

CS 101 Syllabus

4 September 2013

Welcome to CS 101, a broad overview of the main areas of study in Computer and Information Sciences. Topics include computer organization, information processing, algorithms, and programming. The main ideas behind the theory and design of Operating Systems, Databases, and Computer Networks, along with current views on the theory and practice of Software Engineering, and the basics of Artificial Intelligence are also explored. The course highlights the uses of computing systems in business, the sciences, and other professional fields. This course is required for all students majoring in Computer Science or Information Systems. It is also suitable for majors in other disciplines who want to go beyond being casual users of computers to gain a deeper appreciation of some of the most important computing and information technologies developed over the last fifty years.

Section 1: Monday, Wednesday 9–10:50 AM in LLC 207

Section 2: Monday, Wednesday 3–4:50 PM in LLC 207

Credits: 3

Prerequisites: None

Contact Info

Instructor: Prof. Christopher League, Ph.D.

Email: christopher.league@liu.edu – please include the course number (CS101) in the subject.

Google Hangout: cleague@gmail.com

AIM: chrysaleague

Skype: chrisleague

Office hours: Monday, Wednesday 2–2:50 (US Eastern) or make an appointment at <https://liucs.net/bookme>

Office phone: +1 718 488 1274

Office location: LLC 206, LIU Brooklyn

Resources

Web sites: <https://liucs.net/cs101f13/>

<https://blackboard.liu.edu/>

<http://pollev.com/liucs>

<http://www.gradechamp.com/>

Text: *Computer Science Illuminated* by Dale and Lewis (5th edition, ISBN 144-967-2841). <http://amzn.com/1449672841> An older edition is fine, if that saves you some money!

Library: Campus library resources tailored for computer science are available at <https://liucs.net/u1>

Tutors: Tutoring is available from graduate assistants in the Computer Science department. Check signs posted around the department for hours.

Requirements

Your grade will be computed based on assignments, exams, quizzes, and participation. There are a total of 1,000 points available, broken down as follows:

- There will be **11 assignments** during the semester. That's roughly one per week, with some to be completed during class time. Assignments are worth **40 points each**, but I will **drop the lowest score** so only 10 will count, for a total of **400 points**.
- There are **6 quizzes** scheduled throughout the semester, to make sure you are following along with the lectures and online review resources. Quizzes are worth **20 points each**, but I will **drop the lowest two scores** so only 4 will count, for a total of **80 points**.
- There will be **12 online 'check-in' opportunities** scheduled, roughly one per week. These vary from week to week, but may involve responding to a survey, taking a brief online quiz, or participating in a discussion forum. Check-ins are worth **12 points each**, but I will **drop the lowest two scores** so only 10 will count, for a total of **120 points**.
- There will be a midterm and final exam, worth **200 points each** for a total of **400 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 achieve 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 <https://liucs.net/u2>

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.

In a course with programming assignments, it is usually okay to work with and learn from other students to **some** extent, but what you submit in the end needs to be your own. The most reliable way to do that would be to set aside whatever code you created together, and then recreate it from scratch on your own.

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. Additionally, there will be no make-up quizzes. I do not distinguish between 'excused' and 'unexcused' absence. Unless you miss an *exam* due to a severe medical emergency, I don't want to see a doctor's note. If you do miss an exam, the make-up exam will be different – and probably *not* easier.

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.

The **Family Educational Rights and Privacy Act (FERPA)** gives students control over the disclosure of their educational records. During this course you may have the opportunity to create accounts or register with certain public online services. In these cases, you need not make any personally identifying information public. You may use a pseudonym or online handle, as long as you identify yourself to the instructor.

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 do well on the quizzes, assignments, and exams, you will have to spend significant time preparing outside of class. We estimate about **1-2 hours** preparing (reading, reviewing, practicing) for each hour of class time.

In addition, assignments will take approximately **3 hours** each to complete (keeping in mind that certain assignments will require more time than others).

- Lecture time: 4 hours per week \times 15 weeks = 60 hours
- Preparation time (reading, reviewing, practicing, check-ins): 6 hours per week \times 15 weeks = 90 hours
- Assignment completion (problem-solving): 3 hours per assignment \times 10 assignments = 30 hours
- **Total: 180 hours**

Goals and objectives

Upon completion of this course, I expect that you will be able to...

1. understand and follow basic algorithms.
2. understand the mathematical and logical foundations of computing.
3. understand the role of programming languages in software architecture.
4. explain the key concepts of operating systems and computer networks.
5. work with simple data models structured as tables and keys.
6. exhibit awareness of professional organizations and technical opportunities.
7. be inspired to attend computing seminars and workshops outside of classwork.

Assessment of learning

This course is part of a B.S. program in Computer Science. This section relates programmatic objectives with objectives and assessment instruments used in this course. At the completion of the B.S. program...

- 1.1: Students will demonstrate proficiency in basic algorithms and data structures.** Introduced with course objective 1.
- 1.2: Students will understand the mathematical and logical foundations of computing.** Introduced with course objective 2.
- 2.1: Students will master the fundamentals of programming languages and software architecture.** Introduced with course objective 3.
- 3.1: Students will master the key concepts of operating systems and computer networks.** Introduced with course objective 4.
- 3.2: Students will develop a data modeling design for a proposed database application.** Introduced with course objective 5.
- 5.1: Students will exhibit awareness of professional organizations and technical opportunities.** Introduced with course objective 6.
- 5.2: Students will attend seminars and workshops outside of classwork.** Introduced with course objective 7.

Program objectives 1.2 and 2.1 are routinely assessed by scoring a selection of questions from students' midterm exams in CS101.

Schedule

Wed 4 Sep Meeting 1: Introduction and positional numbering systems.

Mon 9 Sep Meeting 2: Binary numbers.

Tue 10 Sep Check-in 1 due at 11:59 PM.

Wed 11 Sep Meeting 3: Classwork on alternative binary encodings — Assignment 1.

Mon 16 Sep Meeting 4: Encoding characters and text as bits. **Quiz 1.** Assignment 1 due in class.

Tue 17 Sep Check-in 2 due at 11:59 PM.

Wed 18 Sep Meeting 5: Classwork on text compression — Assignment 2.

Mon 23 Sep Meeting 6: Representing multimedia content as bits. **Assignment 2** due in class.

Tue 24 Sep Check-in 3 due at 11:59 PM.

Wed 25 Sep Meeting 7: Classwork on music or graphics encoding — Assignment 3.

Mon 30 Sep Meeting 8: Boolean logic. **Quiz 2. Assignment 3** due in class.

Tue 1 Oct Check-in 4 due at 11:59 PM.

Wed 2 Oct Meeting 9: Classwork using logic simulator — Assignment 4.

Mon 7 Oct Meeting 10: Algorithms. **Assignment 4** due in class.

Tue 8 Oct Check-in 5 due at 11:59 PM.

Wed 9 Oct Meeting 11: Classwork on sorting algorithms — Assignment 5.

Mon 14 Oct Meeting 12: von Neumann architecture **Quiz 3. Assignment 5** due in class.

Tue 15 Oct Check-in 6 due at 11:59 PM.

Wed 16 Oct Meeting 13: Classwork using machine code simulator — Assignment 6.

Mon 21 Oct Meeting 14: Review session. **Assignment 6** due in class.

Wed 23 Oct Midterm exam: You may leave after finishing the exam.

Sun 27 Oct Check-in 7 due at 11:59 PM.

Mon 28 Oct Meeting 16: High-level programming languages.

Wed 30 Oct Meeting 17: Classwork using Python — Assignment 7.

Sun 3 Nov Check-in 8 due at 11:59 PM.

Mon 4 Nov Meeting 18: More classwork using Python — Assignment 7.

Wed 6 Nov Meeting 19: Operating systems, the network stack, and the protocols of the web. **Quiz 4. Assignment 7** due in class.

Sun 10 Nov Check-in 9 due at 11:59 PM.

Mon 11 Nov Meeting 20: Classwork on operating systems and networks — Assignment 8.

Wed 13 Nov Meeting 21: More classwork on operating systems and networks — Assignment 8.

Mon 18 Nov Meeting 22: Introduction to databases and SQL. **Quiz 5. Assignment 8** due in class.

Tue 19 Nov Check-in 10 due at 11:59 PM.

Wed 20 Nov Meeting 23: Classwork on databases — Assignment 9.

Mon 25 Nov Meeting 24: Artificial intelligence and machine learning.
Assignment 9 due in class.

Sun 1 Dec Check-in 11 due at 11:59 PM.

Mon 2 Dec Meeting 25: Classwork on artificial intelligence — Assignment 10.

Wed 4 Dec Meeting 26: Computer security and privacy. **Quiz 6. Assignment 10**
due in class.

Sun 8 Dec Check-in 12 due at 11:59 PM.

Mon 9 Dec Meeting 27: Classwork on cryptography — Assignment 11.

Wed 11 Dec Meeting 28: Review session. **Assignment 11** due in class.

Wed 18 Dec Final exam session 1 at 11 am:

Fri 20 Dec Final exam session 2 at 9 am: **Final exam session 3** at 11 am:

Wed 22 Jan Meeting 1.

Mon 27 Jan Meeting 2.

Wed 29 Jan Meeting 3.

Mon 3 Feb Meeting 4.

Wed 5 Feb Meeting 5.

Mon 10 Feb Meeting 6.

Wed 12 Feb Meeting 7.

Tue 18 Feb Meeting 8.

Wed 19 Feb Meeting 9.

Mon 24 Feb Meeting 10.

Wed 26 Feb Meeting 11.

Mon 3 Mar Meeting 12.

Wed 5 Mar Meeting 13.

Mon 17 Mar Meeting 14.

Wed 19 Mar Meeting 15.

Mon 24 Mar Meeting 16.

Wed 26 Mar Meeting 17.

Mon 31 Mar Meeting 18.

Wed 2 Apr Meeting 19.

Mon 7 Apr Meeting 20.

Wed 9 Apr Meeting 21.

Mon 14 Apr Meeting 22.

Wed 16 Apr Meeting 23.

Mon 21 Apr Meeting 24.

Wed 23 Apr Meeting 25.

Mon 28 Apr Meeting 26.

Wed 30 Apr Meeting 27.

Mon 5 May Meeting 28.