Drafting & Design 9/10

Objective

The objective of this course is to build upon fundamental drafting and design skills, developing students' ability to think critically, problem-solve, and communicate ideas visually. Students will advance from freehand sketching to manual drafting and finally to computer-aided design (CAD) and computer-aided manufacturing (CAM). Emphasis is placed on creativity, accuracy, employable skills, and exposure to modern digital fabrication technologies.

By the end of this course, students will:

- *Demonstrate the ability to sketch, plan, and draw objects and structures using proper scale and proportion.*
- *Use drafting instruments to produce accurate orthographic and pictorial views.*
- *Apply CAD software to create, edit, and present 2D and 3D projects.*
- *Transition from design to fabrication using 3D printers, laser engravers, CNC routers, and vinyl plotters.*
- *Develop skills that prepare them for post-secondary studies and career opportunities in design, engineering, trades, and related fields.*

Course Content

a. ***Sketching Unit (Freehand, No Tools)***

- *Shapes and forms (2D vs. 3D)*
- *Proportion, scale, shading, and textures*
- *Product design sketches (tools, everyday objects)*

b. ***Manual Drafting (Board Drawing)***

- *Drafting instruments and standards*
- *Linear, isometric, and orthographic perspectives*

- *Alphabet of lines and dimensioning practices*

c. ***Digital Drafting (CAD & CAM)***

- *AutoCAD fundamentals, 2D drawing, and modifying tools*
- *Layers, object properties, and annotation*
- *Efficiency techniques and advanced drawing tools*
- *Intro to 3D modeling (extrude, revolve, assembly concepts)*
- *Plotting, printing, and scaling*
- *From CAD to CAM (3D printing, CNC, laser cutting, vinyl cutting)*
- *Introductory modules in Inventor and V-Carve*

Skill-Building Projects

This course emphasizes projects that challenge students to apply drafting and design skills in increasingly complex ways.

Proposed Projects (Semester Plan):

- *Freehand Sketch Portfolio (graded for accuracy and creativity)*
- *Manual Drafting Exercises (perspectives, multi-view drawings)*
- *AutoCAD Floor Plan with Layers and Dimensions*
- *Mechanical Part Drawing with Annotations*
- *Laser-Engraved Picture*
- *CNC Router Project (decorative panel, sign, or pattern)*
- *3D Printed Chess Set Project*

Evaluation

Students will be evaluated and graded using the following breakdown:

A. Diagnostic Assessment

1. *Prior knowledge survey/test.*

2. *Drafting and lab safety quizzes (pass required to proceed).*
3. *Student self-assessment (goals, strengths, growth areas).*

B. Formative Assessment – 30%

1. *Class activities and sketching assignments.*
2. *Employable skills (safety, teamwork, problem-solving, cleanup).*
3. *Drafting practice exercises (manual and CAD).*

C. Summative Assessment – 70%

1. *Skill-building projects (individual rubrics).*
2. *Mid-term project (AutoCAD or manual drafting).*
3. *Final Project – Chess Set (presentation, accuracy, creativity).*

Course Costs

As per Surrey School District policy, there is ***no course fee****. Students will be provided with basic materials and access to software and machines necessary to meet prescribed learning outcomes. Students who wish to extend their projects (for example, larger 3D prints, specialty materials, or personal designs) must cover additional costs in advance with teacher approval.*

Classroom Rules and Expectations

- ***Food and Drinks****: No food or drinks in the drafting lab. Water bottles permitted.*
- ***Attendance****: Attendance for demonstrations, labs, and project work is mandatory. Repeated absences may impact success.*
- ***Workspace Care****: Students are expected to keep drafting boards, computers, and shop areas organized and clean.*
- ***Projects****: All projects must be approved. Extra projects may be completed if time allows and costs are covered.*
- ***Electronics****: Personal devices may only be used for course-related tasks. Unauthorized use will result in removal of privileges.*

- ***Academic Integrity****: All submitted work must represent the student's own effort. Copying files or designs is not permitted.*
- ***Vandalism****: Misuse of tools, machines, or software will not be tolerated and will result in disciplinary action.*
- ***Contact****:*
  Teacher: Mr. Sirian
  District Email: sirian_c@surreyschools.ca