Administrative Unit: Computer and Mathematical Sciences Department

Course Prefix and Number: CISS 360

Course Title: Computer Systems and Assembly Language

Number of: Credit Hours: 3  Lecture Hours: 3  Laboratory Hours: 0

Catalog Description: Introduces fundamental concepts of computer systems including data representation, computer arithmetic, Boolean algebra, SSI logic design, register-transfer and micro-operations, computer organization, assemblers and the assembly language programming. Prerequisites: CISS 245 (or CISS 242 and CISS 243). Offered odd Fall.

Prerequisite(s)/Corequisite(s): CISS 245 (or CISS 242 and CISS 243).

Text(s): Clements, Alan. 68,000 Family Assembly Language. PWS.

Irvine, Kip R. Assembly Language for Intelligence-Based Computers. Prentice Hall.

Course Objectives:

• To conceptualize the hardware structure of a modern stored-program digital computer.
• To develop skills in various number systems, specifically binary, octal, and hexadecimal.
• To code assembly language programs.
• To relate higher-level programming constructs and methods to low-level instructions.

Measurable Learning Outcomes:

• Diagram the architecture of a von-Neumann machine.
• Diagram the internal structure of a CPU.
• Perform arithmetic in various bases, specifically binary, octal, and hexadecimal.
• Perform conversions between various number systems, specifically binary, octal, decimal, and hexadecimal.
• Perform bit-wise logical operations (Boolean algebra).
• Manipulate various data representations, including sign-magnitude, two’s complement, IEEE floating point, and ASCII.
• Write assembly language programs including subroutines, recursion, interrupts, and input/output.
• Describe the assembly process.
• Describe how to implement higher-level programming constructs and methods using assembly language.
• Interact with the operating system using assembly language.

Topical Outline (major areas of coverage):

• Introduction to computer hardware
• Logical operations and Boolean algebra
• Data representation
• Computer arithmetic
• Central processing unit
• Assembly language programming
• Input/output
• Computer memory
• Computer communications
• Operating systems

Recommended maximum class size for this course: 30

Library Resources: Online databases are available at http://www.ccis.edu/offices/library/resources.asp. You may access them from off-campus using your eServices login and password when prompted.

Prepared by: David Heise
Name Signature

Date: February 11, 2005

NOTE: The intention of the master syllabus is to provide an outline of the contents of this course, as specified by the faculty of Columbia College, regardless of who teaches the course, when it is taught or where it is taught. Faculty members teaching this course for Columbia College are expected to facilitate learning pursuant to the course objectives and cover the subjects listed in the topical outline. However, instructors are also encouraged to cover additional topics of interest so long as those topics are relevant to the course’s subject. The master syllabus is, therefore, prescriptive in nature but also allows for a diversity of individual approaches to course material.

Office of Academic Affairs
12/04