Solving Engineering Problems with Code
ISE 150 (3 Units)

Spring 2022

Description
While teaching critical thinking skills, this class will use engineering examples as a platform to introduce a programming approach to problem solving.

Objective
This course is an introduction to the Python programming language from an engineer’s perspective. By the conclusion of this course, students will understand:
1. Core Python functional programming
2. Core Python object-oriented programming
3. Using Python for data manipulation

Concepts
Programming fundamentals including variables, control statements, loops, functions and object-oriented programming.

Prerequisites
None. This class is intended for students with no prior programming experience.

Instructor
Listed on Blackboard under Contacts

Office Hours
Listed on Blackboard under Contacts

Lecture / Lab
See online schedule of classes for exact times
1 hour 50 minutes twice weekly

Textbook
Course website
All course material will be on Blackboard (http://blackboard.usc.edu).
We will use Piazza (http://piazza.com/) as an online question and discussion forum.

Course Structure
Topics covered during lecture will be applied to about 14 homework assignments spread throughout the semester. All homework assignments must be completed individually and outside of regularly scheduled class meetings.
Regular class meetings will feature a 60-minute lecture followed by an in-class lab assignment. These “labs” must be completed individually and are due at the end of the class period. These “labs” will immediately apply material from lecture and serve as an introduction to the other programming assignments.
There is a midterm and cumulative final exam in this course.

Grading
The following percentage breakdown will be used in determining the grade for the course.

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab assignments</td>
<td>10%</td>
</tr>
<tr>
<td>Homework assignments</td>
<td>50%</td>
</tr>
<tr>
<td>Participation</td>
<td>5%</td>
</tr>
<tr>
<td>Midterm exam</td>
<td>15%</td>
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<tr>
<td>Final exam</td>
<td>20%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
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</tbody>
</table>
Grading Scale
The following shows the grading scale to be used to determine the letter grade.

93% and above   A
90% - 92%        A-
87% - 89%        B+
83% - 86%        B
80% - 82%        B-
77% - 79%        C+
73% - 76%        C
70% - 72%        C-
67% - 69%        D+
64% - 66%        D
63% and below    F

Policies
Lab assignments
Each lab assignment must be completely *individually*. There are no group projects in this class.
There will be lab assignments after most lectures. These assignments will be an immediate application of the material presented in lecture. These assignments will be graded as pass/fail. For credit on each lab you must complete and submit the lab before class time has ended. Each lab will contribute to your overall grade. There is no way to make up a missed lab.
Policies (continued)

Homework assignments
Each homework assignment must be completely *individually*. There are no group projects in this class.
Each homework assignment will include instructions, a due date, and can be found on the Blackboard site for this course.
It is your responsibility to submit your all homework assignments on or before the due date. Homework assignments turned in one day late will have 20% of the total points deducted from the graded score. Homework assignments turned in two days late will have 50% of the total points deducted from the graded score. After two days, submissions will not be accepted, and you will receive a 0.
All homework assignments must be digitally submitted through Blackboard except when otherwise specified by the course staff. Do not email homework assignments to the course staff.
Homework assignment questions should be posted to the online question forum. Questions about specific code should be private posts while general class questions can be public posts. Class time is for lecture and lab assignments only. Do not send any email to the instructor regarding homework assignments or ask specific homework questions during the lecture sessions. You are encouraged to attend the office hours for homework related questions.

Participation
Participation scores will be evaluated based on responses to in-class polls during lecture. You do not need to get the right answer – only enter an answer to these polls.

Exams
Make-ups are only allowed under extraordinary circumstances. Students must provide a satisfactory reason (as determined by the instructor) along with proper documentation.
There are two exams: a midterm and a final. These exams are comprehensive of all topics covered.

Lab facilities
You are encouraged to save your work using a USB flash drive or a website such as Dropbox. You must keep a copy of all coursework. You will not be able to save your work on the school’s lab computers. Any work saved to the computer will be erased after restarting the computer.
The course staff is not responsible for any work lost.

Course material policy
Do not reproduce, distribute, or post any assignment solutions or exams publicly without written consent of the instructor, as this will be considered an academic integrity violation. Except where otherwise noted, the lecture notes and assignment instructions for this course are © 2021 Nathan Greenfield.
Incomplete and Missing Grades

Excerpts for this section have been taken from the University Grading Handbook, located at http://www.usc.edu/dept/ARR/grades/gradinghandbook/index.html. Please see the link for more details on this and any other grading concerns.

A grade of Missing Grade (MG) “should only be assigned in unique or unusual situations... for those cases in which a student does not complete work for the course before the semester ends. All missing grades must be resolved by the instructor through the Correction of Grade Process. One calendar year is allowed to resolve a MG. If an MG is not resolved [within] one year the grade is changed to [Unofficial Withdrawal] UW and will be calculated into the grade point average a zero grade points.”

A grade of Incomplete (IN) “is assigned when work is no completed because of documented illness or other ‘emergency’ occurring after the twelfth week of the semester (or 12th week equivalency for any course scheduled for less than 15 weeks).”

Academic Conduct and Support Systems

Academic Conduct

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Section 11, Behavior Violating University Standards https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions/. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, http://policy.usc.edu/scientific-misconduct/.

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the Office of Equity and Diversity http://equity.usc.edu/ or to the Department of Public Safety http://capsnet.usc.edu/department/department-public-safety/online-forms/contact-us.

This is important for the safety whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. The Center for Women and Men http://www.usc.edu/student-affairs/cwm/ provides 24/7 confidential support, and the sexual assault resource center webpage sarc@usc.edu describes reporting options and other resources.
Academic Conduct and Support Systems (continued)

Academic Conduct:
Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, “Behavior Violating University Standards” [link]. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, [link].

Support Systems:
Student Counseling Services (SCS) - [phone number] – 24/7 on call
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. [link]

National Suicide Prevention Lifeline - [phone number]
Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. [link]

Relationship & Sexual Violence Prevention Services (RSVP) - [phone number] - 24/7 on call
Free and confidential therapy services, workshops, and training for situations related to gender-based harm. [link]

Sexual Assault Resource Center
For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: [link]

Office of Equity and Diversity (OED)/Title IX compliance – [phone number]
Works with faculty, staff, visitors, applicants, and students around issues of protected class. [link]

Bias Assessment Response and Support
Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. [link]

Student Support & Advocacy – [phone number]
Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. [link]

Diversity at USC – [link]
Tabs for Events, Programs and Training, Task Force (including representatives for each school), Chronology, Participate, Resources for Students
Academic Conduct and Support Systems (continued)
All submissions will be compared with current, previous, and future students’ submissions using a code plagiarism identification program. If your code significantly matches another student’s submission, you will be reported to SJACS with the recommended penalty of an F in the course.
You may discuss solutions to specific problems with other students, but you should not look through another’s code. The code can be from an online forum or another student, the source is immaterial – all code submitted in this course must be your own. Do not share your code with anyone else in this or future sections of the course, as allowing someone to copy your code carries the same penalty as copying the code yourself.
# Solving Engineering Problems with Code

## ISE 150 (3 Units)

### Course Outline

Note: Schedule subject to change

<table>
<thead>
<tr>
<th>W</th>
<th>Topic(s)</th>
<th>Lab</th>
<th>Homework</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
<td></td>
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<tr>
<td>2</td>
<td>Variables</td>
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<tr>
<td>2</td>
<td>Holiday</td>
<td>Lab 01</td>
<td>HW01 assigned (Due week 3)</td>
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<td>2</td>
<td>Booleans and conditionals</td>
<td>Lab 02</td>
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<td>3</td>
<td>Modules</td>
<td>Lab 03</td>
<td>HW02 assigned (Due week 4)</td>
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<td>While loops</td>
<td>Lab 04</td>
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<td>4</td>
<td>More loops; Sequences;</td>
<td>Lab 05</td>
<td>HW03 assigned (Due week 5)</td>
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<td>In class lab</td>
<td>Lab 06</td>
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<td>Tuples</td>
<td>Lab 07</td>
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<td>Dictionaries</td>
<td>Lab 08</td>
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<td>Sets</td>
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<td>Lab 10</td>
<td>HW06 assigned (Due week 8)</td>
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<td>Review</td>
<td>Lab 11</td>
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<td>8</td>
<td>Midterm</td>
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<td>Functions</td>
<td>Lab 12</td>
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<td>In class lab</td>
<td>Lab 13</td>
<td>HW07 assigned (Due week 10)</td>
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<td>Functions</td>
<td>Lab 14</td>
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<td>10</td>
<td>Files</td>
<td>Lab 15</td>
<td>HW08 assigned (Due week 11)</td>
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<td>Errors and Exceptions</td>
<td>Lab 16</td>
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<td>11</td>
<td>Varying function input, separate files</td>
<td>Lab 17</td>
<td>HW19 assigned (Due week 12)</td>
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<td>Objects</td>
<td>Lab 18</td>
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<td>12</td>
<td>Using classes</td>
<td>Lab 19</td>
<td>HW10 assigned (Due week 13)</td>
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<td>Wellness day</td>
<td>Lab 20</td>
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<td>13</td>
<td>Writing classes</td>
<td>Lab 21</td>
<td>HW11 assigned (Due week 14)</td>
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<td>In class lab</td>
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<td>Inheritance</td>
<td>Lab 22</td>
<td>HW12 assigned</td>
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<td>Inheritance</td>
<td>Lab 23</td>
<td>(Due week 15)</td>
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<td>15</td>
<td>Command line python</td>
<td>Lab 24</td>
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<tr>
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<td>Review</td>
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**FINAL EXAM – as according to the final exam schedule**