

IT Clinical Internship

Primary Career Cluster:	Information Technology
Consultant:	Deborah Knoll, (615) 532-2844, Deborah.Knoll@tn.gov
Course Code(s):	6096
Prerequisite(s):	Two credits in the <i>Networking Systems</i> program of study
Credit:	1
Grade Level:	11-12
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 final course in the <i>Networking Systems</i> 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:	CompTIA Network+ CISCO Certified Networking Associate CCENT CISCO Certified Entry Network Tech
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.
Required Teacher Certifications/Training:	A+, NetPlus, CIW or CISCO Industry Certification. Teachers must be trained in Work-Based Learning
Teacher Endorsement(s):	153, 311, 435, 436, 475, 476, 582, 595, 740
Teacher Resources:	https://tn.gov/education/article/cte-cluster-information-technology

Course Description

IT Clinical Internship is a capstone course and work-based learning experience designed to provide students with real-world application of skills and knowledge obtained in previous *Networking Systems* courses. Students are eligible to take the *IT Clinical Internship* if they have successfully completed all the prerequisites in the *Networking Systems* program of study. Prospective students must apply for

admission to the class (acceptance at the discretion of the instructor). The internships are designed to be completed in an IT Support environment, such as the student's school, a community-based shop that provides IT Support, or the IT Support department of a local business. This course puts to practical use all of the skills attained in previous courses, and provides the student with valuable hands-on experience. It meets the recommended 500 hours' work experience to prepare each student to sit for the CompTIA A+ exams, which certifies industry-recognized IT Support technicians. Upon completion of this course, proficient students will be prepared to pursue further training at a Tennessee College of Applied Technology (TCAT) or other postsecondary institution.

Work-Based Learning Framework

Clinical experiences must comply with the Work-Based Learning Framework guidelines established in SBE High School Policy 2.103. The TDOE 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. Additionally, 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>.

Program of Study Application

This is the capstone course in the *Networking Systems* 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>.

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
- 2) Accurately read, interpret and demonstrate adherence to safety guidelines appropriate for the roles and responsibilities of an employee in an IT setting. Listen to safety instructions and be able to explain why certain rules apply. Demonstrate safety techniques and follow all applicable guidelines related to the clinical placement. Based on placement, document

completion of training topics on the appropriate work-based learning (WBL) and work site forms.

- 3) Develop a personalized student-learning plan, in accordance with approved policies, to address the methods for practicing and demonstrating each of the skills identified in the pre-requisite IT course standards. Relate how each skill applies to a placement in an IT setting, and document day-to-day applications. Participate in ongoing review and communications around progress of plan with WBL Coordinator.
- 4) Observe and analyze organizational culture and practices, e.g., how to interact with supervisors, clients, and co-workers, and how to recognize and address health, safety, and sustainability issues. Seek information from supervisors and other employees about appropriate methods of pursuing employment in the industry, and determine what knowledge, skills, and educational credentials are required.
- 5) Apply learning experiences from internship placement to review and update an education and career pathways plan based on the knowledge and feedback acquired. Proactively identify areas of strength and opportunities for professional growth, encourage and act on feedback from peers, supervisors, and customers, and seek and use resources and support to improve skills.
- 6) Identify and ask significant questions to solve problems in the workplace. Use inductive and deductive reasoning methods to recognize faulty reasoning, and to understand problems and alternative solutions.
- 7) Analyze quality assurance methods used by IT professionals in a variety of industries. Solve problems using systems thinking, e.g., by understanding problems in terms of complex processes and environments. Identify key components and relationships that enable, influence, and produce outcomes.
- 8) Demonstrate integrity and ethical behavior when engaging in all worksite activities, including the secure use of client data, responsible Internet use, use of tools and materials, documentation of services provided, sharing of information, client relations, and completion of all personnel-related forms.
- 9) Articulate ideas effectively in written personal communications with supervisors, coworkers, and customers using appropriate IT terminology, reviewing and revising as needed and developing claims with appropriate evidence and reasoning. Verbally articulate ideas effectively in interpersonal communications with supervisors, coworkers, and customers. Develop and deliver messages effectively in oral presentations. Demonstrate effective listening skills, attending to the meaning and intention of communication, and accurately paraphrasing what has been heard. Communicate effectively with individuals of diverse backgrounds who may also speak languages other than English, using foreign language skills as appropriate.
- 10) Work effectively as a member of a team and address conflict with sensitivity and respect for diverse points of view. Demonstrate understanding of one's own impact and build on

different perspectives to strengthen joint efforts. Demonstrate leadership where appropriate to collaborate on workplace tasks. Effectively employ meeting management strategies, such as agenda setting, time keeping, and meeting facilitation strategies, and list action items to identify and schedule next steps.

- 11) Access information efficiently, using sources appropriate to task, purpose, and audience. Distinguish between credible and non-credible sources, including the difference between advertising and legitimate research. Evaluate information for usefulness, bias, and accuracy, and question information that may not originate from credible sources. Demonstrate the ability to organize and manage information effectively and efficiently. Demonstrate ethical and legal use of information, including adherence to all rules and regulations related to sharing of protected information. For example, when a user reports a network system problem, investigate and verify that the problem exists, determine how many users are affected, and diagnose the problem using the information at hand.
- 12) Use appropriate technology for information search and retrieval, synchronous and asynchronous communications, multimedia presentations, document production, quantitative and qualitative analysis, and information management. Use social networking and online collaboration tools such as shared documents and web conferencing to create, integrate, and manage information in group projects.
- 13) Access and manage online communication and information, such as a customer relationship management system, using multiple digital devices. Demonstrate adherence to all rules and regulations related to the use of electronic tools and the Internet, including appropriate protection of passcodes and adherence to all security protocols.
- 14) Complete tasks as directed without direct supervision, knowing when questions or guidance should be requested. Exhibit resourcefulness and initiative in taking on new tasks and solving problems on one's own as appropriate to the workplace setting. Demonstrate how to learn and exhibit personal agency in identifying and achieving instrumental and ultimate learning objectives. Demonstrate curiosity to learn more about the tasks, workplace, and/or industry. Explore deeper content on one's own and request opportunities for professional development. Demonstrate self-efficacy and confidence in one's ability to succeed in specific situations.
- 15) Present oneself professionally and respectfully when interacting with coworkers, supervisors, and customers. Demonstrate reliability and responsibility in attendance and in following through on agreed upon tasks, and communicate with supervisor when circumstances change. Understand and adhere to appropriate workplace non-discrimination standards on the basis of sex, race, color, age, national origin, religion, disability, marital status, sexual orientation, gender identity, pregnancy, veteran status, or any characteristic of a person or group unrelated to the workplace. Respect cultural differences and work effectively with people from diverse social and cultural backgrounds.

- 16) Exhibit flexibility by adapting to varied roles, jobs responsibilities, schedules and contexts; working effectively in a climate of ambiguity and changing priorities; and dealing positively with praise, setbacks, and constructive criticism.
- 17) Manage time and projects effectively by setting goals; developing and using a system for prioritizing, planning and managing daily work; persisting in the face of challenges; and seeking assistance and adjusting plans to adapt to changing circumstances. Demonstrate attention to detail and accuracy appropriate to the task. Demonstrate accountability to supervisors, coworkers, and customers by delivering work to agreed-upon standards; accepting constructive criticism; completing agreed-upon projects on time; and exhibiting pride in workmanship.
- 18) Create a portfolio, or similar collection of work, that illustrates mastery of skills and knowledge outlined in the previous Networking Systems courses and applied in the internship experience. The portfolio should reflect thoughtful assessment and evaluation of the progression of work involving the application of steps of the troubleshooting process, as outlined by the instructor. The following documents will reside in the career portfolio:
 - a. Career and professional development plan
 - b. Resume
 - c. Documentation of work hours at each site
 - d. List of responsibilities undertaken throughout the placement
 - e. Examples of materials developed and used throughout the placement
 - f. Periodic journal entries reflecting on tasks and activities
 - g. Supervisor evaluations and observations
 - h. Approved WBL forms
 - i. WBL coordinator evaluations and observations

Standards Alignment Notes

*References to other standards include:

- P21: Partnership for 21st Century Skills [Framework for 21st Century Learning](#)
 - 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.



Web Design Practicum

Primary Career Cluster:	Information Technology (IT)
Consultant:	Deborah Knoll, (615) 532-2844, Deborah.Knoll@tn.gov
Course Code:	6171
Prerequisite(s):	<i>Web Site Development</i> (6101)
Credit:	1
Grade Level:	11-12
Graduation Requirement:	This course satisfies one of three credits required for an elective focus when taken in conjunction with other IT courses.
Programs of Study and Sequence:	This is the fourth course in the <i>Web Design</i> program of study.
Aligned Student Organization(s):	Future Business Leaders of America (FBLA) www.fblatn.org Steven Mitchell, (615) 532-2829, Steven.Mitchell@tn.gov SkillsUSA: 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:	
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):	070, 203, 204, 230, 231, 232, 233, (042 and 043), (042 and 044), (042 and 045), (042 and 046), (042 and 047), (042 and 077), (042 and 078), (042 and 079), (043 and 044), (043 and 045), (043 and 046), (043 and 047), (043 and 077), (043 and 078), (043 and 079), (044 and 045), (044 and 046), (044 and 047), (044 and 077), (044 and 078), (044 and 079), (045 and 046), (045 and 047), (045 and 077), (045 and 078), (045 and 079), (046 and 047), (046 and 077), (046 and 078), (046 and 079), (046 and 047), (047 and 079), (047 and 077), (047 and 078), (077 and 078), (077 and 079), (078 and 079), 153, 157, 311, 435, 436, 470, 475, 476, 477, 516, 519, 582, 583, 595, 543, 711, 740, 037, 041, 055, 056, 057, 434
Required Teacher Certifications/Training:	For 2016-2017, all individuals teaching this course must hold CIW Web Foundations Associate certification or CIW Site Development Associate certification in order to prepare students for the current job market skills.
Teacher Resources:	https://tn.gov/education/article/cte-cluster-information-technology

Course Description

Web Design Practicum is a capstone course intended to provide students with the opportunity to apply the skills and knowledge learned in previous *Web Design* courses toward the completion of an in-depth project with fellow team members. Students who have progressed to this level in the *Web Design* program of study take on more responsibilities for producing independent work and managing processes involved in the planning, designing, refinement, and launch of a website. In addition to developing an understanding of the professional and ethical issues encountered by web design professionals in the workplace, students learn to refine their skills in problem solving, troubleshooting, teamwork, marketing and analytics, and project management. Upon completion of the practicum, proficient students will be prepared for postsecondary study and career advancement in web design.

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>. 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 *Web Page Design* 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>.

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

Web Design Career Planning

- 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
- 2) Research a company or organization that provides web design/development services for clients. Companies could range from large design firms serving corporate clients, to independent freelance businesses operating in the local community. 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 web design job postings identified from specific company websites or online metasearch engines. Gather information from multiple sources, such as sample resumes, interviews with web design 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 a range of unethical and illegal behaviors frequently encountered by web design professionals. Summarize the legal and professional consequences for engaging in these behaviors, developing claims and counterclaims about the potential ramifications for clients, users, the public, and one's own personal reputation. Deliver findings in the form of a summary document or presentation supported by evidence from news media, company policies, and state and federal laws. Potential issues include spam, flaming, cyberbullying, libel, slandering, and mining of personal data for profit.
- 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) Meet with a potential or mock client who requires a web-based digital product, and discuss the client's wants and needs for the product. In teams or individually, work to develop a project plan, set goals, delegate responsibilities, and determine deadlines to meet the client's specifications. Analyze available resources, then formulate and present a written proposal for the potential client detailing the following:
 - a. Summary of product solution that can be offered
 - b. Strategy for addressing the needs of the client
 - c. Schedule of completion
 - d. Cost to the client, including justification of expenses
- 8) In teams or individually, develop a site map outlining the architecture of the web page(s) to be created in the project. Demonstrate the ability to group content in the form of a flowchart or other visual representation, and apply principles related to continuity of design.
- 9) Work together to assemble adequate documentation of project activities, including end-user documentation. Be able to explain to both lay and technical audiences how various aspects of the site and/or digital product were developed and how they function. For example, annotate code where appropriate such that another web designer could replicate it; or explain to a first-time user how a form developed for the site retrieves and stores information in a remote database.
- 10) Maintain accurate and accessible directories of files relevant to the project, and develop agreements among team members and client surrounding data management, naming conventions, version control, editing permissions, and sharing of files (for example, through cloud-based services or shared drives).
- 11) Use appropriate authoring software to execute the project plan in line with budget constraints, server size, deadlines, and all other specifications in order to meet the vision of the client. In the course of development, apply coding skills to design, organize, create, maintain, and update the site or digital product as needed.

Advanced Troubleshooting, Critiquing, & Problem Solving

- 12) In the course of developing the web-based project, regularly test the site for functionality, navigability, browser and device compatibility, and other design aspects related to user friendliness. Conduct and document the proper code validation to fix broken links, distorted images, and similar errors.
- 13) 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.
- 14) Apply coding skills learned in previous courses to novel contexts and development environments. For example, investigate methods for scaling the site or digital product onto a

mobile device using responsive design. Where appropriate, incorporate the proper CSS code to render a site compatible on multiple web platforms.

Web Marketing and Analytics

- 15) Research factors that affect the sale and distribution of products and services over the Internet, such as the wide availability of customer feedback on sites like Amazon, Yelp, and Google. Select a company whose products/services are purchased online; describe how the factors identified above influence the design of the company's website. Critique the effectiveness of the site in promoting the company's product/service, citing evidence related to user friendliness, accessibility, tone, and composition.
- 16) Analyze a range of web marketing strategies and cite examples of how businesses use them to drive web traffic. Strategies include but are not limited to social media marketing, image-centric content marketing, search engine optimization (SEO), email marketing, or mobile-friendly content. Deliver a mock presentation to "peer clients" outlining how one or more of these strategies could be incorporated to increase the web presence of a real or fictitious business. Drawing on success stories of similar companies, pitch the chosen strategy using persuasive language and relevant supporting data.
- 17) Describe how companies collect data using web analytics. Summarize a range of statistics used when tracking web traffic, such as unique page views, session duration, and bounce rate. Demonstrate the ability to collect and interpret analytics to achieve marketing goals; if applicable, incorporate such analysis into the course project.
- 18) Investigate the ways companies use web data to analyze demographic and psychographic information about their customers. Model to a "peer client" how an ordinary business owner can use IP geolocation, surveys, forms, and other tools to make strategic marketing decisions.

Portfolio

- 19) 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. The following documents will reside in the student portfolio:
 - a. Personal code of ethics
 - b. Career and professional development plan
 - c. Resume
 - d. Links to web pages designed or contributed to
 - e. List of responsibilities undertaken through the course
 - f. Examples of visual materials developed and used during the course (such as graphics, drawings, models, presentation slides, videos, and demonstrations)
 - g. Description of technology used, with examples if appropriate
 - h. Periodic journal entries reflecting on tasks and activities
 - i. Feedback from instructor and/or supervisor based on observations

Communication of Project Results

- 20) Produce a technical report highlighting the purpose, content, use, and intended audience of the web-based project. Cite evidence from the code and from web development best practices in order to justify design decisions and maximize client satisfaction. Include appropriate documentation of license agreements, copyright protections, non-disclosure statements, and other legal issues if dealing with the ideas or data of others.
- 21) 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, sample code, and/or summary data generated from the site. 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:

- P21: Partnership for 21st Century Skills [Framework for 21st Century Learning](#)
 - 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.

Coding Practicum

Primary Career Cluster:	Information Technology (IT)
Consultant:	Deborah Knoll, (615) 532-2844, Deborah.Knoll@tn.gov
Course Code(s):	5908
Prerequisite(s):	<i>Algebra I</i> (0842, 3012) and <i>Programming & Logic II</i> (6099)
Credit:	1
Grade Level:	11-12
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 <i>Coding</i> 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

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 Approved January 30, 2015; Amended April 15, 2016

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>. 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>.

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:

- P21: Partnership for 21st Century Skills [Framework for 21st Century Learning](#)
 - 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.