Title (Units): **COMP4005 Information Systems Theory, Methodology and Architecture (3,2,1)**

Course Aims: To extend the student's knowledge of information systems and development methodology through the study of advanced theories and methodologies, and to provide the student with an integrative perspective of information systems and development. Also, more advanced system design related concepts will be introduced. At the end of the study of this course, students should be able to develop new solutions and models for an information system. They should also have an appreciation of methodological pluralism (that there is not one but many methods and that the 'correct' method is contingent on the problem being studied)

Prerequisite: Year IV Standing in Computer Science or Computing and Information Systems

Course Intended Learning Outcomes (CILOs):
Upon successful completion of this course, students should be able to:

No.	Course Intended Learning Outcomes (CILOs)
	Knowledge
1	Explain system development theoretical concepts including systems concepts, prototyping and information theory
2	Explain and compare different information system development methodologies
3	Describe the concepts behind design patterns and software architecture, and explain their importance in practice
	Professional Skill
4	Perform system development based on some methodologies using related case tools
	Attitude
5	Articulate the integrative perspective of system development with consideration on selecting the most appropriate method based on the problem being studied

Calendar Description: To extend students' knowledge of information systems and development methodology through the study of advanced theories and methodologies, and to provide students an integrative perspective of information systems and development. Also, more advanced system design related concepts will be introduced.

Teaching and Learning Activities (TLAs):

CILOs	Type of TLA
1-3, 5	Students will learn the concepts via lectures, group discussion and assignments.
4	Students will acquire hands-on experience on using different case tools via laboratory sessions, and be challenged to contrast them.

Assessment:

No.	Assessment Methods	Weighting	CILOs to be addressed	Description of Assessment Tasks
1	Assignments	40%	1-4	Continuous assessments are designed to evaluate the degree students understand the differences of some existing system development methodologies, as well as advanced system design concepts.
2	Examination	60%	1-3	Final examination questions are designed to assess how far students have achieved the intended learning outcomes. Questions are designed to measure students' ability to work with each development methodology under different problem domains.

Assessment Rubrics:

Excellent (A)	• Achieves the first four CILOs, demonstrating a good mastery of both the theoretical and practical aspects of the knowledge and skills associated with information systems theory, methodology and architecture • Able to develop and present sound arguments and correct solutions to problems in information systems development, accompanied by in-depth analysis and insight • Demonstrates a thorough understanding and solid knowledge of information systems theory, methodology and architecture • Able to draw on a variety of techniques and relevant knowledge and appropriately apply them to new information systems development situations and problems
Good (B)	• Achieves the first four CILOs, demonstrating a good understanding of information systems theory, methodology and architecture • Able to develop solutions to problems in information systems development, accompanied by adequate explanations • Demonstrates a competent level of knowledge of information systems theory, methodology and architecture • Able to make use of appropriate techniques and knowledge and apply them to information systems development situations and problems
Satisfactory (C)	• Achieves most of the first four CILOs, demonstrating a basic level of understanding of information systems theory, methodology and architecture • Able to provide acceptable solutions to problems in information systems development • Demonstrates an adequate level of knowledge of information systems theory, methodology and architecture

	• Able to make use of some techniques and knowledge and apply them to familiar situations
Marginal Pass (D)	• Achieves most of the first four CILOs, with minimal understanding of information systems theory, methodology and architecture • Able to provide solutions to simple problems in information systems development • Demonstrates a basic level of knowledge of information systems theory, methodology and architecture • Able to apply some techniques and knowledge to a limited number of typical situations
Fail (F)	• Achieves less than two of the first four CILOs, with little understanding of information systems theory, methodology and architecture • Unable to provide solutions to simple problems in information systems development • Knowledge of concepts in the information systems theory, methodology and architecture falling below the basic minimum level • Unable to apply techniques and knowledge to situations or problems

Course Content and CILOs Mapping:

Content		**CILO No.**
I	Theoretical Concepts	1, 5
II	Current Methodologies	2, 3, 4, 5
III	Advances in Software Design	3, 5

References:

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- J. Arnowitz, M. Arent and N. Berger. Effective Prototyping for Software Makers, Morgan Kaufmann, San Francisco, 2007.
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- A. Shalloway and J.R. Trott. Design Patterns Explained. A New Perspective on Object-Oriented Design (2nd Edition), Addison Wesley, 2005.
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- T. Quatrani and J. Palistrant. Visual Modeling with IBM Rational Software Architect and UML: The developerWorks Series. IBM Press, 2006.
- P. Stevens and R. Pooley. Using UML Software Engineering with Objects and Components, Pearson, 2000.
- T.W. Olle et al. Information Systems Methodologies − A Framework for Understanding, Addison-Wesley, 1991.
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Course Content:

Topic

I. Theoretical Concepts
   A. Historical perspectives
   B. Model of information systems
   C. Information theory
   D. Systems concepts
   E. Concept of prototyping
   F. Integrated view of different methodologies

II. Current Methodologies
   A. Structured methodology
   B. Soft systems methodology
   C. Object oriented methodology

III. Advances in Software Design
   A. Introduction to design patterns
   B. Introduction to software architecture