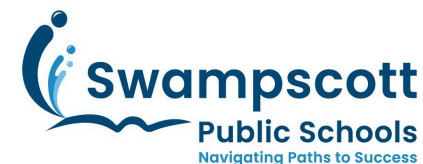


Advanced Manufacturing and Design II



Course Description: With a strong focus on real world applications, this course is designed to provide students with a broad understanding of manufacturing and design practices. Students will be introduced to the fabrication lab, offering hands-on experience that allows students to work collaboratively to solve open-ended problems that are relevant in the 21st century workplace. Projects focus on sustainable practices within the manufacturing industry and emphasize the importance of working with your hands and developing prototypes that are practical as well as functional. Students are introduced to state of the art machinery and equipment used in furniture building, product design, and construction. Students will continue to build on existing knowledge of the engineering design process and complete detailed project portfolios that showcase their creative process. It addresses standards in the Massachusetts Department of Elementary and Secondary Education's [Advanced Manufacturing Curriculum Frameworks](#).

[Link to DESE Curriculum Guide](#) in English for other languages [click here for translations](#)

Unit	Timeframe	Goals	Major Learning Experiences
Workplace Safety	2 Classes	Students will be able to identify and adhere to general safety protocols in manufacturing shop	Shop tour Safety Exams
Unit 2: Joinery/Assemblies	8 Classes	Identify, build, and 3d model three different types of common joinery used in multi part assemblies. Students will independently practice building and apply skills to a group manufacturing project	Mini Design Challenge Joinery Skill Builder Lantern Group Build
Unit 3 : Machine Tool Processes (cell amp)	6 Classes	Read and interpret project plans and cut lists; operate the planer, band saw, router table, and drill press safely. Create a 3d model of a multi part project and generate a template drawing .	Cell Phone Amp Multi-part Assemblies
Unit 4: Lantern Design Project	10 Classes	Complete a functional project from ideation to completion. Students will use the engineering design process to research, sketch, plan, and build a custom lantern.	Lantern Project Intro to CNC machining

Unit 5: Coaster Design Project	8 Classes	Students will use the engineering design process to research, sketch, plan, and build a set of coasters and case. Students must use at least two manufacturing methods (hand tools, CNC, laser, 3d printing), and apply joinery and finishing techniques.	Coaster Project Machine Tolerances
Unit 6: Machine Tool Processes	8 classes	Students will apply the design process and complete a series of games; table toss, penny hockey, and candy dispenser. They will use different joinery and manufacturing processes to make a modified version of existing designs.	Game Redesign Assembly Design
Home - School Connection			