

## **3D PRINTING**

Welcome to 3D Printing! The 3D Printing class is divided into 3 courses: **Beginning, Intermediate, and Advanced** which will be covered over the course of the 2019-2020 school year. There will be an end of the course assessment for each of the 3 courses. A study guide will be given to each student beforehand.

Grades will be based on the following category weights:

<b>COURSE ASSESSMENT (TOTAL OF 3)</b>	<b>30%</b>
<b>LESSON TASKS</b>	<b>20%</b>
<b>PROJECTS</b>	<b>20%</b>
<b>DESIGNS IN TINKERCAD</b>	<b>20%</b>
<b>LESSON HOMEWORK</b>	<b>10%</b>

There will be projects throughout the school year that will be done ENTIRELY in class. Projects include: **Innovation Exposition, Mock 3D Business, 3D Board Games, and working for the SMMS Problem Solving Bank.** Detailed information will be given before each project is assigned.

Each lesson will have a lesson task and homework. All lesson tasks and homework will be posted and completed on PowerSchool Learning. The 3D Printing program Tinkercad will be utilized on the Chromebook to design 3D models.

3D Printing is the wave of the future! I look forward to having you in my class for the 2019-2020 school year, and I hope to equip you with the necessary 21st century skills needed in today's changing world.

Sincerely,

***Dr. Brooks***

## **Learning Outcomes for Beginning 3D Printing**

**By the end of this course, all students will be able to:**

- Recognize what a 3D printer looks like
- Describe where 3D printers are used in society
- Discuss why 3D printers are being widely adopted in society
- Explain the basic concept of how a 3D printer works
- Explain how x,y and z coordinates relate to 3D printing
- Describe the main components of how to create a 3D printed object
- Define the term CAD (computer aided design)
- Define the term CAM (computer aided manufacture)
- Create a basic model using TinkerCAD
- Add fillets and chamfers to models
- Download their models as an STL file

## **Learning Outcomes for Intermediate 3D Printing**

**By the end of this course, all students will be able to:**

- Review the impact that 3D printers can have on people's lives and society.
- Explain how 3D printing is changing how products are made
- Summarize how 3D Printers are being used in the medical industry
- Explain the injection moulding process.
- List the different types of 3D printing technology
- Explain how filament is extruded through a nozzle
- Model basic CAD features, such as extrude, revolve, shell and fillet
- Assess if support material is needed on a design
- Rescale, rotate and move an object ready for slicing
- Export a file for 3D Printing
- Discuss the benefits of sustainable materials

## **Learning Outcomes for Advanced 3D Printing**

**By the end of this course, all students will be able to:**

- Review how 3D printing can disrupt traditional manufacturing supply chains
- Discuss how 3D printing is being used in real life manufacturing case studies
- Describe how 3D printing is impacting the sustainability of manufacturing
- To review how 3D printing design and 3D printers can be sustainable
- Explain the fundamentals of carbon footprint and product miles