# UNIVERSIDAD DE CASTILLA - LA MANCHA
## GUÍA DOCENTE

## 1. General information

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|---|---|
| **Course:** NETWORK INFRASTRUCTURE DESIGN | **Code:** 42337 |
| **Type:** CORE COURSE | **ECTS credits:** 6 |
| **Degree:** 347 - DEGREE PROGRAMME IN COMPUTER SCIENCE ENGINEERING (CR) | **Academic year:** 2020-21 |
| **Center:** 108 - SCHOOL OF COMPUTER SCIENCE OF C. REAL | **Group(s):** 20 |
| **Year:** 3 | **Duration:** C2 |
| **Main language:** Spanish | **Second language:** English |
| **Use of additional languages:** | **English Friendly:** Y |
| **Web site:** | **Bilingual:** N |

**Lecturer: JAVIER AYLLON PEREZ** - Group(s): **20**

| Building/Office | Department | Phone number | Email | Office hours |
|---|---|---|---|---|
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**Lecturer: JUAN CARLOS LOPEZ LOPEZ** - Group(s): **20**

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## 2. Pre-Requisites

Basic TCP/IP Network , programming and theory experience.

## 3. Justification in the curriculum, relation to other subjects and to the profession

In this course you will learn the principles of network design. We will deeply study advanced networks usually found on datacenters such as Infiniband.

## 4. Degree competences achieved in this course

### Course competences

| Code | Description |
|---|---|
| IC08 | Ability to design, develop, manage, and administrate computer networks. |
| INS01 | Analysis, synthesis, and assessment skills. |
| INS02 | Organising and planning skills. |
| INS04 | Problem solving skills by the application of engineering techniques. |
| INS05 | Argumentative skills to logically justify and explain decisions and opinions. |
| PER02 | Ability to work in multidisciplinary teams. |
| PER04 | Interpersonal relationship skills. |
| PER05 | Acknowledgement of human diversity, equal rights, and cultural variety. |
| SIS01 | Critical thinking. |
| SIS03 | Autonomous learning. |
| SIS04 | Adaptation to new scenarios. |
| SIS05 | Creativity. |

## 5. Objectives or Learning Outcomes

### Course learning outcomes

Description

Ability to apply the rules of structured network cabling.
Ability to configure and manage the parameters related to the quality of service of a computer network
Ability to identify the requirements necessary for the design of a network.
Ability to plan and size a SAN, LAN, MAN and WAN network.

## 6. Units / Contents

**Unit 1: Review of networks architecture.**
**Unit 2: Network prerequistes. Quality of service.**
**Unit 3: Intrastructures.**
**Unit 4: High speed networks.**
**Unit 5: Convergence. Hands on with MPI over Infiniband.**

## 7. Activities, Units/Modules and Methodology

| Training Activity | Methodology | Related Competences (only degrees before RD 822/2021) | ECTS | Hours | As | Com | Description |
|---|---|---|---|---|---|---|---|
| Class Attendance (theory) [ON-SITE] | Lectures | IC08 | 0.6 | 15 | N | - | Teaching of the subject matter by lecturer |
| Individual tutoring sessions [ON-SITE] | | IC08 | 0.18 | 4.5 | N | - | Individual or small group tutoring in lecturer¿s office, classroom or laboratory |
| Study and Exam Preparation [OFF-SITE] | Self-study | IC08 | 1.8 | 45 | N | - | Self-study |
| Other off-site activity [OFF-SITE] | Practical or hands-on activities | IC08 INS01 INS02 INS04 INS05 PER02 PER04 PER05 SIS05 | 0.9 | 22.5 | N | - | Lab practical preparation |
| Problem solving and/or case studies [ON-SITE] | Problem solving and exercises | IC08 INS04 INS05 PER02 PER04 PER05 SIS01 | 0.6 | 15 | Y | N | Worked example problems and cases resolution by the lecturer and the students |
| Writing of reports or projects [OFF-SITE] | Self-study | IC08 INS01 INS02 INS04 INS05 PER02 PER04 PER05 SIS01 SIS03 SIS04 SIS05 | 0.9 | 22.5 | Y | N | Preparation of essays on topics proposed by lecturer |
| Laboratory practice or sessions [ON-SITE] | Practical or hands-on activities | IC08 INS04 INS05 PER02 PER04 PER05 | 0.72 | 18 | Y | Y | Realization of practicals in laboratory/computing room |
| Other on-site activities [ON-SITE] | Assessment tests | IC08 INS01 INS04 INS05 PER02 SIS05 | 0.3 | 7.5 | Y | Y | According to the evaluation modality |
| **Total:** | | | **6** | **150** | | | |
| **Total credits of in-class work: 2.4** | | | | **Total class time hours: 60** | | | |
| **Total credits of out of class work: 3.6** | | | | **Total hours of out of class work: 90** | | | |

As: Assessable training activity

Com: Training activity of compulsory overcoming (It will be essential to overcome both continuous and non-continuous assessment).

## 8. Evaluation criteria and Grading System

| Evaluation System | Continuous assessment | Non-continuous evaluation* | Description |
|---|---|---|---|
| Test | 25.00% | 25.00% | Partial test 1 of the first half of the syllabus of the subject |
| Test | 25.00% | 25.00% | Partial test 2 of the second half of the syllabus of the subject |
| Theoretical papers assessment | 15.00% | 15.00% | Non-compulsory activity that can be retaken. To be carried out before end of teaching period |
| Laboratory sessions | 25.00% | 25.00% | Compulsory activity that can be retaken. To be carried out during lab sessions |
| Oral presentations assessment | 10.00% | 10.00% | Non-compulsory activity that cannot be retaken. To be carried out during the theory/lab sessions |
| **Total:** | **100.00%** | **100.00%** | |

*According to art. 4 of the UCLM Student Evaluation Regulations, it must be provided to students who cannot regularly attend face-to-face training activities the passing of the subject, having the right (art. 12.2) to be globally graded, in 2 annual calls per subject , an ordinary and an extraordinary one (evaluating 100% of the competences).*

**Evaluation criteria for the final exam:**

**Continuous assessment:**

In compulsory activities, a minimum mark of 40% is required in order to pass that activity and have the possibility to therefore pass the entire subject. The evaluation of the activities will be global and therefore must be quantified by means of a single mark. If the activity consists of several sections, each section may be evaluated separately provided students are informed in writing of this evaluation criterion at the beginning of the academic year. In the case of the activities that may be retaken (i.e., rescheduling), an alternative activity or test will be offered in the resit/retake exam call (convocatoria extraordinaria).

The partial tests will be common for all the theory/laboratory groups of the subject and will be evaluated by the lecturers of the subject in a serial way, i.e., each part of the final exam will be evaluated by the same lecturer for all the students.

A student is considered to pass the subject if she/he obtains a minimum of 50 points out of 100, taking into account the points obtained in all the evaluable activities, and also has passed all the compulsory activities.

For students who do not pass the subject in the final exam call (convocatoria ordinaria), the marks of activities already passed will be conserved for the resit/retake exam call (convocatoria extraordinaria). The oral presentations assessment (non-recoverable activity) will be conserved for the resit/retake exam call even if it has not been passed. In the case of the passed recoverable activities, the student will have the opportunity to receive an alternative evaluation of those activities in the resit/retake exam call and, in that case, the final grade of the activity will correspond to the latter grade obtained.

The qualification of the passed activities in any call, except for the partial tests, will be conserved for the next academic year at the request of the student, provided that it is equal or superior to 5 and the training activities and the evaluation criteria of the subject are not modified in the next academic year.

The failure of a student to attend the partial 1 and partial 2 tests will automatically result in her/him receiving a "Failure to attend¿ (no presentado). If the student has not passed any compulsory evaluation activity, the maximum final grade will be 40%.

**Non-continuous evaluation:**

Students who are unable to attend training activities on a regular basis may apply at the beginning of the semester for the non-continuous assessment mode. Similarly, if a student who is undergoing continuous assessment incurs any circumstance that prevents her/him from regularly attending the classroom-based training activities, she/he may renounce the accumulated mark in continuous assessment and apply for the non-continuous assessment mode. In this case, a notification by the student must be given before the date scheduled for the tests in the ordinary call, in accordance with a deadline that will be informed at the beginning of the semester. Students who take the non-continuous assessment mode will be globally graded, in 2 annual calls per subject , an ordinary and an extraordinary one (evaluating 100% of the competences), through the assessment systems indicated in the column "Non-continuous assessment".

In the "non-continuous assessment" mode, it is not compulsory to keep the mark obtained by the student in the activities or tests (progress test or partial test) taken in the continuous assessment mode.

**Specifications for the resit/retake exam:**

Evaluation tests will be conducted for all recoverable activities.

**Specifications for the second resit / retake exam:**

Same characteristics as the resit/retake exam call.

| 9. Assignments, course calendar and important dates |
|---|
| **Not related to the syllabus/contents** |

| Hours | hours |
|---|---|

**General comments about the planning:** The subject is taught in 3 x 1,5 hour sessions per week.

## 10. Bibliography and Sources

| Author(s) | Title/Link | Publishing house | Citv | ISBN | Year | Description |
|---|---|---|---|---|---|---|
| Esteban Lapeña, Javier ; López Giménez, Manel | Infraestructuras Comunes de Telecomunicación en Viviendas | Altamar | | 978-84-96334-92-2 | 2010 | |
| Forouzan, Behrouz A. | Transmisión de datos y redes de comunicaciones | McGraw-Hill | | 978-84-481-5617-6 | 2007 | |
| Huidobro, J.M. | Telecomunicaciones. Tecnologías, Redes y Servicios | RAMA | | 978-84-9964-015-0 | 2010 | |
| Stallings, William | Comunicaciones y redes de computadores | Prentice Hall | | 978-84-205-4110-5 | 2008 | |
| William Gropp et al | Using MPI: Portable Parallel Programming with the Message-passing Interface | MIT Press | | | 1999 | |
| William James Dally | Principles and Practices of Interconnection Networks | Morgan Kaufmann | | 978-0122007514 | | |