Cartersville High School



School Year 2024-2025

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| Course Name | CTAE: Engineering Applications | Teacher Name | Jeremy Knight |
| School Name | Cartersville High School | Teacher Email | jknight@cartersvilleschools.org |
| School PhoneNumber | 770-382-3200 | School Website | <https://www.cartersvilleschools.org> |

***Course Description***: Engineering Applications is the third course in the Engineering and Technology Pathway. Students will apply their knowledge of Science, Technology, Engineering, and Math (STEM) to develop solutions to technological problems. Solutions will be developed using a combination of engineering software and prototype production processes. Students will use market research, cost benefit analysis, and an understanding of the design cycle to create and present design, marketing, and business plans for their solutions. A capstone project will allow students to demonstrate their depth of knowledge of the engineering design process and prepare them for future opportunities in the field of engineering. The prerequisite for this course is Engineering Concepts

**Course Prerequisites:** On grade level for Math and Science.

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

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

STEM-EA2 - Demonstrate and follow safety, health, and environmental standards related to the Science, Technology, Engineering and Math (STEM) workplaces.

STEM-EA3 - Identify and explore career opportunities in one or more engineering career pathways to build an understanding of the opportunities available in the STEM workplace.

STEM-EA4 - Apply knowledge of the engineering design process to solve engineering technological problems in the STEM workplace.

STEM-EA5 - Employ planning and time management skills and tools to enhance results and complete work tasks. STEM-EA6 - Apply oral, written, and visual communication skills to obtain, interpret, and present information to and from intended audiences.

STEM-EA7- Develop and apply detailed plans to solutions for design problems using mathematical and scientific concepts.

STEM-EA8- Develop appropriate models.

STEM-EA9- Design and construct testable prototypes.

STEM-EAIO— Understand engineering impacts on social, economic, design, and environmental issues.

STEM-EAII— Explain the impact of business and marketing on engineering design.

STEM-EAI 2— 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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| Engineering Applications overview(Classroom Structure, TSA, Safety, Tools and Equipment, Career Development/Employability Skills) |
| Capstone Exploration STEMProject based learning – Projectile and Hydraulics) |
| Cap stone Exploration- design, build program and engineering design challenge) |
| Capstone Exploration – Systems Control, Electronics Design, Building, Coding, Architectural Design, Arduino Electronics, CNC Milling Modular |

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%**EXPECTATIONS FOR SUCCESS** | A – 90-100B – 80-89C- 70-79F- 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 WORKDUE 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 |
| CLASSROOMEXPECTATIONS | 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!
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| 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. |