ITK 168
Structured Problem-Solving Using the Computer
Fall, 2010

Instructor: Mary Elaine Califf
Office: Old Union 106
Phone: Office: 438-5203
Email: mecaliff@ilstu.edu
AIM: mecalif@ilstu.edu
Yahoo IM: me_califf
Windows/MSN Messenger: mecalif@ilstu.edu
Office Hours: MWF 12:00-12:30, 1:30-1:50; MW 3:00-3:30; and by appt
Section Web Site: http://www.itk.ilstu.edu/faculty/mecalif/ITK168/Fall2010/index.htm
Web Submit for lab: http://kirk.itk.ilstu.edu/submit.html

Catalog Description
Introduction to the development of algorithms for computer systems processing. Emphasis on structured problem solving and the design of problem solutions.

Course Description
This course is designed to introduce you to the basic problem solving and program design skills that are used to create computer programs. Topics include problem solving strategies, program design strategies and tools, program testing, object-oriented programming, common algorithms used in computer programs, user interfaces, and the syntax of a high level programming language.

Course Objectives
Upon completion of this course you should
1. Be able to describe classical problem solving strategies and use them in solving problems that can be implemented on a computer.
2. Be able to use accepted program design strategies and tools to design and implement a solution for a problem on a computer.
3. Understand the various contexts in which computer programs are written.
4. Be able to develop appropriate testing procedures for a simple program.
5. Be able to write computer programs in a high level programming language.

Textbook

Commitment and Time Management
Programming courses are time intensive. You must be prepared to spend the usual 2 hours of study for each hour in lecture plus additional time for designing, coding, debugging and executing your programs (10 hours per week when programming is normal).

Managing your time will be very important in order for you to succeed in this class. You have probably not previously taken a course that requires such a time commitment. You are in control of how you spend your time. Spending it wisely will be essential to your success.
Course Requirements

Exams: This course has two night exams and a final. These exams are scheduled on Wednesdays, September 29 and November 10 at 8:00 PM. The final exam is scheduled for Wednesday, December 15 at 8:00 PM. All of the exams will be held in STV 101.

If you are unable to attend an exam due to illness or another valid reason, you must notify me prior to the exam to make arrangements for making up the exam. If you are unable to reach me personally, email me or leave me a voice mail. You should make arrangements now to attend the exams.

There will also be a lab final exam during your usual lab time in the final week of class. This exam cannot be made up, so make sure you are there. This will be your opportunity to demonstrate your ability to write Java programs to solve fairly simple problems without help. To prepare for this exam and check your progress, you will take several programming quizzes in lab throughout the semester.

Labs: You are required to attend the weekly lab associated with this course. Twenty percent of your course grade will be from laboratory activities. All laboratory classes will be held in Old Union 133. There will generally be assignments to complete before the lab as well as during the lab. Pre-lab activities are due at the beginning of the lab period in which the lab is scheduled. Other lab activities are due at the beginning of the next week’s lab session. Plan to stay for the entire two hour lab period every week. Leaving early without completing everything will affect your participation grade in lab.

Beginning in the 4th week, you will have the opportunity to work with another student on your lab exercises. This will be required for 3 weeks, and then becomes optional.

In several of the labs, there will be a quiz. These will also count toward your lab grade. The lowest quiz grade will be dropped.

Your lowest lab grade will automatically be dropped at the end of the course. This provides you with some flexibility in dealing with assignments that you do not complete or a lab that you do not attend. Missed labs cannot be made up.

Scheduled laboratory sessions will be held in Old Union 133. Homework and programming activities may be completed in Old Union 133 and any other labs in Old Union when they are not in use for classes.

Programming Assignments: You will receive several major programming assignments in this course. Solutions must adhere to the design, coding and documentation standards presented in class. For each programming assignment, you will submit the source code along with any required documentation using Blackboard. Programs containing compilation errors will receive failing grades. Those producing run-time errors will incur a substantial penalty. You should make a serious effort to complete all programs on time. You may turn in one program up to 5 days late with no penalty. All other programs will be accepted only until midnight of the day after they are due and will incur a 10% penalty if they are late.

Note that the programming assignments are individual work. You may not work with another student in the course for any reason or under any circumstances on these assignments. Questions concerning these assignments are best directed to me.

Homework and Quizzes: Ten percent of your grade is based on class participation, homework, and quizzes. You are expected to attend class and be prepared to actively participate. Class time will be used to cover lecture material, clarify readings from the text, answer your questions, and work practice problems. There will be regular quizzes covering your reading as well as topics previously covered in lecture. I will provide practice problems which will not be collected or graded. Some of the quiz
questions will be based on the practice problems. The quiz/homework grade will be curved at the end. (No other aspect of the course grade will be curved.)

Occasionally, you may be given homework to turn in for grading. This will be announced at the time the assignment is made. If you miss a class, it is your responsibility to get the assignment. Late homework is not accepted. Note that you are generally permitted to work together on homework assignments.

**Plagiarism and other forms of cheating**

Knowingly turning in work that you did not do is plagiarism, the most common form of cheating. It is unacceptable in this course and a foolish way to try to get through the course. Do not work together on individual programming assignments. Do not discuss individual assignments with people other than me and the paid debuggers. Do not show someone your code, even if the person claims not to intend to cheat. Do not sit in the lab, or anywhere else, and talk about the program. Note that if you found the code on the web (or anywhere else), you did not do the work. Any case of cheating will result in a minimum penalty of a zero on the assignment. This applies to both the person who did the work and made it available and the person who copied. The maximum penalty will be an F in the course and pursuit of further disciplinary action. Note that the standard penalty for cheating on a program is a zero on the program in question and a loss of 10% on the final course average. All cheating will be reported to CRR as required by university policy.

Bottom line: Do your own work!

**Disability Concerns**

Any student needing to arrange a reasonable accommodation for a documented disability should contact Disability Concerns at 350 Fell Hall, 438-5853 (voice), 438-8620 (TDD).

**Evaluation**

Your grade will be determined based on the following distribution:

- 2-Midterm exams: 20%
- Lab Final: 10%
- Written Final: 15%
- Lab activities (14 weeks): 20%
- Programs: 25%
- Homework, quizzes, and class participation: 10%

**Total: 100%**

Your grade is computed as a *weighted average* based on the percentages above. It is *not* your total points divided by the total number of points possible in the course. You may end up with far more points for quizzes or homework than for programs, but your program average will count two and a half times as much as your quiz and homework average.

The grading scale for this course is:

- A: 90-100 (see note below)
- B: 80-89 (see note below)
- C: 70-79 (see note below)
- D: 60-69
- F: Below 60

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*Note: The grading scale above is provided as an example. Actual grading scales may vary based on specific course requirements.*
**Important:** In order to receive the grades listed above, you must also have at least a 65% exam average to receive a C, a 75% exam average for a B, and an 85% exam average for an A.

**Course Resources**
There are a number of sources of information for this course:

- Your textbook will be used as a source of readings and some problems for labs and possibly also for individual programming assignment. Make certain to take your textbook to lab since many lab exercises are taken from the text.
- You will be provided vocabulary lists and practice sets for each chapter.
- You have a website listed on the first page on this syllabus. There you will find a daily calendar with reading, recommended problems, and assignments for each day as well as links to the PowerPoint slides for the day. This is also where you will find links to lab materials.
- I will also be using Blackboard, accessible from icampus or from blackboard.ilstu.edu. This site requires that you log in using your ULID and associated password. You will use this site to submit programming assignments. You will also be able to see your grades there.
- I am one of your very important course resources. I am available during my office hours. If you cannot come to my office hours, I do make appointments at other times.
- I answer email frequently when I am home – responses will be less prompt when I am on campus, as I seldom have time to check email while on campus between classes, committee meetings, and office hours. When asking questions about programs via email, please be as specific as possible about your question or bug. If you are asking for help with a bug, explain the problem and the error you’re seeing and zip the program as if you were submitting and attach it to your email. The error you think is in one method may be actually caused by something else entirely, so it can speed my answer significantly if I have the whole program as well as your information.
- I am typically available for instant messaging when sitting at my home computer – which is a great deal of many evenings and most of the time on days when I am not on campus. While IM is not as effective as face-to-face help in most cases, it can work better than email for getting help. See the information at the beginning of this document for my IDs on various systems.

**Final advice**
Programming requires a different kind of thinking and a different kind of learning. If you can do interesting math, you can program, but you cannot learn to program by memorizing. You must seek to understand the building blocks, what they mean, how they fit together. This is an odd combination of learning a language and doing problem-solving. The good news is the language is lot simpler than things like French and Spanish, but if you just try to memorize chunks of Java that you don’t understand, you’ll do as poorly in the long run as if you tried to learn French by memorizing whole sentences without understanding what the different words mean and how they’re put together. You may get by for a few weeks, but when that no longer works, you’ll be those weeks behind. Instead, work to understand the patterns and the building blocks.
# Course schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8/23</td>
<td>Introduction to Java/OO</td>
<td>Chapter 1</td>
</tr>
<tr>
<td>2</td>
<td>8/30</td>
<td>Inheritance</td>
<td>Chapter 2</td>
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<tr>
<td>3</td>
<td>9/6</td>
<td>No class Monday (Labor Day) Design</td>
<td>Chapter 3</td>
</tr>
<tr>
<td>4</td>
<td>9/13</td>
<td>Control Structures</td>
<td>Chapter 4</td>
</tr>
<tr>
<td>5</td>
<td>9/20</td>
<td>Control Structures cont.</td>
<td>Chapter 5</td>
</tr>
<tr>
<td>6</td>
<td>9/27</td>
<td>Exam 1 on 9/29 Control Structures cont.</td>
<td>Chapter 5</td>
</tr>
<tr>
<td>7</td>
<td>10/4</td>
<td>Instance variables Input using Scanner</td>
<td>Chapter 6 Handout</td>
</tr>
<tr>
<td>8</td>
<td>10/11</td>
<td>Instance variables cont.</td>
<td>Chapter 7</td>
</tr>
<tr>
<td>9</td>
<td>10/18</td>
<td>Instance variables cont.</td>
<td>Chapter 7</td>
</tr>
<tr>
<td>10</td>
<td>10/25</td>
<td>Class collaboration</td>
<td>Chapter 8</td>
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<tr>
<td>11</td>
<td>11/1</td>
<td>Files</td>
<td>Chapter 9</td>
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<tr>
<td>12</td>
<td>11/8</td>
<td>Arrays Exam 2 on 11/10</td>
<td>Chapter 10</td>
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<tr>
<td>13</td>
<td>11/15</td>
<td>Arrays</td>
<td>Chapter 10</td>
</tr>
<tr>
<td>14</td>
<td>11/22</td>
<td>THANKSGIVING</td>
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<tr>
<td>15</td>
<td>12/6</td>
<td>Ethics/review</td>
<td></td>
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Final exam Wednesday, Dec. 15 at 8pm