

Spring 2023

CS 684: Software Testing and Quality Assurance

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CS684104-Software Test & Qual Assurance



CS 684102 Software Testing and Quality Assurance

Basic Information


CS 684. Software Testing and Quality Assurance

Tuesdays 6:00pm - 8:50pm

Krupfrian Hall room 107

Instructor: Bill McCann

Textbook: Software Testing: Concepts and Operations. Ali Mili, Fairouz Tchier. ISBN: 978-1-118-66287-8. 368

For eBook versions of the textbook, visit <https://www.wiley.com/en-sg/Software+Testing%3A+Concepts+and+Operations-p-9781118662878> 
(<https://www.wiley.com/en-sg/Software+Testing%3A+Concepts+and+Operations-p-9781118662878>)

Contact Information

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NJIT Office Hours - Tuesdays 4pm to 5:30pm. GITC 4321 MS Study Hall

Virtual Office Hours - by appointment

Course Description

This course discusses the general topic of defining software quality attributes and deploying techniques to ensure that these quality attributes are met. Focus is placed on functional quality attributes, such as correctness, reliability, safety, security, etc. A variety of techniques are considered, by virtue of the law of diminishing returns: requirements specifications, static code analysis, software testing including unit, integration & system tests, oracles in testing. Advanced topics such as Agile Development & Testing, Testing Large-Scale Systems such as Cloud-Based, Big-Data, IoT, AI; shall also be covered.

Prerequisites

There are no specific “prerequisite courses”; however, this is a Masters Level Course & a Required Course for MS in Software Engineering at the CS Dept of NJIT.

Grading

Grades for the course will break down as follows:

Grading rubric.

| Item | Percentage of Grade |
|----------------------|---------------------|
| Homework Assignments | 10% |
| Course Project | 60% |
| Final Exam | 30% |

Special Guests

During the semester we will invite software professionals to our class for "Ask Me Anything" sessions.

Getting Ready


It is encouraged that students use a personal laptop as their development device. Device recommendations are:

- Apple computer running MacOS
- Linux computer
- Windows computer running WSL2 (Windows Subsystem for Linux)

Devices must have a minimum of 8g of memory with 16g recommended.

Please install the following software:

- Git
- NodeJS version 14.19 or greater, but not greater than 16.x
- Yarn version 1.15 or greater
- VSCode (optional)

Sign up for a GitHub account (if you don't already have one) at <https://github.com> 

[\(https://github.com\)](https://github.com)

Sign up for a Discord account (if you don't already have one). Join the server "CS 684-104 Spring 2023"

Outcomes

- Describe the overall process of Software Testing & Quality Assurance
- Demonstrate direct, hands-on experience specifying requirements, developing code, & testing code; for an advanced project (DB, Servers, UI, Computations & Logic, Real-Time, A.I., Advanced Data Science ...)
- Illustrate how to develop & implement Unit Tests, Integration Tests & System Tests
- Apply Software Testing Tools; especially Code Coverage, Performance Testing, & General Testing
- Determine complexities in Software Testing and how to handle them

Project

The class will be divided into teams of four or five for a group project. As indicated above, the project represents 60% of each student's grade. Every team will be assigned features and tests on the same

project. It is expected that the project solution has a three-tier architecture comprised of the following tiers:

- A Frontend UI
- A GraphQL API middle tier
- A Backend database

The **CS684 project** (<https://njit.instructure.com/courses/28231/pages/project-overview>) is designed to introduce students to the experience of a professional QA engineer. The student will function as a member of a team adding features to a core codebase in creation of a SaaS product. The student will be onboarded to the product codebase and will use Git and GitHub to manage their work. Development will follow an Agile software development lifecycle (SDLC). Read more [here](https://njit.instructure.com/courses/28231/pages/project-overview) (<https://njit.instructure.com/courses/28231/pages/project-overview>).

Cheating Policy

Cheating on a programming assignment results in zero credit for all students involved. Cheating on an exam will result in an "F" in the course.

You may discuss problems with each other, in fact, you are encouraged to do so. Where does discussion end and cheating start? You may **NOT** copy lines of code from anybody or anywhere. You may **NOT** use code in your assignments that you did not write. You may not use third party frameworks. As a general rule: If you don't understand the code and can't explain the code, you can't use the code.

Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at: <http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf> (<https://t.e2ma.net/click/7xcjqfb/nijeoovf/vc0hkjx>).

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. **Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university.** If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu (<mailto:dos@njit.edu>).