students not attending to 80% of the classes will be required to pass an exam about the topics covered by the course as a requisite to be evaluated.

BASIC BIBLIOGRAPHY

- Craig Labovitz, Abha Ahuja, Abhijit Bose, and Farnam Jahanian Delayed Internet Routing Convergence, IEEE Transactions on Networking, 2002

- Iljitsch Van Beijnum BGP, O'Reilly, 2002

- Lixin Gao and Jennifer Rexford Stable Internet Routing Without Global Coordination, IEEE Transactions on Networking, 1999

- Timothy G. Griffin, F. Bruce Shepherd, and Gordon Wilfong The Stable Paths Problem and Interdomain Routing, IEEE Transactions on Networking, 2001

ADDITIONAL BIBLIOGRAPHY

- T. G. Griffin, F. B. Shepherd, G. Wilfong The Stable Paths Problem and Interdomain Routing, Article: IEEE Transactions on Networking, Vol 10, nº 2, April 2002