

Career Connections

Computer Programming

OBJECTIVES OF THE PROGRAM

The Career Connections program in computer programming is intended as a guide for students who are interested in programming as a potential career. While a very demanding occupation, professional programmers can find the job both rewarding and lucrative. Computer programs are used in some way in almost every facet of life today, giving programmers the opportunity to work in a wide variety of fields throughout their career. From the gaming industry to the health profession, computers and their programs are here to stay.

Computer programmers develop code that drives the operation of computing devices. The creation of computer programs involves careful analysis of the problem the program is to solve and the design of an algorithm to solve the problem. This process takes place prior to the development of any computer code. Once an algorithm is designed, a program can be written and debugged (which is the process of eliminating errors in the code). Debugging can be a very tedious process and requires determination and perseverance. In parallel to the development of the software (or computer program), documentation is created describing the program for both the software designers and end users. Modern software development usually involves large teams of people working collaboratively to build a final application. Computer programmers from liberal arts institutions are in high demand because of their abilities to communicate effectively and to solve problems.

RECOMMENDATIONS

Exploring Options

Computer programming is not for everyone. The lure of a high salary often attracts students to programming as a potential occupation, but this is certainly a field where you need to enjoy what you are doing in order to pursue it as a career. Anyone interested in occupations involving computers should also read the Career Connections brochure on “Information Technology” to help guide them towards an appropriate career path. If you still think you want to be a computer programmer, you should take CS 121 - Programming I as early in your Hanover career as possible. This class will help you find out what computer programming is all about. If you enjoy the class, then you will probably enjoy being a programmer. If not, you likely should look elsewhere for career options.

The Hanover College Career Center has a variety of resources that can help you to learn more about a career in computer programming. You should also consider job shadowing a computer programmer. The Career Center has a database of Hanover alumni who are willing to host and mentor students interested in their career field. You may also benefit from conducting an informational interview with one of these alumni. The Career Center library is another good resource for further career information. There they have books that focus specifically on careers in computer science such as *Great Jobs for Computer Science Majors*, by Jan Goldberg, *Careers in Focus: Computers*, published by Ferguson Publishing, and *Careers in High Tech*, by Nick Basta.

Academics

Most professional computer programmers were Computer Science majors in college. Other potential major programs are Mathematics, Physics, or Business, but most employers will want to see that you have taken a good number of programming courses before they will consider you for hire as a programmer. Fulfilling the requirements for a major in Computer Science will give you an excellent outline of courses to prepare you for a career in programming. If you choose another major, then you should at least take the following courses:

- CS 121 Programming I
- CS 122 Programming II
- CS 223 Data Structures and Algorithm Analysis
- CS 234 Computer Organization
- CS 322 Object Oriented Software Design
- CS 329 Database Systems
- CS 336 Programming Languages
- Math 121 Calculus I

Depending on the specific area in which you would like to become a programmer, other courses may also be appropriate. For instance, if you would like to pursue a career in the video game industry, you should probably take CS 349 - Computer Graphics as well. Meeting with a member of the Computer Science department to discuss your specific career goals will help you to design a plan of study most appropriate for your objectives.

Co-Curricular Activities

There is much more that you can do at Hanover to help you prepare for a career in computer programming than academic work. Any outside of class activities that help to build your writing, speaking, and leadership skills will be extremely beneficial in whatever career field you choose. Many programmers become project managers after several years of work, and the skills you learn while in college will be helpful in many ways. Becoming an officer in a club or fraternity/sorority not only looks good on your resume, but helps you learn to be a successful leader later in life. You could also consider joining the Emerging Leaders program on-campus, or becoming a Peer Advisor or Resident Assistant.

Hanover College also has a student chapter of the ACM (Association for Computing Machinery) that would help you build a network of contacts and provide you with opportunities to explore various computing fields. Joining a professional organization, such as ACM, helps connect you with resources that will be invaluable throughout your career. Go to www.acm.org to learn more.

It may be helpful to think of three different ways that co-curricular activities can be helpful to you. First, they can supplement the knowledge that you are getting in the classroom. Second, they can give you first-hand experience to the environment that will be a part of your working experience. Third, they can provide you with an opportunity to interact in situations that will be invaluable practice, even if those situations are not exactly the same as those you might later experience. Not all activities will provide you with all of these benefits, but a thoughtful selection should provide you with the skills and experiences you will need to be successful.

Work Experience

A summer programming internship would be a great way to get real job experience and help you find out what a position as a programmer is really like. Internships are available in most nearby metropolitan areas (and even potentially some in the Madison area). Students should visit the Internship Office in the Career Center for help obtaining a summer position. Many Hanover students have done computer programming internships in the past. A few of those include: Grote Industries in Madison, Manatron in Indianapolis, and Hendricks Community Hospital in Danville. The best advice for landing a good internship is to start early. Begin your search in November or December for the following summer. Students who wait until April or May will likely not be successful in finding a summer programming position. The summer after your sophomore year would be a great time to try and get your first internship.

Further Training and Education

Depending on what kind of programming job you would like and where you want to work, graduate study may be appropriate for you. You should discuss your career path with a member of the Computer Science department towards the end of your junior year to determine if graduate study is for you or not. Faculty at the college can be one of your best resources. Take advantage of the advice they can offer.

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