



HANYANG UNIVERSITY

Hanyang ERICA Summer School

Office of International Affairs, Hanyang University ERICA
 55 Hanyangdaihak-ro, Sangnok, Ansan, Gyeonggi-do, 15588, Korea
 Tel. +82-31-400-4914 | hess@hanyang.ac.kr

2020 HESS Course Syllabus

Course Information	Course Title(Eng)	Computational Civilization and Artificial Intelligence	Course Category	
	Course Title(Kor)	컴퓨터과학이 여는 세계와 인공지능		
	Credit-Lecture-Lab	3 credits-4.5 hrs-0 hrs	Course Restrictions	
	College/School	International Summer School(ERICA)	College/School Responsible	College of Computing
	Meeting Times	10 times	Electronic Attendance	N

Instructor Info	Department		Name	
	Contacts		E-mail	
	Homepage			
Course Type	Teaching Method	Lectures		

Course Description	This course is to introduce basic concepts in the fields of computer science and artificial intelligence by skimming through the history and underlying principles of each field, respectively.
Course Objectives	This course is to help non-major students understand the core concepts of computer science and artificial intelligence, so that they can obtain the knowledge necessary to adopt computing technologies to their own specialty throughout their career development.
Notice for Students	No a priori knowledge of computer science and artificial intelligence is required. Lecture materials will be provided in the class.

Textbook	No	Title	Author	Publisher	ISBN	Price(KRW)
	1	Neural Networks and Deep Learning	Michael Nielsen	Neuralnetworksanddeeplearning.com	-	Free

Evaluation	Evaluation Criteria	Percentage(%)	Evaluation Criteria	Percentage(%)
	Attendance	40	Quiz	
	Assignments		Mid-term Exam	

	Discussion	30	Final Exam	
	Team Project		Participation	30
	Other			Percentage(%)
	Total 100 %			

Daily Lecture Plan and Assignments	Day	Title	Activity
	1	Introduction	<ul style="list-style-type: none"> The digital revolution: past, present, and future
	2	The Birth of Computer	<ul style="list-style-type: none"> Universal Turing Machine Boolean logic and switching circuits Invention of computing machine
	3	Algorithm and Complexity	<ul style="list-style-type: none"> Algorithm design methodology Classes of algorithm complexity Heuristic and randomized algorithms Quantum algorithms
	4	Language and Logic	<ul style="list-style-type: none"> High-level programming languages Compiling and interpretation techniques Lambda calculus and Turing-completeness Types and program verification
	5	Human-Computer Symbiosis	<ul style="list-style-type: none"> Improving human intelligence Expanding human's social instinct Breaking time and space boundaries
	6	History of Artificial Intelligence	<ul style="list-style-type: none"> Symbolic AI Machine learning and artificial neural networks Symbolic reasoning vs. machine learning
	7	Case study: Using Neural Nets to Recognize Handwritten Digits	<ul style="list-style-type: none"> Perceptrons Sigmoid neurons The architecture of neural networks A network to classify handwritten digits Learning with gradient descent Python Implementation
	8	Frontiers of Artificial Intelligence	<ul style="list-style-type: none"> Introduction to robotics Introduction to computer vision
	9		<ul style="list-style-type: none"> Introduction to speech recognition Introduction to natural language processing
10	Impacts of Artificial Intelligence	<ul style="list-style-type: none"> The singularity Software 1.0 and Software 2.0 	