King Saud University
College of Computer and Information Sciences
Department of Information Systems

IS 466 – Decision Support System (3-0-0)
Semester I, Academic Year 2024-2025 (1446)
Section: 78987
Meeting Times: Monday (1:00 PM -2:50 PM) &
Wednesday (1:00 PM -1:50 PM)
Classroom No.: Bldg. 31 Floor 1 Room A 060

Current Instructor: Prof. Abdulrahman Mirza
Department of Information Systems
Room: Building 31, Office 2099
Office Hours: Monday 3:00 - 4:00PM, and Wednesday: 11:00AM – 1:00PM,
Or, by appointment.
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Course Coordinator: Prof. Abdulrahman Mirza

Textbook(s) and/or Other Required Materials:

Analytics, Data Science, & Artificial Intelligence: Systems for Decision Support, 2020, Pearson, 11th edition, ISBN-13: 9780135755532

You can purchase online access for a Semester only for $10.99 per month:
https://www.pearson.com/en-us/subject-catalog/p/analytics-data-science--artificial-intelligence-systems-for-decision-support/P200000001823/9780135755532/

Course Description (Catalog):
This course covers the following topics: the decision making process, decision making and support systems, modeling and support, categorization of problem-solving techniques, data management and concepts of the data warehousing, modeling; forecasting models, simulation models and association analysis models, decision support system construction methods, decision tree induction, knowledge-based systems and expert systems, expert system architecture, representation of knowledge, forward and backward chaining, inferences making process, applications of expert systems in decision making.

Pre-requisite: IS 230, IS 362
Co-requisite: None
Course Type: Elective

Course Learning Outcomes (CLOs):
After completing this course, the students will be able to:

1. Learn DSS's concepts for decision making, analyzing, and modeling.
2. Create models and solutions using DSS tools.
3. Ability to apply knowledge with Business Intelligence, Analytics, and Forecasting techniques.
4. Ability to derive patterns and predictions with artificial intelligence, machine learning, and data mining methods.
5. Computing and comprehending for the use of Expert System.
6. Determine the differences between different techniques and tools for AI-based decision making, and how and when to use them.

Student Outcomes (SOs) Covered by Course

Outcome	Student Outcome Description	Coverage
1	Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.	X
2	Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.	X
3	Communicate effectively in a variety of professional contexts.	X
4	Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.	
5	Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.	
6	Support the delivery, use, and management of information systems within an information systems environment.	

Course Learning Outcomes (CLOs) vs. Student Outcomes (SOs)

No	Course Learning Outcomes	Student Outcomes					
		1	2	3	4	5	6
1	Learn DSS's concepts for decision making, analyzing, and modeling.	X					
2	Create models and solutions using DSS tools.		X				
3	Be able to apply knowledge with Business Intelligence, Analytics, Forecasting techniques, and Artificial Intelligence.	X					
4	Be able to derive patterns and predictions with artificial intelligence, machine learning, and data mining methods.	X					
5	Computing and comprehending for the use of Expert System.		X				
6	Determine the differences between different techniques and tools for AI-based decision making, and how and when to use them.			X			

Major Topics covered and schedule in weeks:

No	Topic	Weeks
1	Introduction to the decision making process, DSS Framework, DSS characteristics & main components, evolution of computerized DSS.	1
2	Introduction to business intelligence (BI), BI framework, evolution, origins & drivers, data warehouse framework, business analytics framework (descriptive, predictive, prescriptive).	1
3	Introduction to knowledge-based systems, expert systems, artificial intelligence (AI), weak vs. strong AI, flavors of AI decisions.	1
4	Convergence of analytics & AI, human & computer intelligence, functionalities and applications of AI.	1
5	AI technologies & drivers: intelligent agents, machine learning, deep learning, machine & computer vision, video analytics.	1
6	AI tech. & drivers: robotics systems, natural language processing (NLP), recommender systems, chatbots, cognitive computing, augmented reality.	1
7	Data mining characteristics, disciplines & objectives, types of data mining patterns: prediction, association, clustering & time-series.	1
8	A taxonomy for Data mining, data mining applications (CRM, banking, retail & logistics, manufacturing & maintenance, brokerage, insurance.	1
9	Data mining processes for decision making (CRISP-DM, SEMMA, KDD)	1
10	Data mining methods for prediction, estimation methodologies for classification, accuracy of classification models.	1
11	Decision trees, cluster analysis, K-means clustering algorithm	1
12	Association rule mining, apriori algorithm. Data mining software tools	1
13	Text-mining concepts, text analytics, application areas, NLP processing.	1
14	Text-mining process, sentiment analysis, sentiment analysis process, web-mining.	1
15	Web analytics, click stream analysis, Search engine optimization,	1

Grading Distribution:

No	Item	Course Weight
1	Quizzes (about 10)	10%
2	Assignments (2)	20%
3	Midterm Exam	30%
4	Final Exam	40%
	Total	100%

Course Content: Reading the assigned course textbook and other external related material serve as important course resources for the students. Students should expect to be examined on ALL material discussed in the classroom, even if it is not included in the slides. Any subject discussed in the classroom is a fair content to be included in the quizzes and exams.

Attending Policy: Attendance will be recorded during each class. A record of absences is consistently compiled and updated. According to the university regulation, if the student has been absent over 25% of the lectures, he will be excluded from the course. Absences for being sick or any other reason does not mean that absence will not be recorded. In case you have missed a midterm exam and have a valid hospital excuse, you must submit it to the faculty within 1 week of the exam date. This does not apply to quizzes as there is no makeup for them.

Cheating Policy: Students are encouraged to work together and learn from each other. However, cheating in any form on exams, or copying of homework assignments will not be tolerated. Any evidence of cheating may result in a failing grade for the course. Plagiarism detection software may be deployed to detect plagiarism activity.

General Policy: Assignments are due at the start of class on the due date. Late assignment will only be accepted in exceptional circumstances. No late assignments will be accepted. The quizzes may NOT be announced and may be given at any time during class-time. There is NO makeup for any missed quiz regardless of the reason. Finally, all exams are closed book and the final exam will be comprehensive.

Students with Disabilities: If you need assistance under ADA, pleases contact me or call (011)4698722. If you feel you need special accommodations, you should contact me in the first week of the semester or make an appointment to discuss special arrangements required during this course.