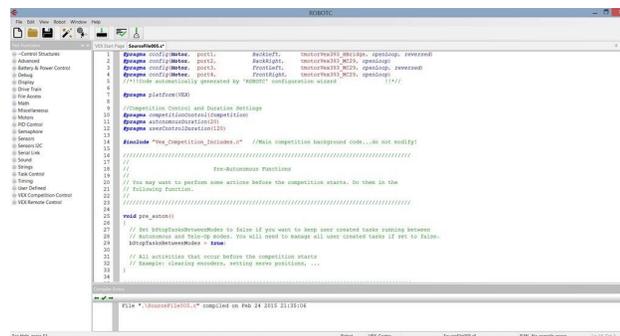


# Software Engineering

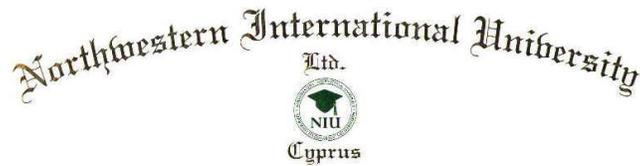
Our team chose software engineering as a possible S.T.E.M. career in the future. VEX IQ robotics is preparing us for this field by teaching us how to code. As coding is key in software engineering, this is a great skill to be learning in preparation for becoming a software engineer. Robotics is also helping us by teaching us how to run designing programs, as well as use them for design work. This prepares us to do technological design work required in software engineering. Finally, robotics is preparing us to be software engineers by teaching us how to do hard math and work together. Hard math and teamwork are also key components in being a good software engineer.



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Robot code (coding software we use for our robot)

There are many required skills and fields of study that persons working within this career gained and studied to allow them to be successful. A software engineer usually has a degree in computer science or machine learning. A Bachelor's Degree is preferred, but some employees require a Master's Degree. They can get a Bachelor's Degree in computer science, software engineering, or another related field. A software engineer also needs to know mobile development and be experienced in multiple programming languages. A few examples are JavaScript, SQL, Java, Ruby, Python, C, C++, C#, HTML, and CSS. Software engineers need strong analytical, as well as problem solving, skills. They also need to be able to develop strategic methods to build a coding frame. A software engineer must be able to multitask, as well as think logically. They must be highly motivated, and be able to maintain strong communication and interpersonal skills. They must be creative, attentive to detail, willing to innovate and compromise, stress tolerant, and work well with others. He or she should be good with data structures, source code, and web services. Our coach, Joe Kennedy, is a chief software architect for a major defense company. He got started in software engineering when he was young. He really wanted a computer, and ended up learning to code on an Atari 800.



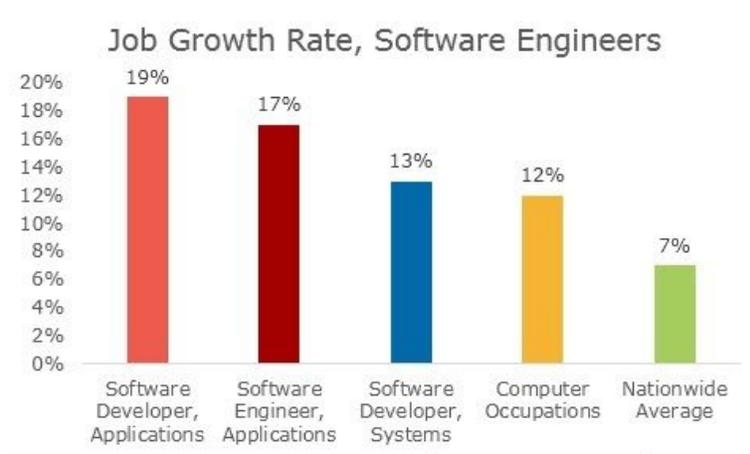
We it known that  
**Philip R. Johnson**  
having completed the course of study as prescribed by the Faculty and Board of Trustees, and having complied with all other requirements of the University is awarded the Degree of  
**Bachelor of Science in Mechanical Engineering**  
In Testimony Whereof the Board of Trustees upon recommendation of the Faculty has granted this diploma bearing the seal of the University  
Dated at the University in Limasool, Cyprus.  
December 10, 2001



*Philip R. Johnson* ..... *David W. Johnson* ..... *John von Neumann*  
Chairperson of the Board of Trustees ..... President ..... Dean of Students

Example of Bachelor's Degree

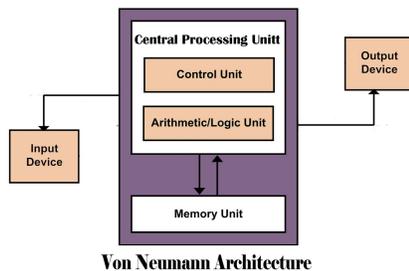
We believe that software engineering will evolve over the next ten years in many ways. Programming will likely become more abstract, as developers may work at higher levels of abstraction. This means they will be more removed from lower level programming. Programming will also become more involved with AI, because developers may need a more advanced AI system to continue with the increasing complexity of the work being done. A universal programming language arising is another possibility of the evolution of software engineering within the next ten years. Finally, software engineering will likely experience a 28.2% growth rate.



Projected growth of software engineering

John von Neumann was a very famous software engineer. He invented the von Neumann architecture and had a large part in creating the Harvard architecture. He went from a child prodigy to one of the world's foremost mathematicians by the time he was in his mid-twenties. He had a natural gift for applied mathematics that influenced the quantum theory, economics, defense planning, and the automata theory. He was one of the conceptual

inventors of self-program digital computers. We chose von Neumann because our coach taught us about Central Processing Units (CPUs) during quarantine, when we were using Zoom to meet up. As CPUs are used in almost all computers, and von Neumann created the von Neumann architecture, we thought we would research his career. As he was a software engineer, we researched software engineering. John von Neumann could likely attribute his high IQ to his success, as well as hard work.



Von Neumann Architecture



John von Neumann

In conclusion, software engineering is a growing, STEM based career which would be a great option for current VEX IQ students in the future. Robotics and software engineering have many things in common, including teamwork, coding, and logical thinking. Software engineering is a skill-based career, with many requirements, many of which VEX IQ robotics is helping fulfill. Hopefully, many VEX IQ students will go into the career of software engineering in the foreseeable future.

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