Overview

IS 101Y/CMSC 104Y
First Year IT

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What is Computing/IT?

Why are you considering IT?

Course Objectives

- **After this course, students should be able to:**
  - **Discuss the characteristics and challenges of key areas of the computing disciplines.**
  - **Analyze and present data to support informed decision-making.**
  - **Write basic programs using variables, conditional logic, and loops.**
  - **Demonstrate the skills necessary to succeed as a computing student and professional.**
  - **Work effectively in a team to solve a complex technological challenge.**

This Course

- **Experimental course (funded by NSF) for freshmen computing /IT majors**
- **Goals**
  - **Survey breadth, nature, challenges, and potential of computing disciplines**
  - **Clarify differences between IT majors at UMBC (BTA, IS, CMSC, CMPE)**
  - **Build experience working productively in teams**
  - **Develop key skills important to academic and professional success**
- **Assessment of impact and effectiveness**
  - **Survey**
  - **Focus group & end of semester interview**
  - **Review of assts**

Consent Forms

Course Staff

- **Instructors**
  - **Dr. Penny Rheingans**
    - » **OH: Thurs 11:15-1**
  - **Dr. Susan Martin**
    - » **OH:**
- **Teaching Fellows**
  - **Alec Pulianas (CMPE)**
    - » **OH: Mon 1-2:15, Tues 11:15-12**
  - **Emily Scheerer (CMSC)**
    - » **OH: Wed 2:30-4:30**
- **Peer Mentors**
  - **Tiffany Ernst (CMSC)**
  - **Marie Wagner (CMSC)**
  - **Clayonna Wheat (IS)**
  - **Max Weinberg (CMSC)**

Computational Thinking (CT)

- **Coined by Jeannette Wing, 2006**
- **Computational thinking involves solving problems, designing systems, and understanding human behavior, by drawing on the concepts fundamental to computer science.**

CT Principles

- **Connecting Computing**
  - Identification of impacts of computing.
  - Description of connections between people and computing.
  - Explanation of connections between computing concepts.
- **Developing computational artifacts**
  - Creation of an artifact with a practical, personal, or societal intent.
  - Selection of appropriate techniques to develop a computational artifact.
  - Use of appropriate algorithmic and information-management principles.

CT Principles (cont.)

- **Abstracting**
  - Explanation of how data, information, or knowledge are represented for computational use.
  - Explanation of how abstractions are used in computation or modeling.
  - Identification of abstractions.
  - Description of modeling in a computational context.
- **Analyzing problems and artifacts**
  - Evaluation of a proposed solution to a problem.
  - Location and correction of errors.
  - Explanation of how an artifact functions.
  - Justification of appropriateness and correctness.

CT Principles (cont.)

- **Communicating**
  - Explanation of the meaning of a result in context.
  - Description using accurate and precise language, notation, or visualizations.
  - Summary of purpose.
- **Working effectively in teams**
  - Application of effective teamwork practices.
  - Collaboration of participants.
  - Production of artifacts that depend on active contributions from multiple participants.

Computing Content Units

- **Big Ideas**
  - **Computational thinking**
  - **Algorithmic problem solving**
  - **Design and abstraction**
- **People**
  - **Graphics/games**
  - **Interfaces/accessibility**
- **Data**
  - **Big data and knowledge discovery**
  - **Visualization**
- **Hardware and Systems**
  - **Hardware and devices**
  - **Software systems**
  - **cybersecurity**
- **Intelligence**
  - **Game play**
  - **Machine learning**

Academic and Professional Skills

- **Working effectively**
  - **As a student**
  - **As a team member**
  - **As a future professional**
- **Soft skills**
  - **Oral presentation**
  - **Technical communication**
  - **Networking**
- **Career planning**

Administrivia

- **Late policy**
- **Academic honesty**
- **Tentative schedule**
- **If not officially registered, see me after class**
- **Fellow student looking for a note-taker**

Readings/Videos

- **Processing text to act as tutorial/reference**
  - **Work along with reading assts**
- **Online articles**
  - **Mix of general and technical**
  - **Some will be challenging (strategy)**
- **Complete reading before day listed in syllabus**
  - **Quiz at beginning of each unit to assess readiness to begin exploration of unit**
  - **Followed by discussion of unclear concepts**
- **Some links to videos**
  - **May be more**
  - **Recommend your favorite to the class**

Assignments

1. **Surveys**
2. **Journal Entries (5)**
3. **Processing**
4. **Data for Decision-Making**
5. **Matlab**
6. **Resume and Cover Letter**
7. **Poster Draft (individual section)**

Team Project

- **Teams design, develop, demonstrate, evaluate, and present a system to simulate and explore the process of student progression -- the semester game**
- **Phases**
  - **Design**
  - **Prototype Demo**
  - **Prototype Evaluation**
  - **Poster**
  - **Presentation**

Grade Components

- **Team Components**
  - **Team Quizzes (5%)**
  - **Data Asst (5%)**
  - **Project (30%)**
- **Individual Components**
  - **Individual Quizzes (5%)**
  - **Individual Assts (25%)**
  - **Final (20%)**
- **Peer evaluation (10%)**

Experiences with Teams

- **Who has had experiences with team/group projects?**
- **What was good about team projects?**
- **What was frustrating?**

Why Teams?

- **Working on well-functioning teams is fun**
- **Students learn more and perform better on teams**
- **Working on teams helps students develop a network that will be useful in later classes**
- **Working on teams is a key skill required in for success in IT careers**

How Teams?

- **What might minimize negative aspects?**
-

Team Structure

- **Same teams for whole semester**
- **Team members receive same grade on team quizzes/assts/projs, except under extraordinary circumstances**
- **Peer evaluation as part of final grade**

Form Teams

Meet with Team

- **Introductions**
  - **Name, contact info**
  - **Interests**
  - **Relevant experiences**
  - **Strengths/weaknesses**
- **Submit team roster**
  - **Team name**
  - **Team members with numbers**
  - **Weekly meeting time, location**