



# Course Specification

## (Bachelor)

Course Title: **Decision Support Application Development**

Course Code: **SE3607**

Program: **BSc in Software Engineering**

Department: **Software Engineering**

College: **College of Computing**

Institution: **Umm Al Qura University**

Version: **1.0**

Last Revision Date: **22/04/2025**



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## A. General information about the course:

### 1. Course Identification

1. Credit hours: (3)

#### 2. Course type

A.  University  College  Department  Track  Others  
 B.  Required  Elective

3. Level/year at which this course is offered: ( 3<sup>rd</sup> year/ 5<sup>th</sup> or 6<sup>th</sup> level) or ( 4<sup>th</sup> year/8<sup>th</sup> level)

#### 4. Course General Description:

Covers methods for developing systems that assist decision-making using data modeling, analytics, and visualization.

This course introduces students to the design and development of intelligent decision support systems (DSS). It covers foundational topics such as decision-making models, data modeling, analytics, visualization techniques, and emerging technologies like predictive and prescriptive analytics. Students will learn to apply these methods in real-world contexts, designing systems that improve decision-making processes under uncertainty.

#### 5. Pre-requirements for this course (if any):

SE2301 - Software Modelling and Analysis

#### 6. Co-requisites for this course (if any):

N/A

#### 7. Course Main Objective(s):

Upon successful completion of this course, you will be able to:

1. Enable students to acquire the knowledge and skills necessary for designing and developing intelligent decision support applications
2. Enable understanding and application of data modeling, analytics, and visualization techniques for decision-making.
3. Introduce students to advanced decision-making technologies, including predictive and prescriptive analytics, and big data analytics.



## 2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%
2	E-learning	0	0
3	Hybrid <ul style="list-style-type: none"> <li>• Traditional classroom</li> <li>• E-learning</li> </ul>	0	0
4	Distance learning	0	0

## 3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	30
3.	Field	0
4.	Tutorial	0
5.	Others (specify)	0
<b>Total</b>		<b>60</b>

## B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
<b>1.0</b>	<b>Knowledge and understanding</b>			
1.1	Understand the decision-making process and criteria.	K2	Lectures, readings, discussions	Quizzes, exams
1.2	Understand foundational analytics and DSS frameworks.	K1	Lectures, practical examples	Mid-term, final exam
<b>2.0</b>	<b>Skills</b>			
2.1	Develop and apply decision-making models.	S1	Group projects	Assignments



Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
2.2	Analyze data for predictive insights using analytics tools.	S3	Group projects	Group project evaluation, quizzes
<b>3.0</b>	<b>Values, autonomy, and responsibility</b>			
3.1	Apply ethical principles in DSS design.	V1	Case studies, group discussions	Participation, case analysis
3.2	Demonstrate collaborative skills in projects.	V2	Group projects	Peer review, project reports

### C. Course Content

No	List of Topics	Contact Hours
1	Introduction to Decision Support Systems (DSS): Overview, frameworks, and the role of business intelligence.	4
2	Decision-making criteria and decision tree analysis. Pragmatic theory in DSS.	8
3.	Players Theory and pay analysis. Game theory applications in DSS.	8
4.	Data warehousing and business reporting: ETL processes and visualization techniques.	4
5.	Sensitivity analysis techniques and risk analysis for decision-making.	4
6.	Predictive analytics: Data mining, sentiment analysis, and text mining techniques.	8
7.	Prescriptive analytics: Optimization methods, simulation, and heuristic search.	8
8.	Big data analytics and its applications in DSS. Integration of social analytics and web mining.	8
9.	Case study: Designing and implementing a decision support system.	8
<b>Total</b>		<b>60</b>

### D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1	Assignments and Quizzes	2-14	10
2	Projects	2-14	20





No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
3.	Lab Assessment	2-14	10
4.	Mid Term	7	20
5.	Final Exam	16-17	40

\*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

## E. Learning Resources and Facilities

### 1. References and Learning Resources

Essential References	<ul style="list-style-type: none"> <li>Sánchez-Marrè, M. (2022). <i>Intelligent decision support systems</i>. Springer. ISBN 978-3030877897.</li> </ul>
Supportive References	<ul style="list-style-type: none"> <li>Pratt, L. Y., &amp; Malcolm, N. E. (2023). <i>The decision intelligence handbook: Practical steps for evidence-based decisions in a complex world</i>. O'Reilly Media. ISBN 978-1098139650.</li> </ul>
Electronic Materials	<ul style="list-style-type: none"> <li>Kaggle. (n.d.). <i>Kaggle datasets</i>. Retrieved from <a href="https://www.kaggle.com/datasets">https://www.kaggle.com/datasets</a></li> <li>UCI Machine Learning Repository. (n.d.). <i>Machine learning repository</i>. University of California, Irvine. Retrieved from <a href="https://archive.ics.uci.edu/ml/index.php">https://archive.ics.uci.edu/ml/index.php</a></li> <li>Google. (n.d.). <i>Google Dataset Search</i>. Retrieved from <a href="https://datasetsearch.research.google.com/">https://datasetsearch.research.google.com/</a></li> <li>Tableau. (n.d.). <i>Tableau Public</i>. Retrieved from <a href="https://public.tableau.com/">https://public.tableau.com/</a></li> </ul>
Other Learning Materials	<ul style="list-style-type: none"> <li>Tableau. (n.d.). <i>Tableau software for data visualization and business intelligence</i>. Retrieved from <a href="https://www.tableau.com/">https://www.tableau.com/</a></li> </ul>

### 2. Required Facilities and equipment

Items	Resources
<b>facilities</b> (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Traditional Classroom
<b>Technology equipment</b> (projector, smart board, software)	Multimedia Projector





Items	Resources
<b>Other equipment</b> (depending on the nature of the specialty)	N/A

## F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Direct, Indirect
Effectiveness of Students' assessment	Faculty, Peer reviewer	Direct, Indirect
Quality of learning resources	Faculty, Course coordinator	Direct, Indirect
The extent to which CLOs have been achieved	Course coordinator, Program management committee	Direct
Other		

**Assessors** (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify))

**Assessment Methods** (Direct, Indirect)

## G. Specification Approval

<b>COUNCIL /COMMITTEE</b>	<b>SOFTWARE ENGINEERING DEPARTMENT COUNCIL</b>
<b>REFERENCE NO.</b>	<b>THE 17<sup>TH</sup> MEETING FOR THE ACADEMIC YEAR 1446H</b>
<b>DATE</b>	<b>22/04/2025</b>

