Syllabus: CSCI 530 Software Testing and Quality Assurance

Kevin Buffardi

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Overview

In-depth study of software verification and validation with a concentration on software testing methods, tools, and metrics. Topics include Test-Driven Development, unit testing, integration testing, acceptance testing, as well as software and testing metrics. Students will work individually as well as in teams to verify and validate large open source projects.

Prerequisites: CSCI 430

Instructor

Kevin Buffardi
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OCNL 220
Office Hours: TBD

Required Materials

Textbook: Software Testing: A Craftsman's Approach (Paul C. Jorgensen)
Laptop computer (with Mac OSX or *nix operating system or virtual machine) required in class.

Learning Outcomes

By completing this course, students will be able to:

- Understand and explain the purpose and impact of software testing

- Demonstrate contemporary testing approaches (such as Test-Driven and Behavior-Driven Development)

- Analyze algorithms and identifying appropriate testing approaches

- Create and execute test plans

- Evaluate the quality of existing tests

The course addresses following broader CSCI Learning Outcomes:
***I**ntroduces, **P**racticed, **A**ssessed*

a. An ability to apply knowledge of computing and mathematics appropriate to the discipline. **(P)**

b. An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution. **(A)**

c. An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs. **(A)**

d. An ability to function effectively on teams to accomplish a common goal. **(A)**

e. An understanding of professional, ethical, legal, security and social issues and responsibilities. **(P)**

f. An ability to communicate effectively with a range of audiences. **(P)**

g. An ability to analyze the local and global impact of computing on individuals, organizations, and society. **(P)**

h. Recognition of the need for and an ability to engage in continuing professional development. **(P)**

i. An ability to use current techniques, skills, and tools necessary for computing practice. **(A)**

j. An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the trade-offs involved in design choices. **(A)**

k. An ability to apply design and development principles in the construction of software systems of varying complexity. **(A)**

Assessment

Grades for this course will be determined by the following assessments, with the provided weights:

- Team Project Deliverables

  - Open Source Project Testing **(20%)**
  - Testing Evaluation **(20%)**

- Individual Assignments:

  - In-class exercises **(25%, cumulative)**
  - Mid-Term exam **(15%)**
  - Final exam **(20%)**

Schedule

The following is a <u>rough schedule</u> of the semester, which is <u>subject to change</u> based on the instructor's discretion:

Week - Topic

1. - Overview of Software Testing

2. - Unit Testing

3. - Test-Driven Development

4. - Acceptance Testing

5. - Behavior-Driven Development

6. - Decision Table-Based Testing

7. - Boundary Value Testing

8. - Path Testing

9. - Data Flow Testing

10. - Testing Metrics

11. - All Pairs Testing

12. - Mutation Testing

13. - Integration Testing

14. - System Testing

15. - Comprehensive course review

Accommodations

If you require any auxiliary aids, services, or other accommodations for this class, please identify your needs to your instructor by the end of the first week of class (via email or schedule an appointment in person), or as soon as you have the required documentation.

If you wish to have special accommodations due to religious holidays, please request those accommodations by the end of the second week of class. Requests made after these deadlines may not be possible to honor.

Principles

Respect: Students in this class are encouraged to speak up and participate during class meetings. Because the class will represent a diversity of individual beliefs, backgrounds, and experiences, every member of this class must show respect for every other member of this class.

I am part of the Safe Zone Ally community network of trained Chico State faculty/staff/students who are available to listen and support you in a safe and confidential manner. As a Safe Zone Ally, I can help you connect with resources on campus to address problems you may face that interfere with your academic and social success on campus as it relates to issues surrounding sexual orientation/gender identity. My goal is to help you be successful and to maintain a safe and equitable campus.