# Scope & Sequence

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| Course Name: Advanced Transportation Systems Laboratory **TSDS PEIMS Code:** 13039510 | **Course Credit:** 1.0**Course Requirements:** Recommended Grade Placement: 11 – 12. **Prerequisites:** None.**Recommended Prerequisites:** A minimum of one credit from the courses in the Transportation, Distribution, and Logistics Career Cluster. **Corequisites:** Automotive Technology ll, Automotive Services, Diesel Equipment Technology ll, Collision Repair, Paint and Refinishing, Aircraft Airframe Technology, or Aircraft Powerplant Technology.  |
| **Course Description:** Advanced Transportation Systems Laboratory provides the opportunity to extend knowledge of the major transportation systems and the principles of diagnosing and servicing these systems. Topics in this course may include alternative fuels such as hybrid, bio diesel, hydrogen, compressed natural gas (CNG), liquidized natural gas (LNG), propane, and solar; total electric vehicles and power trains; advanced transportation systems such as collision avoidance, telematics, vehicle stability control, navigation, vehicle-to-vehicle communications; and other technologies. This study will allow students to have an increased understanding of science, technology, engineering, and mathematics in all aspects of these systems. This will reinforce, apply, and transfer academic knowledge and skills to a variety of relevant activities, problems, and settings. |
| **NOTE:** This is a suggested scope and sequence for the course content. This content will work with any textbook or instructional materials. If locally adapted, make sure all TEKS are covered.**NOTE:** This lab course provides an enhancement opportunity for students to develop the additional skills necessary to pursue industry certification. This course must be taken concurrently with a corequisite course and may not be taken as a stand-alone course. Classroom activities and allotted course time should be modified/adjusted to allow students sufficient time to master the content of both courses. |
| **Total Number of Periods****Total Number of Minutes****Total Number of Hours** | 175 Periods7875 Minutes131.25 Hours\* | \*Schedule calculations based on 175/180 calendar days. For 0.5 credit courses, schedule is calculated out of 88/90 days. Scope and sequence allows additional time for guest speakers, student presentations, field trips, remediation, extended learning activities, etc. |
| **Unit Number, Title, and Brief Description** | **# of Class Periods\***(assumes 45-minute periods)Total minutes per unit | **TEKS Covered****130.451. (c) Knowledge and skills** |
| **Unit 1: Professional Standards** Students will begin the lab course by learning and/or reviewing and discussing professional standards and employers’ expectations, effective problem-solving strategies, interpersonal skills, the principles of group participation and teamwork, appropriate work habits, ethical conduct, and good citizenship skills. Students will further develop and demonstrate these skills and attributes throughout the course. | 5 periods225 minutes | (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:(C) demonstrate the principles of group participation, team concept, and leadership related to citizenship and career preparation;(D) apply competencies related to resources, information, interpersonal skills, problem solving, critical thinking, and systems of operation in the transportation industry; and(G) identify employers' expectations and appropriate work habits, ethical conduct, legal responsibilities, and good citizenship skills. |
| **Unit 2: Corequisite and Lab Courses**Students will participate in classroom/lab activities and discussions regarding requirements and skills, planning, timelines, strategies, and necessary procedures for successful technical skills attainments and task/assignment completion by the end of the course. Students will also discuss the importance of the efficient use of time, task prioritization, and strategies for increasing relevant skill sets in lab activities and assignments. Students will continue to develop and implement interpersonal skills as they participate in classroom/lab activities and tasks. | 10 periods450 minutes | (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:(D) apply competencies related to resources, information, interpersonal skills, problem solving, critical thinking, and systems of operation in the transportation industry.(2) The student demonstrates an understanding of the technical knowledge and skills that form the core of knowledge of transportation services. The student is expected to:(B) demonstrate advanced technical skills related to the corequisite course and its industry.(3) The student develops an elevated aptitude for the essential knowledge and skills listed for the corequisite course. The student is expected to:(A) demonstrate deeper understanding of the corequisite course. |
| **Unit 3: Health and Safety**Students will discuss and identify employers’ expectations regarding safe and appropriate work habits, ethical conduct, and legal responsibilities in the workplace. Students will participate as a class and/or in small groups to model, present, and discuss health and safety scenarios and safety equipment in the workplace as well as response plans to potential emergency situations. Students will examine and discuss safety data sheets, and discuss and demonstrate relevant technical knowledge and skills related to health and safety in the workplace. Students will be given multiple hands on opportunities to observe, discuss, and demonstrate an understanding of the safe use of relevant tools and equipment. | 40 periods1,800 minutes | (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:(A) demonstrate knowledge of the technical knowledge and skills related to health and safety in the workplace such as safety glasses and other personal protective equipment (PPE) and safety data sheets (SDS);(C) demonstrate the principles of group participation, team concept, and leadership related to citizenship and career preparation;(D) apply competencies related to resources, information, interpersonal skills, problem solving, critical thinking, and systems of operation in the transportation industry;(F) discuss response plans to emergency situations; and(G) identify employers' expectations and appropriate work habits, ethical conduct, legal responsibilities, and good citizenship skills.(2) The student demonstrates an understanding of the technical knowledge and skills that form the core of knowledge of transportation services. The student is expected to:(C) demonstrate an understanding of the use of advanced tools and equipment. |
| **Unit 4: Academic Skills**Students will enhance and increase their understanding of science, technology, engineering, and mathematics and reinforce, apply, and transfer their academic knowledge and skills in a variety of relevant activities, problems, and settings related to corequisite course assignments and/or industry-related skill mastery. Students will also use appropriate technology and/or assigned materials to extend their knowledge of research and development in the transportation industry as well as new and emerging technologies, and discuss how new and emerging technologies will affect careers and future occupational tasks in the transportation industry. Students will also discuss and predict what other core academic skills will be necessary for a successful career in the transportation industry, and be given multiple opportunities to demonstrate and apply relevant problem-solving, critical thinking, and academic skills in-context as they continue to develop and demonstrate an understanding of the use of advanced tools and equipment.  | 50 periods2,250 minutes | (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:(D) apply competencies related to resources, information, interpersonal skills, problem solving, critical thinking, and systems of operation in the transportation industry;(G) identify employers' expectations and appropriate work habits, ethical conduct, legal responsibilities, and good citizenship skills; and(H) develop personal goals, objectives, and strategies as part of a plan for future career and educational opportunities.(2) The student demonstrates an understanding of the technical knowledge and skills that form the core of knowledge of transportation services. The student is expected to:(A) extend knowledge of new and emerging transportation technologies related to the corequisite course and its industry such as hybrid, avionics, unmanned aerial systems, collision avoidance, and light duty diesel systems;(C) demonstrate an understanding of the use of advanced tools and equipment; and(D) demonstrate an understanding of research and development in the transportation industry of the corequisite course. |
| **Unit 5: Industry Standards, Skills, and Credentialing Requirements**Students will use appropriate technology and/or assigned materials toresearch, identify, and discuss employment opportunities, including entrepreneurship opportunities and internships, in the field of transportation. Students will learn and/or review technology and technical skills necessary for meeting transportation-related industry standards, certifications, and licensing requirements as well as for successful course completion. Students will demonstrate time management skills by developing personal goals, objectives, and strategies as well as specific plans for meeting skill and credentialing requirements, and exhibit progress toward achieving industry-recognized documentation of specific expertise in a transportation field or skill. Students will continue to develop, master, and apply knowledge and skills in related activities and/or workplace/occupational task scenarios and assignments throughout the course.  | 60 periods2,700 minutes | (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:(B) identify employment opportunities, including entrepreneurship opportunities and internships, and industry-recognized certification requirements in the transportation field of study;(D) apply competencies related to resources, information, interpersonal skills, problem solving, critical thinking, and systems of operation in the transportation industry;(E) discuss certification opportunities; and(H) develop personal goals, objectives, and strategies as part of a plan for future career and educational opportunities.(3) The student develops an elevated aptitude for the essential knowledge and skills listed for the corequisite course. The student is expected to:(A) demonstrate deeper understanding of the corequisite course;(B) develop hands-on skills at an industry-accepted standard; and(C) exhibit progress toward achieving industry-recognized documentation of specific expertise in a transportation field or skill. |
| **Unit 6: Career Development and Leadership Skills**Students will research, explore, and discuss examples and benefits of Career and Technical Student Organizations (CTSO) and/or other extracurricular student activities. Students will then prepare and effectively present brief oral and/or written reports on a CTSO or other extracurricular organization they are willing to join or are already participating in. Students will also discuss their progress toward achieving industry recognized documentation of specific expertise in a business field or skill and self-evaluate their mastery of hands-on skills. | 10 periods450 minutes | (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:(C) demonstrate the principles of group participation, team concept, and leadership related to citizenship and career preparation;(D) apply competencies related to resources, information, interpersonal skills, problem solving, critical thinking, and systems of operation in the transportation industry;(G) identify employers' expectations and appropriate work habits, ethical conduct, legal responsibilities, and good citizenship skills; and(H) develop personal goals, objectives, and strategies as part of a plan for future career and educational opportunities.(3) The student develops an elevated aptitude for the essential knowledge and skills listed for the corequisite course. The student is expected to:(B) develop hands-on skills at an industry-accepted standard; and(C) exhibit progress toward achieving industry-recognized documentation of specific expertise in a transportation field or skill. |