

HUMAN-CENTERED AI INNOVATION CHALLENGE COURSE SYLLABUS

Create Innovative Solutions to Society's Complex Challenges

Instructor: Program Lead: New York Academy of Sciences

Course Time & Format: 10 weeks; approximately 2-4 hours weekly

Format: Blended; Online

Age Level: 13 - 17 years old

COURSE DESCRIPTION & OBJECTIVES

Innovation Challenges are an introduction to foundational concepts of design thinking with an emphasis on developing and testing new solutions to society's greatest challenges. The Human-Centered AI Innovation Challenge requires students to work in self-selected, distributed teams, requiring cross-cultural communication, dynamic problem solving, deep critical thinking related to society, leadership and project management skills.

Students must first identify their project team and then work together with a mentor to apply design thinking processes to approach real-world problems using human-centered AI (and avoiding the downsides of artificial intelligence) in an innovation challenge with the Junior Academy. While each student must identify their own role within the team, together they will learn how to identify and map out a real problem and ways to build and test solutions quickly through an iterative, scientific approach. This course requires extensive student collaboration and regular engagement through The Academy's Junior Academy and its online platform, [Launchpad](#).

THE CHALLENGE

The recent exponential growth of artificial intelligence (AI) has inspired both hopeful excitement and pessimistic trepidation across most sectors and human life, in general. The potential promise of AI to drive powerful tools and innovation can not be understated. At the same time, AI presents several serious challenges and risks that must be addressed and mitigated.

Today and in the near future AI has the potential to improve our lives tremendously. AI could offer increased equity and accessibility as well as innovative engagement in education. In medicine AI promises improved diagnoses and personalized treatment. Some artists are beginning to embrace AI as training and collaboration tools, and even to enhance how people experience their art. Other creatives use AI for inspiration and as a brainstorming partner. In our everyday lives, AI is already making our day-to-day activities safer and easier. Spam filters use AI to identify

suspicious emails. Map and travel apps use AI to monitor traffic patterns in real time and adjust routes to avoid jams and gridlock. Banks employ AI to detect fraudulent credit card charges.

Unfortunately, AI has multiple downsides that have the potential to impact our lives negatively. Bias, misinformation, privacy and ethical concerns are just a few issues that go hand-in-hand with AI. Relying heavily on AI may reduce critical thinking skills if AI results are not questioned and assessed for accuracy or bias. Overuse of AI can also threaten jobs and human roles due to automation and may cut down on human interactions, leading to social isolation and mental health concerns. Artificial intelligence demands incredible amounts of electricity and water - impacting the environment, as well as driving up energy costs.

The best-use case for AI should retain humans at the center of education, the arts, medicine and life in general. AI should be a tool to improve and augment what we can do, rather than replace humans altogether. How might you design a solution that improves human quality of life while also minimizing or eliminating the challenges and risks of AI?

Student Challenge: To design an innovative solution that centers humans in the use of AI in a particular sector (education, medicine, art, finance, etc.). Solutions should focus on quality of human life and ensure that AI technologies augment human roles rather than replace them.

Students will work collaboratively to consider the following when designing their teams' solution:

- What sector will your solution address?
- Who will be your target audience, stakeholder, or AI user?
- What specific risk or challenge will your solution mitigate or address?
- How will your solution increase quality of life for humans?
- How could your solution be applied equitably to improve quality of life for the most humans?
- Will your solution be technological, educational, policy-driven, or something else?
- What might be the cost of your solution? Will it be affordable for your focus audience?
- What kinds of jobs might be added to the economy to support your solution?
- How can you use available data and research to inform or test your solution?
- How will you prototype your solution?
- Could your solution be expanded to other sectors that use AI?

LEARNING OBJECTIVES

INNOVATION CHALLENGE LEARNING OBJECTIVES *At the end of this course, students will be able to:*

- Develop critical thinking and problem-solving skills through brainstorming techniques to develop ideas and design a solution to a complex problem.

- Develop their own arguments and analyze competing perspectives to a complex problem with supporting evidence.
- Develop a deeper, personal civic identity and clearly identify their role in their community.
- Develop a solution that could play a part in transforming a specific societal need regarding a larger issue that is transferable to a specific community and larger global community.
- Use data and insights of an inquiry to answer a research question using scientific terms in charts, tables, or graphs.
- Utilize a social justice lens when applicable to interpret the data and critically think about which groups are not represented around decision making.
- Effectively communicate ideas, data and insights using various forms of media.
- Effectively collaborate with team members with empathy and mutual respect, and develop an expanded perspective about how people from other countries see the world.
- Effectively communicate challenge specific variables that impact the environment, society, and economy including examples of the effect on local communities.
- Understand how to apply Design Thinking methods to understand what users need, and how to develop solutions to meet those needs.
- Learn how to actively listen, work through any disagreements, and solicit input from people in creative ways to generate new ideas.
- Learn how to test ideas and develop rapid prototypes.
- Identify corresponding careers connected to Innovation Challenge.

COURSE OUTLINE

TIME	TOPIC	ASSIGNMENTS	FORMAT
Week 1	<ul style="list-style-type: none"> • Getting Started w/Junior Academy • Onboarding 	<ul style="list-style-type: none"> • Join Launchpad Platform • Review Junior Academy Orientation • Attend Virtual Kick Off Week • Complete Course Pre-Survey 	Individual
PHASE 1 Challenge Team Formation			
Week 2	Challenge introduction <ul style="list-style-type: none"> • Background on your Challenge • Finding Mentors & Experts • Reaching out to experts 	<ul style="list-style-type: none"> • Complete Required Weekly Reading • Engage in Launchpad Discussions • Complete activities found in resource library 	Collaborative
Week 3	Team Building <ul style="list-style-type: none"> • Forming Your Team 	<ul style="list-style-type: none"> • Engage in Launchpad Discussions • Hold 1st Team Meeting 	Collaborative

	<ul style="list-style-type: none"> • Holding a Virtual Team Building • Creating a Team Comm's Plan 	<ul style="list-style-type: none"> • Complete Required Weekly Reading • Due Milestone #1: Team Dynamics 	
PHASE 2 Research, Brainstorm & Plan			
Week 4	<p>Researching</p> <ul style="list-style-type: none"> • Gathering relevant and diverse materials, articles, books, and sources • Developing research questions and interviewing 	<ul style="list-style-type: none"> • Engage in Launchpad Discussions • Engage/Meet with your Team • Complete Required Weekly Reading 	Individual Collaborative
Week 5	<p>Brainstorming</p> <ul style="list-style-type: none"> • Team Concept Brainstorm • Develop How "Might We" Ideas • Building Team Empathy 	<ul style="list-style-type: none"> • Engage in Launchpad Discussions • Engage/Meet with your Team • Complete Required Weekly Reading 	Collaborative
Week 6	<p>Design & Plan</p> <ul style="list-style-type: none"> • Categorizing & Bundling Ideas • Deciding & creating your concept • Developing a user testing plan 	<ul style="list-style-type: none"> • Engage in Launchpad Discussions • Engage/Meet with your Team • Complete Required Weekly Reading • Due: Milestone #2: Design & Test Plan 	Individual Collaborative
PHASE 3 Build, Test & Analyze			
Week 7	<p>Build</p> <ul style="list-style-type: none"> • Creating a Prototype • Build storyboard & journey map • Identifying your variables • Rapid Prototyping 	<ul style="list-style-type: none"> • Engage in Launchpad Discussions • Engage/Meet with your Team • Complete Required Weekly Reading 	Collaborative
Week 8	<p>Test & Analyze</p> <ul style="list-style-type: none"> • Conducting User Testing • Getting User Feedback • Analyzing your data Results 	<ul style="list-style-type: none"> • Engage in Launchpad Discussions • Engage/Meet with your Team • Complete Required Weekly Reading • Due: Milestone #3 Analyze Results 	Collaborative
PHASE 4 Iterate & Develop Final Projects			
Week 9	<p>Iterate</p> <ul style="list-style-type: none"> • Modifying your concept design based on your results • Refining & re-test your prototype 	<ul style="list-style-type: none"> • Engage in Launchpad Discussions • Engage/Meet with your Team • Complete Required Weekly Reading 	Individual Collaborative
Week 10	<p>Develop Final Project</p> <ul style="list-style-type: none"> • Creating draft of Final Project • Project Feedback & revision • Submitting Final Project • Complete Course Post-Survey 	<ul style="list-style-type: none"> • Due: Executive Summary • Due: Final Team Presentation • Due: Personal Reflection • Complete Course Post-Survey 	Individual Collaborative
New York Academy Challenge Final Project Review & Grading			

COURSE ASSIGNMENTS	% of FINAL GRADE
Milestone #1: Team Dynamics: This assignment is focused on team building and planning for how students will work together.	10%
Milestone #2: Design & Test Plan: This assignment is focused on the Team's proposed solution, hypothesis and test plan.	10%
Milestone #3: Build, Test & Analyze: This assignment is focused on building, testing and analyzing data related to your solution.	10%
Team Collaboration & Online Engagement throughout course	20%
Final Presentation, Executive Summary & Personal Reflection Final Presentation Rubric	50%
(100%) Final Grade	

GRADING POLICY

Late-work policy: Milestones 1–3 are allowed to be submitted late for point deduction. Late submissions of the Final Solution Presentation for this course will not be accepted after the due date unless previously arranged with **the Academy** for extenuating circumstances. It is important to stay up-to-date on assignments since much of the work builds on previous assignments and will impact students' ability to be effective in providing solutions for their teams' projects.

Re-grade policy: If a student thinks there has been a technical error in the grading of an assignment, they should email program administration at the Academy within one week of receiving the graded assignment, otherwise the assignment will not be regraded. Feedback is provided upon request.

REQUIRED READING LIST

Students are expected to read and refer to a wide variety of texts throughout this course; all of which can be found in the Launchpad Resource Library.

Please see a sample of the Resource Library reading list for this challenge:

Week 1

[Launchpad Platform](#), Launchpad

[Junior Academy Orientation](#), Launchpad

Week 2

Human-Centered AI Challenge Background, Launchpad

[What is \(AI\) Artificial Intelligence?](#), (University of Illinois at Chicago)
[The state of AI in 2025: Agents, innovation, and transformation](#), (QuantumBlack)
[What is human-centered AI?](#) (IBM)
[Stanford University Human-Centered Artificial Intelligence](#)

Week 3

[What is Human Centered Design?](#), Video Design Kit, Innovation, Design, Engineering & Organization (IDEO)
[Design Thinking for Problem Solving](#), Video Design Kit, Innovation, Design, Engineering & Organization (IDEO)

Week 4

[Artificial Intelligence \(AI\)](#) (United Nations)
[TED Talks from TEDAI San Francisco October 2025](#)
[Human-Centered Artificial Intelligence](#) (Human-Computer Interaction Lab)
[Digital Promise: Artificial Intelligence in Education](#) (Digital Promise)
[Incredible Advantages and Benefits of AI](#) (Simplilearn)
[AI Shields Kids By Revolutionizing Child Safety And Online Protection](#) (Forbes)
[AI's new eyes in the sky helping Colorado get a jump as wildfires spark every few hours](#) (Colorado Sun)
[9 benefits of artificial intelligence \(AI\) in 2026](#) (University of Cincinnati)
[Yann LeCun Emphasizes the Promise of AI](#) (NYAS Blog Article)
[Incredible Advantages and Benefits of AI](#) (scroll down to second third of article)
[The Complex Ecosystem of Artificial Intelligence](#) (NYAS Blog Article)
[In the Age of A.I., What Makes People Unique?](#) (New Yorker)
[Interviewing Experts](#), Design Kit, Innovation, Design, Engineering & Organization (IDEO)
[Interviewing Individuals](#), Design Kit, Innovation, Design, Engineering & Organization (IDEO)
[Interviewing Groups](#), Design Kit, Innovation, Design, Engineering & Organization (IDEO)

Week 5

[How Might We](#), Design Kit, Innovation, Design, Engineering & Organization (IDEO)
[Brainstorming Rules](#), Design Kit, Innovation, Design, Engineering & Organization (IDEO)
[How to Facilitate a Brainstorm](#), Stanford D School, 2020

Week 6

[Bundling Ideas](#), Design Kit, Innovation, Design, Engineering & Organization (IDEO)
[Doing a Gut Check](#), Design Kit, Innovation, Design, Engineering & Organization (IDEO)
[Creating a Concept](#), Design Kit, Innovation, Design, Engineering & Organization (IDEO)

Week 7

[Determine What to Prototype](#), Design Kit, Innovation, Design, Engineering & Organization (IDEO)
[Rapid Prototyping](#), Design Kit, Innovation, Design, Engineering & Organization (IDEO)
[Prototype to Test](#), Design Kit, Innovation, Design, Engineering & Organization (IDEO)
[Identify a Variable](#), Design Kit, Innovation, Design, Engineering & Organization (IDEO)
[Storyboards & Journey Maps](#), Design Kit, Innovation, Design, Engineering & Organization (IDEO)
[Tinkercad](#), Autodesk

Week 8

[Get Feedback](#), Design Kit, Innovation, Design, Engineering & Organization (IDEO)
[Testing with Users](#), Design Kit, Innovation, Design, Engineering & Organization (IDEO)
[Research Methods](#), Launchpad

Week 9 - Week 10

[Integrate Feedback & Iterate](#), Design Kit, Innovation, Design, Engineering & Organization (IDEO)

[How to Create a Presentation](#), Launchpad

[How to Create Video Presentations](#), Movavi

[Presentation Guidelines](#), Launchpad