BOB JONES UNIVERSITY
EST. 1927

College of Arts and Sciences

CpS 490
Programming Challenges
Fall/2023

Instructor:	James A. Knisely, Ph.D.
Office:	Alumni 64
Office Hours:	MWF 8:00 – 8:50 a.m.; TTh 1:30 – 2:45 p.m. Please email or text to confirm availability. Other times available by appointment.
Email/Text/Teams:	jknisely@bju.edu / Cell 864-517-2437 / CpS 490 F23
Telephone:	Extension 8144
Communication Policy:	Feel free to email or contact me via Microsoft Teams for questions and/or extended help. You may text where appropriate (not during class).
Classroom:	MB 204 (formerly ML 3)
Meeting:	MW 3:00 - 4:15 pm
Credit/Load:	3/3
Textbook and Resources:	Competitive Programming 4: *The New Lower Bound of Programming Contests* by Steven Halim, Felix Halim and Suhendry Effendy. | Book 1 and Book 2 HackerRank: *Practice Coding. Compete. Find Jobs.* UHunt: *hunt problems that matter*

Catalog Description:

This course focuses on twelve programming problem solving topics. Students learn how to apply these problem solving techniques to a wide range of problems.

Course Context:

Programming Challenges is an elective course primarily taken by members of our inter-collegiate programming team. Many of the team members are majoring or minoring in computer science. Hence, the courses primary main context is to fulfil the goals and objectives of the Computer Science Program.

Computer Science Program
It is our desire that all students in the Computer Science Major exhibit the ability to:
CS1. Design and implement solutions to practical problems
CS2. Use appropriate technology as a tool to solve problems in various domains
CS3. Create efficient solutions at the appropriate abstraction level
CS8. Demonstrate understanding of fundamental concepts in the student's discipline

Course Goals:

The goals of this course are to

- develop an appreciation of the interplay between theory and practice,
- enhance problem-solving skills,
- demonstrate communication and organizational skills
- expose students to the interaction of computing with mathematics

These goals are based upon the "Characteristics of Graduates" as listed in the 2013 Computer Science curriculum guide.

Course Objectives:

The student will be able to

1. Present (orally) a software solution to a programming problem. This presentation should include why and how a solution solves a problem and what assumptions were made. *Measured in four presentations.*
2. Present, in written for, an advanced algorithmic idea or technique. *Measured in the final exam.*
3. Produce solutions to given problems while under arbitrary time constraints. These solutions will show that when there are

multiple solutions to a problem, one must select based upon the interaction of theory and practice. *Measured by solving contest problems with tight time limits.*

4. Produce solutions while part of a team thus demonstrating the development of interpersonal communication skills. *Measured during the team competitions.*
5. Produce solutions using specific math techniques thus demonstrating the need for domain-specific knowledge when solving various computing tasks. *Measured in solutions to problems requiring specific math skills.*

Course Requirements:

The grade for this class will be based upon the following categories:

Category	Points	Description
Programs	500	
» Sprints	105	Seven worth 15 points each
» Topics	395	Twelve worth approximately 33 points each
Competitions	360	
» Team	200	IEEE and CCSC-SE
» Individual	160	Four Codeforces ones
Communication	140	Verbal and written
» Presentations	80	Present four solutions to the class.
» Final exam	60	Essay discussing a topic covered this semester.
Total	1000	

General Policies:

Class Deportment
Compliance with student handbook policies is expected during class. All class deportment should reflect your intention to pay attention, to be polite, and to be professional. Laptops may be used to take notes and to perform calculations and constructions during class. Please do not use the laptop for other purposes during class since studies have demonstrated that one's student's misuse of a laptop during class tends to diminish the learning of the surrounding students.

Accommodations for Students with Disabilities
Any student with disabilities or any additional needs is encouraged to contact the instructor within the first week of the course to discuss accommodations that may be necessary.

Attendance Policies and Academic Penalty for Absences

- Attendance will be tracked and reported according to the university attendance policy:
  - Students are expected to attend and arrive on time for all scheduled class sessions, including the final exam.
  - Students are to use effective time management in order to meet their class attendance responsibilities.
  - Up to three (3) personal Absences may be taken for funerals, for sickness, for doctor’s or dentist’s appointments, for visits and interviews at graduate schools or for interviews for future employment.
  - Up to four (4) Service Absences may be taken to attend approved academic functions or conferences, approved Christian service projects, required military duty or as part of an intercollegiate athletic team. However, students who exceed the Personal Absence limit due to a chronic illness are not eligible to participate in events that require Services Absences. Also, students who are on any type of academic restriction (including probation) or who have a current grade report with a cumulative GPA below 2.0 are not eligible to participate in events that require Service Absences.
  - Arriving late or leaving early is marked as a partial attendance. Three (3) partial attendance marks count as a personal absence.
  - Missing more than 15 minutes of class is marked as an absence.
  - For more details and information about chronic illness, please see the Class Attendance Policy on the BJU policies page.
- Students are responsible for all material and announcements given in class.
- If a student is absent for an exam and has a good reason, the student is to notify the instructor before the exam is covered in the next class.

Late Work
Work is due at the specified deadline. Late work is seldom accepted. Notify the instructor immediately if a situation arises necessitating an extension. Early, impressive work is encouraged and may be rewarded.

Academic Honesty
You are expected to uphold the school standard of conduct relating to academic honesty:

- School-wide: https://home.bju.edu/media/bju-home/documents/policies/integrity.pdf
- CpS Department clarifications: https://bju.sharepoint.com/sites/Education/computerscience/facsup/SitePages/Academic%20Integrity%20Policy.aspx

You must assume full responsibility for the content and integrity of the academic work you submit. The guiding principle of academic integrity is that your submitted work; examinations, reports, and projects must be your own work. You are guilty of violating this policy if you:

- Represent the work of others as your own.
- Use or obtain unauthorized assistance in any academic work.
- Give unauthorized assistance to other students.
- Modify, without instructor approval, an examination, paper, record, or report for the purpose of obtaining additional credit.
- Misrepresent the content of submitted work.

Misrepresenting your work is unethical in any setting. In an academic setting, it is a breach of the university policies. The penalty for cheating is severe. Any student cheating is subject to receive a failing grade for the assignment and will be reported to the Dean. If you are unclear about whether a particular situation may constitute cheating, consult with your instructor about the situation. For this class, it is permissible to assist classmates in general discussions of construction techniques. General advice and interaction are encouraged. Each of you must develop your own solutions to the assigned projects, assignments, and tasks. In other words, you may not "work together" on graded assignments with other students unless instructed to work as a group on a particular assignment. Such collaboration constitutes cheating. You may not use or copy (by any means) another's work (or portions of it) and represent it as your own.

Learning how to use sources appropriately is a vital part of your development as a student. To assist you in this endeavor, the university uses Turnitin, an academic plagiarism checker. Registration in this course constitutes permission for the teacher to submit any or all assignments to Turnitin.

Need Help?
You must seek help when needed because you are the only one who knows when you need it. If you need help, reach out to one of the following ways:

- Teacher – It is always best to seek help in person, either in my office or before class, if time allows. You may also text me or email me in order to set up a time in which to come see me if you have a class or are working during my announced office hours. My door is always open during my office hours. I encourage you to come see me for help.
- Classmates – Studying for tests and quizzes with another CpS 490 student is helpful. Unless an assignment is a group assignment, it may not be done in collaboration with anyone else. No group assignments are intended to be assigned this semester.

Copyright Policy: