BOB JONES UNIVERSITY
EST. 1927

College of Arts & Sciences

CpS 377 (397)
Hardware & Software Reverse Engineering (Lab)
Fall 2023

Instructor:	Jordan Jueckstock
Office:	AL 76 *(third floor, left hall)*
Office Hours:	10:00-10:50 AM (M-F)
Email:	jpjuecks@bju.edu

Course Description:

Studies the hardware hacking and reverse engineering of electronic devices and embedded systems. Topics will include reverse engineering tools and equipment, modification of circuit boards, securing embedded devices, and common hardware attack vectors.

Course Context:

The material and activities in this course contribute particularly to student progress toward the following Cybersecurity program learning outcomes:

- Cy1: Apply introductory cybersecurity principles to both policy and practice
- Cy4: Communicate technical information effectively, including risks discovered and mitigation strategies
- Cy5: Apply biblical principles of ethics in computing

Course Reading(s):

In lieu of a traditional textbook, we will use open-access resources, including but not limited to technical documentation, research publications, and recorded conference presentations.

Learning Objectives:

By the end of the semester, students will be able to

1. Define and describe the technical methods, ethical ramifications, and legal boundaries of reverse engineering (RE) both within and beyond the field of cybersecurity
2. Demonstrate familiarity with industry-standard RE tools and ability to identify the best tools for a given task
3. Demonstrate proficiency at integrating static and dynamic RE techniques and tools on a range of representative software and embedded system (hardware) cybersecurity challenges

Course Schedule:

A provisional (i.e., subject to change) schedule of planned class topics, activities, and due dates is maintained on the course web page: https://protect.bju.edu/cps/courses/cps377/schedule/.

Assignments & Grading:

Student learning is assessed throughout the semester via:

- **Labs:** tutorial activities designed to familiarize students with tools and techniques
- **Exercises:** activities that evaluate specific skills and build towards completion of a larger project
- **Projects:** summative activities demonstrating mastery over a significant area of RE expertise
- **Final Exam:** written test covering non-skill-based knowledge of philosophy, laws, etc.
- **Research Journal:** graded, semester-long running diary of a student's RE activities

Since RE is an inherently open-ended research activity in which success is not always guaranteed or even well defined, the research journal is graded to evaluate students' ability to document their *process* of exploration, discovery, and thinking regardless of the ultimate results.

Grading			
#	Item	Pts.	Total
7	Journal Checkpoints	20-30	200
5	Tutorial Labs	25	125
5	Technical Exercises	75	375
2	Project Deliverables	100	200
1	Final Exam	100	100
-	"Grace points"	5	0
	TOTAL		**1000**

Scale	
A	900+
B	800-899
C	700-799
D	600-699
F	0-599

Grades are computed on a simple 10-point scale (see below) based on points earned out of 1000. Grades are not rounded up (or down—which probably should go without saying). Instead, all students are allotted 5 bonus "grace points" (which have the effect of rounding up, e.g., 695 to 700). The instructor reserves the right to confiscate these grace points, at his sole discretion and at any time, for repeated (or egregious) displays of disrespect to either the instructor or fellow students. *(Students who lose their grace points will be informed as soon as possible.)*

Course Policies:

- *Attendance*: Absence/tardiness are reported per University policy. Assessment of University vs. personal absences, and official penalties for too many personal absences, are handled by the registrar's office. However, uncommunicated and/or unjustified absence/tardiness will also harm a student's participation grade (see above).
- *Deportment*: Students and instructor will address each other with professional respect and courtesy, no matter how much fun we are (or are not) having. Students shall refrain from talking (or whispering, or texting, or tapping messages in Morse code, or…) during lectures, presentations, etc. unless otherwise indicated by the instructor.
- *Technology*: personal computers (which, let's be honest here, includes phones and smart watches) will not be used in class unless called for by the instructor (e.g., during lab sessions). Phones, smart watches, and other communication doodads should be kept silent and passive except for high-priority communications previously discussed with the instructor (e.g., waiting for word about a sick family member).
- *Due dates:* See the department late policy https://cs.bju.edu/academics/policies/late-work-policy/. Note that students may not apply their "free late" to the final challenge of the semester (for obvious reasons).
- *Academic Integrity*: See the department cheating policy: https://cs.bju.edu/academics/policies/academic-integrity-policy/. The technical artifacts produced for each challenge should be treated as *individual program code* per the policy and should never be shared in any way between students. Students *may* discuss how to approach a given challenge in general terms, and alert each other to time-consuming dead-ends, but students must make a *bona fide* effort not to "give away" solutions (or essential "plot spoilers" that lead directly to solutions).
- *Generative AI*: Students are allowed the use of generative AI tools to (a) research and understand artifacts under RE and (b) craft code to automate the RE process. No other use (e.g., generating text for a report or other written assignment) is permitted. Students using generative AI tools (a) *must* disclose this fact prominently in their report or submission comments, (b) *must* include a substantive written assessment of how the tool's output helped (or did not), and (c) *must* provide full transcripts of their AI tool interactions (prompts entered, artifacts generated) along with their other submission artifacts.

Copyright Policy: