TCET/FRM/IP-02/09   Revision: A

Semester Plan
(Theory)

Semester: VII   Course: BE (EXTC)

Subject: NEURAL NETWORKS AND FUZZY LOGIC   Class: B

Sr. No.	Bridge courses/Technology	Duration (Week/hrs)	Modes of Learning	Recommended Sources
1.	**Prerequisite course:** Basic Mathematics, Linear Algebra.	06 hrs	Self learning and classroom revision	Higher Engineering Mathematics, Dr.B.S.Grewal, Khanna Publication Chapter 01(pg 16-30) Chapter – 02 (Pg31-55)

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
1		L1.1	SOP Theory	Chalk & board, ppt	12/07/17		
2		L1.2	SOP Practical	Chalk & board, ppt	12/07/17		
3		L1.3	NNFL (OBE)	Chalk & board,ppt	12/07/17		
4	M1	L1.4	Introduction to neural networks.	Chalk & board	13/07/17	Simon Haykin, "Neural Network- A Comprehensive Foundation "	

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
5		L1.5	Biological neurons and Artificial Neural network	Chalk & board	14/07/17	Simon Haykin, "Neural Network- A Comprehensive Foundation	
6		L2.1	Types of activation functions and Neural networks architectures	Chalk & board	19/07/17		
7		L2.2	Knowledge representation-Supervised Learning and Unsupervised Learning Neural Networks	Chalk & board	20/07/17	S.N Sivanandan S.N Deepa " Princples of Soft Computing"	
8		L3.1	McCulloch and Pitts models of neuron	Chalk & board	26/07/17	S.N Sivanandan S.N Deepa " Princples of Soft Computing"	
9		L3.2	Numericals on McCulloch and Pitts models	Chalk & board	26/07/17		
10	M1	L3.3	Linearly separable and Hebb's learning.	Chalk & board	27/07/17	S.N Sivanandan S.N Deepa " Princples of Soft Computing"	2 hours lecture is covered in one hour. Practice problems given
11		L3.4	Numericals on Hebb's learning	Chalk & board	28/07/17	S.N Sivanandan S.N Deepa " Princples of Soft Computing"	
12	M2	L4.1	Single layer perception and multilayer perceptron neural networks, their architecture	Chalk & board	02/08/17	S.N Sivanandan S.N Deepa " Princples of Soft Computing"	
13		L4.2	Error back propagation algorithm,	Chalk & board	02/08/17	S.N Sivanandan S.N Deepa " Princples of Soft Computing"	One Practice problem solved in class, rest given as homework

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
14		L4.3	learning factors, step learning	Chalk & board	04/08/17	S.N Sivanandan S.N Deepa " Princples of Soft Computin	
15		L5.1	Momentum learning	Chalk & board	09/08/17	S.N Sivanandan S.N Deepa " Princples of Soft Computing"	
16	M2	L5.2	Training, testing and cross-validation data sets for design	Chalk & board	09/08/17	S.N Sivanandan S.N Deepa " Princples of Soft Computing"	
17		L5.3	Numerical Discussion	Chalk & board	10/08/17	S.N Sivanandan S.N Deepa " Princples of Soft Computing"	Rest of numerical as Practice
18		L5.4	Competitive learning networks, kohonen self-organizing networks	Chalk & board	11/08/17	Simon Haykin, "Neural Network- A Comprehensive Foundation "	
19	M3	L6.1	K-means algorithms	Chalk & board	16/08/17	Simon Haykin, "Neural Network- A Comprehensive Foundation "	
20	.	L6.2	LMS algorithms	Chalk & board	16/08/17	Simon Haykin, "Neural Network- A Comprehensive Foundation "	
21		L6.3	RBF neural network,	Chalk & board	18/08/17		
22		L7.1	Comparison of RBF and MLP networks Learning	Chalk & board	24/08/17		

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
23		L8.1	Vector Quantization neural network	Chalk & board	30/08/17		
24		L8.2	Problem on Vector Quantization	Chalk & board	30/08/17	S.N Sivanandan S.N Deepa " Princples of Soft Computing"	
25	M3	L8.3	Hebbian learning	Chalk & board	31/08/17	S.N Sivanandan S.N Deepa " Princples of Soft Computing"	
26		L8.4	Hopfield networks	Chalk & board	01/09/17		Practice Problem given as homework
27		L9.1	Applications of Neural Networks	Chalk & board	06/09/17		
28		L9.2	Pattern classification	Chalk & board	06/09/17	Simon Haykin, "Neural Network- A Comprehensive Foundation "	
29	M4	L9.3	Handwritten character recognition	Chalk & board	07/09/17		
30		L9.4	Face recognition and Image compression and decompression	Chalk & board	08/09/17		Applications given as student presentation
31		L10.1	Basic Fuzzy logic theory	Chalk & board	13/09/17	S.N Sivanandan S.N Deepa " Princples of Soft	

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
32		L10.2	Fuzzy sets and their properties	Chalk & board	13/09/17	Computing"	
33	M4	L10.3	Operations on fuzzy sets	Chalk & board	14/09/17		
34		L10.4	Fuzzy relation and its numerical	Chalk & board	15/09/17		
35		L11.1	operations on fuzzy relations and its numerical	Chalk & board	20/09/17		
36		L11.2	Problems on fuzzy relation and operations on fuzzy relations and extension principle	Chalk & board	20/09/17		
37	M5	L11.3	Fuzzy membership functions	Chalk & board	21/09/17	S.N Sivanandan S.N Deepa " Princples of Soft Computing	
38		L11.4	Fuzzy linguistic variables	Chalk & board	22/09/17		
39		L12.1	Fuzzy rules	Chalk & board	04/10/17		
40		L12.2	Fuzzy reasoning	Chalk & board	04/10/17		
41		L12.3	Fuzzification and its methods	Chalk & board	05/10/17		

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
42	M5	L12.3	Defuzzification and its methods	Chalk & board	06/10/17		
43	M5	L13.1	Fuzzy inference systems, Mamdani Fuzzy models,	Chalk & board	12/10/17	S.N Sivanandan S.N Deepa " Princples of Soft Computing	
44		L13.2	Fuzzy knowledge based controllers	Chalk & board	13/10/17		
45	M6	L14.1	Fuzzy pattern recognition	Chalk & board	18/10/17		
Remark:: Course:	Syllabus Coverage:			Practice Session:		Beyond Syllabus:	
No. of (lectures planned)/(lecture taken):45							

Bridge courses Objective: Bridging of gaps with respect to prerequisites and industry skills or to carryout research in signal processing field. **(20 Hrs / Semester / student)**

Sr . No.	Bridge courses/Technology	Duration (Week/hrs)	Modes of Learning	Recommended Sources
1	**Advanced course:** Neural Networks and Applications (NPTEL Course)	12 week	Technology Based learning	http://nptel.ac.in/courses/117105084/# 2. Simon Haykin, "*Neural Network- A Comprehensive Foundation*", Pearson Education Laurence Fausett, "*Fundamentals of Neural Networks*", Pearson Education

Text Books:
1. S. N. Sivanandam, and S. N. Deepa, "*Principles of Soft Computing*" , Wiley India Publications
2. S. Rajsekaran and G. A. Vijaylakshmi Pai, " *Neural Networks, Fuzzy Logic, and Genetic Algorithms*", PHI

Recommended Books:

1. Simon Haykin, "*Neural Network- A Comprehensive Foundation*", Pearson Education

2. Thimothy J. Ross, "*Fuzzy Logic with Engineering Applications*", Wiley India Publications

3 Laurence Fausett, "*Fundamentals of Neural Networks*", Pearson Education

4. S. N. Sivanandam, S. Sumathi, and S. N. Deepa, "*Introduction to Neural Network Using MATLAB*", Tata McGraw-Hill Publications

5. Bart Kosko, "*Neural networks and Fuzzy Systems*", Pearson Education

Digital Reference:
- Wikipedia
- Google
- www.sci.brooklyn.cuny.edu/~lucci/notes/lecture11

S.d..	S.d...	S.d...
Mlrs. Jeslin Edison	Dr. Vinitkumar Dongre	DR. R.R Sedamkar
Name & Signature of Faculty	Signature of HOD	Signature of Principal /Dean (Academics)
Date: 20/07/17	Date: 20/07/17	Date: 20/07/17

Note:
1. Plan date and completion date should be in compliance
2. Courses are required to be taught with emphasis on resource book, course file, text books, reference books, digital references etc.
3. Planning is to be done for 15 weeks where 1st week will be AOP, 2nd -13th for effective teaching and 14th -15th week for effective university examination oriented teaching, mock practice session and semester consolidation.
4. According to university syllabus where lecture of 4 hrs/per week is mentioned minimum 55 hrs and in case of 3 lectures per week minimum 45 lectures are to be engaged are required to be engaged during the semester and therefore accordingly semester planning for delivery of theory lectures shall be planned.
5. In order to improve score in NBA, faculty members are also required to focus course teaching beyond university prescribed syllabus and measuring the outcomes w.r.t learning course and programme objectives.
6. Text books and reference books are available in syllabus. Here only additional references w.r.t. non –digital/ digital sources can be written (if applicable)
7. Technology to be used in class room during lecture shall be written below the topic planned within the bracket.