**IED (Intro to Engineering Design) Course Outline:**

**Unit 1: Design Process (10 weeks)**

Lesson 1.1 Introduction to a Design Process **(11 days)**

1.1.1 Basic Design Tools
1.1.2 Introduction to Research
1.1.3 Modeling

Lesson 1.2 Introduction to Technical Sketching and Drawing **(11 days)**

1.2.1 Basic Line Conventions
1.2.2 Pictorial Sketches
1.2.3 Introduction to Multiview Drawings

Lesson 1.3 Measurement and Statistics **(10 days)**

1.3.1 History of Measurement
1.3.2 English and Metric Linear Measurements
1.3.3 Dial Caliper Measurement
1.3.4 Linear Dimensions
1.3.5 Applied Statistics

Lesson 1.4 Puzzle Cube **(17 days)**

1.4.1 Puzzle Design Challenge
1.4.2 Puzzle Part Combinations

1.4.3 Packaging Design

1.4.4 Marketing

**Unit 2: Design Exercises (10 weeks)**Lesson 2.1 Geometric Shapes and Solids **(10 days)**

2.1.1 Geometric Shapes

2.1.2 Geometric Solids

2.1.3 Calculating Area

2.1.4 Calculating Properties

2.1.5 CAD Fundamentals

2.1.6 Modeling Creation

Lesson 2.2 Dimensions and Tolerances **(9 days)**

2.2.1 Dimensioning Conventions

2.2.2 Tolerancing

Lesson 2.3 Advanced Modeling Skills **(19 days)**

2.3.1 Parameters
2.3.2 Auxiliary Views

2.3.3 Section Views

2.3.4 Feature-Based Solid Modeling

2.3.5 Assembly Modeling

2.3.6 Assembly Drawing Standards

2.3.7 Exploding Assemblies

2.3.8 Assembly Animation

Lesson 2.4 Advanced Designs **(12 days)**

2.4.1 Advanced Designs

2.4.2 Design Process

2.4.3 Teamwork

2.4.4 Decision Matrix

2.4.5 Revision Blocks

2.4.6 Assembly Drawing Standards

**Unit 3: Reverse Engineering (9 weeks)**

Lesson 3.1 Visual Analysis **(8 days)**

3.1.1 Visual Design Elements
3.1.2 Visual Design Principles
3.1.3 Composition

3.1.4 Advertising

3.1.5 Graphic Design

Lesson 3.2 Functional Analysis **(4 days)**

3.2.1 Identifying Subsystems
3.2.2 System Analysis

**Lesson 3.3 Structural Analysis** **(15 days)**

3.3.1 Structural Connections

3.3.2 Precision Measurement

3.3.3 Material Analysis
3.3.4 Property Analysis

**Lesson 3.4 Product Improvement by Design** **(16 days)**

3.4.1 Researching Product History and Evolution
3.4.2 Product Innovation
3.4.3 Problem Identification
3.4.4 Writing a Design Brief
3.4.5 Brainstorming
3.4.6 Design Critique
3.4.7 Technical Report

**Unit 4: Open-Ended Design Problems (7 weeks)**

Lesson 4.1 Engineering Design Ethics **(8 days)**

4.1.1 Human Impacts
4.1.2 Product Lifecycle

4.1.3 Recycling
4.1.4 Design For Disassembly (DFD)
4.1.5 Environmental Protection Agency (EPA)
4.1.6 Occupational Safety and Health Administration (OSHA)

Lesson 4.2 Design Teams **(25 days)**

4.2.1 Teamwork

4.2.2 Project Planning

4.2.3 Assessment

4.2.4 Meetings

4.2.5 Virtual Teams

**IED Methods of Assessment:**

The evaluation of projects needs to be on going and cumulative with the use of performance, portfolio, test, and self-report assessments. Evaluators may be teachers, students, or outside experts. These assessments should be check marks of how the students are meeting the standards set in the course and help direct the accomplishment of the project itself.

Project Assessment should include but is not limited to:

1.    Presentation

2.    Written/Oral Report

         Daily Journal

         Engineering Notebook

         Multimedia

3.    Graphic Representation

         Orthographic representation

         Pictorial representations

         Schematics

         Sketches

         Photos

         Diagrams

         Video Clips

         Graphs and Charts

         Statistical Analysis

4.    Final Product

         Constructed Models

         Computer Models

         Computer Simulations

         New standards

         New system

         New process

         New legislation

         New theories

5.    Performance skills

         Breadboarding

         Use of the Multimeter

         Computer Applications (i.e., Word Processing, Spreadsheet, PowerPoint)

         Measurement

         Construction

***Grading Scale:***

A = 90 to 100%

B = 80 to 89%

C = 70 to 79%

D = 60 to 69%

F = 0 to 59%

**Classroom Rules:**

* **WE WILL RESPECT ONE ANOTHER**
	+ Coarse language is unacceptable
	+ Inappropriate physical contact is unacceptable
* **WE WILL BE PUNCTUAL**
	+ Be in room and on task on time everyday
* **WE WILL BE PREPARED**
	+ Bring text, paper, pencil and eraser everyday
* **WE WILL BE PROFESSIONAL**
	+ Stay seated and working
	+ Quietly raise hands for help
	+ Maintain quiet room for everyone’s benefit
	+ Dress according to school codes
	+ Damage or destroy nothing
	+ Do not leave seats or room until officially dismissed

**Consequences:**

* + VERBAL WARNING
	+ LOSS OF BONUS POINTS
	+ REFERRAL AND PARENTAL NOTIFICATION
	+ PRINCIPAL DISCIPLINARY ACTION(S)
* *Consequences may not always occur in this order. Disturbances will result in appropriate consequences*.

**Parents:**

If you have any questions or concerns about your student’s achievement, or if there is anything that I should know that might help me to teach your student, please feel free to contact me gregory.taylor@slps.org throughout the school year.

I am here to prepare your child for college and/or the adult working environment. Good citizenship is highly emphasizes and factored in the grades using cooperative activities, peer and self assessments. Whether this is a freshman or up to a senior level course, citizenship and work ethic shall be emphasized and expected. Any help you might offer will be greatly appreciated and utilized. Thank you.

Finally there is an expectation that you will assume the responsibility of maintaining a current phone number with me, or the main office, to ensure my ability to contact you with issues of concern, or excellence, as necessary throughout the year.

I have read and understand the rules and regulations for Mr. Taylor’s class:

***Parent phone for immediate discretionary contact: ( ) -***

Parent Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Student Signature\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Print Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_\_\_\_\_\_\_\_

Returning this portion of the syllabus document completed and signed in a prompt manner is the ***first assignment*** of the year and ***does carry point value*** for your student grade. Failure to complete this will result in a PAN *(parental appearance notification).*

Thank you for all of your support.