# MODULE HANDBOOK DESCRIPTION

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| Module designation | Machine Learning | |
| Code | FBD0003 | |
| Semester(s) in which the module is taught | 6 / third year | |
| Person responsible for the module | Giri Wahyu Wiriasto, S.T., M.T. | |
| Language | Indonesian | |
| Relation to curriculum | Free Elective for Computer Engineering | |
| Teaching methods | Lectures, Case Base Method, project base learning | |
| Workload (incl. contact hours, self-study hours) | Contact minutes every week, each week of the 16 weeks/semester:<br>• Lectures: 2 x 50 minutes<br>• Exercises and Assignments: 2 x 60 minutes<br>• Private study: 2 x 60 minutes.<br>Total study hours = 5 hours 40 minutes/week | |
| Credit points | 2 (~ 3,2 ECTS) | |
| Required and recommended prerequisites for joining the module | - | |
| Module objectives/intended learning outcomes | 1. Students are able to explain basic of machine learning method : Basics of machine learning and theory of neural networks.<br>2. Students are able to explain various types of machine learning, such as supervised learning, unsupervised learning, reinforcement learning, etc.<br>3. Students are able to explain Neural network architectures and training methods.<br>4. Students are able to explain Optimization algorithms and regularization techniques.<br>5. Students are able to explain Convolutional neural networks (CNNs) and their applications in computer vision.<br>6. Students are able to explain Deep reinforcement learning and its applications in study case and decision making. | PLO3 |

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| | 7. Students are able to design of particular CNN model<br>8. Students are able to design identification software. using CNN Library for particular case ith python programming. | PLO4 |
| | 9. Students are able to compare different various CNN model. | PLO9 |
| Content | Applied Math and Machine Learning Basics, Linear Algebra, Probability and Information Theory, Numerical Computation, Machine Learning Basics, Learning Algorithms, Capacity, Over fitting and Underfitting, Hyper parameters and Validation Sets, Estimators, Bias and Variance, Maximum Likelihood Estimation, Bayesian Statistics, Supervised Learning Algorithms, Unsupervised Learning Algorithms, Stochastic Gradient Descent,, Building a Machine Learning Algorithm, Challenges Motivating Deep Learning. | |
| Examination forms | Presentation case study, project deep learning python library. | |
| Study and examination requirements | Theory and presentation = 50%<br>Project = 50% | |
| Reading list | 1. Ian Goodfellow.et al, Deep Learning.<br>2. John D. Kelleher, Brian Mac Namee, Aoife D'Arcy - Fundamentals of Machine Learning for Predictive Data Analytics_ Algorithms, Worked Examples, and Case Studies-The MIT Press, (2020).<br>3. Related topics journal. | |