I101/B100
Problem Solving with Computers

By:

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I101/B100 – Problem Solving with Computers (4 cr.)

- Basic understanding of hardware (Memory, Processor, Instruction, Data)
- Basic data representation (text, numbers, images, sound, video)
- Structured Programming Techniques (sequence, repetition, condition)
- Problem Solving Techniques (top-down, bottom-up, object oriented)
- Critical thinking skills: (critical reading, listening, observing, interpreting, integrating, analyzing, developing alternative solutions, evaluating solutions, communicating coherent explanations to others, ability to make inference, ability to deduce.)
- Modularity, reusability
- Testing and debugging techniques
- Object-oriented concepts
Course Structure

- three hours of lecture and two hours of closed laboratory per week
- active learning environment
- develop and refine critical thinking and problem solving skills
- CT skills are developed within the context of creating computer solutions to problems drawn from various domains such as health care, bioinformatics, robotics, games, business, education, the arts, or social science.
The course is subdivided into two phases:

**Phase I**
- You will be actively engaged in a series of problem solving exercises. Each exercise will require approximately 2 or 3 class sessions. During these sessions, you (and your group members) will work jointly with me and our lab assistant to analyze and solve problems.

**Phase II**
- The course will become more traditional. I will continue to provide new problems to the class; however, I will limit my contribution to the solution. Instead, I will act as a supervisor or coach who will help you focus your thinking and activities.
Problem Solving Structure

- **First Classroom Session:**
  - Problem Introduction (Instructor)
  - Short lecture-1
  - Brainstorming session (Group)
  - Homework-1 (Group)

- **Laboratory Session:**
  - Skill building exercises

- **Second Classroom Session:**
  - Presentation / Discussion (Students / Groups)
  - Short lecture-2
  - Solution Design (Group and Instructor)
  - Homework 2 (Students)

- **Third Classroom Session:**
  - Solution Implementation (Instructor)
Course grading is determined as follows:

- Assignments (40 %)
- Labs (10%)
- Tests (40 %)
- Participation (10%)
Assignments

☐ The course includes approximately 8 assignments and 16 labs.

☐ Each assignment consist of 3 parts.

☐ Assignment and Labs must be completed and placed in DropBox.
Quizzes and Exams

- The course includes approximately one quiz per unit. Quizzes are for your benefit only. They help you assess your understanding of the material. The quiz grades do not count toward your course grade. You can retake a quiz as many times as you wish.

- The course will also have 2 or 3 tests. The tests will be announced approximately two weeks in advance.
Participation and Engagement

☐ This course employs active learning strategies and provides you with ample opportunity to engage with your classmates as you brainstorm, research, discuss, present, and pursue solutions to the problems posed.

☐ You must engage in at least two such activities per week, in order to qualify for the participation points. (see grading)
How can I get help?

There are a number of different resources that can help you succeed in this course. These include:

- The course web site
- Lecture notes
- Laboratories
- Video Lectures
- On-campus tutoring
- On-line tutoring
- Instructor’s regular office hours (Walk-in)
- Chatroom interaction with other students and the instructor
- Sample code
What will I need to begin the course?

- Need to **attend and participate in class and in the lab**.
- **Mathematical literacy.** (e.g. Knowledge of high school algebra.)
- **Computer literacy.** (basic use of the web, sending email with attachments, installing software, creating and navigating folders.)
Academic Integrity

- It is the responsibility of the student to know of the prohibited actions such as cheating, fabrication, plagiarism, academic, and personal misconduct, and thus, to avoid them.

- All students are held to the standards outlined in the code. Please reference the entire code for a complete listing (www.dsa.indiana.edu/Code/). Any violation may result in serious academic penalty, ranging from receiving a warning, to failing the assignment, to failing the course, to expulsion from the University.

- There is no statute of limitations on academic dishonesty. If you complete this course successfully, receive a passing grade, and then give your work to some other student to hand it as their own, then your course grade will be changed to F.