Course: SENG 581 – Quality Software Process Management

Semester: Spring 2016

Course Format
And Credit hours: 1 hr Student Briefs/Discussion, 2 hr Lecture/Research and Project Presentations
3 hours Course Credit

Prerequisites: SENG 510 or consent

Instructor: Dale G. Dzielski, Dale.Dzielski@mail.wvu.edu, office: 304-293-9135 (use sparingly)
Communication Plan: Please use the eCampus Course Message feature to communicate with anyone in the class and myself. All course material and assignments will be provided using the eCampus features. The Instructor will attempt to respond to learner questions within 24 hours of receipt of inquiry on weekdays and 48 hours on weekends.

Schedule: Mondays 6:00 to 8:20 pm

Location: WVU eCampus, https://ecampus.wvu.edu/

Office Hours: Upon Request

Course Objectives: The objectives of this course are to evaluate quality management theory and practice from a software engineering perspective, research the history, principles and techniques of Quality Management with emphasis on the Software Development and IT Services organization, and apply quality management standards to develop quality processes to deliver quality software products with emphasis on Software Engineering Institute’s (SEI’s) Continuous Maturity Model Integrated (CMMI) models.

Expected Learning Outcomes: Upon successful completion of SENG 581, students will be able to:

1. Identify general quality methods and techniques being utilized by government and business today.
2. Describe where quality practices have come from, why they are needed, and how they are to be utilized to assist the enterprise in achieving its planning of current and future business and IT operations.
3. Utilize and synthesize internet research in software process quality management and business process management and report on findings.
4. Apply the SEI’s CMMI models to real life software development processes in an enterprise.

Required Textbooks: None

Reading assigned from various Internet sources provided by the instructor to include the body of knowledge from these areas:

- Total Quality Management (TQM)
  http://asq.org/learn-about-quality/total-quality-management/overview/overview.html
- Continuous Process Improvement (CPI)
  http://asq.org/learn-about-quality/continuous-improvement/overview/overview.html
- Business Process Management (BPM)
  http://www.bpm institute.org/
- International Quality & Productivity Center
- ISO 9000 Series - Quality Management
- IEEE Quality Standards
  http://www.ieee.org/portal/site
Technology Needed:
Students must have technology compatible with the standard requirements of the current platform with eCampus access, https://ecampus.wvu.edu/, and Windows Media Player. Student assignments are primarily required to be turned in using Microsoft Office 2010 Product Suite therefore reasonable proficiency in this product is required.

Materials Needed: Students must have a current University email account and WVUID with password.

Grades:

<table>
<thead>
<tr>
<th>Task</th>
<th>% of Total Grade</th>
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<tbody>
<tr>
<td>Assignments</td>
<td></td>
</tr>
<tr>
<td>- Research Briefs (6 x 2%)</td>
<td>12</td>
</tr>
<tr>
<td>- Case Studies (3 x 3%)</td>
<td>9</td>
</tr>
<tr>
<td>- Research Paper Presentation</td>
<td>4</td>
</tr>
<tr>
<td>Research Paper</td>
<td>25</td>
</tr>
<tr>
<td>Team Project</td>
<td>25</td>
</tr>
<tr>
<td>Final Exam</td>
<td>25</td>
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</tbody>
</table>

Total Class Points 100%

Grading Scale:
100 – 90 A
89 – 80 B
79 – 70 C
69 – 60 D
59 – 0 F

Grading Policy:
A late assignment equals no assignment; however, brief presentations may be made up. Late research paper assignments and project deliverables will not be graded and count as a zero for the portion of the paper or project that is late. Exam grading appeals must be in writing on the day the exam is returned. There are no make-up exams except by prior arrangement with the instructor.

Every attempt will be made to grade projects, assignments, and case studies within seven days of the due date. Other grades will be graded within the same length of time the student had been given to complete the assignment, e.g. case studies are given two weeks for the student to complete; therefore, the instructor will attempt to provide the grade within two weeks after the case study had been turned into the instructor.
<table>
<thead>
<tr>
<th>#</th>
<th>Module</th>
<th>Objectives - The student will:</th>
<th>Outcomes – The student will be able to:</th>
<th>Related Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Quality Concepts</td>
<td>Read about and analyze quality management theory and practice from a software engineering perspective. Explain key quality terminology. Discuss basic quality concepts across all industries today.</td>
<td>Define key quality concepts and terminology presented in the course. Perform and present research in quality areas. Discuss basic quality topics related to software engineering. Brief other student’s research in quality software engineering topics.</td>
<td>Reading Research Briefs (12%) Discussion Board (5%) Case Study (3%) Final Exam (25%)</td>
</tr>
<tr>
<td>2</td>
<td>Quality Methods</td>
<td>Read about and analyze quality methods and techniques being utilized by government and business today.</td>
<td>Find and report on quality methods and techniques. Study current cases and report on how quality is handled in each case. Discuss quality methods and practices across industry.</td>
<td>Reading Research Briefs (12%) Discussion Board (5%) Case Study 1 (3%) Final Exam (25%)</td>
</tr>
<tr>
<td>3</td>
<td>Quality Standards &amp; Processes</td>
<td>Study quality standards and processes and discuss and report of how they assist the enterprise in achieving its mission.</td>
<td>Find and report on standards and processes. Study current standards and/or processes cases in industry and report on how quality is handled in each case. Discuss quality methods and practices across industry.</td>
<td>Reading Research Briefs (12%) Discussion Board (5%) Case Study 2 (3%) Discussion Board (5%) Final Exam (25%)</td>
</tr>
<tr>
<td>4</td>
<td>Quality Research</td>
<td>Research a selected topic in software quality. Report on the selected topic research findings. Present the history, principles and/or techniques of Quality.</td>
<td>Develop a research paper on a selected quality topic. Present a summary of the research findings on a selected quality topic.</td>
<td>Reading Research Paper (25%) Discussion Board (5%) Research Presentation (4%)</td>
</tr>
<tr>
<td>5</td>
<td>BPM and Quality</td>
<td>Read about and analyze business process management practices utilized by government and business today.</td>
<td>Find and report on business process management. Study current standards and/or business process cases in industry. Report on how business process is handled in each case. Discuss business process practices across industry.</td>
<td>Reading Research Briefs (12%) Discussion Board (5%) Case Study 3 (3%) Final Exam (25%)</td>
</tr>
<tr>
<td>6</td>
<td>Applied Quality Practices</td>
<td>Demonstrate quality management standards. Develop an SOP that will assist in</td>
<td>Deliver an SOP report using the SEI’s CMMI models of a real life software development process within an actual company. Present a summary of the SOP as a training guide for employees of the</td>
<td>CMMI Quality Team Project (25%)</td>
</tr>
</tbody>
</table>
the delivery of quality software products with emphasis on applying SEI’s CMMI models. Work effectively in a team to achieve a successful outcome.

company. Collaborate with others to complete a project successfully.

Research Briefs:
Research briefs will be required every other week and each research brief will be worth 2%, 1% for the report and a 5 minute briefing in class, and 1% for discussion board posting. There will be 6 briefs each worth the same amount with the total worth 12% of the final grade. You can utilize the links from the Required Textbook section above but you are not restricted to only these. It is recommended that you build upon a topic listed within the syllabus. For example, it can be on Quality standard, tools, application of Quality in industry or government, etc. Utilize the references, links provided in class, or other Internet sites, library materials, periodicals, etc. Submit to eCampus by 6 PM the day before class. At the beginning of each class we will take a few minutes to discuss the briefs.

RESEARCH BRIEF RUBRIC (Total 2% x 6 briefs =12%)

<table>
<thead>
<tr>
<th>Formatting/Grammar</th>
<th>Microsoft Word or comparable application that can be converted easily by MS Word, ½ page to no greater than 1 page, 1” margins, 12 pt Times New Roman, single spaced, double spaced paragraphs, Footnotes used for references – hyperlink only is acceptable, at least two references must be used. No Grammar and Spelling errors.</th>
<th>.5% for compliance 0% for noncompliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topic Selection/Presentation</td>
<td>Within the scope of Quality Management or Business Process Management Emerging and innovative ideas or added knowledge to class lectures Different from previous briefs. Presented brief in class within 5 minutes.</td>
<td>.5% for compliance 0% for noncompliance</td>
</tr>
<tr>
<td>Discussion Board Posts</td>
<td>2 sentence overview of your brief posted. 2 comments or questions related to another class member’s brief.</td>
<td>1% for compliance .5% for partial compliance 0% for noncompliance</td>
</tr>
</tbody>
</table>

Case Studies:
Case Studies will be given approximately every fourth or fifth week and each case study will be worth 3%, 1% for the discussion board posts, .5% for in class discussion, and 1.5% for completed questions. There will be 3 case studies each worth the same amount with the total worth 9% of the final grade. The specific Case Study will be provided in eCampus the day it is assigned. Submit to eCampus by 6 pm, the day it is due. At the beginning of each class we will take a few minutes to discuss the case study.
CASE STUDY RUBRIC (Total 3% x 3 case studies = 9%)  

| Formatting/Grammar | Microsoft Word or comparable application that can be converted easily by MS Word, short answer questions that can be bulleted and directly from case study, include questions prior to each answer, 1” margins, 12 pt Times New Roman, single spaced. No Grammar and Spelling errors. | .5% for compliance  
0% for noncompliance |
|-------------------|-------------------------------------------------------------------------------------------------|-----------------|
| Case Study Response | Answered correctly all questions. Had rationale behind answers. Shared in class some of your answers. | 1.5% for compliance  
Partial credit per question based upon Case Study  
0% for noncompliance |
| Discussion Board Posts | Initiate a specific discussion on one of the questions. Post 1 comment on 3 different classmates initiated discussion. | 1% for compliance  
.5% for partial compliance  
0% for noncompliance |

**Individual Research Paper:** You are required to select a topic within the quality management field of study and approved by the instructor. You will turn in a title and synopsis worth 1% of your grade, an annotated outline worth 9% of your grade, the final research paper worth 15% of your grade. You will provide a brief presentation worth 4% of your grade before the instructor and other students in eCampus.

**RESEARCH PAPER PRESENTATION RUBRIC (Total 4%)**  

| Formatting/Grammar | Microsoft PowerPoint or comparable application that can be converted easily by MS PowerPoint of your research paper. No less than 5 slides and no more than 10 slides to include: Title, Content, Summary, and Bibliography. No Grammar and Spelling errors. | 2% for compliance  
Partial credit will be given: -.5% grammar/ spelling errors found  
-.5% difficult to read  
-.5% organized well  
-.5% too much information  
0% for noncompliance |
|--------------------|-------------------------------------------------------------------------------------------------|-----------------|
| Research Paper Presentation | Presented clearly and followed slide material. (.5%) Demonstrated knowledge of topic. (.5%) Topic within paper was covered in summary. (.5%) Questions/Answered session clearly showed signs of topic knowledge. (.5%) | 2% for compliance  
Partial credit will be given based upon assigned percentages in requirement column.  
0% for noncompliance |

**RESEARCH PAPER RUBRIC (Total 25%)**  

| Final Paper Formatting/Grammar | Microsoft Word or comparable application that can be converted easily by MS Word, 1” margins1” margins, 12 pt Times New Roman, double spaced, tab | 5% for compliance  
Partial credit provided .5% for each fraction |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------|-----------------|

Page 5
Title Page: Title, Date, Name, Course Information

Content: No less than 10 pages and no greater than 15 pages, count excluding title and bibliography pages.

Bibliography: No less than 5 references [This means separate PRIMARY sources; reuse of a single route URL such as www.wikipedia.org or www.quality.com counts only once]

You must use the MLA Handbook Seventh Edition. You may use the free citation builder available from the WVU Library online at http://www.libraries.wvu.edu/instruction/citationbuilder/ to help you build your bibliography.

Title Selection and Synopsis

Topic must be within the quality or process management domain. Synopsis should be one paragraph no longer than ½ page single spaced describing purpose and objectives of research.

Annotated Outline and Draft Bibliography

Outline that is annotated with brief discussion in a few sentences about what will be intent of content under each heading.

No less than 5 references [This means separate PRIMARY sources; reuse of a single route URL such as www.wikipedia.org or www.quality.com counts only once]

Does not have to be complete, can vary from final.

You must use the MLA Handbook Seventh Edition for formatting of bibliography.

Final Research Paper

Must meet formatting requirements above.

Organization is easy to follow by reader.

Some information presented on the topic is new from all other course materials presented in class.

Rationale provided on topic is logical.

References are verifiable and represent experts on topic.

Quality Processes Team Project: During this course, you are expected to work in a group of 3 or 4 students to develop a software quality standard operating procedure covering material presented in this course. The specific objective of this project is to apply to a real organization either CMMI for Development or CMMI for Services to develop aspects of Standard Operating Procedures (SOPs) and other supporting documentations and presentations within certain Process Areas (PAs) unique to that organization. The Process Areas depend upon the team’s selection of CMMI for Development Version 1.3 or CMMI for Services Version 1.3. The CMMI for Development Version 1.3 PAs must come from the following list: Project Planning, Process and Product Quality Assurance, Configuration Management, Measurement and Analysis, Project Monitor and Control, or Requirements Management. CMMI for Services PA selection is to be discussed with the instructor. These details will be announced in a class approximately the 5th week of the semester. Additional instructions on specific project deliverables will be provided by the instructor throughout the course. In addition to these deliverables you and your group members will also be required to present the results of your work in a formal oral and PowerPoint presentation, on e-campus before the instructor and students, during the final weeks of the course before finals week. Keep in mind the structure of the project requires everyone to do an equal number of deliverables.

QUALITY PROCESS TEAM PROJECT (Total 25%)

Team Formation and Customer Selection

Think about an organization you can bring to the team to help in selecting your team’s organization for the project. Provide the name of the customer selected.

2%
Discussion Board | Team discussion regarding formation and customer selection to include:
- What organizations are considered?
- Who makes the arrangements?
- Division of Labor?
- Uniformity of Presentation both of Slides and Reports.
Each member of the team provides at least 2 posts to the discussion. Note: You can use off resources, email, and phone to continue project work but must use eCampus for the two initial planning posts. | 3% for compliance
0% for noncompliance

**Deliverable 1 - Project Summary**
Team Member 1 Presents PowerPoint slide. Provide a Project Report that discusses:
Name of organization
Project Name
Project domain
CMMI for Development or CMMI for Service selection process for PAs. Why these PAs?
Current Project status: does one exist now or is this new? Is it online, past, present, future of CMMI effort in organization? What do they want from this effort? | 5% in compliance
2% PowerPoint Slide
1% Presentation
2% SOP Report

**Deliverable 2 – Process Area (PA) 1 Maturity Level 2**
Team Member 2 provides:
PowerPoint Briefing – Requirement:
The Perspective is as a training tool to the organizations personnel.
15 Minutes to Present with 5 minutes discussion.
PA-1 Standard Operating Procedure (SOP) Report – Requirements:
Must be in format the team determines best communicates to the personnel and meets organizational standards for the selected process area addressing. | 5% in compliance
2% PowerPoint Slide
1% Presentation
2% SOP Report

**Deliverable 3 – Process Area 2 Maturity Level 2**
Team Member 3 provides:
PowerPoint Briefing – Requirement:
The perspective is as a training tool to the organizations personnel.
15 Minutes to present with 5 minutes of Q/A discussion.
PA-1 Standard Operating Procedure (SOP) Report – Requirements:
Must be in format the team determines best communicates to the personnel and meets organizational standards for the selected process area addressing. | 5% in compliance
2% PowerPoint Slide
1% Presentation
2% SOP Report

**Deliverable 4 – Process Area 3 Maturity Level 2**
Team Member 4 provides (only if one exists):
PowerPoint Briefing – Requirement:
The Perspective is as a training tool to the organizations personnel.
15 Minutes to Present with 5 minutes discussion.
PA-1 Standard Operating Procedure (SOP) Report – Requirements:
Must be in format the team determines best communicates to the personnel and meets organizational standards for the selected process area addressing. | 5% in compliance
2% PowerPoint Slide
1% Presentation
2% SOP Report

**Final Exam:** The test is designed to gauge the student’s understanding of topics covered in assigned reading, lectures, and homework assignments. The final will be comprehensive. The primary focus will be on all the course materials including that presented by the class. The ‘take home’ exam will be in essay format and you will be given one week to complete the final exam. No outside sources will be allowed.
only the materials found in the course folders. Final Exam Rubric will be provided on the exam and discussed in class during the review.

**Academic Integrity:** Students who practice academic dishonesty, such as cheating or plagiarism, will be penalized. Severe penalties will follow from the discovery of any representation of another individual’s work (in any form) as your own (i.e., copying any portion of written assignments or exams). Check the *MLA Handbook for Writers of Research Papers Seventh Edition* (ISBN: 9781603290241) for proper citation of others’ work to avoid plagiarism in written assignments. Penalties range from a grade of “zero” on the assignment in question to an “unforgivable F” in the course.

If you have not already done so please go to the website [http://www.libraries.wvu.edu/instruction/plagiarism](http://www.libraries.wvu.edu/instruction/plagiarism) and sign-in as WVU Students-First Time. Use your MyID username and password and complete the Tutorial & Take the Test. Please e-mail your certificate for the test to the Software Engineering Program Coordinator, Dale.Dzielski@mail.wvu.edu. Please refer to the [New Student Orientation Manual for Online Courses](http://elearn.wvu.edu/students/images/NewStudentOrientationManual_101910.pdf).

The document provides information on eCampus, Mix, STAR, Help Desk, refund policy, WVU Bookstore and important phone numbers.

**Attendance Policy:** Students are expected to attend every class. Archives are made available to review if missed due to personal or work related absence that should be communicated with instructor when possible. Consistent with WVU guidelines, students absent from regularly scheduled examinations because of authorized University activities will have the opportunity to take them at an alternate time. Make-up exams for absences due to any other reason will be at the discretion of the instructor.

**Inclusivity Statement:** “West Virginia University community is committed to creating and fostering a positive learning and working environment based upon open communication, mutual respect, and inclusion.

If you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class, please advise me and make appropriate arrangement with Disability Services (293-6700). For more information on West Virginia University's Diversity, Equity, and Inclusion initiatives, please see [http://diversity.wvu.edu](http://diversity.wvu.edu).
<table>
<thead>
<tr>
<th>Week/Module</th>
<th>Module/Week Topic</th>
<th>Reading and Assignments</th>
<th>Assignments Due</th>
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<tr>
<td>1/1</td>
<td>Quality Concepts/ Introduction, Syllabus Review, Quality Management Overview Lecture</td>
<td>Course Syllabus Getting Started</td>
<td>None</td>
</tr>
<tr>
<td>2/1</td>
<td>MLK Day</td>
<td>Recess: University Closed</td>
<td>None</td>
</tr>
</tbody>
</table>
- Tr021.95.PDF, Quality Attributes, December 1995, SEI, [http://www.sei.cmu.edu/pub/documents/95.reports/pdf/tr021.95.pdf](http://www.sei.cmu.edu/pub/documents/95.reports/pdf/tr021.95.pdf), Also available in Lecture 2 Folder  
- The 50: People Most Influenced Business This Century, LA Times, October 25, 1999, [http://deming.org/index.cfm/content=651](http://deming.org/index.cfm/content=651)  
- Four Days with W. Edwards Deming by Scott M. Patton, [http://deming.org/index.cfm/content=653](http://deming.org/index.cfm/content=653) | Research Brief 1 |
- Using the Balanced Scorecard to Align Your Organization, Howard Rohm, [http://www.balancedscorecard.org/Portals/0/PDF/BalancedPerformance_Article1.pdf](http://www.balancedscorecard.org/Portals/0/PDF/BalancedPerformance_Article1.pdf)  
<table>
<thead>
<tr>
<th>Date</th>
<th>Title</th>
<th>Details</th>
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</table>
| 5/2  | Quality Methods/Briefs, Case Study 1, Quality and Methods Lecture | - Six Sigma for Better IT Operations and Customer Satisfaction, Tracy Mayor, [http://www.cio.com:80/article/print/31992](http://www.cio.com:80/article/print/31992)  
- A Long, Strange Trip Ahead: Process Management And Data Quality, Thomas C. Redman, Ph. D., ICIQ02-PMDQRedman.pdf  
“Lean Enterprise Model”, fixed handout, USAF.  
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic/Resource Details</th>
<th>Reference Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/4</td>
<td>Quality Research/ Briefs, Research Paper Presentations, Case Study 2</td>
<td>Other students research papers and briefings available on eCampus.</td>
</tr>
<tr>
<td>11/4</td>
<td>Midterm Break</td>
<td>NO CLASS</td>
</tr>
<tr>
<td>13/6</td>
<td>Applying Quality Practices/ Briefs, CMMI Lecture</td>
<td>UNC ITS, ITS Remedy Services, ITIL: Information Technology Infrastructure Library, ITIL Model Overview and Impact on ITS Presentation, April 2012. ITIL Software Scheme – What is it about?, 22</td>
</tr>
<tr>
<td>Date</td>
<td>Topic</td>
<td>Details</td>
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<tr>
<td>14/6</td>
<td>Applying Quality Practices/Briefs, Case Study 3, CMMI Continued Lecture</td>
<td>Team Presentations and Reports in eCampus</td>
</tr>
<tr>
<td>14/6</td>
<td>Applying Quality Practices/Briefs, CMMI Completed Lecture, Team Project Presentations</td>
<td>Take Home Final Exam Discussion</td>
</tr>
<tr>
<td>15</td>
<td>FINAL EXAM</td>
<td>No Class – Turn in Exam in eCampus</td>
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</table>