

강의계획서

1. 과목 기본 정보(Basic Course Information)

교과목명	기계학습개론	코드	AIX20003		
개설년도	2023	개설학기	2		
개설학부		이수구분/영역	/		
대상학년	2	분반	01		
인정전공	AI융합(33),/데이터사이언스(33),				
학점구성	총학점	이론	실험/실습	설계	기타()
	3	2	1	0	0

수업주유형	강의, Project, 토론, 실습			
선수과목	필수		병수과목	
	권장	Python programming		
주관교수성명			주관교수 Email	
담당교수 성명	담당교수 Email	담당교수 전화	Office 위치	Office Hour
김정현	junghyun.kim@handong.edu	1377	NMH 119	To Be Announced
TA성명			TA email	
강의실			강의시간	

2. 학습목표 및 개요(Course Objectives)

● 학습목표(Course Objective)

번호	학습목표
1	Provide basic engineering mathematics required for understanding machine learning algorithms
2	Gain a deeper understanding of the theoretical properties of the most effective machine learning algorithms
3	Learn how to apply machine learning algorithms to real-world problems
4	Write a proper programming code for engineering problems with real data

● 연관 학습성과(Related Learning Outcomes)

역량	학습성과
조회된 데이터가 없습니다.	

● 강의개요(Course Description)

This course provides basic engineering mathematics required for understanding machine learning algorithms and a broad introduction to machine learning techniques with an emphasis on addressing problems arising in computational science and engineering. In addition to introducing the machine learning algorithms, this course features individual and group projects that help students apply the algorithms to real-world problems in preparation for both industry jobs and advanced courses in graduate programs.

The goal of this course is to 1) provide a solid background of the most effective machine learning algorithms and 2) learn how to apply the algorithms to real-world problems. After passing this course, students are expected to 1) gain a deeper understanding of the theoretical and practical properties of machine learning and 2) write a proper programming code for engineering problems with real data. In a nutshell, through this course, students will learn not only the theoretical underpinnings of machine learning algorithms but also gain the practical know-how needed to apply the algorithms to real-world problems.

3. 과목 운영 및 과제물

● 교재

주교재	서명	As the instructor will strive to make the lectures self-contained, textbooks are not designed as required; however, students are welcome to read the following textbooks as needed. Lecture slides and other course materials will be posted periodically to the LMS system.	저자	
	출판사		출판년도	
부교재	서명	Pattern Recognition and Machine Learning	저자	Christopher M. Bishop
	출판사		출판년도	
부교재	서명	Big Data Mathematics	저자	Otto Van Koert
	출판사	빅데이터 혁신융합대학	출판년도	
기자재				

● 평가

출석관리	The instructor will call out each student's name for attendance at the beginning of the class. This course will be basically the format of in-person; however, it will also utilize the hybrid format indicating that it allows students to attend the class through ZOOM when necessary (e.g., COVID-19 positive case).							
학점산출 평가 도구 및 비중(%)	출석	중간시험	기말시험	퀴즈	팀프로젝트	개인과제	기타 1(Participation)	기타2(기타 2)
	5	20	25		25	15	10	
Honor Code 준수 및 평가방법 추가설명	All students are responsible for understanding the Handong honor code as this course follows the Handong's policies. Student grades will be evaluated based on absolute grading with weighted components. The grades may be curved at the discretion of the instructor if necessary. Details about the evaluation will be announced in the first week of the lectures.							

● 수업 활동유형

강의	60%	실험	0%	실습	10%
팀프로젝트	10%	발표	10%	토론	10%
기타1()	%	기타2()	%	기타3()	%
총계	100 %				

● 과제 및 프로젝트(Assignments and Projects)

번호	내용
1	Group project (To Be Announced)
2	Individual assignment (To Be Announced)

4. 강의 일정 계획(Weekly Schedule)

주차	날짜	강의주제 및 범위	과제 결과물 및 평가
1	2023-08-28 2023-08-31	Course overview / Introduction	
2	2023-09-04 2023-09-07	Calculus review	
3	2023-09-11 2023-09-14	Introduction to optimization	
4	2023-09-18 2023-09-21	Gradient descent	

주차	날짜	강의주제 및 범위	과제 결과물 및 평가
5	2023-09-25 2023-09-28	Artificial neural network I Artificial neuron / Perceptron / XOR problem / Multi-layer perceptron	
6	2023-10-02 2023-10-05	Artificial neural network II Multi-layer perceptron with backpropagation	
7	2023-10-09 2023-10-12	Model Evaluation Training vs. validation vs. testing / Bias vs. variance / Overfitting vs. underfitting	
8	2023-10-16 2023-10-19	Midterm	
9	2023-10-23 2023-10-26	Clustering Introduction to clustering / Clustering applications	
10	2023-10-30 2023-11-02	Clustering Partitioning-based clustering / Density-based clustering	
11	2023-11-06 2023-11-09	Classification Introduction to classification / K-NN algorithm / Classification model evaluation	
12	2023-11-13 2023-11-16	Regression Introduction to regression / Linear regression / Regression model evaluation	
13	2023-11-20 2023-11-23	Linear algebra review	
14	2023-11-27 2023-11-30	Support vector machine	
15	2023-12-04 2023-12-07	Invited lectures	
16	2023-12-11 2023-12-14	Final	

5. 공지사항/부가정보

● 본 과목의 수강신청을 위한 주요 공지사항(Notice)

1. Pre-requisites

This course expects students to be comfortable utilizing a programming language. Python is recommended but not mandatory. While no particular programming language is required, all students will be required to use a programming language for course projects. Familiarity with basic engineering mathematics (e.g., calculus) is also recommended. No pre-requisites are enforced to register for this course, but it is recommended to contact the instructor if students are not sure if their background is sufficient for this course.

2. Accommodations

This course is committed to supporting accessibility, meaning that students with disabilities can still participate in this course. The students may need to submit an official letter describing details about their accommodations as we may require verification of eligibility to offer a proper service to the students. Please note that requests for academic accommodations need to be made during the beginning of the semester except for unusual circumstances.

● 전공별 추가 정보(Additional Information)

번호	내용

6. 과목 세부 정보

V	문제해결력 프로젝트 수업 여부										
	현장과 연계한 과목여부 - 코너스톤										
	현장과 연계한 과목여부 - 키스톤										
	현장과 연계한 과목여부 - 캡스톤										
	창업관련 교과목 여부										
V	온라인 콘텐츠 강의활용 수업여부 - 온라인 콘텐츠 강의활용 비율 10 %										
<p>- 온라인 콘텐츠 활용 콘텐츠 선택 (복수개 선택 가능함)</p> <table border="1" style="margin-left: 20px;"> <tr> <td></td> <td>Hudcc(우리대학 강의녹화 서비스)</td> </tr> <tr> <td>V</td> <td>타대학 및 타기관 협력하여 개발된 온라인 강좌 활용</td> </tr> <tr> <td></td> <td>MOOC 활용</td> </tr> <tr> <td></td> <td>OCW 활용</td> </tr> <tr> <td></td> <td>그 외 온라인콘텐츠 활용</td> </tr> </table>			Hudcc(우리대학 강의녹화 서비스)	V	타대학 및 타기관 협력하여 개발된 온라인 강좌 활용		MOOC 활용		OCW 활용		그 외 온라인콘텐츠 활용
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	MOOC 활용										
	OCW 활용										
	그 외 온라인콘텐츠 활용										

7. 장애학생을 위한 강의 및 평가 안내

- 장애학생의 장애유형과 정도를 고려하여 강의, 과제 및 평가를 실시

예)강의 :

- 강의파일 제공, 강의대필도우미 제공.
- 치료 및 입원 등으로 출석이 어려운 경우 증명서류 제출 시 출석으로 간주.

과제 및 평가

- 시험대필도우미, 필요 시 수화 설명 등