ANX-PR/CL/001-01

LEARNING GUIDE

SUBJECT

103000665 - Data science seminars

DEGREE PROGRAMME

10AP - Eit Digital Master's Programme In Data Science

ACADEMIC YEAR & SEMESTER

2018/19 - Semester 2

Index

Learning guide

1. Description

1.1. Subject details

Name of the subject	103000665 - Data science seminars
No of credits	4.5 ECTS
Type	Compulsory
Academic year ot the programme	First year
Semester of tuition	Semester 2
Tuition period	February-June
Tuition languages	English
Degree programme	10AP - Eit digital master's programme in data science
Centre	10 - Escuela Tecnica Superior de Ingenieros Informaticos
Academic year	2018-19

2. Faculty

2.1. Faculty members with subject teaching role

Name and surname	Office/Room	Email	Tutoring hours *
Francisco Javier Soriano Camino (Subject coordinator)	4309	javier.soriano@upm.es	M - 15:00 - 21:00 Please send an email to prof. Soriano to arrange a specific appointment and avoid unnecessary waits.

* The tutoring schedule is indicative and subject to possible changes. Please check tutoring times with the faculty member in charge.

3. Prior knowledge recommended to take the subject

3.1. Recommended (passed) subjects

El plan de estudios Eit Digital Master's Programme In Data Science no tiene definidas asignaturas previas recomendadas para esta asignatura.

3.2. Other recommended learning outcomes

- According to general prerequisites for ICT KIC master programs this is the first course for enrolled students in the DS Master Degree. Students should have finished their Degree Project and should have also participated in the Initial Week.

4. Skills and learning outcomes *

4.1. Skills to be learned

CB06 - Poseer y comprender conocimientos que aporten una base u oportunidad de ser originales en el desarrollo y/o aplicación de ideas, a menudo en un contexto de investigación

CB10 - Que los estudiantes posean las habilidades de aprendizaje que les permitan continuar estudiando de un modo que habrá de ser en gran medida autodirigido o autónomo.

CG08 - Comprensión amplia de las técnicas y métodos aplicables en una especialización concreta, así como de sus límites

CG09 - Apreciación de los límites del conocimiento actual y de la aplicación práctica de la tecnología más reciente

4.2. Learning outcomes

RA95 - The ability to propose a well-founded approach in any domain where big data can play a role.

RA94 - An understanding of the role that big data plays in the context of several business and scientific domains, including finance, publicity, medicine, biomedicine, neurosciencie, environmental science, smart cities, and games.

RA93 - The knowledge of the main concepts, terminology and main issues related to the use of big data in different socio-economic domains

RA96 - The capacity to identify and link the key issues related to the use of big data in the main economic, industrial, societal and scientific domains

RA97 - The knowledge of main European Union (EU) policies and programmes to support research and innovation in Data Science. The role played by the EIT.

* The Learning Guides should reflect the Skills and Learning Outcomes in the same way as indicated in the Degree Verification Memory. For this reason, they have not been translated into English and appear in Spanish.

5. Brief description of the subject and syllabus

5.1. Brief description of the subject

The module is configured around a series of seminars that address the challenges and opportunities emerging from large quantities of heterogeneous, complex, networked and dynamic data influencing virtually all socio-economic domains.

Main themes to be covered by the seminars (not exhaustive):

- Big Data in the medical domain: EHR and image mining
- Neuroscience focus on Big Data
- Data Management in Biomedicine

- Large-scale Biomedical Text Mining
- Feature Extraction in Images
- Data-intensive Workflows in the Scientific Domain
- Data Science in Environmental Research and Applications
- Big Data for Computer Security
- Big Data in the Publicity domain
- Big Data Management and Analytics in the Banking domain
- Big Data Analytics in the Games Industry
- Big Data Analytics for Smart Cities
- Visualizing large datasets in the Semantic Web
- Ontology-based Data Integration
- Atmospheric Science Modelling Systems
- Big Data Visualization
- IoT Mining

The topics covered by the seminars will suffer from small variations yearly, amongst those in the above list or other considered relevant to the subject.

Substantial part of the contents will be based on the interest of students based on case studies, examples and specificities of this DS master course.

The seminars will promote discussions with professionals and experts from renowned ICT companies and research centers. They will also plan visits to some of their premises, including Cajal Lab for Cortical Circuits at the Biomedical Technology Center, IMDEA Software, Madrid Supercomputing and Visualization Center CESVIMA, etc.

5.2. Syllabus

1. Data Science Seminars

6. Schedule

6.1. Subject schedule*

Week	Face-to-face classroom activities	Face-to-face laboratory activities	Other face-to-face activities	Assessment activities
1	**Data Science Seminar** Duration: 04:00 Additional activities			
2	**Data Science Seminar** Duration: 04:00 Additional activities			
3	**Data Science Seminar** Duration: 04:00 Additional activities			
4				
5	**Data Science Seminar** Duration: 04:00 Additional activities			
6				
7	**Data Science Seminar** Duration: 04:00 Additional activities			
8				
9	**Data Science Seminar** Duration: 04:00 Additional activities			
10				
11	**Data Science Seminar** Duration: 04:00 Additional activities			
12				
13	**Data Science Seminar** Duration: 04:00 Additional activities			
14				
15	**Data Science Seminar** Duration: 04:00 Additional activities			
16	**Data Science Seminar** Duration: 04:00 Additional activities			
17				**Assessment** Other assessment Continuous assessment and final examination Duration: 02:00

The independent study hours are training activities during which students should spend time on individual study or individual assignments.

Depending on the programme study plan, total values will be calculated according to the ECTS credit unit as 26/27 hours of student face-to-face contact and independent study time.

* The subject schedule is based on a previous theorical planning of the subject plan and might go to through experience some unexpected changes along throughout the academic year.

7. Activities and assessment criteria

7.1. Assessment activities

7.1.1. Continuous assessment

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
17	Assessment	Other assessment	Face-to-face	02:00	100%	5 / 10	CG08 CG09 CB06 CB10

7.1.2. Final examination

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
17	Assessment	Other assessment	Face-to-face	02:00	100%	5 / 10	CG08 CG09 CB06 CB10

7.1.3. Referred (re-sit) examination

Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
Assessment	Other assessment	Face-to-face	02:00	100%	5 / 10	CB06 CB10 CG08 CG09

7.2. Assessment criteria

Assessment and Grading Procedures

The evaluation of the students will be based on three main sources:

- Continuous evaluation: activities during lectures (classroom interactivity, short tests, etc.)
- Presentation of individual work (Analysis of case studies)
- Written exam (basic concepts understanding)

The student is responsible for enrolling and passing a number of seminars that sum 4,5 or more ECTS, with a grade greater than or equal to 5/10 in each seminar.Workload calculation (contact hours, homework, exam preparation, etc.). The final grade will be calculated as the weighted average of the best grades obtained in enrolled seminars that sum 4,5 ECTS.

The extra examination call will consist in the realization of a number of work assignments proposed specifically for the call that allow him to pass 4,5 ECTS or more (seminars with a grade equal to or higher than 5 in the ordinary/continuous examination call will count). The work assignments in this call could differ from the ones proposed in the continuous evaluation process. The student is responsible for carrying out and submitting for evaluation the work assignments proposed in a number of seminars that let him pass a number of seminars that sum 4,5 or more ECTS.

8. Teaching resources

8.1. Teaching resources for the subject

Name	Type	Notes
Slides used in the lectures	Others	Slides used in the lectures
Selected bibliography recommended by the seminar supervisor	Bibliography	Selected bibliography recommended by the seminar supervisor
References of relevant case studies	Web resource	References of relevant case studies

9. Other information

9.1. Other information about the subject

Teaching and learning methods:

The module is organized around a set of seminars that will explain the whole lifecycle of Big Data-based projects in different business and scientific areas. In these seminars, experts from companies, government institutions, research centers and academia will shed light on the opportunities and challenges in Data Science in the coming years, and discuss how to address the challenges and optimally exploit the opportunities related to big data.

The teaching and learning approach include:

- Formal lecturesDiscussion
- Individual learning
- Individual or team working assignments focused on case studies
- Preparation of individual or group presentations
- Evaluation of knowledge and competence acquisition through exams, homework assignments or classroom participation

- Guided visits to the premises of some partners (IMDEA Software, CESVIMA, CTB, etc.)

ECTS distribution (4,5 ECTS):

Each seminar will be responsible of teaching and evaluating 0,5 or 1 ECTS

The student is responsible for enrolling and passing a number of seminars that sum 4,5 or more ECTS, with a grade greater than or equal to 5/10 in each seminar.

Workload calculation:

Each seminar will be responsible of teaching and evaluating 0,5 or 1 ECTS (i.e. 13,5 / 27 hours of workload) with the following workload distribution (considering 0,5 ECTS per seminar):

- 4-6 hours lecturing
- 3-4 hours for individual work (could include 2 hours for guided visits)
- 4 hours for exam preparation (including materials for presentation and/or assignment deliverables)
- Personal tuition will be offered to students or teams (average 1,5 hour)

Frequency and dates:

This course will be organised during the second semester of the 1st year.

4 - 5,5 contact hours (lecturing, personal tuition) per week, in alternate weeks.

Max. number of participants:

The course is limited to a maximum of 30 students

Enrollment procedure:

Enrollment is not independent of the general enrollment process of the DS master.

The course is a mandatory unit of the first year major. All students in the DS master diploma must cover it.

Other information:

The module will have an entry in the UPM e-learning platform (Moodle), which will be made available to students.

Access to documents included in the ICT-Labs Master School web site will be also made available to students.

UPM bibliographic funds and reference tools will be available for students.