



Approved Innovative Course

- Districts must have local board approval to implement innovative courses
- Innovative courses may meet state elective credit only
- CTE Innovative courses may not be the final course in a coherent sequence for an endorsement
- Course requirements must be met without modification

Course: Engineering Applications of Computer Science Principles

PEIMS Code: N1303772

Abbreviation: EASCP

Grade Level(s): 10-12

Number of Credits: 1.0

Course description:

Engineering Applications of Computer Science Principles (EACSP) is a year-long, design-based high school course for students who want to expand and deepen their engineering design skills and habits of mind through the purposeful integration and application of computer science (CS) principles and practices. Developed by University of Texas Engineering and Computer Engineering faculty, experienced secondary teachers and curriculum developers, and engineers with decades of industry experience, this hands-on course engages students in authentic, integrated engineering and CS practices in a project-based environment. Building on the skills and habits of mind developed in an introductory engineering design course, EACSP scaffolds students' acquisition and application of CS principles across a series of engaging and socially relevant design challenges.

Teacher qualifications:

At least one of the following certificates is recommended:

- Master Science Teacher (Grades 8-12),
- Mathematics/Physical Science/Engineering: Grades 6-12,
- Mathematics/Physical Science/Engineering: Grades 8-12,
- Physical Science: Grades 6-12,
- Physical Science: Grades 8-12,
- Physics/Mathematics: Grades 7-12,
- Physics/Mathematics: Grades 8-12,
- Science, Technology, Engineering, and Mathematics: Grades 6-12,
- Secondary Industrial Arts (Grades 6-12),
- Secondary Industrial Technology (Grades 6-12),
- Secondary Physics (Grades 6-12),
- Technology Education: Grades 6-12
- Technology Applications Grades 8-12



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- Technology Applications EC -12
- Computer Science Grades 8-12
- Secondary computer information systems Grades 6-12
- Junior High School (9-10) or High School Computer Information Systems
- Grades 6-12 or Grades 9-12 Computer information Systems.

Additional information:

For additional information, please contact the course provider: Cheryl Farmer, Director of Precollege Engineering Education Initiatives, cheryl.farmer@mail.utexas.edu or 512-471-6196.

Teachers of EACSP apply project-based instructional methods to enable the constructivist approach intended by the curriculum developers. Although the course does require some direct teaching, EACSP teachers are more often found asking leading questions that require students to arrive at important ideas. Whenever possible, teachers of the course motivate student learning by allowing students to struggle with new or difficult content until they feel the need for additional information, tools or techniques. Constructionism is also an important part of the approach, and teachers are encouraged to give their students a voice, as far as possible, in determining the nature or content of artifacts so that these artifacts are personally meaningful to the students.

Over the course of the year EACSP teachers apply a variety of specific instructional techniques related to the various student learning objectives. Some of these techniques, such as requiring regular reflection by students, are employed in a uniform way throughout the course. Others may build a variety of experiences across the year so that students may compare approaches.