CS101 Syllabus

15 December 2011

Description

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.

Monday, Wednesday 9–10:50am in LLC 207
Three credits, no prerequisites

Contact information

Instructor: Prof. Christopher League, Ph.D.

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

Messaging: chrysleague (AIM), league@contrapunctus.net (MSN), chrisleague (Skype), cleague@gmail.com (GTalk/XMPP)

Phone: +1 718 488 1274 (office), +1 646 450 6278 (Google voice)

Office hours: Monday 12–1; Tuesday, Wednesday 11–12; other times by appointment.

Office location: LLC 206

Resources

Software: Python 2.x from `http://python.org/`

Web sites: `https://blackboard.liu.edu/` **and** `https://liucs.net/cs101f11/`

Text: *Computer Science Illuminated* by Dale and Lewis (4th edition, ISBN 978–0–7637–7646–6). The 3rd edition is fine, if that saves you some money!

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

Tutoring is available from graduate assistants in the Computer Science department. The hours are Monday 11–6, Tuesday 9–2, Wednesday 11–1 and 2–5, Thursday 9–2. Check signs posted around the department.

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.

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 **7 assignments** during the semester (roughly one per week). Assignments are worth **68 points each**, but I will **drop the lowest score** so only 6 will count, for a total of **408 points**.
- There are **6 quizzes** scheduled throughout the semester, to make sure you are following along and reviewing your notes after each meeting. Quizzes are worth **40 points each**, but I will **drop the lowest two scores** so only 4 will count, for a total of **160 points**.
- There will be a midterm and final exam, worth **200 points each** for a total of **400 points**.
- The remaining **32 points** are for your attendance and participation in class.

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. 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.

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 **4 hours** each to complete (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, practicing): 6 hours per week × 15 weeks = 90 hours
- Assignment completion (problem-solving): 4 hours per assignment × 6 assignments = 24 hours, plus 6 hours for assignment 4, which involves computer programming = 30 hours.
- **Total: 180 hours**

Schedule

Wed 14 Sep Meeting 1: Introduction; number systems. *Read §2.1–2.2.*

Mon 19 Sep Meeting 2: Binary numbers. *Read §3.1–3.2.*

Wed 21 Sep Meeting 3: Text encoding. *Read §3.3.*

Mon 26 Sep Meeting 4: Multimedia encoding. *Read §3.4–3.6.* **Assignment 1 due in class.**

Wed 28 Sep Meeting 5: Boolean logic. *Read §4.1–4.2.* **Quiz 1.**

Mon 3 Oct Meeting 6: von Neumann architecture. *Read §5.1–5.3.*

Wed 5 Oct Meeting 7: Algorithms and pseudo-code. *Read §6.1–6.3.* **Assignment 2 due in class.**

Mon 10 Oct Meeting 8: Algorithms and design. *Read §6.4, 6.6.* **Quiz 2.**

Wed 12 Oct Meeting 9: More on algorithms. **Assignment 3 ideas due in class.**

Mon 17 Oct Meeting 10: High-level languages. **Quiz 3.**

Wed 19 Oct Meeting 11: Imperative programming in Python. *Read §8.3.* **Assignment 3 plans due in class.**

Mon 24 Oct Meeting 12: Review session.

Wed 26 Oct Midterm exam.

Mon 31 Oct Meeting 14: More on programming. **Assignment 3 due in class.**

Wed 2 Nov Meeting 15: Programming in other paradigms.

Mon 7 Nov Meeting 16: Sorting and searching. *Read §9.1, 9.4, 9.5.*

Wed 9 Nov Meeting 17: Operating systems. *Read §10.1–10.4.* **Assignment 4 due in class.**

Mon 14 Nov Meeting 18: File systems. *Read §11.1–11.3.*

Wed 16 Nov Meeting 19: Databases. *Read §12.1, 12.3.* **Quiz 4.**

Mon 21 Nov Meeting 20: More on databases.

Mon 28 Nov Meeting 21: Artificial intelligence. *Read §13.1–13.2.* **Assignment 5 due in class.**

Wed 30 Nov Meeting 22: Expert systems and decision trees. *Read §13.3.* **Quiz 5.**

Mon 5 Dec Meeting 23: Networks. Start of Computer Science Education Week. *Read §15.1–15.3.* **Assignment 6 due in class.**

Wed 7 Dec Meeting 24: Technologies of the web. *Read §16.1–16.4.* **Quiz 6.**

Mon 12 Dec Meeting 25: Computer security. *Read §12.5–12.6.*

Wed 14 Dec Meeting 26: Review session. **Assignment 7 due in class.**

Thu 22 Dec Final exam: 11am–1pm in the usual lab.