Solving Complex Problems: Structured Thinking, Design Principles and AI
June 22-26 2020
Professor Sang-Gook Kim

	Finding Problems	Defining Problems	Finding Concepts	Architecting Systems	Epilogue
	Mon	**Tue**	**Wed**	**Thur**	**Fri**
8:30-9:00 AM	Light breakfast with Q&A on previous day lectures and presentations				
09:00 – 10:25 AM	**S. Kim** **Session 1**: Understanding complexity - Functional thinking - Axiomatic Design Framework - AI for Design	**S. Kim** **Session 5**: Fundamentals of AD (I) - Independence Axiom - Design domains Mapping Process	**S. Kim** **Session 9**: Fundamentals of AD (II) - Information Axiom - What is a good system?	**S. Kim** **Session 13**: Cases of System Design - Software design - Micro/Nano systems - Organizational systems	**S. Kim** **Session 17**: System architecting, functional thinking and systems integration
	Coffee Break				
10:35 – 12:00 AM	**T. David** **Session 2**: Developing structure: Pitfalls, Tools and techniques	**J. Gans** **Session 6**: Blue team innovation approach, System Analysis-Toy problem	**S. Kim** **Session 10**: Cases of Social System Design - System design approach to healthcare systems	**S. Kim** **Session 14**: AI for Design: a new paradigm with hybrid intelligence	**S. Kim** **Session 18**: AI for Manufacturing: a new paradigm with big data for industry
	Lunch				
01:00 – 02:30 PM	**S. Kim, all** **Session 3**: Course project and practice I: Discovery of problems to solve. Exercise cases in class. Pre-course assignment will also be elaborated.	**S. Kim, all** **Session 7**: Group design projects and practice session III - Structured problem statement and concepts generation (Milestone 2)	**J. Gans, all** **Session 11**: Group design works IV: Critical concepts and modules (Milestone 3)	**S. Kim, J. Gans** **Session 15**: Group design works V: Technical Review I (Milestone 4)	**S. Kim, All** **Session 19**: Group design discussion VI: Final Presentations (Milestone 5)
	Coffee Break & Free Discussion				
03:00 – 05:00 PM	**S. Kim, All** **Session 4**: Group design project and practice II: Presentations and feedback from lecturers on the choice of problems. (Milestone 1)	**S. Kim** **Session 8**: Concept generation and embodiment in System Architecting - Mind mapping - Structured approaches	**S. Kim, All** **Session 12**: Design of large and complex systems: heuristic approach with principles.	**S. Kim, J. Gans** **Session 16**: Group design work V: Technical review II (Milestone 4)	**S. Kim** **Session 20**: Summary, Recap & Epilogue *Course concludes at 4 PM
05:00 – 05:30 PM	After class Q&A	After class Q&A **Class Dinner** (time & place, TBD)	After class Q&A	After class Q&A	