COURSE	Name	: Soft Computing
	Code	: EE185152
	Credit(s)	: 3
	Semester	: I

Description of Course

In this course, students will learn machine learning inspired by the biological domain. Topics to be studied include: basic types of neural networks, multi layer perceptrons, unsupervised neural networks, fuzzy logic, and genetic algorithms. The learning methods used are lectures, discussions, reading, solving practice questions, quizzes, case studies, examinations, and final projects.

Learning Outcomes

Knowledge

(P01) Mastering the concepts and principles of science in a comprehensive manner, and to develop procedures and strategies needed for the analysis and design of systems related to the field of power systems, control systems, multimedia telecommunications, electronics, intelligent multimedia network, or telematics as a preparation for further education or professional career.

(P02) Mastering engineering concepts and principles to develop the necessary procedures and strategies for systems analysis and design in the areas of power systems, control systems, multimedia telecommunications, electronics, intelligent multimedia network, or telematics.

Specific Skill

(KK01) Being able to formulate engineering problems with new ideas for the development of technology in power systems, control systems, multimedia telecommunications, electronics, intelligent multimedia network, or telematics.

General Skill

(KU11) Being able to implement information and communication technology in the context of execution of his/her work.

Attitude

(S09) Demonstrating attitude of responsibility on work in his/her field of expertise independently.

(S12) Working together to be able to make the most of his/her potential.

Course Learning Outcomes

Knowledge

Mastering the concepts of soft computing, artificial neural networks, fuzzy logic and Evolutionary Algorithm.

Specific Skill

Able to identify and choose the right soft computing technology to solve problems and build solutions.

General Skill

Students are able to implement soft computing to solve problems.

Attitude

Demonstrating attitude of being responsible for the work in his area of expertise independently.

Working together to be able to make the most of their potential.

Main Subjects

1. Neural Network: the concept of neural network; supervised learning: perceptron and multilayer perceptron; unsupervised learning: self-organizing map, Hopfield, ART.
2. Fuzzy Logic: fuzzy set theory, fuzzy system, membership function, rule based, and inference engine development.
3. Evolutionary Algorithm: genetic algorithm, genetic programming, ant colony method, particle swarm optimization, artificial immune system.
4. Hybrid Algorithm: neuro-fuzzy method, neuro-ga method, fuzzy-ga method, immune-evolutionary.

Reference(s)

[1] Jang JSR. " Neuro Fuzzy & Soft Computing" Prentice Hall, 1997
[2] Mauridhi Hery Purnomo. "Supervised Learning Neural Networks" Graha Ilmu. 2006

Prerequisite(s)

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