

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

Course	:	Deep Learning
Credit	:	3 credits
Semester	:	January 2022 – April 2022
Course Outline	:	Introduction to deep learning. Basic neural networks. Applications of modern neural networks. Artificial neural network. Deep learning algorithms. Recurrent Neural Network (RNN), Long Short-Term Memory (LSTM). Gated Recurrent Unit (GRU). Keras library. Pytorch framework. Seq2Seq. model. Deep neural network. 2D Discrete Cross-correlation / Convolutional Neural Network (CNN), 2D Convolutional layer. First CNN: LeNet5. Convolutional and Recurrent network structures. Generative adversarial networks (GAN), Super Resolution GAN (SRGAN). Deep unsupervised and reinforcement learning. DL application on speech recognition and computer vision.
Instructor	:	Assoc. Prof. Dr. Parinya Sanguansat (parinyasan@pim.ac.th) (PIM) Dr. Sumeth Yuanyong (sumeth.yue@mahidol.ac.th) (Mahidol University) Asst. Prof. Dr. Teerasit Kasetkasem (fengtsk@ku.ac.th) (Kasetsart University) Assoc. Prof. Dr. Poj Tangamchit (poj.tan@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 deep 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 artificial neural network (ANN) and deep learning (DL)	3
2	Recurrent Neural Network (RNN), Long Short-Term Memory (LSTM)	3
3	Recurrent Neural Network, Word2Vec, Transformer	3
4	Gated Recurrent Unit (GRU), Keras and Pytorch, Seq2Seq model	3
5	TensorFlow, Loss function Back propagation, Activation Functions,	3
6	Tensor operations, Linear and nonlinear regression, Feature extraction, Autoencoder	3
7	Deep Learning and MNIST Dataset / One-Hot Encoder and Muti-Layer Perceptron	3
8	2D Discrete Cross-correlation / Convolutional Neural Network (CNN), denoising	3
9	Generative adversarial networks (GAN), Super Resolution GAN (SRGAN)	3
10	Deep learning for time series. Deep learning for text	3
11	Reinforcement Learning, Q-Learning, Policy Gradient RL, Rewards & BackTest	3
12	Transfer Learning and Its applications	3
13	Project Workshop 1	10
14	Project Workshop 2	10
15	Project Workshop 3	10
16	Examination	
	Lecture	36
	Workshop	30