

Focus Your Future

Career and Technical Education Center

FISD

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What is Engineering?

Engineering is solving problems to extend human potential and improve the quality of life.

- Design Sports Equipment
- Design Musical Instruments
- Imagine New Products
- Design Theme Parks and Rides
- Save Lives
- Enter Medical School
- Become Lawyers
- Become Presidents
- Become CEO's
- Make a difference

CHANGE THE WORLD



What can you learn by taking PLTW courses?

- Solve Problems
- Listen to Others
- Work in Teams
- Conduct Research
- Analyze information
- Speak in front of a group
- Write Technical information
- Cope with failures and try again
- Improve previous work
- Manage Time to meet deadlines



CTEC Courses

Foundation Courses:

Introduction to Engineering Design (IED)

Principles of Engineering (POE)

Specialization Courses:

Civil Engineering and Architecture (CEA)

Aerospace Engineering (AE)

Digital Electronics (DE)

Capstone Course:

Engineering Design and Development (EDD)



Intro to Engineering Design

- Sketching
- 3D Modeling skills
 - Puzzle Cube
 - Beverage Server
 - Mini Train
 - Cardboard chair
- Design Process/Organization
- Team Building
- Instant Challenges
 - Tallest Tower
 - Longest Bridge
 - Fling Machine





Principles of Engineering

- **Energy and Power**

 - Study Simple Machines

 - Build and Test Machines

- **Materials and Structures**

 - Study and Test Material Structures and Beam Deflection

 - Build and Test Trusses

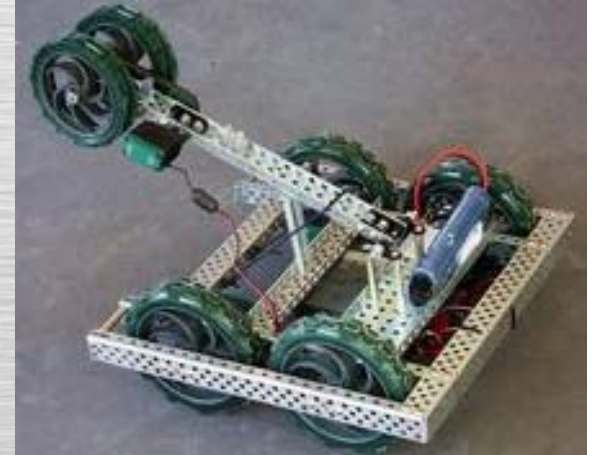
- **Control Systems**

 - Program Machines

 - Robotics

- **Statistics and Kinematics**

 - Use statistics to analyze data from launching an object





Civil Engineering and Architecture

- AutoDesk Revit
- Building Plans
- Calculations
 - Heat Loss/Gain
 - Property Runoff
- Projects
 - Shed
 - Habitat for Humanity House
 - Library
- Final Design Project
 - Group
 - Individual Roles





Aerospace Engineering

- **Design Process/Organization**

- **Research**

 - Drones (UAVs)

 - Space Exploration

 - Rocket Propulsion

 - Human Body

- **New Programs**

 - Flight Simulation

 - Programming Robots

 - Airfoils (3D Printer!)

- **Challenges**

 - Furthest Balsa Wood Glider (Aery)

 - Highest Rocket





Digital Electronics

Hand-Sketching Circuits

Breadboarding

Soldering

Random Number Simulator

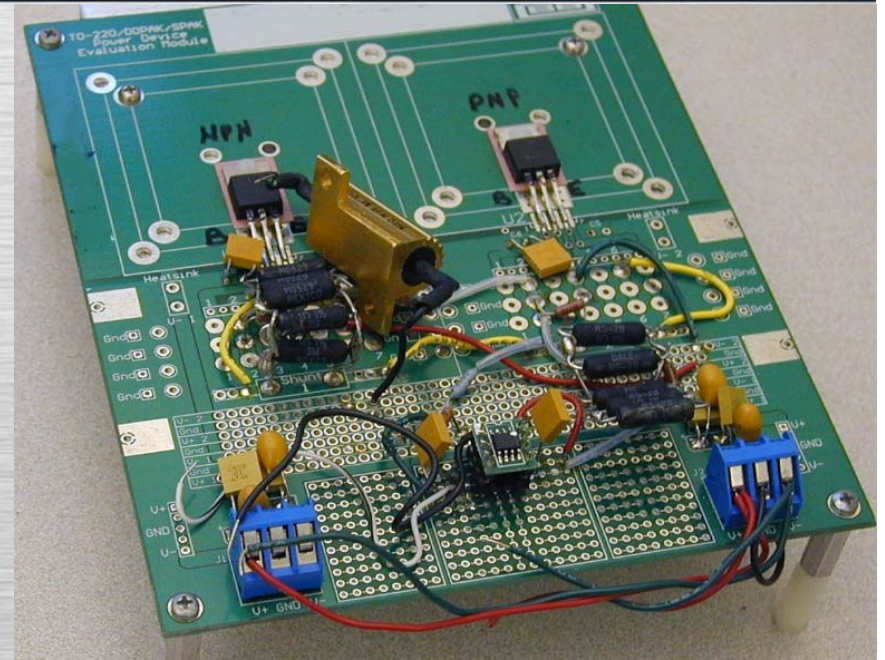
Binary Math

Boolean Logic

Multisim

Draw circuits on the computer

Lots of Mini-Projects





Engineering Design and Development

Year-long project to solve a problem

Brainstorming

Concept Development

Prototyping

Time Management

GANTT Chart

Group Communication

Partner not necessarily in same class





Internship Opportunities

Garver Engineering



Frisco Public Library



Ace Mentor Program



ARCHITECTURE • CONSTRUCTION • ENGINEERING



4 Year Plan with STEM Endorsement

(Algebra I completed in MS)

Grade 9	Grade 10	Grade 11	Grade 12
English World Geography Geometry Biology	English World History Algebra II (<i>qualifies for Distinguished w/Endorsement</i>) Chemistry	English American History Pre-Calculus Physics (<i>Required for STEM Endorsement</i>)	English 12 Government /Economics AP Calculus 4 th Science
<i>Introduction to Engineering Design</i> (<i>satisfies Tech App requirement</i>)	<i>Principles of Engineering</i>	<i>Specialty Course:</i> <ul style="list-style-type: none"><i>Aerospace</i><i>Civil</i><i>Digital</i>	<i>Engineering Design & Development</i>



4 Year Plan with STEM Endorsement

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English World Geography Algebra I Biology	English World History Geometry Chemistry	English American History Algebra II <i>(qualifies for distinguished diploma w/ STEM Endorsement)</i> Physics <i>(required for STEM Endorsement)</i>	English 12 Government/ Economics Pre-Calculus 4 th Science
	<i>Introduction to Engineering Design</i> <i>(satisfies Tech App requirement)</i>	<i>Principles of Engineering</i> <i>Or</i> <i>Civil</i>	<i>Specialty Course:</i> <ul style="list-style-type: none">• <i>Aerospace</i>• <i>Civil</i>• <i>Digital</i>• <i>Engineering Design & Development</i>

PLTW Partner Colleges and Universities

Check pltw.org for all affiliate colleges





Girls in Engineering Informational Website

Engineer Girl	http://www.engineergirl.org/
American Society of Engineering Education (ASEE)	http://www.engineeringk12.org/ www.asee.org/precollege
Discover Engineering	http://www.discoverengineering.org/
Engineering Education Service Center (EESC)	www.engineeredu.com
Junior Engineering Technical Society (JETS)- Info on engineering careers	www.jets.org
National Alliance for Partnerships in Equity (NAPE)	www.napequity.org
Sightseer's Guide to Engineering	http://www.engineeringsights.org/
The Society of Women Engineers	www.swe.org
Women in Engineering Proactive Network (WEPAN)	http://www.wepan.org/

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