Course Description
This course is an introduction to microprocessors and basic computer systems. Topics include programming and machine language, the central processing unit (CPU), memory and input-output devices.

Prerequisites: CMP 101 or CMP 210 and EET 150, or permission of the department head.

Textbook:

Course Objectives:
Listed below are course objectives and associated learning outcomes:
1.     Demonstrate an understanding of Microprocessors and Microcontroller Concepts.
   A. Compare and contrast microprocessors and microcontrollers.
   B. Explain the concept of embedded systems.

GEO 7
Assessment Strategy: Exam questions, quizzes and homework.

2.     Describe the fundamental characteristics of software.
   A. Manipulate data using the registers and Load instructions.
   B. Describe precautions in using the stack in subroutines.
   C. Assemble and run an 68HC11 program.

GEO 7
Assessment Strategy: Exam questions, quizzes and homework.

3.     Describe the fetch, execute, read, write, and I/O machine cycle for a microprocessor.
   A. Show the bus contents and the appropriate control signals in reference to the system clock when these machine cycles are executed.
   B. List the types of external signals and explain their purposes.
   C. Explain the terms instruction cycle, machine cycle, and T-state.

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4.     Use timing diagrams for the following instruction cycles: read, write, and I/O to determine the speed requirements for memory interfacing.
   A. Analyze given EPROM and R/W memory interfacing circuits and specify their Memory address ranges.
B. Explain the terms absolute decoding and fold back memory.
C. List steps required to interface a memory chip.

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Assessment Strategy: Exam questions, quizzes and homework.

5. Write, assemble, and debug software programs.
   A. Access RAM, I/O, and port using bit address.
   B. List special function registers addresses.
   C. Code 68HC11 instruction to manipulate a look-up table.

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Assessment Strategy: Exam questions, quizzes and homework.

6. Interface a microprocessor to an A to D, D to A, and other peripheral devices.
   A. Explain the process of data acquisition using ADC chips.
   B. Describe factors to consider in selecting an ADC chip.
   C. Interface a DAC chip to the 68HC11.

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7. Explain pooled interrupts, vector interrupts, and DMA.
   A. List the 6 interrupts of 68HC11.
   B. Program 68HC11 for interrupt-based serial communication.

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Assessment Strategy: Exam questions, quizzes and homework.

8. Explain how the microprocessor is used in communication by describing the function of parallel and serial ports, UARTS, Ethernet, and the RS-232 Interface.
   A. Describe data transfer rate and bps rate.
   B. Program the 68HC11 serial port in Assembly and C.
   C. Define the RS232 standard.

GEO 7
Assessment Strategy: Exam questions, quizzes and homework.

*Note: Assessment Strategy: There is a required Graded Electronic library Database assignment
*Satisfies GEO objective 7

COURSE GUIDELINES
The course will be 2 hours lecture and 2 hours laboratory per week.

An Electronic library research paper exploring some aspect of digital electronics Circuits will be required with the following minimum requirements: Reference from The electronic library database collection. Due week 12: Cover page with name, title and date; body with Introduction, report and summary. The paper shall be not less than three full pages, and a bibliography from the electronic library database page with a minimum of four total references.
The grading rubric for the paper:

**Cover Page**  
5 %

**Report:**  
70%
- Grammar 10%
- Style 20%
- Organization 30%
- Content 10%

**Show evidence in development of this ELA of thinking critically and reasoning logically**  
10%

**Bibliography**  
15%

**TOTAL**  
100%

**COURSE EVALUATION**
The grade will be based on 1000 points which will be divided as follows:
- Electronic Library database Assignment = 50 points
- Class Preparation & Participation = 50 points
- Monthly Quizzes = 450 points
- Competency = 100 Points
- Comprehensive Final Exam = 200 points
- Laboratory Exercises = 150 points

**TOTAL 1,000 points**

Letter grade will be assigned as follows:  
A = 900-1000 points, B = 800-899 points, C = 700-799 points, D = 600-699 points, F - Less than 600 points

**ACADEMIC HONESTY POLICY:**
Students are expected to maintain a high level of academic performance. Cheating and plagiarism are defined in the college catalog. Infractions of this policy will result in the student’s failure for the assignment or test.
*Addresses GEO objectives 8

**H1N1 STATEMENT:**
In the event of a flu epidemic or other emergency that results in the suspension of classes, faculty will be communicating with students about their courses and course requirements, such as assignments, quiz and exam dates, and class and grading policies, via faculty websites or Blackboard. Students will be responsible for completing all these assignments in accordance with class policies. Information about the resumption of classes will be communicated via the College’s website and email system.
STATEMENT CONCERNING USE OF BLACKBOARD IN COURSE:
Blackboard is being used as a supplementary site in this course. To access course content in Blackboard you need to have access to Internet connection, (other requirements may apply). Computers that meet these requirements are available on campus in MTC 200, AAB 217, HH 100, GH 204, WDC 305, and AHB 108.

Please follow these directions to access course syllabi and any other materials posted for this course:
Login Information:
From WorWic home page, point to “Quick Links” (top right) and click the “Blackboard Login” link. Enter your Wor-Wic user ID and password (same as your Wor-Wic email user ID and password). Don’t know your user ID or password? Contact Student Services.

STATEMENT CONCERNING USE OF ACADEMIC INTEGRITY AND COMPUTER USAGE POLICY:
All students logging into Blackboard affirm that they understand and agree to follow Wor-Wic Community College policies regarding academic integrity and the use of College resources as described in the college catalog. Wor-Wic Community College considers the following as violations of the computer usage policy:
Using the campus computing network and facilities to violate the privacy of other individuals. Sharing of account passwords with friends, family members or any unauthorized individuals. Violators are subject to college disciplinary procedures.

Grading Rubric
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<thead>
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<th>CATEGORY</th>
<th>A</th>
<th>B</th>
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<tr>
<td>Practical</td>
<td>Each assignment demonstrates an</td>
<td>Most assignments demonstrate an</td>
<td>Some assignments demonstrate an</td>
<td>Assignments incomplete or missing.</td>
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