

COSC 2425 Computer Organization and Machine Language Richland College
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Instructor: Hieu D. Vu

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Office Hours: 7:00 – 8:00 M, T, W, R, F

Course Description: Topics include basic computer organization, Central Processor Unit (CPU) Memory, In/output, digital representation of data. Assembly representation of data and instructions; addressing techniques; arithmetic, logic, and shift operations

Prerequisite: One semester of a high-level programming language.

Textbooks and Materials:

- Assembly Language for the IBM PC Family, Third Edition, by William B. Jones, Scott/Jones Inc. Publishers, 1997. ISBN# 1-57676-058-8
- Computer Organization and Architecture. Sixth edition, Williams Stallings, Prentice Hall. 2003. ISBN# 0-13-035119-9
- High-density computer diskettes (3 1/2 inch), IBM-formatting, labeled with your name.
- Richland College Student ID so that you can use the drop-in computer labs.

COURSE OBJECTIVES:

COSC 2425 Learning Outcomes

- . Understand the computer organization and architecture.
- . Understand computer hardware components. The CPU, memory, I/O devices.
- . Write and debug simple programs written in assembly language.
- Interpret data expressed in binary, decimal, and hexadecimal
- Program input/output, arithmetic operations, decisions, and repetitions in assembly
- Use assembly language procedures and macros
- Understand 16-bit addressing
- Use bit operations and perform array processing

Core Curriculum Intellectual Competencies

- Reading: the ability to analyze and interpret a variety of printed materials - books, documents, and articles
- Writing: the ability to produce clear, correct and coherent prose adapted to purpose, occasion and audience
- Speaking: ability to communicate orally in clear, coherent, and persuasive language appropriate to purpose, occasion, and audience
- Listening: analyze and interpret various forms of spoken communication, possess sufficient literacy skills of writing, reading
- Critical Thinking: think and analyze at a critical level
- Computer Literacy: understand our technological society, use computer based technology in communication, solving problems, acquiring information.

Core Curriculum Exemplary Educational Objectives

- Discuss basic computer organization and communications terminology.
- Evaluate the effects and implications of computers and communication technology on society
- Demonstrate knowledge of the impact of technology on the individual's privacy, security, lifestyle, work environment, standard of living, and health
- Gather information for decision-making
- Participate in global communities using available technology
- Create quantitative and qualitative data presentations

Evaluation:

		<i>Numeric Average</i>	<i>Letter Grade</i>
Exams (3)	50%	90 or above	A
		80 - 89	B
Labs,	30%	70 - 79	C
Homework,		60 - 69	D
Programs	20%	below 60	F
Participation			

Students should retain all graded papers through the end of the semester in case there is a question about a grade.

Make-up Exams: If you miss an exam, you must take the comprehensive make-up exam that will be given during the scheduled final exam period.

Late Assignments: Homework assignments will not be accepted late, and quizzes that are missed cannot be made up. Lab assignments will be accepted a maximum of one class period late, with a possible penalty of one letter grade.

Student Code of Conduct: Students should read and abide by the Student Code of Conduct as given on pp. 50-56 of the Richland College 2000/2001 catalog.

Academic Honesty Policy: All students are expected to support the Richland College Statement on Academic Honesty. A copy of this Statement is on the school network at I:\zimm\AcademicHonesty.doc. In this class students are encouraged to help each other solve problems. However, unless an assignment is a team assignment, the work each student turns in should be mainly his/her own effort. Accordingly, duplicate assignments may receive a grade divided among the participants.

Attendance policy: Student input to the class is very important. Therefore, attendance will affect the final class average. One point will be deducted from the final average for each absence over two. Sleeping in class will be considered an absence, as will chronic tardiness. If you have a particular problem with regard to attendance, please talk with me about it as soon as possible. If you must be absent for a class, it is your responsibility to find out from other students in the class what you have missed. Students who will be absent from class for the observance of a religious holiday must notify the instructor in advance. Please refer to the college catalog Student Obligations section.

Withdrawal (Drop) Policy: To drop a class or withdraw from the College, students must obtain a drop or withdrawal form and follow the prescribed procedure. It is the student's responsibility to drop or withdraw. Failure to do so will result in receiving a performance grade, usually a grade of "F." Should circumstances prevent a student from appearing in person to withdraw from the College, the student may withdraw by mail by writing to the Registrar. No drop or withdrawal requests are accepted by telephone. Students who drop a class or withdraw from the College before the semester deadline receive a "W" (Withdraw) in each class dropped. The deadline for receiving a "W" is indicated on the academic calendar and the current class schedule. This semester the drop date is April 11, 2002. The deadline for dropping without a "W" is January 28, 2002. A grade of incomplete (I) is an option at the discretion of the instructor.

Disability Services/Special Services: If you are a student with a disability and/or special needs who requires ADA accommodations, please contact Richland College Disability Services Office, C120, (972) 238-6180.

Computer/Internet Policy: As a Richland College student, you have access to the Del Rio computer labs for educational and instructional purposes. You are required to show your Richland Student ID when requested by lab personnel. You are expected to follow lab policies as well as the Student Code of Conduct specified in the catalog.

Tutoring and Other Assistance Policies: Tutoring is available through the Center for Teaching and Learning Connections ((972) 238-6226, Medina 216) and the Del Rio lab ((972) 238-6317, large counter center of second floor). Generally, one hour per week is free.

Food and Drink Policy: No eating or drinking is allowed at the computer tables in the lab rooms or in the lecture room.

RICHLAND COLLEGE
COURSE SYLLABUS

Week 1	<u>Chapter 1,2:</u>	Introduction to Computer hardware. Organization and Architecture. Brief history of computer. (Stallings). Information Assurance, Security and Controls. Number systems: Decimal, Binary, Hexadecimal number conversion. (Jones).
Week 2	<u>Chapter 3:</u>	Computer functions and interconnection. (Stallings). The Assembler and first assembly program. (Jones).
Week 3	<u>Chapter 4:</u>	Memory system. Internal and cache memory. (Stallings). Using Stack, Data and Code segments in assembly program. (Jones).
Week 4	<u>Chapter 5:</u>	Internal memory DRAM, SRAM, and ROM. (Stallings). Input / Output. External devices. More on I/O (Jones). Programming Assignment # 1 due.
Week 5	<u>Chapter 6:</u>	External memory, Magnetic disks, Optical disks, RAID (Stallings). Numerical arithmetics (Jones).
Week 6	<u>Chapter 7:</u>	Input/Output program I/O. Interrupts (Stallings). Compare and branching, Conditions, Logical expressions and selection control structures. (Jones). EXAM I.
Week 7	<u>Chapter 8:</u>	Operating Systems. Scheduling, Memory management (Stallings). Looping structures (Jones).
Week 8	<u>Chapter 9:</u>	Arithmetic and Logic unit. Integer representation and arithmetic. (Stallings). Subprograms (Jones). Programming Assignment # 2 due.
Week 9	<u>Chapter 10:</u>	Instruction sets. Machine instruction, Operands. Addition, Subtraction, Multiplication and Division. Internal format of Instructions. (Stallings). Subprogram (cont.) (Jones).
Week 10	<u>Chapter 11:</u>	Instruction sets. Addressing mode and formats. (Stallings) Applying assembly. Numeric I/O. (Jones)
Week 11	<u>Chapter 12:</u>	CPU structure and functions. Register organization. (Stallings). Applying assembly. Numeric I/O (cont) (Jones)
Week 12	<u>Chapter 13:</u>	Reduce instruction set. Registers pipelining. (Stallings) Macros, Macros definition, Writing Macros. (Jones). Programming Assignment # 3 due.
Week 13	<u>Chapter 14:</u>	Instruction level. Parallelism and superscalar. (Stallings). Macros (cont.) Micro programmed control. Basic concept. Microinstructions. Writing Macros and program testing. Macro declaration, expansion, Parameter Parentheses, Local Symbols. (Jones) Exam II.

Week 14	<u>Chapter 15</u>	The IA-64 Architecture. Instruction format. Assembly format. Predicate execution. (Stallings). Micro Operations. Control of the processor. Writing Subprograms. Call subprograms, compile and linking. (Jones)
Week 15	<u>Chapter 16:</u>	Control unit operation. (Stallings). Array processing. (Jones)
Week 16		Review course and FINAL EXAM.