

Computer Science Principles

Leadership Development and Careers in Computer Science

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The computing field involves a variety of careers, from gaming, animation, software and even the arts. Many Computer Science majors combine their computer science skills with their knowledge of another discipline such as research, medicine and engineering. During this module, you will be exploring and comparing different computing careers, their training requirements, benefits, salaries, and availability of employment. You will also learn how student organizations provide opportunities to showcase your leadership abilities and talents.

Essential Questions

- What are the daily tasks and responsibilities of a professional in the field of computing?
- What skills are needed in a technological workplace?
- Why are student organizations an integral part of career and technology education?

Key Terms

Leadership styles - A leadership style is a leader's style of providing direction, implementing plans, and motivating people. There are many different leadership

styles that can be exhibited by leaders in the political, business or other fields.

Job Occupational Outlook Handbook - The Occupational Outlook Handbook is a nationally recognized source of career information, designed to provide valuable assistance to individuals making decisions about their future work lives. Revised every two years, the Handbook describes what workers do on the job, working conditions, the training and education needed, earnings, and expected job prospects in a wide range of occupations.

What to Expect

In this module, you will be responsible for completing the following assignments.

- SWOT Analysis Assignment
- Leadership Development Discussion
- Career Research Project
- FBLA Elevator Pitch

Leadership Development and Careers in Computer Science



Do you consider yourself a leader? Most people think of a leader as the boss or person in charge of a group of people. However there are other ways to display leadership. You can display leadership by:

- Taking action on your own when you see that something needs to be done or someone needs help
- Persevering when things go wrong or when the work is hard
- Listening, supporting, and contributing when working in a team
- Accepting responsibility for mistakes and wrong decisions while looking for ways to correct the problem
- Recognizing your own talents and continuing to improve

No matter what career you are planning to pursue, leadership skills are important. To be successful in any career you must work together with people from diverse backgrounds to solve problems. Computer scientists work as part of a team with computer programmers, information technology professionals, mechanical or electrical engineers and many other people from different professions.

SWOT Analysis

Building leadership skills and choosing a career begins with identifying your skills, values, interests, personality and strengths and weaknesses. A tool to help analyze your own strengths and weaknesses is a SWOT analysis. It is a tool used to identify the key internal and external factors seen as important to achieving an objective.

SWOT stands for Strengths, Weaknesses, Opportunities and Threats

A SWOT analysis groups key pieces of information into two main categories:

1. Internal factors- personal strengths and weaknesses
 2. external factors-external opportunities and threats
- Strengths: characteristics that give you an advantage over others.
 - Weaknesses: characteristics that place you at a disadvantage relative to others
 - Opportunities: resources you can use to your advantage
 - Threats: obstacles that could cause you trouble

Users of SWOT analysis need to ask and answer questions that generate meaningful information to make the analysis useful by identifying the issues or problems you intend to change or set. It is also used to reaffirm goals, or create an action plan.

Source

SWOT Analysis Presentation Assignment



You will be creating a presentation using a type of presentation software such as Powerpoint. You may use any presentation software you choose. If you choose to use Powerpoint, there is a template in the sidebar you can download. Please refer to the example document in the sidebar for specific slide headings and directions.

- Type your name on the cover slide.
- List your strengths, weaknesses, opportunities and threats on the second slide.
- Answer the questions on the third slide by analyzing your responses on the SWOT matrix.
- On the last slide, use the information from your SWOT analysis to create an action plan for developing leadership skills and how to take advantage of your opportunities. List specific actions you will take based on your analysis.

Refer to the rubric located in the sidebar before you submit this assignment. Name the assignment My SWOT Analysis. Submit your completed assignment when finished.

Leadership Development Discussion



It is now time to complete the Leadership Development discussion. Describe a situation where you served as a leader for a group or organized a community service or other project. Explain in detail your role and the skills you used. How did individuals respond to your leadership?

Computer Careers



The field of computing is far reaching and has many different career paths for one to choose. We often think of computer scientists as sitting in cubicles behind a computer typing away all day. But today they are much more than that, and work along-side doctors, lawyers, police officers, and business professionals. Technology is constantly moving and changing the way that business is conducted. Because of this, we need computing professionals that are knowledgeable in more areas than just the computer. Today we want our computer professionals to be outgoing, customer facing, and creative. Sitting in a cube and locked to your computer is not enough anymore.

Often professionals in the field of computing are lumped into a category called Computer Scientists. However, the field of computer science is broken down into several more specific fields. Software Engineer is one of these fields. This is a person who designs, writes and tests computer programs. Every program that you use on a computer is written and designed by teams of software engineers. Along this same line are Computer Engineers. Computer Engineers work in the computer systems engineering field. Computer engineering is a discipline that integrates the several fields of electrical engineering and computer science required to develop computer systems.

Through the years, as computers have become a more integral part of our lives, we have found a way to use them to our betterment through robotics, bioinformatics, and medical informatics. Robotics can be used in industry to increase safety and productivity by doing dangerous tasks or by doing menial tasks more quickly. Their precision makes them invaluable in the field of medicine, where surgeons can use robotic "extensions" of their hands allowing

them to do a very invasive surgery with only minor incisions. The medical field is growing with its need for people to integrate computing and science. Two of the main fields of medicine are bioinformatics, the application of statistics and computer science to the field of molecular biology, and medical informatics, a discipline at the intersection of information science, computer science, and health care.



The dramatic increase in internet activity for purchases and Internet banking has driven new fields of web development such as cyber security and computer forensics. Web Development is a means of creation of websites and data systems for advertising business, commerce and networking. However along with this new means of doing business, comes a need for an ability to keep these systems safe. The objective of cyber security, also referred to as computer security, is to protect information and property from theft, corruption or natural disaster, while allowing information and property to remain accessible and productive to its intended users. When cyber security fails, we find that there is a need for computer forensics. Computer forensics, sometimes called computer forensic science, is a branch of digital forensic science pertaining to legal evidence found in computers and digital storage media.

Many students initially become interested in computing as a result of the enjoyment they get from animation and video games. Animators and video game developers often work side by side creating games, programs and other types of visual entertainment. Animators also work to create animated movies, or to enhance movies. Some of the movies we watch are enhanced through computer animation and the scenery does not actually exist. These scenes come out of the imagination of the computer animator and are brought to life with the computer.

In the handout from the Association for Computing Machinery (available in the sidebar), you will learn more about the various computing career pathways that are available. This will help you choose which career you would like to research for your project.

Computer Career Research

Researching careers is an important step in choosing a career. The more research you do early on will help you make career choices based on your aptitude, skills and personality. Through research you will learn information



about the nature of the work, working conditions, training and educational requirements, earning potential, future job outlook, and more.

The Occupational Outlook Handbook is a nationally recognized source of career information, designed to provide valuable assistance to individuals making decisions about their future work lives.

Revised every two years, the Handbook describes what workers do on the on job, working conditions, the training and education needed, earnings, and expected job prospects in a wide range of occupations.

Now that you have had an opportunity to read a little about the different computer careers available, you will choose a career to explore in depth. Visit the U.S. Department of Labor, Bureau of Labor Statistics website and search the Occupational Outlook Handbook link in the sidebar for a list of computing careers.



Career Research Project

You can use any medium to write and present your material. For example, you may use PowerPoint, Prezi, or Movie Maker or another appropriate Web 2.0 tool. Your presentation should include the name of the chosen career, a description of the chosen career that includes what workers do on the job, skills needed for the career, training and education needs, earnings, expected job prospects, and working conditions.

After you have finished researching the career, find a current job posting for that career from either indeed.com, monster.com or another popular job search web site. Include the job posting in your presentation.

Write a reflective paragraph comparing the information you researched to the information in the job posting.

- What are the similarities?
- What type of plan should someone that wants to pursue that career need to make based on the skills needed and education from your research and the job posting?

Your presentation will be more interesting if you include some current developments. Use a news website such as TechNews or CNET to search articles from the past two years that deal with your career. Include facts from the article in your career presentation including the date, title, and author of the article. Refer to the rubric for this assignment located in the sidebar.

Skills for a Technological Workplace

What skills are needed in today's 21st century workplace? To be college and career ready you need academic knowledge, technical knowledge and a set of general employability skills.

A framework comprised of nine key skills, divided into three areas, was identified by numerous employer groups, educational organizations, professional associations, and federal agencies as part of an initiative of the Office of Career, Technical, and Adult Education, U.S. Department of Education.

Review the employability skills framework. Refer back to your SWOT analysis assignment in lesson one. How many of the skills in the framework did you list as your strengths? What opportunities did you list that will help you gain these skills?

In the next lesson you will learn of different opportunities to gain and improve your employability skills through Career Organizations integrated with Career and Technical Education courses.

Leadership through Career Organizations

Student organizations in Career and Technical education provide students an opportunity to learn about the importance of core values, leadership development, and career possibilities. Georgia has identified seven CTSOs integrated into the Career, Technical and Agricultural Education Curriculum.

Career and Technical Student Organization	Purpose
DECA	Focus on marketing, management, and entrepreneurial skills that prepare students to pursue a career in the field of marketing.
*Future Business Leaders of America (FBLA)	Promotes the development of leadership skills, career goals, as well as civic and personal responsibilities
Family Career and Community Leaders of America (FCCLA)	Equip students to address personal, family, work, and social issues through family and consumer science education.
Georgia Skills USA	Fosters the development of leadership and workplace skills in the global workplace through trade and industrial, technical, and health occupations.
Georgia Technology Student Organization (GA TSA)	Encourages students to be critical thinkers, problem solvers, and technically literate leaders in a high-tech society.
Career and Technical Instruction (CTI)	Prepare students with disabilities an opportunity to obtain entry-level job skills in wide-ranging occupation clusters
HOSA	Instruct students to meet the needs of the health care community by offering opportunities for knowledge, skill and leadership.
FFA	Emphasis on agricultural education and promotes problem solving and decision making by utilizing a learning by doing module.

The Future Business Leaders of America (FBLA) organization is the CTSO integrated into the Business and Computer Science Pathway. It prepares students for the workforce by providing opportunities to connect with business leaders who stress the importance of work ethics and character development and share details about the responsibilities involved with their occupation. Students are also able to meet in local school chapters to work on business projects and discuss topics that enhance leadership development. Service opportunities such as the March of Dimes and other charities allow students to learn about real-world issues and understand the needs and concerns of their community. Works created by students can be showcased at local, state, and national conferences. During these events, students are able to compete with students in several business related categories as well as obtain information about career and personal development.

Once you become a member of FBLA, you are able to compete in events at the local, state, and national levels to test your business knowledge and skills. Prior to registering for a competitive event, it is important to familiarize yourself with the event guidelines. The resource in the sidebar will provide you with details and offer resources such as sample event materials, information on the number of participants eligible to participate, and whether the competitive event is open to an individual, team, or chapter. After you have reviewed the guidelines, you will be amazed at the number of exciting events that are available. Some of those events include creating a business financial plan, inventing a mobile application, producing a public service announcement, and constructing a website.

FBLA Elevator Pitch Assignment



Now that you know about FBLA, create an elevator speech to promote the benefits, skills and opportunities associated with the organization. The name "elevator pitch" reflects the idea that it should be possible to deliver the summary in the time span of an elevator ride, or approximately 60 seconds to two minutes. It is a clear, brief message that is carefully planned to grab the listener's attention and says a great deal in a few words. Use an audio recording using audacity or another audio recording software to make your recording.

Use the additional material in the sidebar to learn more about FBLA and creating an elevator pitch. Save it as FBLA Elevator Pitch and submit when finished.

Module Wrap Up



Module Checklist

- SWOT Analysis Presentation
- Leadership Development Discussion
- Career Research Project
- FLBA Elevator Pitch Assignment

Review

Identify the Skills

Quiz Group



Identify the CTSO

Quiz Group

