RAIK183H
Computer Problem Solving Essentials
Class Syllabus
Fall 2014

Instructor

**Leen-Kiat Soh**, Associate Professor  
**Office:** Room 122E, Avery Hall  
**Tel:** 472-6738  
**E-mail:** lksoh@cse.unl.edu  
**Skype:** profsoh  
**Homepage:** [http://cse.unl.edu/~lksoh/Classes/RAIK183H_Fall14/](http://cse.unl.edu/~lksoh/Classes/RAIK183H_Fall14/) (not on Blackboard!)

**Office Hours:** 1:30 – 2:30 PM MW and **Open Door Policy**  
*Blackboard site will have most of the course scores.*

### Teaching Assistants

<table>
<thead>
<tr>
<th>Name</th>
<th>E-mail</th>
<th>Tel</th>
<th>Office Hours</th>
<th>Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tobin Brown</td>
<td><a href="mailto:tjbrown@cse.unl.edu">tjbrown@cse.unl.edu</a></td>
<td>402-213-4014</td>
<td>7:00-11:00 PM</td>
<td>Lounge area, 2nd floor</td>
</tr>
<tr>
<td>Ryan Helmoski</td>
<td><a href="mailto:rhelmosk@cse.unl.edu">rhelmosk@cse.unl.edu</a></td>
<td>507-830-0807</td>
<td>PM Mondays,</td>
<td></td>
</tr>
<tr>
<td>Jake Sanchez</td>
<td><a href="mailto:jsanchez@cse.unl.edu">jsanchez@cse.unl.edu</a></td>
<td>859-797-9941</td>
<td>Tuesdays</td>
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**Lab Assistants:** Ashlyn Lee and Rebecca Dahlman

### Lectures & Labs

**Time:** 9:30 – 11:15 AM MW  
**Room:** Kaufmann 110

There will be 5-6 laboratory days where no lectures will be held. Instead, students work on laboratory assignments. See the course schedule for tentative laboratory days.

### Course Description

First course in the Raikes School of Computer Science and Management program core. This course introduces problem solving with computers including core computer science topics, computational thinking skills, problem analysis and specification, algorithm development, program design and implementation. Emphasis on Java. A broader set of skills include critical thinking, communicating technical concepts, and identifying and applying CS concepts to solving problems in today's world.

### Class Objectives

The objective of this class is to familiarize students with problem solving approaches using computer programming. We study how to specify a problem, how to come up with a solution, how to convert the solution into a program, and how to solve the problem correctly using the program. The conversion of a solution to a program comes in many ways. In this class, we focus on Object-Oriented Programming (OOP) where we build “software objects” that are distinct and standalone that programs can use to carry out more complex tasks. Specifically,
1. Mastery of problem solving in a high-level language, basic data types, and algorithm development; and

2. Familiarity with the object oriented paradigm, software development environments, GUI development and exception handling.

### Topics Covered


### Prerequisites

Admission to the Raikes School of Computer Science and Business Management, CSCE105 and MATH103 (or appropriate scores on placement exams).

### Text Book

iClicker (Required)

### Homework Assignments

There will be about 4-6 homework programming assignments to help you understand and master the basic concepts and train you on problem solving—to ultimately be proficient in developing software programs. Java programming language must be used for all the assignments. The assignments are due at class time on the indicated dates. You will be required to hand in an online copy. In addition, you are required to hand in a hardcopy of your code at class time on the due date. You are expected to write well-documented, modular code. **Programs which do not compile or which do not run will not receive any credit.** Programs that compile and run will be graded as follows: 45% Program Correctness, 15% Software Design, 10% Programming Style, 15% Testing, and 15% Documentation.

### Laboratory Assignments

The laboratories are designed to supplement the lectures and provide hands-on experiences on topics that need additional attention. It is a significant part of the course and you are strongly encouraged to fully take advantage of this opportunity. You are required to read the lab handout and the reading assignments before coming to the lab. You are also required to take the on-line pretest prior to coming to each lab. There are 4-5 laboratories altogether.

### Examinations

We will have two mid-term exams and a final exam. The tentative dates for the tests are listed in the lecture schedule. The final exam comes in two Parts. Part I is online multiple choice questions as part of the CSE Department’s Progress Assessment Test (PAT), to be taken during a certain time of the dead week. Part II is similar to the mid-term exams, to be taken during the finals week. There will be no makeup tests.
Pop Quizzes

In this class, we will make use of an online tool called the iClicker2 to administer pop quizzes. You are required to purchase an iClicker2 clicker from the bookstore, register your ID, and then bring it to class. Each pop quiz will have several questions.

Forums

In this class, occasionally we will hold group activities called forums. Bonus points will be given for student participation in these group activities.

Creative Competency Exercises Evaluation Study

UNL has received federal funding to continue the design and implementation of Creative Competency Exercises designed to improve computational and creative thinking in courses at the University of Nebraska. This semester evaluation will be done in the class to help understand how doing these exercises impacts student learning and student attitudes and motivation for science, engineering, technology and math courses. Faculty from CSCE and Educational Psychology will be coming to class or lab to proctor surveys that will aid in this evaluation. You will be getting more information from them during the first or second week of the semester. Thank you in advance for your help with this important project.

Final Grade

Your final course grade is based on the following: (1) homework assignments (35%), (2) laboratory assignments (10%), (3) midterms (30%), (4) pop quizzes (5%), and (5) final exam (20%). Final grades in this class will be assigned based on the following scale. A+ is awarded to a student whose work and understanding of the class prove to be exceptional. The final grade is determined jointly by your performance in the above two sets of scores: (1) Practices: homework and laboratory assignments, and (2) Tests: midterms, pop quizzes, and final exam. Final grades in this class will be assigned based on the following scale. A+ is awarded to a student whose work and understanding of the class prove to be exceptional.

A:  94% - 100%  B-:  80% - 82%  D+:  67% - 69%
A-: 90% - 93%  C+:  77% - 79%  D:   63% - 66%
B+: 87% - 89%  C:   73% - 76%  D-:  60% - 62%
B:  83% - 86%  C-:  70% - 72%  F:   below 60%

Disabilities

Students with disabilities are encouraged to contact Christy Horn for a confidential discussion of their individual needs for academic accommodation. It is the policy of the University of Nebraska-Lincoln to provide flexible and individualized accommodation to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) office, 132 Canfield Administration, 472-3787 voice or TTY.

Academic Misconduct

Academic dishonesty of any kind will be dealt with in a manner consistent with the CS&E Department's Policy on Academic Integrity (http://cse.unl.edu/undergrads/academic_integrity.php). You are expected to know and abide by
this policy. Those who share their code and those who copy other’s code will be penalized in the same way; both parties will be considered to have plagiarized.

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**This course will satisfy ACE Learning Outcome #3:** use computational and formal reasoning (including reasoning based on principles of logic) to solve problems, draw inferences, and determine reasonableness.

**We will provide the following opportunities for learning the above ACE Learning Outcome.** This course not only teaches students about how to design an algorithmic solution to solve a problem, but also teaches students about how to engineer the design into a working piece of program. Furthermore, the engineering process of implementing a program involves significant debugging, testing, and refining code. These activities teaches and reinforces inferencing: a student has to be able to draw inference when diagnosing why a program crashes or does not compile or generate incorrect output; after making fixes, a student will have to re-evaluate the design to see if the outcome meets his or her expectation, and further draw inferences on how to proceed. Finally, an algorithm is fundamentally a logical sequence of steps that, given a set of input, generates definitively a set of output. The correct derivation of the output provides the decidability of the algorithm, which in turn determines reasonableness.

**We will assess your achievement of the outcome through three primary tools,** among others: exams, programming homework assignments, and structured laboratory assignments. Note that the artifacts of the programming homework assignments inherently embed the results of problem solving, inferencing, and reasonableness reasoning. This is because in order to produce a working program that compiles, runs, and computes the correct output, a student must devise an algorithmic solution and then implement it. For the structured laboratory assignments, worksheets—where students submit their findings from solving the problems given—are graded, and pre- and post-tests are given to students to test how they have learned.

**This course will also reinforce the following skills.** Critical thinking is key in the development of algorithms and also during the debugging process of implementing a program. The course provides numerous opportunities for critical thinking in lectures, homework and programming assignments, and also in the structured laboratories. In the structured laboratories, each assignment is problem-based and students are tasked to apply critical thinking to solve problems.

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The CSE Department has an anonymous suggestion box (http://cse.unl.edu/department/suggestion.php) that you may use to voice your concerns about any problems in the course or department if you do not wish to be identified. It is CSE Department policy that all students in CSE courses are expected to regularly check their email so they do not miss important announcements.

Please make use of the Student Resource Center in Avery 13A: http://cse.unl.edu/src