E.G.S. PILLAY ENGINEERING COLLEGE

(Autonomous)

Approved by AICTE, New Delhi | Affiliated to Anna University, Chennai
Accredited by NAAC with 'A' Grade | Accredited by NBA (CSE, IT, ECE)
NAGAPATTINAM – 611002

B.TECH. INFORMATION TECHNOLOGY

R-2019

SEMESTER VIII									
Course Code	**Course Name**	**L**	**T**	**P**	**C**	**Maximum Marks**			**Category**
						CA	**ES**	**Total**	
Theory Course									
1903IT016	Data Analytics	3	0	0	3	40	60	100	PE
1903IT022	Deep Learning	3	0	0	3	40	60	100	PE
Laboratory Course									
1904IT851	Project Work	0	0	14	7	50	50	100	EEC
Total		**6**	**0**	**14**	**13**	**130**	**170**	**300**	**-**

1903IT016		DATA ANALYTICS	L	T	P	C
			3	0	0	3

AIM: The main objective of this course is to provide practical foundation level training that enables immediate and effective participation in big data and other Analytic projects

PREREQUISITES: Data warehouse and Data mining

COURSE OBJECTIVES:

1. Deploying the Data Analytics lifecycle to address big data analytics projects.
2. Reframing a business challenge as an analytics challenge
3. Applying appropriate analytic techniques and tools to analyze big data.
4. Selecting appropriate data visualizations to clearly communicate analytic insights to business sponsors and analytic audiences.
5. Using tools such as: R and R-Studio, Map Reduce /Hadoop in database analytics.

UNIT I	INTRODUCTION	9 Hours

Introduction to Data Science – Data Classification – Data Analytics - Big data overview – characteristics of Big data – the practice of analytics – the role and required skills of data scientist

UNIT II	DATA ANALYTICS LIFECYCLE	9 Hours

Discovery – Data preparation – model planning and building – communicating results – operation alizing a data analytics project

UNIT III	BASIC DATA ANALYTICS METHOD USING R	9 Hours

Introduction to R - Using basic R commands to analyze data – statistical measures and visualization to understand data – Practical: RStudio basic commands

UNIT IV	MAP REDUCE AND ITS FRAMEWORK	9 Hours

Introduction to Map Reduce – Hadoop ecosystems – SQL OLAP extensions, windows functions, user defined functions and aggregates – MADlib

UNIT V	ADVANCED DATA ANALYTICS	9 Hours

Classification and prediction technique using R – Time Series analysis – Text Analytics - clustering and association technique using R – web mining – graph mining

	TOTAL:	45 Hours

FURTHER READING	Database Management Systems, Artificial Intelligence, Data warehousing and Data Mining

COURSE OUTCOMES:

After learning the course the student should be able to:

CO1: Define the key role of Big data Analytics
CO2: Explain Hadoop Distributed File System and its components
CO3: Solve the basic Analysis problem using Map and reduce
CO4: Construct different format of data using map reduce split up
CO5: Explain Streams in Big Data Analytics

REFERENCES:

1. ICTACT "Data science and big data analytics ", EMC2 edition 2016
2. Noreen Burlingame, Little Book of Big Data‖ Kindle Edition.2015
3. Tom White, Hadoop the definitive Guide‖, O'Reilly Media yahoo Press, 2nd Edition,2012
4. Alex Holmas, Hadoop in Practice‖, Manning Publications, 2012.
5. https://www.openstack.org/
6. http://nptel.ac.in

1903IT022	DEEP LEARNING	L	T	P	C
		3	0	0	3

AIM: To study the concepts of Deep Learning process and analytics procedures

PREREQUISITE: Data Warehousing And Data Mining, Artificial Intelligence

COURSE OBJECTIVES:

1. Teach the concepts of deep learning process
2. Study the deep learning Strategies 1 and 2
3. Study of various learning and classification techniques
4. Study of various real time case studies of deep learning process

UNIT I	**INTRODUCTION**	**9 Hours**
Review of Artificial Intelligence – Neural Networks – Supervised Learning – Back Propagations		
UNIT II	**DEEP LEARNING STRATEGIES - 1**	**9 Hours**
Properties of CNN representations: inevitability, stability, invariance **–** Localization – Regression - RNNs		
UNIT III	**DEEP LEARNING STRATEGIES - 2**	**9 Hours**
Deep Unsupervised Learning – Auto encoders (standard, de-noising, contractive, etc etc) - Variation Auto encoders - Adversarial Generative Networks - Maximum Entropy Distributions		
UNIT IV	**LEARNING AND CLASSIFICATION**	**9 Hours**
Reinforced Learning — Learning Agents – Binary Classification – Multi Class Classification - CNN Classification – Deep Belief – Computer Vision		
UNIT V	**CASE STUDY**	**9 Hours**
Medical Imaging – Natural Language Processing - Speech Processing – Secure Online Processing – Fraud Detection – Cyber Forensics		
	TOTAL:	**45 Hours**

COURSE OUTCOMES:

At the end of this course, students will able to,

CO1: Understand the concept of deep learning
CO2: Explain different representation and strategies of deep learning
CO3: Explain various unsupervised deep learning techniques and networks
CO4: Understand learning and classification techniques
CO5: Demonstrate various case studies of deep learning applications

REFERENCES:

1. Daniel Graupe, “Deep Learning Neural Networks and Case Studies”, World Scientific Publishing Co. Pt. Ltd, 2016
2. Ian Goodfellow, Yoshua Bengio, Aaron Courville, “Deep Learning (Adaptive Computation and Machine Learning series)”, MIT Press, 2017
3. Nikhil Buduma, Nicholas Locascio Fundamentals of Deep Learning: Designing Next-Generation Machine Intelligence Algorithms, O'Reilly Media; 1 edition, 2017
4. Aurélien Géron, Hands-On Machine Learning with Scikit-Learn and Tensor Flow: Concepts, Tools, and Techniques to Build Intelligent Systems, O'Reilly Media; 1 edition, 2017
5. Russell Reed (Author), Robert J Marks II, Neural Smithing: Supervised Learning in Feed forward Artificial Neural Networks, MIT Press A Bradford Book, 2012
6. http://nptel.ac.in

1904IT851	PROJECT WORK	L	T	P	C
		0	0	14	7

Course Objectives:

The student should be made to:

1. To develop knowledge to formulate a real world problem and project's goals.
2. To identify the various tasks of the project to determine standard procedures.
3. To identify and learn new tools, algorithms and techniques.
4. To understand the various procedures for validation of the product and analysis the cost effectiveness.
5. To understand the guideline to Prepare report for oral demonstrations.

Course Outcomes (COs)

At the end of this course, students will able to,

CO1: Formulate a real world problem, identify the requirement and develop the design solutions.
CO2: Express the technical ideas, strategies and methodologies.
CO3: Utilize the new tools, algorithms, techniques that contribute to obtain the solution of the project.
CO4: Test and validate through conformance of the developed prototype and analysis the cost effectiveness.
CO5: Prepare report and present the oral demonstrations.

The students in a group of 3 to 4 works on a topic approved by the head of the department under the guidance of a faculty member and prepares a comprehensive project report after completing the work to the satisfaction of the supervisor. The progress of the project is evaluated based on a minimum of three reviews. The review committee may be constituted by the Head of the Department. A project report is required at the end of the semester. The project work is evaluated based on oral presentation and the project report jointly by external and internal examiners constituted by the Head of the Department.

TOTAL: 140 Hours