# Template of Course Specification

**Faculty: CIT**
**Department: SW**
**Program: B.SW**

| | | | | | | |
|---|---|---|---|---|---|---|
| **I.** | **General information about the course:** | | | | | |
| **1.** | **Course Title:** | Software Testing & Validation | | | | |
| **2.** | **Course Code and Number :** | SE321 | | | | |
| **3.** | **Credit Hours: 3** | **Lecture** | **Seminar/Tutorial** | **Practical** | **Training** | **Total** |
| | | 2 | 2 | -- | -- | 3 |
| **4.** | **Study Level and Semester:** | Level 3 / Semester 6 | | | | |
| **5.** | **Pre-requisites (if any):** | **Software Engineering (CS325)** | | | | |
| **6.** | **Co-requisites (if any) :** | --- | | | | |
| **7.** | **Program in which the course is offered** | B.SC(Software Engineering) | | | | |
| **8.** | **Teaching Language:** | English | | | | |
| **9.** | **Study System :** | Semester Based | | | | |
| **0.** | **Prepared by :** | Course Facilitator (wadee alqubati) | | | | |
| **1.** | **Approval date :** | | | | | |
| **2.** | **Approved by:** | Department | | | | |

## II. Course Description:

This Course is designed to cover the following topics: Introduction to testing - Software validation and verification – Test cases – Managing the testing process: developing test plans, test scripts and test cases, reports - Unit, functional, and acceptance testing - Black-box and white-box testing - Equivalence partitioning - Path testing – Cyclomatic complexity - Integration testing – System Testing: Regression testing; Interface testing; Stress testing; Incremental testing; Interaction and Usability testing ... etc. - Object-oriented testing - Software testing tools - Alpha, beta, and user acceptance testing – Testing in agile development environment - Automated testing. Students participate in a group project on software testing,

## III. Course Aims

**This Course aims to:**

1. Characterize a generic process of software requirements engineering.
2. Understand the difference in requirements engineering for different situations such as information systems and control system.
3. Effectively and efficiently elicit, document requirements, validate, and prioritise requirements.
4. Understand the difference between requirements and design, as well as the inherent difficulty in separating requirements and design.

5. Conduct system modeling through analytical methods.
6. Choose among RE techniques and use an appropriate technique based on the context.

## VI. Course Intended Learning Outcomes (CILOs) :

### Knowledge and Understanding:

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

| Knowledge and Understanding PILOs | Knowledge and Understanding CILOs |
|---|---|
| After completing this program, students would be able to: | After completing this course, students would be able to: |
| **A4**. Understand the software process life cycles, for small, medium and large software projects, and different approaches of software development, software project management, risk and quality management, and human-computer interaction. | |
| **A5**. Recognize the social, professional, legal, ethical, and cultural issues involved in the use of computer technology. | |

### Intellectual Skills :

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

| Intellectual Skills PILOs | Intellectual Skills CILOs |
|---|---|
| After completing this program, students would be able to: | After completing this course, students would be able to: |
| **B1**. Determine and analyze criteria, specifications and requirements appropriate to specific computing problems and formulate strategies to solve them. | |
| **B2**. Differentiate the various methods of computational thinking, determining their wide relevance and applicability within other domains in everyday life, and being able to employ them in different conditions. | |
| **B3**. Choose the most appropriate methods and tools including deploying appropriate theory, practices, and tools for the specification, design, implementation, and maintenance as well as the evaluation of computer-based systems. | |
| **B4**. Criticize systems in terms of general quality attributes and possible tradeoffs presented within the given problem. | |

### Professional and Practical Skills

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

| Professional and Practical Skills PILOs | Professional and Practical Skills CILOs |
|---|---|

| After completing this program, students would be able to: | After completing this course, students would be able to: |
|---|---|
| **C1**. Apply fundamental concepts of computer science, software engineering, human-computer interaction, science and mathematics in the modeling and design of computer systems. | |
| **C2**. Develop a wide range of software through all stages of their life cycle, namely problem analysis, requirements specification, design, construction; verification and evolution using appropriate methods and tools. | |
| **C3**. Operate computing equipment and software systems effectively and efficiently. | |
| **C4**. Evaluate software process and artifacts in terms of software quality and models. | |

## Transferable (General) Skills :

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

| Transferable (General) Skills PILOs | Transferable (General) Skills CILOs |
|---|---|
| After completing this program, students would be able to: | After completing this course, students would be able to: |
| **D1**. Communication skills: Make succinct presentations to a range of audiences about technical problems and their solutions. This may involve face-to-face, written communication or electronic communication. | |
| **D2**. Teamwork: Be able to work effectively as a member of a development team. | |
| **D4**. Self-management skills: Manage one's own learning and development, including time management and organizational skills. | |
| **D5**. Professional development skills: Keep abreast of current developments in the discipline to continue one's own professional development. | an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice |

| الموصف | المراجع | مسؤول البرنامج | رئيس القسم | عميد الكلية |
|---|---|---|---|---|
| | | أ.وديع القباطي | أ.نبيل المخلافي | د. عبدالقادر العبادي |

## VI. Alignment of CILOs to Teaching and Assessment Strategies

### First: Alignment of Knowledge and Understanding CILOs

| Knowledge and Understanding CILOs | Teaching Strategies | Assessment Strategies |
|---|---|---|
| a1. Know IT infrastructure essential components | Lectures | Written Exam |
| a2. Understand IT Strategies & IT Solutions development process | Group Discussions | Observation |
| | Lab sessions | Report/Screen shots |
| | Brain Storming | Viva/Direct Questions |
| | | Quiz |

### Second: Alignment of Intellectual Skills CILOs

| Intellectual Skills CILOs | Teaching Strategies | Assessment Strategies |
|---|---|---|
| b1. Identify technical, business, management components, security & ethical challenges of the global system, different IT Strategies | Lectures | Written test<br>Quizzes |
| b2. Analyze the drawbacks, requirements, decision making scenarios and suggest the best optimal solution | Lab sessions | Lab technical report |
| b3. Explore New Emerging Trends & Technologies, available IT Solutions suitable to enhance organization's performance | Case study | Report |
| | Assignment | |

| Third: Alignment of Professional and Practical Skills CILOs | | |
|---|---|---|
| **Professional and Practical Skills CILOs** | **Teaching Strategies** | **Assessment Strategies** |
| c1. Apply the best optimal IT Solutions, IT Strategies to improve the organizational performance | **Lab sessions** | **Technical Report**<br>**Worksheets** |
| c2. Apply the best of new emerging trends and technologies to benefit organization | **Homework** | **Report + Presentation** |
| c3. Develop a strong application-network controls and secure IT Infrastructure for an organization, the perfect plan in managing projects | **Group Discussions** | **Observations** |
| | | |
| | | |
| | | |
| | | |
| | | |

| Fourth: Alignment of Transferable (General) Skills CILOs | | |
|---|---|---|
| **Transferable (General) Skills CILOs** | **Teaching Strategies** | **Assessment Strategies** |
| d1. Write project - technical report and present projects/assignments | **Grouping**<br>**Tips** | **Presentation** |
| | **Notes** | **Observation** |
| | **Case Study** | **Report** |

| الموصف | المراجع | مسؤول البرنامج | رئيس القسم | عميد الكلية |
|---|---|---|---|---|
| | | أ.وديع القباطي | أ.نبيل المخلافي | د. عبدالقادر العبادي |

## VII. Course topics and sub-topics (theoretical and practical) with contact hours and alignment to CILOs

| Topics/Units of Course Contents | | | | | |
|---|---|---|---|---|---|
| **First: Theoretical Aspects** | | | | | |
| **No.** | **Course Topics/Units** | **Sub-topics** | **No. of Weeks** | **Contact Hours** | **CILOs** |
| 1 | Basics of Software Testing and Validation | 1.1 Why is testing necessary?<br>1.2 What is testing?<br>1.3 Testing principles<br>1.4 Fundamental test process<br>1.5 The psychology of testing | 2 | 4 | a1, a2 |
| 2 | Testing throughout the software life cycle | 2.1 Software development models<br>2.2 Test levels<br>2.3 Test types: the targets of testing<br>2.4 Maintenance testing | 2 | 4 | a2 |
| 3 | Static techniques | 3.1 Reviews and the test process<br>3.2 Review process<br>3.3 Static analysis by tools | 2 | 4 | a2 |
| | **MID TERM EXAM** | | | | |
| 4 | Test design techniques | 4.1 Identifying test conditions and designing test cases<br>4.2 Categories of test design techniques<br>4.3 Specification-based or black-box techniques<br>4.4 Structure-based or white-box techniques<br>4.5 Experience-based techniques<br>4.6 Choosing a test technique | 2 | 4 | |
| 5 | Test management | 5.1 Test organization<br>5.2 Test plans, estimates, and strategies<br>5.3 Test progress monitoring and control<br>5.4 Configuration management<br>5.5 Risk and testing 149<br>5.6 Incident management | 2 | 4 | |
| 6 | Tool support for testing | 6.1 Types of test tool<br>6.2 Effective use of tools: Potential benefits and risks<br>6.3 Introducing a tool into an organization | 2 | 4 | |
| | **FINAL EXAM** | | | | |
| **Total number of weeks and hours** | | | 12 | 24 | |

| Second: Practical/Tutorial/Clinical Aspects | | | | |
|---|---|---|---|---|
| Write up practical/tutorial/clinical topics | | | | |
| **No.** | **Practical/Tutorial/Clinical topics** | **No. of Weeks** | **Contact Hours** | **CILOs** |
| 1 | TUTORIAL 1: Test Automation Patterns | 2 | 4 | c2, c3 |
| 2 | TUTORIAL 2: Creative and Critical Thinking and Testing | 2 | 4 | b1, c3 |
| 3 | TUTORIAL 3: Lean Software Testing | 2 | 4 | b2, c3 |
| 4 | TUTORIAL 4: Practical Agile Testing | 2 | 4 | b2, c3 |
| 5 | TUTORIAL 5: Designing a requirements documentation strategy for effective validation and traceability | 2 | 4 | b3, c3 |
| 6 | TUTORIAL 6: Quality, from Requirements to Tests | 2 | 4 | b3, c3 |
| **Total number of weeks and hours** | | **12** | **24** | |

| I. Tasks and Assignments : | | | | |
|---|---|---|---|---|
| **No.** | **Task/Assignment** | **CILOs** | **Week due** | **Mark** |
| 1 | Assignment 1 | | 10 | 5 % |
| 2 | Assignment 2 | | 12 | 10 % |
| | | | | |

| II. Learning Assessment: | | | | | |
|---|---|---|---|---|---|
| **No.** | **Assessment Tasks** | **Week due** | **Mark** | **Proportion of Final Assessment** | **Aligned CILOs** |
| 1 | **Assignments + Reports** | 12 | 25 | 25% | c1, c2, c3, d1 |
| 2 | **Quiz 1 & Quiz 2** | 4 & 9 | 5 | 5% | a1, a2 |
| 3 | **Mid term exam** | 7 | 20 | 20% | b1, b2, b3 |
| 4 | **Final Exam** | 15 | 50 | 50% | All course ILO's |
| **Total** | | | 100 | 100% | |

| الموصف | المراجع | مسؤول البرنامج | رئيس القسم | عميد الكلية |
|---|---|---|---|---|
| | | أ.وديع القباطي | أ.نبيل المخلافي | د. عبدالقادر العبادي |

| III. Learning Resources : |
|---|
| (Author, (Year), Book Title, Edition, Publisher, Country of publishing) |
| **Textbooks-not more than 2** |
| 1. (Daniel Galin & Addison Wesley,( 2003), Software Quality Assurance: From Theory to Implementation,4th Edition. |
| **Essential References-not less than 4** |
| 1. Efraim Turban , (2011), Information Technology for Managements, 8th Edition, Wiley publications, USA.<br>2. Ellrn F.Monk , (), Concepts in Enterprise Resource Planning, 2nd Edition.<br>3. Raymond Mcleod & George P.Schell, (),M.I.S by, 10th Edition, Pearson Prentice Hall, USA.<br>4. Carroll W. Frenzel & John C. Frenzel, (),Management of IT, 4th Edition, Thomson Course Technology. |
| **Electronic Materials and Web Sites** |
| www.myMISlab.com |

| IV. Course Policies (To be determined by Faculty Deanship): | |
|---|---|
| **Based on university regulations, the following aspects should be figured out:** | |
| 1. | (Class Attendance) : |
| 2. | (Tardy) : |
| 3. | (Exam Attendance/Punctuality) : |
| 4. | (Assignments & Projects) : |
| 5. | (Cheating) : |
| 6. | (Plagiarism) : |
| 7. | (Other policies) : |

# Template of Course Syllabus

**Faculty : TIC**

**Department: CS**

**Program : B.SE**

| **I.** General information about the course instructor : | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Name** | (Facilitator) | **Office Hours (3 Hours Weekly)** | | | | | |
| **Location & phone number** | USTY | **Sat** | **Sun** | **Mon** | **Tue** | **Wed** | **Thu** |
| **Email** | | | | | | | |

| **II.** General information about the course: | | | | | | |
|---|---|---|---|---|---|---|
| **1.** | **Course Title :** | Software Testing & Validation | | | | |
| **2.** | **Course Code and Number :** | SE321 | | | | |
| **3.** | **Credit Hours :** | **Credit Hours** | | | | **Total** |
| | | **Theoretical** | **Seminar/Tutorial** | **Practical** | **Training** | |
| | | 2 | *2* | - | - | 3 |
| **4.** | **Study Level and Semester:** | Level 3 / Semester 6 | | | | |
| **5.** | **Pre-requisites (if any):** | **Software Engineering (CS325)** | | | | |
| **6.** | **Co-requisites (if any):** | --- | | | | |
| **7.** | **Program in which the course is offered:** | B.SC(Software Engineering) | | | | |
| **8.** | **Teaching Language:** | English | | | | |
| **9.** | **Instruction location:** | N/A | | | | |

| الموصف | المراجع | مسؤول البرنامج | رئيس القسم | عميد الكلية |
|---|---|---|---|---|
| | | أ.وديع القباطي | أ.نبيل المخلافي | د. عبدالقادر العبادي |

## I. Course Description

This Course is designed to cover the main IT infrastructure, IT resources within organizations and describe managerial aspects of IT infrastructure & resources in organizations. Also covers the global systems, new emerging trends & technologies in IT & IS, IT Controls & security issues.

## II. Course Aims:

**This course aims to:**

1. Make students Identify & control the main IT resources and infrastructure needed in digital world.
2. Describe the business perspectives of Information Technology & Information Systems.
3. Explain and compare the major systems defining the digital firms in global market
4. Provide skills to develop a suitable IT-IS infrastructure using new trends and technologies.
5. Train students to Monitor IT infrastructure & IT strategies and apply IT Solutions in an organization

## III. Course Intended Learning Outcomes (CILOs) :

1. a1. Know IT infrastructure essential components, types of Information Systems, services, support & needs
2. a2. Understand IT Strategies & IT Solutions development process, essential communication networks, Mobile Computing Technology & Mobile Enterprise Applications, wireless revolution in today's business world
3. b1. Identify technical, business, management components, security & ethical challenges of the global system, different IT Strategies
4. b2. Analyze the drawbacks, requirements, decision making scenarios and suggest the best optimal solution
5. b3. Explore New Emerging Trends & Technologies, available IT Solutions suitable to enhance organization's performance
6. c1. Apply the best optimal IT Solutions, IT Strategies to improve the organizational performance
7. c2. Apply the best of new emerging trends and technologies to benefit organization
8. c3. Develop a strong application-network controls and secure IT Infrastructure for an organization, the perfect plan in managing projects
9. d1. Write project - technical report and present projects/assignments



| الموصف | المراجع | مسؤول البرنامج | رئيس القسم | عميد الكلية |
|---|---|---|---|---|
| | | أ.وديع القباطي | أ.نبيل المخلافي | د. عبدالقادر العبادي |

## IV. Course Contents

**Theoretical Aspect:**

| No. | Course Units | Sub-topics | Week due | Contact Hours |
|---|---|---|---|---|
| 1. | Unit-1 | 1. Introduction – Overview of IT Management concepts<br>2. Telecommunications, the Internet, and Wireless Technology Advanced<br>3. Mobile Computing & M-Commerce Advanced | Week 3 | 9 |
| 2. | Unit-2 | 4. Development Process – Developing Business/IT Strategies<br>5. Development Process – Developing Business/IT Solutions<br>6. Enhancing/Supporting Decision Making | Week 6 | 9 |
| 3. | Unit-3 | 7. IT Controls, Asset Protection, and Security<br>8. Security & Ethical Challenges<br>9. Managing Global Systems | Week 9 | 9 |
| 4. | Unit-4 | 10.Managing Projects | Week 11 | 6 |
| 5. | Unit-5 | 11.New Emerging Trends & Technologies | Week 13 | 6 |
| | | 12.Revision | Week 14 | 3 |
| Total number of weeks and hours | | | 14 | 42 |

| Second: Practical/Tutorial/Clinical Aspects : | | | |
|---|---|---|---|
| Write up practical/tutorial/clinical topics | | | |
| **No.** | **Practical/Tutorial/Clinical topics** | **No. of Weeks** | **Contact Hours** |
| **1.** | N/A | | |
| **2.** | N/A | | |
| **3.** | N/A | | |
| **4.** | N/A | | |
| **5.** | N/A | | |
| **6.** | N/A | | |
| **7.** | N/A | | |
| **8.** | N/A | | |
| **9.** | N/A | | |
| **Total number of weeks and hours** | | | |

## V. Teaching Strategies

1. Lectures
2. Group Discussions
3. Case study
4. Assignment
5. Homework
6. Brain Storming

## VI. Tasks and Assignments

| No. | Task/Assignment | Week due | Mark |
|---|---|---|---|
| 1. | Assignment 1 + report | WEEK 12 | 10 |
| 2. | Assignment 2 + report | WEEK 14 | 15 |
| | | | |



| الموصف | المراجع | مسؤول البرنامج | رئيس القسم | عميد الكلية |
|---|---|---|---|---|
| | | أ.وديع القباطي | أ.نبيل المخلافي | د. عبدالقادر العبادي |

## VII. Learning Assessment:

| No. | Assessment Tasks | Assessment day & date | Mark | Weight |
|---|---|---|---|---|
| 1 | Quiz 1 | WEEK 3 | 5 | 5% |
| 2 | Quiz 2 | WEEK 5 | | |
| 3 | Mid term exam | WEEK 7 | 20 | 20% |
| 4 | Assignment – 1 | WEEK 12 | 10 | 10% |
| 6 | Assignment – 2 | WEEK 14 | 15 | 15% |
| 7 | Reports | WEEK 14 | | |
| 8 | Final Exam | WEEK 15 | 50 | 50% |
| | Total | | | |

## VIII. Learning Resources

SKOOB TXET

James A. O'Brien & George M. Marakas, (2011), Enterprise Information Systems, 13th Edition, Mc. Graw Hill, USA.

K.C.Laudon & J.P.Laudon, (2012), Managing the Digital Firm, 12th Edition, Pearson Prentice Hall, USA.

SECNEREFER

Efraim Turban , (2011), Information Technology for Managements, 8th Edition, Wiley publications, USA.

Ellrn F.Monk , (), Concepts in Enterprise Resource Planning, 2nd Edition.

Raymond Mcleod & George P.Schell, (),M.I.S by, 10th Edition, Pearson Prentice Hall, USA.

Carroll W. Frenzel & John C. Frenzel, (),Management of IT, 4th Edition, Thomson Course Technology.

**Electronic Materials and Web Sites:**

www.myMISlab.com

| IX. Course Policies (To be determined by Faculty Deanship) | |
|---|---|
| 1. | **Class Attendance :** |
| 2. | **Tardy :** |
| 3. | **Exam Attendance/Punctuality:** |
| 4. | **Assignments & Projects:** |
| 5. | **Cheating:** |
| 6. | **Plagiarism:** |
| 7. | **Other policies:** |



| الموصف | المراجع | مسؤول البرنامج | رئيس القسم | عميد الكلية |
|---|---|---|---|---|
| | | أ.وديع القباطي | أ.نبيل المخلافي | د. عبدالقادر العبادي |