강 의 계 획 서(Syllabus)

[1] 기본 정보(Basic Information)					
■강의 정보(Course Information)					
개설년도/학기 (Year/Semester)	2021 / 1		개설 캠퍼스 (Campus)	서울(Seoul Campus)	
교과목번호 (Course No.)	54588		분반번호 (Class No.)	01	학점 (Credit)	3
교과목명 (Course Title)	지능형 사물 인터넷(INTERNET OF INTELLIGENT THINGS)		강의시간/강의실 (Time/Room)	310관 723호 <강의실> 월5,6 / 수6(310관 723호 <강의실> MON5,6 / WED6)	
이수구분 (Course Classification)	전공(Major)		과목구분 (Lecture Type)	단독강의(Lone-teaching course)	
강의유형 (Course Type)	이론(Theoretical course)		원어강의 여부 (Medium of Instruction)	영어A(ENGLISH A)	
대학 자체 인증 여부 (Accreditation)			공학교육인증 여부 (Accreditation of Engineering Education)	공학주제(Engineering subject-related course)	
개설대학 (College)	창의ICT공과대학(College of ICT Engineering)		개설학과(부) (Department)	창의ICT공과대학 전자전기공학부(School of Electrical and Electronics Engineering)	
e-class 활용여부 (Usage of e-class)	No		유연학기		
■교수자 정보(Instructor Information)					
교수명 (Name)	박세현(Se Hyun Park)		소속 (Department)	지능형에너지산업학과 (Department of Intelligent Energy and Industry)	
연구실전화번호 (Office Phone No.)	02-820-5338		연락처 (Contact No.)	02-822-5338	
E-mail 주소 (E-mail)	shpark@cau.ac.kr		학과전화번호 (Department Phone No.)	02-820-5285	
상담가능시간 (Office Hour)	조교에게 문의요망		연구실위치 (Office Location)	207관 626호	
홈페이지 (Course Web-site)	isrc.cau.ac.kr				

[2] 학습 목표/성과(Learning Objectives/Outcomes)

■과목 설명(Course Description)

* 본 강의는 심화 과정의 전공 개념보다는 ICT 분야의 핵심 교양으로서 21세기 AI 기반 최신 ICT 기술과 트렌드의 습득을 통해 사고의 스펙트럼을 넓히고, AI를 막연한 미래 기술이 아니라 4차 산업혁명 시대를 선도하는 실질적 기술로 응용/발전시킬 수 있는 역량을 함양시키고자 함.
- 사물이스스로 지능을 가지고 상황인지/판단/학습/대응할 수 있는 새로운 패러다임이 필요
- 인공지능은 기존의 사물인터넷이 가지고 있던 한계점을 해결할 수 있는 잠재력을 여는 열쇠
- 사물인터넷과 인공지능과의 융합을 통해 단순한 연결을 넘어 지능화 단계에 도입하였으며, 가상과 물리세계를 하나로 결합할 자율 지능 사물인터넷으로 진화하고 있음.
- 인공지능이 결합된 지능형 사물인터넷은 사물이 시시각각 급변하는 상황과 조건을 빠르게 인지하고 신속하면서도 적절하게 판단, 대처함으로써 사용자의 편의를 향상시킬 수 있어야 함.

Currently, a large number of IoTs connect and execute pre-programmed things to the Internet, operate according to the conditions set by the user, and control the things directly or indirectly by the user through related data collected on the cloud server. However, Internet connection and inflexible automation alone have limitations in stable service operation and continuous value creation. Therefore, we need a new paradigm in which is based things have own intelligence can carry out situational awareness, judgment, learning, and response.
The continued increase in investment in artificial intelligence, the development of new products, and the increasing use of artificial intelligence have also begun to affect the Internet of Things. Artificial intelligence has become a key to unlocking the potential to solve the limitations of the existing IoT. Recently, various types of intelligent services are coming through AI technology such as machine learning and deep learning, and new approaches to various problems that could not be solved before were possible. n this way, the IoT is moving beyond the simple connection to the intelligence stage through convergence with artificial intelligence, and is evolving into an autonomous intelligent IoT that will combine the virtual and physical world into one.

■선수과목 및 공통필수과목(Prerequisites and Co-requisites)

■학습 목표(Learning Objectives)

* 인공지능이 결합된 지능형 사물인터넷은 사물이 시시각각 급변하는 상황과 조건을 빠르게 인지하고 신속하면서도 적절하게 판단, 대처함으로써 사용자의 편의를 향상

Gartner, a global market research institute, selected Intelligent Things as one of the top 10 promising technologies in 2017 ~ 18, and selected Autonomous Things (AT) as the top 10 promising technologies in 2020. Autonomous things and intelligent things are slightly different (autonomous things focus on automation and intelligent things focus on intelligent services), but both concepts have something in common with technology that combines artificial intelligence with the Internet of Things.
In the era of internet of intelligent things, should be able to greatly improve user convenience by quickly recognizing, rapidly, and appropriately judge, cope in rapidly changing situations and conditions. To this end, this course will learn utilize intelligent things as much as possible to autonomously recognize, judge, and respond, also, expand related technologies and collaborative intelligence between things to continuously increase the core value of things through repeated learning. In addition, study about flexible system able to provide optimized for self-thousands of scenarios, and customized service that reflects their habits, patterns, and preferences through linkage with AI system such as reinforcement learning based system.

* AI 기반의 사물이 스스로 학습하고 분석할 수 있는 능동적인 지능형 사물인터넷 기술을 구체화 할 수 있는 능력을 함양
1. ICT 기술 간 연계를 통한 현 문제점 도출 및 해결 방안을 수립할 수 있는 능력 함양
2. 사용자와 환경 데이터를 분석, 인지, 학습할 수 있는 플랫폼을 구축하고, 사용자의 편의성을 개선할 수 있는 능력 함향
3. 스마트 스페이스에서 자율 동작하거나 상황에 적절한 서비스를 제공할 수 있는 능력 함양

The intelligent era of greatly improving user convenience is coming, based on the IoT infrastructure, artificial intelligence is integrated into all things. Ultimately, it is possible to move away from pre-programmed and inflexible ways to improve user convenience by analyzing, perceiving, and learning user and environmental data on their own, and to provide autonomous or proactive services appropriately. It aims to cultivate the ability to embody with intelligent IoT technology.

■학습 성과(Learning Outcomes)

* 지능형 사물인터넷에 대한 개념을 이해하고, 이를 AI 기반 스마트 스페이스 및 스마트 도시에서 활용하는 방법과 비즈니스를 도출할 수 있는 4차 산업혁명을 선도할 기술적/사회적 역량 강화
1. 지능형 사물인터넷 전략을 수립할 수 있는 능력
2. 신규 사물인터넷 프로젝트의 잠재력을 평가할 수 있는 능력
3. 기존이 사물인터넷 또는 신규 사물인터넷에서 더 많은 가치를 창출할 수 있는 능력

Sooner or later, the Internet of Things without AI will be hard to find. AI supports all the effective use of the Internet of Things, and data generated from the Internet of Things will have limited value without AI. Artificial intelligence play an important role in the Internet of Things because of its ability to quickly derive insights from data. AI can provide the ability to automatically detect patterns and detect abnormalities in data generated by smart sensors and smart devices (temperature, pressure, humidity, air quality, vibration, sound, etc.). Also, particularly useful for implementing predictive maintenance because it helps identify patterns and anomalies make predictions based large amounts of data. This intelligent IoT technology combined with artificial intelligence not only forms the basis for improved products and services, but also creates completely new products and services. After the course is over, students will be possible explore ways to develop intelligent IoT strategies, assess the potential of new IoT projects, or use artificial intelligence in the IoT to create more value from existing IoT deployments.

[3] 강의 진행 정보(Course Methods)

■강의 진행 방식(Teaching and Learning Methods)

강의 진행 방식(Teaching and Learning Methods)	추가 설명(Additional Description)
강의(Lecture)	Biz modeling lessons and suggestions with the latest textbooks and specialized articles.
강의(Lecture)	We have produced videos for online lecture contents that will be uploaded to the "CAU e-class system ". The video files will be uploaded in Korean and English versions to improve the delivery of the contents. You can select one of the two versions you would like to see.

■과제(Assignments)

■수업 자료(Textbooks, Reading, and other Materials)

[4] 학습 평가 방법(Student Assessment)

평가 항목(Assessment Item)	평가 비율(%)(Assessment Ratio)	추가 설명(Additional Description)
참여도/태도(Participation/Attitude)	10	
중간시험(Mid-term Exam)	45	
기말시험(Final Exam)	45	

[5] 수업 일정(Course Schedule)

주(Week)	강사명(Instructor)	수업주제 및 내용(Topic & Content)	학습과제(Student Assignment)	추가설명 및 교수과제(Additional Description & Instructor Assignment)
1	박세현	Internet of Intelligent Things based AI Introduction - Internet of Things, Intelligent Things, Autonomous Things		Online video on the "CAU e-class system "
2	박세현	AI based Internet of Things Technology - Identification, Sensing, Network, Computation, Platform and Services, Semantics		Online video on the "CAU e-class system "
3	박세현	Big Data for Internet of Intelligent Things - Cloud, Blockchain, Edge Computing		Online video on the "CAU e-class system"
4	박세현	Big Data for Internet of Intelligent Things - Collection, Refining, Analytics, Visualization		Online video on the "CAU e-class system"
5	박세현	Role of Artificial Intelligence in IoT - Machine Learning and Artificial Intelligence		Online video on the "CAU e-class system"
6	박세현	Role of Artificial Intelligence in IoT - Reinforcement Learning		Online video on the "CAU e-class system"

주(Week)	강사명 (Instructor)	수업주제 및 내용(Topic & Content)	학습과제 (Student Assignment)	추가설명 및 교수과제 (Additional Description & Instructor Assignment)
7	박세현	AI Powered Internet of Intelligent Things Applications - Smart City, Healthcare and Wellness, Industrial Automation, Agriculture and Breeding, Inventory and Product Management, Food		Online video on the "CAU e-class system"
8	박세현	Midterm Exam		Submission of assignments
9	박세현	Wring Value from IoT Data - Collecting All That Data - Strategies and Techniques		Online video on the "CAU e-class system"
10	박세현	Wring Value from IoT Data - Data Science for IoT Analytics and Strategies to Organize Data for Analytics		Online video on the "CAU e-class system"
11	박세현	Wring Value from IoT Data - Smart Energy City		Online video on the "CAU e-class system"
12	박세현	Security and Privacy Challenges for both Individuals and Organizations		Online video on the "CAU e-class system"
13	박세현	Internet of Things as a Business Intelligence		Online video on the "CAU e-class system"
14	박세현	Understand AI, IoT and Apply them to Business		Online video on the "CAU e-class system"
15	박세현	Understand AI, IoT and Apply them to Business		Online video on the "CAU e-class system"
16	박세현	Final Exam		

[6] 수강생 학습 안내 사항(Guide to Learning)

This course deals with textbook mainly.

기출문제(Previous Exam Samples)

<추가 자료 다운로드>(<Download Additional Sample>)

첨부 자료가 없습니다.

공학 교육 인증용 설계교과목(Engineering Education)

프로그램 학습 성과(Learning Outcomes)

문제정의 및 공식화능력 : 40　정보 및 도구활용능력 : 40　직업윤리 및 사회적 책임감. : 20

■설계 과목 제목(Title)

Internet of Intelligent Things

■설계 과제 목표(Objective)

Internet of intelligent things is possible to move away from pre-programmed and inflexible ways to improve user convenience by analyzing, perceiving, and learning user and environmental data on their own, and to provide autonomous or proactive services appropriately. It aims to cultivate the ability to embody with intelligent IoT technology.

■설계 제한 사항(Restrictions)

AI based Internet of Intelligent Things.

■설계 평가 방법(Assessment Method)

Evaluation A. Midterm exam 45%, B. Final exam 45%, C. Assignments and class participation.

※시험 부정 행위 적발 시 중앙대학교 학칙 제71조【징계】및 학사운영규정 I제 6장 제 47조 【시험 부정행위자의 처벌】에 따라 징계 처분 대상이 될 수 있습니다.
(※In pursuant to the Article 71 'Discipline "of the Chung-Ang University Regulations, and Article 47 'Punishment for Cheating during Examination "under Chapter 6 of the Academic Affairs Management Rules, any student caught engaging in academic misconduct during an exam will be subject to disciplinary action.)

본 수업을 수강하는 장애학생은 장애유형 및 정도에 따라 정당한 편의지원을 받을 수 있습니다. 이와 관련하여 아래와 같은 편의제공이 필요한 경우, 장애학생지원센터에 문의해 주시기 바랍니다.
1. 시각장애 : 점자, 확대자료, 파일자료, 대필도우미 배치, 평가방법 조정 등
2. 청각장애 : 대필도우미, 속기사 배치, 평가방법 조정 등
3. 지체/뇌병변장애 : 휠체어접근이 가능한 강의실 제공, 대필도우미 배치, 평가방법 조정 등
4. 기타 정신적 장애, 건강장애의 경우 장애학생지원센터 상담 후 지원
※문의처 : 02-820-6577~9(서울캠퍼스), 031-670-4816(안성캠퍼스)
장애학생지원센터 카카오톡 플러스친구(중앙대학교 장애학생지원센터 또는 cauable)

In this class, students with disabilities are eligible for reasonable accommodations depending on the type and severity of disability. If you wish to receive accommodations listed below, please contact the Support Center for Students with Disabilities.
1. Visual Impairment: Braille, large print, electronic class materials, volunteer note-taker, adjustments in assessment practices, etc.
2. Hearing Impairment: Volunteer note-taker, stenographer, adjustments in assessment practices, etc.
3. Physical Disabilities/Brain Lesions: Classrooms with wheelchair access, volunteer note-taker, adjustments in assessment practices, etc.
4. Accommodations for students with other psychiatric disabilities or health impairments can be arranged through the Support Center for Students with Disabilities after consultation.
※Inquiry: 02-820-6577~9 (Seoul Campus), 031-670-4816 (Anseong Campus)
- KakaoTalk Plus Friend ID: @cauable