

Course Syllabus
Machine Learning
Super AI Engineer Course by AI Association of Thailand

Course	:	Machine Learning
Credit	:	3 credits
Semester	:	January 2022 – April 2022
Course Outline	:	Introduction to machine learning, datamining, and statistical pattern recognition. Topics include: (i) Supervised learning (parametric/non-parametric algorithms, support vector machines, kernels, neural networks). (ii) Unsupervised learning (clustering, dimensionality reduction, recommender systems, deep learning). (iii) Best practices in machine learning (bias/variance theory; innovation process in machine learning and AI). The course will also draw from numerous case studies and applications, so that you'll also learn how to apply learning algorithms to building smart robots (perception, control), text understanding (web search, anti-spam), computer vision, medical informatics, audio, database mining, and other areas.
Instructor	:	Dr. Sanparith Marukatat (sanparith.marukatat@nectec.or.th) (NECTEC) Dr. Ekapol Chuangsuwanich (ekapolc@cp.eng.chula.ac.th) (Chulalongkorn U.) Dr. Thanapong Intharah (thanin@kku.ac.th) (Khon Kaen University, KKU) Dr. Thittaporn Ganokratanaa (thittaporn.gan@kmutt.ac.th) (KMUTT)
Grading	:	Attendance / Quiz 20% Examination 40% On-hand Project 40% Top 20% → 'A'. Bottom 20% and/or students whose score < 30% → 'F'
Quiz	:	Quizzes are randomly conducted in the classes
Projects	:	The project aims to give you experience of machine learning. The project will be classified into individual hackathon projects, small group projects, and big bang group projects.
Course Material	:	http://mooc.ariat.or.th/ https://www.unibo.it/en/teaching/course-unit-catalogue/course-unit/2020/446598

Schedule:

No.	Topics	Hours
1	Introduction to machine learning (ML)	3
2	Rule-based ML, supervised and unsupervised learning, linear regression	3
3	Evaluation method: model selection, dataset construction, labelling, metrics, and error	3
4	Classification and clustering	3
5	reinforcement learning, self-supervised learning	3
6	Kernel method, perceptron, margin and generalization, dual problem	3
7	Support vector machine	3
8	Decision tree and random forest	3
9	Ensemble techniques: bagging, boosting, stacking, splitting strategy, evaluation	3
10	One class classification, deep one-class classification	3
11	Generative adversarial network (GAN)	3
12	Principal component analysis, eigen-decomposition, kernel PCA, kernel trick	3
13	Project Workshop 1	10
14	Project Workshop 2	10
15	Project Workshop 3	10
16	Examination	
	Lecture	36
	Workshop	30