ANX-PR/CL/001-01

GUÍA DE APRENDIZAJE

ASIGNATURA

Ingenieria de servicios y protocolos

CURSO ACADÉMICO - SEMESTRE

2016-17 - Segundo semestre

Datos Descriptivos

Nombre de la Asignatura	Ingenieria de servicios y protocolos
Titulación	59AC - Master Univ. en Sistemas y Servicios para la Sociedad de la Informacion
Centro responsable de la titulación	Escuela Tecnica Superior de Ingenieria y Sistemas de Telecomunicacion
Semestre/s de impartición	Segundo semestre
Materia	Telematica
Carácter	Obligatoria
Código UPM	593000115
Nombre en inglés	Services and protocols engineering

Datos Generales

Créditos	5	**Curso**	1
Curso Académico	2016-17	**Período de impartición**	Febrero-Junio
Idioma de impartición	Inglés	**Otros idiomas de impartición**	

Requisitos Previos Obligatorios

Asignaturas Previas Requeridas

El plan de estudios Master Univ. en Sistemas y Servicios para la Sociedad de la Informacion no tiene definidas asignaturas previas superadas para esta asignatura.

Otros Requisitos

El plan de estudios Master Univ. en Sistemas y Servicios para la Sociedad de la Informacion no tiene definidos otros requisitos para esta asignatura.

Conocimientos Previos

Asignaturas Previas Recomendadas

El coordinador de la asignatura no ha definido asignaturas previas recomendadas.

Otros Conocimientos Previos Recomendados

El coordinador de la asignatura no ha definido otros conocimientos previos recomendados.

Competencias

CEI.2 - Capacidad de interpretar y evaluar de forma crítica documentos científicos en el área de las Tecnologías de la Información y las Comunicaciones.

CEI.3 - Capacidad de comunicación y difusión de los resultados de investigación.

CEI.4 - Habilidades de exposición pública de trabajos de investigación y defensa de las conclusiones.

CEP.1 - Capacidad de analizar, interpretar y aplicar estándares relacionados con las TIC.

CESE.3 - Capacidad de analizar y desarrollar aplicaciones software y protocolos para en sistemas telemáticos avanzados.

CESE.4 - Capacidad de especificar y diseñar servicios telemáticos avanzados.

CGEN.2 - Poseer habilidades para el aprendizaje que les permitan continuar estudiando de un modo que habrá de ser en gran medida autodirigido o autónomo

CGEN.8 - Capacidad para la aplicación de los conocimientos adquiridos y resolver problemas en entornos nuevos o poco conocidos dentro de contextos más amplios y multidisciplinares, relacionados con su área de conocimiento, siendo capaces de integrar conocimientos.

CGEN.9 - Capacidad de investigación, desarrollo e innovación en de la ingeniería para la Sociedad de la Información

Resultados de Aprendizaje

RA31 - Apply new technologies with different systems for solving particular problems in the domain of services and protocols engineering

RA32 - Identify researching open areas in the domain of services and protocols engineering

RA33 - Describe new techniques associate with the specification and design of highly complex telematic systems

RA34 - Apply new techniques to solve open research problems in the field of services and protocols engineering

Profesorado

Profesorado

Nombre	Despacho	e-mail	Tutorías
Martinez Ortega, Jose Fernan **(Coordinador/a)**	A-4407	jf.martinez@upm.es	Por definir
Lopez Santidrian, M. Lourdes	A-4405	lourdes.lopez@upm.es	Por definir

Nota.- Las horas de tutoría son orientativas y pueden sufrir modificaciones. Se deberá confirmar los horarios de tutorías con el profesorado.

Descripción de la Asignatura

This subject is taught during the second semester of the "MSc in Systems and Services Engineering for the Information Society" (*Máster en Ingeniería de Sistemas y Servicios para la Sociedad de la Información*), being compulsory in the professional itinerary and optional in the research itinerary of the curriculum. Its 5 ECTS correspond to a total of around 133 hours of student's work, including all activities. Any of the following graduates (or students with demonstrable equivalent knowledge) may access this course the Graduate in Communication Electronics Engineering (Graduado en Ingeniería de Electrónica de Comunicaciones), Graduate in Telecommunication Systems Engineering (Graduado en Ingeniería de Sistemas de Telecomunicación), Graduate in Sound and Image Engineering (Graduado en Ingeniería de Sonido e Imagen), Graduate in Telematic Engineering (Graduado en Ingeniería Telemática).

Note: The written material, both the bibliography and the written reports produced by the students, will be in English. If there is at least one student in the classroom who cannot speak Spanish, all the oral presentations, made both by the lecturers and the students, will be in English. Otherwise, it is possible that some oral presentations are made in Spanish.

Temario

1. UNIT 0: Introduction to ISP
   1.1. Introduction to the course
   1.2. Supervision session for introducing the group research work topics and methodology
2. UNIT 1: Next generation of telematics services
   2.1. Trends to next generation services and systems
   2.2. Next generation services a case study
   2.3. Open issues and challenges
3. UNIT 2: Advanced networking
   3.1. Networking traditional protocols
   3.2. New trends in networking
   3.3. Networking current technical challenges
4. UNIT 3: Network security protocols and services
   4.1. Network security services
   4.2. Network security traditional protocols
   4.3. Security protocols for advanced networ
   4.4. Security and privacy technical challenges
5. UNIT 4: Open research issues in services and protocols engineering
   5.1. Study of state of the art on Advanced Engineering Techniques on Systems and Telematics Services Development
   5.2. Definition of technical reports
   5.3. Definition of research papers

Cronograma

Horas totales: 48 horas

Horas presenciales: 48 horas (36.9%)

Peso total de actividades de evaluación continua: 100%

Peso total de actividades de evaluación sólo prueba final: 100%

Semana	Actividad Prensencial en Aula	Actividad Prensencial en Laboratorio	Otra Actividad Presencial	Actividades Evaluación
Semana 1	**Unit 0** Duración: 02:00 LM: Actividad del tipo Lección Magistral **M1 - Presentation of research work (Lect)** Duración: 01:00 LM: Actividad del tipo Lección Magistral			
Semana 2	**Unit 1** Duración: 03:00 LM: Actividad del tipo Lección Magistral			
Semana 3	**Unit 2 and M2 - Group assignment** Duración: 03:00 LM: Actividad del tipo Lección Magistral			
Semana 4	**UNIT 4** Duración: 03:00 LM: Actividad del tipo Lección Magistral			
Semana 5	**Supervision on demand** Duración: 03:00 OT: Otras actividades formativas			
Semana 6	**Supervision on demand** Duración: 03:00 OT: Otras actividades formativas			
Semana 7				**M3 - 10% research work & presentation** Duración: 03:00 PG: Técnica del tipo Presentación en Grupo Evaluación continua y sólo prueba final Actividad presencial **M3- Technical Annex** Duración: 00:00 TG: Técnica del tipo Trabajo en Grupo Evaluación continua y sólo prueba final Actividad no presencial
Semana 8				
Semana 9	**Supervision on demand** Duración: 03:00 OT: Otras actividades formativas			

Semana 10				**M4 - 20% research work & presentation** Duración: 03:00 PG: Técnica del tipo Presentación en Grupo Evaluación continua y sólo prueba final Actividad presencial **M4- Technical Annex** Duración: 00:00 TG: Técnica del tipo Trabajo en Grupo Evaluación continua y sólo prueba final Actividad no presencial
Semana 11	**Supervision on demand** Duración: 03:00 OT: Otras actividades formativas			
Semana 12				**M5 - 50% research work & presentation** Duración: 03:00 PG: Técnica del tipo Presentación en Grupo Evaluación continua y sólo prueba final Actividad presencial **M5- Technical Annex** Duración: 00:00 TG: Técnica del tipo Trabajo en Grupo Evaluación continua y sólo prueba final Actividad no presencial
Semana 13	**Supervision on demand** Duración: 03:00 OT: Otras actividades formativas			
Semana 14				**M6 - 80% research work & presentation** Duración: 03:00 PG: Técnica del tipo Presentación en Grupo Evaluación continua y sólo prueba final Actividad presencial **M6- Technical Annex** Duración: 00:00 TG: Técnica del tipo Trabajo en Grupo Evaluación continua y sólo prueba final Actividad no presencial
Semana 15	**Supervision on demand** Duración: 03:00 OT: Otras actividades formativas			

Semana 16				**M7 - 100% research work & presentation** Duración: 03:00 PG: Técnica del tipo Presentación en Grupo Evaluación continua y sólo prueba final Actividad presencial **M7- Technical Annex** Duración: 00:00 TG: Técnica del tipo Trabajo en Grupo Evaluación continua y sólo prueba final Actividad no presencial
Semana 17				**M8 - Critical review (ON-LINE)** Duración: 03:00 TI: Técnica del tipo Trabajo Individual Evaluación continua y sólo prueba final Actividad presencial

Nota.- El cronograma sigue una planificación teórica de la asignatura que puede sufrir modificaciones durante el curso.

Nota 2.- Para poder calcular correctamente la dedicación de un alumno, la duración de las actividades que se repiten en el tiempo (por ejemplo, subgrupos de prácticas") únicamente se indican la primera vez que se definen.

Actividades de Evaluación

Semana	Descripción	Duración	Tipo evaluación	Técnica evaluativa	Presencial	Peso	Nota mínima	Competencias evaluadas
7	M3 - 10% research work & presentation	03:00	Evaluación continua y sólo prueba final	PG: Técnica del tipo Presentación en Grupo	Sí	2%	10 / 10	CEI.3 , CEI.4 , CGEN.8, CEP.1
7	M3- Technical Annex	00:00	Evaluación continua y sólo prueba final	TG: Técnica del tipo Trabajo en Grupo	No	5%	10 / 10	CGEN.2 , CGEN.8, CGEN.9, CEP.1, CESE.3 , CESE.4, CEI.2
10	M4 - 20% research work & presentation	03:00	Evaluación continua y sólo prueba final	PG: Técnica del tipo Presentación en Grupo	Sí	3%	10 / 10	CGEN.8, CEI.4 , CEP.1, CEI.3
10	M4- Technical Annex	00:00	Evaluación continua y sólo prueba final	TG: Técnica del tipo Trabajo en Grupo	No	10%	10 / 10	CGEN.9, CEP.1, CESE.3 , CGEN.2 , CGEN.8, CESE.4, CEI.2
12	M5 - 50% research work & presentation	03:00	Evaluación continua y sólo prueba final	PG: Técnica del tipo Presentación en Grupo	Sí	10%	10 / 10	CEI.3 , CEI.4 , CGEN.8, CEP.1
12	M5- Technical Annex	00:00	Evaluación continua y sólo prueba final	TG: Técnica del tipo Trabajo en Grupo	No	10%	10 / 10	CEI.2 , CGEN.8, CGEN.9, CEP.1, CESE.3 , CESE.4, CGEN.2
14	M6 - 80% research work & presentation	03:00	Evaluación continua y sólo prueba final	PG: Técnica del tipo Presentación en Grupo	Sí	10%	10 / 10	CGEN.8, CEP.1, CEI.3 , CEI.4
14	M6- Technical Annex	00:00	Evaluación continua y sólo prueba final	TG: Técnica del tipo Trabajo en Grupo	No	10%	10 / 10	CGEN.9, CEP.1, CESE.3 , CESE.4, CEI.2 , CGEN.2 , CGEN.8
16	M7 - 100% research work & presentation	03:00	Evaluación continua y sólo prueba final	PG: Técnica del tipo Presentación en Grupo	Sí	15%	10 / 10	CGEN.8, CEP.1, CEI.3 , CEI.4
16	M7- Technical Annex	00:00	Evaluación continua y sólo prueba final	TG: Técnica del tipo Trabajo en Grupo	No	15%	10 / 10	CGEN.2 , CGEN.8, CGEN.9, CEP.1, CESE.3 , CESE.4, CEI.2
17	M8 - Critical review (ON-LINE)	03:00	Evaluación continua y sólo prueba final	TI: Técnica del tipo Trabajo Individual	Sí	10%	10 / 10	CEI.2 , CEI.3

Criterios de Evaluación

Activity planning

The students will have to complete a total of about 133 hours (5 ECTS) of work for passing the course. This includes all the time that the students have to spend on course-related activities, including not only in-class time but also all the activities to be done autonomously, either individually or in groups. The autonomous time that the students are foreseen to spend to pass the course is the following:

- Autonomous personal study: 30 hours.
- Autonomous group work: 12 hours.
- Preparatory work for making the oral presentations: 10 hours.
- Preparatory and writing work related to the research reports: 30 hours.
- Critical assessment of technical documents (additional to the time scheduled below): 3 hours.

The following table define the milestones for guaranteeing the quality control of all the activities during the course:

Milestones	
Number	Description
M1	Presentation of research work to be carried out (by teachers)
M2	Group assignment
M3	Delivery of 10% of research work and slides. Presentation
M4	Delivery of 20% of research work and slides. Presentation
M5	Delivery of 50% of research work and slides. Presentation
M6	Delivery of 80% of research work and slides. Presentation
M7	Delivery of **100%** of research work and slides. Presentation
M8	Delivery of critical reviews

Teaching, learning and evaluation activities: Methodology

The students should carry out properly and on time the activities defined by the lectures of the subject, which will be to the satisfactory accomplishment and evaluation of the learning results. A Brief description of the used organizational modalities and the employed learning methods are depicted as follows:

- **Theory:**

  For each one of the first tree units (1 to 3) there will be an introductory session made by a teacher, with the objectives of giving a general technological overview of the topic, providing extra recommended bibliography, ensuring that the students get at least a minimum common background and establishing the main vocabulary and concepts.

- **Research work:**

  Unit 4 consists on the development of a research work. Students will have to perform a research paper presenting it orally. This will require a considerable amount of time, which will be spent on searching scientific information, synthesizing it and analysing it for new solutions.

- **Autonomous work:**

  Each student will have to spend time on reading documents, searching for information, performing the part of the group work they have been assigned with, and in general, assessing that they have grasped the main concepts, knowledge and abilities that will allow them to demonstrate their competence for passing the course evaluation.

- **Group work:**

  There are two main activities that will require group work: i) Students will have to obtain the conclusions of the research work associated to unit 4, it will be proposed by the teachers on specific subjects. ii) Students will have to work in groups for reaching a consensus and a common understanding of the work to perform, by assigning tasks to each of the members, by putting in common their work, by integrating their results and, by preparing the corresponding presentations and reports.

- **Supervision:**

  Groups of students will be tutored by the lecturers on specific pre-scheduled sessions. This will allow the students to ask questions, raise the problems they have not autonomously been able to solve and receive advice on how to continue or tailor their work for the future.

Assessment and evaluation system

The final mark for each student in this course will be a number between 0 and 10 points. The course is passed if the mark is

equal or above 5 points.

The course is designed to be passed using continuous evaluation. The research work performed by the students has a very significant weight in the total course mark, since the total students' work necessary to pass this part of the course is foreseen to be high. This is the reason why in the case of there being a final exam, it is mandatory to have previously passed the research work-related part of the course (i.e. to have attended through the semester, performed the activities and passed the evaluation of Unit 4) in order to the student to be able to access such an exam. The students that pass the course by using continuous evaluation (see the deliverables to be produced below) will not be required to do any additional exam.

The following deliverables produced by the students will be subject to evaluation:

- Research work, done in groups, on a subject related to the course. Two deliverables will be assessed:
    - o The written report developed by the students group.
    - o The oral presentation plus the answers to the questions asked by other students and the lecturers during and after the presentation.
- Critical assessment of scientific and technological papers. In this case, the students will be asked to read the documents by their own classmates, and to produce a critical assessment, in a written form, about their content.

The following table summarizes the weights (out of a total of 10 points) for each evaluated activity.

CUMULATIVE ASSESSMENT				
Evaluated activity	Unit	Week	Place	Assessment weight
• Research work: written documents	1-4	5-16	Others	5.0
• Research work: oral presentation	1-4	5-16	Classroom	4.0
• Critical assessment of documents	4	17	Others	1.0

Qualification criteria

The following criteria will be considered when assessing each of the evaluated activities:

- **Research work: written document:**
    - o Technical correctness, completeness, originality and accuracy. If a formalization language is used (e.g. in the design phase of the project), it has to be semantically and syntactically well used.
    - o Presentation: correctness, clarity, grammar, format.
- **Research work: oral presentation.**
    - o Execution: clarity, conciseness, correctness, fineness of the presentation to the written document, quality of the auxiliary means (power point slides, use of the blackboard, etc.).
    - o Questions: accuracy and correctness when answering to questions.
- **Critical assessment of documents:**
    - o The student must be able to understand and critically analyze and evaluate technical documentation by establishing connections with other approaches associated to other technical information previously read.

Information about copy or plagiarism

In case of copy or plagiarism in any exam, evaluation test or activity, the student or students involved will be grade with zero. The subject steering committee or the department head could report to the Rector of the university in order to take the disciplinary measurements.

Note: Rights and Obligations of the University Students will be find out in the RD 1791/2010 of 30th of December.

Information about communications devices

It is not allowed to use communications devices during, both exams or tests, and lectures.

Recursos Didácticos

Descripción	Tipo	Observaciones
- CERP-IoT - Cluster of European Research Projects on the Internet of Things. Vision and Challenges for Realizing the Internet of Things. March 2010	Bibliografía	Available from: www.internet-of-things-research.eu
- IERC - European Research Cluster on the Internet of Thin	Bibliografía	Available from: http://www.internet-of-things-research.eu/documents.htm
- IETF: Internet Engineering Task Force. RFC pages	Bibliografía	Available from: www.ietf.org/rfc.html
- Internet of Things - New Security and privacy challenges. Rolf H. Weber. ScienceDirect. Computer Law & Security Review 26 (2010) pg 23-30. Ed. Elsevier	Bibliografía	Available from: http://www.sciencedirect.com/science/article/pii/S0267364909001939
Broadband Forum	Bibliografía	Available from: http://www.broadband-forum.org/
The Internet of Things council	Bibliografía	Available from: http://www.theinternetofthings.eu/
Basic papers	Bibliografía	- Most of them will be accessible using the international electronic databases to which the UPM is subscribed. - Some of them could be also uploaded to the Moodle space of the course.
Institutional platform	Recursos web	? Moodle platform space of the course: accessible through the following URL: https://www.upm.es/politecnica_virtual/ (using your e-mail address and password as a UPM student).