

**붙임**

**2021년 가을학기 스마트 융합특강 부제별 Syllabus**

교과목 번호	CoE491(분반 A)																							
교과목 구분	전공선택																							
교과목명	스마트 융합특강: 스마트 라이프: AI 기반 서비스 설계 (Special Topics in Smart Convergence : AI for Smart Life)																							
담당교수	김주호(전산학부), 이탁연(산업디자인학과), 도영임(문화기술대학원)																							
개설학기	봄 또는 가을																							
강의:실험:학점	3:0:3																							
성적구분	S,U																							
교과목 개요	<p>본 수업의 목표는 일상 생활의 경험을 보다 스마트하게 바꿀 인공지능 서비스를 디자인하고 프로토타입으로 구현하는 것이다. 이를 위해 학생들은 인공지능과 인간-컴퓨터 상호작용의 기본 개념, 디자인 프로세스와 프로토타이핑 테크닉, 투명하고 설명 가능한 인공지능의 설계, 그리고 다양한 사회/윤리적 이슈를 학습하게 된다. 이 수업은 전산-디자인-심리학 분야의 세 명의 교수가 팀으로 진행하는 참여식 강의, 토의, 튜토리얼, 그룹 프로젝트로 구성된다.</p>																							
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	7	N/A	- Pitch presentation & Feedback session
	8	No class (Midterm week)	
	9	<b>Design process Part 2. Data</b> Data Ecosystem; Ethical issues of data collection; Crowdsourcing and Human-in-the-loop systems	- Data planning, collection, and processing
	10	<b>Design process Part 3. Model</b> Model-selection, AutoML; Model as a blackbox / Model cards	- Metrics and rationales for model selection
	11	<b>Design process Part 4. Interaction</b> Interaction; Prototyping strategy; Low to high-fidelity prototyping	- Interaction design
	12	<b>Design process Part 5. Evaluation &amp; Improvement</b> Evaluation of model, UI, and service; A/B testing; Importance of continuous monitoring and iterative improvements; Value-sensitive design and socio-ethical issues	- Usability testing & Iterative Planning
	13	<b>Responsible AI</b> Explainability, Bias and Privacy issues Negative impacts of technology; Social responsibility of AI	- Iteration 1
	14	<b>Human-AI Collaboration</b> Levels of initiatives and control; Building a mutual understanding and trust between human and AI	- Iteration 2
	15	N/A	- Final presentation & Feedback session
16	No class (Final exam week)		
성적부여 및 평가기준	<ul style="list-style-type: none"> <li>- 성적 구분 방식: S/U</li> <li>- 출결 확인 방법: 수업중 활동 참여 여부 확인</li> <li>- 성적 평가 기준 <ul style="list-style-type: none"> <li>Team Project: 50%</li> <li>Assignments: 30%</li> <li>Participation: 20%</li> </ul> </li> <li>- 시험 없음.</li> </ul>		

교과목 번호	CoE491(분반 B)		
교과목 구분	전공선택		
교과목명	스마트 융합특강: 지속가능 사회를 위한 스마트 모빌리티 (Special Topics in Smart Convergence : Smart mobility for sustainable society)		
담당교수	여화수(건설및환경공학과), 이진우(조천식녹색교통대학원), 김하나(인문사회과학부)		
개설학기	봄 또는 가을		
강의:실험:학점	3:0:3		
성적구분	S,U		
교과목 개요	<p>본 교과목은 인간-사회 시스템 관점에서 새롭게 부상중인 모빌리티들에 대한 개념을 소개하는 융합, 개론과목으로, 인간의 사회활동으로부터 발생하는 통행과 이를 지원하기 위한 인공지능 기반의 시스템과 모델링 방법, 지속가능한 시스템을 위한 사회이슈들과 미래의 기술들을 다루며, 토론식 강의와 프로젝트의 혼합방식으로 진행된다.</p> <p>* 과목 수강을 위한 필수 선행 교과목이 없으며, 관련 기초지식 없이도 수강할 수 있어, 다양한 전공의 학생들이 참여를 권장함.</p>		
Syllabus (주차별 강의계획)	Period (week)	Lectern Session	Group/Project Session
	1	[Mobility] Introduction to Mobility: Human, Vehicles, and Socio-Economic System	Class Term Project Session>> Topic: Concept Design of Future Mobility System with AI
	2	[Mobility] Travel Patterns and Mobility Data Management	Class Term Project Session>> Team work session
	3	[Mobility] Autonomous Mobility and Intelligent Systems/Mobility as a Service(MaaS)	Group work 1>>Ethics Guideline for AV
	4	Class Term Project Session >> proposal presentation	
	5	[Modeling] Introduction to Mobility modeling	MATSim tutorial 1 >>
	6	[Modeling] Individual shared mobility	MATSim tutorial 2 >>
	7	Class Term Project Session>> Interim Presentation	
	8	Mid-term week:Interim Report	
	9	[Modeling] Collective shared mobility: Ride sharing	Group work 2>> Demand-responsive mobility system simulation (MATSim)

Syllabus (주차별 강의계획)	Period (week)	Lectern Session	Group/Project Session
	10	[Modeling] Multi-purpose mobility services:	Group work 2>> Demand-responsive mobility system simulation (MATSim)
	11	Field Trip to Electric Vehicle Expo or AV operation site	
	12	[Sustainability] Sustainability issues - climate change and air pollution	Discussion Session 1: Mobility-interlinked SDGs
	13	[Sustainability] Energy and infrastructure/Advanced vehicles and fuels	Discussion Session 2: Future energy for mobility and mobility for future energy system
	14	[Sustainability] Mobility for special population, social equity	Discussion Session 3: Affordability and accessibility
	15	Class Term Project Session>> Final presentation	
	16	Final Week	

  

성적부여 및 평가기준	<p>본 과목의 성적은 프로젝트, 그룹과제와 출석, 발표, 토론참여 위주로 부여됨</p> <ul style="list-style-type: none"> <li>-Class Participation 10% points</li> <li>-Discussion session: 10% points</li> <li>-Term Project: 60% points</li> <li>-Group work: 20% points</li> </ul> <p>전체 70% 이상 포인트를 획득한 경우 S 부여</p>
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교과목 번호	CoE491(분반 C)																												
교과목 구분	전공선택																												
교과목명	스마트 융합특강: 스마트 팩토리: AI 기반 제조 (Special Topics in Smart Convergence : AI for Smart Factory)																												
담당교수	서평송(산업및시스템공학과), 이의진(전산학부), 이상윤(문술미래전략대학원)																												
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교과목 개요	<p>본 수업의 목표는 디지털 기술과 접목한 새로운 패러다임의 제조 공학을 이해하는 것을 목표로 한다. 이를 위해 일상의 제품들이 어떻게 만들어지는지에 대한 기초 원리를 경험하고, 미래의 새로운 제조 패러다임에서 필요한 기술혁신과 조직혁신의 관계 및 자동화/지능화 시대에 사람과 기계의 역할에 대한 새로운 관점을 논의한다. 기술-데이터-전략 측면에서 강의, 토론, 실습, 그룹 프로젝트를 진행한다. AI 응용 프로젝트 수행을 위한 기초 프로그래밍(CS101 또는 유사과목)에 대한 선행 지식이 필요하며, 그 외의 다른 선수과목 요구사항은 없다.</p>																												
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	9	Data & Manufacturing	[Lab Session] Sensor Data Collection and Pre-Processing Techniques
	10	Data & Manufacturing	[Lab Session] Machine State Recognition and Applications [Panel Discussion] Data & Manufacturing
	11	Human Factors Basics	[Lab Session] Fitts Law
	12	Human Factors in Manufacturing	[Lab Session] Human Sterotypes and Expectations: Display-Control Compatibility (or DHM with Jack/3DSSPP)
	13	Human in Smart Factory	[Group Presentation & Discussion] Role of Humans and Robots in Smart Factories [Panel Discussion] Human in Smart Factory
	14	Automation and Augmentation	[Group Presentation & Discussion] Augmentation cases [Panel Discussion] Human-Machine Collaboration
	15	Course Project	Final Presentation
	16	Final exam week	
성적부여 및 평가기준	<ul style="list-style-type: none"> <li>- 출결 및 수업 참여도 10%</li> <li>- 미니 프로젝트 3회 * 20% (과제/발표/보고서) = 60%</li> <li>- 팀 프로젝트 (중간발표 10%, 최종발표 10%, 최종보고서 10%) = 30%</li> </ul>		