



## COURSE DESCRIPTION

This course explores **system integration principles, focusing on planning, interoperability, and performance across various industries.** It covers integration strategies, digital twins, and simulation techniques to ensure seamless system functionality before physical integration.

## EXPECTED LEARNING OUTCOMES

- Understand the fundamental principles of system integration across diverse domains.
- Apply various integration strategies and techniques to facilitate subsystem compatibility and interoperability.
- Utilize appropriate tools and methodologies for effective system integration.
- Identify and address common challenges in the system integration process.
- Design and execute integration plans that consider verification needs and integration procedural needs.

## COURSE FORMAT

The course will use a flipped classroom instructional approach. The student will read the required material and attempt to complete the homework on their own before coming to class.



PROGRAM DIRECTOR

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ENROLLMENT

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## COURSE SCHEDULE

### SESSION 0.5

- ▶ Course introduction and Overview
- ▶ System integration in the system lifecycle

### SESSION ONE

- ▶ Fundamental principles of system integration
- ▶ Common challenges in system integration (compatibility, integrability, interoperability, portability)

### SESSION TWO

- ▶ System integration methodologies (top-down, bottom-up, big bang)
- ▶ Integration techniques across application domains
- ▶ Integration of SW-intensive systems versus general systems

### SESSION THREE

- ▶ Simulation and analysis tools to support system integration
- ▶ Supporting and enabling systems for system integration

### SESSION FOUR

- ▶ Designing of integration plans
- ▶ System integration execution

### SESSION FIVE

- ▶ System verification during system integration

### SESSION SIX

- ▶ Success drivers in system integration
- ▶ The use of digital twins and digital models to support system integration

### SESSION SEVEN

- ▶ Architecting for system integration



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