TMJ 3M

Manufacturing Engineering Technology

Teacher	Mr. Pemberton scott.pemberton@ocdsb.ca Room 169, The Makerspace
Required Materials	Binder, lined paper, pen / pencil, **laptop*** *** HIGHLY recommended**
Course Enhancement Fee	**Total $25 + $5** $5 for Machinist's Hammer (aluminum / steel round & hex stock) $15 for CNC plasma, 3D printing, & milling materials $5 for Welding Fabrication (steel & consumables) $5 for safety glasses **(may provide your own)** *students are welcome to purchase additional materials

Course Profile

This program is highly recommended for those considering **Engineering** and related **Skilled Trades**. This course enables students to develop knowledge and skills by giving them an opportunity to design and fabricate products using a variety of processes, tools, and equipment. Students will combine modern manufacturing techniques and processes with computer-aided manufacturing as they develop critical decision-making, problem-solving, and management skills. The Design unit utilizes CAD software and students will complete projects using the CNC plasma table, 3D printers, and CNC mills. Students will develop an awareness of environmental and societal issues related to manufacturing, and will learn about pathways leading to careers in the industry and related professions. **There is no prerequisite to this course.**

You **must** be enrolled in Manufacturing Engineering and / or Computer Engineering in order to participate in **First Robotics**. In grade 11 TMJ 3M, students complete a design & fabrication challenge as part of the **Engineer In Residence** program. In grade 12 TMJ 4M, students are given the opportunity to participate in a **Tetra Society** project (http://www.tetrasociety.org/). Students are encouraged to join our **Manufacturing Specialist High Skills Major**: https://drive.google.com/file/d/14TMW_GlGA5GJDUuajYD2VOGuq23a8Crb/view?usp=sharing

Course Outline

CAD Design Unit - creating & interpreting orthographic drawings with standardized dimensions
Safety Unit - covers safe operating practices for required tools
Skills Units - machining (machinist's hammer), welding (MIG basics, T-joints, and lap joints), 3D Printing / CNC Plasma Cutting / Welding Fabrication Project
Manufacturing & Design Processes, & Technology - 3 online courses
Summative - EIR challenge at the end of the course

Course Evaluation

Course evaluation is divided into 70% term work and 30% final summative task. Details of how the 70% term mark is derived are included below. For explanations of the Ministry expectations, please follow this link:

http://www.edu.gov.on.ca/eng/curriculum/secondary/2009teched1112curr.pdf

Tasks	**Ministry Expectations**											
	A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	D1	D2
Design Unit Test 1	✔			✔								
Design Unit Test 2	✔			✔								
Design Bonus Assignment	✔			✔								
Safety											✔	
Machining Skills - Hammer		✔	✔		✔	✔	✔	✔			✔	
Welding Skills		✔	✔		✔	✔	✔	✔			✔	
3D / CNC / Welding Project		✔	✔		✔	✔	✔	✔			✔	
Rethinking the Product Development Process	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Introduction to Design Thinking and People Centred Design	✔	✔	✔	✔	✔	✔		✔	✔	✔		✔
Mapping Techniques Using Drones	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Engineer in Residence Challenge - Summative	✔	✔	✔	✔	✔	✔	✔	✔				

When assigning new work, the evaluation rubric is provided at that time. Google Classroom is used extensively to assign and track various assignments.