

Computer Science 3304 – Computer Organization and Programming

Student Learning Outcomes

1. Students will learn basic principles of computer architecture as applied to the Intel IA-32 processor family.
2. Students will learn basic Boolean logic and how it applies to programming and computer hardware.
3. Students will learn about data representation, including signed and unsigned integers, real numbers, and character data.
4. Students will learn how to create assembly language application programs.

Course Content

Textbook: *Assembly Language for Intel-Based Computers*, Fifth Edition, by Kip Irvine

The following chapters including the particular sections listed are covered. (See textbook “Contents”)

1. Basic Concepts

- Welcome to Assembly Language
- Data Representation
- Boolean Operations

2. Assembly Language Fundamentals

- Basic Elements of Assembly Language
- Assembling, Linking, and Running Programs
- Defining Data
- Symbolic Constants

3. Data Transfers, Addressing, and Arithmetic

- Data Transfer Instructions
- Addition and Subtraction
- Data-Related Operators and Directives
- Indirect Addressing
- JMP and LOOP instructions

4. Procedures

- Linking to an External Library
- The Book’s Link Library
- Stack Operations
- Defining and Using Procedures
- Program Design Using Procedures

5. Conditional Processing

- Boolean and Comparison Instructions
- Conditional Jumps
- Condition Loop Instructions

6. Integer Arithmetic

- Shift and Rotate Instructions

- Shift and Rotate Applications
- Multiplication and Division Operations

7. Advanced Procedures

- Stack Frames
- Recursion
- INVOKE, ADDR, PROC, and PROTO
- Creating Multi-module Programs

8. Strings and Arrays

- String Primitive Instructions
- Two-Dimensional Arrays
- Searching and Sorting Integer Arrays

Additional Content

Any section or chapter not listed previously.