



**COLLEGE OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY (CSIT)**  
**COURSE OUTLINE**  
**SEMESTER 2 2017/2018**

<b>Name of Course</b>		<b>Software Quality</b>																		
<b>Course Code</b>		<b>CSEB453</b>																		
<b>Lecturer's Name</b>		<b>Dr. Hazleen Aris</b>																		
<b>Room No.</b>		<b>BW-3-C30</b>																		
<b>Office Tel. No.</b>		<b>03-89212368</b>																		
<b>Email</b>		<b>hazleen@uniten.edu.my</b>																		
<b>Section</b>		<b>1 &amp; 2</b>																		
<b>Time Table</b>	<b>Lecture</b>	<b>Section 1</b> <ul style="list-style-type: none"> <li>Tuesdays (10am – 12noon)</li> <li>Thursdays (8am – 9am)</li> </ul> <b>Section 2</b> <ul style="list-style-type: none"> <li>Mondays (10am – 12 noon) – <i>Potential change</i></li> <li>Tuesdays (9am – 10am)</li> </ul>																		
	<b>Lab</b>	-																		
<b>Consultation Hours</b>		<b>By appointment. Email me for appointment.</b>																		
<b>Course Objectives:</b>  This course aims to: <ol style="list-style-type: none"> <li>1. Introduce the concepts of software quality assurance and its components</li> <li>2. Understand the activities involved in software quality assurance field</li> <li>3. Understand the processes and the framework within software quality assurance field</li> </ol>																				
<b>Course Outcomes:</b>  At the end of this course, the student should be able to: <p>CO1. Identify the fundamental concepts associated with quality and software quality</p> <p>CO2. Identify the unique characteristics of software as product and process</p> <p>CO3. Describe the significance of software quality assurance in software development process</p> <p>CO4. Discuss the attributes, techniques, processes and issues associated with software quality</p> <p>CO5. Determine the appropriate standard related to software quality assurance initiative</p> <p>CO6. Select the appropriate techniques and processes in producing a plan for software quality assurance initiative</p> <p>CO7. Discuss on various review techniques, roles and responsibilities involved in review activity</p>																				
<b>Assessment Methods and Types</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Assessment Method</th><th>SLT</th><th>Sem. 2, 2017/18</th></tr> </thead> <tbody> <tr> <td>Quizzes</td><td>0% – 10%</td><td>10%</td></tr> <tr> <td>Assignment/Project/Research/Lab</td><td>10% – 30%</td><td>25%</td></tr> <tr> <td>Test (Mid Term)</td><td>0% – 20%</td><td>15%</td></tr> <tr> <td>Final Exam:</td><td>50%</td><td>50%</td></tr> <tr> <td>Total</td><td></td><td>100%</td></tr> </tbody> </table>			Assessment Method	SLT	Sem. 2, 2017/18	Quizzes	0% – 10%	10%	Assignment/Project/Research/Lab	10% – 30%	25%	Test (Mid Term)	0% – 20%	15%	Final Exam:	50%	50%	Total		100%
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Course Content and Weekly Activity			
Week	Topic	Chapter	Activities
Week 1- 2	<b>Software Quality Overview</b> <ul style="list-style-type: none"> <li>• Definition of Quality</li> <li>• The Importance of Quality</li> <li>• Quality Assurance (QA) Vs Quality Control (QC)</li> <li>• Quality Assurance at each phase of SDLC</li> <li>• The SQA Function</li> <li>• Objectives of SQA</li> <li>• The Benefits of SQA Function</li> <li>• SQA Roles and Responsibilities</li> <li>• Management Involvement in Software Quality Assurance</li> </ul>	1	
Week 3-4	<b>Managing Software Quality in an Organization</b> <ul style="list-style-type: none"> <li>• Quality Management System (QMS) in Organization               <ul style="list-style-type: none"> <li>○ What is QMS?</li> <li>○ Quality Policy</li> </ul> </li> <li>• QMS: Expectations from Relevant Stakeholders               <ul style="list-style-type: none"> <li>○ From Project Manager</li> <li>○ From Programmer/Developer</li> <li>○ From Business Analyst</li> <li>○ From Senior Management</li> <li>○ From Human Resource</li> <li>○ From Customers</li> <li>○ From Testers</li> </ul> </li> <li>• Quality Assurance: QMS Evaluation (Adequacy Audit)</li> </ul>	2	Quiz 1
Week 5	<b>Planning for Software Quality Assurance</b> <ul style="list-style-type: none"> <li>• Software Quality Assurance Plan               <ul style="list-style-type: none"> <li>○ Purpose of SQA Plan</li> <li>○ Content of SQA Plan</li> <li>○ Sample of SQA Plan</li> </ul> </li> <li>• SQA: Organizational Level Initiatives               <ul style="list-style-type: none"> <li>○ Managing the software process                   <ul style="list-style-type: none"> <li>▪ Process Management</li> <li>▪ Standard Process Definition</li> <li>▪ Software Process Measurement</li> <li>▪ Defect Prevention</li> <li>▪ Technology Innovation</li> <li>▪ Process Change Management</li> </ul> </li> </ul> </li> <li>• Audit</li> </ul>	3	
Week 6	<b>Product Quality and Process Quality</b> <ul style="list-style-type: none"> <li>• Product Quality               <ul style="list-style-type: none"> <li>○ Software Attributes</li> </ul> </li> <li>• Models for Software Product Quality               <ul style="list-style-type: none"> <li>○ McCall's Factor-Criteria-Metric Model</li> <li>○ The ISO 9126 Standard Quality Model</li> <li>○ Other Models for Software Product Quality</li> </ul> </li> <li>• Process Quality               <ul style="list-style-type: none"> <li>○ ISO 9001 Quality Management for Process Quality Framework</li> </ul> </li> </ul>	4	

Course Content and Weekly Activity			
Week	Topic	Chapter	Activities
	<ul style="list-style-type: none"> <li>○ Maturity Models for Process Quality</li> </ul>		
Week 7	<b>Software Measurement and Metrics</b> <ul style="list-style-type: none"> <li>• What is Measurement?</li> <li>• Why Measure?</li> <li>• Steps in Measurement</li> <li>• Attributes of Effective Software Metrics               <ul style="list-style-type: none"> <li>• Measurement during Software Life Cycle Context</li> <li>• Measurement for Enhancement phase</li> <li>• Measurement during Construction phase</li> </ul> </li> <li>• Measurement during Testing phase</li> <li>• Defect Metrics</li> <li>• Metrics for Software Maintenance</li> <li>• Classification of Software Metrics</li> <li>• Requirements Related Metrics               <ul style="list-style-type: none"> <li>• Requirements Traceability</li> <li>• Requirements Stability Index</li> </ul> </li> <li>• Measurement and Process Improvement</li> <li>• Measurement Scales</li> <li>• Earned Value Analysis</li> <li>• Benefits of Measurement and Metrics for Project Tracking and Control</li> </ul>	5	Mid semester examination
Week 8	<b>SEMESTER BREAK</b>		
Week 9-10	<b>Inspection &amp; Reviews</b> <ul style="list-style-type: none"> <li>• Why Reviews?</li> <li>• Structured Walkthroughs</li> <li>• Inspections</li> <li>• Roles and Responsibilities involved in Reviews/Inspections               <ul style="list-style-type: none"> <li>○ Moderator</li> <li>○ Producer</li> <li>○ Reviewer</li> <li>○ Recorder</li> </ul> </li> <li>• Making Reviews and Inspection Effective               <ul style="list-style-type: none"> <li>○ Inspecting the Entire Work Product</li> <li>○ Using Combined Knowledge</li> <li>○ Using Different Viewpoints</li> <li>○ Improving the Chances for Finding Errors</li> </ul> </li> <li>• Benefits of Review</li> </ul>	6	
Week 11	<b>Software Configuration Management</b> <ul style="list-style-type: none"> <li>• Configuration Management: What and Why?</li> <li>• Software Configuration Management Activities</li> <li>• Standards for Configuration Audit Functions               <ul style="list-style-type: none"> <li>○ ISO</li> <li>○ CMM</li> <li>○ IEEE</li> </ul> </li> <li>• Personnel in SCM Activities</li> </ul>	7	
Week 12	<b>Software Testing</b> <ul style="list-style-type: none"> <li>• Overview</li> </ul>	8	Quiz 2

Course Content and Weekly Activity			
Week	Topic	Chapter	Activities
	<ul style="list-style-type: none"> <li>• Purpose of Testing</li> <li>• Differences between Inspection and Testing</li> <li>• Testing v/s Debugging</li> <li>• Testing Life Cycle</li> <li>• Roles and Responsibilities in Testing</li> <li>• Test Artifacts</li> <li>• Test Plan</li> <li>• V-Model for Testing phases</li> <li>• Testing Technique</li> <li>• Test Metrics</li> <li>• Risk-Based Testing</li> <li>• Regression Testing</li> </ul>		
Week 13-14	<b>Standardization of Software</b> <ul style="list-style-type: none"> <li>• What is ISO 9000?</li> <li>• Why do Organizations Need ISO 9000?</li> <li>• ISO Certification</li> <li>• What is CMMI?</li> <li>• CMMI Model Representation</li> <li>• Staged Representation</li> <li>• Continuous Representation</li> <li>• Other Process Improvement Models</li> <li>• IEEE 1074</li> <li>• Malcolm Baldrige National Quality Award (MBNQA)</li> </ul>	9	Assignment due
Week 15	<b>FINAL EXAM WEEKS</b>		
Week 16			

<b>Text book:</b>	<b>Compulsory:</b> Nina S Godbole, Software Quality Assurance: Principles and Practice, 4th. Edition, Alpha Science International Ltd. Oxford, UK, 2008
	<b>Additional:</b> Galin, Daniel, Software Quality Assurance: From Theory to Implementation Handbook of Software Quality Assurance, by <a href="#">G. Gordon Schulmeyer</a> , <a href="#">James I. Mcmanus</a> . Prentice-Hall, Inc. Ince, D. 1994. <i>ISO 9001 and Software Quality Assurance</i> McGraw Hill.
<b>Lecture Notes &amp; Announcement</b>	The Lecture Notes can be downloaded from the following website: <a href="http://metalab.uniten.edu.my/~hazleen/CSEB453">http://metalab.uniten.edu.my/~hazleen/CSEB453</a>  Announcement & important notices will be done at our website <i>or via <b>Class Notice (email)</b></i> .
<b>Attendance and Class Policies</b>	Attendance will be taken during each lecture. It is UNITEN rule that student attendance MUST be more than <b>80%</b> in order to be allowed to sit for the final examination.

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**Programme Educational Objectives (PEO)**

(desired skills of alumni)

**PEO for Bachelor of Computer Science (Hons.) programmes:**

	Program Educational Objectives (PEO)
PEO1	Are able to apply knowledge and technical competencies in Computer Science that is suitable to the task being performed.
PEO2	Possess strong analytical and critical thinking to solve problems by applying the knowledge and skills acquired in Computer Science.
PEO3	Are competent in analyzing, modeling, designing, developing and evaluating computing solutions.
PEO4	Uphold professional and ethical attitudes, and able to demonstrate skills in communication, leadership and teamwork with awareness towards the responsibility to the Almighty and the society.
PEO5	Possess skills for lifelong learning, research and career development.
PEO6	Have entrepreneurial skills and a broad business and real world perspective.

**PROGRAMME OUTCOMES (PO)**

(desired knowledge, skills and attitude of graduating seniors)

**PO for Bachelor of Computer Science (Software Engineering) (Hons.)**

At the end of the program, graduates should be able to:

PO1	Demonstrate knowledge and understanding of essential facts, concepts, principles, and theories relating to Computer Science, with an emphasize on Software Engineering;
PO2	Apply theoretical principles of Computer Science, particularly Software Engineering, in relevant areas;
PO3	Apply appropriate methodologies, models and techniques that provide a basis for analysis, design, development, test and implementation, evaluation, maintenance and documentation of a Software System;
PO4	Utilise relevant techniques and demonstrate analytical and critical thinking skills in problem solving;
PO5	Apply skills and principles of lifelong learning in academic and career development;
PO6	Communicate effectively with peers, clients, superiors and society at large;
PO7	Demonstrate professionalism and social and ethical considerations in accordance with ethical and legal principles;
PO8	Demonstrate teamwork, leadership, interpersonal and social skills; and
PO9	Apply broad business and real world perspectives daily and demonstrate entrepreneurial skills.