# Design and Drawing for Production

Course #1220 | 1 Credit | Prerequisite: World Of Technology

## Course Syllabus

* Teacher: Mr. Vertucci
* Email: nvertucci@swrschools.org
* Twitter: @VertucciTechED
* Extra Help: Morning 6:45AM-7:20AM

### Course Description

Ever tried to design something new or draw up an idea you wanted to share with your friends and wondered how you could communicate your idea? Have you wondered how someone designed that new gadget or sleek new smartphone? Then this course is for you. This introductory problem-solving course covers six concept areas in technical drawing required to produce quality mechanical drawings and actual production of their design. The assignments begin with basic drafting techniques, progress to some design problems, and illustrations that culminate with a model. This “hands on” method of instruction presents an effective design solution for student understanding. Students will use the tools of the draftsperson and the required woodworking equipment to complete these projects. The student receives instruction to help them gain competence in two and three view, section and isometric drawings. In addition, you will use SketchUp, a 3D design software package from Google, to help you design solutions to different projects.

***May be taken for Regents credit to satisfy the High School Art/Music requirement.***

### Course Requirements

Students are required to complete multiple drawing assignments including 3D printing prototypes. The quality and overall presentation of these assignments will be used to determine the students grade. Particular attention to detail will be emphasized. Students will be required to accumulate skills from the beginning of the course and will be expected to build on their skills with each successive project and/or assignment. Each assignment will be evaluated based on this grading rubric and at times require mastery in order to be completed:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Category | Weight | 0 points | 25 points | 50 points | 75 points | 100 points |
| Organization | 5% | Unable to find assignments or not routinely saved | Able to demonstrate some organization by backing up files or use of folders | Both drawings and models are identifiable and can be found if needed | All drawings are in a folder and models organized by folders in Google Drive | All drawings are in a folder labeled correctly and models organized by folders in Google Drive labeled correctly |
| Class Participation | 5% | Showed no participation | Limited to no participation | Inconsistent day-to-day participation | Participated only when needed | Engaged daily and actively participated |
| Effort | 10% | No effort | limited to no effort | Inconsistent day-to-day effort | Showed effort only when needed or routinely directed | Continuous day-to-day effort with or without direction |
| Creativity/Originality | 10% | No creativity, copied designs | Minimal creativity based off past designs | Moderate improvements based off past designs | Complete overhaul of past or found designs | Completely new idea/design |
| Craftsmanship/Skill | 70% | Poor execution, no planning | Moderate end result, able to achieve an outcome | Good planning but poorly executed end result | Good planning and good end result although not what had been designed or communicated | Great planning & execution able to achieve what had been designed or communicated |

### Required materials

DDP is a drafting and production course. Effective storage of projects and organization of materials is critical to student success. In order to aid students the items listed below will be beneficial:

* 1 x folder
* 1 x binder
* 1 x Bound Notebook for **Engineering Journal** (composition notebook)
  + The notebook must be bound and no pages can be added or removed. Students will record research, experimental data and observations, calculations, mentor contacts, relevant vocabulary, and ideas for future research within the notebook. You will receive a rubric outlining the notebook requirements to reference throughout the course.

***Laptops are allowed and encouraged as long as they are utilized towards course work and not a distraction or they will not be permitted in class. All students are provided the G Suite of tools via Google and their school account.***

### Course Category Grading

The overall grading of the course is weighted as indicated below:

|  |  |
| --- | --- |
| Category | Weight |
| Assignments | 62.5% |
| Do Nows | 2.5% |
| Presentations | 7.5% |
| Quizzes | 13.75% |
| Pretests | 0% |
| Tests | 13.75% |

### Course Units And Descriptions

|  |  |  |  |
| --- | --- | --- | --- |
| Unit Number | Unit Title | Description | Point Total |
| 1 | Introduction | Introduction to course units, expectations, and grading policy | 1000 points total |
| 2 | The Design Process and Tools | Investigation into the Design Process, the difference between the scientific method and usage | 1000 points total |
| 3 | Lettering | Pencil techniques, styles of lettering, guidelines, lettering with pen | 1000 points total |
| 4 | Alphabet of Lines | Line types, line type usage and characteristics of line types | 1000 points total |
| 5 | Dimensioning | Measuring and dimensioning standards and when to use | 1000 points total |
| 6 | Basic Geometry in Drafting | Using drafting tools to construct basic shapes | 1000 points total |
| 7 | Multiview Drawing | Orthographic projections, Isometrics, object visualization, finishing a drawing | 1000 points total |
| 8 | Modeling | Using design principles to construct and build scaled models | 1000 points total |
| 9 | Reverse Engineering | Students selects a product or object of choice and breakdowns each component to scale | 1000 points total |
| 10 | Puzzle Cube Design Challenge | Design challenge incorporating orthographics and isometrics | 1000 points total |
| 11 | Advanced Modeling | Transitioning from paper to digital construct space, using CAD to create and design artifacts | 1000 points total |
| 12 | Design Research Project | Selection of a product with deep research and analysis that is data driven | 1000 points total |
| 13 | Cardboard Chair Challenge | A design challenge using ONLY cardboard to construct a functional chair | 1000 points total |

### Course Calendar

The school year has a total of 43 weeks, which include breaks and holidays. Units are scheduled to run within or close to these allocated school calendar weeks:

|  |  |  |
| --- | --- | --- |
| Unit Number | Unit Title | Calendar Weeks |
| 1 | Introduction & The Design Process | 1-3 |
| 2 | The Design Process and Tools | 4-5 |
| 3 | Lettering | 6-7 |
| 4 | Alphabet of Lines | 8-9 |
| 5 | Basic Geometry in Drafting | 10-11 |
| 6 | Multiview Drawing | 12-16 |
| 7 | Dimensioning | 17-19 |
| 8 | Modeling | 20-25 |
| 9 | Puzzle Cube Design Challenge | 26-30 |
| 10 | Reverse Engineering | 31-34 |
| 11 | Cardboard Chair Challenge | 35-39 |
| 12 | Advanced Modeling | ??? |
| 13 | Advanced Modeling | ??? |