# Architecture of Complex Systems

## WEEK 1: Systems Thinking

*The course officially kicks off!*

*In the first week, you'll take a Pre-Assessment to get a baseline of your understanding of the course material. During this period, you'll become familiar with the platform and course design. Finally, you'll be introduced to Systems Thinking while focusing on form and relationships among form.*

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| **Entrance Survey** | **5 min** |
| **Pre-Assessment** | **15 min** |
| **Get Started** | **25 min** |
| • Welcome | 3 min |
| • Course Schedule | 3 min |
| • Course Collaboration Tools | 5 min |
| • Course Webinar | 5 min |
| • Teams | 3 min |
| • Who's in the Course | 3 min |
| • Who's Teaching the Course | 4 min |
| • Grading and Completion Criteria | 1 min |
| • Certificate Information and CEUs | 1 min |
| • Learning Objectives and Pedagogy | 2 min |
| • Social Media Groups | 1 min |
| • Software Requirements | 1 min |
| • Get Started Discussion Recap | 10 min |
| **Systems Thinking** | **3.5 hrs** |
| • Webinar with Teaching Assistant | 1 hour |
| • Key Ideas | 4 min |
| • Opening Activity | 15 min |
| • Defining Systems Thinking | 15 min |
| • Systems and Emergence | 20 min |
| • Four Tasks of Systems Thinking | 30 min |
| • Architecture and Form | 40 min |
| • Graded Activity | 15 min |
| • Project | 1-1.5 hrs |
| • Key Takeaways | 2 min |

## WEEK 2: Function and Emergence

*In week two, you will move from form to function. First, you will focus on concepts regarding function. Second, you will be introduced to form and function in system architecture. Finally, you will close the week with documentation of systems, a key component for the success of complex systems.*

| **Function and Emergence** | **4-5 hrs** |
|---|---|
| • Key Ideas | 2 min |
| • Product System | 15 min |
| • Function | 20 min |
| • Analyzing Function | 40 min |
| • Architecture as Form to Function Mapping | 15 min |
| • Documentation of Systems | 25 min |
| • Graded Activity | 15 min |
| • Project | 2 hrs |
| • Action Plan | 30 min |
| • Key Takeaways | 2 min |

## WEEK 3: System Architecture

*The third week of the course focuses on system architecture. You will take a further step in the study of relationships, specifically between form and function.*

*You will cover three key ideas (1) concept, (2) architecture and concept, and (3) system architecture decisions.*

| **System Architecture** | **4-5 hrs** |
|---|---|
| • Key Ideas | 3 min |
| • Concept | 35 min |
| • Architecture and Concept | 20 min |
| • System Architectural Decisions | 35 min |
| • Webinar with Dr. Bruce Cameron | 1 hr |
| • Graded Activity | 30 min |
| • Project | 2.5 hrs |
| • Key Takeaways | 2 mins |

## WEEK 4: Modeling with DSMs and Modularization

*The fourth week of the course will center on the representation of systems using a matrix like-view. Finally, you will cover change management, an important topic when architecting systems.*

| **Modeling with DSMs and Modularization** | **4-5 hrs** |
|---|---|
| • Key Ideas | 1 min |
| • Design Structure Matrix Modeling | 50 min |
| • Architecting Process Flow | 40 min |
| • Modularization, Two Down, One Up | 30 min |
| • Change Management | 40 min |
| • Ask the Instructor a Top 10 Question | 5 mins |
| • Project | 1.5 hrs |
| • Action Plan | 20 min |
| • Key Takeaways | 2 min |

## WEEK 5: System Architect

*Final week!*

*The fifth and final week of this course takes a step back from the architect's point of view. You will view the role of the architect in the development of a system, his or her deliverables, and three main architecture frameworks used in the industry.*

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|---|---|
| **System Architect** | **4-5 hrs** |
| • Key Ideas | 3 min |
| • Role of the Architect | 40 min |
| • Deliverables of the Architect | 15 min |
| • Architectural Frameworks | 35 min |
| • Graded Activity | 15 min |
| • Project | 2 hrs |
| • Key Takeaways | 2 min |
| • Course Wrap-Up | 3 min |
| • Exit Survey | 10 min |
| **Post-Assessment** | 15 min |

## After the course ends...

*Download your certificate.*

**Last Day of the Course**
- Course ends at 23:30 UTC

**Two Days after Course Ends**
- Download your Course Certificate from your student dashboard

**90 days after Course 4 closes**
- Course closes and all content is archived