Universitat de les Illes Balears

Academic year	2017-18
Subject	11542 - Knowledge-based Systems
Group	Group 1, 1S
Syllabus	A
Language	English

Syllabus

Subject

Name 11542 - Knowledge-based Systems
Credits 0.72 in-class (18 hours) 2.28 distance (57 hours) 3 total (75 hours).
Group Group 1, 1S (Campus Extens)
Period First semester
Language English

Lecturers

Lecturers	Office hours for students					
	Starting time	Finishing time	Day	Start date	End date	Office
Margarita María Lourdes Miró Juliá margaret.miro@uib.es	11:30	12:30	Thursday	13/09/2017	06/06/2018	Anselm Turmeda D164

Context

The course *11542 - Knowledge-Based Systems* belongs to Module 2: "Tecnologies informàtiques" and is taught during the first semester.
The course consists of two parts, a theoretical block Knowledge Based Systems (KBS) which will focus on the different models of knowledge representation and their possible applications; and a more practical block Time Series Analysis (TSA) which will introduce methods for interpreting and extracting underlying relationships between data sequences that allows making predictions.

Requirements

Since this is an introductory course, there are no requirements other than those requiered for university access to the master's program.

Recommended

It is highly recommended to have completed successfully the following subjects: 20300 - Discrete Mathematics, 20305 - Mathematics III - Statistics and 21722 - Artificial Intelligence. Knowledge in these subjects is expected and will not be part of the curriculum.

Skills

The objective of the Master's Degree in Computing Engineering (MINF) from the Universitat de les Illes Balears is that students acquire advanced training, specialized and multidisciplinary in nature, oriented to the various areas of information technology; and learning how to use and apply them in the workplace.

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Specific

* CE12: Apply mathematical, statistical and artificial-intelligence methods to model, design and develop applications, services, intelligent systems and knowledge-based systems..

Generic

* CG8: Integrate and apply the knowledge acquired and solve problems in new or little-known situations within broader (or multidisciplinary) contexts..

Basic

* You may consult the basic competencies students will have to achieve by the end of the Master's degree at the following address: http://estudis.uib.cat/master/comp_basiques/

Content

The numbering of items does not imply a temporal sequence.

Theme content

Part A. Knowledge Based Syatems

Knowledge discovery processes. Propositional logic, rules, frames, ...

Part B. Time Series Analysis

Analysis of temporal data. Moving averages, exponential smoothing, ...

Teaching methodology

Note: This subject will be taught in English. All of the material available to the students is in English.

Following below are the different types of activities to be performed by the students, both in the classroom and autonomously (at home, library, group-study, ...).

With the purpose of making easier the student's personal work, it has been requested that the course be part of the Campus Extens project that allows for flexibility in distance teaching and learning. Through this platform students will have at their disposal online communication with the teachers, a calendar with news of interest, electronic documents, proposed problems or assignments for both individual and group work, as well as a suitable environment for submitting assignments and access to their grades.

Workload

The distribution of on-site classroom work is illustrative and represents the planning made by the professors without taking into account any contingencies that might arise during the semester.

The distribution of non-classroom work, which is also indicative, represents the ideal distribution planned by the professors. The different activities are planned for the average student, for each hour of classroom work, the student should work an additional four hours in an autonomous manner (individual study, resolution of

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exercises, ...). Without a non-classroom work load of this magnitude it will be difficult to reach a sufficient level of knowledge and obtain the desired competencies.

In-class work activities

Modality	Name	Typ. Grp.	Description	Hours
Theory classes	Lecture	Large group (G)	Concepts, procedures and their application to exercises and problems are introduced at master classes, where the lecturer will describe the theoretical and practical foundations of the different topics covered in the course. In the lecture the contents of a topic will be presented, techniques and methodologies will be explained, problems will be solved, etc. Educational resources, such as slide shows, videos, etc. will be used. The achievement of competency CE12 is part of this activity.	10
Seminars and workshops	Problems	Medium group (M)	Problems will be solved to facilitate understanding of the topic and a reflection on the theoretical content or its practical application. Proposed problems will be solved individually or in small groups, will be submitted and/or presented in class. This defense allows to assess whether the student has understood the theory, techniques and procedures of the course. The achievement of competencies CE12 and CG8 are part of this activity.	6
Assessment	Assessment	Large group (G)	The final comprehensive exam evaluates the acquisition of the topics and competencies of the course. The achievement of competencies CE12 and CG8 are part of this activity.	2

At the beginning of the semester a schedule of the subject will be made available to students through the UIBdigital platform. The schedule shall at least include the dates when the continuing assessment tests will be conducted and the hand-in dates for the assignments. In addition, the lecturer shall inform students as to whether the subject work plan will be carried out through the schedule or through another way included in the Campus Extens platform.

Distance education work activities

Modality	Name	Description	Hours
Group or individual self-study		Individual self-study to assimilate the contents presented in the master classes or to review autonomously proposed assignments. Individual study or group discussion focused on consolidating what has been assimilated in the individual self-study through the resolution of exercises and problems, and exam preparation. The achievement of competencies CE12 and CG8 are part of this activity.	57

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Specific risks and protective measures

The learning activities of this course do not entail specific health or safety risks for the students and therefore no special protective measures are needed.

Student learning assessment

The assessment of the competencies of the course will be carried out using the following elements:
* FINAL ASSESSMENT: consists in a comprehensive exam of the entire course, Knowledge Based Systems and Time Series Analysis.
* PROJECT: Students must submit two reports that summarizes everything they have learned from part A: Knowledge Based Systems and part B: Time Series Analysis. The projects will de defended by the students before the teacher and peers. The objective of the project is to integrate the knowledge acquired throughout the semester.

Statement on Academic Misconduct

The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations.

For additional information, see https://seu.uib.cat/fou/acord/109/10959.html (In particular, article 33 del Reglament Acadèmic de la UIB respecte al frau.)

Problems

Modality	Seminars and workshops
Technique	Papers and projects **(non-retrievable)**
Description	Problems will be solved to facilitate understanding of the topic and a reflection on the theoretical content or its practical application. Proposed problems will be solved individually or in small groups, will be submitted and/or presented in class. This defense allows to assess whether the student has understood the theory, techniques and procedures of the course. The achievement of competencies CE12 and CG8 are part of this activity.
Assessment criteria	The written report should clearly express the work completed by the student. Aspects that will be considered: - Correctness of the strategy used, the justified mathematical solution of the problem, the clarity of the explanation and the rigor in the reasoning, the ability to express and defend concepts learned throughout the course, the quality of the submitted report or documentation, and the student’s opinion of the problem solving process. - Students must also make a presentation and defense of their work in front of the teacher: clarity and summary of the work done will be assessed.

Final grade percentage: 50%

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Assessment

Modality	Assessment
Technique	Objective tests **(non-retrievable)**
Description	The final comprehensive exam evaluates the acquisition of the topics and competencies of the course. The achievement of competencies CE12 and CG8 are part of this activity.
Assessment criteria	Through the final assessment the level of acquisition of specific competencies of the course will be evaluated. The final assessment will include theoretical aspects and problem solving. Aspects that will be considered: - Correctness of the strategy used, the justified mathematical solution of the problem, the clarity of the explanation and the rigor in the reasoning, the ability to express and defend concepts learned throughout the course.

Final grade percentage: 50%

Resources, bibliography and additional documentation

Basic bibliography

- Knowledge-Based Systems
Rajendra Akerkar
2010, Jones and Bartlett Publishers, LLC
- Intelligent Systems for Engineers and Scientists
Adrian A. Hopgood
2012, CRC Press
- A Course in Time Series Analysis
Daniel Peña, George C. Tiao, R.S. Tsay
2001, John Wilet & Sons
- Introduction to Time Series, Analysis and Forecasting
Douglas C. Montgomery, Cheryl L. Jennings, Murat Kulahci
2008, John Wiley & Sons

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