

Landstown High School Governors STEM Academy

Programs of Study Course Description

Technology Foundations (8403) : In this beginning high school course, students acquire a foundation in technological material, energy, and information and apply processes associated with the technological thinker. Challenged by laboratory activities, students create new ideas and innovations, build systems, and analyze technological products to learn further how and why technology works. They work in groups to build and control systems using engineering design in the development of a technology. *Projects will reflect on each of the three cluster pathways and help students identify their program.*

Introduction to Engineering Design (PLTW) (8439): In this foundation course in Project Lead the Way (PLTW), students use 3-D computer modeling software as they learn the engineering-design process and solve design problems for which they develop, analyze, and create product models.

Computer Information Systems (6612): Students apply problem-solving skills to real-life situations through word processing, spreadsheets, databases, multimedia presentations, and integrated software activities. Students work individually and in groups to explore computer concepts, operating systems, networks, telecommunications, and emerging technologies.

Marketing (8120): Students examine activities in marketing and business important for success in marketing employment and postsecondary education. Students will learn how products are developed, branded, and sold to businesses and consumers. Students will analyze industry trends and gain hands-on experience in the marketing of goods, services, and ideas. Topics will include professionalism in the workplace, product planning and positioning, promotion, pricing, selling, economic issues, and the impact of technology on the marketplace. Computer/technology applications and DECA activities enhance the course. DECA, the co-curricular student organization, offers opportunities in leadership, community, and competitive events.

Communication Systems (8415): Communication Systems provides experiences in the fields of imaging technology, graphic productions, video and media, technical design, and various modes of communicating information through the use of data. Students develop critical-thinking and problem-solving skills using the universal systems model. Students also learn about the impact of communication on society and potential career fields relating to communications.

Aerospace Technology I (8487): Aerospace Technology I offers an introduction to the aerospace industry through a hands-on approach and exploration of topics such as flight, space, and supporting technologies. Students explore the aviation and space industries by examining the history of aviation, aerodynamics and aircraft components, flight conditions, airport and flight operations, space systems, rocketry, and living and working in space.

Aerospace Technology II (8488): Aerospace Technology II provides an advanced exploration of flight, space travel, and supporting technologies through a practical approach centered around problem solving. Students explore concepts in aircraft operations; aircraft design, flight safety, and maintenance; airport infrastructure; and small unmanned aircraft systems (sUAS).

Engineering Drawing & Design (TE8436): Students use a graphic language for product design, technical illustration, evaluation of designs, and engineering drawings. They increase their understanding of drawing techniques learned in the prerequisite course. Students use computers, calculators, and descriptive geometry and adhere to established standards to solve design problems. They work in teams to design solutions for an identified need.

Digital Visualization (TE8459): Students gain experiences related to computer animation by using graphics and design concepts. Students solve problems involving 3-D object manipulation, storyboarding, texturing/mapping, lighting concepts, and environmental geometry. Students create a variety of animations that reflect real-world applications and are introduced to interactive and 3-D animation software. Production of a portfolio showcasing examples of original student work is included.

Biomedical Engineering (8467): The biomedical engineering course focuses on the design of biomedical devices and their contributions to human health. Students engage in the design of a variety of biomedical engineering solutions such as artificial limbs, replacement organs, assistive devices, and clinical instruments. Students explore career and postsecondary education opportunities related to the field.

Biotechnology Foundations in Technology (8468): This course focuses on various techniques that are used to modify living organisms, or parts of organisms, to improve plants and animals, and the development of microorganisms for specific purposes. Student activities range from bioprocessing and deoxyribonucleic acid (DNA) analysis, to medicine, and the environment. Students gain insight and understanding about biotechnology career fields.

Electronics Systems I (8416): Electronic devices are everywhere in modern life and business, and, as a result, opportunities abound for any who should master the knowledge and skills required to design, alter, repair, and construct them. This course allows students the opportunity to explore principles of electricity, apply knowledge in mathematics and science, and conduct experiments with electronics. Students solve problems using simple electrical devices and circuits and build electronic projects using DC and AC devices and circuits.

Technology of Robotic Design (8421): Students engage in the study of computers and microprocessors and their applications to manufacturing, transportation, and communication systems. Topics include computer equipment and operating systems, robotics, programming, control systems, and social/cultural impact of these technologies. Problem-solving activities challenge students to design, program, and interface devices with computer systems. Learning activities include robotics, computer-aided design, computer-aided manufacturing and design, and control of electromechanical devices.

Game Design and Development (8400): The game design industry is the fastest revenue growing entertainment medium, and has created many new job disciplines. In this project-based course, students will create innovative games through the application of graphic design, animation, audio, and writing skills. Students will work in teams while developing problem-solving, critical thinking, and effective communication skills. They will analyze, design, prototype, and critique interactive games within a project management environment. Career opportunities across multiple industries, including the entertainment and educational arenas, will be explored.

Advanced Game Design and Development (8401): Students will work collaboratively in teams to refine their game design skills as they apply graphic design, animation, audio and writing skills to create

innovative games for education and entertainment. This project-based course enhances problem solving, project management, and communication skills through the analysis, design, construction, and critique of interactive games. Students will learn about career opportunities in game design and development and investigate the training and certification requirements.

Database Design and Management (6660): This course includes database design and Structured Query Language (SQL) programming. Students study database fundamentals, including database development, modeling, design, and normalization. In addition, students are introduced to database programming with SQL. Students gain the skills and knowledge needed to use features of database software and programming to manage and control access to data. Students will prepare for the first of two certification exams.

Java Programming (6661): Students study Java, perhaps the most widely used object-oriented, class-based, general-purpose programming language, to create and manipulate database objects and applications. Instruction will emphasize preparation for industry certification.

Cybersecurity Fundamentals (6302): Cybersecurity affects every individual, organization, and nation. This course focuses on the evolving and all-pervasive technological environment with an emphasis on securing personal, organizational, and national information. Students will be introduced to the principles of cybersecurity, explore emerging technologies, examine threats and protective measures, and investigate the diverse high-skill, high-wage, and high-demand career opportunities in the field of cybersecurity.

Cybersecurity Software Operations (6304): Cybersecurity Software Operations is designed to teach many aspects of computer support and network administration. Students learn networking concepts, from usage to components, and create peer-to-peer network systems and client server networks. Students learn how to install and configure network cards and connect them to networks; to install the operating systems; to create, set up, and manage accounts; to load software; and to establish, implement, and maintain network integrity security plans. This course may cover software-based network operating systems, such as Windows Server or Linux, to prepare students with a foundation in computer network administration.

Digital and Social Media Marketing (8125): This course introduces students to digital and social media marketing. Students explore principles, strategies, tools, and tactics related to consumers, branding, advertising, and promotions. Students explore how success is measured in a digital and social media marketing campaign. This course emphasizes ethics, laws, and security. Students also investigate business and marketing plans as well as careers in digital and social media marketing

Video and Media Technology (8497): This course offers students a hands-on opportunity to study all aspects of video and media production. Students will conceptualize, plan, and contribute through all production phases: preproduction, production, and postproduction. In addition, students will practice various methods of gathering and recording information and creating novel content to create a variety of video and media productions while operating studio editing software and video and audio equipment.

Entrepreneurship (9093): This course introduces students to the exciting world of creating, owning, and launching their own business. Students will learn concepts and techniques for planning an entrepreneurial venture, using design thinking and business model development. Students will learn about financial statements, marketing principles, sales and customer service, and basic economic principles for successful operation.

Graphic Communications Systems (8458): This course provides experiences related to a wide range of tools and materials used to reproduce information and images. Several mediums are used, including paper, metal, plastic, and fabric. Students develop competencies in message design, composition and assembly, and message transfer and product conversion.