

## Instructor's Information

**Name and Title** Dr. Alioune Ngom, Assistant Professor of Computer Science.

**Office Location** 5107 Lambton Tower, School of Computer Science, 401 Sunset Avenue, University of Windsor.

**Web Page** <http://www.cs.uwindsor.ca/~angom>

### Contact information

**Telephone** 519-253-3000 extension 3789.

**Fax** 519-973-7093.

**E-Mail** [angom@cs.uwindsor.ca](mailto:angom@cs.uwindsor.ca)

**Office Hours** Wednesday: 8:30am-12:00pm. Walk-ins with *very short* questions are encouraged anytime

## Course Description, Philosophy, Objectives, and Prerequisite

**Course Description** Introduction to abstract data types. Implementations of stacks, lists and queues. Simple algorithms for manipulating lists. Trees, binary search trees, balanced trees. Searching, hashing and hash tables. Sorting. Simple examples of complexity analysis. Graphs, simple graph algorithms: depth-first search and breadth-first search, minimum spanning trees, shortest path. Other algorithms and data structures.

**Course Objectives** The main goal of this course is to convey the importance of separating specification from implementation, and, to foster skills in specifying and implementing data structures. Widely used data structures and algorithms will be taught. You will learn the principles of good algorithm design and the important role of data structures in problem solving. You will also learn to analyze algorithms in order to be able to evaluate algorithms designed for the same problem. This course is not about any particular programming language, both the textbook and the lecture notes are 99% language independent. However, the assignments must be done in a specific programming language - JAVA or C. The assignments assume you are already familiar with: built-in data types (integer, real, character), arrays, enumeration types, structures, unions, user-defined types, functions and parameter passing, input/output and control structures (if, switch, for, while). Labs are an important part of this course where you will implement (in JAVA or C) the algorithms and data structures that you learn in classroom. These will help in consolidating the concepts discussed in lectures.

**Course Prerequisite** Minimum grade of C- in 60-100, 60-140, 60-141 and 60-212.

## Basic Course Information

### Lectures and Laboratories

**Lectures** Monday and Wednesday, 08:30-11:20 AM, BB 113.

### Laboratory

Section 51: Thursday 01:00-03:50 PM, LT 3119

## Textbooks

1. **Course textbook:** Michael T. Goodrich and Roberto Tamassia, *Data Structures and Algorithms in Java*, Fifth Edition, Wiley, ISBN 978-0-470-38326-1
2. Mark Allen Weiss, *Data Structures & Problem Solving Using Java*, Third Edition, Addison-Wesley, ISBN 0-321-32213-4, 2005.
3. Any *Data Structures and Algorithm* book, with JAVA preferably.

## Course Outline (tentative and subject to change)

1. Abstract Data Types and Analysis of Algorithms
2. Stacks and Queues
3. Lists and Linked Lists
4. Recursion and Recursive Programs
5. Sorting Algorithms
6. Trees and Search Trees
7. Hash Tables and Hashing
8. Heap and Priority Queues
9. Graph Algorithms

## Course Work and Grading

**Course Work** Grades are based on the following:

**Q** Average over all labs, worth 8%

**A** Average over a three assignments, worth 12%

**M** One Midterm Exam, worth, 30%

**F** Final Exam, worth 50%

### Exam Dates

Midterm Exam: Wednesday, June 2-nd, 2010.

Final Exam: Date determined by the Faculty of Science.

**Grading** *To pass this course, one must have at least 50% of the weighted sum of midterm and final examinations.* That is, the final numeric grade  $G$  (total: 100 points) will be calculated as follows:

If  $(0.30 \times M) + (0.50 \times F) < 40$  Then

$$G = (0.30 \times M) + (0.50 \times F)$$

Else

$$G = (0.08 \times Q) + (0.12 \times A) + (0.30 \times M) + (0.50 \times F)$$

**Letter Grading** The final letter grade,  $L$ , will be given from the numeric grade based on the following conversion rule:

| Letter Grade | Numeric Grade Range |
|--------------|---------------------|
| A+           | $93 \leq G < 100$   |
| A            | $86 \leq G < 93$    |
| A-           | $80 \leq G < 86$    |
| B+           | $77 \leq G < 80$    |
| B            | $73 \leq G < 77$    |
| B-           | $70 \leq G < 73$    |
| C+           | $67 \leq G < 70$    |
| C            | $63 \leq G < 67$    |
| C-           | $60 \leq G < 63$    |
| D+           | $57 \leq G < 60$    |
| D            | $53 \leq G < 57$    |
| D-           | $50 \leq G < 53$    |
| F            | $35 \leq G < 50$    |
| F-           | $0 \leq G < 35$     |

## Teaching Evaluation

Student Evaluation of Teaching (SET) forms will be administered during the last two weeks of the class schedule.

## Course Policies

**Attendance and preparation** Lecture attendance is mandatory and students are expected to come well-prepared for every class. Notetaking is encouraged to help understand ideas more deeply.

**Assignment submission** All assignments must be handed in to me in classroom at the beginning of the lecture on the due dates and in envelopes with the School of Computer Science and University of Windsor logo on them. ***Late submission will not be accepted (tolerated).*** Students are responsible for making sure that I receive their assignments by or on the due dates. All assignments as well as envelopes must be clearly marked with the student name, student number, course name and number, section number and the instructor's name.

**Academic honesty** *You are expected to do all of your work on assignments and examinations individually. That is, collaboration on the assignments and/or plagiarism is not accepted; what you turn in should be your own work. **Anyone found cheating on any graded assignment or examination will get no points at all for that homework assignment or question in exam.** The instructor reserves the right to assign anyone involved in cheating a failing grade (F-) and will initiate the proceedings for disciplinary actions by the department and the university. This will be irrespective of who cheated from whom. In other words, you are responsible to protect your work from others. **Please read the University of Windsor regulations on cheating.***

**Makeup/Incomplete** *Makeup work or incomplete grade are only given in unusual circumstances, and only when work has been completed satisfactorily up to the point when the incomplete was requested. If you suspect that you will be unable to attend an examination because of a **valid and verifiable reason**, you **must** give me a prior notice, **at least** one full day before the examination. Even if you are sick or face unavoidable circumstances, you **must** notify me or the department through phone, email, fax, etc. along with a valid documentary evidence. I **must** receive a **proper documentary evidence within a week** of the examination. **In the absence of such notice and a proper documented proof, makeup examination(s) will not be allowed.** Unless mentioned otherwise, all examinations will be closed book, closed notes and closed neighbors. Date and place for makeup examination will be announced at an appropriate time. It will be your responsibility to get the necessary information about the makeup examination. **Please read the University of Windsor regulations.***

**Appeal** Students who wish to appeal an assignment or exam mark should do it within two weeks of the reception of the mark. I will be glad to remark your work and explain my marking scheme to you. Numerical errors in adding marks will be corrected when identified. In case of a total disagreement on a mark, you must then submit a formal appeal. **Please read the University of Windsor regulations on appealing**