Chico Computer Science

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California State University, Chico

CSCI 356: *Design and Analysis of Algorithms*

Prerequisites

Grade of C− or better in CSCI 151 (Algorithms and Data Structures)
Math 120 (Discrete Mathematics)

Description

Algorithms from many areas of computer science will be analyzed. Topics include algorithms from combinatorics, graph theory, artificial intelligence, and systems programming.

Note: Students will be required to open and maintain a *WebCT* account in order to access an up−to−date on−line calendar of events/progress, on−line quizzes, etc.

Meeting Days/Times TR 8:00 a.m. – 9:15 p.m. Langdon Hall, LANG 104

Instructor

Dr. Benjoe A. Juliano (*a.k.a.* Dr. J) `http://www.ecst.csuchico.edu/~juliano/`
`Juliano@ecst.csuChico.edu` `http://www.ecst.csuchico.edu/~juliano/csci356`
`http://www.ecst.csuchico.edu/~juliano/Algorithms`

Office Hours

9:00 a.m. – 11:00 a.m. MW (SEN priority Wednesdays) OCNL 222, ☎ (530) 898−4619
Other times strictly by appointment only; walk−ins welcome (see hours posted on office door).

Required Text

Computer Algorithms: Introduction to Design and Analysis, 3/e
S. Baase and A. Van Gelder, 2000.
Addison−Wesley Publishing, Inc., Reading, Massachusetts. `ISBN 0−201−61244−5`

Objectives

(a) To develop an awareness of algorithm design techniques such as divide−and−conquer, greedy algorithms, dynamic programming, and others..
(b) To become familiar with the most popular and powerful algorithm analysis techniques.
(c) To develop a fundamental understanding of difficult problems, classes of difficult problems, and the underlying implications of such problems.

Grade Evaluation

This course is designed to give students an equal opportunity of exposure to both Theory and Practice. Students are expected to demonstrate proficiency on both the theoretical and practical aspects of this course.

Theoretical Component (50%)	
27.50%	Midterm Exam 1, Thursday, February 22, class time
27.50%	Midterm Exam 2, Thursday, April 5, class time
45.00%	Final Exam, Tuesday, May 15, 10:00−11:50 a.m.
Practical Component (50%)	
50.00%	Written Homework
40.00%	Programming Assignments
10.00%	Participation in Class Discussions

Students are required to earn a C− (70%) or better in **both** the theoretical and practical components; otherwise, the minimum of the scores of the two components will be used to calculate the student's final grade.

Final Grades

Final grades shall be expressed as a percentage of the maximum possible score of all evaluated materials. Assigned letter grades are based on the following scheme:

Real Interval	Letter Grade	University Definition
[96.25,100.00] [92.50, 96.25)	A A−	Superior Work
[88.75, 92.50) [85.00, 88.75) [81.25, 85.00)	B+ B B−	Very Good Work
[77.50, 81.25) [73.75, 77.50) [70.00, 73.75)	C+ C C−	Adequate Work
[66, 70) [60, 66)	D+ D	Minimally Acceptable Work
[0, 60)	F	Unacceptable Work

It is Dr. J's policy not to assign a grade of D or D+ to graduate students; any graduate student with a class standing less than C− (70%) earns a final grade of F.

Guidelines/Policies

Students registered for this course are held responsible for reading and understanding Dr. J's course guidelines and policies, as indicated by the following on−line documents:

General Policies	`/~juliano/Teaching/Policies.html`
Academic Policies	`/~juliano/Teaching/Academic_Policies.html`
Notes on Academic Integrity	`/~juliano/Teaching/Academic_Integrity.html`
Students with Disabilities	`/~juliano/Teaching/Disability.html`
CSUC Computing Resources Policy	`http://www.csuchico.edu/sjd/compolicy.html`

Guidelines and policies listed below are modifications/extensions of the policies outlined above.

HW/Assignments

Written homework/assignments will be assigned and collected regularly. These materials will be collected at the start of the class period in which they are due. Not all homework will be graded; however, it is the student's responsibility to complete all homework problems assigned knowing that any subset may be graded.

Tentative Schedule

Week	Week of	Chapter	Topic
1	Jan 22	1,2	Introduction: principles and examples; data abstraction and basic data structures
2	Jan 29	3	Recursion and induction. ◆ *Feb 2 (F), last day to add or drop classes without special permission of instructor and department chair.*
3	Feb 5	4	Sorting
4	Feb 12	4,5	Sorting; selection and adversary arguments ◆ *Feb 18 (F), Census Date, no adding, dropping of classes, or changing of grade option beyond this date without a serious and compelling reason approved by the instructor, department chair, and college dean.*
5	Feb 19	5	Selection and adversary arguments **EXAM 1**: ***February 22 (Thursday), class time***
6	Feb 26	6	Dynamic sets and searching
7	Mar 5	7	Graphs and graph traversals
8	Mar 12	8	Graph optimization problems and greedy algorithms
	Mar 19		***S P R I N G B R E A K***
9	Mar 26	9	Transitive closure, all−pairs shortest paths
10	Apr 2	10	Dynamic programming **EXAM 2**: ***April 5 (Thursday), class time***
11	Apr 9	10,11	Dynamic programming; string matching
12	Apr 16	11	String matching *April 16, Easter Monday, no classes.*
13	Apr 23	12	Polynomials and matrices
14	Apr 30	13	Introduction to NP−Completeness
15	May 7	13	NP−Complete problems
16	May 14		**FINAL EXAM**: ***May 15 (Tuesday), 10:00 a.m. − 11:50 a.m.***

NOTE: The above schedule is subject to change. It is your responsibility to make sure you know what is to be covered in the following weeks and if any changes were made on the schedule.