CALIFORNIA STATE UNIVERSITY
FULLERTON

CPSC 240: Computer Organization and Assembly Language
Fall 2020

Course Description and Objective

Digital logic and architecture of a computer system, machine level representation of data, memory system organization, structure of low-level computer languages. Machine, assembly, and macro language programming. Principles of assembler operation, input-output programming, interrupt/exception handling. Laboratory programming assignments. Students are expected to write most part of their C/C++ programs in assembly and also be able to design combinatorial and sequential logic components.

Prerequisite

- CPSC 131
- Mathematics 270A or Mathematics 280

Instructor

Instructor:	Yu Bai, Ph.D.
Office Location:	E-412
Office Telephone:	(657) 278-5359
E-mail:	ybai@fullerton.edu
Office Hours:	Mo & We 10:00 AM – 11:30 AM Or by appointment During final exam week, office hours are by appointment only

Meeting Information

Lecture:	WEB Fully online instruction, Mo & We 8:00 AM – 8:50 AM
Lab:	WEB Fully online instruction, Mo & We 8:50 AM – 9:50 AM

Virtual Learning

Students are expected to join the class Zoom meeting at the time listed above to participate in every scheduled lecture. Zoom sessions will be accessed on the TITANium course page. Please mute your microphone upon joining the class meeting. Attendance will be monitored and used to evaluate the participation grade at the end of the semester. Scheduled lecture meetings, office hours, due dates, and examination time are as per Pacific Time (California time).

Minimum Technology Requirements for Virtual Learning

• A stable high-speed internet connection. Your internet connection is critical to the successful completion of this course.
• Less than 5-year old computer (desktop/laptop) with a built-in or external webcam, speaker and microphone; for participating in Zoom lectures, review sessions, and exams. A mobile device (smartphone or tablet) may work, but such devices limit the full capabilities available for class participation, interacting with classmates, and attending office hours via Zoom.
• Document scanner or smartphone/tablet device with appropriate scanning apps (such as Camscanner https://camscanner.com/user/download or Dropbox https://www.fullerton.edu/it/students/software/dropbox/)
• Access to software such as PDF viewer/reader, Microsoft office (Word, Excel, PowerPoint)

The university may provide limited support to students who need help with meeting above technology needs. Please email studentITHelpDesk@fullerton.edu or call (657) 278-8888.

Course Communication

All course announcements and updates will be provided via CSUF email. Therefore, you MUST check your CSUF email on a regular basis for the duration of the course. In addition to regularly scheduled office hours, students may ask questions via email. Generally, responses will be provided within two business days.

Important Dates

CSUF's Academic Calendar is posted online at http://apps.fullerton.edu/AcademicCalendar/. The Academic Calendar contains all the campus closures and holidays you should be aware of. CSUF's Admissions Calendar is posted online at http://www.fullerton.edu/admissions/Resources/Calendars.asp. The Admissions Calendar contains all the major dates with respect to adding, dropping, and withdrawing from your classes.

Textbooks

Required Course Text

- Assembly Language for x86 Processors, 7th edition. Kip Irvine

Supplementary Course Text

- Digital Design, 2010 by Morris Mano; Richard Ciletti

Many popular technical books may be read online through the campus's subscription to Safari Books Online. From outside of the campus network, the campus library's WWW proxy will grant you access, http://www.library.fullerton.edu/asp/ipcheck.aspx?url=http://proquest.safaribooksonline.com/?uicode=calstate. The Safari Books Online service can be accessed directly from any computer on the campus network, http://proquest.safaribooksonline.com/.

Learning Goals

At the end of the semester, students should have an understanding of:

(a) Ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline
(b) Ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
(c) Ability to design, implement, and evaluate a computer-based system, processes, component, or program to meet desired need
(d) Ability to function efficiently on teams to accomplish a common goal
(e) Understanding of professional, ethical, legal, security and social issues and responsibilities
(f) Ability to communicate effectively with a range of audiences
(g) Ability to analyze the local and global impact of computing on individuals, organizations, and society
(h) Recognition of the need for and an ability to engage in continuing professional development
(i) Ability to use current techniques, skills, and tools necessary for computing practice
(j) Ability to apply mathematical foundations, algorithmic principles, and computer science theory in modeling and design of computer-based systems in a way that demonstrate comprehension of the tradeoffs involved in design choices
(k) Ability to apply design and development principles in the construction of software systems of varying complexity

GE Requirements

This class does not meet any CSU General Education requirements.

Course Outline

1. The structure of a computer
2. Number systems, base conversions, representing negative numbers, arithmetic operations at base 2, 8, 10, and 16
3. The MOV, ADD, SUB, INC, and DEC instructions. 8 bits, 16 bits and 32 bits registers. Multiplications and divisions
4. Comparing and Branching (including loop structures) in assembly, Bitwise Operations in C/C++, Bit Operations in assembly
5. Arrays and floating-point arithmetic in Assembly (End of Part I)
6. Boolean Algebra and Logic Design
7. Simplification of Boolean Functions using K-maps
8. Combinatorial Circuits (decoders and multiplexors)
9. Sequential Circuits (Flip-Flops, Finite-Sate-Machine Models)
10. Storage Components (End od Part II)

Course Equipment

Equipment will be provided so that you can complete the assignments. It is expected that the equipment is returned in complete working order. Damaged, broken, or missing equipment caused from mishandling, misuse, carelessness, or failure to follow directions will be charged to the student(s).

Grading

Plus and minus grading will be used when determining final grades. Final grades are computed by first finding the average score in each category described in the table below on the right. All scores are normalized to a scale of 0 to 100 before being averaged. The average score for each category is then used to compute the weighted average according to the weights in the second table below.

Letter Grade	*% of Total Points*
A+	96% & Above
A	93% – 95.99%
A-	88% – 92.99%
B+	85% – 87.99%
B	82% – 84.99%
B-	78% – 81.99%
C+	75% – 77.99%
C	72% – 74.99%
C-	68% – 71.99%
D+	65% – 67.99%
D	62% – 64.99%
D-	58% – 61.99%
F	Less than 58%

Category	*% of Final Grade*
Lab	15%
Attendance	5%

Assignments	15%
Midterm Exams 1	20%
Midterm Exams 2	20%
Final Exam	25%

Attendance

Attending class is mandatory. Missing class is not allowed unless it is excused by the instructor. Missing class as part of a documented accommodation is guaranteed to be excused. The ADA accommodated student must make a reasonable effort to coordinate any absences with the instructor.

An absence is excused if:

- You are required to participate in an official University activity (documentation required)
- You are under a doctor's care (documentation required)
- You are granted a leave of absence from the University for reasonable cause (documentation required)

Homework/Lab

Homework/Lab will usually be assigned at the end of every other lecture and will be collected one week later. The laboratory activities are an integral part of the course. Some of the laboratory activities may have pre-lab homework assignments. All students are expected to satisfactorily complete all of the laboratory activities. You may be required to demonstrate your design to the instructor. In this case, the demonstration will count as a portion of your lab grade. All lab activities will require a formal write-up unless stated otherwise. The reports must use the template available on the course website.

Late Submission Policy

The homework/lab are assigned following the schedule of the course. Each assignment must be completed individually unless specified otherwise.

- Homework/Lab reports are always due on the **9:50 AM** at specific date.
- Late submission is not allowed only if you use **one-time late submission ticket*** through TITANium. You must always submit your assignment through TITANium. **NO EMAIL ATTACHMENTS.**
- Anything submitted after the due date will **NOT** be accepted and **NO point** will be given unless you have a compelling reason. Note that a reason is different from an excuse. Students must provide supporting documentation.
- If you need to make any changes to your first submission, you can redo and resubmit your work to TITANium only if the deadline has not already passed. However, anything submitted after the due date will not be accepted.
- Each student in the class is granted a **one-time late submission ticket.** It is valid before the solution or answer is given to students. It is not valid during/after the exam week.

Exams and Quizzes

All exams are closed notes and closed book unless specified otherwise. The midterms will cover specific topics and the final exam will be comprehensive. Prior notification is required if the student is unable to take the midterms for any compelling reason. A grade of zero will be incurred for any unexcused missed midterm exams. However, the final exam is mandatory for successful completion of the course. Quizzes may be given to assess the progress of the class.

Extra Credit

Although not guaranteed, extra credit may be offered as an additional task to specific lab assignments.

Make-Up Policy

Exams and quizzes cannot be taken after they have been given in class. Due to an act of nature, personal medical emergency, a family crisis, an act of terrorism, severe civil unrest, etc. students have 10 calendar days to petition the instructor to retake any exam/quiz or submit an assignment without late penalty. Exceptions will be made on a case by case basis, provided there is time to evaluate the merits of such an application.

Participation

In the context of this course, participation is defined as the following:

- Arriving to class prepared and on time
- Taking notes
- Actively listening to the lecture and asking questions when appropriate
- Annotating code listings and handouts
- Bringing any required materials to class
- When needed/desired, seeking assistance to complete assignments
- Barring an emergency, not leaving the class session early unless the instructor consents
- Not distracting oneself or others with smartphones, games, online diversions, etc.
- Respecting and treating the instructor and the student's peers civilly

Required Materials

- A writing instrument
- A notebook
- A USB memory stick
- A personal computer with the requisite development tools or regular access to a computer lab

Academic Dishonesty

Students are encouraged to assist one another and discuss the course materials with your peers. It is your responsibility to be aware of and follow the spirit of CSU Fullerton's academic honesty policy which can be found at http://www.fullerton.edu/senate/documents/PDF/300/UPS300-021.pdf. Academic dishonesty will not be tolerated. The University Catalog and the Class Schedule provide a detailed description of Academic Dishonesty under University Regulations.
By submitting work for evaluation, you acknowledge that you have adhered to the spirit of the university's academic honesty policy and that your submission is an original work by you unless otherwise directed to work in groups. Failure to follow the spirit of the academic honesty policy will result in a severely negative evaluation of the work in question and may result in involving the Department Chair and the Judicial Affairs office to seek a disciplinary remedy.

Students are expected to maintain a high standard of academic integrity:

- If students conduct any kind of academic dishonesty behavior, **ZERO** will be given for that specific task.

- Students who conduct academic dishonesty behavior again will be reported to the College and the University, and will fail the course.

ADA Accommodations

Any student who, because of a disability, may require special arrangements in order to meet course requirements must register with the Office of Disability Support Services within the first week of classes. The Office of Disability Support Services' website is http://www.fullerton.edu/DSS/. They can be reached by phone at 657-278-3117 or TDD at 657-278-2786. Their email address is dsservices@fullerton.edu. Their office is located in University Hall, room 101. The instructor may request verification of need from the Dean of Students Office. Students requesting accommodations shall inform their instructors during the first week of classes about any disability or special needs that may require specific arrangements/accommodations related to attending class sessions, completing course assignments, writing papers or quizzes, tests or examinations.

Emergency Preparedness

For your own safety and the safety of others, each student is expected to read and understand the guidelines published at http://prepare.fullerton.edu/campuspreparedness/. Should an emergency occur, follow the instructions given to you by faculty, staff, and public safety officials. An emergency information recording is available by calling the Campus Operation and Emergency Closure line at 657-278-4444.

Instructional Continuity

Due to an event such as an epidemic or a natural disaster that disrupts normal campus operations, students must monitor the course Titanium site and their campus email address for any instructions and assignments that the instructor announces.

Laboratory Safety

Safety is no accident. Learning and following the appropriate safety practices and protocols is an integral part to all laboratory courses. Following the appropriate safety practices and protocols minimizes the chances of repetitive stress injuries, mishandling hazardous materials, and injury to self and others. Additional campus laboratory safety information regarding hazardous materials is online at http://riskmanagement.fullerton.edu/laboratorysafety/.