



ROBOTICS & AUTOMATION I

Year at a Glance (YAG)



FIRST SEMESTER		SECOND SEMESTER	
First Nine Weeks		Third Nine Weeks	
<p>TEKS 2A, 2B, 2C, 2D, 2E, 2F</p>	<p>Science, Technology, Engineering, and Mathematics (STEM) Robotics Overview This Science, Technology, Engineering, and Mathematics (STEM) Robotics Overview unit is designed to give students the opportunity to explore training, education, and career opportunities. Students will investigate and create a plan to achieve industry certifications. Upon culmination of the unit, students will discuss ethical issues related to robotics and incorporating proper ethics in submitted projects, as well as identify appropriate actions and consequences relating to discrimination, harassment, and inequality.</p>	<p>TEKS 10A, 10B, 10C</p>	<p>Time for Project Based Learning The Science, Technology, Engineering, and Mathematics (STEM) Career Cluster focuses on planning, managing, and providing scientific research and professional and technical services, including laboratory and testing services, and research and development services. In this unit, students will use tools and laboratory equipment in a safe manner to construct and repair system and use precision measuring instruments to analyze systems and prototypes. The culminating activity for this unit will be for students to use multiple software applications to simulate robot behavior and present concepts.</p>
<p>2G, 2H, 2I</p>	<p>Science, Technology, Engineering, and Mathematics (STEM) Robotics Exploration In this unit, students will explore careers and preparation programs in robotics. Upon culmination of the unit, students will submit findings about career preparation, including job shadowing, mentoring, and apprenticeship training.</p>	<p>7A, 7B, 7C, 7D, 7E</p>	<p>Engineering Principles and Fundamental Physics In this unit, students will perform functions to demonstrate knowledge of Newton’s Law as it applies to robotics and demonstrate knowledge of motors and gears as used in robotic systems. The culminating activity will include students describing the application of the simple machines to robotics.</p>
<p>5A, 5B, 5C, 5D, 5E, 5F, 5G, 5H</p>	<p>Safety Precautions 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. The culminating activity will have students describe the results of negligent or improper maintenance of tools, equipment, and machines.</p>	<p>8A, 8B, 8C</p>	<p>Components Required for Robotic Functions 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. In this unit, students will describe the workings of a robotic arm. The culminating activity will have students describe the relationship between torque and gear ratio to payload in robotic arm operations.</p>
Second Nine Weeks		Fourth Nine Weeks	
<p>TEKS 3A, 3B, 3C</p>	<p>Teamwork in STEM In this unit students will apply principles of problem solving through collaboration and conflict resolution. Students will use positive attitudes to demonstrate effective teamwork. The culminating activity will be for the students to identify and demonstrate the proper attitude found in team leaders in the field of robotics.</p>	<p>TEKS 6A, 6B, 6C</p>	<p>Maintain Technological Products, Processes, and Systems In this unit, students will demonstrate principles of project documentation and workflow to simulated and actual work situations. The culminating activity will include having students read and interpret technical drawings, manuals, and bulletins.</p>
<p>4A, 4B, 4C, 4D</p>	<p>Project Management</p>	<p>9A, 9B, 9C, 9D, 9E, 9F, 9G, 9H</p>	<p>Design Methodologies In this unit, students will perform such functions such as apply testing and reiteration strategies to</p>

<p>1A, 1B, 1C, 1D, 1E</p>	<p>In this unit, students will develop a project management plan including initiating, executing, monitoring, controlling, and closing a real or simulated project. The culminating activity will have students develop and present a production plan for an individual project.</p> <p>Employability Skills This unit offers students basic technical skills necessary to fulfill careers in the workforce. Through group activities, students will demonstrate interpersonal skills, such as: communication, professionalism, decision-making, leadership, and conflict resolution. The unit culminates with a peer review evaluation and reflection upon skills needed for success in the workforce.</p>	<p>11A, 11B, 11C, 11D, 11E, 11F</p>	<p>develop or improve a product and apply decision-making strategies when developing solutions. Students will use an engineering notebook to document the project design process as a legal document.</p> <p>Extended Learning Experience During this unit students will build a prototype circuit. In this unit, students are encouraged to expand their learning experiences through avenues such as STEM organizations and other leadership or extracurricular organizations. By connecting with these networks and/or their peers in the previous unit, students will present their final project which may lead to future career opportunities.</p>
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