Syllabus Details

Syllabus ID:	11796
Syllabus Name:	**Software Testing_Kiểm thử phần mềm**
Course Name English:	**Software Testing**
Subject Code:	**SWT301**
NoCredit:	3
Degree Level:	Bachelor
Time Allocation:	Study hour (150h) = 45h (60 sessions) contact hours + 1h TE + 1.5h PE + 102.5 h self-study
Pre-Requisite:	SWE102 or SWE201c
Description:	• General concepts about software testing • Testing techniques aimed at assuring that appropriate functionality has been implemented correctly in the software system or product, including: a) black box or functional testing, b) clear box or structural testing, c) usage-based statistical testing. These testing techniques are organized by their underlying models, including lists, partitions and equivalent classes, finite-state machines. • Test activities, management, and related issues, such as testing sub-phases, team organization, testing process, people's roles and responsibilities, test automation, etc., will also be discussed. • Other testing, verification and validation techniques…
StudentTasks:	Students must attend at least 80% of contact sessions in order to be accepted to the final examination. - Students are responsible to do all exercises, assignments and labs given by instructor in class or at home and submit on time - Use laptop in class only for learning purpose - Promptly access to the https://flm.fpt.edu.vn/ for up-to-date course information
Tools:	- Unit Test Framework - Bug Management Tool - Ms Office - IDE - Static Analyst Tool
Scoring Scale:	10
DecisionNo MM/dd/yyyy:	862/QĐ-ĐHFPT dated 08/16/2024
IsApproved:	**True**
Note:	In the case: (5 > Final TE Score >=4) & (5 > Final PE Score >=4) & FR < 5, the student can choose to take the resit of both TE & PE OR just either TE or PE.
MinAvgMarkToPass:	5
IsActive:	True
ApprovedDate:	8/16/2024

9 material(s)

MaterialDescription	Author	Publisher	PublishedDate	Edition	ISBN	IsMainMaterial	IsHardCopy	IsOnline	Note
https://cmshn.fpt.edu.vn/						☐	☐	☑	
Foundations of software testing istqb certification						☐	☐	☐	
Software Quality Engineering: Testing, Quality assurance, and Quantifiable Improvement. Jeff Tian						☐	☐	☐	
Course Software Testing and Quality Assurance by Tian in http://engr.smu.edu/~tian/class/7314.06f/syl.html (availble in FU library)						☐	☐	☑	
Ian Sommerville. Software Engineering 8e. Part 5: Verification and Validation.						☐	☐	☐	
Towards Zero Defect Software: The Cleanroom Approach. Mario A. Nascimento, Mario A. Nascimento, Murat M. Tanik, Murat M. Tanik. 1994. Available at http://www.cnptia.embrapa.br/~mario/Papers/tr-94-cse-31.ps.gz						☐	☐	☐	
Computer Software Validation. Alan Muirhead. News & Views, March 2000. Available at http://www.stcpmc.org/archive/archive/n&v/feat0300.html						☐	☐	☑	
Agile Testing: A Practical Guide for Testers and Agile Teams	Lisa Crispin,Janet Gregory				978-0321534460	☐	☑	☐	

Foundations of Software Testing: ISTQB Certification	Dorothy Graham, Erik van Veenendaal, Rex Black	Cengage Learning, EMEA	2020	4th	978-1-4737-6479-8	☑	☑	☐

10 LO(s)

CLO Name	CLO Details
CLO1	Know definitions, concepts and terminologies about Software Testing
CLO10	Understand and apply Agile testing
CLO2	Understand Software Test process and various testing techniques
CLO3	Write test cases based on requirement specifications, test and execute testing for two simple software projects;
CLO4	Conduct effective and efficient inspections.
CLO5	Apply a wide variety of testing techniques in an effective and efficient manner.
CLO6	Compute test coverage and yield, according to a variety of criteria.
CLO7	Use statistical techniques to evaluate the defect density and the likelihood of faults.
CLO8	Understand and apply bug logging, bug reporting, test reporting, automation testing tools,
CLO9	Present and work in team

View mapping of CLOs to PLOs

Download All Teacher Material | Download All Student Material

Session	Topic	Learning-Teaching Type	LO	ITU	Student Materials	S-Download	Lecturer Materials	T-Download	Student's Tasks	Lecturer Tasks	URLs
1	Course Introduction Topic 1. Fundamentals of testing 1.1 Why is testing necessary? 1.2 What is testing?	Offline	LO1-LO2		text book: Chapter 1	SWT301	text book: Chapter 1	SWT301	Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
2	1.3 Testing principles	Offline	LO1-LO2		text book: Chapter 1		text book: Chapter 1		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
3	1.4 Fundamental test process	Offline	LO1-LO2		text book: Chapter 1		text book: Chapter 1		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
4	1.5 The psychology of testing	Offline	LO1-LO2		text book: Chapter 1		text book: Chapter 1		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
5	1.5 The psychology of testing (cont.)	Offline	LO1-LO2		text book: Chapter 1		text book: Chapter 1		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	

6	1.6 Codes of ethics	Offline	LO1-LO2		text book: Chapter 1		text book: Chapter 1		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
7	Topic 2. Testing throughout the software life cycle 2.1 Software development models	Offline	LO1-LO2, LO8		text book: Chapter 2 and Tutorial		text book: Chapter 2 and Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
8	2.2 Test levels	Offline	LO1-LO2, LO8		text book: Chapter 2 and Tutorial		text book: Chapter 2 and Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
9	2.2 Test levels (cont.)	Offline	LO1-LO2, LO8		text book: Chapter 2 and Tutorial		text book: Chapter 2 and Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
10	Lab Introduction	Offline	LO1-LO2, LO8		text book: Chapter 2 and Tutorial		text book: Chapter 2 and Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
11	2.3 Test types: the targets of testing	Offline	LO1-LO2, LO8		text book: Chapter 2 and Tutorial		text book: Chapter 2 and Tutorial		Read text book, do Exersise	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
12	2.3 Test types: the targets of testing (cont.)	Offline	LO1-LO2, LO8		text book: Chapter 2 and Tutorial		text book: Chapter 2 and Tutorial		Read text book, do Exersise	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
13	Guiding Lab 1 (Create Test Plan)	Offline	LO9		text book: Chapter 2 and Tutorial		text book: Chapter 2 and Tutorial		Read text book, do Exersise	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
14	Progress test 1	Offline	LO1, LO2, LO8		text book: Chapter 2 and Tutorial		text book: Chapter 2 and Tutorial		Read text book, do Exersise	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
15	Topic 3. Static techniques 3.1 Reviews and the test process 3.2 Review process	Offline	LO7, LO2, LO5		text book: Chapter 3 and Tutorial		text book: Chapter 3 and Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	

16	Topic 3. Static techniques 3.1 Reviews and the test process 3.2 Review process (cont.)	Offline	LO7, LO2, LO5		text book: Chapter 3 and Tutorial		text book: Chapter 3 and Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
17	Topic 3. Static techniques 3.1 Reviews and the test process 3.2 Review process (cont.)	Offline	LO7, LO2, LO5		text book: Chapter 3 and Tutorial		text book: Chapter 3 and Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
18	3.3 Static analysis by tools	Offline	LO7, LO2, LO5		text book: Chapter 3 and Tutorial		text book: Chapter 3 and Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
19	Lab 1 Assitant	Offline	LO7, LO2, LO5		text book: Chapter 3 and Tutorial		text book: Chapter 3 and Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
20	Guiding Lab 2 (Staic Analysis by tools)	Offline	LO3, LO8, LO5, LO4, LO9		text book: Chapter 3 and Tutorial		text book: Chapter 3 and Tutorial		Read text book, do Exersise	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
21	Guiding Lab 2 (Staic Analysis by tools) (cont.)	Offline	LO3, LO8, LO5, LO4, LO9		text book: Chapter 3 and Tutorial		text book: Chapter 3 and Tutorial		Read text book, do Exersise	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
22	Topic 4. Test design techniques 4.1 The test development process	Offline	LO2, LO3, LO4, LO7, LO5, LO6		text book: Chapter 4 and Tutorial		text book: Chapter 4 and Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
23	4.1 The test development process (cont.)	Offline	LO2, LO3, LO4, LO7, LO5, LO6		text book: Chapter 4 and Tutorial		text book: Chapter 4 and Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
24	4.2 Categories of test design techniques 4.3 Specification-based or black-box techniques	Offline	LO2, LO3, LO4, LO7, LO5, LO6		text book: Chapter 4 and Tutorial		text book: Chapter 4 and Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
25	Lab 2 Assitant	Offline	LO2, LO3, LO4, LO7, LO5, LO6		Tutorial		text book: Chapter 4 and Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	

26	Automation Test Tool (Use tools: NUnit, JUnit, Selenium ..) Defect Management System: Mantis, bugzilla,...	Offline	LO2, LO3, LO4, LO7, LO5, LO6		Tutorial		text book: Chapter 4 and Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
27	Automation Test Tool (Use tools: NUnit, JUnit, Selenium ..) Defect Management System: Mantis, bugzilla,... (cont.)	Offline	LO2, LO3, LO4, LO7, LO5, LO6		Tutorial		Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
28	4.4 Structure-based or white-box techniques 4.5 Experience-based techniques	Offline	LO2, LO3, LO4, LO7, LO5, LO6		Tutorial		Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
29	4.6 Choosing a test technique	Offline	LO2, LO3, LO4, LO7, LO5, LO6		Tutorial		Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
30	Guiding Lab 3 (Unit Test)	Offline	LO3, LO4, LO5, LO6		Tutorial		Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
31	Progress test 2	Offline	LO2, LO3, LO4, LO7, LO5, LO6		Tutorial		Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
32	Topic 5. Test management 5.1 Test organization 5.2 Test plans, estimates, and strategies	Offline	LO2, LO4, LO7, LO8		Tutorial		text book: Chapter 5 and Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
33	Progress test and/or Review Problems Topic 5. Test management 5.1 Test organization 5.2 Test plans, estimates, and strategies (cont.)	Offline	LO2, LO4, LO7, LO8		Tutorial		text book: Chapter 5 and Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
34	Progress test and/or Review Problems Topic 5. Test management 5.1 Test organization 5.2 Test plans, estimates, and strategies (cont.)	Offline	LO2, LO4, LO7, LO8		Tutorial		text book: Chapter 5 and Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
35	5.3 Test progress monitoring and control	Offline	LO2, LO4, LO7, LO8		Tutorial		text book: Chapter 5 and Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	

36	5.3 Test progress monitoring and control Guiding Problems (cont.)	Offline	LO2, LO4, LO7, LO8		Tutorial		text book: Chapter 5 and Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
37	Lab 3 Assitant Review Problems	Offline	LO2, LO4, LO7, LO8		Tutorial		Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
38	5.4 Configuration management 5.5 Risk and testing 5.6 Incident management	Offline	LO2, LO4, LO7, LO8		Tutorial		Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
39	5.4 Configuration management 5.5 Risk and testing 5.6 Incident management (cont.)	Offline	LO2, LO4, LO7, LO8		Tutorial		Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
40	5.4 Configuration management 5.5 Risk and testing 5.6 Incident management (cont.)	Offline	LO2, LO4, LO7, LO8		Tutorial		Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
41	Guiding Lab 4 (Integration Test or System Test)	Offline	LO2, LO4, LO3, LO7, LO8		Tutorial		Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
42	Topic 6. Tool support for testing 6.1 Types of test tool 6.2 Effective use of tools: Potential benefits and risks	Offline	LO8, LO9, LO5		text book: Chapter 6		text book: Chapter 6 and Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
43	6.3 Introducing a tool into an organization	Offline	LO8, LO9, LO5		text book: Chapter 6		text book: Chapter 6 and Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
44	Lab 4 Assitant	Offline	LO8, LO9, LO5		Tutorial		Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
45	Progress Test 3	Offline	LO8, LO9, LO5		Tutorial		Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	

46	Topic 7. ISTQB Foundation Exam 7.1 Preparing for the exam 7.2 Taking the exam	Offline	LO8, LO9, LO5		Tutorial		Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
47	7.3 Mock exam	Offline	LO8, LO9, LO5		Tutorial		Tutorial		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
48	Topic 8. Agile Testing 8.1 The fundamentals of Agile software development	Offline	LO8, LO9, LO5, LO10		Slide		Slide		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
49	8.2 Aspects of Agile approaches	Offline	LO8, LO9, LO5, LO10		Slide		Slide		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
50	8.3 Mostly used Agile Methods	Offline	LO8, LO9, LO5, LO10		Slide		Slide		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
51	8.4 Fundamental Agile Testing Principles, Practicles and Processes	Offline	LO8, LO9, LO5, LO10		Slide		Slide		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
52	8.5 Agile Testing Methods, Techniques and Toools	Offline	LO8, LO9, LO5, LO10		Slide		Slide		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
53	Lab 1 presentation and mark	Offline	LO9		Slide		Slide		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
54	Lab 1 presentation and mark (cont.)	Offline	LO9		Slide		Slide		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
55	Lab 2 presentation and mark	Offline	LO9		Slide		Slide		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	

56	Lab 2 presentation and mark (cont.)	Offline	LO9		Slide		Slide		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
57	Lab 3 presentation and mark	Offline	LO9		Slide		Slide		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
58	Lab 3 presentation and mark (cont.)	Offline	LO9		Slide		Slide		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
59	Lab 4 presentation and mark	Offline	LO9		Slide		Slide		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	
60	Lab 4 presentation and mark (cont.)	Offline	LO9		Slide		Slide		Self Study - Watch all videos, - Read all materials in the module - Self Practice	- Review Quiz - Support student's practice - Anwers any questions of Students within this course	

42 Constructive question(s)

	Session No	Name	Details
1	4	CQ2.1	Why is testing necessary?
2	5	CQ2.2	What are typical objectives of testing?
3	6	CQ2.3	What are the differences between testing and debugging?
4	7	CQ3.1	What are the differences of quality assurance and testing?
5	8	CQ3.2	How does testing influence and quality and other factors?
6	9	CQ3.3	What the main groups of activities in a test process include?
7	10	CQ4.1	What the major activities in test analysis include?
8	11	CQ4.2	What the major activities which test design include?
9	12	CQ4.3	Who should be tester? Why? What is their reponsibility?
10	13	CQ5.1	What are tester's and developer's mindsets?
11	14	CQ5.2	How many testing ways? Description?
12	15	CQ5.3	Why should we apply the early test design in software development life cycle?
13	16	CQ6.1	What is V- model? What are advantages of V-Model?
14	17	CQ6.2	What is Unit test, Integration test, System test, Acceptance test?
15	18	CQ6.3	The test levels are characterized by which attributes?
16	19	CQ7.1	What incremental integration strategy in software testing?
17	20	CQ7.2	How to test function (functional testing)?
18	21	CQ7.3	How to test software product characteristics (non-functional testing)?
19	22	CQ8.1	What are Functionality, reliability, usability, effciency, maintainability, portability?
20	23	CQ8.2	How to test software structure/architecture (structural testing)?
21	24	CQ8.3	What are stubs and drivers in intergration testing?
22	25	CQ9.1	How to test to preserve quality?

23	26	CQ9.2	What is impact analysis in maintenance testing?
24	27	CQ9.3	Systematic technique: What is Static (non-execution) testing? Which Tools can be use for static testing?
25	28	CQ10.1	What is Process of Static Testing? What are the difference between static and dynamic techniques?
26	29	CQ10.2	What the common types of reviews and their associated attributes?
27	30	CQ10.3	Which work products can be examined using static testing?
28	31	CQ11.1	When are test cases written and when are they executed? On what basis to evaluate testcase quality?
29	32	CQ11.2	Systematic technique: What is Functional (Black Box) testing? What are differences between EP and BVA?
30	33	CQ11.3	What is state transition testing? How to derive test cases from a use case?
31	34	CQ12.1	What are Automatic test tools? What the differences between JUnit/Nunit and Selenium?
32	35	CQ12.2	What are Defect Management System? What are advantages of defect management system for a small business?
33	36	CQ12.3	What is Structural (White Box) testing? How to compute the cyclomatic complexity?
34	37	CQ13.1	Which are factors that influence the selection of appropriate test design technique for a particular kind of problem?
35	38	CQ13.2	What are Organisational structures of testing? Which skills needed in testing?
36	39	CQ13.3	What is Configuration of management? What are Problems resulting from poor configuration management?
37	40	CQ14.1	What are benefits and drawbacks of independent testing within an organization?
38	41	CQ14.2	What are main roles of tester, test leader, test manager? Which skills test staff need?
39	42	CQ14.3	What are test strategy and test approach? How to measure test execution?
40	43	CQ15.1	What is Incident management? How to track and manage incidents in software testing?
41	44	CQ15.2	How to manage test plan? Which factors influencing the test effort?
42	45	CQ15.3	What is a Test Report? What does it include?

5 assessment(s)

Category	Type	Part	Weight	Completion Criteria	Duration	CLO	Question Type	No Question	Knowledge and Skill	Grading Guide	Note
Lab	on-going	4	25.0%	>0	Option 1: Lab 1: 2-6 weeks; Lab 2-4: 2 weeks. Option 2 (For Constructivism Approach only): Follow lecturer's proposal	LO1, LO2, LO4, LO5, LO7, LO8, LO9	Option 1: N/A; Option 2 (For Constructivism Approach only): Follow lecturer's proposal	Option 1: N/A; Option 2 (For Constructivism Approach only): Follow lecturer's proposal	Option 1: Lab1: Understand Test Processes, Test Level, Test Type, Test Strategy, Test Management; Lab 2: Install and study static analyst tool, Configure and use bug management tool, Write test report; Lab3: Install and study an unit test framework, Use IDE to write unit test code and run unit test, Write test report; Lab 4: Design test case, Write test case, Conduct test, Write test report. Option 2 (For Constructivism Approach only): Follow lecturer's proposal	In class, by teacher	
Presentation	on-going	1	10.0%	>0	Option 1: 20'/each; Option 2 (For Constructivism Approach only): Follow lecturer's proposal	LO8, LO9	Option 1: Presentation; Option 2 (For Constructivism Approach only): Follow lecturer's proposal	Option 1: N/A ;Option 2 (For Constructivism Approach only): Follow lecturer's proposal	NUnit, JUnit, Selenium Or Defect Management System....	in class, by instructor and groups	Instructor makes commend during students present and grades.

Progress Test	on-going	3	15.0%	>0	Option 1: 30'/each; Option 2 (For Constructivism Approach only): Follow lecturer's proposal	LO1, LO2, LO3, LO4, LO5, LO6, LO7, LO8	Option 1: Multiple choices Marked by Computer or a suitable format; Option 2 (For Constructivism Approach only): Follow lecturer's proposal	Option 1: 20-30/each; Option 2 (For Constructivism Approach only): Follow lecturer's proposal	Test 1: Chapter 1 and 2; Test 2: Chapter 3 and 4; Test 3: Chapter 5 and 5	in class, by instructor	Instruction and schedules for Progress Tests must be presented in the Course Implementation Plan approved by director of the campus. Progress test must be taken right after the last lectures of required material. Instructor has responsibility to review the test for students after graded.
PE	final exam	1	25.0%	4	90' (85' for assignment + 5' for exam submission)	LO1, LO2, LO3, LO4, LO5, LO6, LO7, LO8	Assignment		Chapter 1 to 6	by Exam Board	Customized from the assignments or labs that students have learned
TE	final exam	1	25.0%	4	60'	LO1, LO2, LO3, LO4, LO5, LO6, LO7, LO8	Multiple choicesMarked by Computer	60	Chapter 1 to 6	by exam board, using computer	The exam questions must be updated or different at least 70% to the previous ones.