Course Description

Coding Practicum is a capstone course intended to provide students with the opportunity to apply the skills and knowledge learned in previous Coding courses toward the completion of an in-depth project with fellow team members. Students who have progressed to this level in the program of Study and Sequence: This is the capstone course in the Coding program of study.

Graduation Requirements:

This course satisfies one of three credits required for an elective focus when taken in conjunction with other Information Technology courses.

Programs of Study and Sequence:

This is the capstone course in the Coding program of study.

Aligned Student Organization(s):

Skills USA: http://www.tnskillsusa.com
Tracy Whitehead, (615) 532-2804, Tracy.Whitehead@tn.gov
Technology Student Association (TSA): http://www.tntsa.org
Tracy Whitehead, (615) 532-2804, Tracy.Whitehead@tn.gov

Coordinating Work-Based Learning:

Teachers who hold an active WBL certificate may offer placement for credit when the requirements of the state board's WBL Framework and the Department's WBL Policy Guide are met. For information, visit https://tn.gov/education/topic/work-based-learning.

Available Student Industry Certifications:

See https://tn.gov/education/article/cte-cluster-information-technology

Dual Credit or Dual Enrollment Opportunities:

There are no known dual credit/dual enrollment opportunities for this course. If interested in developing, reach out to a local postsecondary institution to establish an articulation agreement.

Teacher Endorsement(s):

037, 041, 055, 056, 057, 152, 153, 203, 204, 311, 434, 435, 436, 474, 475, 476, 477, 582, 595, 740, 742

Required Teacher Certifications/Training:

All endorsements except for 742 will require the equivalent of twelve semester hours of computer course work including at least six hours of programming language. If students are assigned in work-based learning settings, teachers must attend WBL training and earn the WBL Certificate provided by the Tennessee Department of Education.

Teacher Resources:

https://tn.gov/education/article/cte-cluster-information-technology
study take on more responsibilities for producing independent work and managing processes involved in the planning, designing, refinement, and production of original software applications. The course is designed to allow students to choose their specific application of interest, be it the development of a mobile application (app), an animation package, a game or other educational tool, or any other approved program that requires coding and development skills. Upon completion of the practicum, proficient students will be prepared for postsecondary study and career advancement in programming and software development, and will be equipped to market their finished product should they choose.

**Work-Based Learning Framework**

Practicum activities may take the form of work-based learning (WBL) opportunities (such as internships, cooperative education, service learning, and job shadowing) or industry-driven project-based learning. These experiences must comply with the Work-Based Learning Framework guidelines established in SBE High School Policy 2.103. As such, this course must be taught by a teacher with an active WBL Certificate issued by the Tennessee Department of Education and follow policies outlined in the Work-Based Learning Policy Guide available online at [https://tn.gov/education/topic/work-based-learning](https://tn.gov/education/topic/work-based-learning). The Tennessee Department of Education provides a *Personalized Learning Plan* template to ensure compliance with the Work-Based Learning Framework, state and federal Child Labor Law, and Tennessee Department of Education policies, which must be used for students participating in WBL opportunities.

**Program of Study Application**

This is the fourth course in the *Coding* program of study. For more information on the benefits and requirements of implementing this program in full, please visit the Information Technology website at [https://tn.gov/education/article/cte-cluster-information-technology](https://tn.gov/education/article/cte-cluster-information-technology).

**Course Requirements**

This capstone course aligns with the requirements of the Work-Based Learning Framework (established in Tennessee State Board High School Policy), with the Tennessee Department of Education's Work-Based Learning Policy Guide, and with state and federal Child Labor Law. As such, the following components are course requirements:

**Course Standards**

1) A student will have a Personalized Learning Plan that identifies their long-term goals, demonstrates how the Work-Based Learning (WBL) experience aligns with their elective focus and/or high school plan of study, addresses how the student plans to meet and demonstrate the course standards, and addresses employability skill attainment in the following areas:
   a. Application of academic and technical knowledge and skills (embedded in course standards)
   b. Career knowledge and navigation skills
   c. 21st Century learning and innovation skills
   d. Personal and social skills
Programming & Software Development Career Planning

2) Research a company or organization that employs computer programmers or specializes in software design and development solutions. Companies could range from large software developers, to niche organizations that retain programmers on staff to serve their particular clients' needs. For the chosen company, cite specific textual evidence from the company's literature, as well as available press coverage (if available) to summarize:
   a. The mission and history of the organization
   b. Headquarters and organizational structure
   c. Products or services provided
   d. Credentials required for employment and how they are obtained and maintained
   e. Policies and procedures
   f. Reports, newsletters, and other documents published by the organization
   g. Website and contact information

3) Analyze the requirements and qualifications for various programming and development job postings identified from specific company websites or online metasearch engines. Gather information from multiple sources, such as sample resumes, interviews with professionals, and job boards, to determine effective strategies for realizing career goals. Create a personal resume modeled after elements based on the findings above, then complete an authentic job application as part of a career search or work-based learning experience.

4) Participate in a mock interview. Prior to the interview, research tips on dress and grooming, most commonly asked interview questions, appropriate conduct during an interview, and recommended follow-up procedures. Upon completion of the interview, write a thank you letter to the interviewer in a written or email format.

Professional Ethics and Legal Responsibilities

5) Investigate current issues surrounding the use of software applications to collect and track user data. Explore a range of arguments concerning privacy rights as they relate to the mining of personal data; determine when it is ethical and legal to collect data for profit versus for security purposes. Advance an original argument that debates the pros and cons and summarizes the potential ramifications for clients, users, the public, and one's own personal reputation, drawing on evidence gathered from news media, company policies, and state and federal laws.

6) Research a case study involving an ethical issue related to intellectual property rights. Examine a variety of perspectives surrounding the issue, then develop an original analysis explaining the impact of the issue on those involved, using persuasive language and citing evidence from the research. Potential issues include copyright infringement, piracy, plagiarism, art licensing, creative commons, and the state/federal laws that govern them.

Course Project

7) In teams or individually, develop a written proposal for an original program or software application that involves advanced refinement and transfer of skills and knowledge acquired in previous Programming & Software Development courses. The proposal should be narrative
in nature but supplemented by relevant data and graphic illustrations as needed, such as
flowcharts of development processes and diagrams or sketches of what the end product
would resemble. Sample projects include: developing a mobile app; designing an animation
package or plug-in; writing an original game program; or any other programming-based
project. Present the proposal to the class, and continually revise based on feedback from peers.

8) Throughout the design and development process, develop supplementary documents,
presentations, and strategies to support the production and promotion of the program, app,
or product. Identify the target market for the product, and devise a tentative plan to inform,
promote, and convince prospective users of the product's functions and value. Research
marketing plan templates and sample presentations, and synthesize information to produce
an original plan outlining how the team intends to market the product once it is finished.

9) Apply coding skills learned in previous courses to novel contexts and development
environments. For example, develop skills in an emerging technology that would support the
completion of the course project, or learn a new programming language not previously
studied in order to enhance the functionality of the product.

Advanced Troubleshooting, Critiquing, & Problem Solving

10) In the course of developing the project, regularly test for functionality, compatibility, and
other design aspects related to user friendliness. Conduct and document the proper code
validation to resolve errors encountered in the design process.

11) Analyze the code written by another team member or peer and create a flowchart for
suggesting changes to improve functionality. Cite specific examples in the code to support
recommendations.

12) Research and test for potential security threats related to the intended uses of the app,
program, or product. For example, if a mobile app is developed, determine the most
common security threats and identify areas of vulnerability in the product that could be
remedied by adjusting for the proper code, patching, or system update. If possible, develop
and incorporate security measures into the final product to ensure user safety.

Portfolio

13) Create a portfolio, or similar collection of work, that illustrates mastery of skills and
knowledge outlined in the previous courses and applied in the practicum. The portfolio
should reflect thoughtful assessment and evaluation of the progression of work involving
the application of steps of the design process, as outlined by the instructor. The following
documents will reside in the student's portfolio:
   a. Personal code of ethics
   b. Career and professional development plan
   c. Resume
   d. Project proposal with supporting documents
   e. List of responsibilities undertaken through the course
f. Examples of visual materials developed and used during the course (such as drawings, models, presentation slides, videos, and demonstrations)

g. Marketing plan

h. Description of technology used, with examples if appropriate

i. Periodic journal entries reflecting on tasks and activities

j. Feedback from instructor and/or supervisor based on observations

Communication of Project Results

14) Produce technical reports highlighting the purpose, content, and use of the app, program, and product developed for this course. Cite evidence from multiple authoritative sources in order to justify design and development decisions and maximize the user experience. Incorporate supporting graphics, sketches, and data as needed to summarize the technical specifications of the product.

15) Upon completion of the practicum, develop a technology-enhanced presentation showcasing highlights, challenges, and lessons learned from the experience. The presentation should be delivered orally, but supported by relevant graphic illustrations, such as diagrams, flowcharts, and/or market data on the target users. Prepare the presentation in a format that could be presented to both a technical and a non-technical audience, as well as for a career and technical student organization (CTSO) competitive event.

Standards Alignment Notes

*References to other standards include:
    - Note: While not all standards are specifically aligned, teachers will find the framework helpful for setting expectations for student behavior in their classroom and practicing specific career readiness skills.