CSCI 314: Algorithms

Contents

1 Overview

1.1 Catalog Description

"Introduction to analysis and complexity of algorithms. Big-O notation. Running time analysis of algorithms for traversing graphs and trees, searching and sorting. Recursive versus iterative algorithms. Complexity, completeness, computability."

1.2   Prerequisites

The official prerequisite is CSCI 180 (Data Structures) and MATH 143 (Calculus II) or the equivalent.

2   Course Administration

2.1   The Staff

Instructor:	Dr. Michael Goldwasser
Email:	`goldwamh@slu.edu`
Web:	`http://euler.slu.edu/~goldwasser/`
Office:	Ritter Hall 006
Telephone:	(314) 977-7039
Office hours:	Mondays 10:30–11:30am
	Wednesdays 2:05–3:05pm
	Thursdays 2:00–3:00pm
	or by appointment

Please make sure to take advantage of office hours, as they offer a wonderful opportunity for individual interaction.

2.2   Class Meetings

The Lectures

The material will be presented in three weekly lectures. Though attendance in class is not explicitly required, it is certainly expected. Lectures are designed to be interactive and class participation is most welcome. These meetings will offer learning opportunities that cannot be recreated purely from readings. That said, for those who miss a lecture, information on the lecture topic can often be found on the course schedule web page.

Time:	Mon/Wed/Fri, 1:10–2:00pm
Place:	Ritter Hall 26

2.3   Textbook

The required textbook for this course is:

Title:	*Algorithm Design*
Authors:	Jon Kleinberg and Éva Tardos
Publisher:	Pearson Education, 2006
ISBN:	0-321-29535-8
Website:	`www.aw-bc.com/info/kleinberg`

The text should be available through the campus bookstore as well as various online book vendors.

3   Online Resources

This course will take advantage of the Internet and the departmental network in many ways.

3.1   CSCI 314 Web Page: `euler.slu.edu/~goldwasser/314/`

With the exception of the first day's printed handouts, most of the information for this course will be distributed only by means of the course web page. This web site will contain all assignments, a schedule of lectures, detailed lecture notes and links to many other sources of information.

The web page contains some information (e.g. solutions, submitted assignments, individual grades) which is more sensitive and therefore which will be available to students in the class only after they have identified themselves properly. To gain access to these parts of the web page, a student must first complete an online questionnaire, creating a unique identity and password.

3.2   Electronic Assignment Submission

Many assignments for this course will be completed with pen and paper and submitted in person. However there may be some times where we ask for electronic materials to be submitted electronically. In such cases, the submission procedure will be done through the course web page, and allow students to submit from any computer connected to the Internet. Each student in this class will be selecting a unique username/password combination solely for use in identifying the student when using the course web page.

3.3   Email with Instructor

Face-to-face contact in class and in office hours is most desirable. Yet email is a convenient form of communication as well. I try to respond to email promptly, including at least once each evening when possible.

If your question involves your progress on a current programming assignment, my response will be more informative if you can point out the specific problem you have encountered, and if I am able to see all of your source code. Threfore I strongly suggest that you either attach all relevant files to the email or submit preliminary versions of such files through our online system.

4   Graded Work

4.1   Homework Assignments (55%)

We expect there to be a total of 6–8 homework assignments during the course, each of which will be mostly written exercises, though perhaps including some programming assignments. Unless otherwise specified, all assignments will be equally weighted. At the end of the semester, **we will throw away your lowest of the homework grades,** with the remaining assignments contributing equally to this portion of the grade.

Homework will often contain one or more practice problems which are not to be turned in and which can be discussed freely between classmates. The problems which are to be submitted for a grade, however, must be done entirely individually. A more complete explanation of our policy towards Academic Integrity is given in Section 4.5.

4.2   Exams (45%)

- **In-Class Midterm Exam (15%)**, Friday, 14 Mar 2008, 1:10–2:00 p.m

- **Take-Home Final Exam (30%)**, due Tuesday, 13 May 2008

4.3   Extra Credit

Homework will generally include a small extra credit challenge. Please notice, however, that the actual extra credit given for these challenges is relatively insignificant. Students who are seriously concerned about improving their overall grade would be best advise to focus all efforts on doing as well as possible on the required work and in preparing for exams.

Our true reason for including these opportunities is to provide some fun and encouragement for students who wish to dig a bit deeper than was required in an assignment. For those students, the chosen extra credit challenges provide a good next step.

4.4   Course Grades

Letter grades will be based on each students overall percentage of awarded points according to the following formula.

Student percentage above 90% will result in a grade of A   or better.
Student percentage above 87% will result in a grade of A- or better.
Student percentage above 83% will result in a grade of B+ or better.
Student percentage above 80% will result in a grade of B   or better.
Student percentage above 77% will result in a grade of B- or better.
Student percentage above 73% will result in a grade of C+ or better.
Student percentage above 70% will result in a grade of C   or better.

Student percentage above 67% will result in a grade of C-   or better.
Student percentage above 60% will result in a grade of D   or better.
Student percentage below 60% will result in a grade of F.

Any modification to this scale at the end of the year will be *in favor of the students.*
That is we may later decide to award an A to a student who is slightly below the above
cutoff, but we certainly will not deny an A from someone who is above the cutoff.

4.5   Academic Integrity

Students are expected to have read and abide by the University statement on Aca-
demic Integrity available on page 58 of the Saint Louis University's Undergraduate
Catalog. A more detailed policy statment is given by the College of Arts & Science
(`http://www.slu.edu/colleges/AS/academic_honesty.html`) which applies to this course
as well.

In addition to those general statements, we wish to discuss our policy in the context of
this course. When it comes to learning and understanding the **general course material**,
you may certainly use other reference materials and you may have discussions with other
students in this class or other people from outside of this class. This openness pertains
to material from the text and practice problems.

However, when it comes to **work which is submitted for this course**, you are
not to use or to search for any direct or indirect assistance from unauthorized sources,
including but not limited to:

- other students in this class

- past students, whether from this school or other schools

- other acquaintances

- other texts or books

- online information other than that referenced by course materials

Acceptable sources of information include consultations with the instructor, teaching
assistants, or members of organized tutoring centers on campus, as well as any materials
explicitly authorized in an assignment. Even in these cases, if you receive significant help
you should make sure to document both the source of the help as well as the extent.

On certain assignments, we will explicitly allow students to work in pairs. In this case,
conversations between partners is both permissible and required. Furthermore, both
students are expected to contribute significantly to the development of the submitted
work. It is unethical to allow a partner to "sign on" to a submission if that partner did
not significantly contribute to the work.

Any violations of these policies will be dealt with seriously. Penalties will apply
as well to a student who is aiding another student. Any such violations will result in a
minimum penalty of a zero on the given assignment which cannot be dropped, and severe
or repeated violations will result in an immediate failing grade in the course. Furthermore

all incidents will be reported in writing to the Department and/or the Dean, as per the College procedure.

4.6   Late Policies

All exams must be taken promptly at the required time. Requests for rescheduling an exam will only be considered if the request is made prior to the start of the exam, or else in an "emergency" situation with appropriate documentation.

For homework assignments, we wish to allow students to continue to work comfortably beyond the official deadline when a little more time will result in more progress, while at the same time discourage students from falling significantly behind pace and jeopardizing their success on future assignments. Our solution is the following exponentially decaying late formula (some have suggested that we should offer extra credit to anyone who fully understands this formula).

We will consider an assignment submission "complete" when any part of the assignment is last submitted or modified. Any assignment which is not complete promptly by its due date and time will be assessed a penalty based on the formula $S = R \cdot e^{-h/240}$, where S is the grade given, R is the grade the work would have received had it been turned in on time, and h is the amount of time (in hours or fractions thereof) that the work was late. Examples:

— work turned in 1 hour late receives over 99.6% of its original credit
— work turned in 5 hours late receives almost 98% credit
— work turned in one full day late receives only 90%
— work turned in two full days late receives less than 82%
— work turned in five days late receives only 60%

The above policies will be waived only in an "emergency" situation with appropriate documentation.

5   Additional Information

5.1   Students with Disabilities or Special Needs

In accordance with the Americans with Disabilities Act, reasonable accommodations may be made to assist a student with a documented disability.

Any student who feels that he/she may need academic accommodations in order to meet the requirements of this course, as outlined in the syllabus, due to presence of a disability, should contact the Office of Diversity and Affirmative Action. Please telephone the office at 314-977-8885, or visit DuBourg Hall Room 36. Confidentiality will be observed in all inquiries.