MODULE HANDBOOK DESCRIPTION

Module designation	*Deep Neural Network*	
Code	*FBC001*	
Semester(s) in which the module is taught	*7/fourth year*	
Person responsible for the module	*Bulkis Kanata, ST., MT.*	
Language	*Indonesian*	
Relation to curriculum	*Free Elective*	
Teaching methods	*lectures, small group discussion, case base method.*	
Workload (incl. contact hours, self-study hours)	Contact minutes every week, each week of the 16 weeks/semester: • Lectures: 2 x 50 minutes • Exercises and Assignments: 2 x 60 minutes • Private study: 2 x 60 minutes. total study hours = 5 hours 40 minutes/week	
Credit points	*2 SKS (~ 3.2 ECTS)*	
Required and recommended prerequisites for joining the module	-	
Module objectives/intended learning outcomes	1. *Students are able to explain: Definition of Artificial Neural Network (ANN), Elements of Deep Neural Network (DNN), Architecture and algorithms of Convolutional neural networks (CNN), Recurrent Neural Network (RNN), Autoencoder, Generative Adversarial Network (GAN), Restricted Boltzmann Machine (RBM), Deep Belief Network (DBN), Recursive Neural Network (RecNN), Capsule Neural Network (CapsNet)*	*PLO3 50%*
	2. *Students are able to design of programs to apply DNN (CNN, RNN, RBM)*	*PLO4 30%*

	3. Students are able to validate and analyze the design of CNN, RNN and RBM.	*PLO9 20%*
Content	*Definition of Artificial Neural Network (ANN), Elements of Deep Neural Network (DNN), Architecture and algorithms of Convolutional Neural Networks (CNN), Recurrent Neural Network (RNN), Autoencoder, Generative Adversarial Network (GAN), Restricted Boltzmann Machine (RBM), Deep Belief Network (DBN), Recursive Neural Network (RecNN), Capsule Neural Network (CapsNet)*	
Examination forms	- *Written case study* - *Create program* - *Presentation case study* - *Midterm and final test*	
Study and examination requirements	*The final grade in the module is composed of:* *a. Attendance: 10%* *b. Case I assessment: 15%* *c. Case II assesment: 15%* *d. Midterm assessment: 30%* *e. Final assessment: 30%*	
Reading list	*1. Aggarwal, charu C. Neural Network and Deep Learning. (2018). doi:10.1007/978-3-319-94463-0.* *2. Geron, A. Hands-On Machine Learning with Scikit-Learn and TensorFlow Concepts, Tools, and Techniques to Build Intelligent Systems. (O'Reilly, 2017).* *3. LazyProgrammer. Deep Learning in Python, Master with Modern Neural networks written in Python, Theano, and TensorFlow. (2016).*	