

INLS 570
Fundamentals of Programming Information Applications
Spring 2020

Sections: 001: Monday & Wednesdays, 11:15am – 12:30pm, Manning 208
002: Monday & Wednesdays, 1:25pm – 2:40pm, Manning 304

Instructor: Dr. Robert Capra
Office: Manning 210
Office Hours: by appointment
(use the link on the course website to schedule an appointment)
Email: r<lastname> at unc dot edu

Prerequisite(s): COMP110, INLS 560, or equivalent

Texts/Resources:

INTPY: *How to Think Like a Computer Scientist, interactive edition 2.0:*
<https://runestone.academy/runestone/static/thinkcspy/index.html>

TPY: Think Python: How to Think Like a Computer Scientist, 2nd ed.
Downey, A. <http://www.greenteapress.com/thinkpython2/>

PDA: *Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython, 2nd edition.* McKinney, W.

Course Webpage: http://www.ils.unc.edu/courses/2020_spring/inls570_001/

NOTE: We will also use a Sakai site for this course.

Grade Weighting:

Class Participation	5%
Exercises & Quizzes	10%
Programming Assignments	45%
Midterm exam	20%
Final exam	20%

1. Course Description and Prerequisites

This course provides fundamental skills needed to design, implement, and maintain computer applications focused on information processing, management, retrieval, and presentation. Students will learn object-oriented programming, data structures, algorithm analysis, and data processing techniques in the context of information science topics such as metadata harvesting, information retrieval, text analysis, and user interfaces. The course combines conceptual understanding of data structures and algorithms with practical techniques for implementation and debugging. Course concepts are taught using the Python programming language. Pre-requisite: COMP 110, INLS 560, Introduction to Programming, or the equivalent.

2. Course Objectives

- Develop skills to design and implement information processing applications.
- Gain experience with object-oriented programming in Python.
- Learn practical and theoretical concepts about data structures.
- Understand and be able to apply principles of algorithm analysis.
- Gain experience with recursion and recursive algorithms.
- Gain experience writing information processing applications.
- Learn to use advanced Python data structures and modules for data analysis.

3. Computing Requirements

In-class computer requirement: You are expected to have a laptop computer that meets CCI requirements and to bring this computer to each class. In many class periods we will do examples and in-class exercises that will count as part of your course grade.

Development environment(s): For the programming assignments in this course, we will use **Python 3.8**. Python and the IDLE development environment are available for free for a variety of platforms (Win/Mac/Linux) at: <http://www.python.org/download/>
During the course, we may also use the Anaconda Python distribution and development environment. Instructions about how to download and install it will be given later in the semester.

4. Graded Work

Your grade will be based on participation, quizzes, in-class exercises, programming projects, a midterm exam, and a final exam. These will be weighted as shown on the table on the first page.

- **Participation:** Students are expected to regularly attend and participate in class. Throughout the semester, students will be called on in class to answer questions, to present work from assignments, exercises, and quizzes. Your participation grade will be based on regular class attendance, courteous behavior in class, being prepared, and being fully and actively engaged during class. **Part of being prepared for class is that you are expected to read and interact with the assigned readings PRIOR to each class period.** You may miss one class period without penalty without prior approval from the instructor. If you need to miss additional class periods, you should contact the instructor as soon as possible (preferably in advance) to discuss your absence and any work that you might need to make up.
- **Exercises and Quizzes:** Throughout the semester, there may be quizzes designed to gauge your understanding of course material. Quizzes may also be given based on the assigned readings, and may draw from questions posed in the text. In addition, during many class periods, short exercises will be assigned. Sometimes you will work on these exercises individually, sometimes in pairs, and sometimes the entire class may collaborate on them. Most of these assignments will require you to submit a solution or program via Sakai to get credit for the exercise. Some exercises will be designed to be completed and submitted by the end of the class period; for other exercises you may be given additional time to finish and submit the exercise.

- **Programming Assignments:** There will be two or three programming assignments designed to give you in-depth, “hands-on” experience with the concepts and programming techniques that are covered in this course. The assignments will involve planning, design, implementation and debugging. These may require a significant amount of time – students are advised to start working on the programming assignments early.

NOTE: For some assignments and exercises, we may do “peer reviews” in which students submit their code to Sakai and then review the code of one to three other students. There are several benefits to this. First, reviewing other students’ code is a good way to solidify your understanding of programming techniques. Second, doing code reviews is a good way to improve your ability to understand code that someone else has written (like reading someone else’s essay in a writing class). And finally, you may learn new programming techniques by having your code reviewed and critiqued by your peers!

- **Exams:** There will be a mid-term exam and a comprehensive final exam.

5. Grading Policies

The following scales will be used as a GUIDELINE ONLY. The final grade scales may differ.

The following grade scale will be used AS A GUIDELINE for **undergraduates**:

Grade Range	Definition*
A 90-100%	Mastery of course content at the <u>highest level of attainment</u> that can reasonably be expected of students at a given stage of development. The A grade states clearly that the students have shown such <u>outstanding promise</u> in the aspect of the discipline under study that he/she may be strongly encouraged to continue.
B 80-89.9%	<u>Strong performance</u> demonstrating a high level of attainment for a student at a given stage of development. The B grade states that the student has shown solid promise in the aspect of the discipline under study.
C 70-79.9%	A <u>totally acceptable performance</u> demonstrating an adequate level of attainment for a student at a given stage of development. The C grade states that, while not yet showing unusual promise, the student may continue to study in the discipline with reasonable hope of intellectual development.
D 60-69.9%	A <u>marginal performance</u> in the required exercises demonstrating a minimal passing level of attainment. A student has given no evidence of prospective growth in the discipline; an accumulation of D grades should be taken to mean that the student would be well advised not to continue in the academic field.
F 0-59.9%	For whatever reason, an <u>unacceptable performance</u> . The F grade indicates that the student’s performance in the required exercises has revealed almost no understanding of the course content. A grade of F should warrant an advisor’s questioning whether the student may suitably register for further study in the discipline before remedial work is undertaken.

* Definitions are from: <http://registrar.unc.edu/academic-services/grades/explanation-of-grading-system/> (underlining is my emphasis)

The following grade scale will be used AS A GUIDELINE for **graduate students**:

Grade Range	Definition*
H: 95-99%	High Pass
P: 80-94.9%	Pass
L: 70-79.9%	Low Pass
F: 0-69.9%	Fail

* Definitions are from: <http://registrar.unc.edu/academic-services/grades/explanation-of-grading-system/>

Due Dates and Late Work

Each assignment will have a due date and time and will include instructions for submission. A late penalty of 10% per day may be applied unless prior arrangements have been made with the instructor.

Assignments submitted more than 5 days after the due date may not be graded unless prior arrangements have been made with the instructor.

Requests for Extensions and Absences

Any request for an extension must be made, preferably by email, at least 24 hours prior to the due date.

Written documentation is required for illness. If a serious illness prevents you from taking any of the tests, send your instructor an e-mail message, or a friend with a note, describing your condition before the scheduled test.

Statute of Limitations

Any questions or complaints regarding the grading of an assignment or test must be raised within one week after the score or graded assignment is made available (not when you pick it up).

6. Course Communication

Course Website

The course website is at:

http://www.ils.unc.edu/courses/2020_spring/inls570_001/

The website will contain the course syllabus, schedule and other useful information.

Sakai

All enrolled students should have access to the UNC Sakai site for this course:

<http://sakai.unc.edu/>

We will use Sakai for many of the administrative aspects of the course.

- **Course Announcements:** I will often use the Sakai messaging feature to post announcements to the class. Usually these posts will also be sent via email to each student's email address of record. However, it is the responsibility of every student to check the Sakai site regularly for announcements and messages. The Sakai site is a reliable source for announcements and messages from the instructor. If something the instructor says in class conflicts with information posted by the instructor on Sakai, then the information posted on by the instructor on Sakai takes precedence. Verbal instructions are easily mis-interpreted, and do not leave a documentation trail.

- **Assignments:** In order for you to receive credit for an assignment, it must be submitted using the Sakai “Assignments” section. In my experience, Sakai is a reliable method to submit assignments. It is the responsibility of each student to make sure they have access to Sakai and can submit assignments when they are due.
If for some reason you are unable to submit an assignment to Sakai, as a last resort you may email it to the instructor along with a note about the problem you encountered. Then, **as soon as you are able to, it is your responsibility to submit the exact same assignment to Sakai.** The email serves as a record that you tried to submit the assignment on time, but to receive credit, your assignment must be uploaded to Sakai.
- **Grades:** I will use the Sakai “Gradebook” to record your course grades.

Email

Email can be an effective means for you to contact me regarding quick and simple class-related communication. If you have a detailed question about an assignment or class concept, I encourage you to talk to me before or after class or schedule a time to meet with me. Please note that I receive a large amount of email and while I try to reply to student emails quickly, there are times that it may take me 2-3 days to reply to email. You may get an answer faster by seeing me in person – I am typically available for a few minutes before and after class.

7. Honor Code

The UNC Honor Code is in effect for all work in this course. The “Instrument of Student Judicial Governance” gives examples of actions that constitute academic dishonesty:

<http://instrument.unc.edu/instrument.text.html#academicdishonesty>

Students often ask what is okay to talk about with other students and what is not. I do encourage you to help each other learn the course material – your fellow students can often be a great resource. However, you should NOT discuss the details of a solution to a particular assignment with other students, and should never copy or share answers for an assignment with other students. It is okay to talk about course material with other students, but you should not discuss detailed solutions to pending assignments. **All work you submit should be your own.** One way to help insure this is that if you do discuss course material with other students, do not take any written notes.

8. Alert Carolina

We will heed Alert Carolina warnings and notifications and will discuss emergency responses on the first day of class. If you receive “Emergency Warning” level message from Alert Carolina during class, you should promptly notify the instructor and the entire class.

9. Special Accommodations

If any student needs special accommodations, please contact the instructor during the first week of classes.