January 10, 2006

METROPOLITAN STATE COLLEGE *of* DENVER
Office of Academic Affairs

REGULAR COURSE SYLLABUS

School of: Letters, Arts, and Sciences

Department: Mathematical and Computer Sciences

CIP Code: 11.9999

Prefix & Course Number: CS 4283 **Crosslisted With*:** _____

Course Title: Software Testing and Quality Assurance

Check All That Apply: Required for Major: _____ Required for Minor: _____ Specified Elective: _____
Required for Concentration: _____ Elective: X Service Course: X

Credit Hours: 3 (3 + 0)

Total Contact Hours per semester (assuming 15-16 week semester):

Lecture 45 Lab 0 Internship 0 Practicum 0 Other (please specify type and hours): 0

Schedule Type(s): Lecture **Grading Mode(s):** Letter

Variable Topics Courses (list restrictions, including the maximum number of hours that can be earned**):

_____

** **NOTE: This information must be included in the course description.**

Restrictions (Variable Topics Course): _____

Prerequisite(s): CS 4250 or permission of department

Corequisite(s): _____

Prerequisite(s) or Corequisite(s): _____

Banner Enforced:

Prerequisite(s): _____
Corequisite(s): _____
Prerequisite(s) or Corequisite(s): _____

Catalog Course Description:

This course exposes the student to the key concepts and practices in software testing and quality assurance. Topics covered include aspects of software quality assurance relevant to all phases of the software life cycle, alternative approaches to software testing, application of current automated tools, standards, and emerging trends.

APPROVED:

Ruth G. Yarar — 1-17-06
Department Curriculum Committee — Date

Steve Beaty — 1/19/06
Department Chair OR Program Director — Date

Hal Tamzy — 1/31/06
Dean OR Associate Dean — Date

Linda S. Cuevas — 2/2/06
Associate VP, Academic Affairs — Date

*If crosslisted, attach completed Course Crosslisting Agreement Form

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Required Reading and Other Materials will be equivalent to:

Systematic Sotware Testing,, by Norwwod, MA., Artech House Publishers, 2002.

ISBN: 1-58053-508-9

Specific, *Measurable* Student Behavioral Learning Objectives:
Upon completion of this course the student should be able to:
1. Analyze a software engineering project and determine appropriate software quality metrics
2. Discuss implications of ISO 9000 and SEI CMM on software quality
3. Identify and assess tools for software quality assurance and software testing
4. Review test plans for effectiveness
5. Create effective test plans
6. Apply current automated testing frameworks, methods, and tools
7. Provide justified rationale for determining when software testing should be halted

Detailed Outline of Course Content (Major Topics and Subtopics):

I. Survey of software quality assurance (SQA)
   A. Components of software quality
   B. Software quality metrics
   C. Tracking and managing SQA
   D. Introduction to ISO 9000 and SEI CMM
   E. SQA tools
II. Fundamentals of software testing
   A. Testing dimensions
   B. Design for testability
   C. Defect classification, tracking, reporting, and metrics
   D. Configuration management in testing
III. Types of Testing
   A. Unit vs. integration vs. system vs. acceptance testing
   B. Black box vs. white box testing
   C. Bottom-up vs. top-down testing
   D. Regression testing
IV. Automated testing support
   A. Frameworks and methods
   B. Tools
V. Determining sufficiency of testing
   A. Assessment of coverage
   B. Assessment of return on investment
VI. Emerging trends in SQA and software testing

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Evaluation of Student Performance (format: 1, a, i, ii, etc.):

1. Homework assignments
2. Quizzes and examinations
3. Final examination
4. Projects
5. Research papers and/or book reports
6. Oral presentations

as determined by the instructor. Written and verbal communication skills will be applied in this course.