



University: *Fayoum University*  
 Faculty: *Computers and Information*  
 Department: *Information Systems*



### Course Specification

1- Basic Information								
<b>Code:</b> INF 489	<b>Course Title:</b> Data Mining	<b>Year/Level:</b> Fourth year – Second term						
<b>Programme:</b> B.Sc degree in Information Systems	<b>Number of units:</b>	<table border="1"> <tr> <td><b>Lecture:</b></td> <td>3 hrs/ week</td> </tr> <tr> <td><b>Tutorial:</b></td> <td>0 hrs/ week</td> </tr> <tr> <td><b>Practical:</b></td> <td>2 hrs/ week</td> </tr> </table>	<b>Lecture:</b>	3 hrs/ week	<b>Tutorial:</b>	0 hrs/ week	<b>Practical:</b>	2 hrs/ week
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<b>Tutorial:</b>	0 hrs/ week							
<b>Practical:</b>	2 hrs/ week							

<b>2- Aims of Course:</b>	Knowledge discovery in databases, Data mining process, Data cleaning and preparation, Mining association rules, Classification, Prediction, Clustering, Web mining, Applications of data mining, Mining advanced databases, Data Warehousing, Sampling Techniques, Similarity Techniques.
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3- Intended Learning Outcomes	
<b>A- Knowledge and Understanding:</b>	<p>A6. Explain essential concepts, principles, and theories related to computer-application development such as: databases, information systems development.</p> <p>A7. Demonstrate essential facts, concepts, principles and theories relating to computing and information and computer applications as appropriate to the program of study</p> <p>A9. Identify programming fundamentals and languages, algorithms analysis, and data structures.</p> <p>A10. Identify and explain the fundamental concepts, principles, and techniques needed for the analysis, development, validation, verification, deployment, and operations of computer-based and information systems.</p> <p>A11. Describe main concept of operating systems, information system and databases.</p> <p>A12. Selects advanced topics to provide a deeper understanding of some aspects of the subject such as Unified Process, object-oriented analysis and design, e-commerce technologies, and Decision support systems</p> <p>A16. Demonstrate the life cycle principles of the information systems applications</p> <p>a1) Define the concepts, techniques and algorithms of the data-mining.</p>

	<p>a2. Discuss the principles and techniques of a number of application areas informed by the research directions of data mining.</p> <p>a3. Discuss a working application using a commercial data mining/data warehousing software tool.</p> <p>a4. Identify tools, practices and methodologies used in the specification, design, implementation and critical evaluation of information and computer systems.</p> <p>a5. Outline research fields across a range of knowledge areas.</p>
<p><b>B- Intellectual Skills:</b></p>	<p>B2. Determine different computer- system application attributes, components, relationships, patterns, architecture, and source of errors</p> <p>B3. Generate a range of innovative design patterns and solutions to solve a computer science problem containing a range of commercial and industrial constraints.</p> <p>B7. Determine goals for problem solving and test the result of the solution of the problems</p> <p>B8. Identify criteria to measure and interpret the appropriateness of a computer system for its current deployment and future evolution.</p> <p>B9. Compare between the classifications of (data, results, methods, techniques, algorithms... etc.).</p> <p>B12. Define the standard methodologies for solving information systems problems</p> <p>b1. Assess raw input data to provide suitable input for a range of data mining algorithms.</p> <p>b2. Critically evaluate and select appropriate data-mining algorithms.</p> <p>b3. Perform comparisons between (methods, techniques...etc).</p> <p>b4. Identify attributes, components, relationships, patterns, main ideas, and errors.</p>
<p><b>C- Professional and Practical Skills:</b></p>	<p>C7. Plan, schedule, control, and lead ICT projects.</p> <p>c1. Design and implementation of a data mining application.</p> <p>c2. Perform problem analysis from written descriptions; derive requirements specifications from an understanding of problems (analysis, synthesis).</p>
<p><b>D- General and transferable Skills</b></p>	<p>D3. Work as a member of a development team, recognizing the different roles within a team and different ways of organizing teams</p> <p>D6. Demonstrate skills in team work, team management, time management and organizational skills.</p> <p>d1. Collaborate effectively within team.</p>

	<p>d2. Work in stressful environment and within constraints.</p> <p>d3. Manage tasks and resources.</p> <p>d4. Acquire entrepreneurial skills.</p> <p>d5. Communicate effectively by oral, written and visual means.</p> <p>d6. Develop a range of fundamental research skills, through the use of online resources, technical repositories and library-based material.</p>
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<b>4-Course Content:</b>	<ol style="list-style-type: none"> <li>1. Knowledge Discovery Process</li> <li>2. Pre-processing Techniques</li> <li>3. Finding association rules</li> <li>4. Market basket analysis, rules, frequent item sets, A Priori algorithm, scalability</li> <li>5. Classification Techniques</li> <li>6. Fields of Application of Data Mining</li> <li>7. Similarity Techniques</li> <li>8. Data warehousing</li> </ol>
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<b>5- Teaching and Learning Methods:</b>	<ol style="list-style-type: none"> <li>1. Lectures</li> <li>2. Class discussions</li> <li>3. Internet searches</li> <li>4. Independent Work</li> <li>5. Problem-based Learning</li> </ol>
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<b>6- Teaching and Learning Methods for handicapped students :</b>	-
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<b>7- Student Assessment</b>	
<b>A- Assessment Methods:</b>	<ol style="list-style-type: none"> <li>1. Assignments and Quizzes</li> <li>2. Midterm written exam</li> <li>3. Oral exam</li> <li>4. Final written exam</li> </ol>
<b>B- Assessment schedule:</b>	<p>Midterm Examination: Week 7</p> <p>Oral Examination: Week 14</p> <p>Final Examination: Week 15</p>
<b>C- Weighting of assessments:</b>	<p>Assignments and Quizzes: 0%</p> <p>Mid-Term Examination: 10%</p> <p>Oral Examination: 10%</p> <p>Final-term Examination: 80%</p>

<b>8- Books and References</b>	
<b>A- Notes:</b>	PowerPoint presentations for the course
<b>B- Essential Books (Text Books):</b>	<ul style="list-style-type: none"> <li>▪ Han, J &amp; Kamber, M 2005, Data mining: concepts and techniques, Morgan Kaufmann, San Francisco</li> </ul>
<b>C- Recommended</b>	<ul style="list-style-type: none"> <li>▪ CHand, D, Mannila, H &amp; Smyth, P 2001, Principles of</li> </ul>

<b>Books:</b>	data mining, MIT Press, Cambridge, Mass
<b>D- Periodicals, Web sites, ... etc</b>	-

**Course Professor:Dr.Amira Edress    Department Head:Dr.Amira Edress**

**Course Content Intended Learning Outcomes Matrix****Course Title:** Data Mining**Course Code:** INF 489

Course Content	Week	Knowledge & Understanding					Intellectual Skills				Professional & Practical Skills		General & Transferable Skills					
		a1	a2	a3	a4	a5	b1	b2	b3	B4	c1	c2	d1	d2	d3	d4	d5	d6
1. Knowledge Discovery Process	1	x	x	x	x	x				x								x
2. Pre-processing Techniques	2	x			x	x		x		x		x						x
3. Finding association rules	3	x	x		x		x	x	x	x	x		x	x				x
4. Market basket analysis, rules, frequent item sets, A Priori algorithm, scalability	4,5		x	x	x	x	x	x		x		x					x	x
5. Classification Techniques	6,7	x	x	x	x	x		x	x	x	x		x					x
6. Midterm Exam	8																	
7. Fields of Application of Data Mining	9,10			x	x								x				x	x
8. Similarity Techniques	11				x	x	x	x		x			x					x
9. Data warehousing	12	x	x		x			x		x								x

Course coordinator: Dr.Amira Edress

Head of Department: Dr.Amira Edress