



HEALTHCARE SYSTEMS ENGINEERING AND THINKING

JOHNS HOPKINS UNIVERSITY
WHITING SCHOOL OF ENGINEERING

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PROGRAM INFORMATION

INTRODUCTION

PROGRAM DURATION

Four days

MODALITY

Virtual Live (via Zoom)

ACADEMIC PROGRAM DIRECTOR

Matt Montoya and Dr. Alan Ravitz

PREREQUISITES

It is recommended that program participants have at least seven to 10 years' experience working in the healthcare or a systems-related field, as well as at least three to five years' experience in a leadership role so they can make an impact their organization's long-term strategy as well as contribute to the program's team learning objectives. It is also recommended that participants have at least a bachelor's degree in systems, science, business, or healthcare field as well, as it will better enable the learning and application of the program's concepts.

ABOUT THE PROGRAM

THE JOHNS HOPKINS HEALTHCARE SYSTEMS ENGINEERING AND THINKING EXECUTIVE PROGRAM PROVIDES PARTICIPANTS WITH A DEEP UNDERSTANDING TODAY'S ONGOING HEALTHCARE CHALLENGES AND THE TOOLS AND STRATEGIES THEY NEED TO DEVELOP HIGH-IMPACT, LONG-LASTING SYSTEMS-BASED SOLUTIONS.

Using a systems-thinking and engineering approach, participants will learn to define, parse, and articulate solutions to existing and anticipated healthcare challenges in a variety of settings and ecosystems to understand different intervention concepts, archetypes, and frameworks that can be applied to solve the most pressing healthcare challenges.

WHO SHOULD TAKE THIS PROGRAM

- Executive, senior, and rising junior healthcare professionals as well as healthcare stakeholders who are passionate about creating enduring change in the global healthcare systems



KEY TAKEAWAYS

PARTICIPANTS WILL BE ABLE TO:

1. Differentiate systems thinking and engineering terms and concepts
2. Enumerate systems methods to better impact change in healthcare challenges
3. Describe healthcare systems and their components in an ecosystem
4. Map public health challenges to systems frameworks to address risks
5. Identify technology and process possibilities to address and improve healthcare systems

These learning objectives will be realized through the process of creating enduring healthcare change. The specific use cases will involve applying baseline knowledge and approaches to create change that enables remote care in large-scale health events (LSHE) instances, where immediate, on-site care is not possible. Given the ways COVID-19 exposed the frailties of the global healthcare system, as well as its impact on emerging healthcare innovations, this is a particularly timely objective. and need for increased value.

DAY 1

PROGRAM SCHEDULE

1-1 SYSTEMS CONTEXT, CHALLENGES, AND DRIVERS

Matt Montoya
Alan Ravitz

Context and challenge landscape for complex solving and systems thinking, and engineering approaches for problem solving.

Healthcare as a complex problem and the synchronizing of systems problem solving.

1-2 SYSTEMS THINKING, MENTAL MODELS, AND INTERVENTIONS FOR CHANGE

Matt Montoya

Systems thinking and its key elements—including mental models and interventions with change to better enable a remote care environment.

1-3 SYSTEMS ENGINEERING APPROACH AND LIFECYCLE FOR IMPROVEMENTS AND CHANGE

Matt Montoya

Systems engineering approaches and overall systems engineering lifecycle, using case settings as examples.

1-4 HEALTHCARE SYSTEMS THINKING AND ENGINEERING: APPROACHES AND CHALLENGES FOR CHANGE IN A REMOTE CARE SETTING

Matt Montoya

Healthcare as a complex problem requiring systems solutions, along with challenges to implementation for change within a remote care environment.

DAY 2

2-1 HEALTH SYSTEM DRIVERS AND HEALTHCARE DELIVERY FRAMEWORK FOR ANALYSIS

Alyson Phillips
Lia Scarince

General operations and knowledge of the healthcare system. The Lee & Jones model as a framework for organizing epidemiological and health engineering work.

2-2 VARIATION

Alyson Phillips
Lia Scarince

Variation in health care delivery, including examples of how multiple factors can have an impact on the quantity and quality of health care delivery.

2-3 VARIATION

Alyson Phillips
Lia Scarince

The three hardest variation challenges: concepts of diagnostic uncertainty, provider practice patterns, and need vs. demand.

2-4 CHOOSING PROXIMAL MEASURE OF CHANGE

Alyson Phillips
Lia Scarince

Common system assessment models and measures, challenges to design collection and reporting.

DAY 3

3-1 POPULATION HEALTH SYSTEM FRAMEWORK

Alyson Phillips
Lia Scarince

A framework for health systems which serves as the basis for recommended structures and functions of health systems.

3-2 POPULATION HEALTH SYSTEM FRAMEWORK

Alyson Phillips
Lia Scarince

Guiding principles of this model and comparisons with the current U.S. health system, measuring functional health and value

3-3 ACCESS BEGETS ACCESS

Alyson Phillips
Lia Scarince

Concepts that drive care practices, including the current payment system in the U.S., alternative payment models (ACOs) and over diagnosis of conditions.

3-4 3 PS: POLITICS, PROFIT, PRESTIGE

Alyson Phillips
Lia Scarince

Drivers that impact the healthcare system.

DAY 4

4-1 HEALTHCARE PAIN POINTS AND OPPORTUNITY FOR CHANGE

Matt Montoya Three key systems thinking elements to promote healthcare change: information sharing, shared vision, and team learning.

4-2 INFORMATION SHARING FOR CHANGE

Matt Montoya Innovations that promote healthcare change through information sharing in digital health. (interview with healthcare specialist)

4-3 SHARED VISION FOR CHANGE

Matt Montoya Innovations that promote healthcare change through creating a shared vision in supply chain approaches. (interview with healthcare specialist)

4-4 TEAM LEARNING FOR CHANGE

Matt Montoya Innovations that promote healthcare change through healthcare data analytics. (interview with healthcare specialist)

ELEMENTS OF PROGRAM DESIGN

This is a highly interactive course that includes a range of individual and group activities. Every session focuses on technical knowledge and skills that can be implemented immediately in participants' careers.



All learners obtain Whiting Lifelong Learner status

INSTRUCTORS



MATTHEW MONTOYA (DESIGN THINKING TEAM)

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Dr. Matthew (Matt) Montoya is a mentor-advisor, instructor, researcher, professor, and academic portfolio manager at The Johns Hopkins University in the Systems Engineering, Healthcare Systems Engineering, and Lifelong Learning programs and is a past recipient of the JHU Outstanding Instructor Award. For 35 years Dr. Montoya was also a principal chief engineer and portfolio director for The Johns Hopkins University Applied Physics Laboratory where he was responsible for strategic and technical direction for several/multi-million-dollar complex systems pertaining to national security and healthcare delivery. Dr. Montoya received his B.S. in engineering physics/mathematics from Colorado State University, his M.S. in applied mathematics and systems engineering from The Johns Hopkins University, an MBA from Loyola University of Maryland, an MPH from Dartmouth College, and a Doctorate of Engineering in Systems Engineering/Operations Research from The George Washington University.



ALAN D. RAVITZ

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Alan D. Ravitz is chief engineer in JHU/APL's National Health Missing Area and is chair of the Whiting School of Engineering's Engineering for Professionals MS program in Healthcare Systems Engineering. He holds an MS in electrical engineering from the University of Miami Florida, an MS in technical management from Johns Hopkins University, and a PhD in systems engineering from George Washington University. In addition, Ravitz holds a Professional Engineering (Electrical) License. He has more than 30 years' experience in systems engineering, design, field testing, and analysis, extending across biomedical and healthcare systems and airborne, surface ship, and submarine sonar programs.



ALYSON PHILLIPS

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Alyson (Aly) Phillips is the chief of staff for the Network Specialty Care Team at ChenMed, a value-based primary care and specialty care provider that delivers high-touch, affordable VIP health care to seniors with Medicare Advantage. Previously, Phillips was an assistant program manager for JHU/APL's National Health Mission Area. Phillips is an instructor in Johns Hopkins Engineering for Professionals Systems Engineering and Healthcare Systems program and received her MBA from the University of Michigan, and master's in health care delivery science from Dartmouth College.



LIA SCARINCE

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Lia Scarince leads program strategy and project execution initiatives within the National Health Mission Area at JHU/APL, where she leverages 20 years' experience at the front lines of public, private, and military health systems. With a focus on warfighter health and readiness, she targets science and technology development to meet critical health challenges in military operational medicine and austere expeditionary environments. She is also an instructor in Johns Hopkins University's Engineering for Professionals programs, where she teaches a course on healthcare systems. Scarince holds an MS degrees in industrial and operations engineering from the University of Michigan and an MS in applied science in spatial statistics from Johns Hopkins University's Bloomberg School of Public Health.

DESIGN THINKING TEAM



ANDREW BALL

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Andy Ball is the human and complex systems design strategist in JHU/APL's Design Thinking Group, where he leads cross-functional teams in the delivery of amazing solutions in the service of national security and space exploration. Ball is an award-winning learning and human design practitioner who excels in understanding complex challenges through the careful application of design thinking, change design, and cognitive science. He currently also works with IDEO as a teaching lead and design fellow and with the Cognitive DESIGNLAB as a director. He has a MSc. in Learning and Change from Northwestern University and an adult learning credential from The University of Cambridge.



SARAH RIGSBEE

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Sarah Rigsbee is a senior human-centered design and innovation strategist and senior professional staff member at JHU/APL and is the lead the human-centered design strategist for JHU's Institute for Assured Autonomy (IAA). At JHU/APL, Rigsbee is a supervisor and project lead across a variety of internally and externally focused human-centered challenges, including in the Navy Innovation Tactical Advancements for the Next Generation (TANG) Program and is an experienced design strategist, data analyst, and human system engineer. Rigsbee earned a PhD in engineering management from George Washington University and an MS in system engineering from the University of Virginia.



CORPORATE PROGRAMS

At Johns Hopkins Engineering Lifelong Learning, we are committed to supporting organizations as they aspire to provide professionals lifelong learning critical for success in today's competitive environment.

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CERTIFICATE OF COMPLETION

All participants that successfully complete the course will receive a Digital Certificate of completion from Johns Hopkins Engineering Lifelong Learning.



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