

**Jefferson County High School
Course Syllabus**

Course – Technological Design

Department – Career & Technical Education

Course Description - This course integrates STEM in problem-solving, project-based learning, and engineering design helping all students develop a better understanding of information and communication, construction, manufacturing, and power and energy technologies.

A. Grade Term – Fall Semester 2016

B. Grading Scale

<u>Range</u>	<u>Honors/ Regular</u>	<u>College-Level</u>	<u>A.P.</u>
93-100 A	4.0	4.5	5.0
85-92 B	3.0	3.5	4.0
75-84 C	2.0	2.5	3.0
70-74 D	1.0	1.5	2.0

C. Term Dates

- a. 1st 9 Weeks August 5, 2016 – October 7, 2016
- b. 2nd 9 Weeks October 8, 2016 – December 16, 2016
- c. 3rd 9 Weeks January 5, 2017 – March 15, 2017
- d. 4th 9 Weeks March 16, 2017 – May 25, 2017

D. Textbook – N/A

E. Other Required Reading

- a. As directed – Mostly online technology and engineering websites

F. Other Resources

- a. Odysseyware

G. Major Assignments

H. Procedures for Parental Access to Instructional Materials

- a. Aspen Parent Portal
- b. Instructor's Website
- c. Instructor can be emailed at the following address: jwilliams@jcboe.net
- d. Parent Teacher Conference

- a. There are two designated conference dates during the school year. Parents who would like to request additional meetings may make appointments for conferences with the teachers (during their planning periods), counselors, or a principal by telephoning the school office.

I. Field Trips

- a. Any schedule fieldtrip will have a definite educational purpose and will reflect careful planning. Signed permission forms will be obtained when an off campus trip is planned.
- b. If student is involved in the Technology student association, there is a possibility of multiple day field trip in the spring for participation in the TSA State Conference in Nashville.

J. Standards & Objectives

Technological Design - EBD Course #5885 Standards and Competencies 2016-17

Standard 1 - Demonstrate leadership, citizenship, and teamwork skills required for success in the school, community and workplace.

1.1 - I can cultivate positive leadership skills. Take part in opportunities to practice and demonstrate personal leadership skills. For example, taking advantage of opportunities provided by a career and technical student organization (CTSO)...

1.2 - I can assess situations, apply problem-solving techniques and decision-making skills within the school community, and workplace.

1.3 - I can participate as a team member in a learning environment.

1.4 - I can respect the opinions, customs, and individual differences of others.

1.5 - I can build personal career development by identifying career interests, strengths, and opportunities.

Standard 2 - Safely use tools, materials, equipment and other technology resources.

2.1 - I can understand general laboratory safety rules and regulations when using tools, equipment and performing processes.

2.2 - I can successfully pass a safety a test on general laboratory safety and regulations with 100% accuracy.

2.3 - I can successfully pass a safety test on power tools used in the classroom with 100% accuracy.

2.4 - I can successfully pass a written or oral test on the chemical, electrical and fire safety hazards that exist in a Technology Engineering classroom and their school.

2.5 - I can demonstrate continuous awareness of potential hazards to self and others and respond appropriately.

Standard 3 - Students will understand how introduction to technological design in the designed world is the product of a design process that provides ways to turn resources and materials, tools and machines, people, information.

3.1 - I can understand and identify the relationship between the technological design process and selected attributes of the designed world.

3.2 - I can understand, use and apply the technological design process, sketching and drawing techniques, and prototyping to design a product or process following the steps of the technological design process.

3.3 - I can define and describe principles of design and analyze technological systems based on these principles.

3.4 - I can document the technological design processes and communicate them to audiences using appropriate oral and written techniques, such as a design proposal, models and prototypes, process and results communications, and a design portfolio.

Standard 4 - Students will apply technological design skills to the solution of practical problems. They will develop sketching and modeling skills, and communicate observations, processes and results of the technological

4.1 - I can apply the technological design process including problem identification, development of constraints, design and prototyping, conceptual, physical, and mathematical modeling, and final development.

4.2 - I can convey design ideas through sketches.

4.3 - I can fabricate physical models or prototypes that will be used to test systems or components.

4.4 - I can document the technological designs processes and communicate them to audiences using appropriate oral and written techniques.

Standard 5 - Technological design is a distinctive process with a number of defining characteristics: It is purposeful; it is

based on certain requirements; it is iterative; it is creative; and it is systematic.

5.1 - I can understand the relationship between systems and resources and the technological design process including measurable attributes of objects and the units; systems and process of measurement; and appropriate techniques, tools, and formulas to determine measurements.

5.2 - I can understand that optimization is a process used to make a design as effective or functional as possible within the given criteria and constraints.

5.3 - I can understand that controls are mechanisms or activities that use information to cause a system to change; demonstrate by designing, fabricating, and testing a feedback-controlled system.

5.4 - I can apply the principles of human factors engineering to product design and use.

5.5 - I can understand the relationship between the protections of intellectual property through the patent process and technology transfer.

5.6 - I can understand the fundamental concepts of project management (process of planning, organizing, and controlling work) through use of tools such as flow charts, graphs, technical vocabulary and symbols.

5.7 - I can understand the career pathways related to technological design.

Standard 6 - Engineering resources, sometimes referred to as the core technologies, are the basic building blocks from which all technology systems are created.

6.1 - I can understand the fundamentals of mechanical technology, the technology of putting mechanical parts together to produce, control, and transmit motion which is critical to the technological design...

6.2 - I can understand the fundamentals of fluid technology, including common components, basic system design, controls, system performance evaluation, science concepts applied...

6.3 - I can understand the fundamentals of thermal technology including common components, basic system design, controls, system performance evaluation, science concepts applied...

6.4 - I can understand the fundamentals of electrical technology including common components, basic system design, controls, system performance evaluation, and science concepts, applied...

Standard 7 - Students to analyze technology systems that are associated with selected areas of the designed world and to apply technological design skills in problem solving.

7.1 - I can apply, use, manage, analyze and research the functioning and applications of power and energy technology systems.

7.2 - I can apply, use, manage, analyze and research the functioning and applications of information and communication technology systems, including the inputs, processes, and outputs associated with sending and receiving information from human to human, human to machine, and machine.

7.3 - I can apply, use, manage, analyze and research the functioning and applications of transportation technologies, describe how transportation impacts the operation of other technologies, such as manufacturing, construction, communication, health and safety, and agriculture.

7.4 - I can apply, use, manage, analyze and research the functioning and applications of manufacturing technologies.

7.5 - I can apply, use, manage, analyze and research the functioning and applications of construction technologies.

34 Competencies

