CS 1150, Spring 2020
Intro to Programming Environments
For Elementary Education

General Information

Time and Place:  MWF 2:00-2:50, ITTC 328

Class Website:  http://www.cs.uni.edu/~schafer/1150/

Credit Hours:  Three (3).  This course meets the Course Credit Hour Expectation outlined in the Course Catalog.

Instructor:  Ben Schafer
Email:  schafer@cs.uni.edu  [Note, please use this address instead of my @uni.edu address]
Office:  316 ITTC, phone 273-2187
Office Hours:
  •  MWF,  9:00-9:50 AM, 11:00-11:50 AM, 1:00-1:50 PM
    o  No reservation is necessary, but if you would like priority you can reserve a time using:
      •  http://bit.ly/2oUoNbr
  •  If those times don't work for you, PLEASE, send me an email and propose a specific alternative.

Course Information:

Course Description
Introduction to computational thinking and computer programming. Taught as a survey of programming environments used by elementary education teachers. Topics include structure of programming and the study of several programming environments used by students at a variety of age/ability levels.

Student Learning Objectives
By the end of this semester students taking this course should be able to meet the following objectives:

Programming Oriented Outcomes.  Students should be able to:
  •  trace a segment of code to determine the result produced or state achieved by given code
  •  modify a provided piece of code to accomplish a given task
  •  choose and sequence action statements to accomplish a given task
  •  develop and use selection statements (if-then, if-then-else, etc.) to control selection between actions
  •  develop and use iteration statements (for, while) to control repetition of actions
  •  explain the concepts of sequence, loops, parallelism, events, conditionals, operators, variables, and lists within the context of computer science.

Teaching Oriented Outcomes.  Students should be able to:
  •  discuss resources for learning about several programming environments
  •  discuss which of several programming environments would be appropriate in a given classroom
  •  explain the concepts of sequence, loops, parallelism, events, conditionals, operators, variables, and lists within the context of a K-12 classroom.

Required Materials
No single textbook fits our needs. Instead, all required readings and other materials will be selected from legally available resources on the internet or from instructor produced materials. Everything you will need to complete this course is either directly contained within the class website (see above) or is available on the internet from other sources.
Course Grading

You will earn seven sets of course-wide "grade points" in this course.

These seven grades will consist of:

- **4 Unit Activity Grades**
  - There are five units in this course. Units are graded based on activity specifications and a grade table published later in this syllabus.
  - Units 1, 4, and 5 are worth up to 5 grade points each.
  - Units 2 and 3 are combined into a single assignment of up to 10 grade points
  - Thus, you can earn a total of 25 course points from unit activities

- **2 Competency Demos**
  - These are sort of like "mid-term" exams.
  - Each is worth 5 grade points each.
  - Thus, you can earn a total of 10 course points from competency demos.

- **1 Final Exam**
  - Given during the university scheduled exam period
  - Failure to take the final exam results in an F for the semester.
  - The final is worth 5 course points.

At the end of the semester you will have had the opportunity to earn up to 40 course points. Your overall grade will be based on the sum of these scores and the following hard cutoffs. [That is, a score of 36.99 is not automatically rounded up and is still considered an A-].

<table>
<thead>
<tr>
<th>Score Cutoff</th>
<th>Grade</th>
<th>Score Cutoff</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>37 – 40</td>
<td>A</td>
<td>23 – 27</td>
<td>C</td>
</tr>
<tr>
<td>35 – 37</td>
<td>A-</td>
<td>21 – 23</td>
<td>C-</td>
</tr>
<tr>
<td>33 – 35</td>
<td>B+</td>
<td>19 – 21</td>
<td>D+</td>
</tr>
<tr>
<td>30 – 33</td>
<td>B</td>
<td>15 – 19</td>
<td>D</td>
</tr>
<tr>
<td>28 – 30</td>
<td>B-</td>
<td>13 – 15</td>
<td>D-</td>
</tr>
<tr>
<td>27 – 28</td>
<td>C+</td>
<td>0 – 13</td>
<td>F</td>
</tr>
</tbody>
</table>

Course Structure

There are a few things that may make this course very different from other courses you have taken.

First, some portions of this course will be taught using a manner that is "flipped" from the "traditional" course structure. In many classrooms you come to class for a lecture on new material and then you go home to practice that material. In parts of this class we will do the opposite. You will prepare for class by watching a series of online lecture videos before you come to class. You will then spend almost every in-class session working on code with a small group, a partner, or by yourself. In most cases this is much more efficient because you will need the most help when you are actually doing the programming. In this structure you are in my classroom and I am available to provide that help.

Second, most activities in this course can be attempted multiple times.

- In the case of the in-unit activities, you may resubmit multiple times up to the unit deadline.
- In the case of competency demos, you have the option to attempt a second version of the demo. If you do not like the grade you earned on the original CD you will be provided one opportunity to attempt a second CD to improve your grade. If you do better on the retake I will replace your original grade with that from the retake.

The final exam is the only activity that may not be attempted more than once.
Technology Requirements
Students in this course will rely heavily on the use of the computer. Fortunately, all of the preparation materials and some of the programming environments for this course are available from any computer with a web browser and internet access. Furthermore, all of the required assignments can be completed using software available in most CHAS computer labs or available for free download to a personally owned machine. If you do not own a computer than you can find appropriate machines (with all the correct software) in several different labs on campus. While many will work, I suggest either Wright 339 or ITTC 335.

Scholastic Conduct
You are responsible for being familiar with the University’s Academic Ethics Policies:

https://www.uni.edu/policies/301

Copying from other students is expressly forbidden. Doing so on exams or assignments will be penalized every time it is discovered. The penalty can vary from zero credit for the copied items (first offense) up to a failing grade for the course. If an assignment makes you realize you don't understand the material, ask a fellow student a question designed to improve your understanding, not one designed to get the assignment done. Your final submission for assignments should be individual, original work unless otherwise specified. Any substantive contribution to your solution by another person or taken from a publication should be properly acknowledged in writing. Failure to do so is plagiarism and will necessitate disciplinary action. In addition to the activities we can all agree are cheating (plagiarism, bringing notes to a closed book exam, etc), assisting or collaborating on cheating is cheating. Cheating can result in failing the course and/or more severe disciplinary actions. Remember: Discussing assignments is good. Copying code or answers is not.

Class Distractions
While you are welcome to own and use electronics such as cell phones, tablets, and laptops, the use of these, and other, electronic devices for non-classroom purposes in the classroom is forbidden without my explicit permission (This is a University-wide policy). A few exceptions do exist, and I reserve the right to approve these situations on a case-by-case basis with prior notification. Unless we have discussed it in advance, all electronic devices should be left out of sight during class time.

Accessibility
The University of Northern Iowa (UNI) complies with the Americans with Disabilities Act Amendments Act of 2008 (ADAAA), Section 504 of the Rehabilitation Act of 1973, the Fair Housing Act, and other applicable federal and state laws and regulations that prohibit discrimination on the basis of disability. To request accommodations please contact Student Accessibility Services (SAS), located at ITTC 007, for more information either at (319) 273-2677 or Email accessibility services@uni.edu. Visit Student Accessibility Services (https://sas.uni.edu/) for additional information.

Finally, all students are encouraged to use The Learning Center @ Rod Library (formerly The Academic Learning Center) for assistance with writing, math, science, reading and learning strategies. Meet with trained and certified tutors during walk-in hours or by appointment. For more information, visit us in person on the main floor of Rod Library, on the web at tle.uni.edu or by calling 319-273-6023.
Unit One – Code.org/CS Fundamentals
January 13 – 31, 2020

During this unit you will participate in the following activities:

- "Unplugged" lessons
  - 6 activities/reflections worth 2, 1, or 0 points each.
    - These activities are conducted in-class. Failure to attend class robs you of the learning opportunity. If you miss class for any reason you will need to discuss with me how you can make up this missed activity and how it will be assessed.
    - You can earn up to 2 points for each of these activities:
      - 2 points – You are in class and engaged with the activity
      - 1 point – You are in class but fail to participate OR you miss class but complete a make-up activity
      - 0 points – You are not in class and fail to make up the activity

- "Plugged" lessons/activity set
  - 26 online activity sets worth 2, 1, or 0 points each.
  - These will be completed outside of class and will require an account with Code.org
  - Each lesson/activity set will consist of several puzzles/coding activities on the Code.org website.
  - Code.org does an analysis of your submissions.
    - You can earn up to 2 points for each of these activity sets:
      - 2 points – You complete every activity in the set to the "perfect" level (the dark green circles).
      - 1 point – You complete every activity in the set but 1 or more is still labeled as "too many blocks" (the light green circle)
      - 0 points – One or more activities in the set are not yet completed
  - NOTE: It is YOUR responsibility to make sure that you are logged in when attempting these activities and that your progress is properly reported in the progress table(s).

This unit is scheduled to officially end on Monday, February 3. All activities must be attempted for the first time by that date. Any activity sets not begun by that date will be marked as a zero. You will have until Friday, February 7th to fully complete all "plugged" activity sets. After that deadline your Unit 1 grade will be assigned as follows:

<table>
<thead>
<tr>
<th>Unit Points Earned</th>
<th>Grade Points Assigned</th>
<th>Approximate Letter Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 or more</td>
<td>5</td>
<td>A</td>
</tr>
<tr>
<td>56 or more</td>
<td>4.5</td>
<td>A-/B+</td>
</tr>
<tr>
<td>52 or more</td>
<td>4</td>
<td>B</td>
</tr>
<tr>
<td>48 or more</td>
<td>3.5</td>
<td>B-/C+</td>
</tr>
<tr>
<td>44 or more</td>
<td>3</td>
<td>C</td>
</tr>
<tr>
<td>40 or more</td>
<td>2.5</td>
<td>C-/D+</td>
</tr>
<tr>
<td>36 or more</td>
<td>2</td>
<td>D</td>
</tr>
<tr>
<td>30 or more</td>
<td>1</td>
<td>F</td>
</tr>
<tr>
<td>29 or less</td>
<td>0</td>
<td>F</td>
</tr>
</tbody>
</table>
Units Two and Three – Fundamentals of Programming using Scratch  
February 3 – March 13, 2020

During this unit you will participate in the following activities:

- **Non-graded Programs**
  - Non-graded, "practice" programs.
  - These will frequently be completed with a partner and may be shared with the rest of the class.
  - While the successful completion of these programs will not have an effect on your unit grade it is strongly suggested that you complete each one. These are designed to help you practice some skills that will be used in other activities that will count for credit.

- **Graded Programs**
  - 6 assignments worth 2, 1, or 0 points each.
  - These programs are typically assigned after the completion of a paired, non-graded, program so you have had a chance to practice with the new content for the week.
  - These programs are typically completed as an individual.
  - You can earn up to 2 points for each activity:
    - 2 points – Program meets all of the requirements of the published grading rubric
    - 1 point – Program runs but does not yet meet 1 or 2 of the rubric requirements
    - 0 points – Program fails to meet multiple rubric requirements or was not submitted at all.

- **Peer-review activities**
  - 6 activities worth 1 or 0 points each.
  - After the "deadline" for each graded program has passed you will be asked to complete peer reviews of the deliverables from several of your classmates. [Further instructions will be provided].
  - You can earn up to 1 point for each activity:
    - 1 point – You have completed the required peer reviews that meet the expectations of an appropriate peer-review.

This segment is scheduled to officially end on Friday, March 13th. All programs must be attempted for the first time by that date. Final peer reviews and resubmissions to correct deficiencies will be accepted through Friday, March 27. After that deadline your Unit 2/3 grade will be assigned as follows:

<table>
<thead>
<tr>
<th>Unit Points Earned</th>
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<th>Approximate Letter Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>10</td>
<td>A</td>
</tr>
<tr>
<td>17</td>
<td>9</td>
<td>A-/B+</td>
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<tr>
<td>16</td>
<td>8</td>
<td>B</td>
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<tr>
<td>15</td>
<td>7</td>
<td>B-/C+</td>
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<tr>
<td>14</td>
<td>6</td>
<td>C</td>
</tr>
<tr>
<td>13</td>
<td>4</td>
<td>D</td>
</tr>
<tr>
<td>12 or fewer</td>
<td>0</td>
<td>F</td>
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</table>

**Note:**
While rare, I reserve the right to adjust the letter grade assigned for this unit either up or down based on individual circumstances and my perception of your efforts to co-operate with vs. gaming the grading system. In other words, if you have earned a B for a unit based on the specification guide, but have done so by consistently doing the absolute minimum required to earn the points needed for that B, I reserve the right to assign a slightly lower grade. If it comes to this, I will discuss this situation with you so you are well aware that it is happening.
Unit Four – LEGO Mindstorms Robotics
March 23 – April 17, 2020

During this unit you will participate in the following activities:

- **In-class Participation**
  - 12 days when you will get credit for being in class and participating with your robot team.
    - 1 unit point per day
    - Because you are working with special equipment, it is impossible to make up missed days of class. The overall grading system allows you to miss a day or two but your team will need to be working together.

- **Training Missions**
  - 2 team-based training missions
  - Each mission can earn your team (and thus, you) 1 unit point

- **Competition Missions**
  - 10 team-based missions
    - Worth a variable number of points depending on what you actually complete
    - Technically worth a possible 50 unit points. However, I don't expect that any team can complete even half of the missions during the four days of competition.
    - I consider 18 points to be "full credit." However, you and your team can earn more than 18 points to make up for deficiencies in the participation or training missions.

This unit is scheduled to officially end on Friday, April 17. After that deadline your Unit 4 grade will be assigned as follows:

<table>
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<td>D</td>
</tr>
<tr>
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<td>1</td>
<td>F</td>
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<tr>
<td>15 or less</td>
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<td>F</td>
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**Note:**
There are ~20 (or more) unit points earned as a team during this Unit. If you are frequently absent on days when your team is earning team points I reserve the right to base your grade on a modified/lower number of these team points. Again, this unit uses specialized equipment and class attendance is important.

Unit Five – Extra Resources and CS Standards
April 20-May 2 2020

The grading specification for Unit 5 has not been finalized. It will be discussed prior to the end of Unit 4 and posted on the class website.