CSCE 181
Introduction to Computing
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http://elearning.tamu.edu
http://courses.cse.tamu.edu/taylor/csce181
Today’s Class

• Introductions
• Review of the Syllabus
• Brief review of the Department
• Brief overview of the CS Curriculum
• Brief overview of the Writing Center
• Pre-test
My Path

• **Education**
  » BS & MS: Purdue University
  » PhD: University of California at Berkeley

• **Research**
  » Use of multiple computers to simultaneously solve a problem
  » Computers can be at one site or multiple sites

• **Career**
  » Faculty at Northwestern University for 11 yrs.
  » Join TAMU in January 2003 as Department Head
Goals

• Introduction to the broad field of computing
  » Include presentations on how fundamental concepts (algorithms, data structures, etc.) are used in end products and research

• Introduction to technical writing
  » Presentations on writing (2\textsuperscript{nd}/4\textsuperscript{th} lectures)
  » Required text on writing
  » Significant writing assignments
What is Computer Science?

• Bierman: Computer science is the study of algorithms
  » how to conceive them and write them down, programming-in-the-small vs. programming-in-the-large
  » how to execute them (why does a machine act the way it does, what are limitations, what improvements are possible)
What is Computer Science?

- Brookshears: "Computer Science is the discipline that seeks to build a scientific foundation for such topics as computer design, computer programming, information processing, algorithmic solutions of problems, and the algorithmic process itself."

  » Most fundamental concept of CS is an algorithm: a set of steps that defines how a task is performed
  » An algorithm is instantiated in a program and then executed on a machine
Brookshears's Diagram

- Limitations of theory of computation,…
- Execution of architecture, operating systems, networks,…
- Analysis of algorithmics,…
- Communication of software engineering,…
- Discovery of artificial intelligence,…
- Representation of data structures, programming language design,…
What is Computer Science?

- Schneider and Gersting start with what computer science is not:
  1. Computer science is not the study of computers. Fellows and Parberry: "Computer science is no more about computers than astronomy is about telescopes, biology is about microscopes, or chemistry is about beakers and test tubes. Science is not about tools. It is about how we use them, and what we find out when we do."
What is Computer Science?

2. Computer science is **not** the study of how to write computer programs.

   Programming is a very important tool for studying new ideas and building and testing new solutions.

   A program is a means to an end (solving some problem), not the end in itself.
What is Computer Science?

3. Computer science is *not* the study of the uses and applications of computers and software.

Schneider and Gersting: "Learning to use a software package is no more a part of computer science than driver's education is a branch of automotive engineering."

Computer scientist works on specifying, designing, building, and testing software for others to use.
What is Computer Science?

Schneider and Gersting: Computer science is "the study of algorithms, including
- their formal and mathematical properties
- their hardware realizations
- their linguistic realizations
- their applications"
Schneider & Gersting's Diagram

Social Issues

Applications
artificial intelligence,…

The Software World
programming langs, compilers,…

The Virtual Machine
assemblers, operating systems,…

The Hardware World
computer organization,…

g's Data

Algorithmic Foundations of CS
design & analysis of algorithms,…
What is Computer Science?

• C.A.R. Hoare: the central core of computer science is "the art of designing efficient and elegant methods of getting a computer to solve problems"

• David Reed: Identifies 3 main themes:
  » hardware: circuit design, chip manufacturing, systems architects, parallel processing
  » software: systems software (e.g., operating systems), development software (e.g., compilers), applications software (e.g., web browsers)
  » theory: understand inherent capabilities and limitations of different models of computation (for instance, proving that certain problems CANNOT be solved algorithmically)
Subfields of Computer Science

(From Reed, based on work by Denning)

- Algorithms and Data Structures
- Architecture
- Operating Systems and Networks
- Software Engineering
- Artificial Intelligence and Robotics
- Bioinformatics
- Programming Languages
- Databases and Information Retrieval
- Graphics
- Human-Computer Interaction
- Computational Science
- Organizational Informatics
The CS Curriculum

• Give students more fundamental Computer Science earlier on
  » Most fundamental information in first 2 years
• Give students more flexibility later on
  » Allow students to tailor degree to match interests
• Intro class to gives overview of CS
• Capstone class during senior year
• Developed in conjunction with industry
• Have necessary background to obtain industry job after freshman year
The “Intro” Sequence of CS classes

• Semester 1:
  » CSCE 181: Intro Seminar
  » CSCE 121: Intro to Programming in C++

• Semester 2:
  » CSCE 221: Data Structures & Algorithms
  » CSCE 222: Discrete Structures

• Semester 3:
  » CSCE 314: Programming Languages
  » CSCE 312: Computer Organization

• Semester 4:
  » CSCE 315: Programming Studio
  » CSCE 313: Computer Systems
Upper Level

- Four “Tracks” of classes:
  - Algorithms/Theory
  - Systems
  - Software
  - Information and Intelligent Systems
- Take 1 class from each track (breadth)
  - Must take CSCE 411
- Take 3 classes in one track (depth)
- Take 1 class in any track
- Also: Upper level seminar class (CSCE 481), Senior Capstone class (CSCE 482)
Advising Staff

• Dr. Joseph Hurley, Senior Lecturer
• Dr. Richard Furuta, Professor
• Ms. Marilyn Payton
• Location: 901 Richardson
Student Organizations

- **Aggie Women in Computer Science (AWICS)**
  » [http://awics.cse.tamu.edu/](http://awics.cse.tamu.edu/)
- **Student Engineers’ Council (SEC)**
  » [http://sec.tamu.edu/](http://sec.tamu.edu/)
- **Texas A&M Computing Society (TACS)**
  » Student chapter of ACM and IEEE-CS
  » [http://tacs.cse.tamu.edu/](http://tacs.cse.tamu.edu/)
- **Texas Aggie Game Developers (TAGD)**
  » [http://tagd.cse.tamu.edu/](http://tagd.cse.tamu.edu/)
- **Upsilon Pi Epsilon (UPE) Computer Science Honor Society**
  » [http://upe.cse.tamu.edu/](http://upe.cse.tamu.edu/)
The CSE Department

• Look at the department website:
  » http://www.cse.tamu.edu
  » Lots of information there to help you learn about the department

• Also, individual faculty, research groups have their own websites
Textbook & Website

• Required
  » Excellent reference book

• WebCT: http://elearning.tamu.edu
  » Check often for:
    - Writing assignment grades
    - Recording of questions asked (receive a grade of 2)
    - Attendance (receive a grade of 1, assuming no questions asked)

• Course website:
  http://courses.cse.tamu.edu/taylor/csce181
Course Requirements

• Written Assignments
  » About previous lecture
  » Complete at least six assignments with a grade of 7 or higher (grading scale: 1-10)
  » First two assignment are required
  » One-two page write-up & cover page
    - 12 point size, single-spaced, one inch margins
  » Have 12 opportunities to write reports
  » Grading rubric is given on course website
  » Checkpoints
    - 10/20: Have at least 3 reports submitted
    - 11/17: Have at least 5 reports submitted
  » Due by 2:00pm on Tuesdays (lectures)
Course Requirements

• Final Report
  » 5-7 pages on a CS topic of your choice
  » One iteration - must achieve a grade of 70 or higher
  » Grading rubric is given on course website
  » Have checkpoints
    - 10/20: Proposal (topic and references)
    - 11/10: Detailed outline
    - 11/24: Draft report
    - 12/8: Final report

• Class Participation
  » Identify yourself when asking questions
  » Must ask questions in at least 2 lectures
  » Must visit the instructor or TA at least once
Office Hours

• Instructor: Prof. Taylor
  » Wednesdays: 9:30am – 10:30am
  » By appointment

• TA: Ben Fine
  » Mondays: 10am – 12noon
  » Thursdays: 2pm – 4pm
  » Fridays: 10am – 12noon
  » By appointment
First Assignment

• Survey of faculty in this department.
  » Due in 2 weeks, 15 September 2009
  » Pick 6 faculty, two from each level
    • Assistant Professors - new, not tenured
    • Associate Professors - not new, usually tenured
    • Full Professors - senior researchers, tenured
  » Write one paragraph about each faculty member
  » Visit: http://www.cse.tamu.edu
    - Click on people, faculty
    - Research profiles provide research interests
    - Home pages provide more detailed information
First Assignment

• Important to proof-read your write-up prior to turning in the assignment

• Assignments must be turned in using the “Assignments” tools on WebCT
  » Due by 2:00pm on 15 September 2009

• Will have an opportunity to revise the first and second write-up for a new grade

• See the grading rubric (course syllabus) to understand the grading process
Second Assignment

• Based upon the IAP Distinguished Lecture on 15 September 2009
• Due 22 September 2009
• Again proofread your assignment prior to turning in the assignment
• You will have an opportunity to revise the write-up based upon the feedback
Remaining Four Assignments

• Will have 10 lectures from which to write four assignments with a grade of 7 or higher

» Use your time wisely
University Writing Center

• See writingcenter.tamu.edu for resources and to make appointments

• Location:
  » 214 Evans Library
  » 205 West Campus Library

• Mission: Provide students of TAMU with the opportunity to enhance written communication skills through the use of face-to-face, online consulting sessions, and other resources
UWC: Hours

• **Evans Library**
  » Sunday: 5:00pm – 10:00pm
  » Monday – Thursday: 9:00am – 10:00pm
  » Friday: 9:00am – 2:00pm

• **West Campus Library**
  » Sunday: 5:00pm – 10:00pm
  » Monday – Thursday: 12:00noon – 10:00pm
  » Friday: Closed
In-Person Sessions

- Sessions begin on the hour and can last up to 45 minutes; limited to one per day.
- Best to make an appointment one day in advance.
- Allow drop-in’s. More than 5 minutes late, results in a forfeit of the appointment.
- Bring a copy of your assignment and prioritize your concerns.