

**Jefferson County High School
Course Syllabus**

Course – Advanced Design Applications

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

Advanced Design Applications – EBD Course 5920 Standards and Competencies for 2016-17

Standard 1 - The student will demonstrate leadership, citizenship, and teamwork skills required for success in the school, community and workplace through Technology Student Association.

1.1 - I can exhibit positive leadership skills.

1.2 - I can participate in the Technology Student Association (TSA) as an integral part of the classroom instruction.

1.3 - I can demonstrate the ability to work cooperatively with others in a professional setting.

1.4 - I can outline leadership skills and team building.

1.5 - I can identify personal, teamwork and leadership skills used in various occupations.

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

2.1 - I can successfully pass a test on general classroom, lab, and/or shop safety guidelines with 100 percent accuracy.

2.2 - I can successfully pass a test on the safe use of tools and equipment used in the lab and/or shop with 100 percent accuracy.

2.3 - I can successfully pass a test on the safety hazards that exist at home, school and in the workplace.

2.4 - I can use research relating to OSHA regulations conduct a safety inspection for a lab, school, or business.

2.5 - I can list and explain the importance of safety guidelines for TSA competitive events.

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

2.7 - I can understand safety, nomenclature and usage of all hand tools used in this course.

2.8 - I can understand and explain potential safety, chemical, electrical and fire safety hazards that exist in a Technology Engineering classroom and their school.

2.9 - I can list all safety rules required when competing in specific TSA competitive events.

Standard 3 - Demonstrate knowledge and skills related to Manufacturing Technologies.

3.1 - I can analyze and differentiate between materials and processes utilized to manufacture a variety of products.

3.2 - I can utilize appropriate design principles while developing an automated manufacturing machine.

3.3 - I can expose students to how customer, societal, and environmental concerns affect the design of products.

3.4 - I can explore factors that affect the quality control in manufacturing processes.

3.5 - I can utilize the applications of the engineering design model and a set of design principles that will guide thinking while solving technological problems.

3.6 - I can focus on the use of microprocessors that are used in computer integrated manufacturing environments and apply knowledge of basic electronics and circuitry.

3.7 - I can interact with different types of sensors and explain their functions with the manufacturing process.

3.8 - I can understand why relays are used and how they work in manufacturing systems.

Standard 4 - Demonstrate knowledge of and skills related to Construction Technologies.

4.1 - I can Individually design a house to meet certain criteria provided by a hypothetical client.

4.2 - I can understand the techniques and tools used in technical drawing and modeling.

- 4.3 - I can analyze and design the elements for a new or existing neighborhood that promote positive and negative interactions between residents of a community.
- 4.4 - I can identify the infrastructural systems that are involved in most large-scale construction.
- 4.5 - I can identify and describe the key ideas of how green building trends are changing the way residential buildings are being designed and built.

Standard 5 - Demonstrate knowledge of and skills related to Energy and Power Technologies.

- 5.1 - I can build and experiment with different energy and power systems.
- 5.2 - I can examine issues related to ethical, environmental, social and political influences behind the energy and power choices we make.
- 5.3 - I can utilize simple electronics equipment to provide basic introduction to the theory of electricity.
- 5.4 - I can explore and test simple fluid and mechanical power systems.

Standard 6 - Demonstrate knowledge of and skills related to Transportation Technologies.

- 6.1 - I can understand and define the four modes of transportation technology.
- 6.2 - I can explain the principles of appropriate technology and how to analyze the risks and benefits of a transportation design.
- 6.3 - I can calculate and determine distance and direction.
- 6.4 - I can describe how structure and support systems are related within a transportation device and how both systems affect passenger and cargo safety.
- 6.5 - I can explore the technical concept of control and begin to understand how these controls are applied to transportation systems.
- 6.6 - I can explore and understand the concepts of torque, gear trains, gear ratios, and how to increase and decrease the torque of a small electric motor.