



Dublin City Schools
STEAM
Graded Course of Study
2022

DCS STEAM Vision

Dublin City Schools is committed to providing purposeful STEAM learning experiences to students throughout their K-12 journey. These experiences will be in the form of integrated, interdisciplinary experiences as well as focused pathways in the areas of STEAM.

We commit to transforming STEAM into more than the integration of Science, Technology, Engineering, and Mathematics with vision to expand ownership to all disciplines and grade levels. By creating a culture of thinking, curiosity and creativity across content, students will engage in interest based learning that will help them develop the attitudes and skills that will support them in a variety of career and life pathways. These learning experiences will support students as lifelong, adaptable learners who can thrive in a quickly changing world.

We believe in STEAM learning for all students and commit to creating equitable access so that our STEAM classrooms are representative of our school populations and communities.

Instructional Agreements:

- We recognize the importance of early access and exposure to STEAM learning.
- We prioritize learning where students will identify and solve open-ended problems and engage in experiential learning.
- We will engage students through a lens of design thinking and promote opportunities for PBL.
- We will provide students with industry connections and experiences.
- We prioritize educating the whole child, in addition to our content. This includes a commitment to employability skills and emotional intelligence.
- We value students seeing themselves in STEAM fields.

Introduction to Engineering and Industrial Design - High School

Introduction to Engineering and Industrial Design Course Goals:

In this introduction course, students will learn about engineering and industrial design concepts and how they are used to solve real world design problems. Students will learn how to communicate their designs by learning to master industry standard 2D/3D virtual modeling software. By utilizing the Engineering Design Process, students will synthesize unique design iterations, document their work through a digital portfolio, and effectively communicate solutions to peers and members of the professional community.

Safety		
Strand	Topic	Content Statements
Equipment Safety	Tools and Habits	Develop safe workshop habits using power tools and hand tools.

Introduction to the Engineering Design Process		
Strand	Topic	Content Statements
Design & Technology (OH Tech) Addresses the nature of technology to develop and improve products and systems over time to meet human/societal needs and wants through design	1. Define and describe technology, including its core concepts of systems, resources, requirements, processes, controls, optimization and trade-offs.	9-12.DT.1.a. Explore and document how systems theory includes the concepts of system dynamics, systems thinking and computational thinking. 9-12.DT.1.b. Discuss how a design process builds on the core concepts of technology, including the relationship between systems.
	2. Identify a problem and use an engineering design process to solve the problem.	9-12.DT.2.a Evaluate a design solution using conceptual, physical, digital and mathematical models at various intervals of a design process in order to check for proper design and note areas where improvements are needed (e.g., check the design solutions against criteria and constraints).

processes.		
------------	--	--

Introduction to Solid 2D/3D Modeling		
Strand	Topic	Content Statements
Information and Communications Technology (OH Tech) The understanding and application of digital learning tools for accessing, creating, evaluating, applying and communicating ideas and information.	3. Use digital learning tools and resources to construct knowledge.	9-12.ICT.3.c Create artifacts using digital learning tools and resources to demonstrate knowledge.
	4. Use digital learning tools and resources to communicate and disseminate information to multiple audiences.	9-12.ICT.4.d Use digital learning tools to represent and model complex systems of information to a target audience.

Introduction to Concept Sketching and Technical Drawing		
Strand	Topic	Content Statements
Information and Communications Technology (OH Tech) The understanding and application of digital learning tools for accessing, creating, evaluating,	1. Identify and use appropriate digital learning tools and resources to accomplish a defined task.	9-12.ICT.1.a Develop strategies for using digital learning tools and resources to plan, implement and reflect upon a complex task.

applying and communicating ideas and information.		
Design and Technology (OH Tech) Addresses the nature of technology to develop and improve products and systems over time to meet human/societal needs and wants through design processes.	2. Identify a problem and use an engineering design process to solve the problem.	9-12.DT.2.b Implement, document and present a design process as applied to a particular product, process or problem.

Design Cycle		
Strand	Topic	Content Statement
Design and Technology (OH Tech) Addresses the nature of technology to develop and improve products and systems over time to meet human/societal needs and wants	2. Identify a problem and use an engineering design process to solve the problem.	9-12.DT.2.a Evaluate a design solution using conceptual, physical, digital and mathematical models at various intervals of a design process in order to check for proper design and note areas where improvements are needed (e.g., check the design solutions against criteria and constraints).

through design processes.		
---------------------------	--	--

3D Parts Assembly		
Strand	Topic	Content Statement
Design and Technology (OH Tech) Addresses the nature of technology to develop and improve products and systems over time to meet human/societal needs and wants through design processes.	2. Identify a problem and use an engineering design process to solve the problem.	9-12.DT.2.b Implement, document and present a design process as applied to a particular product, process or problem.

Intro to Tooling, Prototyping, Manufacturing		
Strand	Topic	Content Statement
Design and Technology (OH Tech) Addresses the nature of technology to develop and improve products and systems over	4. Evaluate designs using functional, aesthetic and creative elements.	9-12.DT.4.a Evaluate project/product solutions and communicate observations of the entire design process results. 9-12.DT.4.b Interpret data/information related to product testing to determine revisions and modifications to a design's function and aesthetics. 9-12.DT.4.c Critically evaluate a design solution at multiple points of a

time to meet human/societal needs and wants through design processes.		design process. Consider design requirements and adjust processes and outcomes as needed.
---	--	---

Digital Portfolio Development		
Strand	Topic	Content Statement
Information and Communications Technology (OH Tech) The understanding and application of digital learning tools for accessing, creating, evaluating, applying and communicating ideas and information.	4. Use digital learning tools and resources to communicate and disseminate information to multiple audiences.	9-12.ICT.4.a Use digital learning tools and resources to identify communication needs considering goals, audience, content, access to tools or devices, timing of communication (e.g., time zones), etc. 9-12.ICT.4.b Based on communication needs, develop, implement and evaluate a communication plan to disseminate information to multiple audiences. 9-12.ICT.4.c Integrate accessibility principles to effectively communicate to, and meet the needs of, multiple audiences. 9-12.ICT.4.d Use digital learning tools to represent and model complex systems of information to a target audience.

Design Project B		
Strand	Topic	Content Statement
Design and Technology (OH Tech) Addresses the nature of technology	4. Evaluate designs using functional, aesthetic and creative elements.	9-12.DT.4.a Evaluate project/product solutions and communicate observations of the entire design process results. 9-12.DT.4.b Interpret data/information related to product testing to determine revisions and modifications to a design's function and

to develop and improve products and systems over time to meet human/societal needs and wants through design processes.		aesthetics. 9-12.DT.4.c Critically evaluate a design solution at multiple points of a design process. Consider design requirements and adjust processes and outcomes as needed.
--	--	--

Final Semester Project		
Strand	Topic	Content Statement
Design and Technology (OH Tech) Addresses the nature of technology to develop and improve products and systems over time to meet human/societal needs and wants through design processes.	3. Demonstrate that solutions to complex problems require collaboration, interdisciplinary understanding and systems thinking.	9-12.DT.3.c Describe techniques for making decisions about the future development of technology. 9-12.DT.3.d Analyze the interactions within systems and between systems. 9-12.DT.3.e Apply systems thinking to solve a complex problem.