

COURSE SYLLABUS
SANDERS COLLEGE OF
BUSINESS AND TECHNOLOGY
FALL SEMESTER, 2026



CS 430-01

Design and Analysis of Algorithms

INSTRUCTOR: James A. Jerkins, Ph.D., CISSP

OFFICE HOURS: M 10:00 - 11:00
W 10:00 - 11:00, 1:00 - 3:00
F 10:00 - 11:00
or by appointment

OFFICE LOCATION: Computing & Mathematics # 228

OFFICE TELEPHONE: 256-765-5036

EMAIL:

Do **NOT** send messages via Canvas,
send to jajerkins@una.edu from your UNA
email account.

COURSE HOMEPAGE: <https://buildingthepride.com/faculty/jajerkins/>

CLASS LOCATION: Computing & Mathematics # 245

COURSE TIME: MWF 11:00-11:50 a.m.

COURSE DESCRIPTION: Advanced asymptotic analysis of algorithms utilizing mathematical modeling with an emphasis on efficient methods for searching, sorting, trees, and graphs. Classic algorithm design techniques such as greedy, divide and conquer, dynamic programming, backtracking, and randomized algorithms will be investigated and analyzed. Study of the classification of the computational difficulty of problems; i.e. NP, intractable, and unsolvable.

SECTION NUMBER: 01 (CRN 15842)

CREDIT HOURS: 3

PREREQUISITE: CS 245 with a C or better
-AND-
CS 355 with a C or better

COURSE DELIVERY METHOD: Traditional classroom

COURSE OBJECTIVES:

1. Analyze the asymptotic complexity of algorithms.
2. Demonstrate an algorithm is correct
3. Apply major algorithm paradigms and data structures in the design of new algorithms

TOPICS COVERED:

1. Correctness of algorithms
2. Worst-case running times of algorithms using asymptotic analysis.
3. Algorithm paradigms such as divide-and-conquer, dynamic programming, greedy, etc.
4. Recurrences
5. Graph algorithms
6. N and NP
7. Intractability

COURSE EVALUATION PROCESS (Grade Components):

Homework, labs, quizzes, programs, and presentations	30% of course grade
Exams	35% of course grade
Comprehensive final exam	35% of course grade

Letter grades will be assigned based on the University scale.

REQUIRED TEXTBOOK, SOFTWARE, AND SUPPLIES:

The Algorithm Design Manual, Steven S. Skiena, 3rd edition, ISBN 978-3-030-54255-9, Springer,
UNA Mane card with funds, Internet access, active UNA email account

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COURSE PREREQUISITE POLICY FOR CSIS All **CS**, **ITE**, and **CIS** courses that are prerequisites for other CS, ITE, and CIS courses must be completed with a grade of "C" or higher. These courses will be limited to two attempts including withdrawals. In special circumstances, a third attempt may be approved by the department chair.

ACADEMIC HONESTY - UNIVERSITY POLICY:

Students of the university academic community are expected to adhere to commonly accepted standards of academic honesty. Allegations of academic dishonesty can reflect poorly on the scholarly reputation of the University including students, faculty and graduates. Individuals who elect to commit acts of academic dishonesty such as cheating, plagiarism, or misrepresentation will be subject to appropriate disciplinary action in accordance with university policy.

Incidents of possible student academic dishonesty will be addressed in accordance with the following guidelines:

1. The instructor is responsible for investigating and documenting any incident of alleged academic dishonesty that occurs under the instructor's purview.
2. If the instructor finds the allegation of academic dishonesty to have merit, then the instructor, after a documented conference with the student, will develop a plan for disciplinary action. If the student agrees to this plan, then both instructor and student will sign the agreement. The faculty member will forward a copy of the signed agreement to the Office of Student Conduct for record-keeping purposes.
3. If the student disagrees with the instructor's proposed plan for disciplinary action and wishes to take further action, he/she is responsible for scheduling a meeting with the chair of the department where the course is housed to appeal the proposed disciplinary plan. The department chair shall mediate the matter and seek a satisfactory judgment acceptable to the faculty member based on meetings with all parties. If a resolution is reached, the disposition of the case will be forwarded to the Office of Student Conduct. If a resolution at the departmental level is not reached and the student wishes to take further action, he/she is responsible for scheduling a meeting with the dean of the college where the course is housed to appeal the proposed disciplinary plan. The college dean shall mediate the matter and seek a satisfactory judgment acceptable to the faculty member based on meetings with all parties. If a resolution is reached, the disposition of the case will be forwarded to the Office of Student Conduct. If a resolution at the college level is not reached and the student wishes to take further action, he/she is responsible for scheduling a meeting with the Vice President for Academic Affairs and Provost (VPAA/P) to appeal the proposed disciplinary plan. The VPAA/P shall mediate the matter and seek a satisfactory judgment acceptable to the faculty member based on meetings with all parties. After reviewing all documentation, the VPAA/P may, at his/her discretion, choose either to affirm the proposed action, to refer the case to the Office of Student Conduct for further review, or to dismiss the matter depending on the merits of the case. The final disposition of the case will be disseminated to appropriate parties, including the Office of Student Conduct.

4. If a student is allowed academic progression but demonstrates a repeated pattern of academic dishonesty, the VPAA/P may, after consultation with the Office of Student Conduct, assign additional penalties to the student, including removal from the University.

COMMUNICATION POLICY - UNIVERSITY POLICY

The official method of communication at UNA is UNA portal, with emphasis placed on University email. You may access your UNA Portal email through the University's homepage. The link to Portal is at the top of the page. It is important for students to read their UNA Portal e-mail on a regular basis for information regarding University deadlines, policies, and events. These messages are outside your Canvas courses and relate to ALL University communication. Please understand the importance of each communication vehicle and the distinction between the two.

ACADEMIC HONESTY POLICY - ADDENDUM

Professors may not be notified of potential academic misconduct until the semester has ended. In such instances, the student will be contacted by the faculty member. Violations of exam rules (such as those identified by SmarterProctoring exam results) may result in a change in the final grade that was previously submitted to the Registrar's Office.

AI USE POLICY - COURSE POLICY

This course is designed to foster your independent critical thinking, creativity, and skill development. To ensure that you meet the learning objectives and demonstrate your personal understanding of the course material, the use of artificial intelligence (AI) tools for any aspect of coursework is strictly prohibited.

Unacceptable AI Use Prohibited AI Activities Include But Are Not Limited to:

- **Generating Content:** Using AI tools (e.g., ChatGPT, Claude, Jasper, Grammarly AI) to generate essays, assignments, reports, code, or any other form of academic work is not allowed.
- **Assisting with Writing or Revisions:** AI tools cannot be used to help with writing, editing, or revising your work. This includes grammar correction, sentence restructuring, or suggesting ideas.
- **Problem Solving and Coding:** AI tools are not to be used to solve problems, generate solutions, or assist with coding assignments. All work submitted must reflect your own efforts and understanding.
- **Research and Idea Generation:** You must not use AI tools to generate research topics, conduct research summaries, or formulate ideas for your coursework.
- **Exams and Quizzes:** During exams, quizzes, or any form of assessment, the use of AI tools is strictly prohibited, whether for generating answers or assisting in completing the task.

Consequences of Misuse

Misuse of AI will be treated as a violation of academic integrity and may result in penalties ranging from assignment point deductions to failure of the course, depending on the severity of the infraction.

For more information, visit UNA's Guidelines for Responsible Generative AI Use.

UNDERGRADUATE COURSE WITHDRAWAL - UNIVERSITY POLICY:

A student may withdraw from a course with a grade of W by the withdrawal period deadline indicated on the University Academic Calendar.

Any student wishing to withdraw from a class during the withdrawal (W) period may login to their secure UNA Portal and follow the same steps as when they initially registered, selecting web withdraw beside the desired course(s) and submit. This policy is valid for all courses offered by the University of North Alabama. The class will be withdrawn as requested and a notification sent to the student and instructor. The Registrar's Office will notify the Office of International Affairs for any international student wishing to withdraw from a class.

Withdrawing from a class after the withdrawal period deadline will require the permission of the Instructor and Department Chair or the Dean's Office.

Please visit the [Withdrawal Page](#) in the University Catalog for additional information

ACADEMIC AND INSTITUTIONAL SUPPORT SERVICES - UNIVERSITY POLICY

The University of North Alabama is committed to providing students with a supportive and inclusive learning environment that promotes student success. Many offices and centers are available to students on campus and online:

- University Success Center provides tutoring and houses the Center for Writing Excellence, Math Learning Center, and Advising Services.
- Student Counseling Services is available to provide students with a safe and confidential space to discuss mental health and well-being needs.
- The University Case Manager assists students in overcoming barriers to success (including lack of food through The Pantry and financial concerns through Caring for the Pride).

INFORMATION TECHNOLOGY ACCEPTABLE USE - UNIVERSITY POLICY:

UNA Technology policies and Usage statements may be found on the UNA Information Technology Services Policies/Usage Statements page (<https://www.una.edu/its/campus-technology/Policies.html>).

DISABILITY ACCOMMODATIONS - UNIVERSITY POLICY:

In accordance with the Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act of 1973, the University offers reasonable accommodations to students with eligible documented learning, physical and/or psychological disabilities. It is the responsibility of the student to contact The Aubrey and Annie Looney Disability Support

Services to initiate the process to develop an accommodation plan. This accommodation plan will not be applied retroactively. Appropriate, reasonable accommodations will be made to allow each student to meet course requirements, but no fundamental or substantial alteration of academic standards will be made. For assistance, please contact Aubrey and Annie Looney Disability Support Services.

IMPORTANT TECHNICAL SUPPORT CONTACT INFORMATION - UNIVERSITY POLICY:

Login Issues

If you cannot log-in to Canvas or your UNA Portal account, please e-mail UNA Information Technology Services at helpdesk@una.edu to request assistance. Be sure to include your full name, UNA email address, an alternative e-mail address (if applicable) and a phone number. Additional information for UNAPortal can be found in the online Troubleshooting and FAQ.

Canvas Issues

If you have questions about using Canvas, please visit the Canvas Support for Students page. If Canvas misbehaves, please use the HELP(?) icon on the navigation menu in Canvas and click **Report a Problem** to submit a technical support ticket to our Canvas support team.

TITLE IX - UNIVERSITY POLICY:

The University of North Alabama has an expectation of mutual respect. Students, staff, administrators, and faculty are entitled to a working environment and educational environment free of discriminatory harassment.

UNA is required to ensure that all of its education programs and activities do not discriminate on the basis of sex. Discrimination on the basis of sex includes discrimination on the basis of sex stereotypes, gender identity, gender expression, sexual orientation, and pregnancy or related conditions.

UNA has obligations under Title IX to provide certain supports and modifications to people experiencing pregnancy or related conditions in order to ensure their equal access to UNA's program or activity. Pregnancy or related conditions include pregnancy, childbirth, termination of pregnancy, lactation; medical conditions related to pregnancy, childbirth, termination of pregnancy, or lactation; and recovery from pregnancy, childbirth, termination of pregnancy, lactation, or related medical conditions. Students should contact the Title IX Coordinator for more information.

Faculty and staff are required to report any observations of harassment (including online harassment) as well as any notice given by students or colleagues of any of the behaviors noted above. Retaliation against any person who reports discrimination or harassment is also prohibited. UNA's policies and regulations covering sex- and gender-based discrimination and harassment may be accessed at www.una.edu/titleix. If you have experienced or observed sex -based discrimination or sex-based harassment, you can contact one of the confidential resources available at www.una.edu/titleix. On

that website, you also have the option to make a report to the Title IX Coordinator at report.una.edu.

You may also report directly to the Title IX Coordinator at 256-765-4223 or by emailing titleix@una.edu to set up an appointment.

ADDITIONAL INFORMATION ABOUT CONFIDENTIAL REPORTING AND TITLE IX REPORTING - UNIVERSITY POLICY

Confidential Reporting:

If a reporting party would like the details of an incident to be kept confidential, the reporting party may speak with:

- Student Counseling Services 256-765-5215
- University Health Services 256-765-4328

Reporting to Title IX:

Reports under the University's Sexual Misconduct Policy may be made directly to the Title IX Coordinator by phone, email, in-person, through the mail, or online. A report to the Title IX Coordinator does not automatically initiate an investigation. Contact information for the Title IX Coordinator is:

Title IX Coordinator and Compliance Administrator
titleix@una.edu
202 Guillot University Center
UNA Box 5023 Florence, AL 35632
(256) 765-4223

Reports can also be made online by visiting www.una.edu/titleix

REPORT.UNA.EDU - UNIVERSITY POLICY

In an effort to continue to support University of North Alabama's commitment to the health, well-being and safety of our campus community the website <https://www.una.edu/report/index.html> was created. This site allows you to share important information regarding incidents or observed behavior occurring in the UNA community. This does not replace reporting to UNA Police. If you believe that a situation you are reporting is an emergency, call 911. For non-emergencies, call UNA PD at (256) 765-4357.

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Course Policies - CS 430-01

Attendance policy:

Regular and punctual attendance at all scheduled classes and activities is expected and is integral to successful completion of the course. You may not receive credit for this course if you miss more than the equivalent of four weeks of classes (12 MWF, 8 TH, or 4 MTWH). Excessive absences or arriving late frequently may result in a reduction of your final grade as follows:

- More than 1 week equivalent absences or tardiness - Reduction of 1 letter grade
- More than 2 weeks equivalent absences or tardiness - Reduction of 2 letter grades
- More than 3 weeks equivalent absences or tardiness - Reduction of 3 letter grades
- More than 4 weeks equivalent absences or tardiness - Failure of course

Makeup policy:

Exams:

You must inform your instructor prior to an exam if you have a valid reason to miss (even if your absence is announced by a University official). If the instructor determines that you have a valid excuse for missing the exam, a makeup exam will be scheduled within one week of the missed exam. You may be required to provide written proof for your excuse (for example a doctors note). If you do not contact your instructor within one week of the missed exam, your absence will be recorded as unexcused and you will receive a zero for the exam.

Homework, labs, quizzes, programs, and presentations:

No makeups will be offered for the lab/homework/quiz/program/presentation portion of your grade.

General policies and procedures:

Come to class on time. Arriving late and/or leaving early are both disruptive to your fellow students and to the instructor. Be considerate of your fellow students and your instructor.

Silence all cell phones, pagers, electronic/watch alarms, tablets, laptop computer sounds, etc. These are extremely disruptive and rude.

Assignments:

Unless explicitly directed otherwise, assignments are to be done by yourself, though you may use any resources such as class notes, web pages, etc. The source of all your information **MUST** be explicitly identified in the work you turn in, unless it is from the class notes. You will be graded on the accuracy, completeness, and clarity of your answers. The *course collaboration policy* on the class web page is the definitive document describing what type of collaboration is permissible and how you denote collaborative work.

All assignments are due at the beginning of class on the assigned due date unless

otherwise specified. I will deduct at least 10% for assignments turned in one class period late. No credit may be earned for assignments more than one class period late without prior approval from the instructor.

If you feel there is an error in the grading of your assignments, you must bring it to the instructor's attention within one week after the assignment was graded and returned.

Use of electronic devices during exams:

At no time during an examination are you allowed to have accessible a cell phone, camera, recorder, tablet, calculator, music player, personal computer or any other device that could be used to record/playback/display course content or communicate with any person or network. Exceptions must be specifically granted by the instructor in advance. I reserve the right to enforce this rule as necessary. Protect yourself by placing all these things completely out of the way, or leaving them somewhere else during an exam.

Extra credit:

I do **not** give individual extra credit assignments or have a student resubmit work for additional points. I believe that it is unfair to other students who have already done well in the same assignments. In rare cases, I may offer an extra credit assignment to the entire class. I sometimes recommend that a student re-work their assignment for their own benefit, and I may be willing to offer them comments and suggestions that may improve future grades.

Communication:

I will use the primary email address that is stored with your student record on UNAPortal. You are expected to check this email frequently as part of this (and all) courses at UNA. You may send me email from any other email address you want, but you are responsible for reading email that is sent to your UNAPortal account.

Students may contact me by email (preferred), by telephone at the phone number shown above, or by individual meetings. Email messages should have the course number (e.g., CS 430-01) in the subject line. I normally respond to email several times a day. In general, office hours are available for "drop-in" meetings; however, there may be scheduled appointments during office hours.

Do **NOT** use Canvas messages to contact me, use the email address listed on page #1.

Course web site and materials:

<http://buildingthepride.com/faculty/jajerkins/>

Course materials and information will be made available to the class in one or more of the following ways:

- On the course web page
(PDF documents require a free PDF reader such as Acrobat Reader).
- Announcement during class meetings

- Email (see previous section)
- Departmental/class/lab server

Student responsibility:

You are responsible for all material covered in class. If you are going to miss a class, inform the instructor at least one week in advance and arrange for a classmate to take notes for you. It may be a good idea to arrange in advance for a “buddy” who will take notes in case you are absent without advance notice.

It is important for your instructor to be able to evaluate your performance in this course fairly and accurately. It is always expected that you will do your own work on all individual examinations, while neither receiving from nor giving assistance to others. It is also expected that on homework or other assignments, you will submit only your own work, except for external sources (properly referenced and cited) if explicitly permitted. See the class web page for the course collaboration policy and the UNA Student Handbook (particularly the Code of Student Conduct) for policies relating to students rights, responsibilities and academic behavior. Please ask your instructor if you have questions or concerns about any of these policies or procedures. You are responsible for meeting these expectations, whether you have read them or not (so read them).