Subject: Deep Learning			
Course Code: PCCAIML 602		**Semester: VI**	
Duration: 36 Hrs.		**Maximum Marks: 100**	
Teaching Scheme		**Examination Scheme**	
Theory: 3 hrs./week		End Semester Exam: 70	
Tutorial: 0		Attendance : 5	
Practical:		Continuous Assessment:25	
Credit: 3			
Aim:			
Sl. No.			
1.	To improve the performance of a Deep Learning model		
2.	to the reduce the optimization function which could be divided based on the classificationand the regression problems		
Objective:			
Sl. No.			
1.	To acquire knowledge on the basics of neural networks.		
2.	To implement neural networks using computational tools for variety of problems.		
3.	To explore various deep learning algorithms.		
Pre-Requisite:			
Sl. No.			
1.	Calculus, Linear Algebra		
2.	Probability & Statistics		
3.	Ability to code in R/Python		
Contents		**Hrs./week**	
Chapter	**Name of the Topic**	**Hours**	**Marks**

01	**Introduction** Various paradigms of earning problems, Perspectives and Issues in deep learning framework, review of fundamental learning techniques.	**3**	**5**
02	**Feed forward neural network** Artificial Neural Network, activation function, multi-layer neural network, cardinality, operations, and properties of fuzzy relations.	**6**	**10**
03	**Training Neural Network** Risk minimization, loss function, backpropagation, regularization, model selection, and optimization.	**6**	**15**
04	**Conditional Random Fields** Linear chain, partition function, Markov network, Belief propagation, Training CRFs, Hidden Markov Model, Entropy.	**9**	**15**
05	**Deep Learning** Deep Feed Forward network, regularizations, training deep models, dropouts, Convolutional Neural Network, Recurrent Neural Network, Deep Belief Network.	**6**	**15**
06	**Deep Learning research** Object recognition, sparse coding, computer vision, natural **language**	**6**	**10**
	Sub Total:	**36**	**70**
	Internal Assessment Examination & Preparation of Semester Examination	**4**	**30**
	Total:	**40**	**100**

List of Books
Text Books:

Name of Author	Title of the Book	Edition/ISSN/ISBN	Name of the Publisher
Rajiv Chopra	Dep Learning (AICTE Recommended Textbook)	First Edition	Khanna Book Publishing
Goodfellow, I.,Bengio,Y., andCourville A.,	Deep Learning		MIT Press
Satish Kumar	Neural Networks: A Classroom Approach		Tata McGraw-Hill

Reference Books:

Bishop, C. ,M.	Pattern Recognition and Machine Learning		Springer
Yegnanarayana, B.	Artificial Neural Networks		PHI Learning Pvt. Ltd
Golub, G.,H., and VanLoan,C.,F.	Matrix Computations		JHU Press

Soft Computing
Code: PCCAIML603 & PCCAIML693
Contacts: 3L + 4P

Name of the Course:	**Soft Computing**
Course Code: **PCCAIML603 & PCCAIML693**	Semester: VI
Duration:6 months	Maximum Marks: 100
Teaching Scheme	**Examination Scheme**
Theory: 3 hrs./week	Mid Semester exam: 15
Tutorial: NIL	Assignment and Quiz : 10 marks
	Attendance: 5 marks
Practical: 4 hrs./week	End Semester Exam: 70 Marks
	Practical Sessional internal continuous evaluation:40
	Practical Sessional external examination: 60
Credit Points:	3 + 2

Unit	Content	Hrs/Unit	Marks/Unit
1	Introduction: Introduction to soft computing; introduction to fuzzy sets and fuzzy logic systems; introduction to biological and artificial neural network; introduction to Genetic Algorithm	8	