Palomar College
Computer Science Program
Frequently Asked Questions

What is Computer Science?
The study of Computer Science involves a variety of topics such as analysis and design of algorithms, design of programming languages, software engineering, computer organization, distributed computing, artificial intelligence and mathematical analysis.

Computer scientists study how to efficiently organize, store and retrieve data, how to write efficient programs, probe the limits of algorithmic techniques in designing programs to behave intelligently, develop new applications that benefit society and humankind, design complex software programs and design effective interfaces between programs and humans.

Is Computer Science the right choice of major for me?
Computer Science students focus on the fundamental principles of computing and develop skills in algorithmic reasoning, data structures, hardware-software design needs and trade-offs, and integrated software application design. Students are prepared to apply these principles creatively and responsibly.

A common misconception among students attracted to the discipline is that they will learn to be skilled web page developers, graphic specialists, or application users (word processing, spreadsheet, graphical design, and CAD applications.)

What are the first Computer Science courses I should take?
The first two Computer Science courses in our program constitute an introduction to structured programming in C (CSCI 112 Programming Fundamentals I) and object-oriented program design in Java (CSCI 114 Programming Fundamentals II).

Be aware that some computer courses will not count toward a Computer Science major at Palomar College because they are not part of the degree requirements. As an example, a course in computer peripherals, word processing or spreadsheets (CSIT 105) is not part of our degree requirement and will not transfer into a Computer Science program at a 4-year college or university.

What kind of a student succeeds as a Computer Science major?
Most successful Computer Science students have demonstrated the ability to be flexible and adaptable (i.e. they MORPH well). Specifically, the MORPH traits include: (i) Mature: Clarity of thought (long-term focused career vision). (ii) Organized: Able to manage time and balance personal work habits. (iii) Responsible: Ability to take lead and handle responsibility. (iv) Persistence: Ability to be tenacious and deliberative in problem solving. (v) Helpful: Team-oriented, societal-issues consciousness and supportive of diverse needs and reach of the discipline.

One key attribute that many successful majors have is the ability to think logically (or in Computer Science parlance, algorithmically). This means developing the ability to break down a problem into a series of small steps each of which can be solved through a logical sequence of actions.

Why should I study Computer Science?

For almost all choice jobs of the future – whether in engineering, natural or social sciences, economics, finance or government, one has to be familiar with the essential fundamentals of computing to understand and leverage technology in the search for scientific breakthroughs, the development of new products and services, or the way work is done in a technologically-driven society. Daniel A. Reed, Professor & Director of the Institute for Renaissance Computing at the University of North Carolina at Chapel Hill and the current director of CRA (Computing Research Association – http://www.cra.org) says, "Computing has become the third pillar of science, along with theory and experiment".

What are some career opportunities for Computer Science majors?

The rapid growth in technology-based jobs in all industries has created a need for technologically skilled professionals. Virtually every industry applies Computer Science professionals in a variety of ways – from computerized control of hazardous and remote environments to payroll processing in traditional industries. Industry, government and businesses seeking graduates in a wide variety of areas including software systems design, Internet computing and networking. Thus, career opportunities for Computer Science graduates are limitless.

Quick Facts: Software Developers	
2022 Median Pay	$124,200 per year $59.71 per hour
Typical Entry-Level Education	Bachelor's degree
Work Experience in a Related Occupation	None
On-the-job Training	None
Number of Jobs, 2022	1,795,300
Job Outlook, 2022-32	25% (Much faster than average)
Employment Change, 2022-32	451,200

Source: US Dept. of Labor, Bureau of Labor Statistics: https://www.bls.gov/ooh/computer-and-information-technology/software-developers.htm

What languages are used in the Computer Science curriculum?

The introductory courses in Computer Science utilize C, Java, and C++ as the tools to teach basic computer science concepts. Many subsequent courses in computer science expect you to learn other languages as necessitated by specific problems in those classes.

Do I need to own my own personal computer?
Owning a computer is obviously advantageous in terms of ease and convenience to work on your assignments at any given time. However, we do not require you to have your own computer. In addition to wireless access across the campus, we have many open computer labs for your use, which are equipped with the necessary software for your classes. While some computer labs are devoted to computer science exclusively, others are for the general student population at Palomar. Thus, some labs may have specialized software installed that is not available in every lab.

Some people I know have a technology-related job without studying much Mathematics in their college major. However, I see that a degree in Computer Science involves a year or two of Calculus. Why is Calculus required?
Most stable and well-paying technology-based jobs require adeptness with algorithmic reasoning. Studying mathematics develops your analytical ability and prepares you to think precisely, thereby preparing you to be creative – a trait essential for being a successful computer scientist. Calculus for example, is not just for engineering students, since it builds in you the ability to think about, and rank the impact of, relationships among different items. The foundations provided by studying mathematics will give you the ability to grasp the essentials of a problem, understand the various abstractions and predict patterns of change induced by changing certain parameters. Such ability is essential to be intellectually productive in your professional life (in any discipline). Note that it is not the knowledge of mathematics but rather a familiarity and comfort with algorithmic reasoning that correlates with success in the computing discipline.

If you are not able take calculus, then take trigonometry and other pre-calculus courses as a prerequisite to calculus. You should always be on solid footing in mathematics since mathematics is a long-term sequence of courses, which depend upon each other and complement corresponding Computer Science classes.

What courses are required for an A.S. Degree Major or Certificate of Achievement in Computer Science?

Required Core Courses

CSCI 112 Programming Fundamentals I	(4)
CSCI 114 Programming Fundamentals II	(4)
CSCI 210 Data Structures	(4)
CSCI 212 Machine Organization & Assembler Language	(4)
CSCI 222 C++ & Object-Oriented Programming	(4)

Electives (Choose 2)

CSCI 130 Linux Fundamentals	(3)
CSCI 250 Introduction to Artificial Intelligence	(4)
CSCI 290 Introduction to Machine Learning	(4)
CSIT 175 Python Programming	(3)
CSIT 275 Advanced Python Programming	(3)
MATH 245 Discrete Mathematics	(3)

Who should I contact for further information?

Anthony Smith
awsmith@palomar.edu

Duy Nguyen
dnguyen@palomar.edu

CSIT Department Website:
https://www.palomar.edu/csit