Georgia Department of Education
Career Pathway Descriptions

Science, Technology, Engineering & Mathematics Cluster

Planning, managing, and providing scientific research and professional and technical services (e.g., physical science, social science, engineering) including laboratory and testing services, and research and development services.

Engineering and Technology Pathway

The Engineering and Technology Education pathway is one of three pathways in the STEM Career Cluster. Engineering & Technology combines hands-on projects with a rigorous curriculum to prepare students for the most challenging postsecondary engineering and technology programs. Students build solid technical writing, comprehension, calculation, problem-solving, and technical skills. Students are encouraged to take relevant math and science courses, such as advanced algebra, chemistry, calculus, geometry, trigonometry, physics, design, and engineering concepts. In addition to classroom and laboratory experiences, Engineering & Technology students participate in the Technology Student Association (TSA). Activities in Technology Student Association promote soft skills, leadership skills, and high standards of craft quality, scholarship, and safety. Through Technology Student Association, students have the opportunity to explore industrial and technological resources, practice parliamentary procedures and democratic decision-making, and earn recognition for exemplary performance. Engineering & Technology graduates typically pursue postsecondary education at two-year or four-year colleges to prepare for engineering, engineering technology, and engineering technician-oriented positions. Possible college majors include architectural, biomedical, chemical, civil, computer, computer science, electrical, environmental, industrial, manufacturing, materials, mechanical, nuclear engineering, and engineering technology. Career opportunities in these fields generally involve planning, managing, and providing scientific research and professional and technical services. The demand for skilled engineers in the United States far outpaces the current supply, so the future looks bright for students who want to follow an engineering-related career. This pathway culminates with an opportunity for students to take the NOCTI Engineering or SkillsUSA Engineering end of pathway assessment.

Course 1 – Foundations of Engineering and Technology 21.42500
Course Description: The Foundations of Engineering and Technology is the introductory course for the Engineering and Technology Education pathways. This STEM driven course provides the students with an overview of engineering and technology including the different methods used in the engineering design process developing fundamental technology and engineering literacy. Students will demonstrate the skills and knowledge they have learned through various project based activities while using an engineering design process to successfully master the "E" in STEM.

Proposed Course 2 – Engineering Concepts

Proposed Course 3 – Engineering Applications

Electronics Pathway

The Electronics pathway is one of three pathways within the STEM Career Cluster. This pathway covers electronic practices and fundamentals, roles of electronics in communications and industry, and career development. Topics include safety, tools, direct current, schematics, measuring electricity, Ohm's/Watt's/Kirchoff's Laws, power, and circuits. Leadership skills, science, thinking skills, and principles of technology are reinforced. This pathway also covers advanced electronic practices and principles, special equipment and materials, and employment opportunities. Safety, mathematics, reading, problem solving, tools, and using test equipment are reinforced. In the Electronics Pathway students lay out, build, test, troubleshoot, repair, and modify developmental and production electronic components, parts, equipment, and systems, such as computer equipment, missile control instrumentation,

electron tubes, test equipment, and machine tool numerical controls, applying principles and theories of electronics, electrical circuitry, engineering mathematics, electronic and electrical testing, and physics. This pathway culminates with an opportunity for students to take the NOCTI Electronics Technology end of pathway assessment.

Course 1 – Foundations of Electronics 21.45200
Course Description: This foundational course is designed for students who are interested in careers related to the design, production, analysis, repair, and operation of devices that use electronics. Students will study and apply using project based learning activities the fundamentals of electricity and electronic systems including the theory and operation of how the basic components function, how a variety circuits are connected, and how to design these circuits.

Proposed Course 2 – Advanced AC and DC Circuits

Proposed Course 3 – Digital Electronics

Engineering Drafting and Design Pathway

The Engineering Drafting and Design pathway is one of three pathways in the STEM Career Cluster. Behind every product, building, or process are drawings and models created by someone using the techniques and principles taught in a drafting course. In the study of Engineering Drafting and Design, students learn the math and drawing techniques needed to represent three-dimensional buildings and objects. The pathway courses cover such topics as interpreting specifications and estimating materials. Students learn to draw plans on paper as well as the computer. With computer-assisted drafting programs, students can make changes and add detail to plans quickly. Increasingly sophisticated technology allows drafters and designers to create more realistic images that almost seem like three-dimensional models, making it easy to imagine the finished structure or object. Engineering Drafting and Design is the process of turning ideas of how things should be constructed into technical drawings. These drawings are based on sketches and calculations made by engineers, surveyors, architects and/or scientists. The drawings provide visual guidelines such as dimensions, materials to be used, and procedures to be followed to build everything from manufactured products such as spacecraft, automobiles, and industrial machinery to structures such as homes, office buildings, and oil and gas pipelines. This pathway culminates with an opportunity for students to take the American Design Drafter Association (ADDA) Certified Apprentice Mechanical; Certified Drafter Mechanical; Autodesk Certiport.

Course 1 – Introduction to Drafting and Design 48.54100
Course Description: This introductory course exposes students to a variety of fundamental skills utilized in entry-level drafting and design positions. Students are exposed to CAD technologies and conventional drafting methods to produce various designs, working drawings, charts, forms and records. Students will be exposed to both classroom theory and laboratory projects.

Proposed Course 2 – Survey of Engineering Drawing

Proposed Course 3 – 3D Modeling and Analysis

For more information, please contact Mark Crenshaw at mcrenshaw@doe.k12.ga.us