# C404: Assembly Language

## Course summary

This course covers the organization and behavior of real computer systems at the assembly-language level. Topics include the mapping of statements and constructs in a high-level language onto sequences of machine instructions, as well as the internal representation of simple data types and structures. Numerical computation and subroutines are examined.

## Course Goals

You will gain the following knowledge in topics related to assembly language:

- Intel and AMD processor architecture and programming.
- Describe von Neumann architecture and how its components interact.
- Real-address mode and protected mode programming.
- Assembly language directives, macros, operators, and program structure.
- Demonstrate how fundamental high-level programming constructs are implemented at the machine-language level.
- Understand the Assembly Language's procedures, parameter passing and stack operations.
- Programming methodology, showing how to use assembly language to create system-level software tools and application programs.
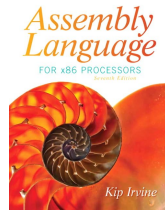- Diagnosing and debugging assembly language programs.

**Textbooks**



Figure 1: Assembly Language for x86

- *Assembly Language for x86 Processors*
- by **Kip Irvine**
- Pearson 2019, 8th Edition

**Lab Resources**

It is quite important to try all examples in the lecture notes. You have two options:

1. Use online compilers (Quick and easy):

   - OneCompiler.com

2. See Lab(1)

**Grading**

| Activity   | Weight |
|------------|--------|
| Labs       | 40%    |
| Final Exam | 60%    |

**Tentative Schedule**

| Week # | Topic | Kip | Assignment |
|--------|-------|-----|------------|
| Week 1 | Basic Concepts | Ch.1-2 | |
| Week 2 | Assembly Language Fundamentals | Ch.3-4 | Lab(1) |