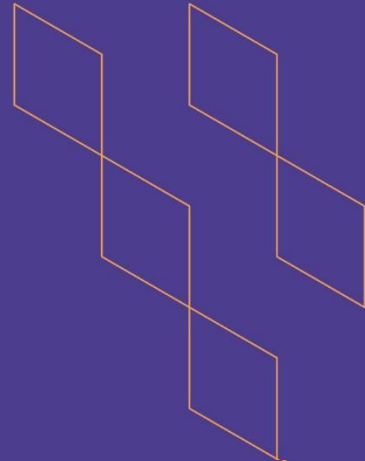




T-104  
2023

## Course Specification



Course Title: <b>Data Visualization</b>
Course Code: <b>IS1768</b>
Program: <b>B.Sc. Computer Information Systems</b>
Department: <b>Computer Information Systems</b>
College: <b>Computer Science and Information Technology</b>
Institution: <b>AL-Baha University</b>
Version: <b>T104-V2</b>
Last Revision Date: 25 May 2023



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No	List of Topics (Lab)	Contact H
1.	Design Principles and Excel	4
2.	Chart Types	2
3.	Exploratory Data Analysis	4
4.	Data Visualization Techniques for Trees, Graphs, and Networks	4
5.	Visualizing Geospatial	2
6.	Visualization Techniques for Time-Oriented Data	2
7.	Text and Document Visualization	2
Total		20
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## A. General information about the course:

Course Identification	
1. Credit hours:	3 Credit Hours (2, 2, 0) (Lecture, Lab, Tutorial) (4 Contact Hours)
2. Course type	
a.	University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Track <input type="checkbox"/> Others <input type="checkbox"/>
b.	Required <input type="checkbox"/> Elective <input checked="" type="checkbox"/>
3. Level/year at which this course is offered:	Elective course (12 <sup>th</sup> Level/ 4 <sup>th</sup> Year)
4. Course general Description	
<p>This course will provide introduction of the essential concepts and principles of data and information visualization from both theoretical and practical perspectives; Emphasizes the development of critical thinking and problem-solving abilities in the context of data and information visualization. Provides exposure to current data and information visualization tools.</p> <p><b>LAB</b></p> <p>The lab is planned to give students practical skills with concrete deliverables in data visualization. Students will use main tool for data exploratory and explanatory data visualization techniques</p>	
5. Pre-requirements for this course (if any): IS1004 Database 1	
6. Co- requirements for this course (if any): None	
7. Course Main Objective(s)	
<p>At the end of the course students will be able to:</p> <ul style="list-style-type: none"> <li>• Describe data-and information visualization principles and techniques.</li> <li>• Understand the practical use visualization techniques.</li> <li>• Understand the criteria for designing successful visualization.</li> <li>• Apply best practices in visualization.</li> <li>• Demonstrate the ability to develop visualization.</li> <li>• Interact in groups collaboratively.</li> <li>• Communicate learned concepts and techniques in oral presentations.</li> </ul>	

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

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	20	50%
2.	E-learning		
3.	Hybrid <ul style="list-style-type: none"> <li>• Traditional classroom</li> <li>• E-learning</li> </ul>		
4.	Distance learning		
5.	Lab	20	50%





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

No	Activity	Contact Hours
1.	Lectures	20
2.	Laboratory/Studio	20
3.	Field	
4.	Tutorial	
5.	Others (specify)	
	<b>Total</b>	<b>40</b>

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
<b>1.0</b>	<b>Knowledge and understanding</b>			
1.1	Describe data-and information visualization principles and techniques.	K1	- Lectures	<b>Direct Assessment Tool</b> - Midterm Exam - Final Exam <b>Indirect Assessment Tool</b> Course Exit Survey
1.2	Understand the practical use visualization techniques.	K3	- Lectures	<b>Direct Assessment Tool</b> - Homework - Midterm Exam - Final Exam <b>Indirect Assessment Tool</b> Course Exit Survey
1.3	Understand the criteria for designing successful visualization.	K3	- Lectures	<b>Direct Assessment Tool</b> -Midterm Exam - Final Exam <b>Indirect Assessment Tool</b> Course Exit Survey
<b>2.0</b>	<b>Skills</b>			
2.1	Apply best practices in visualization.	S1	- Lectures - Tutorials - Exercises	<b>Direct Assessment Tool</b> - Homework - Final Exam - project - Lab Exam <b>Indirect Assessment Tool</b> Course Exit Survey
2.2	Demonstrate the ability to develop visualization.	S2	- Lectures - Tutorial - Exercises - Course Projects	<b>Direct Assessment Tool</b> - Homework - Final Exam - project - Lab Exam <b>Indirect Assessment Tool</b> Course Exit Survey





Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
3.0	Values, autonomy, and responsibility			
3.1	Communicate learned concepts and techniques in oral presentations.	V1	- Teamwork (Small group).	<b>Direct Assessment Tool</b> Course Project. <b>Indirect Assessment Tool</b> Course Exit Survey
3.2	Interact in groups collaboratively.	V1	- Teamwork (Small group).	<b>Direct Assessment Tool</b> Course Project <b>Indirect Assessment Tool</b> Course Exit Survey

## C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to information visualization	2
2.	Prerequisites for enlightening analysis	2
3.	Thinking with our eyes	2
4.	Analytical interaction, techniques, and practices	2
5.	Analytical patterns	2
6.	Time series analysis	2
7.	Part-to-whole and ranking analysis	2
8.	Correlation analysis	2
9.	Multivariate analysis	2
10.	Promising trends in information visualization	2
Total		20

No	List of Topics (Lab)	Contact Hours
1.	Design Principles and Excel	4
2.	Chart Types	2
3.	Exploratory Data Analysis	4
4.	Data Visualization Techniques for Trees, Graphs, and Networks	4
5.	Visualizing Geospatial	2
6.	Visualization Techniques for Time-Oriented Data	2
7.	Text and Document Visualization	2
Total		20





## D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Homework exercises	Periodically	10%
2.	Midterm exam	Week 6	15%
3.	Course Project	Week 10	15%
4.	Final Lab Exam	Week 11	20%
4.	Final Exam	Week 12	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	SCHWABISH, J. (2021) Better Data Visualizations: A guide for scholars, researchers, and wonks. COLUMBIA UNIVERSITY PRESS.
Supportive References	
Electronic Materials	<ul style="list-style-type: none"> <li>• Access to the Saudi Digital Library (SDL).</li> <li>• Using the learning management system of the university – Rafid System (<a href="https://lms.bu.edu.sa/">https://lms.bu.edu.sa/</a>).</li> </ul>
Other Learning Materials	None

### 2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	<ul style="list-style-type: none"> <li>• A classroom or lecture hall with whiteboard for 25 students.</li> </ul>
Technology equipment (projector, smart board, software)	<ul style="list-style-type: none"> <li>• A digital image projection system with connection to desktop computer and laptop computer.</li> <li>• High speed Internet connection.</li> <li>• An instructor computer station.</li> </ul>
Other equipment (depending on the nature of the specialty)	None.

## F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	<ul style="list-style-type: none"> <li>• Student</li> <li>• Faculty</li> </ul>	<ul style="list-style-type: none"> <li>• Surveys (indirect).</li> </ul>



Assessment Areas/Issues	Assessor	Assessment Methods
		<ul style="list-style-type: none"> <li>Direct feedback from students.</li> </ul>
Effectiveness of students assessment	<ul style="list-style-type: none"> <li>Student</li> <li>Faculty</li> </ul>	<ul style="list-style-type: none"> <li>Surveys (indirect).</li> <li>Direct feedback from students.</li> </ul>
Quality of learning resources	<ul style="list-style-type: none"> <li>Students</li> <li>Program Leaders</li> <li>Peer Reviewer</li> </ul>	<ul style="list-style-type: none"> <li>Surveys (indirect)</li> <li>Course evaluation by Peer Reviewers (indirect).</li> </ul>
The extent to which CLOs have been achieved	<ul style="list-style-type: none"> <li>Faculty</li> <li>Program Leaders</li> <li>Peer Reviewer</li> </ul>	<ul style="list-style-type: none"> <li>Surveys (indirect).</li> <li>Student Results (direct)</li> </ul>
Other		

**Assessor** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

**Assessment Methods** (Direct, Indirect)

## G. Specification Approval Data

COUNCIL /COMMITTEE	Curriculum Committee Meeting
REFERENCE NO.	
DATE	

