CS 164 Syllabus

28 January 2013

Welcome to CS 164. Here's what the bulletin says we should do:

> A study of software project management concepts, software cost estimation, quality management, process involvement, overview of analysis and design methods, user interface evaluation, and design. Also considered are dependable systems - software reliability, programming for reliability, reuse, safety-critical systems, verification and validation techniques; object-oriented development; using UML; and software maintenance.

Here's what we'll actually do: learn all the above stuff in the context of a **real software project.** You will be responsible for many parts of the system yourself, but we will discuss the overall design and direction as a class so that we can stay on track and learn from each other.

Monday 6–9:40pm in LLC 234C. Three credits, prerequisite: CS130.

Contact information

Instructor: Prof. Christopher League, Ph.D.

Email: christopher.league@liu.edu – please include course number in subject.

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Office hours: Monday, Wednesday 11–11:50 or make an appointment at `https://liucs.net/bookme.html`

Office location: LLC 206

Resources

Software: TBD

Web site: `https://liucs.net/cs164s13/`

Text: There are two books we will be using: the first is **very strongly** recommended, the second is *merely* recommended.

1. *The Pragmatic Programmer: from Journeyman to Master* by Andrew Hunt and David Thomas, Addison-Wesley 0-201-61622-X. [Paperback, Kindle, PDF]

2. *The Mythical Man-Month* by Frederick P. Brooks, Jr., Addison-Wesley 0-201-83595-9. [Paperback, Kindle]

Library: Campus library resources tailored for computer science are available at http://www2.brooklyn.liu.edu/library/wlp/LibPortal-CS-BC.htm

Requirements

There are a total of 1,000 points available, broken down as follows:

- There will be **8 project milestones** scheduled throughout the semester. The exact requirements and expectations for each will be posted to the course web site. Your contribution will be worth **125 points each,** but I will drop the lowest, so that only 7 milestones count, for a total of **875 points. Warning:** the *last* milestone cannot be dropped.
- There is no midterm exam, but there will be a final exam, worth **125 points.**

On the 1,000-point scale, you can expect the following letter grades:

		≥ 870:	**B+**	≥ 770:	**C+**	≥ 670:	**D+**
≥ 930:	**A**	≥ 830:	**B**	≥ 730:	**C**	≥ 600:	**D**
≥ 900:	**A–**	≥ 800:	**B–**	≥ 700:	**C–**	else:	**F**

In the end, I may choose to adjust the scale slightly to compensate for assignments or questions that turned out to be trickier than I intended. Such adjustments would never *lower* your grade from what is designated in the above table; if you get 930 points, you are guaranteed an **A**.

Policies

No late assignments will be accepted, because we will discuss and evaluate your work promptly after the deadline. This helps to ensure that everyone receives timely feedback, and that you can learn from mistakes while they are still fresh in your mind.

There will be no extra credit. Students usually ask for extra credit late in the semester after they have already messed up their original opportunities. Be sure to start your work early, so that we can detect and solve any problems before they can affect your grade.

Plagiarism is the use or presentation of ideas, words, or work that is not one's own and that is not common knowledge, without granting credit to the originator. Plagiarism is a practice that is not only unacceptable, but which is to be condemned in the strongest terms possible on the basis of moral, educational and legal grounds. Under University policy, plagiarism may be punishable by a range of penalties from a failing grade in the assignment or course to dismissal from the School of Business, Public Administration

and Information Sciences. All students are required to read the handbook on avoiding plagiarism by visiting http://bit.ly/lVShWN

Cheating includes, but is not limited to the following: falsification of statements or data; listing sources that have not been used; having another individual write your paper or do your assignments; writing a paper or creating work for another student to use without proper attribution; purchase of paper or research work for one's submission as his/her own work; using written, verbal, or electronic or other sources of aid during an examination (except when expressly permitted by the instructor, depending on the nature of the examination) or knowingly providing such assistance to aid other students.

Showing up on time to class every week is extremely important. If you must be absent or more than 5 minutes late, please try to notify me in advance. I will be keeping track of whether you are in class, and when you arrive. A few missed classes will not count against you, but habitual absence will significantly hurt your grade.

Long Island University seeks to provide reasonable accommodations for all qualified persons with disabilities. This University will adhere to all applicable federal, state and local laws, regulations and guidelines with respect to providing reasonable accommodations as required to afford equal educational opportunity. It is the student's responsibility to register with Special Education Services (SES) as early as possible and to provide faculty members with the formal communication from SES for suitable accommodations. All accommodations must be approved through SES. Contact Information: 718 488 1221 or 718 488 1044.

Time commitment

New York State defines one credit as a total of 15 hours instructional time, plus 30 hours of student preparation. Thus, a typical three-credit course will amount to 45 hours instruction plus 90 hours preparation. (For these computations, an 'hour' actually consists of 50 minutes.)

To perform well, you will have to spend some time preparing and reviewing outside of class, and a **significant** amount of time completing programming assignments (keeping in mind that earlier assignments will require less time than later ones).

- Lecture time: 4 hours per week × 15 weeks = 60 hours
- Preparation time (reading, reviewing): 2 hours per week × 15 weeks = 30 hours
- Assignment completion (problem-solving, programming): approximately 10–14 hours per assignment × 7 assignments ☒ 90 hours.
- **Total: 180 hours**

Goals and objectives

Upon completion of the course, students should be able to…

- demonstrate proficiency in basic algorithms and data structures (1.1, mastery level).
- understand the mathematical and logical foundations of computing (1.2, mastery level).
- master the fundamental facilities of various programming languages and software architectures (2.1, mastery level).
- effectively use tools for software development (2.2, mastery level).
- develop a data modeling design for a proposed database application (3.2, mastery level).
- communicate technical ideas and specifications in writing (4.1, introductory level).
- give an effective oral presentation on some technical subject area (4.2, introductory level).
- exhibit awareness of professional organizations and technical opportunities (5.1, mastery level).
- productively attend seminars and workshops outside of class work (5.2, mastery level).

Schedule

Mon 28 Jan **Meeting 1** at 6 pm: Project planning. *Read Brooks ch. 2 "The Mythical Man-Month," Pragmatic §13 "Estimating," Spolsky "Evidence-Based Scheduling".*

Sun 3 Feb **Milestone 1 due** at midnight.

Mon 4 Feb **Meeting 2** at 6 pm: Requirements analysis *Read Pragmatic §36 "The Requirements Pit," Brooks ch. 5 "The Second-System Effect".*

Mon 11 Feb **Meeting 3** at 6 pm: Prototyping. *Read Brooks ch. 11 "Plan to Throw One Away," Pragmatic §11 "Prototypes and Post-it Notes".*

Sun 17 Feb **Milestone 2 due** at midnight.

Tue 19 Feb **Meeting 4** at 6 pm: Design DRY. *Read Pragmatic §7 "The Evils of Duplication," Pragmatic §8 "Orthogonality".*

Mon 25 Feb **Meeting 5** at 6 pm: Contracts and assertions, part 1. *Read Pragmatic §21 "Design by Contract".*

Sun 3 Mar **Milestone 3 due** at midnight.

Mon 4 Mar **Meeting 6** at 6 pm: Design strategies, part 1. *Read Pragmatic §26 "Decoupling and the Law of Demeter," Pragmatic §29 "It's Just a View".*

Mon 18 Mar **Meeting 7** at 6 pm: Testing. *Read Pragmatic §34 "Code That's Easy to Test," Pragmatic §43 "Ruthless Testing".*

Sun 24 Mar **Milestone 4 due** at midnight.

Mon 25 Mar **Meeting 8** at 6 pm: Effective debugging. *Read Pragmatic §18 "Debugging," Graham "Maker's Schedule, Manager's Schedule".*

Mon 1 Apr **Meeting 9** at 6 pm: Tools, part 1. *Read Pragmatic §14 "The Power of Plain Text," Pragmatic §15 "Shell Games".*

Sun 7 Apr **Milestone 5 due** at midnight.

Mon 8 Apr **Meeting 10** at 6 pm: Tools, part 2. *Read Pragmatic §17 "Source Code Control," Pragmatic §42 "Ubiquitous Automation".*

Mon 15 Apr **Meeting 11** at 6 pm: Contracts and assertions, part 2. *Read Pragmatic §22 "Dead Programs Tell No Lies," Pragmatic §23 "Assertive Programming".*

Sun 21 Apr **Milestone 6 due** at midnight.

Mon 22 Apr **Meeting 12** at 6 pm: Design strategies, part 2. *Read Pragmatic §31 "Programming by Coincidence," Pragmatic §33 "Refactoring," Graham "Taste for Makers".*

Mon 29 Apr **Meeting 13** at 6 pm: Maintenance. *Read Pragmatic §2 "Software Entropy," Pragmatic §44 "It's All Writing," Pragmatic §46 "Pride and Prejudice".*

Sun 5 May **Milestone 7 due** at midnight.

Mon 6 May **Meeting 14** at 6 pm: Conclusion. *Read Brooks ch. 16 "No Silver Bullet".*

Sun 12 May **Milestone 8 due** at midnight.

Mon 13 May **Final Exam due** at midnight.