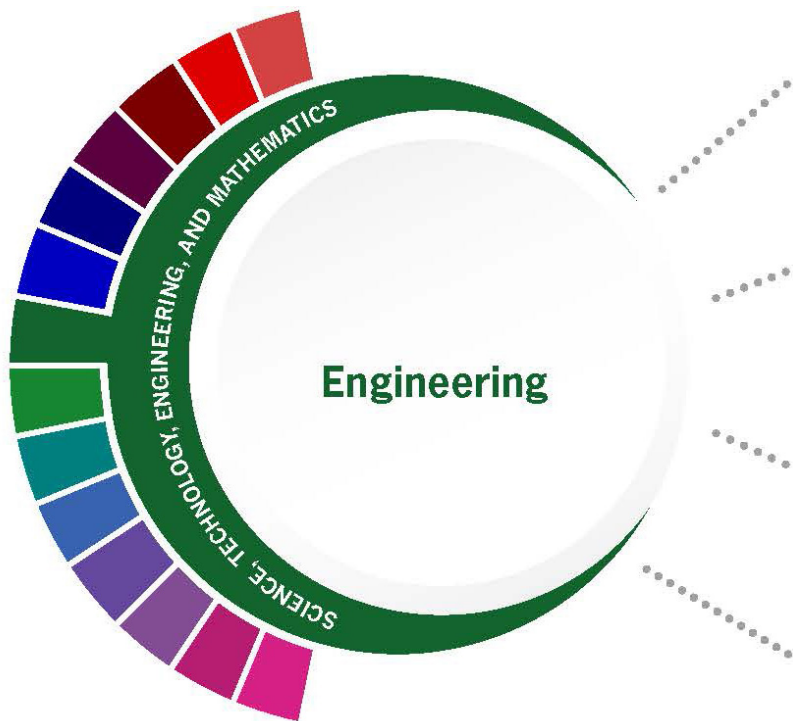


|                                      |      |
|--------------------------------------|------|
| Principles of Applied Engineering    | CHS9 |
| Engineering Design & Presentation    | CHS  |
| Engineering Design & Problem Solving | CHS  |
| Practicum in STEM I                  | CHS  |
| Practicum in STEM I                  | CHS  |
| Practicum in STEM II                 | CHS  |



| HIGH SCHOOL/INDUSTRY CERTIFICATION                       | CERTIFICATE/LICENSE*              | ASSOCIATE'S DEGREE                                  | BACHELOR'S DEGREE                                      | MASTER'S/DOCTORAL PROFESSIONAL DEGREE     |
|--|-----------------------------------|---|--|---|
| Autodesk Certified Professional or User (ACU) - Inventor | Engineer, Professional            | Electrical and Electronics Engineering              | Electrical and Electronics Engineering                 | Electrical and Electronics Engineering    |
| Certified SolidWorks Associate (CSWA)                    | Fluid Power Systems Designer      | Drafting and Design Technology/ Technician, General | CAD/CADD Drafting and/or Design Technology/ Technician | Mechanical Engineering                    |
| Certified Engineering Technician - Audio Systems         | Certified Biomedical Auditor      | Engineering Technology                              | Bioengineering and Biomedical Engineering              | Bioengineering and Biomedical Engineering |
|  | Certified Cost Estimator/ Analyst |   | Construction Engineering Technology/ Technician        |   |

| OCCUPATIONS          | MEDIAN WAGE | ANNUAL OPENINGS | %GROWTH |
|----------------------|-------------|-----------------|---------|
| Aerospace Engineers  | \$110,843   | 481             | 9%      |
| Industrial Engineers | \$97,074    | 1,263           | 10%     |
| Mechanical Engineers | \$91,707    | 1,535           | 11%     |
| Chemical Engineers   | \$112,819   | 474             | 9%      |
| Electrical Engineers | \$98,405    | 1,137           | 10%     |

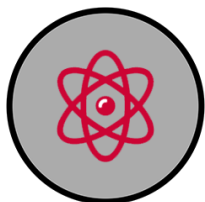
**WORK BASED LEARNING AND EXPANDED LEARNING OPPORTUNITIES**

|   |   |
|---|---|
| <b>Exploration Activities:</b> Technology Student Association (TSA); National Technical Honors Society (NTHS) | <b>Work Based Learning Activities:</b> Obtain Industry based certification. |
|---|---|

Additional industry based certification information is available from the TEA CTE website.  
 For more information on postsecondary options for this program of study, visit TXCTE.org.

The Engineering program of study focuses on the design, development, and use of engines, machines, and structures. Students will learn how to apply science, mathematical methods, and empirical evidence to the innovation, design, construction, operation, and maintenance of different manufacturing systems.

The Science, Technology, Engineering, and Mathematics (STEM) Career Cluster® focuses on planning, managing, and providing scientific research and professional and technical services, including laboratory and testing services, and research and development services.



Successful completion of the Engineering program of study will fulfill requirements of the Business and Industry or STEM Endorsement.

Approved Statewide Program of Study - September 2019



# COURSE INFORMATION

## Principles of Applied Engineering

7300Y (7300 A and B)

**Grades: 9**

**Level: 2**

**Credit: 1 (+.5 Professional Communications Credit)**

**Prerequisites: None**

**Certification Possibility: OSHA 10-Hour- General**

**CTSO Membership opportunity: TSA- Technology Student Association- \$25 Dues**

Principles of Applied Engineering provides an overview of the various fields of science, technology, engineering, and mathematics and their interrelationships. Students will learn how to apply engineering design principles to solve various real world problems. This course is appropriate for students who are interested in design and engineering. The nature of the course is hands-on with students participating in a number of team design challenges. Throughout the year, students will work on various skills in an individualized, self-paced environment. Projects include: LEGO Robotics, introduction to sketching & 3D modeling, and control systems. In some cases, project supplies will not be provided by the class to allow learners the widest choices in materials and options. Students are encouraged to participate in the Technology Student Association and the related competitions.

## Engineering Design & Presentation

7307Y (7307 A and B)

**Grades: 10-12**

**Level: 2**

**Credit: 1**

**Prerequisites: Algebra I**

**Recommended Prerequisite: Principles of Applied Engineering**

**Certification Possibility & Required Fees: TBD- \$25**

**CTSO Membership opportunity: TSA- Technology Student Association- \$25 Dues**

Engineering Design and Presentation I is a continuation of knowledge and skills learned in Principles of Applied Engineering. Students enrolled in this course will demonstrate knowledge and skills of the design process as it applies to engineering fields using multiple software applications and tools necessary to produce and present working drawings, solid model renderings, and prototypes. Students will use a variety of computer hardware and software applications to complete assignments and projects. Through implementation of the design process, students will transfer advanced academic skills to component designs. Additionally, students explore career opportunities in engineering, technology, and drafting and what is required to gain and maintain employment in these areas.

## Engineering Design & Problem Solving

3702Y (3702 A and B)

**Grades: 11-12**

**Level: 2**

**Credit: 1**

**Prerequisites: Algebra I and Geometry**

**Recommended Prerequisites: At least two courses in Program of Study**

**Certification Possibility & Required Fees: Certified SolidWorks Associate (CSWA)- \$25**

**CTSO Membership opportunity: TSA- Technology Student Association- \$25 Dues**

The Engineering Design and Problem-Solving course is the creative process of solving problems by identifying needs and then devising solutions. The solution may be a product, technique, structure, or process depending on the problem. Science aims to understand the natural world, while engineering seeks to shape this world to meet human needs and wants. Engineering design takes into consideration limiting factors or "design under constraint." Various engineering disciplines address a broad spectrum of design problems using specific concepts from the sciences and mathematics to derive a solution. The design process and problem solving are inherent to all engineering disciplines. This course satisfies a high school science graduation requirement. Students shall be awarded one credit for successful completion of this course.

**Note: This CTE course satisfies a science credit requirement for students on the Foundation High School Program.**

# COURSE INFORMATION

## Practicum in STEM (Science, Technology, Engineering, and Mathematics) I

7303Y (7303 A and B)

Grades: 11-12

Level: 3

Credit: 2 (This is a DOUBLE BLOCKED COURSE- 2 periods)

**PROGRAM QUALIFICATION FORM & PATHWAY TEAM APPROVAL REQUIRED FOR ALL SENIOR LEVEL / PRACTICUM COURSES**

**Prerequisites: Algebra I and Geometry**

**Recommended Prerequisites: At least two courses in the Program of Study**

**Certification Possibility & Required Fees: Certified SolidWorks Associate (CSWA)- \$25**

**CTSO Membership opportunity: TSA- Technology Student Association- \$25 Dues**

Need to be able to provide transportation for off campus Practicum Experiences

Practicum in STEM I is designed to give students supervised practical application of previously studied knowledge and skills. Practicum experiences can occur in a variety of locations appropriate to the nature and level of experience. This course is the senior capstone-engineering project. Learners will participate in up to two distinct projects over the course of the year as they demonstrate the skills acquired over the previous three years. In some cases, the class to allow learners the widest choices in materials and options will not provide project supplies.

**There is no level-down option for this course.**

## Practicum in STEM (Science, Technology, Engineering, and Mathematics) II

7304Y (7304 A and B)

Grades: 12

Level: 3

Credit: 2 (This is a DOUBLE BLOCKED COURSE- 2 periods)

**PROGRAM QUALIFICATION FORM & PATHWAY TEAM APPROVAL REQUIRED FOR ALL SENIOR LEVEL / PRACTICUM COURSES**

**Prerequisites: Practicum in STEM I**

**Certification Possibility & Required Fees: TBD**

**CTSO Membership opportunity: TSA- Technology Student Association- \$25 Dues**

Need to be able to provide transportation for off campus Practicum Experiences

Practicum in STEM II is designed to give students supervised practical application of previously studied knowledge and skills. Practicum experiences can occur in a variety of locations appropriate to the nature and level of experience. This course is the senior capstone-engineering project. Learners will participate in up to two distinct projects over the course of the year as they demonstrate the skills acquired over the previous three years. In some cases, the class to allow learners the widest choices in materials and options will not provide project supplies.

**There is no level-down option for this course.**

Coppell ISD offers career and technical education programs in Business, Marketing, Arts, AV Tech & Communications, Engineering, Computer Science and Health Science. Admission to these programs is based on grade level and prerequisites met.

It is the policy of Coppell ISD not to discriminate on the basis of race, color, national origin, sex or handicap in its vocational programs, services or activities as required by Title VI of the Civil Rights Act of 1964, as amended; Title IX of the Education Amendments of 1972; and Section 504 of the Rehabilitation Act of 1973, as amended.

It is the policy of Coppell ISD not to discriminate on the basis of race, color, national origin, sex, handicap, or age in its employment practices as required by Title VI of the Civil Rights Act of 1964, as amended; Title IX of the Education Amendments of 1972; the Age Discrimination Act of 1975, as amended; and Section 504 of the Rehabilitation Act of 1973, as amended.

Coppell ISD will take steps to assure that lack of English language skills will not be a barrier to admission and participation in all educational and vocational programs.

For information about your rights or grievance procedures, contact the Title IX Coordinator, at 200 S. Denton Tap Rd.; Coppell, Texas 75019, 214-496-6000, and/or the Section 504 Coordinator, at 268 Southwestern Blvd; Coppell, Texas 75019, 214-496-6938.

El Distrito Escolar Independiente (Independent School District, ISD) de Coppell ofrece programas de educación técnica o profesional en las áreas de comercio, mercadeo, artes, tecnología y comunicación audiovisual, ingeniería, informática y ciencias de la salud. La admisión a estos programas se basa en el nivel de estudios y el cumplimiento de los requisitos.

Es política del ISD de Coppell no discriminar en sus programas vocacionales, servicios o actividades en función de la raza, color, origen nacional, sexo o discapacidad, tal como lo exigen el Título VI de la Ley de Derechos Civiles de 1964, enmendada, el Título IX de las Enmiendas Educativas de 1972 y la Sección 504 de la Ley de Rehabilitación de 1973, enmendada.

Es política del ISD de Coppell no discriminar en sus prácticas laborales en función de la raza, color, origen nacional, sexo, edad o discapacidad, tal como lo exigen el Título VI de la Ley de Derechos Civiles de 1964, enmendada, el Título IX de las Enmiendas Educativas de 1972, la Ley de Discriminación por Edad de 1975, enmendada, y la Sección 504 de la Ley de Rehabilitación de 1973, enmendada.

El ISD de Coppell tomará medidas para garantizar que la falta de conocimientos del idioma inglés no sea un impedimento en la admisión y la participación en todos los programas educativos y vocacionales

Para obtener información sobre sus derechos o procedimientos de quejas, contacte al Coordinador del Título IX, ubicado en 200 S. Denton Tap Rd.; Coppell, Texas 75019, a través del teléfono 214-496-6000; o a la Coordinadora de la Sección 504, ubicada en 268 Southwestern Blvd; Coppell, Texas 75019, a través del teléfono 214-496-6938.