

Software Engineering 2AA4: Software Design I - Introduction to Software Development, and Computer Science 2ME3: Introduction to Software Development

January 4, 2018

This course outline contains important information that will effect your grade. You should retain and refer to this outline throughout the term. It is your responsibility to be familiar with the contents of this outline.

1 Instructor

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Office Hours Term 1: Drop in, or by appointment

2 Teaching Assistants (TAs)

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3 Calendar Description

Software life cycle, quality attributes, requirements documentation, specifying behavior; classes and objects, interface specification; creational patterns, structural design patterns,

behavioral design patterns; implementation in code, reviews, testing and verification.

4 Mission

This course introduces students to the profession of software engineering and the software development process. In particular, students will gain an appreciation of software design strategies that facilitate working on large applications with multiple developers. Students will study the basic principles of software design, focusing on software modularization and software units (modules/classes/components) that are small, sequential and terminating. They will learn how to use precise specifications to design, implement, and verify (test/review/inspect) software units in the programming languages Python and C++. Later courses will teach how to specify and design large software systems that may be concurrent and nonterminating.

4.1 Learning Objectives: Postcondition

The learning objectives are summarized at:

<https://gitlab.cas.mcmaster.ca/smiths/.../CourseOutline/LearningOutcomes>

4.2 Learning Objectives: Precondition

The *precondition* of the course is the set of university-level learning objectives that the student is expected to have achieved before the start of the course. The student should have taken an introductory programming course and a discrete math course.

5 Schedule

5.1 COMP SCI 2ME3

5.1.1 Lecture C01 and C02

Monday and Wednesday, 2:30PM – 3:20PM; Friday 4:30PM – 5:20PM in T13 125

5.1.2 Tutorial T01

Friday, 2:30PM – 4:20PM in ITB 139

5.1.3 Tutorial T02

Tuesday, 2:30PM – 4:20PM in T13 107

5.2 SFWR ENG 2AA4

5.2.1 Lecture C01

Monday, Wednesday and Thursday, 1:30PM – 2:20PM in BSB B135

5.2.2 Tutorial T01

Friday, 3:30PM – 5:20PM in T13 107

5.2.3 Tutorial T02

Friday, 8:30AM – 10:20AM in ITB 139

5.2.4 Tutorial T03

Monday, 2:30PM – 4:20PM in T13 106

5.3 Course Web Site

This course will be administered via Avenue to Learn. Go to

<http://avenue.mcmaster.ca/>

to access the course's Avenue to Learn page. Please send only normal McMaster e-mail; do not send mail via Avenue.

Students should be aware that, when they access the electronic components of this course, private information such as first and last names, user names for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in this course will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure please discuss this with the Instructor.

It is the student's responsibility to be aware of the information on the course's Avenue to Learn page and to check regularly for announcements.

The primary purpose of Avenue will be for maintaining grades. Most of the course content will be maintained in a public git repository. You can access this repository at:

https://gitlab.cas.mcmaster.ca/smiths/se2aa4_cs2me3/

6 Required Textbook

Carlo Ghezzi, Mehdi Jazayeri, and Dino Mandrioli. *Fundamentals of Software Engineering*. Prentice Hall, Upper Saddle River, NJ, USA, 2nd edition, 2003.

7 Other Resources

Daniel M. Hoffman and Paul A. Strooper. *Software Design, Automated Testing, and Maintenance: A Practical Approach*. International Thomson Computer Press, New York, NY, USA, 1995

Hans van Vliet. *Software Engineering (2nd ed.): Principles and Practice*. John Wiley & Sons, Inc., New York, NY, USA, 2000. ISBN 0-471-97508-7

8 Outline of Topics

During the course of the term, a subset of the following topics will be covered. The chapter numbers given are from [Ghezzi et al. \(2003\)](#).

1. Introduction to Course
2. Software Engineering as an Engineering Discipline [Chapter 1]
3. Software Qualities [Chapter 2]
4. Software Engineering Principles [Chapter 3]
5. Software Design [Chapter 4]
6. Modularization [Chapter 4]
7. Specification [Chapter 5]
8. Verification [Chapter 6]
9. The Software Development Process [Chapter 7]
10. Design Patterns

9 Grade Assessment

1. Assignments 30% (Four equally weighted assignments)
2. Midterm 25%
3. Final Exam 45%

Notes:

1. The assignment grade will only be counted in the final grade if the weighted average of the midterm exam and the final exam is greater than 50 %.
2. The instructor reserves the right to re-evaluate any of the above via an oral examination.
3. The instructor reserves the right to conduct a deferred final exam as an oral examination.
4. The final grade will be converted to the 12-point scale recommended by the Registrar.

10 Assignments

All assignments are required to be a student's own work. If a student is found to have copied from any source, or allowed someone to copy their work, it will be reported as academic dishonesty to the Office of Academic Integrity and to the Associate Dean and the student will get 0 on the assignment. **DO NOT ALLOW OTHER STUDENTS TO COPY YOUR ASSIGNMENT**; this is also considered academic dishonesty.

You are allowed and encouraged to use various resources, including journals, texts, Internet resources, consultations with the instructor or the TA or your fellow students, but you must explicitly cite all sources. If it is found that you used a resource and did not cite it, then you will be considered to have copied. All students are asked to keep all working notes used for the preparation of the assignments. The instructor or teaching assistant may ask to see these working notes as evidence of original work.

If there is a problem with the grading of an assignment, please contact the TA to discuss it. If the problem cannot be resolved through discussion with the TA, then please contact the course instructor. Grades for assignments will only be changed if the problem is reported within two weeks of the date that the assignments are returned.

11 Midterm

A 90 minute midterm will be held on Wednesday, February 28 starting at 7:00 pm in MCMST T13 106, MCMST T13 123, MCMST UH 213. (Specific room assignments will be announced in class.) Please bring your student card to the exam.

12 Final Examination

A final exam of 2.5 hour duration, covering the entire course, will be scheduled by the Registrar during the regular examination period.

13 Policy Statements

This section summarizes the policy statements on calculators, improving the course, the Centre for Student Development, Missed Work, Discrimination and Academic Dishonesty.

13.1 Calculators

No calculators will be necessary (or permitted) in this course.

13.2 Improving the Course

Ideas to improve the course are always welcome. Moreover, if you have problems in the course, please contact the instructors as early as possible.

13.3 Missed Work and Late Work

A student who would like to receive accommodation for missed academic work due to an absence needs to complete a McMaster Student Absence Form (MSAF) on-line at

<http://www.mcmaster.ca/msaf/>.

When the MSAF tool asks you for the party who should receive your request for accommodation, enter `smiths@mcmaster.ca`. MSAFs sent to any other e-mail address will be ignored. Late work is not graded without an MSAF.

The MSAF accommodation for a missed assignment is a 5 day extension from the original assignment deadline. The MSAF accommodation for a missed midterm is to roll the weight of the midterm into the weight of the final examination.

13.4 Discrimination

The Faculty of Engineering is concerned with ensuring an environment that is free of all adverse discrimination. If there is a problem, that cannot be resolved by discussion among the persons concerned, individuals are reminded that they should contact their Department Chair and the Human Rights and Equity Services (HRES) office as soon as possible.

13.5 Academic Dishonesty

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity.

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g., the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: “Grade of F assigned for academic dishonesty”), and/or suspension or expulsion from the university.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy, located at

<http://www.mcmaster.ca/academicintegrity/>

The following illustrates only three forms of academic dishonesty:

1. Plagiarism, e.g., the submission of work that is not one’s own or for which other credit has been obtained.
2. Improper collaboration in group work.
3. Copying or using unauthorized aids in tests and examinations.

Your work must be your own. Plagiarism and copying will not be tolerated! If it is discovered that you plagiarized or copied, it will be considered as academic dishonesty. Further information on the importance of citing all sources are given in the section on assignments (Section 10). Students may be asked to defend their written work orally.

13.6 Course Evaluations

Every student will have the opportunity to evaluate the effectiveness of this course. The feedback that is received from the course evaluation is very valuable, so we are providing a course evaluation bonus to each student based on the level of class participation in the course evaluation according to the following table:

Class Participation	Bonus (%)
80–84%	0.75
85–89%	1.00
90–94%	1.25
95–100%	1.50

Thus, for example, if 80% of the students enrolled in the class participate in its course evaluation, every student’s final mark will receive a 0.75 percentage point bonus.

13.7 Course Modifications

The instructor and university reserve the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of the student to check their McMaster e-mail and course websites weekly during the term and to note any changes. Your McMaster e-mail is the one with the address ending in @mcmaster.ca. This is a separate e-mail address from your Avenue address.

13.8 Other Policy Statements

1. Significant independent work is expected for this course.
2. The student is expected to communicate any questions comments or concerns that they may have.
3. If there is a problem with the marking of any deliverable, the student should first discuss the problem with the TA who marked it. Marks will only be changed if the problem is reported within two weeks of the date that the deliverable was returned.
4. Suggestions on how to improve the course and the instructor’s teaching methods are always welcomed.