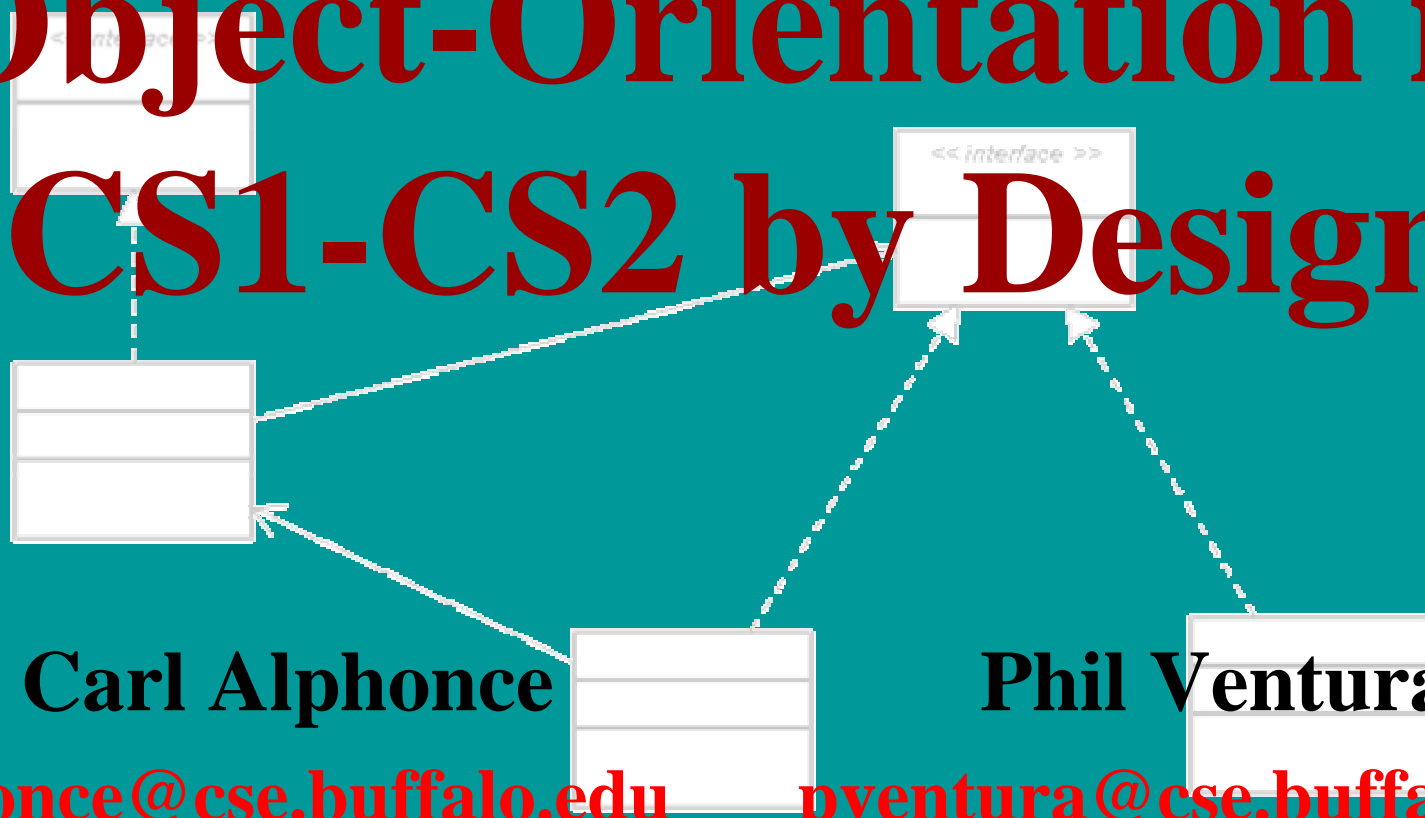
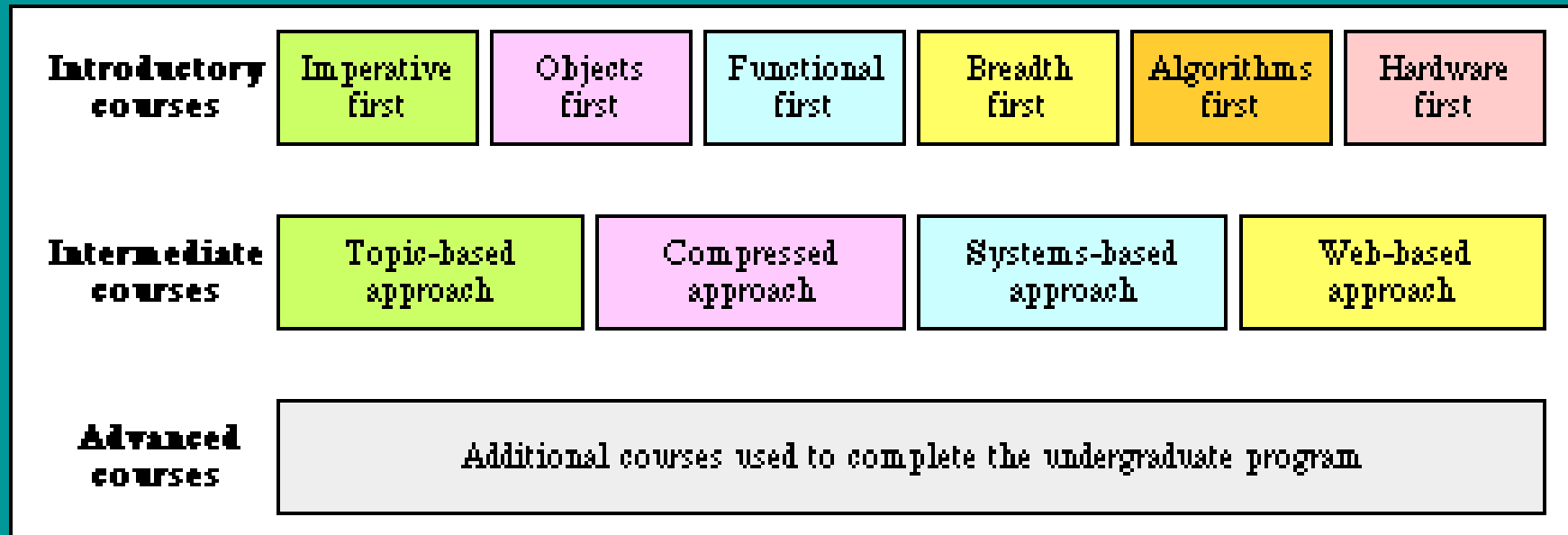


# Object-Orientation in CS1-CS2 by Design



**Computer Science & Engineering**  
**University at Buffalo**

# CC2001 Approaches to CS1-CS2



From: <http://www.acm.org/sigcse/cc2001/images/course-levels.gif>

# Programming-first weaknesses

- Focus on syntax
- Oversimplifies programming process
- Favours students with programming experience
- Promotes view that programming is the only way to solve a CS problem

# OO + Design

- Approach programming through design
- Introduce syntax only as needed
- Focus on OO building blocks
- UML tool
  - Create and edit UML class diagrams
  - Code generation with specific semantics
  - Classes & Interfaces
  - composition, association, dependency, generalization & realization

# History of Courses

- (1998) Moved to Java from C++
- Moved class/object intro earlier
- Object-orientation stressed from day 1
  - Use OO problem-solving techniques
  - Tackle problems which emphasize OO strengths

# CS1

- Early exercises: problem description & design (class diagram with documentation)
- Intermediate exercises: problem description with design development in lecture
- Late exercises: problem description with design hints in lecture

# CS1 Final projects

- Tetris (Brown)
- Nibbles
- Darwin's World (Parlante)
- TM simulator

# CS2

- Semester-long project
- Team-based project
- Multi-stage project
  - Each stage comes with a specification
  - Specs from previous stage may not be respected
  - Code-swap

# CS2 Projects

- Distributed Scrabble
- Othello with computer player
- Graphically simple Adventure game
- Lotus (2-4 player board game) with computer player

# Programming first revisited

- Focus on syntax
  - DESIGN
- Oversimplifies programming process
  - CS2 PROJECT
- Favours students with programming experience
  - FEW STUDENTS HAVE OO/DESIGN SKILLS
- Promotes view that programming is the only way to solve a CS problem
  - CODE RE-USE IS EMPHASIZED

# To Learn More

- Website:
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- Email
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  - [pventura@cse.buffalo.edu](mailto:pventura@cse.buffalo.edu)

