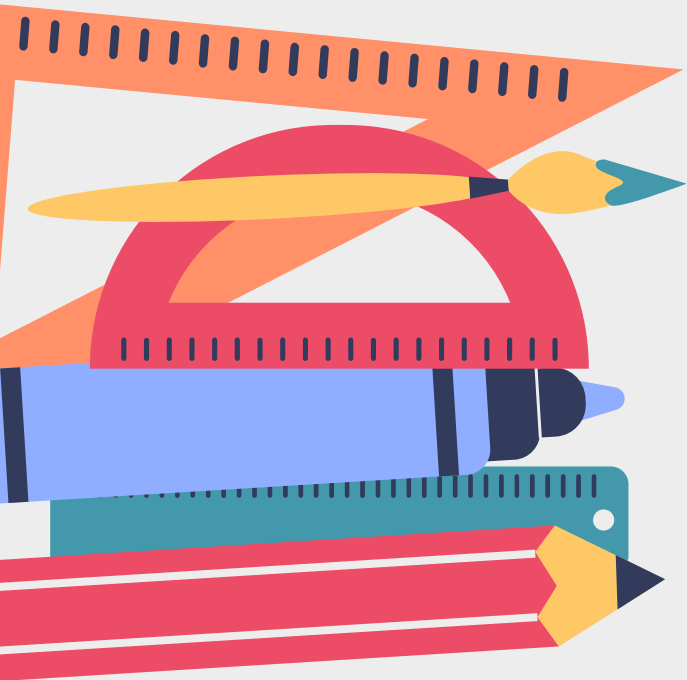




APPALACHIAN STATE UNIVERSITY

COLLEGE OF ARTS AND SCIENCES

Computer Science



UNDERGRADUATE PROGRAM

Professor Joel Swanson

Today's presentation



**What is Computer
Science?**



**What can you do
with a Bachelor's
in CS?**



**Requirements for
the Bachelor's
degree**



**Transferring in
courses**



AP courses



**Why CS at App
State?**

What is Computer Science

- ❖ **Computer Science is the study of computers and computing**
 - Theory - mathematical foundations of computing
 - Systems - hardware and systems software (compilers, operating systems)
 - Software Engineering - design, development, testing, and maintenance of software
- ❖ **Computer Science is not Computer Programming**
 - Programming is a tool
 - Computer Scientists use their knowledge of theory, systems, and software engineering to design secure, high performance software systems

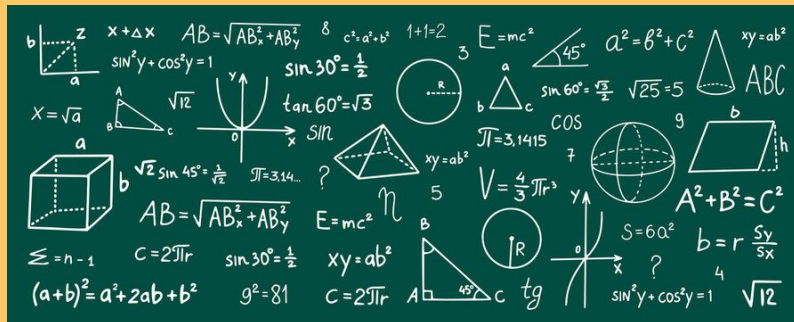


What do you do with a Bachelor's in Computer Science?

- ❖ **The majority of Computer Science graduates will work in software development positions**
 - However, some take positions with less software development requirements (network administrators, database administrators, security officers, system administrators, ...)
- ❖ **Job titles include:** software engineering, system analyst, computer programmer, cloud engineer, data scientist, full stack software engineer, ...
- ❖ **Computer Scientists are hired by a myriad of different businesses** (banks, high tech, health care, engineering, medicine, research ...)
- ❖ In 2023, Bureau of Labor and Statistics reported the **median salary** for Computer and Information Technology occupations to be \$104,420

Is Computer Science for me

- ❖ Do you enjoy technology?
- ❖ Do you love solving puzzles?
- ❖ Are you interested in figuring out how things work?
- ❖ Do you like math?



Requirements for the Bachelor's degree

Computer Science, BS (Total of 120 hours)

- ❖ 44 hours of General Education
- ❖ 41 hours of required Computer Science courses
 - Theory, systems, programming, writing in the discipline, capstone course or honors thesis
- ❖ 12 hours of Computer Science electives
- ❖ 18 hours of Mathematics
 - Discrete mathematics, calculus 1 and 2, linear algebra, statistics
- ❖ 8-10 hours of a science sequence
 - Astronomy, biology, chemistry, geology, or physics
 - Two physics sequences - one algebra based and one calculus based

Computer Science Electives

- ❖ Mobile Device Programming
- ❖ Server and Client Side Web Programming
- ❖ System Administration and Security
- ❖ Artificial Intelligence
- ❖ Data Communication and Networking
- ❖ Human Computer Interfaces
- ❖ Embedded Systems
- ❖ Machine Learning
- ❖ Neural Networks
- ❖ Computer Graphics
- ❖ Digital Image Processing
- ❖ Operating Systems
- ❖ Advanced Theory
- ❖ Algorithms
- ❖ Special topics courses; recently:
 - Cybersecurity
 - Parallel Computing
 - GPU programming
 - Digital forensics
 - Problem Based AI
 - Functional Programming
 - Modern Data Structures
 - Discrete Structures and Reasoning
 - Cloud Computing
 - Visual Analytics

Capstone Course

- ❖ **Mobile Device Students complete a capstone project of their choice**
- ❖ **Recent projects have included:**
 - Camp.io - camp site discovery, tracking, and rating website/mobile app
 - MuscleUp - iOS workout app
 - Broyhill Wind Turbine Kiosk - reactive website providing information and data visualizations in near real time
 - Career Passport - Mobile app version of a paper-based student engagement tool used by the Career Center
 - Equation Maker - math game for elementary school students

Checkout the bulletin board in the hallway to see the capstone projects being completed this semester.

Transferring in courses?

- ❖ **CS degree requirements include math courses that can be taken at most community colleges in North Carolina**
 - Calculus I, Calculus II, Linear Algebra
- ❖ **CS degree requirements include a science sequence that can be taken at most community colleges in North Carolina**
 - Astronomy, Chemistry, Physics, Biology, Geology
- ❖ **Check to see how a course will transfer (transfer services)**
 - <https://transfer.appstate.edu/transferadvising>
- ❖ **Check CS degree requirements (undergraduate bulletin)**
 - https://bulletin.appstate.edu/preview_program.php?catoid=30&poid=13438
- ❖ **CS courses at community colleges do not transfer in as CS courses at App State, in general**
 - But they can contribute to the 120 hours needed to graduate
 - You can petition for them to transfer in as CS (transfer services)

AP Computer Science courses

❖ Computer Science A

- Score of 3 transfers in as CS 1425: Overview of Computer Science
 - Not required for CS degree, but contributes to the 120 hours needed to graduate
- Score of 4 or 5 transfers in as CS 1440: Computer Science I
 - Is required for CS degree

❖ Computer Science Principles

- Score of 3, 4, 5 transfers as elective credit
 - Not required for CS degree, but contributes to the 120 hours needed to graduate

Why CS at App State?

- ❖ Department is large enough to offer a **wide and varied set of electives**
- ❖ Although we have 600 undergraduate students, we're **committed to keeping class sizes relatively small**
 - Largest classes have about 40 students
- ❖ We are **committed to the success of our students**
 - In turn, our graduates make us look good!

It's a hard major, but you can do it if you...

Get Engaged & Stay Engaged:

- ❖ CS Clubs
- ❖ AppHack
- ❖ Research
- ❖ Become a tutor or teaching assistant

Commit to:

- ❖ doing your own work
- ❖ asking for help when you need it
 - Instructors, teaching assistants, tutors, ...
- ❖ mastering the material in each course (each course builds upon the previous one, often more so than in other majors)



Department fast facts

- ❖ **Academic Programs**
 - Bachelor's of Science, ABET accredited, 600 students, 110 graduates/yr
 - Master's of Science, 25 students, 10 graduates/yr
 - Data Science Certificate, 30 students
- ❖ **Engaged Faculty**
 - 21 funded grants, > \$6 million over last 9 years
 - 21 faculty members
- ❖ **Program began in mid 1970s, became department in 1998**



(Dr. Tashakkori with student working on AppMAIS project)

Questions

Also don't forget to visit these rooms:

- ❖ **Reaching Higher in room ?????**
 - Earn a Master's degree with just one extra year of study!
 - Earn an extra, highly marketable, credential
 - Take graduate courses that can count toward the Master's degree and graduating with honors

Student Life:

- ❖ **Student Success in room ????**
 - Extra curricular activities help our students succeed!
- ❖ **Student Research Lab in room 312-W**
 - See what research some of our students are working on!