

**City University of Hong Kong
Course Syllabus**

**offered by Department of Computer Science
with effect from Semester B 2016/17**

Part I Course Overview

Course Title: Software Engineering

Course Code: CS5351

Course Duration: One semester

Credit Units: 3 credits

Level: P5

Medium of Instruction: English

Medium of Assessment: English

Prerequisites:
(Course Code and Title) Nil

Precursors:
(Course Code and Title) Nil

Equivalent Courses:
(Course Code and Title) Nil

Exclusive Courses:
(Course Code and Title) Nil

Part II Course Details

1. Abstract

This aim of this graduate-level course is to provide students with a comprehensive understanding of the state-of-art in the software engineering (SE) discipline, its associated processes/methodologies and current trends. This includes in-depth coverage of some of the key SE issues, best practices and guidelines and an overview of project management techniques. The key objective is to equip students with SE knowledge so that they will be able to take full advantage of these concepts, processes, and best practices in their future software development projects.

2. Course Intended Learning Outcomes (CILOs)

(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs	Weighting (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	A2	A3
1.	Explain and contrast the different major SE process models and current trends and select appropriate SE process models for software projects.			✓	
2.	Explain how different SE principles, techniques, best practices, guidelines, etc. are used during different stages of the SE process model and apply them appropriately to create design of good quality software.			✓	✓
3.	Explain how different project management techniques are used within the SE process model.			✓	
4.	Explain the role and importance of ethics in the SE process.		✓		
		100%			

A1: Attitude

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to self-life problems.

A3: Accomplishments

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

3. Teaching and Learning Activities (TLAs)

(TLAs designed to facilitate students' achievement of the CILOs.)

Teaching pattern:

Suggested lecture/tutorial/laboratory mix: 3 hrs lecture/tutorial.

TLA	Brief Description	CILO No.				Hours/week (if applicable)
		1	2	3	4	
Lectures	Since this is a graduate-level course, the role of the lectures is mainly to provide a backdrop to guide student's learning.	✓	✓	✓	✓	
Tutorials	Technical questions and study cases are provided to lead students' discussions and practice of various skills in software development.	✓	✓	✓	✓	
Reading	Motivated by the lecture, students will be required to do reading from both assigned material as well as online material that students are required to research on by themselves. Online discussions will be used to help reinforce student learning as well as promote knowledge sharing.		✓		✓	
Group Project	A group project (involving maximum 4 people in a team) gives an opportunity to collaborate and share in their learning process. The group project will be a document deliverable following industry standards or recommendations, including a project plan, analysis of requirements and design of an application software. Selected teams will be required to give a presentation of their work.	✓	✓	✓	✓	

4. Assessment Tasks/Activities (ATs)

(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.				Weighting	Remarks
	1	2	3	4		
Continuous Assessment: <u>60%</u>						
Reading		✓		✓	15%	
Project		✓	✓	✓	45%	
Examination [^] : <u>40%</u> (duration: 2 hours)						
					100%	

[^] For a student to pass the course, at least 30% of the maximum mark for the examination must be obtained.

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Adequate (C+, C, C-)	Marginal (D)	Failure (F)
1. Reading	1.1 ABILITY to explain good practices in software engineering.	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Project	2.1 ABILITY to apply software engineering techniques and good practices for actual software development. 2.2 ABILITY to use project management skills in team project. 2.3 ABILITY to report in an organised and logical way. All works are professional presented. All sources are correctly and thoroughly documented.	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Examination	3.1 ABILITY to explain software development processes and compare process models. 3.2 ABILITY to apply software analysis and design techniques. 3.3 ABILITY to apply project management techniques on given case study. 3.4 ABILITY to apply good software engineering practices on given case study.	High	Significant	Moderate	Basic	Not even reaching marginal levels

Part III Other Information (more details can be provided separately in the teaching plan)

1. Keyword Syllabus

(An indication of the key topics of the course.)

Overview of the software engineering discipline. Software engineering process models and trends. Software engineering standards, techniques, best practices, and guidelines. Software project management. Ethics issues in software engineering.

Syllabus

1. Overview of the Software Engineering Discipline
History and overview of the software engineering discipline. Major roles, issues and problems. Current trends and directions.
2. Software Engineering Process Models and Trends
Overview of different SE process models, such as structured analysis and design, object-oriented analysis and design, agile methodologies, and trends. Contrasting and comparing the different models. The individual processes within the process models (such as requirements, implementation, testing, etc.), their roles, issues, deliverables (both diagrams, documents and software), quality management and project management.
3. Software Engineering Standards, Best Practices, and Guidelines
Overview of different SE-related standards, best practices and guidelines, such as those provided by IEEE, ACM, SEI, etc.
4. Software Project Management
Overview of project management concepts as they relate to SE, such as those outlined by PMI (and its PMBOK), for example scope, schedule development, costing and quality management.
5. Ethics and Safety Issues in Software Engineering
Overview of ethical issues in SE, in particular, the SE Code of Ethics and Professional Practice.

2. Reading List

2.1 Compulsory Readings

(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	<i>Pressman R.S. and Maxim B.R. <u>Software Engineering: a Practitioner's Approach.</u> 8th Ed. McGraw-Hill (2015)</i>
2.	<i>Sommerville I. <u>Software Engineering.</u> 10th Ed. Addison Wesley (2016)</i>

2.2 Additional Readings

(Additional references for students to learn to expand their knowledge about the subject.)

1.	<i>Software Engineering Institute: http://www.sei.cmu.edu/</i>
2.	<i>Project Management Institute: http://www.pmi.org/</i>
3.	<i>IEEE SE Online: http://www.computer.org/portal/site/seportal/</i>
4.	<i>IEEE SE Standards: http://standards.ieee.org/software/</i>
5.	<i>IEEE/ACM SE Code of Ethics and Professional Practice: http://www.acm.org/about/se-code</i>