# Scope & Sequence

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| **Course Name:** Practicum in Science, Technology, Engineering, and Mathematics/Extended Practicum in Science, Technology, Engineering, and Mathematics  **TSDS PEIMS Code:** 13037405 (First Time Taken)  13037415 (Second Time Taken) | **Course Credit:** 3.0  **Course Requirements:** Recommended for students in Grade 12.  **Prerequisites:** Algebra I and Geometry.  **Recommended prerequisites**: Two Science, Technology, Engineering, and Mathematics (STEM) Career Cluster credits.  **Corequisites:** Practicum in Science, Technology, Engineering, and Mathematics Career Cluster credits. |
| **Course Description:** Extended practicum course is a paid or unpaid capstone experience for students participating in a coherent sequence of career and technical education courses in the Science, Technology, Engineering, and Mathematics (STEM) Career Cluster. Extended Practicum in STEM is designed to give students supervised practical application of previously studied knowledge and skills. Practicum experiences can occur in a variety of locations appropriate to the nature and level of experience. This course must be taken concurrently with Practicum in Science, Technology, Engineering, and Mathematics and may not be taken as a stand-alone course. Students shall be awarded one credit for successful completion of this course. A student may repeat this course once for credit provided that the student is experiencing different aspects of the industry and demonstrating proficiency in additional and more advanced knowledge and skills. | |
| **NOTE 1:** The practicum course is a paid or unpaid capstone experience for students participating in a coherent sequence of career and technical education courses in the Science, Technology, Engineering, and Mathematics (STEM) Career Cluster. This is a suggested scope and sequence for the course content. This content will work with any textbook, instructional materials or practicum experience. If locally adapted, make sure all TEKS are covered.  **NOTE 2:** Completion of skill sets may be demonstrated throughout the practicum. Therefore, content based on the TEKS does not have to be delivered sequentially. The major reason students take a practicum is to provide additional time on task for learning specialized skills. In most cases where the Extended Practicum is added to the Practicum, it is because the student is spending more than 15 hours per week at his/her training station (place of employment or internship).  **NOTE 3:** The information in this scope and sequence document does not describe detailed activities, because the activities will vary from student to student and training station to training station. The intent is that students incorporate and use previously learned knowledge and skills related to the career cluster. | |

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| **Practicum Plan** | **TEKS Covered**  **130.418. (c) Knowledge and skills** |
| **Section 1: Science, Technology, Engineering, and Mathematics (STEM) Practicum Introduction**  This Science, Technology, Engineering, and Mathematics (STEM) Practicum is designed to give students supervised practical application of previously studied knowledge and skills. Practicum experiences will occur in a variety of locations appropriate to the nature and level of experience. Students will take a pre- and post-inventory self-evaluation of strengths and weaknesses to improve upon in order to succeed in the STEM field. Upon culmination of the unit, students will submit the technical knowledge and skills developed through the hands-on experience. | (5) The student demonstrates technical knowledge and skills required to pursue a career in a science, technology, engineering, and mathematics career field. The student is expected to:  (A) develop advanced technical knowledge and skills related to the student's occupational objective; and  (B) evaluate strengths and weaknesses in technical skill proficiency. |
| **Section 2: Application of Communication Skills in the STEM Field**  The pre-required courses have introduced the concept that the STEM Career Cluster focuses on planning, managing, and providing scientific research and professional and technical services such as physical science, social science, engineering, including laboratory and testing services, and research and development services. Students willnowapply technical skills and knowledge of Science, Technology, Engineering, and Mathematics to analyze, evaluate, and communicate problems and solutions in this unit. Students will develop and demonstrate communication skills to relay this information to others both verbally and written. | (4) The student demonstrates oral and written communication skills in creating, expressing, and interpreting information and ideas, including technical terminology and information. The student is expected to:  (A) demonstrate the use of content, technical concepts, and vocabulary when analyzing information and following directions;  (B) employ verbal skills when obtaining and conveying information;  (E) interpret verbal and nonverbal cues and behaviors to enhance communication;  (F) apply active listening skills to obtain and clarify information; and  (G) use academic skills to facilitate effective written and oral communication. |
| **Section 3: Application of Research in the STEM Field**  Students willdemonstrate use of research to exhibit critical thinking in this unit. By using informational texts, scientific websites, and technical materials students will solve occupational tasks. | (4) The student demonstrates oral and written communication skills in creating, expressing, and interpreting information and ideas, including technical terminology and information. The student is expected to:  (C) use informational texts, scientific websites, and technical materials to review and apply information sources for occupational tasks;  (D) evaluate the reliability of information from informational texts, scientific websites, and technical materials and resources. |
| **Section 4: Application of Problem Solving Skills**  In this unit, students willapply problem-solving skills critical to the STEM field. Students will analyze information and gather data to ascertain and demonstrate solutions to problems. | (2) The student applies concepts of critical thinking and problem solving. The student is expected to:  (A) analyze elements of a problem to develop creative and innovative solutions;  (B) analyze information to determine value to the problem-solving task;  (C) compare and contrast alternatives using a variety of problem-solving and critical-thinking skills; and  (D) conduct technical research to gather information necessary for decision making. |
| **Section 5: Application of Workforce Professionalism**  This unit offers students the opportunity to demonstrate basic technical skills necessary to fulfill careers in the workforce.  Students will demonstrate professionalism such as dressing for success and conducting oneself appropriately for the workforce. | (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:  (A) demonstrate knowledge of how to dress appropriately, speak politely, and conduct oneself in a manner appropriate for the profession;  (B) show the ability to cooperate, contribute, collaborate, and accept constructive criticism as a member of a group in an effort to achieve a positive collective outcome;  (C) present written and oral communication in a clear, concise, and effective manner. |
| **Section 6: Application of Strong Work Ethics**  This unit offers students the opportunity to demonstrate technical skills necessary to succeed in the workforce.  Students will set goals and demonstrate strong work ethics, such as: time management, punctuality, and dependability. | (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:  (D) demonstrate time-management skills in prioritizing tasks, following schedules, and performing goal-relevant activities in a way that produces efficient results;  (E) demonstrate punctuality, dependability, reliability, and responsibility and adhere to policies and procedures in performing assigned tasks as directed;  (F) apply ethical reasoning to a variety of situations in order to make ethical decisions;  (G) complete tasks with the highest standards to ensure quality products and services. |
| **Section 7: Application of Safety**  This unit offers students the opportunity to demonstrate basic technical skills necessary for safety precautions in the STEM field. Students will adhere to and follow all guidelines and regulations to maintain a safe working environment. | (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:  (H) comply with practicum setting safety rules and regulations to maintain safe and healthy working conditions and environments. |
| **Section 8: Teamwork in STEM**  In this unit students will demonstrate teamwork processes that promote team building, consensus, continuous improvement, respect for the opinions of others, cooperation, adaptability, and conflict resolution. Students will collaborate to work together efficiently, using positive interpersonal skills to establish and maintain effective working relationships in order to accomplish objectives and tasks. | (3) The student demonstrates leadership and teamwork skills in collaborating with others to accomplish goals and objectives. The student is expected to:  (B) demonstrate teamwork processes that promote team building, consensus, continuous improvement, respect for the opinions of others, cooperation, adaptability, and conflict resolution;  (C) demonstrate responsibility for shared group and individual work tasks;  (D) use positive interpersonal skills to establish and maintain effective working relationships in order to accomplish objectives and tasks;  (F) demonstrate respect for individuals, including those from different cultures, genders, and backgrounds and diversity. |
| **Section 9: Leadership in STEM**  In this unit students will demonstrate leadership skills. Students will use positive interpersonal skills to establish and maintain effective working relationships in order to accomplish objectives and tasks by building trust with integrity. | (3) The student demonstrates leadership and teamwork skills in collaborating with others to accomplish goals and objectives. The student is expected to:  (A) analyze leadership in relation to trust, positive attitude, integrity, and willingness to accept key responsibilities in a work situation;  (E) negotiate effectively to arrive at decisions. |
| **Section 10: Planning for a STEM Career**  In this unit, students will focus on planning to secure a career within the STEM Career Cluster. Students will update a professional portfolio to include samples of work.  Students will research licensures and/or certification requirements. | (6) The student documents technical knowledge and skills. The student is expected to:  (A) update a professional portfolio to include information such as:  (A) attainment of technical skill competencies;  (B) licensures or certifications;  (C) recognitions, awards, and scholarships;  (D) extended learning experiences such as community service and active participation in career and technical student organizations and professional organizations;  (E) abstract of key points of the practicum;  (F) resume;  (G) samples of work; and  (H) evaluation from the practicum supervisor. |
| **Section 11: Pursuing a STEM Career**  Culmination of this course will be for the students to present a completed robust portfolio to potential employers (namely the ones students have been interning with) for feedback and potential career opportunities. | (6) The student documents technical knowledge and skills. The student is expected to:  (B) present the portfolio to interested stakeholders. |

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| **Extended Practicum Plan** | **TEKS Covered**  **130.419. (c) Knowledge and skills** |
| **Section 1: Science, Technology, Engineering, and Mathematics (STEM) Extended Practicum Experience**  This Science, Technology, Engineering, and Mathematics (STEM) Extended Practicum is designed to give students supervised practical application of previously studied knowledge and skills. Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions. Practicum experiences will occur in a variety of locations appropriate to the nature and level of experience. Students will take a self-inventory self-evaluation of strengths and weaknesses to improve upon in to succeed in the STEM field. Upon culmination of the unit, students will submit the technical knowledge and skills developed through the hands-on experience. | (6) The student participates in a supervised STEM experience. The student is expected to:  (A) conduct, document, and evaluate learning activities in a supervised STEM experience;  (B) develop advanced technical knowledge and skills related to the student's occupational objective;  (C) evaluate strengths and weaknesses in technical skill proficiency. |
| **Section 2: Application of Communication Skills in the STEM Field**  The pre-required courses have introduced the concept that the STEM Career Cluster focuses on planning, managing, and providing scientific research and professional and technical services such as physical science, social science, engineering, including laboratory and testing services, and research and development services. Students willnowapply technical skills and knowledge of STEM to analyze, evaluate, and communicate problems and solutions in this unit. Students will develop and demonstrate communication skills to relay this information to others both verbally and written. | (2) The student applies professional communications strategies. The student is expected to:  (A) demonstrate verbal and non-verbal communication consistently in a clear, concise, and effective manner;  (B) apply active listening skills to obtain and clarify information;  (C) create and deliver formal and informal presentations effectively;  (D) analyze, interpret, and effectively communicate information, data, and observations; and  (E) observe and interpret verbal and nonverbal cues and behaviors to enhance communication. |
| **Section 3: Applying Research to Make Decisions in the STEM Field**  Students willdemonstrate use of research to exhibit critical thinking in this unit. By using informational texts, scientific websites, and technical materials students will acquire the necessary decision-making skills. | (3) The student implements advanced problem-solving methods. The student is expected to:  (D) conduct technical research to gather information necessary for decision making. |
| **Section 4: Application of Advanced Problem-Solving Skills**  In this unit, students willapply problem-solving skills critical to the STEM field. Students will analyze information and gather data to ascertain and demonstrate solutions to problems. | (3) The student implements advanced problem-solving methods. The student is expected to:  (A) employ critical-thinking skills with increased fluency both independently and in groups to solve problems and make decisions;  (B) analyze elements of problems to develop creative and innovative solutions;  (C) apply decision-making techniques with increased fluency to the selection of technological solutions. |
| **Section 5: Application of Workforce Professionalism**  This unit offers students the opportunity to demonstrate basic technical skills necessary to fulfill careers in the workforce.  Students will participate in training, education, or preparation for licensure, certification, or other relevant credentials to prepare for employment. | (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:  (A) participate in a paid or unpaid, laboratory- or work-based application of previously studied knowledge and skills related to STEM;  (B) participate in training, education, or preparation for licensure, certification, or other relevant credentials to prepare for employment. |
| **Section 6: Application of Strong Work Ethics**  This unit offers students the opportunity to demonstrate technical skills necessary to succeed in the workforce.  Students will set goals and demonstrate strong work ethics, such as: time management, punctuality, and dependability. | (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:  (C) demonstrate professional standards and personal qualities needed to be employable such as self-discipline, positive attitude, integrity, leadership, appreciation for diversity, customer service, work ethic, and adaptability with increased fluency. |
| **Section 7: Application of Safety**  This unit offers students the opportunity to demonstrate basic technical skills necessary for safety precautions in the STEM field.  Students will adhere to and follow all guidelines and regulations to maintain a safe working environment. | (4) The student understands and applies proper safety and security techniques in the workplace. The student is expected to understand and consistently follow workplace safety rules and regulations. |
| **Section 8: Teamwork in STEM**  In this unit students will demonstrate teamwork processes that promote team building, consensus, continuous improvement, respect for the opinions of others, cooperation, adaptability, and conflict resolution. Students will collaborate to work together efficiently, using positive interpersonal skills to establish and maintain effective working relationships to accomplish objectives and tasks. | (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:  (D) employ teamwork and conflict-management skills with increased fluency to achieve collective goals. |
| **Section 9: Leadership in STEM**  In this unit students will demonstrate skills exhibited in leaders. Students will prioritize and complete tasks and perform goal-relevant activities. | (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:  (E) employ planning and time-management skills and tools such as prioritizing tasks, following schedules, and performing goal-relevant activities with increased fluency to enhance results and complete work tasks. |
| **Section 10: Compliance with Regulations in STEM Careers**  In this unit, students will focus on apply ethical reasoning to a variety of situations in order to make ethical decisions. Ultimately, the experience will lead them to the importance of compliancy with regulations, rules, and laws in the STEM field. | (5) The student understands the professional, ethical, and legal responsibilities in STEM-related fields. The student is expected to:  (A) demonstrate a positive, productive work ethic by performing assigned tasks as directed;  (B) apply ethical reasoning to a variety of situations in order to make ethical decisions; and  (C) comply with all applicable rules, laws, and regulations in a consistent manner. |
| **Section 11: Pursuing a STEM Career**  Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations. Culmination of this course will be for the students to present their collective work to the network they have developed for feedback and potential career opportunities. | (6) The student participates in a supervised STEM experience. The student is expected to:  (D) collect representative work samples. |