

<b>COURSE</b>	Name	: Basic Intelligent Electronic System
	Code	: EE184940
	Credits	: 3
	Semester	: Elective

### Description of Course

Basic Intelligent Electronic System course discusses the basic principles of components in intelligent systems such as machine learning (neural network, visual recognition), machine reasoning (fuzzy system), and optimization (genetic algorithm). In this lecture, the design of intelligent electronics systems for particular applications, and an implementation of intelligent systems in microcontroller-based embedded systems (e.g., raspberry pi, Arduino, and so forth), will also be studied.

### Learning Outcomes

#### Knowledge

(P03) Mastering the concepts and principles of design procedure in power systems, control systems, multimedia telecommunications, or electronics.

(P05) Mastering the factual knowledge about information and communication technology, and the latest technology and its applications in power systems, control systems, multimedia telecommunications, or electronics.

#### Specific Skill

(KK03) Able to describe system design for problem solving in power systems, control systems, multimedia telecommunications, or electronics by concerning technical standards, performance aspect, reliability, ease of application, and assurance of sustainability.

(KK05) Able to utilize analytical and engineering design tools based on appropriate information and computation technology to perform engineering activities in power systems, control systems, multimedia telecommunications, or electronics.

#### General Skill

(KU01) Able to apply logical, critical, systematic and innovative thinking in the context of development or implementation of science and technology that concerns and implements the value of humanities in accordance with their area of expertise.

#### Attitude

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

### Course Learning Outcomes

#### Knowledge

Mastering the basic principles of the components in an intelligent system.

#### Specific Skill

Able to design and realize intelligent electronics systems for specific applications.

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**General Skill**

Able to use electronic devices and software to realize an intelligent system.

**Attitude**

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

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**Main Subjects**

1. Fundamentals of neuroscience and neuron modeling, neural network feedforward model and feedback propagation.
2. Learning methods in neural network.
3. Topics on visual recognition.
4. Fuzzy logic and fuzzy inference system.
5. Genetic algorithm.
6. Design and implementation of intelligent electronics systems.

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**Reference(s)**

- [1] NK Bose, and P. Liang, "Neural Network Fundamental", McGraw Hill Inc., 1996.
- [2] Frederic M Hum, and Ivica Kostanic, "Principles of Neurocomputing for Science & Engineering", McGraw Hill Inc., 2001.
- [3] JSR Jang, CT Tsun, "Neuro-Fuzzy and Soft Computing", Prentice Hall Inc., 1997.
- [4] T. Ross, "Fuzzy Logic with Engineering Applications", McGraw Hill Inc., 1995.
- [5] David B Fogel, "Evolutionary Computation", IEEE Press.

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**Prerequisite(s)**

EW184004 Numerical Methods

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