Computer Information Technology

ITSE 1391 (3-3-1) – Special Topics in Computer Programming
Fundamentals of Software Testing
Credit Spring 2017
Synonym 20458 Section 002

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Course Description: Topics address recently identified current events, skills, knowledge, and/or attitudes and behaviors pertinent to the technology or occupation and relevant to the professional development of the student. This course was designed to be repeated multiple times to improve student performance. This course is a study of the multiple phases of testing necessary to ensure the reliability of software products.

Pre-requisite: B-Reading and Math.

Approved Text and Teaching Materials:
Foundations of Software Testing, ISTQB Certification, 3rd edition, Black / Van Veenendaal / Graham, Cengage Learning, 2012. (ISBN-13: 978-1-4080-4405-6, ISBN-10: 1-408-04405-6)

Instructional Methodology: This section is a competency based version of ITSE 1391 and is offered online as part of the Accelerated Programmer Training program. The student will need to demonstrate proficiency in seven competencies, which are listed in the Course Objectives/Learning Outcome section.

Course Rationale: This course is required as part of the Associate of Applied Science degree in Software Testing. The course will introduce the student to the concepts of software testing and the use of several software testing and reporting tools.

Competencies / Learning Outcomes: At the conclusion of this course, the student will have demonstrated the following competencies:

1. Fundamentals of testing and testing throughout the software life cycle (Chapters 1 – 2)
   - Explain why testing is necessary and support that explanation with examples and evidence
   - Discuss how testing supports quality and contrast defects and symptoms
   - Relate how testing finds and prevents defects
   - Explain the fundamental principles of testing
   - Describe the fundamental test processes
   - Explain the psychology of testing and how people influence testing success
   - Explain and contrast the mindset of testers and programmers and why they often conflict
   - Explain the relationship between development and testing within a development life cycle
   - Relate the typical levels of testing with respect to their major objectives
   - Identify which persons perform the testing activities at various test levels (
   - Relate the four major types of test (functional, non-functional, structural and change-related) and show concrete examples for each
   - Compare maintenance testing with testing new applications
   - Identify triggers and reasons for maintenance testing
   - Demonstrate an understanding of software testing terminology

2. Labs 1 - 3
   - Create and execute a test plan, including test cases, to verify the correctness of documentation
   - Prepare a test summary report, and bug reports if necessary
   - Create and execute a test plan, including test cases, to evaluate compliance with specifications
   - Prepare a test summary report, and bug reports if necessary
   - Experiment with internet loading to create and execute a test plan that evaluates internet speed under various loads
   - Analyze and summarize the results of the experiment

3. Static techniques and test design techniques (Chapters 3 – 4)
   - Explain the importance and advantages of static testing
   - Contrast the difference between static testing and dynamic testing
   - Compare the differences between formal and informal reviews
   - Explain the factors for successful performance of reviews
   - Differentiate objectives of static analysis from static and dynamic testing
   - Describe the main features of static analysis
   - Differentiate between a test condition, a test case and a test procedure
   - Explain why both specification-based and experience-based testing approaches are useful
   - Write test cases from software models using equivalence partitioning, boundary value analysis, decision tables and state transition diagrams
   - Describe the concept and importance of code coverage

- Categorize the reasons for writing test cases based on intuition, experience and knowledge about common defects
- List factors that influence selection of test techniques
- Demonstrate an understanding of software testing terminology

4. Labs 4 – 6
   - Develop test cases based upon a given specification
   - Interpret actual results against predicted results
   - Prepare bug reports using an incident logging tool
   - Rewrite test cases to match changes in product specifications
   - Update the status of incident reports

5. Test management and tool support for testing (Chapters 5 – 6)
   - Explain the basic ideas of test organization
   - Describe the fundamentals of test planning and implementation
   - Explain the essentials of test progress monitoring and control
   - Identify the basics of configuration management that relate to testing
   - Explain how risk and testing relate
   - Describe incident logging
   - Classify different types of test tools according to the test process activity that they support
   - Recognize the tools that may help developers in their testing
   - Assess the potential benefits and potential risks of tool support for testing in general
   - State the main principles of introducing a tool into an organization
   - State the goal of a proof-of-concept or piloting phase for tool evaluation
   - Demonstrate an understanding of software testing terminology

6. Labs 7 – 9
   - Construct detailed test schedules using Microsoft Project
   - Create test cases and scripts using industry standard tools
   - Create test scenarios that incorporate the test cases and scripts previously created

Capstone Lab 10 and Research Paper
- Evaluate and arrange data collected from testing history
- Prepare and justify a ship recommendation based on your analysis
- Select a topic of interest in software testing
- Prepare a research paper on this topic
- Summarize the key elements as they relate to Software Testing

SCANS (Secretary's Commission on Achieving Necessary Skills):
Refer to http://www.austincc.edu/cit/courses/scans.pdf for a complete definition and explanation of SCANS. The following list summarizes the SCANS competencies addressed in this particular course:

RESOURCES 1.1 Manages Time	**INTERPERSONAL** 2.1 Participates as a Member of a Team 2.2 Serves Clients/Customers 2.6 Works with Cultural Diversity	**INFORMATION** 3.1 Acquires and Evaluates Information 3.2 Organizes and Maintains Information 3.3 Uses Computers to Process Information	**SYSTEMS** 4.1 Understands Systems 4.2 Monitors and Corrects Performance 4.3 Improves and Designs Systems
TECHNOLOGY 5.1 Selects Technology 5.2 Applies Technology to Task 5.3 Maintains and Troubleshoots Technology	**BASIC SKILLS** 6.1 Reading 6.2 Writing 6.3 Arithmetic 6.5 Listening 6.6 Speaking	**THINKING SKILLS** 7.1 Creative Thinking 7.2 Decision Making 7.3 Problem Solving 7.4 Mental Visualization 7.5 Knowing How to Learn 7.6 Reasoning	**PERSONAL SKILLS** 8.1 Responsibility 8.4 Self-Management 8.5 Integrity/Honesty

Grade Policy:

Grade will be assigned based both on concepts and practical application. Exams, quizzes, and lab projects will be a part of the grade. An overall grade will be assigned on the following grading scale:

90% - 100%	A
80% - 89%	B
70% - 79%	C
60% - 69%	D
0% - 59%	F

Each student's grade for this course consists of the grades from all competencies

Orientation Exam	60 points
Competency 1 – EXAM 1	200 points
Competency 2 – Labs 1-3	60 points
Competency 3 – EXAM 2	200 points
Competency 4 – Labs 4-6	60 points
Competency 5 – EXAM 3	200 points
Competency 6 – Labs 7-9	60 points
Capstone Competency (Lab 10)	60 points
Capstone Competency (Research Paper)	100 points
TOTAL	**1000** points

ALL Exams must be taken at an ACC testing Center**.** http://www.austincc.edu/testctr/

Availability of computers is **NOT** an excuse for being late with any assignment. The last date to submit assignments for consideration this semester is May 12, 2017.

Course/Class Policies:

Attendance/Class Participation
Regular and punctual class and laboratory attendance is expected of all students. If attendance or compliance with other course policies is unsatisfactory, the instructor may withdraw students from the class.

Withdrawal Policy
It is the responsibility of each student to ensure that his or her name is removed from the roll should he or she decides to withdraw from the class. The instructor does, however, reserve the right to drop a student should he or she feel it is necessary. If a student decides to withdraw, he or she should also verify that the withdrawal is submitted before the Final Withdrawal Date. The last date to withdraw for this semester is April 24, 2017. The student is also strongly encouraged to retain their copy of the withdrawal form for their records.

Students who enroll for the third or subsequent time in a course taken since Fall, 2002, may be charged a higher tuition rate, for that course. State law permits students to withdraw from no more than six courses during their entire undergraduate career at Texas public colleges or universities. With certain exceptions, all course withdrawals automatically count towards this limit. Details regarding this policy can be found in the ACC college catalog.

Incompletes
A student may receive a temporary grade of "I" (Incomplete) at the end of the semester only if ALL of the following conditions are satisfied:

1. The student is unable to complete the course during the semester due to circumstances beyond their control.
2. The student must have earned at least half of the grade points needed for a "C" by the end of the semester.
3. The request for the grade must be made in person at the instructor's office and necessary documents completed.
4. To remove an "I", the student must complete the course by two weeks before the end of the following semester. Failure to do so will result in the grade automatically reverting to an "F".

Statement on Scholastic Dishonesty
A student attending ACC assumes responsibility for conduct compatible with the mission of the college as an educational institution. Students have the responsibility to submit coursework that is the result of their own thought, research, or self-expression. Students must follow all instructions given by faculty or designated

college representatives when taking examinations, placement assessments, tests, quizzes, and evaluations. Actions constituting scholastic dishonesty include, but are not limited to, plagiarism, cheating, fabrication, collusion, and falsifying documents. Penalties for scholastic dishonesty will depend upon the nature of the violation and may range from lowering a grade on one assignment to an "F" in the course and/or expulsion from the college.

See the Student Standards of Conduct and Disciplinary Process.

For this course, the penalty for scholastic dishonesty is a grade of 'F' for the course.

Student Rights and Responsibilities
Students at the college have the rights accorded by the U.S. Constitution to freedom of speech, peaceful assembly, petition, and association. These rights carry with them the responsibility to accord the same rights to others in the college community and not to interfere with or disrupt the educational process. Opportunity for students to examine and question pertinent data and assumptions of a given discipline, guided by the evidence of scholarly research, is appropriate in a learning environment. This concept is accompanied by an equally demanding concept of responsibility on the part of the student. As willing partners in learning, students must comply with college rules and procedures.

Statement on Students with Disabilities Each ACC campus offers support services for students with documented disabilities. Students with disabilities who need classroom, academic or other accommodations must request them through the office of Student Accessibility Services (SAS). Students are encouraged to request accommodations when they register for courses or at least three weeks before the start of the semester, otherwise the provision of accommodations may be delayed. Students who have received approval for accommodations from SAS for this course must provide the instructor with the 'Notice of Approved Accommodations' from SAS before accommodations will be provided. Arrangements for academic accommodations can only be made after the instructor receives the 'Notice of Approved Accommodations' from the student. Students with approved accommodations are encouraged to submit the 'Notice of Approved Accommodations' to the instructor at the beginning of the semester because a reasonable amount of time may be needed to prepare and arrange for the accommodations.

Safety Statement Austin Community College is committed to providing a safe and healthy environment for study and work. You are expected to learn and comply with ACC environmental, health and safety procedures and agree to follow ACC safety policies. Because some health and safety circumstances are beyond our control, we ask that you become familiar with the Emergency Procedures poster and Campus Safety Plan map in each classroom.

Please note, you are expected to conduct yourself professionally with respect and courtesy to all. Anyone who thoughtlessly or intentionally jeopardizes the health or safety of another individual will be immediately dismissed from the day's activity, may be withdrawn from the class, and/or barred from attending future activities.

Testing Center Policy
http://www.austincc.edu/testctr/

Freedom of Expression Policy
It is expected that faculty and students will respect the views of others when expressed in classroom discussions.

Tutoring
Free tutoring is provided for this course both on line and face-to-face. For online schedules and details please refer to http:://www.austincc.edu/cit .

Student Files – Privacy
Their instructor for educational and academic reasons may view the information that a student stores in his/her student volume in the Computer Studies Labs.

Fundamentals of Software Testing

Schedule for Accelerated Programming Training

Week Num	Learning Competency	Reading / Exams	Labs / Projects	Due Date
1	Orientation	**Course Orientation Exam**		1/20
2	1	Read Chapter 1		1/27
3	1 / 2		**Lab 1**	2/3
4	1 / 2	Read Chapter 2	**Lab 2**	2/10
5	1 / 2	Study for Exam 1	**Lab 3**	2/17
6	1	**EXAM 1**		2/24
7	3 / 4	Read Chapter 3	**Lab 4**	3/3
8	3 / 4	Read Chapter 4	**Lab 5**	3/10
9	3 / 4	Study for Exam 2	**Lab 6**	3/24
10	3	**EXAM 2**		3/31
11	5 / 6	Read Chapter 5	**Lab 7**	4/7
12	5 / 6	Read Chapter 6	**Lab 8**	4/14
13	5 / 6	Study for Exam 3	**Lab 9**	4/21
14	5	**EXAM 3**		4/28
15	Capstone		**Lab 10**	5/5
16	Capstone		**Research Paper**	5/12

Note 1: Items in **bold** are graded assessments.

Note 2: This is the required schedule to ensure that the course is finished by the end of the 16 week semester. Assessments are always accepted earlier.