Washington State University
MAJOR CURRICULAR CHANGE FORM -- NEW/RESTORE COURSE

☐ Please attach rationale for your request, a complete syllabus, and explain how this impacts other units in Pullman and other campuses (if applicable).
☐ Obtain all required signatures with dates.
☐ Provide original stapled packet of signed form/rationale statement/syllabus PLUS 10 stapled copies of complete packet to the Registrar’s Office, campus mail code 1035.
☐ Submit one electronic copy of complete packet to wsu.curriculum@wsu.edu.

Requested **Future** Effective Date: Fall 2016
(Enter the term/year course typically offered)

DEADLINES: For fall term effective date: October 1st; for spring or summer term effective date: February 1st. See instructions.
NOTE: Items received after deadlines may be put to the back of the line or forwarded to the following year. Please submit on time.

☐ New Course

☐ Temporary Course

☐ Restore Course

Cpt. S 583

Software Quality

Course subject/crosslist 3 0

Course no.

Graduate standing

Credit hrs lecture hrs per week lab or studio hrs per week prerequisite

Description for catalog:
Software quality, quality assurance, process and product quality, software measures, quality attributes, quality management.

Additional Attributes: Check all that apply.

☐ Crosslisting (between WSU departments)*

☐ Variable credit:

☐ Conjoint listing (400/500):

☐ Repeat credit (cum. max. hrs):

Special Grading: ☐ S, F; ☐ A, S, F (PEACT only); ☐ S, M, F (VET MED only); ☐ H, S, F (PHARMACY, PHARDSCI only)

☐ Cooperative with UI

☐ Other (please list request):

The following items require prior submission to other committees/depts. (see instructions.)

☐ Request to meet Writing in the Major [M] requirement (Must have All-University Writing Committee Approval.)

☐ Request to meet UCORE in ________________ (Must have UCORE Committee Approval >> See instructions.)

☐ Special Course Fee ________________ (Must submit request to University Receivables.)

Josh Whiting

Contact: joshwhiting@wsu.edu

5-2446

Phone number:

2752

Campus mail code:

Email:

Instructor, if different:

Chair/date 9/29/15

Dean/date 9/22/15

All-University Writing Com / date

Chair (if crosslisted/interdisciplinary)*

Dean (if crosslisted/interdisciplinary)*

UCORE Committee Approval Date

Catalog Subcommittee Approval Date

GSC or AAC Approval Date

Faculty Senate Approval Date

*If the proposed change impacts or involves collaboration with other units, use the additional signature lines provided for each impacted unit and college.
This new course is required as part of the newly proposed BS SE or MS SE degrees as mandated by the State Legislature and to meet the state industry demand for trained workforce in the computer and software sectors. Full justification and rationale for offering these new degrees and courses are outlined in the corresponding new degree proposals to the Faculty Senate.
Software Quality

Course Name: Software Quality  
Course Number: Cpt S 583  
Credits: 3  
Lecture Hours: 3  
Schedule: Offered online (asynchronously) via Global Campus  
Prerequisites: Graduate standing.  
Course required/elective: required.  
Professors/Coordinators: Venera Arnaoudova, Bolong Zeng, and Evan Olds.

Textbook(s):  

Course description: Software quality, quality assurance, process and product quality, software measures, quality attributes, quality management.

Overview and Course Goals: In this course students will learn about the different facets of software quality. They will also learn to define specific quality goals and develop a plan to meet these goals. The course will teach techniques that allow to manage software quality as well as metrics that can be used to assess different quality attributes that are related to the defined quality goals.

Course topics and the corresponding program learning outcomes⁴:  
- Software quality models and improvement [1,2,3,4,5,6,7,8,9]  
- Software quality assurance. [1,2,3,4,5,6,7,8,9]  
- Software Verification and Validation (V&V) [1,2,3,4,5,6,7,8,9]  
- Software quality measurement [1,2,3,4,6,8,9]  
- Software quality management [1,2,3,4,5,6,7,8,9]

Learning outcomes and evaluation:  

Students that successfully complete the course will be able to:

1. Measure the degree to which software artifacts achieve the desired quality. 
2. Explain tradeoffs among cost, schedule, and quality. 
3. Defining specific quality goals, and estimating the effort and schedule of software quality activities. 
4. Determine how software quality is affected by the software development process used. 
5. Select and use standards in the quality management process.

³ Available on the IEEE Xplore Digital Library; access provided by WSU Libraries.  
⁴ The student learning outcomes for the MSSE program are labeled from ‘1’ to ‘9’.

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6. Explain the process of and conduct different activities to manage software quality such as reviews, audits, and walkthroughs.
7. Measure and relate the software quality to the appropriate quality attributes.

Mapping student learning outcomes, course topics, and evaluations:

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Course topics/dates</th>
<th>Evaluation of Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Software product quality measurement (weeks 5 and 14)</td>
<td>Mid-term 2, final exam, and project</td>
</tr>
<tr>
<td>2</td>
<td>Quality tradeoffs (weeks 1 and 2)</td>
<td>Mid-term 1, project</td>
</tr>
<tr>
<td>3</td>
<td>Quality definition (weeks 3 and 5)</td>
<td>Mid-term 1</td>
</tr>
<tr>
<td>4</td>
<td>Software process quality (week 4)</td>
<td>Project</td>
</tr>
<tr>
<td>5</td>
<td>Quality management (week 13)</td>
<td>Mid-term 2, project</td>
</tr>
<tr>
<td>6</td>
<td>Quality assurance (weeks 8, 9, and 10)</td>
<td>Final exam</td>
</tr>
<tr>
<td>7</td>
<td>Quality measurement (week 14)</td>
<td>Final exam, project</td>
</tr>
</tbody>
</table>

**Week-by-week schedule:**

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Software engineering culture and ethics.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Value and costs of quality.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Quality models and characteristics.</td>
<td>Mid-term 1</td>
</tr>
<tr>
<td>4</td>
<td>Software process quality.</td>
<td>Project deliverable 1</td>
</tr>
<tr>
<td>5</td>
<td>Software product quality.</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Quality improvement.</td>
<td>Project deliverable 1</td>
</tr>
<tr>
<td>7</td>
<td>Safety-critical systems.</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Software quality assurance.</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Software Verification and Validation (V&amp;V).</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Reviews and audits: e.g., management reviews, technical reviews, systematic walk-through.</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Software quality requirements: influence factors, dependability, and software integrity levels.</td>
<td>Mid-term 2</td>
</tr>
<tr>
<td>12</td>
<td>Defect characterization.</td>
<td>Project deliverable 2</td>
</tr>
<tr>
<td>13</td>
<td>Software quality management techniques.</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Software quality measurement.</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Software quality tools.</td>
<td></td>
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<tr>
<td>----</td>
<td>-------------------------</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Final exam, project deliverable 3</td>
<td></td>
</tr>
</tbody>
</table>

**Grading framework:** Course grades are based on 3 exams (two mid-terms and one final) totaling 50% of the final grade and a project totaling 50% of the final grade.

The project consists of defining, assuring, and assessing the quality of a software system. For the first project deliverable students will be given a project description and will be asked to 1) define quality goals and 2) estimate the cost of software quality based on the economic assessment of the software quality development and maintenance processes. For the second deliverable student will design and develop the software product and show that it meets the previously defined quality goals. For the third deliverable students will assess the process and product quality of a project developed by another team and suggest quality improvement.

Final grades will be awarded on the following scale:

<table>
<thead>
<tr>
<th>Interval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>[90,100]</td>
<td>A</td>
</tr>
<tr>
<td>[87,90)</td>
<td>A-</td>
</tr>
<tr>
<td>[83,87)</td>
<td>B+</td>
</tr>
<tr>
<td>[80,83)</td>
<td>B</td>
</tr>
<tr>
<td>[77,80)</td>
<td>B-</td>
</tr>
<tr>
<td>[73,77]</td>
<td>C+</td>
</tr>
<tr>
<td>[70,73]</td>
<td>C</td>
</tr>
<tr>
<td>[67,70]</td>
<td>C-</td>
</tr>
<tr>
<td>[63,67)</td>
<td>D+</td>
</tr>
<tr>
<td>[60,63)</td>
<td>D</td>
</tr>
<tr>
<td>[0,60)</td>
<td>F</td>
</tr>
</tbody>
</table>

**Course rules:**

You must take exam during the assigned test period. Failure to do so will result in a score of zero. However, in extraordinary circumstances and at the discretion of the instructor, a make-up exam may be offered. An advanced notice must be given to the instructor beforehand.

Unless posted otherwise, assignment documents shall be submitted electronically.

Late penalty is a flat 10% deduction per day. Late assignments may be turned up to one week after the original due date, and an advanced notice must be given to the instructor beforehand for the late submission. No homework will be accepted after its due day without advanced notice or special permission from the instructor.

Bonus points will be added to your total class score for attendance as follows: 0 absence = 5% of the final grade, 1 absence = 4 %, 2 absences = 3%, and 3 or more absences = 0% bonus.

**Reasonable Accommodation:**
Reasonable accommodations are available for students with a documented disability. If you have a disability and need accommodations to fully participate in this class, please either visit or call the Access Center (Washington Building 217; 509-335-3417) to schedule an appointment with an Access Advisor. All accommodations MUST be approved through the Access Center.

Academic Integrity:

I encourage you to work with classmates on assignments. However, each student must turn in original work. No copying will be accepted. Students who violate WSU's Standards of Conduct for Students will receive an F as a final grade in this course, will not have the option to withdraw from the course and will be reported to the Office Student Conduct. Cheating is defined in the Standards for Student Conduct WAC 504-26-010 (3). It is strongly suggested that you read and understand these definitions. (Read more: http://apps.leg.wa.gov/wac/default.aspx?cite=504-26-010)

Safety:

Washington State University is committed to maintaining a safe environment for its faculty, staff, and students. Safety is the responsibility of every member of the campus community and individuals should know the appropriate actions to take when an emergency arises. In support of our commitment to the safety of the campus community the University has developed a Campus Safety Plan, http://safetyplan.wsu.edu. It is highly recommended that you visit this web site as well as the University emergency management web site at http://oem.wsu.edu/ to become familiar with the information provided.