Subject:	WIRELESS SENSOR NETWORK LAB (Lab - I) (ITPALT2)	Credits			
Type:	Practical	L	T	P	Total
Teaching Scheme:	Lectures: 4 hours/week	0	0	2	2

M.Tech. (IT) First Semester

List of WSN Lab Experiments

Exp-01: Perform Blinking of LED Experiment by using Arduino Nano?

Exp-02: Control Buzzer Operation by using Arduino Nano?

Exp-03: Display Temperature and Humidity Sensor's data on the LCD by using

Arduino Nano?

Exp-04: Perform Automatic Garage Door Opener Experiment with Stepper and

Ultrasonic Sensor by using Arduino Nano?

Exp-05: Complete the Full Setup and Installation of the Raspberry Pi Board?

Exp-06: Perform Blinking of LED Experiment by using Raspberry Pi Board?

Exp-07: Get the Distance by using Ultrasonic Sensor?

Exp-08: Publish DTH Sensor Values to Web page by using MQTT Server?

Exp-09: Setup & Update the DTH Sensor Values online to ThingSpeak?

Exp-10: Create Intruder Detection System by using IOT Board?

Subject:	ADVANCED ALGORITHMS LAB (Lab - II) (ITPBLT1)	Credits			
Type:	Practical	L	T	P	Total
Teaching Scheme:	Lectures: 4 hours/week	0	0	4	2

Course Objective: The student can able to attain knowledge in advance algorithms.
Course Outcomes: The student can able to analyze the performance of algorithms

List of Experiments
1. Implement assignment problem using Brute Forcemethod
2. Perform multiplication of long integers using divide and conquermethod.
3. Implement solution for knapsack problem using Greedymethod.
4. Implement Gaussian eliminationmethod.
5. Implement LUdecomposition
6. Implement Warshall algorithm
7. Implement Rabin Karp algorithm.
8. Implement KMP algorithm.
9. Implement Harspool algorithm
10. Implement max-flowproblem.

Text Book:
1. Design and Analysis of Algorithms, S.Sridhar, OXFORD University Press

References:
1. Introduction to Algorithms, second edition, T.H. Cormen, C.E. Leiserson, R.L. Rivest and C.Stein,PHI Pvt. Ltd./ PearsonEducation.
2. Fundamentals of Computer Algorithms, Ellis Horowitz, SatrajSahniand Rajasekharam, UniversitiesPress.
3. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearsoneducation.

Subject:	DATA SCIENCE LAB (Lab – III) (ITPBLT2)	Credits			
Type:	Practical	L	T	P	Total
Teaching Scheme:	Lectures: 4 hours/week	0	0	4	2

Course Objectives:
1. To make students understand learn about a Big Data – R Programming, way of solving problems.
2. To teach students to write programs in Scala to solve problems.

Introduction to R Programming:

What is R and RStudio? R is a statistical software program. It has extremely useful tools for data exploration, data analysis, and data visualization. It is flexible and also allows for advanced programming. RStudio is a user interface for R, which provides a nice environment for working with R.

1.	Write an R program to evaluate the following expression ax+b/ax-b.
2.	Write an R program to read input from keyboard (hint: readLine()).
3.	Write an R program to find the sum of n natural numbers: 1+2+3+4+….n
4.	Write an R program to read n numbers. (i) Sum of all even numbers (ii) Total number of even numbers.
5.	Write an R program to read n numbers. (i) Total number of odd numbers (ii) Sum of all odd numbers
6.	Write an R program to obtain (i)sum of two matrices A and B (ii) subtraction of two matrices A and B (iii) Product of two matrices.
7.	Write an R program for "declaring and defining functions "
8.	Write an R program that uses functions to add n numbers reading from keyboard
9.	Write an R program uses functions to swap two integers.
10.	Write an R program that use both recursive and non-recursive functions for implementing the Factorial of a given number, n.
11.	Write an R program to reverse the digits of the given number {example 1234 to be written as 4321}
12.	Write an R program to implement (i)Linear search (ii) Binary Search.
13.	Write an R program to implement (i)Bubble sort (ii) selection sort.
14.	Write a R program to implement the data structures (i) Vectors (ii) Array (iii) Matrix (iv) Data Frame (v) Factors
15.	Write a R program to implement scan(), merge(), read.csv() and read.table() commands.
16.	Write an R program to implement "Executing Scripts" written on the note pad, by calling to the R console.
17.	Write a R program, Reading data from files and working with datasets (i) Reading data from csvfiles, inspection ofdata. (ii) Reading data from Excelfiles.
18.	Write a R program to implement Graphs (i) Basic high-level plots (ii)Modifications of scatter plots (iii) Modifications of histograms, parallel boxplots. Suggested Books for Lab: 1. Big data – Black Book: 2015 edition: dreamtechpress. Pg. (490-642) 2. Introducing to programming and problem solving by scala, mark c. lewis, lisal.lacher.

	CRC press, second edition. Suggested Links: 1. https://www.tutorialspoint.com/scala/ 2. https://www.tutorialspoint.com/r/