Course Change Request

Date Submitted: 02/05/18 10:22 am

Viewing: **CSCE 411: Design and Analysis of Algorithms**

Last edit: 02/07/18 10:34 am
Changes proposed by: smilingsheila

Catalog Pages referencing this course
- CSCE - Computer Sci & Engr (CSCE)
- CSCE - Computer Sci. & Engr,
- Department of Computer Science & Engineering
- Department of Computer Science and Engineering

Programs referencing this course
- BS-GIST-CDA: Geographic Information Science and Technology - BS, Computation, Design and Analysis Track
- BS-APMS-CPS, Applied Mathematical Sciences - BS, Computational Emphasis

Faculty Senate Number

Contact(s)

<table>
<thead>
<tr>
<th>Name</th>
<th>E-mail</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheila Dotson</td>
<td><a href="mailto:dotson@tamu.edu">dotson@tamu.edu</a></td>
<td>979-845-6176</td>
</tr>
</tbody>
</table>

Rationale for Course

Edit

The proposed changes are to meet the demand/interest of students.

Course prefix CSCE Course number 411

Department Computer Science & Engineering

College/School College of Engineering

Academic Level Undergraduate

Undergraduate course level justification (Select One)

Academic Level Graduate

(alternate)

Effective term 2018-2019

Complete Course Title Design and Analysis of Algorithms

Abbreviated Course Title DESIGN ANALY ALGORITHMS

Catalog course
description

Study of computer algorithms for numeric and non-numeric problems; design paradigms; analysis of time and space requirements of algorithms; correctness of algorithms; NP-completeness and undecidability of problems.

Prerequisites and Restrictions

Grade of C or better in CSCE 221 and CSCE 222; junior or senior classification or approval of instructor.

Concurrent Enrollment No

Should catalog prerequisites / concurrent enrollment be enforced? Yes

Enforced Prerequisites / Concurrent Enrollment

In Workflow

1. CSCE Department Head
2. Curricular Services Review
3. EN Committee Preparer UG
4. EN Committee Chair UG
5. EN College Dean UG
6. UCC Preparer
7. UCC Chair
8. Faculty Senate Preparer
9. Faculty Senate
10. Provost II
11. President
12. Curricular Services
13. Banner

Approval Path

1. 02/07/18 9:48 am Scott Schaefer (schaef): Approved for CSCE Department Head
2. 02/07/18 10:34 am Sandra Williams (sandra-williams): Approved for Curricular Services Review
3. 02/28/18 1:34 pm Eileen Hoy (ehoy): Approved for EN Committee Preparer UG
4. 03/02/18 9:33 am Prasad Enjeti (enjeti): Approved for EN Committee Chair UG
5. 03/02/18 9:38 am Prasad Enjeti (enjeti): Approved for EN College Dean UG
6. 03/05/18 9:06 am Sandra Williams (sandra-williams): Approved for UCC Preparer
7. 03/09/18 3:31 pm Sandra Williams (sandra-williams): Approved for UCC Chair

https://nextcatalog.tamu.edu/courseleaf/approve/
<table>
<thead>
<tr>
<th>And/Or</th>
<th>(</th>
<th>Course Prefix/Number</th>
<th>Min Grade/Score</th>
<th>Academic Level</th>
<th>)</th>
<th>Concurrency?</th>
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<tbody>
<tr>
<td>And</td>
<td></td>
<td>CSCE 221</td>
<td>C</td>
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<tr>
<td></td>
<td></td>
<td>CSCE 222</td>
<td>C</td>
<td>UG</td>
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<tr>
<td>Crosslistings</td>
<td>No</td>
<td>Crosslisted With</td>
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<tr>
<td>Stacked</td>
<td>No</td>
<td>Stacked with</td>
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</tbody>
</table>

Semester 3
Credit Hour(s)
Contact Hour(s) (per week): Lecture: 3 Lab: 0 Other: 0 Total 3
Repeatable for credit? No
Three-peat? No
CIP/Fund Code 1102020006
Default Grade Mode Letter Grade(G)
Alternate Grade Modes Satisfactory/Unsatisfactory
Method of instruction Lecture
Will sections of this course be taught as non-traditional? (i.e., parts of term, distance education) Yes

Learning Outcomes
Meets traditional face-to-face learning outcomes.
Describe how learning outcomes are met or provide justification why they are not met.
Meets traditional learning outcomes.

Hours
Meets traditional face-to-face hours.
Describe how hours are met or provide justification why they are not met.
Meets traditional face-to-face hours.

Will this course be taught as a distance education course? Yes No
I verify that I have reviewed the FAQ for Export Control Basics for Distance Education. Yes No
Is 100% of this course going to be taught in Texas? Yes
Will classroom space be needed for this course? Yes
This will be a required course or an elective course for the following programs:
Required (select program)
Elective (select program)
Has/will this course be(en) submitted for
No
Has/will this course be(en) submitted for Writing or Communication consideration? No

Has/will this course be(en) submitted for ICD consideration? No

Course Syllabus

Syllabus: Upload syllabus
Upload syllabus 411 Combined Syllabus.pdf

Letters of support or other documentation No

Additional information Offering distance Summer 2018

Reviewer Comments Sandra Williams (sandra-williams) (02/01/18 3:34 pm): Rollback: You need to attached syllabi to this request - a traditional and non-traditional (if applicable).
Sandra Williams (sandra-williams) (03/09/18 3:31 pm): UCC approved March 9 via e-vote.

Reported to state? No
Course title and number | CSCE 411: Design and Analysis of Algorithms
---|---
Term (e.g., Fall 200X) | Summer 2018
Meeting times and location | WEB

Course Description and Prerequisites

Course description: Modern computers rely on efficient algorithms for solving all types of problems. This course will help students grasp the fundamental concepts of algorithm design and analysis, understand its underlying theories, and learn essential algorithm-design techniques. Covered topics include dynamic programming, greedy algorithms, amortized analysis, graph algorithms, minimum spanning tree, shortest paths, maximum flow, linear programming, NP completeness, and approximation algorithms. Credits: 3 (3 Lecture Hours).

Prerequisite: Grade of C or better in CSCE 221 and CSCE 222/ECEN 222; junior or senior classification or approval of instructor.

Learning Outcomes or Course Objectives

The objective of this course is to study the principles and methods for designing and analyzing computer algorithms. Students are expected to obtain a comprehensive understanding of fundamental algorithm design techniques including dynamic programming, greedy algorithms, graph algorithm, etc., and also learn basic theories on the hardness of problems and the methods for obtaining approximate or randomized solutions.

Instructor Information

Name: Anxiao Jiang
Telephone number: 979-845-7983
Email address: ajiang@cse.tamu.edu
Office hours: TBD
Office location: 309B HRBB

Textbook and/or Resource Material


Grading Policies

Based on exams and homework:

- Exams: There are two exams during the semester, including a mid-term exam and a final exam. Each exam is worth 35% of the grade.
- Homework: There are multiple homework assignments per week, which contain written problems. Homework is worth 30% of the grade. Late policy: no late assignments accepted except with prior permission or by university rule.

By default, all work is solo; no collaboration allowed unless stated in the homework description.

Grading Scale

*Standard Letter Grading Scale:*
A = 90-100
Submissions of Assignments
Homework assignments will be posted and submitted on eCampus. It is the student’s responsibility to make sure that the correct assignment is submitted to the correct place. Also, eCampus submissions may look completed when they actually are not. It is the student’s responsibility to make sure that the submission process is completed. It is best to download the submission and to confirm that the submission stored on eCampus is the intended one.

The instructor and the TA’s will not consider non-submitted material, and they will not consider the file timestamps (as opposed to submission timestamps) as indication of completion of the assignment. (Time stamps of files can be easily tampered with and will therefore not be considered.)

Course Topics, Calendar of Activities, Major Assignment Dates

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dynamic Programming, Greedy Algorithm, Amortized Analysis</td>
</tr>
<tr>
<td>2</td>
<td>Graph Algorithms, Minimum Spanning Tree, Shortest Paths</td>
</tr>
<tr>
<td>3</td>
<td>Maximum Flow, Linear Programming</td>
</tr>
<tr>
<td>4</td>
<td>Linear Programming, NP Completeness</td>
</tr>
<tr>
<td>5</td>
<td>Approximate Algorithm</td>
</tr>
<tr>
<td>6</td>
<td>Summary</td>
</tr>
</tbody>
</table>

Other Pertinent Course Information

1 Midterm Exam
1 Final Exam
7-9 Homework Assignments
Reading Assignments

The use of bootleg copies of the textbook is strictly prohibited.

For the assignments in this class, discussion of concepts with others is encouraged, but all assignments must be done on your own, unless otherwise instructed.

If you use any source other than the text, reference it/him/her, whether it be a person, a book, a solution set, a web page or whatever. You MUST write up the solutions in your own words. Copying is strictly forbidden.

Americans with Disabilities Act (ADA)

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit http://disability.tamu.edu.

Academic Integrity

For additional information please visit: http://aggiehonor.tamu.edu

“An Aggie does not lie, cheat, or steal, or tolerate those who do.”
Course title and number: CSCE 411: Design and Analysis of Algorithms
Term (e.g., Fall 200X): Spring 2018
Meeting times and location: MW 4:10pm-5:25pm ETB 2005

**Course Description and Prerequisites**

Modern computers rely on efficient algorithms for solving all types of problems. This course will help students grasp the fundamental concepts of algorithm design and analysis, understand its underlying theories, and learn essential algorithm-design techniques. Covered topics include dynamic programming, greedy algorithms, amortized analysis, graph algorithms, minimum spanning tree, shortest paths, maximum flow, linear programming, NP completeness, and approximation algorithms. Credits: 3 (3 Lecture Hours).

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**Instructor Information**

Name: Dr. Tim Davis  
Telephone number: 979-845-4094  
Email address: davis@tamu.edu  
Office hours: TBD  
Office location: HRBB 425E

**Textbook and/or Resource Material**


Class websites

- Piazza: [https://piazza.com/tamu/spring2018/csce411/home](https://piazza.com/tamu/spring2018/csce411/home) We will be using Piazza for class dialog, posting of homeworks, projects, and solutions. Do not send me email; use Piazza instead. Many questions can be posted publicly on Piazza for other students to see and reply to, and they can also benefit from the answers. For private messages, I will be able to reply more quickly to Piazza. I get way too much email to read it quickly. A Piazza notification bypasses my lengthy email queue. So use Piazza for the quickest response from me.

- eCampus: this will only be used for submitting homeworks and any take-home quizzes or exams, and for posting grades.

**Grading Policies**

Based on exams and homework:

- Exams: There are two exams during the semester, including a mid-term exam and a final exam. Each
exam is worth 35% of the grade.

- Homework: There are multiple homework assignments per week, which contain written problems. Homework is worth 30% of the grade. Late policy: no late assignments accepted except with prior permission or by university rule.

By default, all work is solo; no collaboration allowed unless stated in the homework description.

**Grading Scale**

*Standard Letter Grading Scale:*

- A = \( \leq 90-100 \)
- B = \( \leq 80-89 \)
- C = \( \leq 70-79 \)
- D = \( \leq 60-69 \)
- F = <60

**Submissions of Assignments**

Homework assignments will be posted and submitted on eCampus. It is the student’s responsibility to make sure that the correct assignment is submitted to the correct place. Also, eCampus submissions may look completed when they actually are not. It is the student’s responsibility to make sure that the submission process is completed. It is best to download the submission and to confirm that the submission stored on eCampus is the intended one.

The instructor and the TA’s will not consider non-submitted material, and they will not consider the file timestamps (as opposed to submission timestamps) as indication of completion of the assignment. (Time stamps of files can be easily tampered with and will therefore not be considered.)

The University views class attendance as the responsibility of an individual student. Attendance is essential to complete the course successfully. University rules related to excused and unexcused absences are located on-line at [http://student-rules.tamu.edu/rule07](http://student-rules.tamu.edu/rule07).

**Course Topics, Calendar of Activities, Major Assignment Dates**

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<tr>
<th>Topic</th>
<th>Required Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundations</td>
<td>Chapter 1: Role of Algorithms</td>
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<td></td>
<td>Chapter 2: Getting Started</td>
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<tr>
<td></td>
<td>Chapter 3: Growth of Functions</td>
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<tr>
<td></td>
<td>Chapter 4: Divide and Conquer (but not 4.6)</td>
</tr>
<tr>
<td></td>
<td>Section 8.1 Lower Bound for Sorting</td>
</tr>
<tr>
<td>Sorting</td>
<td>Chapter 15: Dynamic Programming</td>
</tr>
<tr>
<td>Advanced Design and Analysis Techniques</td>
<td>Chapter 16: Greedy Algorithms (but not 16.4 and 16.50</td>
</tr>
<tr>
<td></td>
<td>Chapter 17: Amortized Analysis</td>
</tr>
<tr>
<td>Advanced Data Structures</td>
<td>Chapter 18: B-trees</td>
</tr>
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<td></td>
<td>Chapter 21: Disjoint Sets</td>
</tr>
<tr>
<td>Graph Algorithms</td>
<td>Chapter 22: Elementary Graph Algorithms (some is review)</td>
</tr>
<tr>
<td></td>
<td>Chapter 23: Minimum Spanning Trees</td>
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<td>Chapter 24: Single-Source Shortest Paths</td>
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<td></td>
<td>Chapter 25: All-pairs Shortest Paths</td>
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<td>Chapter 26: Max Flow</td>
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<td>Selected Topics</td>
<td>Chapter 27: Multithreaded Algorithms</td>
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<td>Chapter 28: Matrix Operations</td>
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<td>Chapter 29: Linear Programming</td>
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<td>Chapter 33: Computational Geometry</td>
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<td></td>
<td>Chapter 34: NP-completeness</td>
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<td>Chapter 35: Approximation Algorithms</td>
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<td></td>
<td>Undecidability: Other Sources</td>
</tr>
</tbody>
</table>
Other Pertinent Course Information

1 Midterm Exam
1 Final Exam
7-9 Homework Assignments
Reading Assignments

The use of laptops is prohibited in class, unless I approve otherwise (for example, if you have horrible handwriting and require a laptop to take notes). Laptops are a distraction to your fellow students. Please see me if you need an exception. Do not use cell phones or tablets in class, either. The use of bootleg copies of the textbook is strictly prohibited.

For the assignments in this class, discussion of concepts with others is encouraged, but all assignments must be done on your own, unless otherwise instructed.

If you use any source other than the text, reference it/him/her, whether it be a person, a book, a solution set, a web page or whatever. You MUST write up the solutions in your own words. Copying is strictly forbidden.

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