



Sample Brief Course Description

Course title	Special Topics in Electronics
Course code	ECE 495
College	Engineering
Department / Program	Electrical Engineering /Electronic Engineering
Year/ Level	5 th year / 9 th Level
Course Type	A. <input type="checkbox"/> University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others b. <input type="checkbox"/> Required <input checked="" type="checkbox"/> Elective
Credited Hours	3
Contact Hours	(LT:3, LB:0, TR:0)
Pre-requisites (if any)	ECE 202, ECE 260 Passing 136 hours
Co-requisites (if any)	---
Course description	Introduction to Neural Networks and various computational techniques, Biological Neuron, ANN versus BNN, Important definitions: Weight, Bias, Threshold, Activation Functions: viz. Sigmoid, Hyperbolic tangent, Rectified Linear Unit (ReLU) and variants, Exponential Linear Unit (ELU) and variants, SoftMax and Swish. Neural Network Architecture: single layer and multi-layer feed forward networks, Residual Net, Recurrent Network, The Long Short Term Memory Network. Convolution and Deconvolution Neural Network, Perceptron and implementation of Perceptron Learning Algorithm, Supervised versus Unsupervised Learning. Introduction to Pattern



	Recognition, Linear Classification. Gradient Descent Algorithm. Artificial Intelligence, Physical Symbol System Hypothesis, Semantics, Turing Test, State Space Search, and algorithms. Representational Techniques. Formal description of problem with relevant examples. Introduction to Genetic Algorithm. Introduction to Fuzzy Logic. Basic idea of Microprocessor and Microcontrollers, Concept of Assembly Language Programming.
Course Main Objectives	<ol style="list-style-type: none">1. Concepts and function of Artificial Neural Networks.2. Applications of ANN in Artificial Intelligence.3. Understanding conventional AI algorithms.
Learning Outcomes	<p>1. Knowledge and Understanding:</p> <ol style="list-style-type: none">1.1 Recognize and recall the digital logic concepts and its implementation.1.2 Learn the basic concepts of Artificial Neural Networks and elements AI.1.3 Identify different systems based on AI and its applications. <p>2. Skills:</p> <ol style="list-style-type: none">2.1 Apply ANN for basic logical operations.2.2 Demonstrate theoretical knowledge to AI based research. <p>3. Values:</p> <ol style="list-style-type: none">3.1 Support teamwork and demonstrate commitment to exercise leadership when appropriate.
References	<p>Required Textbooks:</p> <p>Introduction to Neural Networks “A Classroom Approach” by Satish Kumar Mc Graw Hill. 2nd Edition 1 July 2017.</p>