

# IST 238 Algorithms

Course Syllabus – Spring 2014<sup>1</sup> (TR 9:30 am–10:45 am PH 200)

**Instructor:** Dr. SeungJin Lim      **Office:** Prichard Hall 217  
**Telephone:** (304)696-3436 (W)      **E-mail:** lims@marshall.edu  
**Office hours:** 12:30 – 3:30 pm TR by appointment.

**Course Description:** Covers algorithm-design methods, algorithm performance and analysis, and optimization techniques. Covers algorithm applications used in solving frequently occurring problems, such as pattern matching, data compression, searching, and sorting. (CR: IST 236 Data Structures.)

**Required Text, Additional Reading, and Other Materials:** Data Structures and Algorithms in C++, by Adam Drozdek, (the edition available at the MU bookstore). For the downloadable source code for the text example programs, consult with the book.

**Recommended Materials:** *Eclipse IDE for C/C++ Developers* with MinGW. MinGW is a port of the GNU Compiler Collection and provides a complete Open Source programming tool set which is suitable for the development of native MS-Windows applications.

## Course Student Learning Outcomes and Assessment Measures:

<i>Course student learning outcomes: Students will</i>	<i>How practiced in this course</i>	<i>How assessed in this course</i>
Demonstrate a disciplined approach to problem solving methods using well-established algorithms.	discussion, hands-on, in-class presentation	6 to 8 assignments, 3 exams
Demonstrate a disciplined approach to the selection of an algorithm over others.	discussion, hands-on, in-class presentation	6 to 8 assignments, 3 exams
Demonstrate the use of specific algorithms such as tree/graph traversal, sorting, searching, and string matching.	discussion, hands-on, in-class presentation	6 to 8 assignments, 3 exams
Be able to program algorithms.	discussion, hands-on, in-class presentation	6 to 8 assignments, 3 exams

This course is designed to develop critical thinking with respect to the workings of computer algorithms. The student will learn not only from the traditional textbook reading but also tryout through a number of hands-on experiences to solve real-world problems using the best-known algorithms that are carefully selected through critical thinking. In the end, the student will appreciate the need for an efficient solution out of possibly many correct solutions to the selected real-world problems.

## Course Requirements and Grading:

Attendance	5% deduction from the overall grade for each absence beyond the third absence
Assignments	50% of the overall from 6 to 8 assignments, equally weighted
Exams	50% of the overall from 3 exams, equally weighted

<sup>1</sup>Last modified: Tuesday 7<sup>th</sup> January, 2014 10:54

Grades from assignments and exams are posted to Blackboard. Final letter grades are determined based on the following grading scale:

[0,60)	[60,70)	[70,80)	[80,90)	[90,∞)
<i>F</i>	<i>D</i>	<i>C</i>	<i>B</i>	<i>A</i>

Late assignments will be penalized at the rate of 10% per day, up to two days (including weekends and holidays) after the due date.

There will be no make-up chances for missed exams and assignments unless a proper action has been taken for an Excused Absence<sup>2</sup>. It is the student's responsibility to make up the missing exam within a week.

The instructor reserves the right to change these values depending on the overall class performance and/or extenuating circumstances.

**Attendance Policy:** Attendance and participation are required in class. For each absence beyond the third absence, 5% will be deducted from the student's overall grade. If a student is absent, it is his or her responsibility to find out what he or she missed, e.g. announcements, assignments, etc. The instructor will assume no responsibility in this regard.

**Class preparation:** Preparation is necessary for learning. For this class, reading the textbook chapters before coming to class is an absolute necessity. Keep in mind that this course is not about programming but about performance issues of programs at the algorithm level. Students need to understand the cost of an algorithmic solution first before putting it in a computer program. It is a fair assumption that all the suggested readings will be covered by exams.

**Course Outline:** (subject to changes)

<i>Weeks of</i>		<i>Topics to be covered</i>	<i>Assignments due</i>
1	1/13	Syllabus; Ch 1 Review	
2	1/20	Ch 2 Complexity	HW 1
3	1/27		
4	2/3	Ch 3 Linked Lists	HW 2
5	2/10	Ch 4 Stack, Queues and Priority Queues; <i>Exam (2/13), Ch 1-3</i>	
6	2/17		HW 3
7	2/24	Ch 5 Recursion	
8	3/3	Ch 6 Binary Trees	HW 4
9	3/10	<i>Exam (3/13), Ch 4-6</i>	
10	3/17	<i>Spring break</i>	
11	3/24	Ch 7 Multiway Trees	
12	3/31		HW 5
13	4/7	Ch 8 Graphs	
14	4/14	Ch 9 Sorting	HW 6
15	4/21	Ch 10 Hashing; <i>Exam (4/24), Ch 7-9</i>	
16	4/28	Ch 13 String Matching	HW 7

<sup>2</sup>Defined in the Undergraduate Catalog.

**Contact:** Students are encouraged to visit with me. Most problems can be resolved more efficiently and effectively by personal visit. In particular, it may not be the best way to send an e-mail on the due day of an assignment asking a help for the assignment.

Should e-mails are preferred, students should use the e-mail address of the instructor at the beginning of this syllabus. Only the e-mails sent to this account will be responded.

The subject line of any e-mails sent to the instructor should start with “[IST238]”. Otherwise, the e-mails may not be responded properly in a timely manner. Emails sent after hours or weekend will be replied the next school day.

**University policies:** By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy be going to [www.marshall.edu/academic-affairs](http://www.marshall.edu/academic-affairs) and clicking on “Marshall University Policies.” Or, you can access the policies directly by going to [http://www.marshall.edu/academic-affairs/?page\\_id=802](http://www.marshall.edu/academic-affairs/?page_id=802).

Academic Dishonesty/ Excused Absence Policy for Undergraduates/ Computing Services Acceptable Use/ Inclement Weather/ Dead Week/ Students with Disabilities/ Academic Forgiveness/ Academic Probation and Suspension/ Academic Rights and Responsibilities of Students/ Affirmative Action/ Sexual Harassment