CSCI 3100: 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 prerequisites are CSCI 2100 (Data Structures), MATH 1510 (Calculus I), and MATH 1660 (Discrete Mathematics), or the equivalent.

2   Course Administration

2.1   The Staff

Instructor:	Dr. Michael Goldwasser
Email:	`goldwamh@slu.edu`
Web:	`http://cs.slu.edu/~goldwasser/`
Office:	Ritter Hall 355
Telephone:	(314) 977-7039
Office hours:	Mondays 11:00am–12:00pm
	Wednesdays 1:00–2:00pm
	Thursdays 10:00–11:00am
	or by appointment

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, 10:00–10:50am
Place:	Ritter Hall 115

2.3   Textbook

The required textbook for this course is:

Title:	*Introduction To Algorithms, Third Edition*
Authors:	Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein
Publisher:	MIT Press, 2009
ISBN:	978-0-262-03384-8
Website:	`mitpress.mit.edu/algorithms`

The text should be available through the campus bookstore as well as various online book vendors. We will be placing a hardcopy of it on reserve in Pius library. Furthermore, **SLU has one electronic subscription to the textbook**, available to all members of the SLU community.

3   Online Resources

3.1   CSCI 3100 Web Page: `http://cs.slu.edu/~goldwasser/3100/`

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; the instructor will provide proper credentials.

3.2   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, and the instructor will attempt to respond to each email as promptly as possible.

4   Course Grades

4.1   Graded Work

Course Grades will be based on the following components:

- **Homework Assignments (50%)**

  We expect there to be 6–8 homework assignments during the semester. All homeworks will be weighted equally.

  Most homeworks will be pen-and-paper assignments, meant to challenge students' reasoning and understanding of algorithms. However, we may include a programming assignment, and an assignment in which students must present their results orally.

  Further instructions will be provided with each homework regarding when students must work individually, and when they may collaborate with others. In all cases, academic integrity will be of utmost importance, as described below.

- **Examinations (50%)**.

    - **Midterm Exam (15%)**, Friday, 14 October 2016, 10:00–10:50am
    - **Final Exam (35%)**, Monday, 12 December 2016, 12:00–1:50pm

4.2   Letter 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.

4.3   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). Any assignment that 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 Academic Integrity and Collaboration Policy

5.1 Academic Integrity

Academic integrity is honest, truthful and responsible conduct in all academic endeavors. The mission of Saint Louis University is "the pursuit of truth for the greater glory of God and for the service of humanity." Accordingly, all acts of falsehood demean and compromise the corporate endeavors of teaching, research, health care, and community service via which SLU embodies its mission. The University strives to prepare students for lives of personal and professional integrity, and therefore regards all breaches of academic integrity as matters of serious concern. The governing University-level Academic Integrity Policy was adopted in Spring 2015, and can be accessed on the Provost's Office website.

Additionally, each SLU College, School, and Center has adopted its own academic integrity policies, available on their respective websites. All SLU students are expected to know and abide by these policies, which detail definitions of violations, processes for reporting violations, sanctions, and appeals. Please direct questions about any facet of academic integrity to your faculty, the chair of the department of your academic program, or the Dean/Director of the College, School or Center in which your program is housed. Specific College of Arts and Sciences Academic Honesty Policies and Procedures may be found at: `http://www.slu.edu/x12657.xml`

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, for **work that is submitted for this course**, you are not to use or search for any direct assistance from unauthorized sources, including but not limited to:

- other texts, books, or solution manuals
- online information other than that referenced by course materials (e.g., online forums, websites for courses at other educational institutions)
- students or acquaintances who are not in this course
- other students in this course (other than when collaboration is explicitly allowed, as described below)

Acceptable sources of information include consultations with the instructor or any materials explicitly authorized in an assignment. Even in these cases, if you receive significant help you should document both the source of the help as well as the extent.

Any violations of these policies will be dealt with seriously, including 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.

5.2   Collaboration Policy

Each homework problem throughout the course will be designated with one of the two instructions:

- **"Work entirely on your own."**
  You should not discuss such problems with anyone other than the instructor, nor should you search for direct or indirect assistance from any outside references.

- **"You may discuss ideas with other students."**
  Our philosophy is that there are two distinct stages in working on each problem. First is reaching a point where you understand how to solve the problem, and second is formally writing up your solution in a clear way for a reader to understand.

  For problems where we allow collaboration, you are only allowed to collaborate on the first of these stages. Discussions with your peers are very helpful in understanding new material, and working through the puzzle of a new problem. You may therefore feel free to discuss with classmates general ideas, approaches, examples or stumbling blocks while trying to understand a homework problem.

  However, when it comes time to write up your solutions, you may not discuss this in any way with others, nor may you use anyone else's written solution as a guide. Our goal is that you will eventually be able to understand the problem so clearly that you are then able to lock yourself in a room with a blank piece of paper and produce a clear written explanation of your solution.

  When you do collaborate with classmates, you must work in groups of at most four students, and must write the names of all collaborators for each problem on the cover page submitted with the homework.

6   Additional Information

6.1   Title IX Statement

Saint Louis University and its faculty are committed to supporting our students and seeking an environment that is free of bias, discrimination, and harassment. If you have encountered any form of sexual misconduct (e.g. sexual assault, sexual harassment, stalking, domestic or dating violence), we encourage you to report this to the University. If you speak with a faculty member about an incident of misconduct, that faculty member must notify SLU's Title IX coordinator, Anna R. Kratky (DuBourg Hall, room 36; `akratky@slu.edu`; 314-977-3886) and share the basic fact of your experience with her. The Title IX coordinator will then be available to assist you in understanding all of your options and in connecting you with all possible resources on and off campus.

    If you wish to speak with a confidential source, you may contact the counselors at the University Counseling Center at 314-977-TALK. To view SLU's sexual misconduct policy and for resources, please visit the following web address: `www.slu.edu/here4you`.

6.2 Supporting Student Success

In recognition that people learn in a variety of ways and that learning is influenced by multiple factors (e.g., prior experience, study skills, learning disability), resources to support student success are available on campus. The Student Success Center, a one-stop shop, which assists students with academic and career related services, is located in the Busch Student Center (Suite 331) and the School of Nursing (Suite 114). Students can visit `www.slu.edu/success` to learn more about:

- Course-level support (e.g., faculty member, departmental resources, etc.) by asking your course instructor.

- University-level support (e.g., tutoring services, university writing services, disability services, academic coaching, career services, and/or facets of curriculum planning).

6.3 Disability Services

Students with a documented disability who wish to request academic accommodations **must** contact Disability Services to discuss accommodation requests and eligibility requirements. Once successfully registered, the student also **must** notify the course instructor that they wish to access accommodations in the course.

Please contact Disability Services, located within the Student Success Center, at `Disability_services@slu.edu` or 314-977-3484 to schedule an appointment. Confidentiality will be observed in all inquiries. Once approved, information about academic accommodations will be shared with course instructors via email from Disability Services and viewed within Banner via the instructor's course roster.

Note: Students who do not have a documented disability but who think they may have one are encouraged to contact Disability Services.