CS 101 Syllabus

22 January 2014

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.

When: Monday, Wednesday 9–10:50 AM
Where: 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: chrysleague
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/cs101s14/
https://blackboard.liu.edu/
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 my graduate assistant, Srujana. Her regular hours
are Wednesday 12–2 and Thursday 1–3, in the CS Department (LLC 206) or GA
Room (beside the lab).

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 follow-
  ing 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.

I participate in the **LIU Safe Zone** program. Representatives of the program serve as contacts for individuals on campus with questions or concerns related to sexual orientation and gender identity, whether of self or of a friend or family member. The goal of the program is to promote a safe and free campus for all students. Safe Zone

areas can be identified by a sticker with the LIU Safe Zone logo.

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 × 15 weeks = 60 hours
- Preparation time (reading, reviewing, practicing, check-ins): 6 hours per week × 15 weeks = 90 hours
- Assignment completion (problem-solving): 3 hours per assignment × 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 22 Jan Meeting 1 at 9 am: Introduction and positional numbering systems.

Mon 27 Jan Meeting 2 at 9 am: Binary numbers.

Tue 28 Jan Check-in 1 due at 11:59 PM.

Wed 29 Jan Meeting 3 at 9 am: Classwork on alternative binary encodings — Assignment 1.

Mon 3 Feb Meeting 4 at 9 am: Encoding characters and text as bits. **Quiz 1.**

Wed 5 Feb Meeting 5 at 9 am: Classwork on text compression — Assignment 2.

Thu 6 Feb Check-in 2 due at 11:59 PM.

Mon 10 Feb Assignment 1 due in class. **Meeting 6** at 9 am: Representing multimedia content as bits.

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

Wed 12 Feb Meeting 7 at 9 am: Classwork on music or graphics encoding —
    Assignment 3.

Mon 17 Feb Check-in 4 due at 11:59 PM.

Tue 18 Feb Assignment 2 due in class. **Meeting 8** at 9 am: Boolean logic. **Quiz 2.**

Wed 19 Feb Meeting 9 at 9 am: Classwork using logic simulator — Assignment 4.

Mon 24 Feb Assignment 3 due in class. **Meeting 10** at 9 am: Algorithms.

Tue 25 Feb Check-in 5 due at 11:59 PM.

Wed 26 Feb Meeting 11 at 9 am: Classwork on sorting algorithms — Assignment 5.

Mon 3 Mar Assignment 4 due in class. **Meeting 12** at 9 am: von Neumann
    architecture **Quiz 3. Assignment 5** due in class.

Tue 4 Mar Check-in 6 due at 11:59 PM.

Wed 5 Mar Meeting 13 at 9 am: Classwork using machine code simulator —
    Assignment 6.

Mon 17 Mar Meeting 14 at 9 am: Review session. **Assignment 6** due in class.

Wed 19 Mar Midterm exam at 9 am: You may leave after finishing the exam.

Sun 23 Mar Check-in 7 due at 11:59 PM.

Mon 24 Mar Meeting 16 at 9 am: High-level programming languages.

Wed 26 Mar Meeting 17 at 9 am: Classwork using Python — Assignment 7.

Mon 31 Mar Meeting 18 at 9 am: More classwork using Python — Assignment 7.

Tue 1 Apr Check-in 8 due at 11:59 PM.

Wed 2 Apr Meeting 19 at 9 am: Operating systems, the network stack, and the
    protocols of the web. **Quiz 4.**

Sun 6 Apr Check-in 9 due at 11:59 PM.

Mon 7 Apr Assignment 7 due in class. **Meeting 20** at 9 am: Classwork on operating
    systems and networks — Assignment 8.

Wed 9 Apr Meeting 21 at 9 am: More classwork on operating systems and networks
    — Assignment 8.

Mon 14 Apr Meeting 22 at 9 am: Introduction to databases and SQL. **Quiz 5.**

Tue 15 Apr Check-in 10 due at 11:59 PM.

Wed 16 Apr Meeting 23 at 9 am: Classwork on databases — Assignment 9.

Mon 21 Apr **Assignment 8** due in class. **Meeting 24** at 9 am: Artificial intelligence and machine learning.

Tue 22 Apr **Check-in 11** due at 11:59 PM.

Wed 23 Apr **Meeting 25** at 9 am: Classwork on artificial intelligence — Assignment 10.

Mon 28 Apr **Assignment 9** due in class. **Meeting 26** at 9 am: Computer security and privacy. **Quiz 6.**

Tue 29 Apr **Check-in 12** due at 11:59 PM.

Wed 30 Apr **Meeting 27** at 9 am: Classwork on cryptography — Assignment 11.

Mon 5 May **Meeting 28** at 9 am: Review session. **Assignment 11** due in class.

Thu 8 May **Final Exam** at 3:40 pm: