



## SEARI Short Course Series

Course: PI.26s Epoch-based Thinking: Anticipating System and Enterprise Strategies for Dynamic Futures

Lecture: Lecture 0: Introductions and Course Overview

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This course was taught at PI.26s as a part of the MIT Professional Education Short Programs in July 2010 in Cambridge, MA. The lectures are provided to satisfy demand for learning more about Multi-Attribute Tradespace Exploration, Epoch-Era Analysis, and related SEARI-generated methods. The course is intended for self-study only. The materials are provided without instructor support, exercises or “course notebook” contents. Do not separate this cover sheet from the accompanying lecture pages. The copyright of the short course is retained by the Massachusetts Institute of Technology. Reproduction, reuse, and distribution of the course materials are not permitted without permission.



**Systems Engineering Advancement Research Initiative**

***[PI.26s] Epoch-Based Thinking: Anticipating System  
and Enterprise Strategies for Dynamic Futures***

**Introductions and Course Overview**

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Massachusetts Institute of Technology



# Welcome and Introductions

- MIT Instructor Team
- Course Schedule/Logistics
- Learning Objectives
- Class Introductions

# Instructor Team

**Dr. Donna H. Rhodes**

**MIT**

SEARI Director

Principal Research Scientist

**Dr. Adam M. Ross**

**MIT**

SEARI Co-Director

Lead Research Scientist

***Our research is motivated by having impact on practice, not just academic thought***

# Systems Engineering Advancement Research Initiative (SEARI)

SEARI is positioned within the Engineering Systems Division at MIT



## Mission

*Advance the theories, methods, and effective practice of systems engineering applied to complex socio-technical systems through collaborative research*

### Current Sponsors:

US Air Force, Singapore DSTA, MIT Portugal Program, Lean Advancement Initiative, selected US Government Agencies



292 Main Street

E38-575

# Logistics & Information

- We are in MIT Building E38, 5<sup>th</sup> floor, located at 292 Main Street
  - Classroom opens at **8:45** each morning
- Nearby:
  - MIT Press Bookstore (below us)
  - MIT COOP Bookstore (across from us)
  - Food Court (across/behind MIT COOP)
  - Rooftop garden (top of parking structure by Marriott)
  - Starbucks – one in Marriott, one nearby
  - Many restaurants along Main Street

# Class Introductions

Please share:

- Your name
- Your organization and position
- Your motivation for attending the class

# Daily Schedule

Class runs from 9am to 5pm every day, with two 15 minute breaks and one 1 hour lunch

Lunch will be on your own

- classroom will be locked/secure over lunchtime
- re-opens 10 minutes before afternoon session

Bathrooms are located in back hall (key card required for reentry)



# Eight Learning Objectives (slide 1 of 2)

1. Understand the **motivation for and increasing importance** of developing products, systems, and enterprises for dynamic futures
2. Gain appreciation of the **impact of epoch-shifts on technology and organizations** through several example cases
3. Understand the concept of epoch-based thinking and how to **apply it in formulating decision strategies**
4. Have an appreciation for **contextual and temporal methods used to develop scenarios and strategies to address uncertainties** and anticipated changes

## **ABOUT THE COURSE**

*Contemporary systems and enterprises operate and evolve within dynamic environments characterized by changes in leadership, policy, technologies, markets, and stakeholder needs.*

*Learn to apply contextual, temporal and perceptual-based approaches to anticipate possible futures, and evaluate impacts on systems and enterprises.*

*Understand how to formulate responsive decision strategies for technology and organizational solutions.*

# Eight Learning Objectives (slide 2 of 2)

5. Understand how **external drivers and factors** (political, economic, cultural, market, etc.) can be formally described and evaluated
6. Have an **appreciation for temporal properties (ilities) and epoch-based metrics** used to aid strategic decision making
7. Discuss **perceptual issues** faced in strategic decision making including cognitive preferences, risk aversion, domain biases, and others
8. Have **pointers to recently published literature** in the field and insight into **research directions**

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# Enhanced Learning Mechanisms

- Illustrative Examples
  - Illustration of key concepts using simplified examples
- Hands-on Exercise
  - Experience in deriving epoch-based strategies
- Case Study Discussion
  - Discussion of recent real-world epoch-based analysis project
- Class Discussion
  - Elicited class discussion on key points from perspective of your own enterprise

# Your Course Materials

- Lecture Materials
- Exercises
- Survey and Assessment
  - Daily Feedback Survey
- Reading List
- Supplemental Materials