Centre | University College of Engineering of Vitoria-Gasteiz
Name of subject | 26027 – Decision Support Systems
Qualification | Degree in Computer Management and Information Systems Engineering
Type | Compulsory
Credits | 6 ECTS
Year | 3
Term(s) | 2nd
Department | Systems and Automatics Engineering
Language | Spanish

**Outcomes / Objectives**

1.-Understand the fundamentals of decision support.
2.-Apply the different decision making strategies under uncertainty.
3.-Discuss the nature of the different ways to approach the decision making problem in a variety of contexts and applications.

**Syllabus**

0.-Introduction to the decision making problem and general presentation of the techniques to use
1.-Bayesian networks
   1.1.-Naive Bayesian method
   1.2.-Notion of graph and its application to Bayesian networks
   1.3.-Inference with Bayesian networks
   1.4.-Need for machine learning for the construction of a Bayesian network
2.-Influence diagrams and decision trees
   2.1.-Definition and construction of influence diagrams and decision trees
   2.1.-Cost-utility analysis
   2.2.-Sensitivity analysis
3.-Machine learning
   3.1.-Supervised neural networks
   3.2.-Unsupervised neural networks
   3.3.-Optimisation algorithms and genetic algorithms
   3.4.-Classifiers and meta-classifiers: ID3, AdaBoost.

**Methodology**

**Teaching Method**

<table>
<thead>
<tr>
<th>Face-to-Face Teaching Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>40</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Student Hours of Non Face-To-Face Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>60</td>
</tr>
</tbody>
</table>
Assessment System

General criteria

→ Written essay exam
→ Practical tasks (exercises, case studies or problems)

Clarification regarding assessment

1.- Written exam on the first 2 units. 3.5 points over total points. Halfway through the course.
2.- Written exam on the last unit. 3.5 points over total points. At the end of the course.
3.- Laboratory practice. 3 points over total points. Throughout the course.

If in the first exam the student achieves half the points allocated to that exam, the score achieved will be kept and added to the other scores. Otherwise, the student must sit the second exam, which in that case will be over 7 points and the student will be assessed on all the units. Therefore, students who pass the first exam do not need to take an exam on those units again.

The final score will be the sum of the 3 assessment scores. The passing grade for the subject is a final score of 5, and the sum of the 2 exam scores must be at least 3.5.

Bibliography

Basic Bibliography

➢ 1.- S. Ríos, C. Bielza, A. Mateos. Fundamentos de los sistemas de ayuda a la decisión. Ra-Ma, 2002.
➢ 3.- Francisco Javier, Díez, Introducción a los modelos gráficos probabilistas, Departamento de Inteligencia Artificial, Uned, Octubre de 2007
➢ 4.- REDES NEURONALES Y SISTEMAS BORROSOS.
➢ MARTIN DEL BRIO, BONIFACIO / SANZ MOLINA, ALFREDO

In-depth Bibliography

➢ Sistemas Expertos y Modelos de Redes Probabilísticas, Enrique Castillo y otros, Universidad de Cantabria.

Journals

➢ Decision Support Systems
➢ IEEE TRANSACTIONS ON PATTERN ANALYSIS AND MACHINE INTELLIGENCE
➢ International Journal of Neural Systems
➢ IEEE Computational Intelligence Magazine
➢ JOURNAL OF MACHINE LEARNING RESEARCH

Websites

➢ http://dssresources.com
➢ http://www.hindawi.com/journals/cin/aims/
➢ http://siba-ese.unisalento.it/index.php/ejasa_dss
➢ http://www.hindawi.com/journals/aans/aims/