# Computer Science 3A
## Computer Organization and Machine Language
## Fall 2020 Ticket #16835 (MW)

**Instructor**: George Eaton          **Email:**  geaton4@saddleback.edu

Welcome to Computer Organization and Machine Language, an introductory course in computer organization with emphasis on machine language programming. Concepts covered include finite precision arithmetic, fixed and floating point formats, Boolean Algebra, computer systems organization, microprogramming, and conventional machine language programming with the corresponding assembly language notation.

## This Class Covers the Following Topics (order may change):

1. Basic Computer Architecture
2. Number Systems and Codes
3. Digital Combinational Logic
4. Boolean Algebra
5. Digital Arithmetic
6. Digital Sequential Logic
7. Simple As Possible Computer (SAP-1)
8. Machine Language and Micro-programming

## Student Learning Outcomes:

Students who successfully complete CS 3A will be able to:

1. Construct internal representation of simple data types.
2. Explain different number systems and manipulate bits and bytes.
3. Demonstrate Boolean Algebra concepts related to electronics circuits, gates, and the corresponding logic involved.

**Prerequisite:** CS 1A

**CS Website:**     http://www.saddleback.edu/mse/computer-science

## E-mail:

All course email will be sent to your Saddleback or IVC account (depending on which college you registered through).  **You are expected to check your e-mail regularly** so that you don't miss out on important announcements. If you forward your e-mail, make sure your forwarded account is in working order.  **Make sure that you have your canvas notifications set such that you will always receive class announcements and assignment date changes.**

## Important Dates:

September 7th                                              - Last day to drop **without** a W

October 30th                                               - Last day to drop with a W

If you want to drop the course then be sure you do so by the required dates.

## Disabilities:

If you need **any** accommodations due to a disability, please come and talk to me.

Saddleback Disability services: http://www.saddleback.edu/dsps

## Course Materials:

| | |
|---|---|
| REQUIRED Textbook: | Digital Computer Electronics, Third Edition, by Albert Paul Malvino |
| Publisher: | Glencoe, ISBN-10: 0-02-800594-5 (or LAD Custom Publishing in Saddleback bookstore) |
| OPTIONAL Reference: | CODE: The Hidden Language of Computer Hardware and Software, by Charles Petzold |
| Publisher: | Microsoft Press, ISBN-10: 0-73-561131-9 (may be purchased on line) |
| OPTIONAL Reference: | The Elements of Computing Systems: Building a Modern Computer from First Principles, by Nisan, Schocken |
| Publisher: | The MIT Press, ISBN-13: 780262640688 (relevant chapters provided on nand2tetris.org and Canvas) |

Most course lecture/project materials will be posted online.

## Attendance (online):

Attendance online in this course is **strongly encouraged**. Class is also the official place for announcements. Should you miss a class, please obtain the lecture notes and announcements **from one of your colleagues.**  Although I will post lecture materials on Canvas, these materials by themselves will not cover all that is discussed. They are intended to be used as supplemental material to aid you in taking notes and studying.

If you want to drop the course then be sure you do so by the required dates.  Although I **may** drop students if they miss 6 hours of lecture/labs, it is ultimately the responsibility of the student to drop themselves by the appropriate dates.

## Grading:

Final grades will be assessed on a straight scale based on the student's proficiency in the topics outlined above.  Occasionally I will scale the grades at the end of the semester if I feel it will result in a more appropriate or fair assessment of the class. I will not, however, adjust grades for a student that did not complete all of their work (or skipped a quiz, lab, or exam) or for any student(s) that is (are) involved in academic dishonesty.  Success in this class is largely dependent upon you.  Successful students attend lecture and labs, do the work, and come prepared.

| Item | Approx. Points | % |
|------|------|------|
| Homework | 125 | 25% |
| Individual Projects | 75 | 15% |
| Group Projects | 50 | 10% |
| Quizzes | 75 | 15% |
| Mid-Term Exam | 75 | 15% |
| Final Exam | 100 | 20% |
| Total | 500 | 100% |

| Grade | Percentage Grade |
|------|------|
| A | 90% - Top Score |
| B | 80% - 89.9% |
| C | 70% - 79.9% |
| D | 60% - 69.9% |
| F | Below 60.0% |

## Individual Projects:

There will be several individual projects and assignments throughout the semester that will include simple logic design with the nand2tetris simulator and machine language programs for the SAP-1 computer. Projects and assignments will be posted on Canvas along with their due dates. Late projects or assignments are not accepted and they cannot be made up.

**All individual projects are to be completed individually. If you need assistance for individual projects, you may get help from me. You may be asked to demonstrate your individual project(s) in order to obtain credit.**

## Group Projects:

There will be some group projects throughout the semester which will be posted on Canvas along with their due dates. Late projects are not accepted and they cannot be made up. Groups will be assigned by me and may be different for each group assignment.

## Exams & Quizzes:

Exams and quizzes will be based on lectures and coursework. I will on occasion assign in-class work – these are usually short exercises that are provided on the lecture slides for Canvas quizzes. **Quizzes and Exams are closed book** unless otherwise stated. **You are required to use Proctorio** proctoring software for exams and/or quizzes. **Cameras may be required for quizzes and exams.**

All exams will be announced at least 1 week ahead of time. Quizzes may be given without prior notice. Please keep up on your coursework.

## Late Policy:

In general, no late homework or projects will be accepted in this class. If you know you will be late or absent, then turn your assignment in early.

## Exceptions to the late policy:

Approval to turn projects in late may be given under extenuating circumstances. Exceptions without prior notification may be made in the case of unforeseen valid reasons (serious illness, unplanned surgery, accident, family emergency… etc.).  **Any exceptions will be made at my discretion**.

## Make up Quizzes/Exams:

The official policy for this class is that there will be **no make-up quizzes or exams.**

Exceptions **for exams only** may be made in the case of an unforeseen, extenuating circumstance (serious illness, non-elective surgery, accident, family emergency… etc.). Exceptions will not be made without prior notification and proof of circumstances may be required. **Any exceptions will be made at my discretion**.

## Academic Dishonesty:

There is a **no tolerance policy** for any instance of Academic Dishonesty in the Division of Math, Science, and Engineering.  This course will follow the guidelines of the college and of the Division.  Division polices can be found here:  http://www.saddleback.edu/uploads/mse/integrity.pdf .  College policies are defined in the course catalog.  It is required that you understand these policies; ignorance will not be considered a justification for a violation of policies in this class. Cases of academic dishonesty will be dealt with individually and may result in an 'F' grade in the course.

In this course, all individual projects **should be completed solely by you**.  If you need assistance you may get help from me.  You may not show or distribute your work to anyone in any CS3A class.  You may not copy any portion of a project from another student or other source (e.g. the internet). All work you submit must be your own.

**Falsifying results rather than having your project produce the results you submit is considered an act of academic dishonesty**. Be sure that the project you submit produces the output you submit.

No grades will be scaled for students with any instance of academic dishonesty.  All instances will result in a zero grade for the project/lab and may result in an 'F' for the course.

## Audio / Video recording:

Lectures may be recorded as they are presented so that students may review them later. Recordings may include your participation while the lecture is being recorded.