**CIS454: Software Implementation**

**(Link Hall, Room 105; MW 3:45-5:05PM)**

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| --- | --- | --- | --- | --- |
| Instructor | C. K. Mohan | Phone 315-443-2322 | 315-443-2322 | |
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| Office Hours | <https://syracuseuniversity.zoom.us/j/5663347508?pwd=OFZTa011bno4MTBKQU5MdDhJMDVqdz09>  Tue.9AM-10AM, Thu.11AM-12PM  Meeting ID: 566 334 7508, Passcode: 502152 |  |  |
| Teaching Assistant& Grader | **Sanup Araballi (**[**ssarabal@syr.edu**](mailto:ssarabal@syr.edu)**)**  Mon. & Wed. 11AM-12PM  <https://syracuseuniversity.zoom.us/j/98733649876?pwd=T1VhSFNGZXNzQW5IVlhHeVFYV2Z6QT09>    **Arpit Shekhar Raj ([araj01@syr.edu](mailto:araj01@syr.edu)**)  Wed.6-7PM, Fri. 4-5PM,<https://syracuseuniversity.zoom.us/j/91244710483?pwd=VTAxd28wb1cwNlcrUlFCOWdFSmdndz09>  Meeting ID: 912 4471 0483, Passcode: 306188 |  |  |

## Prerequisite: CIS453

## Credits: 3

## Learning Objectives:

### After taking this course, students will be able to:

* Participate in agile software development
* Create high quality code
* Evaluate and test software developed by others

## Bibliography/ Texts– Required:

* Code Complete (2nd Edition), by Steve McConnell, Microsoft Press

## Bibliography/ Texts– Useful references:

* Software Engineering (10th Ed.), Chapter 3, Ian Sommerville, 2015, Pearson
* Extreme Programming Explained, 2nd Edition, Kent Beck and Cynthia Andres, 2005, Addison-Wesley
* Essential Scrum: A Practical Guide to the Most Popular Agile Process, by Kenneth Rubin, 2013, Addison-Wesley

# Systems Analysis and Design: An Object-Oriented Approach with UML by [Alan Dennis](https://www.amazon.com/Alan-Dennis/e/B001ITXEEQ/ref=dp_byline_cont_book_1) , [Barbara Haley Wixom](https://www.amazon.com/Barbara-Haley-Wixom/e/B00PJ232YA/ref=dp_byline_cont_book_2) and [David Tegarden](https://www.amazon.com/s/ref=dp_byline_sr_book_3?ie=UTF8&text=David+Tegarden&search-alias=books&field-author=David+Tegarden&sort=relevancerank), 2020, Wiley

# Introduction to Software Testing, second edition, by P. Ammann and J. Offutt, 2017 (second edition), Cambridge

## Grading:

* 60%: Agile software development project (teams of 3-6 students)
* 10%: Testing other students’ code (individual work)
* 20%: 3-8 unannounced quizzes, equally weighted (individual work)
* 10%: Class exercises

If two or more of your team-mates say you did less than 10% of the project work, then your course grade will be F, irrespective of everything else.

## Deliverables (due by 1159PM on the indicated date):

* 2/9: Proposal for team project (include title, names of 4-5 team members, one paragraph description, use case diagram)
* 2/16: Sprint 0 Report outlining product backlog items and sprint plan
* 2/23, 3/2, 3/9, 3/23, 3/30: End-of-sprint reports, including the Sprint backlog, task allocation, Burndown Chart, and Product Backlog, minutes of Scrum meetings, any new documented software requirements, design, code, and test results.
* 4/6: Final Report with all components (including requirements, design, code, test cases, and test results)
* 4/9: Open House presentations of selected projects
* 4/13: Video presentation (demonstrating software) uploaded to Blackboard
* 5/4: Testing results (individual work)

## Project Meeting Requirements:

(Complete the meetings a day before the due date for the reports!)

* By Feb.2, decide on team-members and project. Plan meeting times.
* By Feb. 8, meet to finalize the project proposal, and contact a TA to schedule the Sprint 0 meeting (for which the TA will serve as Scrum-master).
* By Feb. 15, the team must have the Sprint 0 meeting.
* Between Feb. 16 and March 29, five week-long sprints are expected. Each team member must serve as the Scrum-master in at least one week. Another team-member must take notes (‘minutes”) during the meeting and circulate them right away to all team-members. [If you have six team-mates, arrange for a sixth sprint during 3/30-4/5.]
* During each sprint, begin with a meeting to review the past week and to update plans for the current week; this will combine Sprint Planning, Review, and Retrospective meetings (which are usually separate in the workplace setting). In addition, each sprint must include two brief Scrum meetings to identify progress, obstacles, and actions to be taken.

**All team-members must attend all meetings!**

Rubric for (Agile) team project grading:

|  |  |  |  |
| --- | --- | --- | --- |
|  | ***Poor*** | ***Moderate*** | ***Good*** |
| **Scrum Meetings and Agile Processes** | No evidence of following the Agile/scrum process: 0.0 | Irregular meetings and processes: 0.3 | Regular meetings, with consistent adherence to Scrum processes: 0.5 |
| **Sprint reports** | 0-1 submitted and adequate (reporting sufficient progress): 0.0 | 2-4 submitted and adequate: 0.3 | All submitted & adequate: 0.5 |
| **Results of testing code** | Does not meet requirements: 0.0 | Meets some (but not all) requirements: 0.5 | Performs as specified, including on unexpected inputs: 1.0 |
| **Code quality** | Does not follow guidelines discussed in class and textbook: 0.0 | Mostly follows guidelines: 0.3 | Completely follows code quality guidelines: 0.5 |
| **Completeness of specification and design** | Insufficient documentation of requirements and design: 0.0 | Some elements missing or poor quality: 0.3 | All essential elements present: 0.5 |
| **Understandability** of specification, design, code and documentation | Difficult to read and understand: 0.0 | Moderately easy to understand: 0.3 | Easy to understand: 0.5 |
| **Programming effort** | Little programming work: 0.0 | Moderate amount of programming: 0.3 | Real-world problem requiring considerable effort: 0.5 |
| **Bonus for project presentation** |  |  | Clear and effective: 0.2 |

* If a team-mate is not contributing, or if another major obstacle arises, you must alert the instructor and TAs as soon as the problem is noticed, so that the issue can be resolved quickly.
* In the code, every class and method should have documentation (at the top) indicating when each revision/version was completed, and by whom.
* Confidential teamwork feedback submissions are expected of all students, and will be used in assigning final individual grades. Some students in a team may receive higher grades than others in the same team.

**Expected quiz topics:** writing pseudocode, writing high quality code, improving/modifying code, devising test cases, testing code, assessing code quality

**Rubric for grading each class exercise:**

|  |  |  |  |
| --- | --- | --- | --- |
| ***Failing*** | ***Poor*** | ***Moderate*** | ***Good*** |
| Copied answer from another source: 0 **and** reported to college for academic dishonesty | Not submitted, or irrelevant, or nonsense:0 | Some effort, but not understood what needs to be done: 2 | Sufficient effort, indicating that you have been paying attention and reading up on the required material: 4 |

**University Attendance Policy**

Attendance in classes is expected in all courses at Syracuse University. Students are expected to arrive on campus in time to attend the first meeting of all classes for which they are registered. Students who do not attend classes starting with the first scheduled meeting may be academically withdrawn as not making progress toward degree by failure to attend. Instructors set course-specific policies for absences from scheduled class meetings in their syllabi.

It is a federal requirement that students who do not attend or cease to attend a class to be reported at the time of determination by the faculty. Faculty should use “ESPR” and “MSPR” in Orange Success to alert the Office of the Registrar and the Office of Financial Aid. A grade of NA is posted to any student for whom the Never Attended flag is raised in Orange SUccess. More information regarding Orange SUccess can be found at <http://orangesuccess.syr.edu/getting-started-2/>

Students should also review the University’s religious observance policy and make the required arrangements at the beginning of each semester.

**Course Specific Policies** on attendance, late work, etc.:

* All students are expected to attend every class, and hand in any class exercise due that day.
* If you are ill or out of town (e.g., due to a job interview), you must email the instructor **before** the class in which you will be absent. Then you can take a missed quiz during Prof. Mohan’s Office Hours on the next day.
* Class exercises missed due to travel or illness (and having informed the instructor beforehand) will result in averaging the scores for those you attended (with no make-up).
* Late submissions will be penalized at the rate of 10% per day.

**Syracuse University Policies:** Syracuse University has a variety of other policies designed to guarantee that students live and study in a community respectful of their needs and those of fellow students. Some of the most important of these concern:

**Diversity and Disability** (ensuring that students are aware of their rights and responsibilities in a diverse, inclusive, accessible, bias-free campus community) can be found at: <https://www.syracuse.edu/life/accessibilitydiversity/>

**Religious Observances Notification and Policy** (steps to follow to request accommodations for the observance of religious holidays) can be found at: <http://supolicies.syr.edu/studs/religious_observance.htm>

**Orange SUccess** (tools to access a variety of SU resources, including ways to communicate with advisors and faculty members) can be found at: <http://orangesuccess.syr.edu/getting-started-2/>

**Disability-Related Accommodations**:

Syracuse University values diversity and inclusion; we are committed to a climate of mutual respect and full participation. There may be aspects of the instruction or design of this course that result in barriers to your inclusion and full participation in this course. I invite any student to meet with me to discuss strategies and/or accommodations (academic adjustments) that may be essential to your success and to collaborate with the Office of Disability Services (ODS) in this process.

If you would like to discuss disability-accommodations or register with ODS, please visit their website at: <http://disabilityservices.syr.edu> Please call (315) 443-4498 or email [disabilityservices@syr.edu](mailto:disabilityservices@syr.edu) for more detailed information.

ODS is responsible for coordinating disability-related academic accommodations and will work with the student to develop an access plan. Since academic accommodations may require early planning and generally are not provided retroactively, please contact ODS as soon as possible to begin this process.

## Academic Integrity Policy:

Syracuse University’s Academic Integrity Policy reflects the high value that we, as a university community, place on honesty in academic work. The policy defines our expectations for academic honesty and holds students accountable for the integrity of all work they submit. Students should understand that it is their responsibility to learn about course-specific expectations, as well as about university-wide academic integrity expectations. The policy governs appropriate citation and use of sources, the integrity of work submitted in exams and assignments, and the veracity of signatures on attendance sheets and other verification of participation in class activities. The policy also prohibits students from submitting the same work in more than one class without receiving written authorization in advance from both instructors. Under the policy, students found in violation are subject to grade sanctions determined by the course instructor and nongrade sanctions determined by the School or College where the course is offered as described in the Violation and Sanction Classification Rubric. SU students are required to read an online summary of the University’s academic integrity expectations and provide an electronic signature agreeing to abide by them twice a year during pre-term check-in on MySlice. For more information and the complete policy, see <http://academicintegrity.syr.edu/>.

In the final project report document, there must be a section titled “References” where students must mention all tools, templates, papers and other documents on which they relied, including textbooks and websites. Not doing so may be construed to indicate academic dishonesty.

## Student Academic Work Policy

SU policy on student academic work may be found at:

<http://coursecatalog.syr.edu/content.php?catoid=3&navoid=270#Student_Academic_Work>

Educational use of student work: Academic work that you complete in this course may be used for educational purposes during this semester and in future semesters, as well as in compiling accreditation reports. Your registration and continued enrollment constitute your permission.

***Course Schedule:*** Dates, topics, and required reading (“CC”=Code Complete)

| Dates | Topic | Required Reading |
| --- | --- | --- |
| 1/24 | Course plan, overview of course, project planning | Syllabus and additional materials on Blackboard |
| 1/26-2/9 | Agile software development | Miscellaneous materials available on Blackboard |
| 2/14-2/23 | Coding and programming style | CC: Ch.6-11, 14-16, 31-32 |
| 2/28-3/9 | Testing and debugging | * CC: Ch.22-23; * Sommerville book * Ammann & Offutt |
|  | BREAK |  |
| 3/21-3/23 | Quality assurance | CC: Ch.20-21 |
| 3/28-3/30 | Software maintenance, re-engineering | CC: Ch. 24-26 |
| 4/4 | Software metrics | Various |
| 4/6 | Software ethics | Various |
| 4/11-5/4 | **Presentations by industry professionals** |  |

**CoViD and other health-related problems:**

* If isolating (e.g., due to exposure or testing CoViD-positive) but asymptomatic, you are expected to study the course materials posted online, submit work on schedule, and attend the office hours of the instructor during the week of the missed classes, during which you may be able to make-up any missed quiz.
* If you are ill and unable to complete coursework on schedule or attend office hours, please alert the instructor immediately and request submission deadline extension (as soon as you learn that you cannot attend the relevant class or complete the work). **Requests made after the due date will not be considered.**
* The project is the most important part of the course. Even if you are ill or isolating, you are expected to work with your team-mates so that the project work is not interrupted, perhaps by arranging with them to do more work in a later week to compensate. If you are unable to do so, please inform them and the instructor ASAP, and plan to drop or withdraw from the course, to avoid receiving an F grade.
* Many things in this syllabus may change if required by circumstances such as increases in the number of CoViD-positive cases on campus or in the county, accompanied by new directives from the Syracuse University administration. If that happens, a new version of the Syllabus will be posted on Blackboard.