

**Title (Units):** **COMP 7030 Advanced Theory and Methodology for Information Systems Development (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 examine the critical issues of current IS research, so as to provide a student an integrative perspective of information systems and development.

**Prerequisite:** Research Postgraduate Student Standing.

**Learning Outcomes (LOs):**  
Upon successful completion of this course, students should be able to:

No.	Learning Outcomes (LOs)
	<b>Knowledge</b>
1	Explain system development theoretical concepts including systems concepts, prototyping and information theory
2	Identify the system development concerns in soft systems methodology
3	Illustrate the advanced concepts in structured approach and object-oriented methodology
4	Describe recent research focus on systems development theories and methodologies
	<b>Professional Skill</b>
5	<b>Perform system development under different approaches</b>
	<b>Attitude</b>
6	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 examine the critical issues of current IS research, so as to provide a student an integrative perspective of information systems and development.

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).

**Assessment:**

No.	Assessment Methods	Weighting	Remarks
1	Research project	50%	Students will be asked to propose or identify a topic from a set of provided research issues on system development theories and methodologies for the project. The nature of the project can be a literature review or of some other relevant forms of research studies.
2	Examination	50%	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:**

<b>Criteria</b>	<b>Excellent (A)</b>	<b>Good (B)</b>	<b>Satisfactory (C)</b>	<b>Fail (F)</b>
<b>Use software tools to perform system development under various methodologies</b>	Compare, contrast and perform system development under a carefully chosen methodology given only the requirements of more sizeable system.	Use software tools to perform system development under structured and OO methodologies given only the requirements of a more sizeable system.	Use software tools to perform system development under structured and OO methodologies given only the requirements of a simple system.	Unable to use software tools to perform system development
<b>Describe the key concepts of various system development methodologies - --indicating their purposes and interactions among them</b>	Describe the features of various key system development methodologies and how they are used to assist the development in the context of different applications.	Describe the features of various key system development methodologies and how they are used to assist the development of a simple system.	Describe the features of various key system development methodologies.	Unable to clearly differentiate existing system development methodologies

**Learning Outcomes and Weighting:**

<b>Content</b>	<b>LO No.</b>
I. Theoretical Concepts	1, 4, <b>6</b>
II. Current Development Methodologies	2, 3, <b>6</b>
III. CASE Life Cycle	2, 3, 5, 6

**References:**

**Andrew Stellman and Jennifer Greene. Learning Agile: Understanding Scrum, XP, Lean, and Kanban, 1<sup>st</sup> Edition, O’Reilly, 2013**  
 Arnowitz, J., Arent, M., Berger, N. Effective Prototyping for Software Makers, Morgan Kaufmann, San Francisco. 2007  
 A.W. Brown, S. Iyengar, S. Johnston. A Rational approach to model-driven development. IBM Systems Journal, Vol.45, No.3, 2006  
 Alan Shalloway, James R. Trott. Design Patterns Explained. A New Perspective on Object-Oriented Design (2<sup>nd</sup> Edition), Addison Wesley, 2005  
**David Avison, & Guy Fitzgerald. Information Systems Development: Methodologies, Techniques and Tools (4<sup>th</sup> Edition), McGraw Hill, 2006**  
 David E. Avison, Where Now for Development Methodologies? Communications of the ACM, Vol, 46, No.1, 2003  
 Peter Checkland and Jim Scholes, “Soft Systems Methodology in Action”, John Wiley, 1999  
**Peter Checkland and John Poulter, “Learning For Action: A Short Definitive Account of Soft Systems Methodology, and its use for Practioners, Teachers and Students (1<sup>st</sup> Edition), Wiley, 2007**

**Approach:**

Lectures and a research project will be used to attain the stated objectives.

Lectures will be theoretical in nature and will also attempt to expose students to the literature in various topics in the course materials and to real life aspects of application development.

**Projects will be used for comparing and contrasting different methodologies. Students will also be required to develop an integrated view of different methodologies.**

There will be an Examination to test students on both knowledge and application of course materials.

**Course Content in Outline:**

**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 Development Methodologies**
  - A. Methodology framework – structured approach
  - B. Soft systems methodology
  - C. Object oriented methodology**
  - D. Agile and other contemporary development methodologies**
  
- III **CASE Life Cycle**