Programming and software Development

# Information Technology

 The **Programming & Software Development** program is study is designed for students interested in computer programming. Students will develop standard programming techniques and learn the logic tools and methods typically used by programmers to create simple computer applications. Proficient students will be able to solve problems by planning multistep procedures; write, analyze, review, and revise programs, converting detailed information from workflow charts and diagrams into coded instructions in a computer language; and will be able to troubleshoot/debug programs and software applications to correct malfunctions and ensure their proper execution. This program of study also challenges students to develop advanced skills in problem analysis, construction of algorithms, and computer implementation of algorithms as they work on programming projects of increased complexity. In so doing, they develop key skills of discernment and judgment as they must choose from among many languages, development environments, and strategies for the program life cycle. Course content is reinforced through numerous short- and long-term programming projects, accomplished both individually and in small groups. Upon completion of this POS, proficient students will be prepared to pursue industry certification at a technology college or more advanced coursework at a two-year or four-year postsecondary institution.

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| **Dual Credit/ Dual Enrollment/ Industry Certifications options include:*** CompTIA A+ Certification
* CompTIA IT Fundamentals
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For more college and career planning resources, visit <http://collegefortn.org>

**Programming & Software Development** pathways offer opportunities to funnel into careers at a variety of education levels. The Tennessee Department of Labor and Workforce Development listed five information technology jobs on the list of Hot Careers to 2022.1 Among these careers were Computer Programmers and Computer Systems Analysts.2 According to O\*Net, the rate of employment is expected to grow in these occupations (See Figure 1 for details). Computer Programmers will grow at a slower rate (10%) compared to Software Developers (21%) or Computer Systems Analysts (24%) it is still at average growth.3 Although these occupations are all related to Programming and Software Development, they each have different roles and responsibilities. Software developers provide the conceptual design that is the foundation for a computer program. Although education for computer programmers and software developers varies by employer, most students will be able to enter the occupation with an associate’s degree. However, for students who want to advance in their careers and earn higher salaries, a bachelor’s degree in computer programming or software development should be attained. Upon completing a postsecondary education, students will find that occupations in various companies can include: software engineer, IT director, and computer and information systems managers.4

1 O\*Net Online on the Internet at <http://www.onetonline.org>/ (visited January 31, 2016).

2 Tennessee Department of Labor and Workforce Development. (2014). Tennessee's Hot Careers to 2022 on the Internet at [http://www.tn.gov/assets/entities/labor/attachments/statewide\_2020outlooks.pdf](http://www.tn.gov/assets/entities/labor/attachments/statewide_2020outlooks.pdf%20%20%20)  (visited January 31, 2016).

3 O\*Net Online on the Internet at <http://www.onetonline.org>/ (visited January 31, 2016).

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| **Postsecondary Offerings Aligned to this Program of Study** |
| **Program of Study** | **School** | **Degree Program** |
| Information Technology | TCAT | CompTIA A+Comp TIA IT Foundations Certifications |
| Computer Science | Pellissippi State | A.S.S., Computer Science and IT/Computer Systems Technology Concentration |
| Computer Science | Middle Tennessee State University | B.S., Computer Science |

4 Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2014-15 Edition, <http://www.bls.gov/oes>(visited January 31, 2016).

 Students in this program of study will be eligible to join TSA. In addition to school events, students will be able to compete at the regional, state, and national level. The Technology Student Association fosters personal growth, leadership, and opportunities in Science, Technology, Engineering, and Mathematics (STEM); members apply and integrate these concepts through co-curricular activities, competitions, and related programs. See your technology teacher to learn more about TSA or visit <http://www.tsaweb.org.>

SkillsUSA serves more than 300,000 students and instructors annually.

The organization has 13,000 school chapters in 54 state and territorial associations.
More than 14,500 instructors and administrators are professional members of SkillsUSA.

HIGH SCHOOL

COUNTY SCHOOLS

CTE DIRECTOR:

TECHNOLOGY TEACHERS:

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**POSTSECONDARY OPTIONS**

Have you registered for the Tennessee Promise? Seniors enrolled in this program have the chance to attend a two-year program at a Tennessee College of Applied Technology (TCAT), community college, or some 2-year university programs for free! To learn more, please see your school counselor or visit <http://www.tennesseepromise.gov>.