

COURSE PLAN & COURSE DATA SHEET

PROGRAM: BCA/BCS	DEGREE: BCA/BCS
COURSE: NEURAL NETWORK	SEMESTER: 4 th CREDITS: 4
COURSE CODE: BCA-304/BCS-304 REGULATION:	COURSE TYPE: CORE
COURSE AREA/DOMAIN: Data Science	CONTACT HOURS: 4 hours/week
CORRESPONDING LAB COURSE CODE (IF ANY): BCA-354/BCS-354	LAB COURSE NAME (IF ANY): NEURAL NETWORK LAB

PROGRAM EDUCATIONAL OBJECTIVES:

SYLLABUS:

UNIT	DETAILS	HOURS
I	Overview of biological neurons: Structure of biological neurons relevant to ANNs.	10
II	Fundamental concepts of Artificial Neural Networks: Models of ANNs; Feed forward & feedback networks; learning rules; Hebbian learning rule, perception learning rule, delta learning rule, Widrow-Hoff learning rule, correction learning rule, Winner take all learning rule, etc.	13
III	Single layer Perception Classifier: Classification model, Features & Decision regions; training & classification using discrete perception, algorithm, single layer continuous perception networks for linearly separable classifications	12
IV	Multi-layer Feed forward Networks: linearly non-separable pattern classification, Delta learning rule for multi-perceptron layer, generalized delta learning rule, Error back propagation training, learning factors, Examples.	11
V	Single layer feedback Networks: Basic Concepts, Hopfield networks, Training & Examples, associative memories	10
TOTAL HOURS		56

Teacher Centric Approach			
TC1: Chalk and Talk, Blended learning	TC2: PPT,	TC3: Video Lectures	TC4:
Learner Centric Approach:			
LC1: Assignment.	LC2: Mini project.	LC3: Quiz/Class test.	LC 4: Seminar on recent trends.
LC5: Group Task.	LC6: Others		

DETAILED SESSION PLAN

Lecture session/ Number	Topics to be covered	CO addressed	Teacher Centric Approach	Learner Centric Approach	References	Relevance with POs and PSOs
1	UNIT-1 Overview of biological neurons:		TC1	LC1,LC3	T1	PO5,PO6,PSO1
2	Overview of biological neurons:		TC1	LC1,LC3	T1	PO5,PO6,PSO1
3	Structure of biological neurons relevant to ANNs.		TC1	LC1,LC3	T1	PO5,PO6,PSO1
4	Structure of biological neurons relevant to ANNs.		TC1	LC1,LC3	T1	PO5,PO6,PSO1
5	Structure of biological neurons relevant to ANNs.		TC1	LC1,LC3	T1	PO5,PO6,PSO1
6	Doubt class		-	-	-	-
7	UNIT-2 Fundamental concepts of Artificial Neural Networks:		TC1	LC1,LC3	T1	PO1,PO3,PO5,PO9,PSO1,PSO2
8	Mining Methods– Mining Various kinds of Association Rules		TC1	LC1,LC3	T1	PO1,PO3,PO5,PO9,PSO1,PSO2
9	Models of ANNs		TC1	LC1,LC3	T1	PO1,PO3,PO5,PO9,PSO1,PSO2
10	Models of ANNs		TC1	LC1,LC3	T1	PO1,PO3,PO5,PO9,PSO1,PSO2
11	Feed forward & feedback networks;		TC1	LC1,LC3	T1	PO1,PO3,PO5,PO9,PSO1,PSO2
12	learning rules		TC1	LC1,LC3	T1	PO1,PO3,PO5,PO9,PSO1,PSO2
13	Hebbian learning rule		TC1	LC1,LC3	T1	PO1,PO3,PO5,PO9,PSO1,PSO2

14	perception learning rule		TC1	LC1,LC3	T1	PO1,PO3,PO5,PO9,PSO1,PSO2
15	delta learning rule		TC1	LC1,LC3	T1	PO1,PO3,PO5,PO9,PSO1,PSO2
16	Widrow-Hoff learning rule		TC1	LC1,LC3	T1	PO1,PO3,PO5,PO9,PSO1,PSO2
17	correction learning rule		TC1	LC1,LC3	T1	PO1,PO3,PO5,PO9,PSO1,PSO2
18	Winner take all learning rule		TC1	LC1,LC3	T1	PO1,PO3,PO5,PO9,PSO1,PSO2
19	Doubt class		-	-	-	-
20	UNIT-3 Single layer Perception Classifier:		TC1	LC1,LC3	T1	PO1,PO2,PO3,PO5,PSO1
21	Classification model,		TC1	LC1,LC3	T1	PO1,PO2,PO3,PO5,PSO1
22	Features & Decision regions		TC1	LC1,LC3	T1	PO1,PO2,PO3,PO5,PSO1
23	training & classification using discrete perception,		TC1	LC1,LC3	T1	PO1,PO2,PO3,PO5,PSO1
24	training & classification using discrete perception,		TC1	LC1,LC3	T1	PO1,PO2,PO3,PO5,PSO1
25	Algorithm		TC1	LC1,LC3	T1	PO1,PO2,PO3,PO5,PSO1
26	single layer continuous perception networks for linearly separable classifications.		TC1	LC1,LC3	T1	PO1,PO2,PO3,PO5,PSO1
27	single layer continuous perception networks for linearly separable classifications.		TC1	LC1,LC3	T1	PO1,PO2,PO3,PO5,PSO1
28	Doubt class		-	-	-	-
29	UNIT-4 Multi-layer Feed forward Networks		TC1	LC1,LC3	T1	PO1,PO2,PO3,PO5,PSO1
30	linearly non-separable pattern classification		TC1	LC1,LC3	T1	PO1,PO2,PO3,PO5,PSO1
31	Delta learning rule for multi-perceptron layer		TC1	LC1,LC3	T1	PO1,PO2,PO3,PO5,PSO1
32	Delta learning rule for multi-perceptron layer		TC1	LC1,LC3	T1	PO1,PO2,PO3,PO5,PSO1
33	generalized delta learning rule,		TC1	LC1,LC3	T1	PO1,PO2,PO3,PO5,PSO1

34	Error back propagation training		TC1	LC1,LC3	T1	PO1,PO2,PO3,PO5,PSO1
35	learning factors, Examples.		TC1	LC1,LC3	T1	PO1,PO2,PO3,PO5,PSO1
36	Doubt class		-	-	-	-
37	UNIT-5 Single layer feedback Networks		TC1	LC1,LC3	T1	PO2,PO3,PO5, PSO1,PSO2
38	Basic Concepts,		TC1	LC1,LC3	T1	PO2,PO3,PO5, PSO1,PSO2
39	Basic Concepts,		TC1	LC1,LC3	T1	PO2,PO3,PO5, PSO1,PSO2
40	Hopfield networks		TC1	LC1,LC3	T1	PO2,PO3,PO5, PSO1,PSO2
41	Training & Examples		TC1	LC1,LC3	T1	PO2,PO3,PO5, PSO1,PSO2
42	associative memories		TC1	LC1,LC3	T1	PO2,PO3,PO5, PSO1,PSO2

TEXT/REFERENCE BOOKS:

T/R	BOOK TITLE/AUTHORS/PUBLICATION
1	Introduction to artificial neural systems by Jacek M. Zurada, 1994, Jaico Publ.House.
2	Neural Networks :A Comprehensive formulation , Simon Haykin, 1998, AW
3	Neural Networks , Kosko, 1992, PHI
4	Neural Network Fundamentals N.K. Bose , P. Liang, 2002, T.M.H

WEB SOURCE REFERENCES (W):

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COURSE PRE-REQUISITES:

C.CODE	COURSE NAME	DESCRIPTION	SEM
	A course on "Database Management Systems"		
	Knowledge of probability and statistics		

COURSE OBJECTIVES:

1	It presents methods for mining frequent patterns, associations, and correlations.
2	It then describes methods for data classification and prediction, and data-clustering approaches.
3	It covers mining various types of data stores such as spatial, textual, multimedia, streams.

COURSE OUTCOMES:

S.NO	DESCRIPTION	PO(1..12) MAPPING	PSO(1..3) MAPPING
Cxxx.1	Ability to understand the types of the data to be mined and present a general classification of tasks and primitives to integrate a data mining system.	PO5,PO6,	PSO1
Cxxx.2	Apply preprocessing methods for any given raw data.	PO1,PO3,PO5,PO9	PSO1, PSO2
Cxxx.3	Extract interesting patterns from large amounts of data.	PO1,PO2,PO3,PO5	PSO1
Cxxx.4	Discover the role played by data mining in various fields.	PO1,PO2,PO3,PO5	PSO1
Cxxx.5	Choose and employ suitable data mining algorithms to build analytical applications CO6: Evaluate the accuracy of supervised and unsupervised models and algorithms.	PO2,PO3,PO5,	PSO1, PSO2
COURSE OVERALL PO/PSO MAPPING:			

COURSE OUTCOMES VS POs MAPPING (DETAILED; HIGH:3; MEDIUM:2; LOW:1):

S.NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Cxxx.1					2	1								1	
Cxxx.2	2		2		1				2					2	2
Cxxx.3	1	2	1	3										1	
Cxxx.4	1	1	2	1										1	
Cxxx.5		2	1		1									1	2

POs & PSO REFERENCE:

PO 1	Engineering Knowledge	PO7	Environment & Sustainability	PSO1	To equip the students with theoretical and implementation knowledge in all the latest area of Computer Science and Engineering for successful career in software industry, pursuing higher studies, or entrepreneurial establishment.
PO 2	Problem Analysis	PO8	Ethics	PSO2	To nurture the students with the critical thinking abilities for better decision making by offering them a socially acceptable solutions to real life problem through computing paradigm.
PO 3	Design & Development	PO9	Individual & Team Work	PSO3	To nurture the students with the comprehensive analytical and design by offering them techno-commercial feasible solutions of real business problem through computing.
PO 4	Investigations	PO10	Communication Skills		
PO 5	Modern Tools	PO11	Project Mgt. & Finance		
PO	Engineer &	PO12	Life Long		

6	Society		Learning		
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COs VS POs MAPPING JUSTIFICATION:

S.NO	PO/PSO MAPPED	LEVEL OF MAPPING	JUSTIFICATION
Cxxx.1			
Cxxx.2			
Cxxx.3			
Cxxx.4			
Cxxx.5			
Cxxx*			

GAPS IN THE SYLLABUS - TO MEET INDUSTRY/PROFESSION REQUIREMENTS, POs & PSOs:

SNO	DESCRIPTION	PROPOSED ACTIONS
1		
2		
3		
4		
5		

PROPOSED ACTIONS: TOPICS BEYOND SYLLABUS/ASSIGNMENT/INDUSTRY VISIT/GUEST LECTURER/NPTEL ETC

TOPICS BEYOND SYLLABUS/ADVANCED TOPICS/DESIGN:

1	
2	
3	
4	
5	
6	
7	

DELIVERY/INSTRUCTIONAL METHODOLOGIES:

<input type="checkbox"/> CHALK & TALK	<input type="checkbox"/> STUD. ASSIGNMENT	<input type="checkbox"/> WEB RESOURCES	<input type="checkbox"/> NPTEL/OTHERS
<input type="checkbox"/> LCD/SMART BOARDS	<input type="checkbox"/> STUD. SEMINARS	<input type="checkbox"/> ADD-ON COURSES	<input type="checkbox"/> WEBNIARS

ASSESSMENT METHODOLOGIES-DIRECT

<input type="checkbox"/> ASSIGNMENTS	<input type="checkbox"/> STUD. SEMINARS	<input type="checkbox"/> TESTS/MODEL EXAMS	<input type="checkbox"/> UNIV. EXAMINATION
<input type="checkbox"/> STUD. LAB PRACTICES	<input type="checkbox"/> STUD. VIVA	<input type="checkbox"/> MINI/MAJOR PROJECTS	<input type="checkbox"/> CERTIFICATIONS
<input type="checkbox"/> ADD-ON COURSES	<input type="checkbox"/> OTHERS		

ASSESSMENT METHODOLOGIES-INDIRECT

<input type="checkbox"/> ASSESSMENT OF COURSE OUTCOMES (BY FEEDBACK, ONCE)	<input type="checkbox"/> STUDENT FEEDBACK ON FACULTY (TWICE)
<input type="checkbox"/> ASSESSMENT OF MINI/MAJOR PROJECTS BY EXT. EXPERTS	<input type="checkbox"/> OTHERS

INNOVATIONS IN TEACHING/LEARNING/EVALUATION PROCESSES:

1.



Lingaya's Vidyapeeth

Deemed-to-be-University u/s 3 of UGC Act 1956, Government of India

NAAC ACCREDITED

Approved by MHRD / AICTE / PCI / BCI / COA / NCTE

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Additionally, the details to be compiled separately by the Departmental Coordinator for the entire Department.