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|  | csus_ecs_logo  **Course Syllabus for the Spring 2021 Semester** |

**CSC 35 - Introduction to Computer Architecture, Sec 4,8 lectures and 5,6,9-11 labs;**

***(Lecture MW 8-8:50am; Labs MW 9:00-10:40am; Lecture TR 8-8:50am; Labs TR 9:00-10:40am, T 12-140pm;)***

# Instructor: Dr. Isaac Ghansah

**Contact Information:** [ghansah@csus.edu](mailto:ghansah@csus.edu) (Please insert "CSc 35 -" somewhere in the subject line); **No email via Canvas**

**Note for COVID19:** In the event I am not available during the semester for whatever reason, students will be contacted and advised how the course will proceed. This may include a change in instructor and/or modality.

**Office Hours:** M 2-3:30pm, Th 1-2:30pm at Zoom link <https://csus.zoom.us/j/2491877404>. **Notes:** 1**)** This is my personal zoom meeting room address used only for office hours. The zoom addresses for the lecture and lab sessions are incorporated within Canvas.

2) Instructor is also available at other times by prior appointment.

**Course Modality:** This course is being taught synchronously on Zoom through Canvas. The lectures and lab sessions will be recorded and made available. There is more information below under Netiquette. The class schedule is as shown above.

**Webcam Access:** Normally you should be muted and do not need to have your video on. However, there are EXCEPTIONS. You should have your Video on 1) During the First week of classes (I need to know who is in my class); 2) During Exams (for proctoring); 3) If you need to speak during the class session and 4) During office hours I might ask you to turn your video if I need to. In all cases, whether you have video on or not, I should see your name first and last names displayed because I do not want to deal with cryptic names. I need to be able to detect intruders.

# Course Description

## Catalog Description: CSc 35 is an introduction to assembly level machine organization. Emphasis is on the architecture of processors, memory system organization and architecture, input/output, exceptions/interrupts and software interfaces. The general concepts of assemblers and assembly language programming as seen through the Intel 80x86, Pentium, core3i, core5i, core7i Processor Family.

***Note:*** the lab has experiments and design assignments.

## Prerequisites: CSc 15

# Course Format: This course has, essentially, two different parts:

1. Two 50-minute lectures each week.
2. One 100-minute lab periods per week. The labs are used to give the student "hands-on" experience.

**Note:** Even though lecture and lab components are held at different times, they complement each other. Thus, the instructor will cover lecture topics in the lab and vice versa. Similarly, exams will cover both lecture and lab topics. For the same reason, there are grade requirements for lecture and lab covered under Grading section in this syllabus.

**Student Learning Objectives:** In this course, students will…

**Course Materials:**

**Textbook:** Kip R. Irvine, “Assembly Language for x86 Processors”, 7Ed, Prentice Hall, 2015 (Required)

**Technology requirements for Labs**

We will be using in ECS Remote labs. The Remote Lab uses Windows PCs (i.e. x86 processor architectures), MASM (Microsoft Assembler) configured within Microsoft Visual C++ which is part of Microsoft Visual Studio IDE with a Linker and Debugger.

You can also set up this environment for yourself using the free Microsoft Visual Studio Community Edition installed on your own local computer. Please note that Modern platforms such as Windows 10 and Linux do not permit direct access to hardware (which is major focus for this course) for protection/security reasons. However, the textbook author has website that provides Libraries to do hardware access as well as instructions on how to configure Visual Studio for MASM on your local machine. It is strongly recommended that you obtain help from the website if you want to develop and test your lab assignments on your own machine. Here is the URL for the Irvine Website.

<http://asmirvine.com/gettingStartedVS2019/index.htm>

Assembly language programming in this course will be based on Intel syntax and not AT&T syntax used in GNU Assembler (GAS) and which is part of Linux.

**Notes About Lab Assignments**:

1) Labs require demonstration. Because the course modality is online this semester demonstration will be handled as follows. You will upload the source code on Canvas by the due date. The instructor will then run it on a local machine to see if it works. For each lab you will receive a grade for submission (report) and a grade for demonstration. The demonstration grade is 100% if it completely works according to specifications. There is no partial credit for lab demonstration but you can receive partial credit for the lab report submission. Except for the first 2 weeks of lab, you should plan to come to the lab to ask questions about debugging issues. That is, after lab has been assigned be sure you understand requirements, design the program, code, and test it, before lab period. DO NOT WAIT TILL THE BEGINNING OF THE LAB PERIOD TO START WORKING ON THE LAB ASSIGNMENT.

2) I will check the Zoom record for each lab session to figure out who was present. Thus, I will not do roll call by calling out names at lab sessions unless this becomes necessary.

During the lab sessions I will clarify requirements for lab assignments and answer any questions you might have on any of the steps.

3) You are encouraged to help each other. However, you must do and submit your own report. Evidence of copying is cause for a failing grade -- for both the one who did the work and the one that copied.

4) It is common to give hints about labs at the beginning of lab session. Therefore, come to lab on time. It is unfair for a late arrival to waste lab time, raising questions which were already answered.

5) Each lab requires 1) Demonstration; and 2) Report submission on Canvas. The report will contain source code which the instructor will download and run. This will be used for demonstration. You will receive a grade for Both demonstration and report. There is NO partial credit for demonstrations.

5) Late labs will not be accepted. However, if you have to submit lab late because of COVID19 illness, I will handle it on case-by-case basis. This will occur only if, I was given a prior notice by the student as soon as the illness occurred.

**Criteria and Grading Rubric for Assignments:**  This applies to Lab for this class and has been covered above.

# Lectures

***Note:*** CSc 35 is about computer architecture, **not** about assembly programming language or computer programming.

## Overview

Each week, there are two lectures followed by a lab session. The lectures will normally cover topics in the textbook as well as basic concepts of computer architecture that are not covered in the textbook. As a result, attendance is vital to understand all the content presented in the course. The textbook contains a large amount of information that will not be covered in the lectures. By reading the chapter in its entirety, you will perform better on both the labs and the exams.

## Attendance and Netiquette

Students are expected to attend classes regularly. Students are responsible for the portion of the material covered in class and any homework given during the semester. Online Classroom etiquette requires you to come to class on time, remain until class ends, and not maintain an audible conversation while the instructor or another student is speaking. Make sure you’re muted but turn video on so I know who is present in the class. If your video is not on, make sure your real name is visible. If you must leave early, please do so without disrupting the class. Use the Chat facility within zoom as much as possible during class sessions to ask questions. If I need you to speak I will tell you to unmute and speak. Please show respect to everyone consistent with the [Hornet Honor Code](https://www.csus.edu/student-affairs/_internal/_documents/hornet-honor-code.pdf). Please read assigned chapters from the textbook and supplementary material as assigned. Much material must be covered in class. Therefore, come to class on time. It is unfair for late arrivals to waste class time raising questions which were already answered*.*

**CANVAS**: We will use this online learning environment extensively for the class. It will be used for posting this syllabus, Class Notes, Quizzes (if any), Assignments, and Exams. I will use it to send you Notices (Announcements). I will also use it to create Discussion Board topics that you can post questions to. I will monitor the discussion board from time to time to answer questions, but anyone can answer questions that are posted there, if they know the answer.

# Exams

There are two major exams during the semester – Midterm Exam close to the middle of the semester and a Final Exam during the Finals week. Any material covered in the lectures, textbook (within the scope of the syllabus), or labs can be included in the exams. Attendance is mandatory for both exams. The exams will be on Canvas, live and proctored.

# Grading

Class meetings on zoom will be recorded. If you miss class for any reason you can view the recording. If you turn in assignment late because of COVID-19 illness, it will be accepted only if I received prior notification as soon as the illness occurred. This policy also applies to exams.

## Grading Policy

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| **Title** | **Percentage of Grade** |
| Lab Assignments | 40% |
| Home-Work Assignments (Exam prep) | 0% |
| Unannounced Quizzes (online) | 0% |
| Midterm | 25% |
| Final | 35% |
| Total | 100% |

## 

## Final grades in the course will be based on the following:

To pass the course you must have passing grade for both lab assignments and exams. Final weighted Grades could, but not necessarily be based on a "curve".

## Grading Scale

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| **Grade** | **Range** | **Comment** |
| A | 100% to 90% | Outstanding |
| B | 89% to 80% | Excellent |
| C | 79% to 70% | Average |
| D | 69% to 60% | Inadequate |
| F | 59% to 0% | Failure |

**Grading Breakdown (%):**

A = 94-100 C = 74-76

A- = 90-93 C- = 70-73

B+ = 87-89 D+ = 67-69

B = 84-86 D = 64-66

B- = 80-83 D- = 60-63

C+ = 77-79 F = 59 or below

# Drop Policy

If you plan to drop this course, please make sure you understand the following information.

* **There is no such thing as an "automatic drop"**. The instructor can drop you from the course, but this does not happen automatically. If you plan to drop the course, make sure to use MySacState.
* After the 2nd week, you cannot drop the course through MySacState. At this point, you must provide written verification of a compelling reason. Both the instructor and the Department Chair must approve.
* After the 4th week, you must fill out a "Petition to Drop after Deadline" form and collect all the necessary signatures. This must be turned in to Admission and Records in Lassen Hall.

# Academic Integrity

Universities and other academic institutions hold academic integrity in **high** regard. The following list is a *short* summary of the policies of California State University, Sacramento.

* **Do not cheat**. This includes copying information from other students, using "cheat cheats" or other devices not explicitly permitted by the instructor.
* Do not submit work previously graded in another course unless the instructor explicitly permits it.
* Do not take an exam for another student or allow another student to take your exam.
* Do not plagiarize. Plagiarism is the act of incorporating another person’s work into yours and claiming it as your own. This includes (but is not limited too):
* Copying the work verbatim
* "Mosaic copying" – copying the work but interspersing a few of your own words.
* Paraphrasing – rewriting another's work without giving credit.
* Fabrication – falsifying or inventing sources.
* Ghost-writing – submitting another work as your own.
* Do not aid any student to commit academic fraud. This includes all the items mentioned above.

Please visit <https://www.csus.edu/umanual/student/stu-100.htm> for more information

# SOME COURSE POLICIES:

1. Information in this syllabus is subject to change with notice.

2. Attendance to class and frequent check of email/notifications is expected. Class roll will not be checked after first week of classes, except for lab sessions as specified above. However, you are responsible for material presented and announcements made in class or by email. This could include changes to the syllabus, exam dates, etc.

3. Late assignment/project will generally be penalized by 20% if one lecture late.

Nothing will be accepted if more than one lecture late, or if solution has been posted.

4. I will not give make-up for exams or unannounced quizzes (if any).

5. Be aware of the school’s policy on *drops, incomplete, repeats, and ethics/academic honesty*.

**COMPUTER ACCOUNTS AND POLICY ON SUBMISSIONS:**

**a) ECS account:** You should obtain an account on the ECS systems for this class if you do not have one. Though not required you might find it useful for some assignments especially Lab Assignments. These are the steps:   
**a. Use your favorite Browser and Go to www.ecs.csus.edu  
b.Click on Computing Services -> Network Accounts -> Get a new Account.  
c. Fill out all required fields**

Note: ECS IT management is currently being incorporated into campus so this might change.

**b) Submissions:** You must submit all deliverables electronically via CANVAS, which can be reached from mySacState ( my.csus.edu ) or <https://csus.instructure.com/> . Examples of deliverables include homework, assignments, project reports, source code, etc. *I will not accept a hardcopy. For this class nothing hand-written will be accepted even if it is in electronic form.* Any file which is placed in CANVAS should be named according to one of the formats below (depending on the type of assignment). Please do NOT submit PDF files as I might not be able to make comments on them. Word format is preferable.

## Your-name\_course#\_hmwk \_hmwk#, your-name\_course#\_lab\_lab#, your-name\_course\_project\_project#

For example, if a student named John Doe is submitting homework#1 the file name of the submission should be ***doe-john\_35\_hmwk\_1.*** Similarly, Lab1 submission from the same student should have the format **doe-john\_35\_lab\_1**

Please note: If the attachment is not according to proper format as stated above, it will not be accepted.

If a PDF is submitted without permission you will lose points.

**Health & Safety Information:**

If you are sick, stay home but if you are unable to attend class, notify your instructor. Please self-diagnose if you are experiencing any COVID- like symptoms (fever, cough, sore throat, muscle aches, loss of smell or taste, nausea, diarrhea, or headache) or have had exposure to someone who has tested positive for COVID contact **Student Health & Counseling Services (SHCS) at 916-278-6461** to receive guidance and/or medical care. You are asked to report any possible COVID related illnesses/exposures to SHCS via this link [COVID-19 Illness/Exposure Report Form](https://sacstateshcs.wufoo.com/forms/covid19-illnessexposure-report/). Expect a call from SHCS within 24 hours. The CDC provides a good source of information regarding COVID-19 and a way to self-check symptoms: <https://www.cdc.gov/coronavirus/2019-ncov/index.html>

**Campus Support:**

* Services to Students with Disabilities ([SSWD](https://www.csus.edu/student-affairs/centers-programs/services-students-disabilities/)) offers a wide range of accommodation services that ensure students with disabilities have equal access and opportunity to pursue their educational goals. If you have a disability and require accommodations, you need to provide disability documentation from SSWD, Lassen Hall 1008, (916) 278-6955. Please discuss your accommodation needs with me during office hours, early in the semester.
* [Student Health and Counseling Services](https://www.csus.edu/student-life/health-counseling/) staff are committed to continuing to provide exceptional service to our campus community. Though many students may be away from campus, most services are offered using secure remote technology.
* If you are experiencing challenges with food, housing, financial or other unique circumstances that are impacting your education, help is just a phone call or email away! The CARES office provides case management support for any enrolled student. Email the CARES office at [cares@csus.edu](mailto:cares@csus.edu) to speak with a case manager about the resources available to you. Check out the [CARES website](https://bit.ly/3fhQ1kY).
* Further resources and information: [Martin Luther King Center](https://www.csus.edu/student-affairs/centers-programs/mlk-scholars/), [Multicultural Center](https://www.csus.edu/student-affairs/centers-programs/diversity-inclusion/multicultural-center.html), [Dreamer Resource Center](https://www.csus.edu/student-affairs/centers-programs/dreamer-resource-center/), [Student Success Center](https://www.csus.edu/college/health-human-services/student-success/), [Academic Advising](https://www.csus.edu/student-life/academic-advising/), [PARC](https://www.csus.edu/student-affairs/centers-programs/peer-academic-resource/), [Reading & Writing Center](https://www.csus.edu/undergraduate-studies/writing-program/reading-writing-center.html), [Grading Policy](https://www.csus.edu/umanual/acad/umg05150.htm), [Academic Calendar](https://catalog.csus.edu/academic-calendar/), [Hornet Honor Code](https://www.csus.edu/student-affairs/_internal/_documents/hornet-honor-code.pdf), [Student Rights and Responsibilities](https://www.csus.edu/umanual/student/stu-0119.htm)

# CSc 35 – TENTATIVE SCHEDULE (Subject to Change)

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| **Week** | **Topic Covered** | **Textbook**  **(reading assignment)** | **Lab Activity** | **Lab Due** |
| 1 | Course format and requirements  Introduction  Binary, hex, decimal, 2’s complement, and ASCII | Ch1 | Lab 0 Demonstration | None |
| 2 | IA-16, IA-32, and IA-64 Processor Architecture | Ch2 | Lab 1 |  |
| 3 | Fundamentals  Machine Language and The Assembler | Ch3 | Lab 2 | Lab 1 |
| 4 | Instruction Set: Data transfer and basic instructions  Direct addressing | Ch4 | Lab 3 | Lab 2 |
| 5 | Instruction Set: Data transfer and basic instructions  Indirect addressing | Ch4 | Lab 4 | Lab 3 |
| 6 | Instruction Set: Procedures. Stack Instructions, Procedure definition, Procedure Calls. Parameter Passing via Registers | Ch5&8 | Lab 5 | Lab 4 |
| 7 | Instruction Set: Conditional Processing-Conditional Branch simple Instructions. | Ch6 | Lab 6 | Lab 5 |
| 8 | \*\*MIDTERM EXAM\*\* |  | Lab 7 | Lab 6 |
| 9 | **SPRING BREAK** |  |  |  |
| 10 | Instruction Set: Conditional Processing – Logical Instructions. | Ch6 | Lab 7 |  |
| 11 | Parameter Passing by Stack. Stack mechanism and Stack Frame  (Advanced Procedures) | Ch8 | Lab 7 |  |
| 12 | Instruction Set: Integer Arithmetic, Shift, Rotate | Ch7 | Lab 8 | Lab 7 |
| 13 | Instruction Set: Strings and Arrays | Ch9 | Lab 8 |  |
| 14 | High-Level Language Interface | Ch13 | Lab 9 | Lab 8 |
| 15 | Input/Output. Interrupt mechanism and interrupt vectors | Notes | Lab 10 | Lab 9 |
| 16 | Instruction Encoding, CPU Design Concepts. Future of Micro Processors | Notes | Lab 10  (continued) | Lab 10 |
| 17 | FINAL EXAM |  |  |  |

##### **IMPORTANT DATES:**

Spring Break: March 22 – March 26;

Cesar Chavez Holiday: Wed March 31, 2021

Final Exam: Monday May 17, (Sec4), 8-10AM; Thursday May 20 (Sec8), 8-10AM

Grades Due: May 26, 2021