CS 3352: Theory of Algorithms  
Fall 2022  
Course syllabus

Class meetings  
section 020: MWF 8:00–8:50 in Archer (HHS) 130

Instructor  
Rob LeGrand  
e-mail: rlegrand@angelo.edu  
webpage: www.cs.angelo.edu/~rlegrand/  
office phone: 325-486-5422  
office location: MCS 205I  
office hours: online MTWRF 2:00–4:00 and by appointment

Textbook  

Description  
An in-depth study of computer algorithms, including those for hash tables, trees and graphs; analysis of time and space requirements of algorithms; NP-completeness and undecidability of problems.

Prerequisites  
CS 2336 (Data Structures and Algorithms) is a prerequisite and MATH 2305 (Discrete Mathematics I) is a co-requisite for this course. Please see me if you haven’t taken CS 2336 or if you’re unsure about your proficiency in data structures and/or discrete math.

Grading breakdown  
50% assignments/quizzes/homework  
50% exams (three or four, including final)

Student learning outcomes  
After successful completion of this course, students will be able to  
• demonstrate proficiency in analyzing time and space complexity of iterative and recursive algorithms.  
• demonstrate proficiency in programming algorithms for hash tables, trees and graphs.  
• demonstrate an understanding of the theory of NP-completeness.
Class format

This face-to-face class will usually have a lecture/discussion format, with homework and programming assignments done primarily outside of class. It is very important that you do all assigned reading before class and come with relevant questions. There may be in-class quizzes over reading and lecture material.

I will take attendance, and you will need to sit in the same place all semester. Class attendance is strongly encouraged. You have a duty to inform me as soon as you know that you’ll have to miss a class.

You will generally be asked to work individually on assignments. Discussion and giving and receiving help are generally encouraged when working on assignments, but all work you turn in must be your own; anything you turn in you must understand thoroughly and be prepared to explain in detail. Whenever you work with anyone but me (including tutors) in any way, you must write fully detailed comments in your code describing the help: who helped, how they helped on which part(s), etc. Failure to do so is considered taking credit for work not done and thus cheating. I will be glad to help you on assignments and concepts when you need it. Exams must be completed entirely independently. Many exam questions will be similar to questions you will see on the Major Field Test.

Blackboard (angelo.blackboard.com) will be used to keep track of grades and assignments. You should check Blackboard and your ASU e-mail at least once a day to make sure you’re not missing anything. In particular, your ASU e-mail is the only reliable way I have of contacting you outside of class, so please don’t neglect it.

Safety

I encourage wearing a mask and keeping as much distance from others as is reasonably possible. Keep an eye on ASU’s public health updates at www.angelo.edu/public-health.

For safety reasons, I will hold office hours online using Blackboard Collaborate. Please take advantage of face-to-face class meetings to ask questions and get help, but when you need help outside of class just get in touch and I’ll do what I can to help.

Computer requirements

You may use PCs in the computer labs, but I recommend that you have your own Windows 10 computer ready to use when you can’t get to a lab. You may need to download and install free software, such as the Respondus LockDown Browser. It is your responsibility to have and to use a reliable Internet connection; for best results, use an Ethernet cable to connect to your Internet source instead of relying on Wi-Fi. You will need a webcam to use Blackboard Collaborate for virtual office hours.
Semester schedule

This schedule of topics should be considered approximate and tentative.

<table>
<thead>
<tr>
<th>week of</th>
<th>topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 22nd</td>
<td>asymptotic analysis</td>
</tr>
<tr>
<td>August 29th</td>
<td>asymptotic analysis</td>
</tr>
<tr>
<td>September 7th</td>
<td>recurrence relations</td>
</tr>
<tr>
<td>September 12th</td>
<td>recurrence relations</td>
</tr>
<tr>
<td>September 19th</td>
<td>sorting</td>
</tr>
<tr>
<td>September 26th</td>
<td>hash tables</td>
</tr>
<tr>
<td>October 3rd</td>
<td>hash tables</td>
</tr>
<tr>
<td>October 10th</td>
<td>binary search trees</td>
</tr>
<tr>
<td>October 17th</td>
<td>binary search trees</td>
</tr>
<tr>
<td>October 24th</td>
<td>graph algorithms</td>
</tr>
<tr>
<td>October 31st</td>
<td>graph algorithms</td>
</tr>
<tr>
<td>November 7th</td>
<td>graph algorithms</td>
</tr>
<tr>
<td>November 14th</td>
<td>NP-completeness</td>
</tr>
<tr>
<td>November 21st</td>
<td>NP-completeness</td>
</tr>
<tr>
<td>November 28th</td>
<td>approximation algorithms</td>
</tr>
</tbody>
</table>

Final exam

The final exam for this course is scheduled for Monday, December 5th, 8:00–10:00.

Academic honesty

Angelo State University expects its students to maintain complete honesty and integrity in their academic pursuits. By remaining enrolled in this course you agree not to commit academic misconduct as defined in section I.B.1 of the Student Handbook, available at www.angelo.edu/student-handbook.

Important university policies

- You must contact Student Disability Services in order to request and to implement academic accommodations.
- For ASU’s policy on absences due to religious holy days, see OP 10.19 at www.angelo.edu/opmanual.
- I am obligated to report any knowledge of sexual misconduct to the Title IX office; see www.angelo.edu/services/title-ix for more.

Modifications

This syllabus, including grade evaluation and course schedule, is subject to modification. In particular, the COVID-19 pandemic may require significant changes in course delivery and content on potentially short notice.