

# Neural Network Syllabus - AKTU 2019

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## Unit 1 - Neurocomputing & Neuroscience

1. Historical notes
2. Human brain
3. Neuron models
4. Knowledge representation
5. AI and NN
6. Learning process: Supervised and Unsupervised
7. Error correction learning
8. Competitive learning
  - Adaptive Resonance Theory
  - Self-organising map and SOM algorithm

## Unit 2 - Data Processing Scaling

1. Normalisation
2. Principle Component Analysis
3. Regression
4. Eigen values and eigen vectors
5. Basic models of artificial neurons
6. Activation functions
7. Multilayer perceptron
8. LMS algorithm
9. Delta learning rule & Gradient descent rule
10. Nonlinearly separable problems in NN

## Unit 3 - Multilayered Network Architecture

1. Backpropagation algorithm
2. Approximation properties of RBF networks
3. Comparison of RBF network with multilayer perceptron
4. Adaline network
5. Madeline network

## Unit 4 - RNN & Temporal Feedforward Network

1. Independent component analysis
2. Associative memory
  - Hetero-associative
  - Auto-associative
3. Hopfield network

## Unit 5 - Complex valued NN & Complex valued BP

1. Soft computing
  2. Fuzzy logic
  3. Genetic algorithm
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### Combined notes:

- [Link 1](#)
- [Link 2](#)

### Separate notes:

#### Unit 1 - Neurocomputing & Neuroscience

Topic Name	Links
Human brain	<a href="#">Link 1</a>
Neuron models	<a href="#">Link 1</a>
Knowledge representation	<a href="#">Link 1</a>
Learning process: Supervised and Unsupervised	<a href="#">Link 1</a>
Error correction learning	<a href="#">Link 1</a>
	<a href="#">Link 1</a>
Competitive learning	<a href="#">Link 2</a> <a href="#">Link 3</a>

#### Unit 2 - Data Processing Scaling

Topic Name	Links
Principle Component Analysis	<a href="#">Link 1</a>
Regression	<a href="#">Link 1</a>
Eigven values and eigen vectors	<a href="#">Link 1</a>
Basic models of artificial neurons	<a href="#">Link 1</a>
Activation functions	<a href="#">Link 1</a>
Multilayer perceptron	<a href="#">Link 1</a>
LMS algorithm	<a href="#">Link 1</a>

Topic Name	Links
Delta learning rule &	<a href="#">Link 1</a>
Gradient descent rule	<a href="#">Link 2</a>

## Unit 3 - Multilayered Network Architecture

Topic Name	Links
Backpropagation algorithm	<a href="#">Link 1</a>
Approximation properties of RBF networks	<a href="#">Link 1</a>
Comparison of RBF network with multilayer perceptron	<a href="#">Link 1</a>
Adaline network	<a href="#">Link 1</a> <a href="#">Link 2</a>
Madeline network	<a href="#">Link 1</a> <a href="#">Link 2</a>

## Unit 4 - RNN & Temporal Feedforward Network

Topic Name	Links
Independent component analysis	<a href="#">Link 1</a> <a href="#">Link 2</a>
Associative memory	<a href="#">Link 1</a>
Hopfield network	<a href="#">Link 1</a> <a href="#">Link 2</a>

## Unit 5 - Complex valued NN & Complex valued BP

Topic Name	Links
Soft computing	<a href="#">Link 1</a>
Fuzzy logic	<a href="#">Link 1</a>
Genetic algorithm	<a href="#">Link 1</a> <a href="#">Link 2</a>