

Course unit title:	Software Engineering I
Course unit code:	CSC411
Type of course unit: (Compulsory/optional)	Compulsory
Level of course unit: (First, second or third cycle)	Bachelor (1st cycle)
Year of study:	3
Semester when the unit is delivered:	6
Number of ECTS credits allocated:	6
Name of lecturer(s):	TBA
Learning outcomes of the course unit:	
<p>Upon successful completion of this course students should be able to:</p> <ul style="list-style-type: none"> • Describe the principles of Software Engineering and the main software development process models • Plan, schedule and control a software development project • Elicit and analyze requirements for a software development project and construct the software requirements specification document • State the fundamental concepts of software design • Create design model representations of software data, architectures, components and interfaces • Construct the software design specification document 	
Mode of delivery:	Face- to- face
Prerequisites and co-requisites:	CSC331, COM101, CSC230
Recommended optional program components:	None

Course Contents:**Objective:**

The material is designed to support a first part of a course in software engineering of an applied program. A student's first task is to gain a sense of the underlying process of the issues involved in the analysis of a system, the identification of the problem areas and the development of alternative solutions. A key objective of this course is the production of the Software Requirements Specification document which will be used in a later course as the base of the design and development of a software system.

Description:**Software Engineering:**

What is Software Engineering? The need for software engineering. Software characteristics, components and applications. Software reliability, software reuse, Software process models: waterfall model, incremental model, prototyping, RAD model, spiral model, Rational Unified Process, Agile Methodology. Systems concepts, boundaries, environment, inputs, outputs, characteristics of systems.

Object-Oriented analysis:

Unified Modeling Language. UML diagrams: class/object diagrams, activity diagrams, swimlane diagrams, sequence diagrams, state diagrams.

Project Management:

Management activities, project planning, project scheduling, Managing teams, the team leader. Task definition, work allocation. PERT diagrams, GANTT diagrams, the Critical Path Method (CPM). Risk management, quality management, configuration management, process improvement activities.

Estimation:

Estimating effort, time and cost. Human, Hardware and Software resources, Software productivity metrics. Cost estimation techniques.

Design in the context of Software Engineering

Main elements of the design process: architectural design, component design, data design, algorithm design, interface design.

System design concepts

Coupling, cohesion, layering, partitioning.

Architectural design considerations

Architectural styles: repository style, client-server style, peer-to-peer style, layered style, multi-tier styles, pipes and filters style. Decomposition styles, control styles.

The Object-Oriented design process
 System decomposition, deployment diagrams, hardware/software mapping, object design, reuse concepts, design patterns, object interface design.

Recent developments and contemporary issues pertaining to the subject-matter of the course.

<p>Recommended or required reading:</p>	<p>Sommerville Ian, SOFTWARE ENGINEERING, Addison-Wesley</p> <p>Pressman Roger, S., SOFTWARE ENGINEERING: A PRACTITIONERS APPROACH, McGraw Hill</p> <p>Bruegge, B. and Dutoit, A.H., OBJECT-ORIENTED SOFTWARE ENGINEERING USING UML, PATTERNS AND JAVA, Pearson Prentice Hall</p> <p>Maciaszek, L.A. and Liong, B.L., PRACTICAL SOFTWARE ENGINEERING: A CASE STUDY APPROACH, Addison Wesley</p> <p>Rumbaugh J., Jacobson, I., and Booch, G., THE UNIFIED MODELING LANGUAGE REFERENCE MANUAL</p>								
<p>Planned learning activities and teaching methods:</p>	<table border="1"> <tr> <td>Class Instruction</td> <td>42 Hours</td> </tr> <tr> <td>Consultation/Computer Lab</td> <td>30 Hours</td> </tr> </table>	Class Instruction	42 Hours	Consultation/Computer Lab	30 Hours				
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<p>Assessment methods and criteria:</p>	<table border="1"> <tr> <td>Examinations</td> <td>40%</td> </tr> <tr> <td>Major Project</td> <td>40%</td> </tr> <tr> <td>Assignments/ Class Participation</td> <td>20%</td> </tr> <tr> <td></td> <td>100%</td> </tr> </table>	Examinations	40%	Major Project	40%	Assignments/ Class Participation	20%		100%
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<p>Language of instruction:</p>	<p>English</p>								
<p>Work placement(s):</p>	<p>No</p>								
<p>Place of Teaching:</p>	<p>Theoretical Part: Regular Classroom European University Cyprus, Nicosia</p> <p>Practical Part: Computer Laboratory European University Cyprus, Nicosia</p>								