COURSE OUTLINE

CITA 152 – COMPUTER LOGIC

Prepared By: Judith Beider
A. **TITLE:** Computer Logic

B. **COURSE NUMBER:** CITA152

C. **CREDIT HOURS:** 3

D. **WRITING INTENSIVE COURSE (OPTIONAL):** N/A

E. **COURSE LENGTH:** Semester (15 weeks)

F. **SEMESTER(S) OFFERED:** Fall/Spring

G. **HOURS OF LECTURE, LABORATORY, RECITATION, TUTORIAL, ACTIVITY:** Three lecture hours per week.

H. **CATALOGUE DESCRIPTION:** This course provides a background in number systems, logic gates & logic circuit basics, relational and logical operators, and problem solving skills used in computing. It introduces students to programming concepts and program design through the study of a programming language with a reduced set of instructions.

I. **PREREQUISITE/CO-REQUISITE COURSES:**
   a. Prerequisites
      • Intermediate Algebra (MATH 106) or
      • Permission of the instructor.
   b. Co-requisites: None.

J. **GOALS (STUDENT LEARNING OUTCOMES):**
   Upon completion of the course, the student will be able to:

<table>
<thead>
<tr>
<th>Course Objective</th>
<th>Institutional SLO</th>
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<tr>
<td>1. Identify what defines a number system and apply the conversion rules between</td>
<td>2. Professional Competence</td>
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<td>different number systems (emphasis: decimal, binary &amp; hexadecimal).</td>
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<td>2. Describe internal data representation in digital devices; examine operations</td>
<td>2. Professional Competence</td>
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<td>with binary integers.</td>
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<td>3. Describe the basic logic gates; show their applications in logic circuits</td>
<td>2. Professional Competence</td>
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<td>using truth tables and Boolean expressions.</td>
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<td>4. Examine general problem solving methods. Apply problem solving techniques to</td>
<td>1. Critical Thinking</td>
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<td>designing simple programs.</td>
<td>2. Professional Competence</td>
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<td>5. Experiment with a reduced instruction set programming language to write</td>
<td>1. Critical Thinking</td>
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<td>simple programs. Recognize the relationship between program variables and</td>
<td>2. Professional Competence</td>
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<td>their memory representation.</td>
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<td>6. Differentiate between arithmetic, relational and logical operators. Apply</td>
<td>2. Professional Competence</td>
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<td>them in control expressions for loop and decision statements.</td>
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<td>7. Work independently and in teams on the assigned problems.</td>
<td>1. Critical Thinking</td>
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<td></td>
<td>2. Professional Competence</td>
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<td></td>
<td>4. Inter/Intrapersonal Skills</td>
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K. **TEXTS:**
Handouts and online references provided by the instructor.

L. **REFERENCES:**
Online references provided by the instructor

M. **EQUIPMENT:** The course requires a computer lab.

N. **GRADING METHOD:** A-F

O. **MEASUREMENT CRITERIA/METHODS:**
- Class and home assignments
- Quizzes
- Exams

P. **DETAILED TOPICAL OUTLINE:**
1. Number Systems.
   a. How number systems work.
   b. The binary number system.
   c. The hexadecimal number system.
   d. Number system conversions.
      i. From decimal.
      ii. To decimal.
      iii. Binary and hexadecimal
   e. Types of numbers.
      i. Unsigned integers.
      ii. Signed integers
      iii. Representing numbers in computer memory.

2. Introduction to logic gates and logic circuits.
   a. Logic gates
   b. Logical/Boolean expressions.
   c. Truth tables
   d. Logic circuits and applications of logic circuits

   a. Problem solving concepts.
   b. The input/process/output (IPO) method.

4. Structured Programming - Introduction
   a. Program design concepts and tools.
   b. Variables and constants.
   c. Language structures.
      i. Assignment statements.
      ii. Loops.
      iii. Decisions.
   d. Functions and procedures.
   e. Simple programs

Q. **LABORATORY OUTLINE:** n/a