SYLLABUS

**Code**: CS114 - 002 **Title**: Information Technology

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| CS114-002 | Intro To Computer Science II | Monday  Thursday | 1:00PM - 02:25PM  04:00PM – 05:25PM | GITC1400  GITC2400 |  |

**Institute:** NJIT **Department:** Computer Science

* **Instructor:** Shu Lee **Email**: [sl65@njit.edu](mailto:sl65@njit.edu) **Office hours**: Thursday 3:00pm at GITC 4420 (by appointment only)

**Course Description:** This course is an introduction to study of data structures and algorithms, emphasizing implementations in the Java programming language. At the conclusion of the course, students will be able to write computer programs using standard data structures and algorithms, and be able to bind the resources used by an algorithm.

**Corequisites**: - None

**Prerequisites or Corequisites**: - CS113 completion of a required 100 level GUR course in CS plus an approved CIS105. You must be able to program in Java.

**Credits**: 3 **Lecture Hours:** 3 **Lab/Studio Hours:** 0

**REQUIRED TEXTBOOK MATERIALS**

*Data Structure & Algorithm in* Java, Third Edition, by Clifford A. Shaffer, Dover, 2011. ISBN:

0486485811. For information on the book, see the author's web page: <http://people.cs.vt.edu/~shaffer/Book/>

Download all program source files from Java [zipped version](http://people.cs.vt.edu/~shaffer/Book/JAVA/Javacode20110520.zip) (Last updated: 05/20/2011) on the webpage

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You may find following textbook useful:

*Data Structure & Algorithm in* Java, Fifth Edition, by M. Goodrich and R. Tamassia, Wiley, 2010. ISBN: 978-0-470-38326-1

**Storage:** A portable secondary storage media (i.e., USB Flash Drive) or Cloud storage account.

**COURSE MATERIAL AND COMMUNICATION:** We will be using the Moodle system (http://moodle.njit.edu). All class information (including this syllabus, class notes, homework assignments) will be posted there. You can post questions (and answers) there, and I will post occasional updates. All communications should be through the “News forum” (do not use “Messages”).

If you have a personal issue that you wish to bring to my attention (for example if you want to inquire about your grade, or inform me that you need to miss class due to illness) you should email or call me, or speak to me in person. For other communications, you should use Moodle (for example, questions on homework or what will be on the exam).

**LEARNING OUTCOMES:**

Upon completion of this course, students will be able to:

Understanding topics of logical structures of data, their physical representation, design and analysis of computer algorithms operating on the structures, and techniques for program development and debugging.

**GRADING STANDARD:**

**Homework will be assigned each week during the class, and due before class on the following class**. Usually homework assignment will have a programming component and an analysis component. Each assignment is 5 points and there are eleven assignments. One Lab will be bonus. Some assignments will have extra bonus points.

If you are unable to meet any of the course requirements (for example due to illness), you must contact me immediately (email). In order to be excused from a component of the course that contributes to the final grade, you must supply documentation explaining your absence to the office of the dean of students, and they will in turn contact me.

**Grade Calculation**

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| --- | --- | --- |
| **Activity** | **Max Pts.** | **Comments** |
| Mid-term test 1 | 15 |  |
| Mid-term test 2 | 15 |  |
| Final test | 20 |  |
| HW/Lab assignments | 50 | 11 Labs 4 points  1 Lab 6 points |
| **Total** | 100 |  |

**AVERAGE FINAL GRADE**

90 –100 A

85 - 89 B+

80 - 84 B

75 – 79 C+

70 - 74 C

60 – 69 D

BELOW 60 F

Tentative Course Outline

Week Topics

1. Introduction
2. Recursion
3. Polymorphism
4. Lists
5. Algorithm analysis
6. Stacks
7. Queues,
8. Dictionaries
9. Tree, Binary trees, binary search trees
10. Priority queues, heaps
11. Hashing
12. Iterator & Sorting - 1
13. Sorting - 2
14. Graphs ,Topological sort, shortest paths

***Department Policies***:

It is every student's responsibility to understand and adhere to the provisions of the academic honor code. You

may discuss homework problems with your colleagues, but all written work must be your own. Copying programs

or written assignments from any source is a serious violation of the academic honor code. Violations of the exam

instructions will result in a score of zero for the exam. Any evidence of dishonesty will be reported to the Dean

of Students for disciplinary action.

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| **WK** | **Lecture Session** | **Comments** | **Date** | **Lab session** | **Comments** | **Date** |
| **1** |  |  |  | Introduction  Java warmup |  | 01/21/2016 |
| **2** | School close |  | 01/25/2016 | Inheritance & Polymorphism Lecture & Lab 1 |  | 01/28/2016 |
| **3** | Data Structure & Recursion |  | 02/01/2016 | Recursion Lab 2 |  | 02/04/2016 |
| **4** | Algorithm analysis |  | 02/08/2016 | Array List Lab 3 |  | 02/11/2016 |
| **5** | List + Stacks |  | 02/15/2016 | List Lab 4 |  | 02/18/2016 |
| **6** | Mid-term Test 1 |  | 02/22/2016 | Stacks Lab 5 |  | 02/25/2016 |
| **7** | Queues |  | 02/29/2016 | Queue Lab 6 |  | 03/03/2016 |
| **8** | Dictionaries |  | 03/07/2016 | Dictionaries Lab 7 |  | 03/10/2016 |
|  |  | **Spring Recess** |  |  |  |  |
| **9** | Tree/Binary trees |  | 03/21/2016 | Tree/Binary Tree Lab 8 |  | 03/24/2016 |
| **10** | Mid-Term Test 2 |  | 03/28/2016 | Binary search trees Lab 8+ |  | 03/31/2016 |
| **11** | Heap & Priority queues |  | 04/04/2016 | Heaps Lab 9 |  | 04/07/2016 |
| **12** | Hashing |  | 04/11/2016 | Hashing Lab 10 |  | 04/14/2016 |
| **13** | Iterator & Sorting 1 |  | 04/18/2016 | Sorting-1 Lab 11 |  | 04/21/2016 |
| **14** | Sorting 2 |  | 04/25/2016 | Sorting-2 Lab 12 |  | 04/28/2016 |
| **15** | Graph |  | 05/02/2016 | Final Test |  | 05/05/2016 |