**Department of Computer Science**

**Georgia State University**

**CSC 3210 Computer Organization and Programming**

**Syllabus**

**Spring 2022**

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| **Course Type** | On campus. All the lectures, office hours, laboratory works, and tests will be on campus. However, we will post the recorded lecture as well on the iCollege.  Lecture attendance will be 5% of the grade. Students take a 5 minutes attendance quiz to receive the attendance grade during the lecture. It is a very easy quiz on the contents covered in the last lecture. They contain 3 questions (multiple choice or True/False). One of the questions is about your seat location in the class.  Even though it is NOT mandatory, you are highly encouraged to get vaccinated before joining the lecture. Also, even though it is NOT mandatory, you are highly encouraged to wear face covering when you are attending the lecture.  If student tests positive for COVID-19 during the course, please inform the instructor immediately.  There might be seating plan in the class room, so that contact tracing can be easier when anyone tested positive for COVID-19.  You are most welcome to stop by during the office hours to clarify any topics. If you have time conflict with the office hours, you can make an appointment with the instructor to clarify your questions. You can email the instructor to setup an appointment. Student can also request for an online meeting over Zoom.  **All the Labs will be on campus**. Lab attendance is 2% of the grade. You must inform the instructor if you fail to attend the lab due to unavoidable reasons. You also need to show documents.  **Lecture time:**  Tuesday – 11:00 AM – 12:15 PM Eastern Time (US and Canada)  Thursday –11:00 AM – 12:15 PM Eastern Time (US and Canada)  **Place:**  **Room 169, Petit Science Center** |
| **Instructor:** | Dr. Zulkar Nine |
| **Office Hours:** | Monday (11:00 AM – 12:00 Noon Eastern Time (US and Canada))  Wednesday (11:00 AM – 12:00 Noon Eastern Time (US and Canada))  And by appointment |
| **Office Location:** | 1 Park Place, Room 724  You can join over Zoom as well (link is posted on the iCollege). |
| **Email:** | [mnine@gsu.edu](mailto:mnine@gsu.edu)  Always use the above email to contact the instructor.  Please do not email to the iCollege email. Instructor might not check that regularly. |
| **Class web page:** | Slides, assignments, announcements, grades, and other important information will be posted on **iCollege.** |
| **Online Discussion forum** | piazza.com  Instructor send you an invitation to join the discussion forum. You can post questions and doubts here. However, do not post your assignment or lab work publicly in this forum. If you need feedback to your lab or assignment work, you can post privately (look for instructor only option) to the instructor about that. |
| **TA information:**  **Grader information** | See iCollege (Content-> Contacts)  There is a section in the iCollege named “Who graded my work!”. You can find the TA/Instructor responsible for grading your work. If you have any question about the grading, you can contact the TA, however, always cc the instructor ([mnine@gsu.edu](mailto:mnine@gsu.edu)) in your email. |
| **Prerequisites:** | CSC 1302: Principles of Computer Science II,  CSC 2510: Theoretical Foundations of Computer Science,  MATH 2420: Discrete Mathematics, with grades of C or higher are enforced. |

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| **Required Textbook:** | **"Assembly Language for x86 Processors"**, by Kip R. Irvine (7th Edition). |
| **Required Software** | 1. Microsoft Visual Studio Community Edition 2. Virtualbox for Mac users 3. Mac OS users must need to buy Windows Operating system if it is not freely available to the students. 4. Zoom and Webex video conferencing |
| **Required Hardware** | Your computer must have **Intel or AMD x86** based Processor. If you have other processors (e.g. Apple M1 Processor) contact your instructor immediately. Without access to an Intel or AMD x86 based processor, you might not be able to continue the course. |
| **Test taking tool and Hardware** | It might be necessary to take tests- including quizzes, midterm and finals - online depending on the situation. However, tests can be on campus as well. Instructor will inform you about it beforehand.  You must have a functioning **Respondus lockdown browser** installed in your computer, in case, we decide to take the tests online. It is expected that your computer (laptop or desktop) can run Respondus lockdown browser. Also, you must have a working webcam and microphone that works with Respondus lockdown browser.  You must let the instructor know at least 2 weeks before the exam if you have issues with required hardware or software. |
| **Course Description:** | This course introduces: the principles of computer architecture as applied to the Intel x86 processor family; data representation; the concepts of basic Boolean logic to computer hardware and programming; the syntax and constructs of assembly language, sequence, selection, repetition, procedures and integer arithmetic; the stack and the stack frames; creating, assembling, linking, running, and debugging assembly language programs using the Microsoft Visual Studio Integrated Development Environment. |
| **Learning Outcomes:** | Each learning outcome will be assessed via the following mechanisms: Feedback during lectures; discussion of questions in Piazza; quizzes; tests; assignments; and labs.  - **Computers Architecture**: students will be able to:   * identify the differences between Microprocessor and Microcontroller and identify different types of Microprocessors * identify the computer architecture and explain the difference between the main two computer architectures * identify the main differences between architectures * explain the Instruction Set Architecture (ISA) * identify different Computer Implementations   **-Core Concepts Relating to Assembly Language Programming**: students will be able to:   * define how assembly language fits into the wide spectrum of languages and applications. * perform binary and hexadecimal conversions and solve basic signed and unsigned integers arithmetic using 2’cmp and Hexadecimals. * give examples on how fundamental Boolean logic (AND, OR, NOT, XOR) is used to build main computer unites such as Multiplexer and adders.   **-Basic Hardware Associated with X86 Assembly Language**: students will be able to:   * identify Basic Microcomputer Design, Instruction Execution Cycle, Reading from Memory, Loading and Executing a Program. * define 32-Bit and 64-bit x86 Processors Modes of Operation, Basic Execution Environment and x86 Memory Management. * identify the components of a typical x86 Computer such as Motherboard and Memory. * explain the level of Input-Output System access.   - **Basic Building Blocks of Microsoft MASM Assembler Programs:** students will be able to:   * explain how Basic MASM Programs Elements such as constants and variables, standard formats for numeric and string literals are defined, * explain how to assemble, link, and run programs using Microsoft Visual Studio. * recognize MASM Program Intrinsic Data Types such as their size (byte, word, doubleword, and so on), whether they are signed or unsigned integers or reals, and symbolic constants. * recognize 64-Bit Assembly Programming   - **Essential Instructions for Transferring Data and Performing Arithmetic***,* students will be able to:   * solve problem related to moving data of different sizes, similar sources, and different sources using instructions such mov, movzx, movsx, xchg, etc. * use basic Arithmetic Instructions such as add, sub, neg, inc and dec and show the effect of those instructions on flag register values such as sign, zero overflow. * discriminate between Memory Addressing Modes such as direct, immediate, and indirect. * create loops using loop instructions, and use some of the basic operators for transferring data such as OFFSET, PTR, and LENGTHOF.   - **Conditional Processing**, students will be able to explain and use:   * Conditional Branching, * Boolean and Comparison Instructions, * Conditional Jumps, * Conditional Structures such as while loop.   - **Integer Arithmetic**, students will be able to use:   * Shift and Rotate Instructions, * Multiplication and Division Instructions, * Extended Addition and Subtraction.   - **Procedures and Advanced Procedures***,* students will be able to:   * explain and use Stack and Stack Operations, * define and use Procedures, * use an External Library. * explain Stack Frames and use them to solve Recursion algorithms problems such as calculating a Factorial.   - **Floating-Point Processing and Instruction Encoding***,* students will be able to:   * explain and apply Floating-Point Binary Representation. * identify Floating-Point Units * use the major floating-point loading and arithmetic instructions. |

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| **Grading** | |  |  |  |  | | --- | --- | --- | --- | | **Elements** | **Numbers (might vary)** | **Duration** | **Weight** | | Final Exam | 1 | 2.5 hours | 30% | | Midterm | 1 | 1 hour | 25% | | Biweekly Quizzes | 5~6 (Lowest scoring quiz will be dropped) | 30 minutes | 15% | | Lecture Attendance Quizzes | 26~28 | 5 minutes | 5% | | Assignments | 4~5 |  | 15% | | Lab works | 12~13 | 1 weeks | 8% | | Lab attendance | 12~13 |  | 2% |   Number of quizzes and Assignment might change during the course.  **Assignments:**  There will be five assignments:   * Assignments are due on the due date with specific time * Assignments have to submit using iCollege. * Assignments must be your own work. * If you turn in assignment with in 48-hours after the deadline, there will be a 20% penalty. * Assignments will not be graded after that.   **Biweekly Quizzes:**  There will be 5 to 6 biweekly quizzes.  **Lab works: 2 points for attendance + 8 points for lab work**  **You can find your appropriate lab section in GSU PAWS account**.  The lab sections along with the schedule, place and TA information, are listed below:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Lab Section** | **CRN** | **Lab time** | **Room** | **TA** | **Email** | | 8 | 18118 | Fri 09:00 AM - 10:40 AM | Classroom South 200 | TBA | TBA | | 6 | 18119 | Fri 11:00 AM - 12:40 PM | Classroom South 210 | TBA | TBA | | 2 | 18120 | Fri 01:00 PM - 02:40 PM | Classroom South 203 | TBA | TBA | | 4 | 21769 | Fri 01:00 PM - 02:40 PM | Classroom South 203 | TBA | TBA |   **Your lab TA is responsible for grading your lab work.**  During the lab, your lab TA demonstrates couple of examples with a short overview on the topic. It is expected that you practice the examples. However, those examples will not be graded. Then the Lab TA explains the problems those will be graded. You can complete those labs during the lab time (recommended), however, you can submit the lab work within 2 days after the lab.    **Final grade will be determined based on the following:**  **A+ (97 – 100), A (90 - 96.9),**  **B+ (87 – 89.9), B (80 - 86.9),**  **C+ (77 – 79.9), C (70 – 76.9),**  **D (60 – 69), F (59 and below)** |
| **Policies** | **COVID related policies:**   * You probably have an opinion on the effectiveness and use of masks to limit the spread of COVID-19 but wearing a face mask is not required in Georgia State classrooms. I will be wearing my face mask, and you are encouraged to wear yours. If you choose not to wear a face mask there is no penalty, and students should not engage an any type of disruptive behavior towards those who have made a different choice about wearing a mask.   You can read more about Vaccinations and Preventative Measures, including mask requirements, here: <https://covidinfo.gsu.edu/vaccine>   * Students who want to do well in this course will attend class following the class attendance policy. You will need an excused absence due to illness. GSU has a new process for students seeking excused absences through the Dean of Students Office. Please submit documentation to <https://deanofstudents.gsu.edu/student-assistance/professor-absence-notification/>. I will then be notified by the Dean of Students of any excused absences. * Should a student test COVID positive, any accommodations to the class attendance policy will be informed by evolving guidance from the CDC on quarantine. In most cases there will be no major change to mode of course delivery, so students will be responsible for collecting notes for missed in-person classes and making up any work they miss during quarantine. Anyone who has a positive COVID test is encouraged to alert the university so that appropriate contact tracing can be conducted.   **Attendance Policies:**  Regular attendance is expected during the lectures. Lecture attendance and lab attendance will be the 7% of the course grade. Students need to take an attendance quiz during the lecture to get the attendance points. You might see three questions in lecture quiz (e.g. True/False, Multiple choice). Topics are from the last lecture.  **Lab Policies:**  **All the Labs will be on campus**. Lab attendance is 2% of the grade. You must inform the instructor if you fail to attend the lab due to unavoidable reasons. You might need to show documents.  During the lab, your lab TA demonstrates couple of examples with a short overview on the topic. It is expected that you practice the examples. However, those examples will not be graded. Then the Lab TA explains the problems those will be graded. You can complete those labs during the lab time (recommended), however, you can submit the lab work within 2 days after the lab.    **Lecture recordings:**  We highly encourage you to attend the lecture or watch the recorded lectures regularly, so that you do not fall behind. We are planning to post the lecture recording within 12-hours after the lecture.  There will NOT be any recordings for the lab sessions.  **Policies regarding absence, missed biweekly quizzes and assignments:**  If you are unable to take an exam or make an assignment deadline due to an *exceptional reason (*e.g., illness, death of family member*) that can be officially documented*, you must request the instructor in advance for **possible alternative arrangements**. If you have any job interview or job-related difficulties, we are open to consider your case, however, you need to show the documents to prove your case to the instructor. The possible alternative arrangement can be (but not limited to) – extra credit assignment to replace the missed lab, quiz or assignments, due-date extension. Instructor will decide the alternative arrangement.  **Grading:**  All re-grading requests must be made within 2 classes from returned work.  All interactions during the lecture will be civil, respectful, and supportive of an inclusive learning environment for all students.  **Accommodation:**  Students who wish to request **accommodation for disability** may do so by registering with the Office of Disability Services. Students may only be accommodated upon issuance by the Office of Disability Services of assigned Accommodation Plan and responsible for providing a copy of that plan to instructors of all classes in which accommodations are sought.  Your constructive assessment of this course plays an indispensable role in shaping education at Georgia State University. Upon completing the course, please take the time to fill out the online course evaluation.  **Posting Materials in External Sites:**  **GSU Policy Prohibiting Students from Posting Instructor-Generated Materials on External Sites**  The selling, sharing, publishing, presenting, or distributing of instructor-prepared course lecture notes, videos, audio recordings, or any other instructor-produced materials from any course for any commercial purpose is strictly prohibited unless explicit written permission is granted in advance by the course instructor. This includes posting any materials on websites such as Chegg, Course Hero, OneClass, Stuvia, StuDocu and other similar sites. Unauthorized sale or commercial distribution of such material is a violation of the instructor’s intellectual property and the privacy rights of students attending the class, and is prohibited. This policy was approved by the GSU Faculty Senate on August 21, 2020.  **Diversity:**  It is my intent that students from all diverse backgrounds and perspectives be well served by this course, that students’ learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. It is my intent to present materials and activities that are respectful of all diversity including gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture. Your comments (in the discussion posts and in person) related to the class and content will be encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups.  **Resources for Homelessness (Embark)**  Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact the Dean of Students for support. Furthermore, please notify the professor if you are comfortable in doing so. This will enable us to provide resources that we may possess. The [Embark program at GSU](https://nam03.safelinks.protection.outlook.com/?url=https%3A%2F%2Fdeanofstudents.gsu.edu%2Fstudent-assistance%2Fembark%2F&data=02%7C01%7Ccknight4%40gsu.edu%7C911f2fa2c62f430959cc08d7c052b815%7C515ad73d8d5e4169895c9789dc742a70%7C0%7C0%7C637189333812387583&sdata=kjV89T0qLZ6mUSMKUXhR17KtL35HCwr36nl23m5ABMQ%3D&reserved=0) provides resources for students facing homelessness and [Panther’s Pantry](https://nam03.safelinks.protection.outlook.com/?url=https%3A%2F%2Flewis.gsu.edu%2Fnutrition%2Fpanthers-pantry%2F&data=02%7C01%7Ccknight4%40gsu.edu%7C911f2fa2c62f430959cc08d7c052b815%7C515ad73d8d5e4169895c9789dc742a70%7C0%7C0%7C637189333812387583&sdata=sZVOKM1221tjvIwliV0GjnhHr5LEplkW3nAtYYmET8E%3D&reserved=0) provides resources for students facing food insecurity. |
| **Plagiarism** | Plagiarism will result in a score of 0 for the work or dismissal from the course. It is the students’ responsibility to allow no one to copy her/his work. If it is found, both works will be assigned 0 regardless of who copied from whom. The instructor has the right to evaluate if the students are cheating and make a decision. For more: <https://deanofstudents.gsu.edu/student-conductpolicy-on-academic-honesty/> |
| **Disclaimer** | This course syllabus provides a general plan for the course, but is subject to change as course events unfold. All changes will be announced on the iCollege. |
| **Initial Plan** | The course syllabus provides a general plan for the course; deviations may be necessary. Some of the materials will be from outside. You must follow the lectures: |

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| **Week** | **Date** | **Lectures and Topics** | **Book**  **Sections** | **Biweekly Quizzes** | **Assignments** | **Labs** | **Note** |
| 1 | 01/10-01/14 | L1: Syllabus, Big picture  L2: Chapter 1 - Basic concept | 1.1, 1.2 |  | A1 | No Lab | Late registration |
| 2 | 01/17-01/21 | L3 & L4: Chapter 1 - Basic Concepts | 1.3, 1.4, 1.5 | Q1  (01/20) |  | Lab1 | 01/17/2022  Holiday (MLK) |
| 3 | 01/24-01/28 | L5& L6: Chapter 2 - x86 Processor Architecture | 2.1, 2.2, 2.3 |  | A2 | Lab2 |  |
| 4 | 01/31-02/04 | L7: Chapter 2 - x86 Processor Architecture,  L8: Chapter 3- Assembly Language Fundamentals | 2.4, 2.5, 2.6,  3.1, 3.2 | Q2  (02/03) |  | Lab3 |  |
| 5 | 02/07-02/11 | L9 & L10: Chapter 3- Assembly Language Fundamentals | 3.3, 3.4, 3.5 | Grade Q2 |  | Lab4 |  |
| 6 | 02/14-02/18 | L11: Chapter 3- Assembly Language Fundamentals  L12: Chapter 4 - Data Transfers, Addressing, and Arithmetic | 4.1, 4.2, 4.3 |  |  | Lab5 |  |
| 7 | 02/21-02/25 | L13- Chapter 4 - Data Transfers, Addressing, and Arithmetic | 4.5, 4.6 |  |  | Lab6 | Midterm  (02/24/21) |
| 8 | 02/28-03/04 | L14 & L15- Chapter 4-Data Transfers, Addressing, and Arithmetic | 6.1, 6.2, 6.3 |  | A3 | Lab7 | Midpoint  (03/01/21) |
| 9 | 03/07-03/11 | L16 & L17: Chapter 6 - Conditional Processing | 6.4, 6.5 | Q3  (03/10) |  | Lab8 |  |
| 10 | 03/14-03/20 | SPRING BREAK | | | | | |
| 11 | 03/21-03/25 | L18 & L19: Chapter 6 – Conditional Processing | 7.1, 7.2, 7.3,  7.4 | Grade Q3 |  | Lab9 |  |
| 12 | 03/28-04/01 | L20 & L21: Chapter 7 - Integer Arithmetic | 5.1, 5.2, 5.3,  5.4, 5.8 | Q4  (03/31) | A4 | Lab10 |  |
| 13 | 04/04-04/08 | L22: Chapter 7 - Integer Arithmetic  L23: Chapter 7 - Integer Arithmetic, Chapter 5 - Procedure | 8.2, 8.3 | Q5  (04/07) |  | Lab11 |  |
| 14 | 04/11-04/15 | L24 – Chapter 5 - Procedures,  L25 – Chapter 8 - Advanced Procedures | 12.1, 12.2 |  | A4 | Lab12 |  |
| 15 | 04/18-04/22 | L26: Chapter 12 - Floating point processing, Instruction Encoding.  Review for final exam | 12.2, 12.3 |  |  | No Lab | April 25th is the last day of the class |