



Preparing People to Lead Extraordinary Lives

LOYOLA
UNIVERSITY
CHICAGO

Department of Computer Science
Lake Shore Campus
Doyle Hall

Syllabus - COMP 271 and COMP 400B Data Structures I

Catalog Description

This course explores the concepts of data abstraction and data structure, including stacks, queues, lists, sets, and trees. The implementation of data structures gives us an opportunity to review design by interface or contract, classes with encapsulation, and other important coding techniques. Sorting and searching techniques are analyzed. The concepts of correctness and efficiency of algorithms are developed.

This course is programming intensive. Considerable additional time working on reading, preparing, and programming will be required outside of class time. Class participation and discussion are a key part of learning in the course. Some work may be done with other students in teams.

COMP 271 is an extension and continuation of COMP 170 Introduction to Object Oriented Programming. Students are expected to be able to read, write, and debug basic computer programs using standard tools including compilers and editors. Students are expected to know the basics of Object Oriented Programming and be able to use classes and methods they or others have written. Students must understand basic control structures (conditional execution, loops) and basic data or information types (integer, float, Boolean, etc) and be familiar with using arrays or lists to organize information in a program. The logical mindset of mathematics is generally helpful in learning programming.

COMP 400B meets co-located with COMP 271 and is for use by graduate students doing prerequisites.

Prerequisites

COMP 170, Introduction to Object Oriented Programming with a passing grade
COMP 163, Discrete Structures with a passing grade

NOTE: The Syllabus and course schedule are subject to change; changes will be announced in advance in class and posted on Sakai. A change history is at the end of this Syllabus.

Special Course Requirements

1. COMP 271 is a programming intensive course. Considerable time will be spent creating programs in and outside class. The largest portion of your grade will be determined by

your success in writing, reading, compiling, running, and testing these programs and how you explain and discuss programming with the class.

2. The course may include some programming assignments done with another person (“Pair Programming”) or small teams of 2 to 6 students (“Team Programming”).
3. The course uses Sakai to organize materials. You will generally submit your assignments using Sakai or get grading information returned in Sakai. Ask for help if you are not familiar with Sakai.
4. The course may use Zoom or other online connection software for online sessions and occasions when it is not possible or wise to be in the classroom. Zoom or other tools may be used in the classroom to support sharing your work with others.

Course Textbook and Included Online Materials (required)

You must acquire the **textbook online edition** before the first week of class. Class labs, readings, videos, and homework will be based on this textbook. You will not be able to complete most assignments unless you have access to the textbook in the online edition.

Introduction to Python Programming and Data Structures (3rd edition)

by Y. Daniel Liang

ISBN: 9780137915972

Online version required

Access from Pearson Plus <https://www.pearson.com/en-us/pearsonplus/p/9780137915972>

Course Objectives and Goals

Upon successful completion of this course, students will be able to

1. Discuss the appropriate use of built-in data structures. Describe common applications and construct and debug programs that use each of the following data structures: lists, tuples, sets, dictionaries, stacks, queues, trees, and sets.
2. Describe the concept of abstract data types (ADT) in terms of interface (contract), client (user), and implementation (provider). Explain how to implement abstract data types in an object-oriented language using classes, built-in data structures, and appropriate encapsulation.
3. Describe the concept of recursion and give examples of its use. Implement, test, and debug simple recursive functions and procedures. Determine whether a recursive or iterative solution is most appropriate for a problem.
4. Explain why the creation of correct program components is important in the production of high-quality software. Describe how a contract can be used to specify the behavior of a program component. Apply a variety of strategies to the testing and debugging of simple programs.
5. Analyze the extent to which another programmer’s code meets documentation and programming design and style standards.

Course Schedule

The preliminary COMP 271 course schedule will be posted on Sakai in the same area as this Syllabus. Changes may occur based on class needs; any changes will be announced in class and updates posted in Sakai. The course schedule is an integral part of this course syllabus.

Course Components and Grading

Your grade will consist of several components with relative weights as follows (faculty reserve the right to adjust the percentages in **your favor** if circumstances warrant). Also see the

sections on Expectations and Academic Honesty. **Note: these components are weighted, so you can't just add your points on Sakai and divide by the total points to get your grade!**

1. Course Assignments (weight: 30%). Python assignments, and other written work throughout the course. You will design, write, compile, run, and test your program before turning it in. Additional assignments and in class work may be added at any time. **Programs that do not successfully compile without errors in the standard tools and versions used for class will receive 0 points. Point will be deducted for programs that do not use the features and capabilities covered in class in the order and sequence of the course learning schedule.**
2. Lab Assignments (20%). Hands on programming and other work often from the textbook. These labs provide “contact time” and encourage you to spend time trying out solutions. Grading will usually be based on completion of a minimum portion of the work (and in some cases all items). **You are encouraged to ask questions and share approaches and questions with other students.** Learning programming takes time and engagement.
3. Exams and Quizzes (40%). Exams and quizzes may cover any course materials up to the date given. Quizzes may occur any time and may not be announced in advance. There will be **no “make-up” exams or quizzes** unless you have an approved absence with documentation ahead of time. Final Exam will take place according to the published university final exam schedule during the final week of the semester.
4. Participation (10%). **Students are expected to read and study all text and other assigned material prior to classes, and attend all class sessions for the full time period.** The participation grade will be based upon attendance and enthusiastic involvement and contributions to discussions in the class sessions, and contributions to the course discussion board. Attendance will be taken for all class sessions.

All course work will be graded numerically, and your letter grade will be determined from total points earned, weighted as above. Your total points will be converted to a letter grade using the following percentage ranges. Calculations will generally round fractional percentages below .500 down to the full number less than that value.

93-100 = A 90-92 = A-
87-89 = B+ 82-86 = B 79-81 = B-
74-78 = C+ 68-73 = C 62-67 = C-
56-61 = D+ 50-55 = D
49 and lower = F

If for any reason you do miss a class session, it is your responsibility to determine what you missed, locate any handouts, determine any changes in assignments, course plans, or schedules, etc. It is not my obligation to help you make up for missing class. We will not always cover all information from the online course material and textbooks in class; additional materials may be added, and additional guidance will be given. Information and activities in class and labs that are not in the books will likely appear on exams and quizzes and will be helpful for your assignments and programming projects.

Please do not ask for personal “extra credit” to improve your grade as this is neither practical in the course nor fair to your fellow students. I reserve the right to provide extra credit assignments for the entire class if appropriate. I will be happy to discuss your performance in the course with you at any time, including discussing your possible grade based on current performance plus ways to improve your performance during the remainder of the course. I encourage you to arrange time to talk with me if you have any questions, are considering dropping, or want to know how to do better in the remainder of the class.

Expectations and Timely Completion

You are expected to complete all assignments, readings, presentations, labs, and projects on time and with correct process for submitting them. You are required to be prepared to participate in classroom and online discussions on all topics up to the current point in the class schedule.

You are required to be in all class sessions for the full class time. If for any reason you do miss a class session, it is your responsibility to determine what you missed, locate any handouts, determine any changes in assignments, course plans, or schedules, etc. It is not my obligation to help you make up for missing class.

You need to follow these rules to be successful in the class:

Timely Completion: Late assignment submission is **generally not allowed**.

1. In computer systems in the “real world” there is always a strong emphasis on getting projects done on time. Use this class to develop your own skills at timely completion.
2. Each student will be allowed up to **TWO (2)** late assignments of their choice. Think of this as having two “Late OK” passes. These passes may be used for lab sessions, programming, and non-programming assignments (not for quizzes or exams). Late Passes allow you to turn in the assignment up to 48 hours after the due date. See the Late Pass assignments for full details.
3. No assignments will be accepted after the due date unless you are using one of your late passes and the assignment is turned in within 48 hours of the original date. Once your two Late Passes are used no further assignments will be accepted after the due date. There are no exceptions except for documented emergencies with approval and consent of your college advisor or the Wellness Center.
4. Please plan your work ahead and do not wait for the last minute to begin work! **Try the homework before the day it is due!** This step will be key to your success in class. **No sympathy given for procrastination!**

Sakai Grading Feedback: Be sure to read your grading comments in Sakai regularly. These comments are there to help you learn. Questions on grades are welcome. However, to encourage timely review of grading notes (see immediately above), no changes will be made beyond 2 weeks after the comments are posted.

Academic Honesty

Students are expected to have read the statement on academic integrity available at http://www.luc.edu/academics/catalog/undergrad/reg_academicintegrity.shtml. This policy applies to the course. The minimum penalty for academic dishonesty is a grade of F or zero points for that assignment. Multiple instances or a single severe instance on a major exam or assignment may result in a grade of F for the course. All cases of academic dishonesty will be

reported to the department office and the relevant college office where they will be placed in your school record.

Academic dishonesty includes, but is not limited to, working together on assignments that are not group assignments, copying or sharing assignments or exam information with other students except in group assignments, submitting as your own information from current or former students of this course, copying information from anywhere on the web and submitting it as your own work, and submitting anything as your own work which you have not personally created for this course. If you do wish to use materials that are not your own, please check with your instructor ahead of time and cite your source clearly. When in doubt, ask first! Be aware that we may have changed the values for many of the textbook problems that are used for homework problems. For those problems that require open-ended answers, please be very careful to state the answers in your own words, not in the words of the Instructor's Manual, nor in the words of students who have previously taken this course.

The use of Chegg or any other online help, including reviewing YouTube videos, to solve homework or exam problems is not allowed! While you are allowed to collaborate on in-class Lab exercises, jointly developing homework or exam problem answers is not allowed.

Generative AI Usage (eg, ChatGPT)

Gaining fluency in a programming language requires a fair amount of trial/error and the process is often uncomfortable for many at first. This sentiment is perfectly normal and should be embraced as part of the learning process. This course is a foundational course in computer science with a major goal of obtaining fluency in using the Python programming language. As a result, students are discouraged from using generative AI as a primary means of obtaining solutions for Lab exercises and homework problems.

While using AI to answer software problems can appear to save time, it can also inhibit key learning in areas such as logical / computational thinking, abstraction, and problem solving. If a student wishes to use generative AI to obtain hints for exercises, they are required to cite which tool was used and submit an evaluation of the answers the AI tool proposes, both in terms of accuracy and correctness and the logical approach the tool is using. Any such assignment may have its score lowered based on use of AI to solve the assignment. Your instructors can usually detect the use of AI to solve a problem based on your previous work and how different an AI solution is in terms of sophistication and use of unusual programming approaches.

Just like use of Chegg, etc, use of generative AI is strictly forbidden on all course quizzes and exams.

Online Recording Policy

In this class software may be used to record live class discussions. As a student in this class, your participation in live class discussions may be recorded. These recordings will be made available only to students enrolled in the class, to assist those who cannot attend the live session or to serve as a resource for those who would like to review content that was presented. All recordings will become unavailable to students in the class when the Sakai

course is unpublished (i.e. shortly after the course ends, per the Sakai administrative schedule: <https://www.luc.edu/itrs/sakai/sakaiadministrativeschedule/>).

In cases where an online session is recorded, students who prefer to participate via audio only will be allowed to disable their video camera so only audio will be captured. Please discuss this option with your professor. The use of all video recordings will be in keeping with the University Privacy Statement shown *below*:

Privacy Statement

Assuring privacy among faculty and students engaged in online and face-to-face instructional activities helps promote open and robust conversations and mitigates concerns that comments made within the context of the class will be shared beyond the classroom. As such, recordings of instructional activities occurring in online or face-to-face classes may be used solely for internal class purposes by the faculty member and students registered for the course, and only during the period in which the course is offered. Students will be informed of such recordings by a statement in the syllabus for the course in which they will be recorded. Instructors who wish to make subsequent use of recordings that include student activity may do so only with informed written consent of the students involved or if all student activity is removed from the recording. Recordings including student activity that have been initiated by the instructor may be retained by the instructor only for individual use.

Religious Holidays

If you need to miss class for a religious holiday, please alert your instructor **in advance** so that will not be counted as an absence. As needed, conflicting due dates for quizzes and tests, homework, and Lab assignments can be adjusted with advanced notice.

Gender Misconduct Mandatory Reporting

Loyola University Chicago faculty are committed to supporting our students and upholding gender equity laws as outlined by Title IX. Therefore, if a student chooses to confide in a member of Loyola's faculty or staff regarding an issue of gender-based misconduct, that faculty or staff member is obligated to tell Loyola's Title IX Deputy Coordinator. The Title IX Deputy Coordinator will assist the student in connecting with all possible resources for support and reporting both on and off campus.

Students with Disabilities

Loyola University provides reasonable accommodations for students with disabilities. Any student requesting accommodations related to a disability or other condition is required to register with Student Accessibility Center (SAC), located in Sullivan Center, Suite 117. Students will provide professors with an accommodation notification from SAC, preferably within the first two weeks of class. Students are encouraged to meet with their professor individually in order to discuss their accommodations. All information will remain confidential. Please note that in this class, software may be used to record class lectures in order to provide equal access to students with disabilities. Students approved for this accommodation use recordings for their personal study only and recordings may not be shared with other people or used in any way against the faculty member, other lecturers, or students whose classroom comments are

recorded as part of the class activity. Recordings are deleted at the end of the semester. For more information about registering with SAC or questions about accommodations, please contact SAC at 773-508-3700 or SAC@luc.edu. **Note: students who are allowed to take their exams at the SAC office are encouraged to do so. *Should you choose to take an exam in the classroom, we cannot guarantee that the classroom environment will be quiet enough to provide you with the environment that your disability may require. If you choose to take the exam in the classroom, you will be taking that risk.*** If you cannot access the SAC office because of any continuing pandemic restrictions we can make the exams available for you to take online.

Students with Sponsorships and Scholarships

If you require a certain grade in order to satisfy a sponsor or a scholarship requirement, please be sure to monitor your grade on Sakai. We will consider only your performance in this course in calculating grades, using the grading rubric posted in this syllabus. If you cannot achieve a minimum grade that is required by a sponsor or a scholarship, we will not change your grade to help you meet that requirement. This would be unfair to other students, and not reflective of your performance in this course. You are responsible to monitor your grade and to keep apprised of the [withdrawal dates](#) posted by the registrar.

Office Hours and Help

See course and instructor web site or Sakai for current office hours. Extra time and special arrangements on request. You are encouraged to set up times to talk with instructors and TA about the course, programing careers, questions you have, etc.

The Department of Computer Science provides tutors for this and other courses; you can find information about tutors on the CS website at <http://luc.edu/cs/people/tutors/>.

Continuous Improvement

The department believes in a quality process of continuous improvement. Anything can be improved by applying the quality process of “Plan, Do, Check, Act” (PDCA). To improve the course and the learning of programming and computer science concepts, your feedback, comments, suggestions, and complaints are welcome at any time.

In support of this PDCA process above, the instructors may ask you to participate in surveys and discussions during the course. These surveys will measure student impressions of the course; when time permits results may be shared with the class. Your inputs on these surveys are anonymous and in no way affect your grade.

We will also be using a LUC feedback system called IDEA toward the end of the course to gather your feedback on both the course itself and teaching; the department uses this kind of feedback to improve how we teach the information in the course and to help refresh our course offerings.

Version 3.0, updated for revised course content January 2023
Version 2.0, updated for new textbook and policies January 2017
Version 1.0, original. 11 January 2011