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Decision Support Systems

Academic Year: (2023 / 2024)   **Review date: 06-09-2023**

Department assigned to the subject: Computer Science and Engineering Department

Coordinating teacher: TOLEDO HERAS, MARIA PAULA DE

Type: Electives ECTS Credits : 3.0

Year : 1 Semester : 2

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Data analysis and Big data

OBJECTIVES

Subject related competencies:
- Ability to understand the need for computerized support of managerial decision making.
- Ability to create and design decision support systems (DSS).
- Ability to apply and integrate the acquired knowledge in order to solve problems in new and multidisciplinary environments.
Learning results:
- Ability to understand the need of business computerized decision support.
- Be capable of designing a decision support system in a business environment.
- Be capable of evaluating and choosing from different decision support systems.
- Be familiar with the mathematical, statistical and artificial intelligence methods used in the design and construction of decision support systems.
- Be capable of designing and creating intelligent systems able to make decisions in the resolution of problems with Bussiness Intelligence

DESCRIPTION OF CONTENTS: PROGRAMME

Unit 1. Introduction to Decision support systems and business intelligence
- Decision support systems
- Phases of the Decision-Making Process
- Models in decision making
- Computerized systems for decision making
- Business Intelligence
- Analytics: Descriptive Analytics, Predictive Analytics, Prescriptive Analytics

Unit 2. Descriptive analytics and visual analytics
- Data preparation: Data warehousing; ETL process: extract, transform and load
- Data description: OLAP Online Analytical Processing ; visual analytics; Business reporting; - KPI and Dashboards
- Business Performance Management: (Balanced scorecards); BPM Technologies and Applications
- Performance Dashboards and Scorecards

Unit 3. Predictive analytics and data mining
- Introduction: predictive analytics; data mining; knowledge acquisition; methodologies (Crisp-DM, Knowledge Discovery in databases)
- Modeling and evaluation
- Association rule mining
- Text mining and sentiment analytics
- Web analytics, web y mining social analytics

Unit 4. Decision support using models
- Prescriptive analytics in DSS
- Model-Based decision making
- Certainty, Uncertainty, and Risk
- Mathematical models for Decision support

- Lineal Programming (Optimization)
- Uncertainty: Sensitivity Analysis, What-If Analysis, and Goal Seeking
- Support Systems Modeling with Spreadsheets
- Decision Analysis
- Problem-Solving Search Methods
- Simulation

Unit 5. Expert systems
- Artificial Intelligence
- Expert systems
- Structure of Expert Systems
- Knowledge Engineering
- Rule based expert systems
- Inference with uncertainty
- Expert systems in the financial sector
- Development of Expert Systems

Unit 6. Knowledge management systems and collaborative systems

Tema 7. DSS in the financial sector

LEARNING ACTIVITIES AND METHODOLOGY
Master clasess

Practices and labs

Tutorships

e-learning activities

Individual work

Group project (Case study)

ASSESSMENT SYSTEM
Individual assignments 40% = 30% assignments, 10% participation in class
Final case study (workgroup) 30% (evaluation: presentation at the end of the term)
End of term exam 30%

Convocatoria extraordinaria: 100% of the final grade is the end of term exam grade

The end of terrm exam (60%) consists of a written exam (30%) and a final project /case study (30%). The final project is workgroup but the assessment is individual and includes the presentation.

% end-of-term-examination:	60
% of continuous assessment (assigments, laboratory, practicals…):	40

BASIC BIBLIOGRAPHY
 - Ramesh Sharda, Dursun Delen, Efraim Turban Business Intelligence and Analyitics. Systems for Decision Support, Pearson, 2014
 - Ramesh Sharda, Dursun Delen, Efraim Turban Analytics, Data Science, & Artificial Intelligence: Systems for Decision Support. 11th edition, Pearson, 2019