Cartersville High School



School Year 2024-2025

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| Course Name | CTAE: Engineering Concepts | Teacher Name | Jeremy Knight |
| School Name | Cartersville High School | Teacher Email | jknight@cartersvilleschools.org |
| School Phone  Number | 770-382-3200 | School  Website | https://www.cartersvilleschools.org |

Course Description: Engineering Concepts is the second course in the Engineering and Technology Pathway. Students will learn to design technical solutions to engineering problems using a whole systems approach to engineering design. Students will demonstrate the application of mathematical tools, teamwork, and communications skills in solving various design challenges, while maintaining a safe work environment. The prerequisite for this course is Foundations of Engineering and Technology.

TSA, (Technology Student Association), a co-curricular organization provides additional experiences for development of skills in the technology education program. Activities of TSA are a fundamental part of the instructional program and prepare students to be successful leaders and responsible citizens in a technological society. The program promotes communication, leadership and competitive skill development, scholarship and safety in the classroom/laboratory environment and provides experiences with the community's industrial and technological resources and for recognition for exemplary performance.

GPS Standards: Upon successful completion of this course the student will have:

STEM-ECI - Demonstrate employability skills required by business and industry.

STEM-EC2 - Demonstrate and follow safety, health, and environmental standards related to the Science, Technology, Engineering and Math (STEM) workplaces.

STEM-EC3 — Describe the characteristics of engineering disciplines and engineered products.

STEM-EC4 - Demonstrate the knowledge and skills required to pursue the full range of engineering post-secondary education and career opportunities

STEM-EC5 - Explain a whole systems approach to the engineering design process to solve a technical problem.

STEM-ECG - Employ critical thinking skills and teamwork skills when working in groups to solve problems, to make decisions, achieve group goals and use team members' talents effectively.

STEM-EC7 - Summarize and apply engineering solutions through the audience appropriate application of engineering graphics and technical writing.

STEM-EC8 - Apply basic engineering tools and resources to aid in data collection and problem solution sets.

STEM-EC9 - Cite evidence for the role of troubleshooting, research and development, inventions, and innovations in problem solving.

STEM-ECIO-Explore the use of social media and other 21 st century technologies and their impacts of the fields of engineering and technology.

STEM-ECI 1-Students explore how related career and technology student organizations are integral parts of career and technology education courses. Students will develop leadership, interpersonal, and problem-solving skills through participation in co-curricular activities associated with Technology Student Association.

Curriculum Overview

The following academic concepts will be covered. THIS IS ONLY A GUIDE MAY BE SUBJECT TO CHANGE.

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| Introduction to Engineering Concepts  (Classroom Structure, TSA, Safety, Tools and Equipment, Career Development/Employability Skills) |
| Project Based Learning Prototyping Lab/ Parametric Modeling Using Inventor (Project Based Learning, Intro to 3D Modeling) |
| Manufacturing Prototype  (Wood Shop Machine Usage Project/Project Based Learning in Prototyping Lab) |
| Implementing Engineering Design Process and System Design (Introduction to Electronics/Arduino) |

BOARD-APPROVED INSTRUCTIONAL MATERIALS

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| Title: | Engineering the Future |
| ISBN | 978-1-55953-963-0 |

GRADING SYSTEM: The Cartersville City School District believes that the most important assessment of student learning shall be conducted by the teachers as they observe and evaluate students in the context of ongoing classroom instruction. A variety of approaches, methodologies, and resources shall be used to deliver educational services and to maximize each student's opportunity to succeed. Teachers shall evaluate student progress, report grades that represent the student's academic achievement, and communicate official academic progress to students and parents in a timely manner through the electronic grading portal.

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| GRADING CATEGORIES | \*GRADE PROTOCOL |
| Formative Assessment — 40%  Pre-Assessments - 5%  Quizzes - 15%  Group Practice/Homework — 20%  Summative Assessment — 60%  Engineering Notebook - 15%  Cumulative Unit Tests — 15%  Project and Performance - 20%  Mid-Term and Final Exams — 10%  Culmination Project/Performance Final Exam - 10% | A – 90-100  B – 80-89  C- 70-79  F- below 70 |

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| STUDENT PROGRESS | Semester progress reports shall be issued at 4 1/2 weeks, 9 weeks and 13 % weeks into each semester. The progress of students shall be evaluated frequently, and plans shall be generated to remediate deficiencies as they are discovered. Plans shall include appropriate interventions designed to meet the needs of the students. |
| ACADEMIC INTEGRITY | Students will not engage in an act of academic dishonesty including, but not limited to, cheating, providing false information, falsifying school records, forging signatures, or using an unauthorized computer user ID or password. See the Student Handbook |
| HOMEWORK | Homework assignments are meaningful and an application or adaptation of a classroom experience. Homework is at all times an extension of the teaching/learning experience. It is considered the possession of the student and will be collected, evaluated and returned to the students. |
| MAKE-UP WORK  DUE TO ABSENCES | When a student is absent because of a legal reason as defined by Georgia law or when the absence is appropriately beyond the control of the student, the student shall be given an opportunity to earn grade(s) for those days absent. Make-up work must be completed within the designated time allotted. |
| Late Assignments: | Late work can be turned in one day late for 70% of grade. |
| Re-do Policy: | Only the assessment of projects can be re-done. If the project was turned in, but received lower than a 90%, can be redone for no more than 90% of the grade. Must be done within one week of original due date. |
| SCHOOL EXPECTATIONS FOR SUCCESS | |
| CLASSROOM  EXPECTATIONS | 1. Know and follow all Student Handbook Rules.   1. Be on time and prepared for class every day. 2. Listen and follow all instructions carefully to prevent injuries or accidents. 3. Turn in work on time. LATE class work will not be accepted without excused absence pass. 4. Tampering with computer settings will result in office detention. 5. Clean computer area and log off prior to leaving class. 6. Clean Engineering Operator Zone prior to leaving work area. 7. Follow all safety rules in the lab and classroom. 8. Return tools and supplies to proper storage area. 9. Stay focused, engaged, and HAVE FUN! |
| DETENTION | Detention will be given after two tardies to class, horse playing in the classroom, or failure to perform housekeeping responsibilities. |
| MATERIALS AND SUPPLIES | Required Materials: USB drive 8GB, Scientific Calculator, two (2) Composition Notebooks to be used as the Engineering Design Notebook, and office 365 e-mail or mail account. |
| TUTORIAL HOURS | Each day from 8:00-8:20 am & FAB Wednesdays during ALL sessions when possible. |