

software quality and will be aware of some relevant techniques and tools. The student will also understand the importance of software configuration management and software maintenance and will be aware of some relevant techniques and tools.

Successful completion of the Software Engineering course should lead to the following outcomes:

(4103 Software Engineering(2))

**3- Knowledge and Under-Standing:**

a1. Understand the importance of product and process quality in the software development process  
 a2. Understand how the software testing can be performed and managed using different methods and techniques.

**Programme(s) on which the course is given:** Under graduate program in Computer Science  
**Major or minor element of programme:** Compulsory

**Department offering the programme:** Department of Computer Science  
**Department offering the course:** Department of Computer Science  
**Year / Class:** Explains the goals and deliverables of software configuration management and how to control software change.

**Date of specification approval:** 22/9/2015

**A- Basic Information**

**Title:** Software Engineering(2)

**Code:** 4103

**Weekly Hours:**

**Lecture :** 3

**Exercise: -**

**Practical:** 3

**Total:** 6

**B- Professional Information**

**1- Course Objectives:**

Understand the problems of managing large software development projects, and the techniques used to address them, including:

After completing this course, the student should acquire the knowledge of :

- Software testing techniques
- Software metrics
- Software Quality management
- Software maintenance
- Software Configuration management

**2- Program ILOs Covered by Course**

**Program Intended Learning Outcomes**

<b>Knowledge and understanding</b>	<b>Intellectual Skills</b>	<b>Professional and practical skills</b>	<b>General and Transferable skills</b>
<b>a9, a11, a15, a16, a18, a20, a21</b>	<b>b2, b4, b5, b6, b7, b8, b11, b12, b14, b15, b18, b19</b>	<b>c2, c3, c4, c5, c6, c9, c10, c11, c13, c15, c17, c18, c19</b>	<b>d1, d2, d3, d4, d6, d7, d8, d9, d10, d12</b>

**3- Intended learning outcomes of course (ILOs)**

In this course student will understand the management activities involved in the conventional software life cycle models; student will be aware of the potential benefits of good software project management; student will be able to perform thorough testing of software projects; student will be able to apply software quality management techniques; and student will understand the importance of controlling the software development process to achieve software quality and will be aware of some relevant techniques and tools. The student will also understand the importance of software configuration management and software maintenance and will be aware of some relevant

techniques and tools.

Successful completion of the Software Engineering course should lead to the following outcomes:

**a. Knowledge and Under-Standing:**

- a1. Understand the importance of product and process quality in the software development process
- a2. Understand how the software testing can be performed and managed using different methods and techniques.
- a3. Clarify the reasons for a highly structured approach to the software lifecycle and understand the properties of good software and how these relate to different types of software, and how to improve the software process.
- a4. Explains the goals and deliverables of software configuration management and how to control software change.
- a5. Understand the role and scope of software maintenance.

**b. Intellectual Skills:**

- b1. demonstrate how a software team prepares test plans and test cases.
- b2. Discuss the basic concepts and principles of the software quality management.
- b3. Discuss the basic concepts and principles of software process improvement, and the role Of CMMI in this domain.
- b4. Identify important issues in configuration management of software.
- b5. Evaluate the categorize application domains for computer software.

**c- Professional and practical skills**

- c1. Apply the process models to software development.
- c2. Apply the management activities in the conventional software life cycle models

**d- General and transferable skills**

- d1. Collaborate effectively within multidisciplinary team.
- d2. Work in stressful environment and within constraints.
- d3. Prepare technical reports, and a dissertation, to a professional standard; use IT skills and display mature computer literacy.
- d4. Lead and motivate individuals.
- d5. Search for information and adopt life-long self-learning.

**4- Contents**

Topic	Hours	Lec.	Exc/Lab
Software Testing Techniques: White box testing, black box testing	6	3	3
Software Testing Techniques: Unit testing, integration testing	6	3	3
Software Testing Techniques: Validation testing, system testing	6	3	3
Quality management: Quality Assurance and Standards.	6	3	3
Quality Planning, Quality Control.	6	3	3
Software measurements and metrics.	6	3	3
Process Improvement: Process and Product Quality	6	3	3
Process Classification, Process Measurement	6	3	3
The SEI Process Capability Maturity Model	6	3	3
Software Maintenance :maintainability, Maintenance tasks.	6	3	3
Change, Version and Release Management.	6	3	3
Course Project	12	6	6

## 5- Teaching and learning methods

- 5.1 Lectures
- 5.2 Tutorial Exercises
- 5.3 Practical Lab
- 5.4 Discussions.

## 6 -Student assessment methods

- 6.1 Midterm Exam: To assess the knowledge and understanding achieved by the student during the previous weeks.
- 6.2 Final Exam: To evaluate what the student gain at the end of the course, and to assess: the knowledge and understanding, general skills, and intellectual skills.
- 6.3 Course Project: To allow students work in team, and to evaluate knowledge, understanding, intellectual, and transferable skills.
- 6.4 Course Work & Quizzes: To keep the student always in the course, and to evaluate knowledge, understanding, intellectual, and transferable skills.
- 6.5 Practical Exam: to measure the ability of students to design and implement a software program.

### Assessment Schedule

Assessment	Week #
Mid Term Exam	8
Final Exam	16
Course Project	3-14
Course Work & Quizzes	2-14
Practical Exam	15

### Assessment Weight

Assessment	Weight %
Mid Term Exam	5%
Final Exam	70%
Course Project	10%
Course Work & Quizzes	5%
Practical Exam	10%
Total	100

Course Work & Quizzes: (Short Exams, Assignments, Researches, Reports, Presentations, Class/Project discussion)

## 7- List of references

- 7.1 Text Books
  - Software Engineering, 8<sup>th</sup> Edition, Ian Sommerville
- 7.2 Internet Location :

- <http://ranger.uta.edu/~elmasri/>
- <http://infolab.stanford.edu/~ullman/dscb/gslides.html>
- <http://www.mysql.com/>

## 8- Required Facilities

- 8.1 Tools/Software
  - TestComplete
  - Rational Rose
  - .NET, MS SQL server

## 9- Course Matrices

### 9.1- Course Content/ILO Matrix

Course Contents	a1	a2	a3	a4	a5	b1	b2	b3	b4	b5	c1	c2	d1	d2	d3	d4	d5
Software Testing Techniques: White box testing, black box testing		√				√											
Software Testing Techniques: Unit testing, integration testing		√				√											
Software Testing Techniques: Validation testing, system testing		√				√											
Quality management: Quality Assurance and Standards.	√		√				√										
Quality Planning, Quality Control.	√		√				√										
Software measurements and metrics.			√				√										
Process Improvement: Process and Product Quality			√				√	√									
Process Classification, Process Measurement			√								√						
The SEI Process Capability Maturity Model			√								√	√	√				
Software Maintenance :maintainability, Maintenance tasks.					√				√								
Change, Version and Release Management.				√							√	√					
Course Project													√	√	√	√	√

### 9.2- Learning Method /ILOs Matrix

Learning Methods	a1	a2	a3	a4	a5	b1	b2	b3	b4	b5	c1	c2	d1	d2	d3	d4	d5
Lectures	√	√	√	√	√	√	√	√	√	√	√	√					
Tutorial Exercises						√	√	√	√	√	√	√					
Practical Lab						√	√	√	√	√	√	√					
Discussion						√	√	√	√	√	√	√	√	√	√	√	√

### 9.3 Assessment Methods /ILOs Matrix

Assessment Methods	a1	a2	a3	a4	a5	b1	b2	b3	b4	b5	c1	c2	d1	d2	d3	d4	d5
Mid Term Exam	√	√	√	√	√	√	√	√	√	√	√	√					
Final Exam	√	√	√	√	√	√	√	√	√	√	√	√					
Course Project	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Course Work & Quizzes	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Practical Exam	√	√	√	√	√	√	√	√	√	√	√	√					

**Course Coordinator:** Prof.Dr. Ahmed El-Abbassy ( )

**Head of Department:** Dr. Farouk Shabaan ( )

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