

## **Subject Description Form**

<b>Subject Code</b>	COMP 5123
<b>Subject Title</b>	Intelligent Information Systems
<b>Credit Value</b>	3
<b>Level</b>	5
<b>Pre-requisite/Exclusion</b>	Nil
<b>Objectives</b>	<p>The objectives of this subject are to:</p> <ul style="list-style-type: none"> <li>• introduce the principles, concepts, theories, and technologies that are developed in the fields of artificial and computational intelligence</li> <li>• understand how the intelligent techniques can be used in the construction of information systems to support management decision making</li> <li>• enable students to master the techniques for problem solving in various application areas in business and finance, computing and engineering.</li> </ul>
<b>Intended Learning Outcomes</b>	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> <li>a) understand and apply the latest techniques in artificial and computational intelligence that can be used to facilitate decision making processes;</li> <li>b) apply principles and techniques in knowledge management to solve practical business problems;</li> <li>c) critically review and consolidate existing knowledge to design the important components to support the decision making processes in an Executive Support system;</li> <li>d) possess the knowledge to evaluate the different commercially available or public domain tools that can be used to tackle specific problems related to business decision making; and</li> <li>e) possess the ability to understand and decide if future new techniques in artificial and computational intelligence can be used to solve different practical business problems.</li> </ol>
<b>Subject Synopsis/ Indicative Syllabus</b>	<ul style="list-style-type: none"> <li>• <b>Introduction, Data, Information and Knowledge:</b> Architecture of an intelligent information systems; decision making and systems; artificial intelligence techniques, concepts of data and information; methods to process data into information in organizations; transaction processing systems; database and knowledge base management.</li> <li>• <b>Expert Systems for Managers:</b> Introduction to expert systems; knowledge engineering; knowledge acquisition; knowledge representation and inference; uncertainty representation and reasoning; verification and validation; applications in business and finance.</li> <li>• <b>Case Based Reasoning:</b> Reasoning using cases, representing cases, indexing and retrieving cases, organizational and retrieval algorithms, case adaptation, case base maintenance,</li> </ul>

	<p>soft computing in case based reasoning, applications and case studies</p> <ul style="list-style-type: none"><li>• <b>Data and Text Mining:</b> Data mining and knowledge discovery life cycle, association, classification, clustering and prediction, soft computing in data mining, text mining, information extraction and retrieval.</li><li>• <b>Intelligent Decision Support Systems for Business Intelligence:</b> Computational intelligence techniques; genetic algorithms for organizational modeling; neural networks and fuzzy logic for business applications; hybrid systems; integration of expert systems and neural networks; integrated intelligent systems.</li><li>• <b>Fuzzy Information Systems:</b> Classical vs. fuzzy sets; membership functions; predicate vs. fuzzy logic; approximate reasoning; natural language; linguistic hedges; rule-based systems; likelihood and truth qualification; graphical techniques of inference.</li><li>• <b>Genetic algorithms for management applications:</b> Natural evolution; a simple genetic algorithm; evaluation; population; parent selection; mutation; crossover; the inversion operator; performance enhancement; elitism; steady-state reproduction; robustness; interpolating operator fitness; applications in business, finance and management.</li><li>• <b>Neural Computation for business and finance:</b> Biological vs. artificial neural networks; single- and multiple-layer perceptron; the learning rules; partition of pattern space; back-propagation; Kohonen Self-Organizing Networks; Hopfield Networks; supervised and unsupervised learning; associative memories.</li></ul>																																	
Teaching/Learning Methodology	39 hours of Class activities including - lecture, tutorial, lab, workshop seminar where applicable																																	
Assessment Methods in Alignment with Intended Learning Outcomes	<table><tr><th rowspan="2">Specific Assessment Methods/Tasks</th><th rowspan="2">% weighting</th><th colspan="5">Intended subject learning outcomes to be assessed</th></tr><tr><th>a</th><th>b</th><th>c</th><th>d</th><th>e</th></tr><tr><td>Assignments, Tests &amp; Projects</td><td>55</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr><tr><td>Final Examination</td><td>45</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td></td></tr><tr><td>Total</td><td>100</td><td colspan="5"></td></tr></table>	Specific Assessment Methods/Tasks	% weighting	Intended subject learning outcomes to be assessed					a	b	c	d	e	Assignments, Tests & Projects	55	✓	✓	✓	✓	✓	Final Examination	45	✓	✓	✓	✓		Total	100					
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Student study effort expected	<table><tr><td colspan="2"><b>Class Contact:</b></td></tr><tr><td>Class activities (lecture, tutorial, lab)</td><td>39 hours</td></tr><tr><td colspan="2"><b>Other student study effort:</b></td></tr><tr><td>Assignments, Quizzes, Projects, Exams</td><td>66 hours</td></tr><tr><td><b>Total student study effort</b></td><td><b>105 hours</b></td></tr></table>	<b>Class Contact:</b>		Class activities (lecture, tutorial, lab)	39 hours	<b>Other student study effort:</b>		Assignments, Quizzes, Projects, Exams	66 hours	<b>Total student study effort</b>	<b>105 hours</b>																							
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Reading list and references	(1) Chan, K.C.C., 2004, Intelligent Information Systems: Course Notes, Department of Computing, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong.																																	

	<ul style="list-style-type: none"> <li>(2) Pal, S.K., and Shiu, S.C.K., Foundations of Soft Case-Based Reasoning, John Wiley &amp; Sons, Hoboken, New Jersey, 2004.</li> <li>(3) Liebowitz, J., 2010, Knowledge Management: Learning from Knowledge Engineering, CRC Press, Boca Raton, FL.</li> <li>(4) Bojadziev, G., and Bojadziev, M., 2007, Fuzzy Logic for Business, Finance and Management, World Scientific, Singapore.</li> <li>(5) Miller, T.W., 2005, Data and Text mining: A Business Application Approach, Prentice Hall.</li> </ul>
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