University of Southern Illinois Carbondale
Special Topics: Java Programming with Data Structures – CS491
Fall 2015

Course Objectives:
- To provide an in-depth exposure on data abstraction and abstract data types
- To provide a thorough coverage of data structures such as lists, stacks, queues, trees, graphs and their implementation
- To provide an insight about algorithm efficiency and complexity
- To discuss recursion and its implementation
- To discuss different sorting and searching algorithms

Course Prerequisites:
- CS 202 and CS 215, with a grade of C or higher.

Time:
- Lecture: MWF 1:00-1:50PM
- Lab:  T 1:00-2:50 PM

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TA: Nagalakshmi Satyanarayanan
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Office Hours: T & TR 3:20-4:50PM

Text Book:
- *Data structures and Abstractions with Java*, Third Edition, by Frank M. Carrano, Pearson/Prentice Hall (Required)

Grading:
- Lab assignments: 25%
- Mid exam: 15%
- Comprehensive Final Exam: 30%
- Project :30%
Course Tentative Schedule:

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<th>Week</th>
<th>Topics Covered</th>
<th>Labs &amp; Exam</th>
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<tr>
<td>Week 1</td>
<td>Overview of Object Oriented Programming in Java</td>
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<tr>
<td>Week 2</td>
<td>Data Abstraction and Abstract Data Type (ADT)</td>
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<td>Week 3 &amp; 4</td>
<td>ADT and its Implementation</td>
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<td>Week 5</td>
<td>Stack and its Implementation</td>
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<td>Week 6</td>
<td>Algorithm Complexity</td>
<td>Mid Exam</td>
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<tr>
<td>Week 7 &amp; 8</td>
<td>Queue and its Implementation</td>
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<td>Week 9</td>
<td>Recursion</td>
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<td>Week 10 &amp; 11</td>
<td>Sorting and Searching Algorithms</td>
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<td>Week 12 &amp; 13</td>
<td>Tree and its Implementation</td>
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<tr>
<td>Week 14</td>
<td>Graph and its Implementation</td>
<td>Final Exam</td>
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Course Policy:

1. **Attendance.** Due to the nature of the course and the frequency of assignments, attendance is mandatory. You are responsible for all announcements and for all material presented in the lectures. Come prepared for class. Read the assigned material in advance of lectures. If you have to miss class, please consult with your class members so that you can find out what happened in class.

2. **Assignments.** There are several lab assignments and homework sets. Lab assignments involve programming, and homework sets contain questions that require written answers. Additional help sessions for each lab assignment may be scheduled after the assignment is posted. Please make sure that your programs are properly documented and indented. Your solution to the homework sets can be hand-written or typed. You must talk to the instructor, not the TAs, for any grade appeal about an assignment, and it must be made within one week after the assignment is handed back.

3. **Exams.** There will be one midterm exam and one final exam, midterm lasts 1 hour and 2 hours for the final. All exams are closed-book (unless otherwise specified) but not comprehensive except the final. Additional review and Q&A sessions may be scheduled prior to the exams. The time and location of the midterm exam is to be announced. There will be no
make-ups except under very special circumstances. Any reason for a make-up must be approved by the instructor.

4. **Programming Environment.** All programs in lab assignments must compile and run in at least the Java SE 6 environment. You can compile and run your source code from the command line or you can choose to use any IDE you prefer, for example Eclipse, NetBeans, DrJava or BlueJ. All of the necessary software can be freely installed on your PC. For any technical questions regarding software installation, lab assignments, Java programming, and development environment, please consult the TA first. Programs that cannot be compiled or run will receive zero points.

5. **Collaboration and Plagiarism.** All homework and lab assignments are to be done individually unless otherwise specified. You are allowed and even encouraged to *verbally* discuss the assignment material with your classmates or consult others for debugging assistance, but you must prepare the solution on your own. Plagiarism and other anti-intellectual behavior are not tolerated and are subject to severe penalties. For more information, please carefully read the Departmental Policies on Academic Dishonesty available at [http://www.cs.siu.edu/dishonesty.shtml](http://www.cs.siu.edu/dishonesty.shtml)

7. **Project.** A project is an integrated part of this course. You are required to form a group of three (maximum) and develop a program by applying the concepts discussed in class. The title of the project should be submitted and approved by the instructor before you start working on it. The time for submitting a title and the final program is to be announced.

6. **Time Management.** This course is an extremely time-demanding course. Please plan your time wisely, and start work on the assignments as soon as they are available. Nevertheless, this course is probably the most important and useful course in your Computer Science education.