

CSIT 256-01 Computer Architecture & Assembly Language CRN 27557

Spring 2024 - Syllabus v0.0

Section Info: 01 - CRN 27557

Tuesday 2:30 pm - 4:50 pm W309

Thursday 2:30 pm - 4:50 pm W309

Course Modality: in the classroom

The class will be conducted as a regular class with Lecture and Lab time in the classroom. Canvas is the official source for: Syllabus, Class Schedule, Slides, Demos, Homework/Lab/Project Assignments, Exam Information

Syllabus Versions

- Version 0.0 - 1/15/2024 - first draft

Book Information

There are two books for the course:

Computer Organization & Architecture, William Stallings, Pearson/Prentice Hall, 11th Edition

<https://console.pearson.com/enrollment/vds2lb>

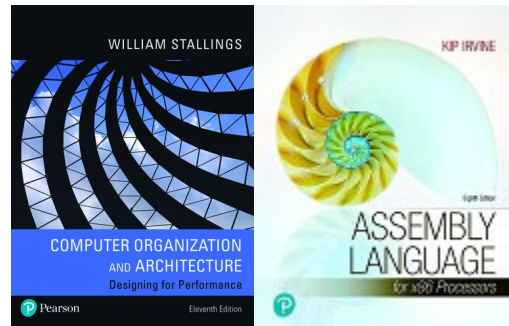
Note: homework will be from the Stallings Book

Assembly Language for x86 Processors, Kip Irvine, Pearson/Prentice Hall, 8th Edition

<https://console.pearson.com/enrollment/bejqp5>

Note: To complete the labs in Assembly Language, the Irvine book is a needed reference

Author's Website: <http://asmirvine.com/>



Instructor Information:

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Department Information:

Math and Computer Science Department. Chair: Dr. Lori Austin, Lori.Austin@raritanval.edu

Spring 2024 Student Hours (1/17-4/30):

Location: West 324 and Zoom (see Canvas for Zoom links)

- Monday 1:00 - 2:30 & 5:30 - 6:30
- Wednesday 1:00 - 2:30 & 5:30 - 6:30
- and by appointment

Course Overview

(Prerequisite: CSIT 254 Data Structures & MATH 151 Calculus I or equivalent)

This course is the third in the sequence for students in Computer Science planning to transfer to a four-year college. It may also be taken as a free elective by interested students with sufficient background. This course focuses on the components of a computer that describe its architecture: storage, the central processing unit, the instruction set and addressing modes. The course also examines the way these components are interconnected and the nature of the information flow between them. Students will use Assembly language to reinforce these concepts.

General Education Learning Outcomes

At the conclusion of the course, students will be able to:

1. Apply creative and critical thought in designing computing solutions that demonstrate knowledge of the computer architecture
2. Apply quantitative reasoning to interpret data used in solving problems

Course Learning Outcomes

At the conclusion of the course, students will be able to:

1. Describe the main components of computer systems that define its architecture (CPU, storage, memory, instruction sets, and addressing modes)
2. Discuss the way the main components of computers are interconnected
3. Recognize assembly language syntax while reading and analyzing assembly language programs
4. Design, develop and test programs using MS Assembly Language commands while featuring various basic Assembly Language operations (data/program transfer, arithmetic instructions, indirect memory, addressing, procedures and stack operations)
5. Design, develop and test programs in the MS Assembly Language that include strings, arrays, macros, and conditional processing (Boolean instructions, loops)

Course Management, Structure and Pace

This course meets for approximately five hours a week for 14 weeks. Students should plan on putting in at least two hours of study time for every hour spent in class for lecture. Additionally, students should plan study time of another half hour for every hour spent in the lab. Students who are successful in this class typically spend approximately seven hours *outside of class* each week working on the subject. This includes reviewing class notes, reading and studying the textbooks, doing homework and reviewing demo Assembly code.

Attending all lectures is essential for success in this course because this reinforces and explains the material presented in the textbook. Additional programming techniques, which may not be found in the book, will be demonstrated in class and during lab time.

Grade Determinants:

Item	Percent
Homework (~9) *	5%
Assembly Labs (~10) *	10%
Architecture Labs (~7) *	5%
Assembly Project (1)	10%
Exam #1 (2/29)	15%
Exam #2 (4/9)	25%
Final Exam (5/2) **	30%

* At the end of the semester the lowest Homework grade, the lowest Assembly Lab grade, and the lowest Architecture Lab grade will be dropped

**** In order to pass the course, you will need an overall average of 60 in the course and you will need a 60 or above on the Final Exam.**

Grade % Range

A	89.5-100.0+
B+	86.5-89.4
B	79.5-86.4
C+	76.5-79.4
C	69.5 - 76.4
D	59.5 - 69.4
F	0 - 59.4

Software/Computer Requirements:

The computer labs have the “Visual Studio 2022 Professional” software needed to complete the in-class labs. The Author’s Library and sample project has to be installed; a .zip file is in Canvas that contains all of the files needed.

Exam 2 is a computer-based exam. Everyone must use the school computer for the exam.

If you own a computer that can run the Visual Studio 2022 software (Macs are tricky), you can download the “Visual Studio 2022 Community” version which is free from Microsoft (see <https://visualstudio.microsoft.com/downloads/>)

The Irvine Library that is in Canvas in the "Visual Studio 2022 - Library Addendum" module, is configured to be installed on the root of the C:\ drive

If you wish to install the Irvine Library on a different driver or a different folder, you need to edit the configuration files. The author of the Assembly book, Kip Irvine, has installation/running notes on his web page: See <http://kipirvine.com/asm/> and then click on "Getting Started with MASM and Visual Studio 2022".

The installation process takes time, so don't wait until the night the Assembly Project is due to install the software.

Note: If we become displaced from campus, the Open Lab may not be available or have reduced hours

Laptops in the classroom:

You are allowed to use your own laptops in the classroom. Wireless devices should be able to connect to "RVCC-Student" by providing your G# and password. (see: <https://commons.raritanval.edu/admin/mis/tshome/TSGuide/Pages/Network.aspx>)

Which Email to use and Email Response Time

If you have a question or have an issue submitting an assignment in Canvas, the preferred (fastest) way to contact the instructor is via his preferred email: stephen.brower@raritanval.edu

Over the last several semesters, I found the email system embedded in Canvas frustrating, and the Canvas alerts are not always punctual.

So please email me at: stephen.brower@raritanval.edu

The goal is to respond in less than 24 hours. Please don't expect a response after 10 pm.

Occasionally there are known exceptions such around Spring Break where a response may take a little longer. If the instructor knows ahead of time there will be a period of unavailability longer than 24 hours, that will be communicated to the class.

Course Routine:

Most "weeks" will be broken into 5 segments: Architecture Lecture, Architecture Lab, Assembly Lecture, Lab Lecture, Lab

Architecture Lecture: This lecture will be on the Computer Architecture material.

Architecture Lab: The Architecture Labs will be done in groups.

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Assembly Lecture: This lecture will be on the Assembly Language material and will include demonstrations in Assembly Language. Students are encouraged to experiment in Assembly

Lab Lecture: The Instructor will introduce the Lab for the evening. It will vary week to week how long the introduction will take. It could be as short as a few seconds or as long as 15 minutes.

Lab: This is lab time to work on the Assembly Language Labs and Project. Almost every week there will be an assembly lab. During lab time take as many breaks as you need.

Pattern (mostly)

Not every week follows a pattern but many weeks will have Lecture and Architecture Lab on Tuesday and Programming Lab time on Thursday

Homework

Homework will only be from the Architecture book and the page/question numbers will be posted in Canvas.

Homework must be submitted electronically via Canvas :

- Typed in assignment
- Typed and saved as a .docx or .rtf file and attached to assignment
- For a problem based homework (such as S10/S12) you can handwrite, scan/take a pic and the image attached to assignment

Once an assignment is due it is closed in Canvas and work cannot be submitted through Canvas. Attaching files to the "comments" is not allowed and those files will be ignored.

See below for the Late Policy (don't be late) and the Cheating Policy (don't cheat)

Assembly Labs

The Assembly Labs will be posted in Canvas (usually right before lab time).

The Assembly Labs correspond to the chapters covered in the Assembly book. They are designed as "In-Class Labs" meaning the intent is that the labs can be completed in about 2 hours. Some labs have multiple parts.

Questions during lab time must be asked in person during lab time. Emails sent during lab time will be ignored.

The expectation is that the Assembly programs will compile, but this course doesn't have the "if it doesn't compile it's a 0" policy the way the CSIT 105 and CSIT 254 have. However, **20 minutes is the max time that will be spent trying to fix syntax errors; if there are still syntax errors it will be a 0.**

To submit the lab the *.asm file(s) must be attached to the assignment in Canvas. This way the instructor can run the assembly code.

Once an assignment is due it is closed in Canvas and work cannot be submitted through Canvas. Attaching files to the “comments” is not allowed and those files will be ignored.

See below for the Late Policy (don't be late) and the Cheating Policy (don't cheat)

Architecture Labs

The problem-based questions that would have been part of the homework, are now done as an “Architecture Lab”. There are only ~8 Architecture Labs.

The Architecture Labs will be distributed on paper in class and you will return the paper. These Architecture Labs can be done in small groups (2-3 per group)

It is preferable that you submit the Architecture Labs by the end of the Architecture Lab time, but the latest to submit is the end of class (4:50 pm)

See below for the Late Policy (don't be late) and the Cheating Policy (don't cheat)

Assembly Project

The hope is that the Assembly Project will be posted around 4/11 in Canvas.

Unlike the Assembly Labs which can be done in 2 hours, the Assembly Project will be a larger more complicated program which will take longer to write. Students in the past ignored this warning, waited until the night it was due to start, were unable to complete it in time, and complained that Brower is a lousy instructor.

The expectation is that the Assembly Project will compile, however, **5 minutes is the max time that will be spent trying to fix syntax errors; if there are still syntax errors it will be a 0.**

To submit the project the *.asm file must be attached to the assignment in Canvas. This way the instructor can run the assembly code.

Once an assignment is due it is closed in Canvas and work cannot be submitted through Canvas. Attaching files to the “comments” is not allowed and those files will be ignored.

See below for the Late Policy(don't be late) and the Cheating Policy (don't cheat)

Exams

The schedule has the dates/times of the exams.

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Exams must be taken on days assigned. If you know ahead of time that you cannot take an exam, ask the instructor to arrange for the exam to be left in the testing center or to arrange another time.

Exam 1 will be paper based / closed note / closed book / no electronic devices and will be on Architecture and Assembly. The Architecture part will be Short Answer and "Problem" type questions. The Assembly part will have questions that will be either to hand write a few lines of assembly code or some code will be provided and you have to describe the output and/or show the contents of the registers in hexadecimal.

Exam 2 will be an open note / open book / open computer "hands on" exam in Assembly.

Since Exam 2 is a computer-based exam, everyone must use the school computer for the exam.

Failure to notify the instructor that the Exam 1 or Exam 2 will be missed will result in a makeup that *might* be harder, *not by design, but by consequence of being different*. Missing the Final Exam will result in a 0 on the Final Exam so that grades can be submitted on time before fleeing the state.

The Final Exam will be paper based / closed note / closed book / no electronic devices. The format will be like Exam 1.

For all of the exams, about a week before the exam an "Information Sheet" with format, content, and sample questions will be loaded into Canvas and reviewed in class

Note: In order to pass the course, you will need an overall average of 60 in the course and you will need a 60 or above on the Final Exam.

Cheating Policy...don't cheat!

You must work alone on the Homework, Assembly Project, and Assembly Labs. Cheating is not allowed. All parties involved in cheating will be dealt with according to the school's policy on cheating. The penalty can range from 0 on the assignment to F for the course.

For the assembly labs, asking the instructor for hints is not considered cheating.

NOTE: you have permission to use the instructor's demo .asm files, in whole or in part, for your labs and projects

Late Policy

According to the RVCC Catalog, for a 14-week course students are not to be penalized for 1 week of absences. To accommodate this, at the end of the semester the lowest "Homework" grade, the lowest "Assembly Lab" grade, and the lowest "Architecture Lab" grade will be dropped.

"Life Happens"

According to the RVCC Catalog, students are not to be penalized for 1 week of absences. To accommodate this, at the end of the semester the lowest "Homework" grade, the lowest "Assembly Lab" grade, and the lowest "Architecture Lab" grade will be dropped. That handles "life happens".

Extra Credit

Some exams/assignments contain extra credit questions/opportunities. Other than that, no extra credit opportunities will be provided.

For example, if you choose not to submit ANY homework and then in April you ask for "Extra Credit" to make up for the missed homework, the answer is NO.

Additional Policies:

Classroom Behavior

Cell Phones:

For the "lectures" please silence cell phones. It is understood that there may be times when emergency calls occur or the "pick me up at the airport" call needs to happen. For those calls please step into the hallway to take the call. During lab time, you can turn the sounds back on the cell phones.

Talking:

For the "lectures" please don't talk. It is understood that you may need to turn to a neighbor for the occasional question like "what slide is he on?" or "which file is that?" or "what page # did he say?" and that's fine. It is the full conversations that are distracting not only to the instructor but to the class as a whole.

For the Lab Time you can talk all you want, but "indoor voices" please.

Language:

The instructor will try his darn-doodliest to not swear during class time but an occasional expletive may slip out. Please try your darn-doodliest not to swear but don't fear reprisals if an occasional expletive slips out.

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Proper Use of Computers:

Lecture: the instructor is easily distracted by typing and would prefer that computers are not used during the lecture, except for opening and view demo Assembly files. Pointing and laughing at the monitors is very distracting. ***Printing during lecture is extremely distracting and very upsetting.*** If class members repeatedly distract the instructor, then all computers and laptops must be closed down for the rest of the semester.

Lab: During lab time everyone should be working on the labs/projects in Assembly. None of the labs/projects require social media sites like Facebook.

Bathroom Breaks:

Lecture: Depending on the length of the lecture there may be a break partway through, and usually it will be announced at the start. If you need to leave for a break just quietly get up and leave.

Lab: take all the breaks you need.

Student Handbook

You are responsible for all policies stated in the Student Handbook, including Academic Integrity Policy and Code of Student Conduct.

In Canvas, there is a tab on the left "RVCC Student Resources", it is there

Class Attendance:

See "RVCC Student Resources" for official policy.

Note: sometimes attendance is taken based on what graded items were not returned. If you come in late and see that graded items were returned, please wait for a break or Lab Time to get your graded items

Withdrawal Procedure

See school's web page for Spring 2024 Withdrawal and Refund Schedule and Refund Info (see:

<https://commons.raritanval.edu/admin/finance/Documents/Spring%202024%20Withdrawal%20and%20Refund%20Schedule.pdf>)

(see: https://commons.raritanval.edu/admin/finance/Pages/refund_info.aspx)

Class Schedule

Please see the Class Schedule for the listing of lecture topics and timing of homework / labs / project / exams.

Syllabus Part 2 - College Policies and Resources

In Canvas, there is a tab on the left "RVCC Student Resources", additional policies and information about resources are found there

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