INTRODUCTION TO PROBLEM SOLVING IN MANUFACTURING, SOCIETY, AND ENTREPRENEURSHIP

term course/sophomores

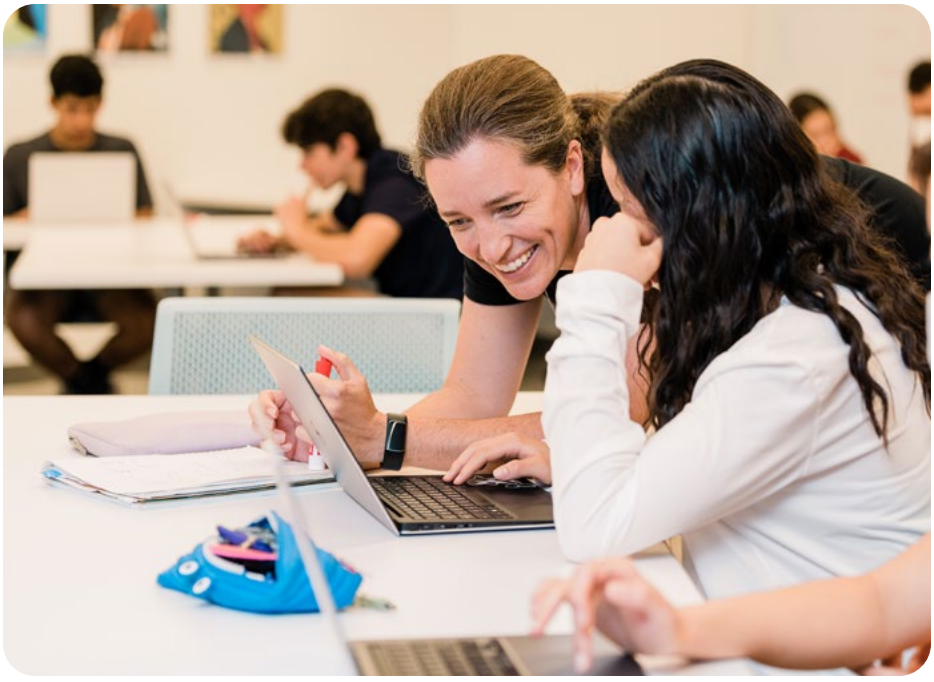
This course will introduce students to the process of design thinking and provide them with an opportunity to practice the skills involved in three different areas.

- Students will learn the design-build process and gain manufacturing experience in the makerspace.
- Students will design and implement a solution for a problem related to the concept of the common good.
- Students will tackle a business-related entrepreneurship problem for a local business. This course will meet in the Pearse Hub for Innovation.

PROBLEM SOLVING FOR THE COMMON GOOD GESC

term course/juniors and seniors

Students will learn about and gain experience in the process of design thinking and how it can be applied to problems related to the common good and social entrepreneurship. Students will identify and design solutions for problems/challenges on campus as well as within the local community (Windsor or Hartford area). At least one of the challenges will be global or environmental in nature. This course will meet in the Pearse Hub for Innovation.



PROBLEM SOLVING FOR THE BUSINESS WORLD

term course/juniors and seniors

Students will learn about and gain experience in the process of design thinking as it applies to businesses, both established businesses and start-up companies. Students will partner with local businesses to solve real-world problems/challenges and will present their solutions to the partners. This course will meet in the Pearse Hub for Innovation.

PROBLEM SOLVING FOR ENGINEERING

term course/juniors and seniors

Students will be exposed to concepts and problem solving techniques taught in typical civil and mechanical engineering curricula. They will also develop computer-aided design skills that will enable them to put these concepts into practice using resources in the Pearse Hub for Innovation. Projects may include using structural design software to analyze and build trusses, designing and testing custom gear boxes and kinematic mechanisms for transforming motion, and testing the properties of various engineering materials. Formal engineering design methods will be used to identify and solve the given problems, providing students with an understanding of what it means to pursue a college degree and career in engineering.

INTRODUCTION TO COMPUTER SCIENCE: ROBOTICS

term course

This hands-on, experiential term course exposes students to concepts and problem solving techniques taught in typical electrical, computer, and mechatronics engineering curricula. Students will learn about the scientific principles that enable complex systems to measure and act on key information about their environment. Students will learn to use analysis software and integrated development environments in tandem with practical experiments that teach them the basics of analog circuits, numerical representation in microprocessors, and digital logic. Students will apply their newly acquired knowledge to solve more complex problems that may include analog music synthesis, designing hardware that can solve basic mathematical problems, and controlling motors with both analog circuits and microprocessors to respond to a variety of measured inputs. Projects require students to become familiar with formal engineering design processes and the tools and resources in the Pearse Hub for Innovation. The course is intended to complement Problem Solving for Engineering and provides students with a fundamental understanding of how engineers designed computers to do what they do. This course prepares students to take CL Computer Science.

INTRODUCTION TO COMPUTER SCIENCE: PROGRAMMING

offered as a term course and half course

This course uses a variety of tools to introduce students to the underlying principles of computing. Students will be exposed to a survey of ideas in computer science, centered on building skills in basic programming and algorithm development. Topics include calculations, decision-making, handling data, and basic control structures. Various programming tools and languages will be explored to support a deeper understanding of the topics covered. This course prepares students to take CL Computer Science.

GAME DESIGN: WHERE ART MEETS CODE

half course

This year-long introductory half course combines the creativity of digital art with the logic of programming to guide students through the process of designing and building their own 2D video games. In the first trimester, students will

explore tools and techniques for creating digital art, learning about design principles, color theory, and digital illustration to develop characters, environments, and other visual elements for their games. During the second trimester, students will learn foundational programming concepts and build confidence in coding, while applying their new skills to create programmatically-generated works of art in a beginner-friendly language. In the final trimester, students will bring together their programming skills and artistic creations to develop a simple, playable 2D game. This course emphasizes creativity, problem-solving, and technical skill, empowering students to bring their ideas to life in an interactive format. No prior experience is necessary. This course fulfills one visual arts diploma requirement and prepares students to take CL Computer Science.

COMPUTER SCIENCE: AI AND DIGITAL LITERACY

term course

This computer science course builds foundational digital literacy and practical skills through a non-coding, hands-on exploration of artificial intelligence. Students will learn essential computer skills—from navigating online resources and managing data securely to understanding how algorithms and AI influence daily interactions. Focusing on large language models (LLMs), students will gain a practical understanding of AI's capabilities, examining both the opportunities it presents and its ethical implications. With real-world applications and interactive case studies, students will build the skills to use computers effectively, analyze AI-driven information, and understand the impact of these technologies on privacy, fairness, and society. This course synthesizes essential computer skills with a deep understanding of AI's role in society, preparing students to use technology effectively and thoughtfully in a rapidly evolving digital world.

CL COMPUTER SCIENCE

two-term course

This course is a programming-intensive follow-up to Introduction to Computer Science. Students will spend most of the initial term learning how to code in Python and establishing a solid foundation in key techniques, such as iteration and data management, as well as some common higher-order programming paradigms. Along the way, students will delve deeper into the theory behind computer architecture to bolster their understanding of algorithms and data structures. By the second term, the course will circle back, and students will combine the concepts they have learned with Python libraries to build larger and more in-depth projects. This course is not focused on preparing students for either AP Computer Science exam. Prerequisite: Introduction to Computer Science, Game Design, or permission of the department

CL TOPICS IN COMPUTER SCIENCE A

term course/not offered in 2025–26

CL TOPICS IN COMPUTER SCIENCE B

term course

A student who has completed the two-term CL Computer Science course or its equivalent may pursue further studies through this project-oriented term course. Projects are designed in concert with the instructor and may involve either extensions of topics and concepts covered in CL Computer Science or of those not presently offered. Students will be especially encouraged to study, design, and build applications of computing that help others by combining software engineering with entrepreneurial and design thinking. **Students may take both the A and B versions of the course, which will focus on different themes and will be offered in alternate years**. Prerequisite: CL Computer Science or permission of the department

GLOBAL, DIGITAL CULTURES GESC

term course

Will our fascination with social media and technology lead to our downfall or will it save us? Does technology lead us to become more distrustful of one another and more attached to static definitions of identity, or does it foster better connections and more fluid conceptions of identity? To what extent are our very thoughts shaped by decisions made within the programs we interact with on a daily basis? By examining the effects that digital technology and algorithms have had on the practices and products of modern society through a variety of cultural lenses and texts, we will seek to gain a more nuanced understanding of the way the digital age is shaping the way we live, interact, and communicate. Resources guiding our investigation will include excerpts of popular films and shows such as Andrew Stanton's WALL-E and Charlie Brooker's Black Mirror; these will be complemented by literary texts (e.g., Richard Powers' The Overstory) and articles. Prerequisite: open to seniors, juniors, and sophomores by permission of the MCL department.

CL SENIOR WRITING SEMINAR: ALGORITHMS, AI, AND US

term course/seniors

Computers and computing have had such an impact on the modern world that it's easy to overlook the breadth of their influence. This course invites students to do the opposite: closely examine the role and impact that computers have on the human world. The course operates from the premise that it is imperative to understand not only how technologies function, but also how they interface with the ways we work, learn, play, and socialize. Our primary mode of exploring these questions will be through an older technology – prose writing. We'll begin by defining what algorithms are and how they feed off data. We'll then turn and examine specific categories of technology and how they impact parts of what it means to be human. Topics might include social media algorithms, fitness and health monitoring, algorithms in finance, and artificial intelligence. We'll also explore the ethical questions surrounding computing such as algorithmic bias, the attention economy, and questions of data privacy. In fitting with the PHI's drive to "make something and make a difference", the writing in this course will all engage directly with audiences that have direct stakes in the content of the course. Examples of this might include engaging authors about their work, reaching out to legislators, writing amicus briefs for current court cases, or connecting with local community members or organizations through writing. Familiarity with programming or previous coursework in computer science is not required. Prerequisite: permission of the departments

INDEPENDENT STUDIES IN THE PHI

term course

A student who desires to study a topic not offered as a course may propose an Independent Study Project for credit. The student must arrange for a project advisor from within the department, **submit a written proposal**, and obtain approvals from the academic advisor, project advisor, department head, and dean of faculty.