

Course Title	Decision Science				
Course Code	CIS415				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	4 <sup>th</sup> Year / 8 <sup>th</sup> Semester				
Teacher's Name	TBA				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	None
Course Purpose and Objectives	The objective of this course is to provide students with the theoretical knowledge and skills required in order to identify, model, analyse, and solve problems within a business environment from a high-level managerial perspective. Special focus is given to the decision-making methodologies and considerations involved in this process.				
Learning Outcomes	<p>Upon successful completion of this course, students should be able to:</p> <ul style="list-style-type: none"> <li>• Identify and document the objectives of a business organisation</li> <li>• Develop a strategy and use appropriate tools and techniques in order to identify and document problems to be solved, or opportunities to be exploited within a business environment</li> <li>• Assess problem scope within a business environment by utilising appropriate business analysis methodologies</li> <li>• Develop and carry out a scientific problem-solving approach based on the analysis and modelling of the business environment</li> <li>• Evaluate the results of the problem-solving process and perform sensitivity analysis on the implemented solutions</li> </ul>				
Prerequisites	AEF105, BUS400	Co-requisites	None		
Course Content	<p><u>Introductory Concepts:</u> Definition of a problem, problem structure, understanding a problem, the business / corporate environment, aims and objectives of an organization, decision making within an organisation, decision-making criteria and metrics.</p> <p><u>Performance Measuring and Problem Identification:</u> Organisational planning, modelling current business environment through Activity Relationship Matrices and Activity Relationship Diagrams, qualitative and quantitative measures of business performance, identifying problematic areas and / or areas of improvement.</p> <p><u>Problem Scoping:</u> High-level business process modelling, defining process flows and corresponding operational impact, methods and techniques in process modelling.</p>				

	<p><u>Using Data for Decision Making</u>: The use of information in decision making, finding and analysing information, data mining, statistical data analysis, alternative tools and techniques for data analysis.</p> <p><u>Problem Solving</u>: Developing a problem-solving approach, use of analysis results in problem-solving, choosing a solution, computer-based techniques for solution generation, developing a decision model, the role of the decision-maker in choosing an optimal solution, human and organisational considerations in decision making.</p> <p><u>Evaluation of Results</u>: Measuring the quality of the problem-solving process, performing what-if and sensitivity analysis, assessing financial considerations.</p> <p><u>Decision methodologies</u>: Guidelines for building effective decision models, description of specific decision methodologies: single and multi-criteria decision making, group decision making, forecasting, Artificial Intelligence, Human-inspired Computing, neural networks, expert eystems, fuzzy logic, evolutionary computation.</p> <p><u>Case Studies</u>: Presentation and analysis of problem-solving and decision-making activities from real-life business environments.</p>		
Teaching Methodology	Face- to- face		
Bibliography	<p>“A Professional's Guide to Problem Solving with Decision Science” by Frank A. Tillman and Deandra T. Cassone</p> <p>“Practical Management Science” by Wayne L. Winston, and Christian S. Albright</p> <p>“Decision Science: A Human-Oriented Perspective”, by George Mengov</p> <p>“Algorithms to Live By: The Computer Science of Human Decisions”, by Brian Christian and Tom Griffiths</p> <p>“The Science of Common Sense: Best Practical Decision Science Methods”, by Frank A. Tillman and Deandra T. Cassone</p>		
Assessment	Mid-term Examination	20%	
	Final Examination	20%	
	Project	50%	
	Class Participation and attendance	10%	
		100%	
Language	English		