	INSTITUT TEKNOLOGI SEPULUH NOPEMBER (ITS) **FAKULTAS TEKNOLOGI ELEKTRO DAN INFORMATIKA CERDAS** **DEPARTEMEN TEKNIK ELEKTRO** **Program Studi Magister (S2) Teknik Elektro**

1	**Nama Mata Kuliah / *Course Name***	:	Artifical Intelligence / *Artifical Intelligence*
2	**Course Code**	:	EE235271
3	**Kredit / *Credits***	:	3 SKS
4	**Semester / *Semester***	:	2

Deskripsi Mata Kuliah / *Course Description*

Mata kuliah Artificial Intelligence mempelajari beberapa pokok bahasan dalam Artificial Intelligence (AI) diantaranya machine learning, machine reasoning, dan optimization. Problem pada machine learning meliputi supervised learning (regression dan classification) dan unsupervised learning (clustering). Untuk menyelesaikan problem tersebut akan dibahas secara khusus neural network dan perkembangan teknik tersebut dalam deep learning. Pada bagian fuzzy system, dibahas tentang konsep fuzzy beserta aplikasinya dalam decision making. Pada bagian akhir, dibahas tentang genetic algorithm untuk menyelesaikan persoalan dalam optimisasi.

The Artificial Intelligence course studies several topics in Artificial Intelligence (AI) including machine learning, machine reasoning, and optimization. Problems in machine learning include supervised learning (regression and classification) and unsupervised learning (clustering). To solve these problems, neural networks and the development of these techniques in deep learning will be discussed specifically. In the fuzzy system section, the concept of fuzzy and its application in decision making are discussed. In the final section, genetic algorithms are discussed to solve problems in optimization.

Capaian Pembelajaran Lulusan (CPL) Yang Dibebankan Mata Kuliah / *Program Learning Outcomes Charged to The Course*

1. (CPL-04) Mampu menguasai konsep, prinsip keilmuan secara komprehensif, prinsip rekayasa, dan pengetahuan faktual tentang Teknologi Informasi untuk mengembangkan prosedur dan strategi yang diperlukan pada analisis dan perancangan sistem terkait bidang Teknik Elektro.

   (PLO-04) Able to master concepts, scientific principles comprehensively, engineering principles, and factual knowledge about Information Technology to develop procedures and strategies required in the analysis and design of systems related to the field of Electrical Engineering.

2. (CPL-08) Mampu mengambil keputusan dalam konteks menyelesaikan masalah pengembangan ilmu pengetahuan dan teknologi yang memperhatikan dan

menerapkan nilai humaniora berdasarkan kajian analisis atau eksperimental terhadap informasi dan data.

(PLO-08) Able to make decisions in the context of solving problems in the development of science and technology that pay attention to and apply humanities values based on analytical or experimental studies of information and data.

Capaian Pembelajaran Mata Kuliah / *Course Learning Outcomes*

1. Menguasai konsep dan aplikasi machine learning /*Mastering machine learning concepts and applications.*
2. Menguasai konsep dan aplikasi machine learning /*Mastering machine learning concepts and applications.*
3. Menguasai konsep dan aplikasi fuzzy system /*Mastering the concept and application of fuzzy systems.*
4. Menguasai konsep dan aplikasi genetic algorithm /*Mastering the concept and application of genetic algorithms*.

Pokok Bahasan / *Contents*

1. Machine learning /*Machine learning*
2. Neural network /*Neural network*
3. Deep learning /*Deep learning*
4. Fuzzy system / *Fuzzy system*
5. Genetic algorithm /*Genetic algorithm*

Prasyarat / *Pre-requisite*

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Pustaka / *Reference*

Utama / *Primary*:

1. Nithin Buduma, Nikhil Buduma, and Joe Papa, Fundamentals of Deep Learning: Designing Next-Generation Machine Intelligence Algorithms, O'Reilly Media Inc, 2022
2. Ethem Alpaydin, Introduction to machine learning, The MIT Press, 2014
3. Timothy J. Ross, Fuzzy logic with engineering applications, John Wiley & Sons Ltd, 2010
4. Randy L. Haupt and Sue Ellen Haupt, Practical genetic algorithms, John Wiley & Sons, Inc, 2017
5. Madan M. Gupta, Liang Jin, and Noriyasu Homma, Static and Dynamic Neural Networks: from Fundamentals to Advanced Theory, John Wiley & Sons Inc, 2003

Pendukung / *Supporting*:

6. Makalah ilmiah internasional bereputasi dan terindeks scopus