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**

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

**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