

**CMR TECHNICAL CAMPUS**  
**UGC AUTONOMOUS**  
**M.Tech. Syllabus (A.Y. 2022-23)**

**COMPUTER SCIENCE AND ENGINEERING**

**I SEMESTER**

S. No	Course Code	Course Title	L	T	P	Credits
1	22CS101PC	Mathematical Foundations of Computer Science	3	0	0	3
2	22CS102PC	Advanced Data Structures	3	0	0	3
3	22CS111PE	1. Database Programming with PL/SQL	3	0	0	3
	22CS112PE	2. Machine Learning				
	22CS113PE	3. Natural Language Processing				
4	22CS121PE	1. Applied Cryptography	3	0	0	3
	22CS122PE	2. Cloud Computing				
	22CS123PE	3. Data Mining				
5	22CS103PC	Advanced Data Structures Lab	0	0	4	2
6	22CSXXXPL	Professional Elective-I Lab	0	0	4	2
7	22CS104PC	Research Methodology & IPR	2	0	0	2
8	22CSXXXAC	Audit Course - I	2	0	0	0
<b>Total Credits</b>			<b>16</b>	<b>0</b>	<b>8</b>	<b>18</b>

**II SEMESTER**

S. No	Course Code	Course Title	L	T	P	Credits
1	22CS201PC	Advanced Algorithms	3	0	0	3
2	22CS202PC	Advanced Computer Architecture	3	0	0	3
3	22CS231PE	1. Web and Database Security	3	0	0	3
	22CS232PE	2. Internet of Things				
	22CS233PE	3. Data Science				
4	22CS241PE	1. Robotic Process Automation	3	0	0	3
	22CS242PE	2. Advanced Computer Networks				
	22CS243PE	3. Big Data Analytics				
5	22CS203PC	Advanced Algorithms Lab	0	0	4	2
6	22CSXXXPL	Professional Elective – III Lab	0	0	4	2
7	22CS204PR	Mini Project with Seminar	0	0	4	2
8	22CSXXXAC	Audit Course - II	2	0	0	0
<b>Total Credits</b>			<b>14</b>	<b>0</b>	<b>12</b>	<b>18</b>



DEPT. OF COMPUTER SCIENCE & ENGINEERING  
CMR TECHNICAL CAMPUS  
UGC AUTONOMOUS

Approved by AICTE, New Delhi and JNTU, Hyderabad



LAB STUDENT LIST A.Y 2022-23

Year & Sem: M.TECH I YEAR I SEM

Labs: Advanced Data Structures Lab

Database Programming with PL/SQL Lab

S.No.	Roll No	Name of the Student
1	227R1D5801	DASARI KRISHNA KUMAR
2	227R1A5802	THALUKA MOHAN RAJ
3	227R1A5803	KESANA VANISRI

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**CMR TECHNICAL CAMPUS**  
UGC AUTONOMOUS  
Kandlakoya, Medchal Road, Hyderabad - 501 40



**Department of Computer Science & Engineering**  
**Time Table for Academic Year 2022-23**

Semester: M.Tech-I	Section:	Class Coordinator: Mr Nuthanakanti Bhaskar
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Day/ Time	09:20 AM	10:20 AM	11:20 AM	LUNCH BREAK 12:20- 1:00 PM	01:00 PM	02:00 PM	03:00 PM
MON	MFCS/AGP	APC/AUK	RM&IPR/SGN		ADS/APB	DBPL/SQL LAB/MMD	
TUE	MFCS/AGP	APC/AUK	DM/SSA		DBPS/MMD	ADS LAB/APB	
WED	ADS/APB	DBPS/MMD	APC/AUK		MFCS/AGP	ASSOCIATION	
THU	APC/AUK	DBPS/MMD	ADS/APB		RM&IPR/SGN	DBPL/SQL LAB/MMD	
FRI	DM/SSA	ADS LAB/APB			MFCS/AGP	DBPS/MMD	ADS/APB

Subject Code	Subject Name	Subject Abbreviation	Name of faculty/s	Faculty Short Name
22CS101PC	Mathematical Foundations of Computer Science	MFCS	Mr A Ganapathi	AGP
22CS102PC	Advanced Data Structures	ADS	Dr A Prabhu	APB
22CS111PE	Database Programming with PL/SQL	DBPS	Mr M Madhusudhan	MMD
22CS121PE	Applied Cryptography	APC	Mr A Uday Kiran	AUK
22CS103PC	Advanced Data Structures Lab	ADS Lab	Dr A Prabhu	APB
22CS104PE	Database Programming with PL/SQL Lab	DBPS Lab	Mr M Madhusudhan	MMD
22CS105PC	Research Methodology & IPR	RM&IPR	Dr Suvarna Gothane	SGN
22CS002AC	Audit Course1: Disaster Management	DM	Ms Saba Sultana	SSA

Time Table In charge

HOD

Dean - Academics

Director

**22CS103PC: ADVANCED DATA STRUCTURES LAB (Lab – I)****M.Tech. I SEM**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

**Prerequisites:** A course on Computer Programming & Data Structures**Course Objectives:**

1. Introduces the basic concepts of Abstract Data Types.
2. Reviews basic data structures such as stacks and queues.
3. Introduces a variety of data structures such as hash tables, search trees, tries, heaps, graphs, and B-trees.
4. Introduces sorting and pattern matching algorithms.

**Course Outcomes:**

1. Ability to select the data structures that efficiently model the information in a problem.
2. Ability to assess efficiency trade-offs among different data structure implementations or combinations.
3. Implement and know the application of algorithms for sorting and pattern matching.
4. Design programs using a variety of data structures, including hash tables, binary and general tree structures, search trees, tries, heaps, graphs, and B-trees.

**List of Programs**

1. Write a program to perform the following operations:
  - a) Insert an element into a binary search tree.
  - b) Delete an element from a binary search tree.
  - c) Search for a key element in a binary search tree.
2. Write a program for implementing the following sorting methods:
  - a) Merge sort
  - b) Heap sort
  - c) Quick sort
3. Write a program to perform the following operations:
  - a) Insert an element into a B- tree.
  - b) Delete an element from a B- tree.
  - c) Search for a key element in a B- tree.
4. Write a program to perform the following operations:
  - a) Insert an element into a Min-Max heap
  - b) Delete an element from a Min-Max heap
  - c) Search for a key element in a Min-Max heap
5. Write a program to perform the following operations:
  - a) Insert an element into a Leftist tree
  - b) Delete an element from a Leftist tree
  - c) Search for a key element in a Leftist tree
6. Write a program to perform the following operations:
  - a) Insert an element into a binomial heap
  - b) Delete an element from a binomial heap.
  - c) Search for a key element in a binomial heap
7. Write a program to perform the following operations:
  - a) Insert an element into a AVL tree.
  - b) Delete an element from a AVL search tree.

- c) Search for a key element in a AVL search tree.
- 8. Write a program to perform the following operations:
  - a) Insert an element into a Red-Black tree.
  - b) Delete an element from a Red-Black tree.
  - c) Search for a key element in a Red-Black tree.
- 9. Write a program to implement all the functions of a dictionary using hashing.
- 10. Write a program for implementing Knuth-Morris-Pratt pattern matching algorithm.
- 11. Write a program for implementing Brute Force pattern matching algorithm.
- 12. Write a program for implementing Boyer pattern matching algorithm.

**TEXT BOOKS:**

- 1. Fundamentals of Data structures in C, E.Horowitz, S.Sahni and Susan Anderson Freed, 2nd Edition, Universities Press
- 2. Data Structures Using C – A.S.Tanenbaum, Y. Langsam, and M.J. Augenstein, PHI/Pearson education.
- 3. Introduction to Data Structures in C, Ashok Kamthane, 1 st Edition, Pearson.

**REFERENCES:**

- 1. The C Programming Language, B.W. Kernighan, Dennis M.Ritchie, PHI/Pearson Education
- 2. C Programming with problem solving, J.A. Jones & K. Harrow, Dreamtech Press
- 3. Data structures: A Pseudocode Approach with C, R.F.Gilberg And B.A.Forouzan, 2 nd Edition, Cengage Learning.

**22CS104PE: Database Programming with PL/SQL (Lab – II)****M.Tech. I SEM**

L	T	P	C
0	0	4	2

**Course Objectives:**

1. Knowledge on significance of SQL fundamentals.
2. Evaluate functions and triggers of PL/SQL
3. Knowledge on control structures, packages in PL/SQL and its applications

**Course Outcomes:**

1. Understand importance of PL/SQL basics
2. Implement functions and procedures using PL/SQL
3. Understand the importance of triggers in database ,

**List of Experiments:**

1. Write a PL/SQL program using FOR loop to insert ten rows into a database table.
2. Given the table EMPLOYEE (EmpNo, Name, Salary, Designation, DeptID), write a cursor to select the five highest paid employees from the table.
3. Illustrate how you can embed PL/SQL in a high-level host language such as C/Java And demonstrates how a banking debit transaction might be done.
4. Given an integer i, write a PL/SQL procedurc to insert the tuple (i, 'xxx') into a given relation.
5. Write a PL/SQL program to demonstrate Exceptions.
6. Write a PL/SQL program to demonstrate Cursors.
7. Write a PL/SQL program to demonstrate Functions.
8. Write a PL/SQL program to demonstrate Packages.
9. Write PL/SQL queries to create Procedures.
10. Write PL/SQL queries to create Triggers.

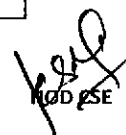
**LAB STUDENT LIST A.Y 2022-23**

**Year & Sem:** M.TECH I YEAR II SEM

**Labs:** Advanced Algorithms Lab

Internet of Things Lab

S.No.	Roll No	Name of the Student
1	227R1D5801	DASARI KRISHNA KUMAR
2	227R1A5802	THALUKA MOHAN RAJ
3	227R1A5803	KESANA VANISRI



KODASE



# CMR TECHNICAL CAMPUS

Kandlakoya (V), Medchal Road, Hyderabad-501 401

## TIME TABLE

### COMPUTER SCIENCE AND ENGINEERING

#### M.TECH (II SEMESTER)

2022-2023

Room No-224

With effect from:03/04/2023

DAY / HOUR	9.20AM to 10.20AM	10.20AM to 11.20AM	11.20AM to 12.20PM	12.20 PM TO 1:00 PM	1:00PM to 02:00PM	2.00PM to 03:00PM	03.00PM to 04:00PM
MON	A A	IOT	LIB	LUNCH BREAK	A C A	<-----AA LAB----->	
TUE	ACA	AA	BDA		IOT	IOT LAB	
WED	IOT	A C A	SPORTS		AC-II	<---IOT LAB--->	
THU	-----PROJECT WITH SEMINAR-----		A A		BDA	ASSOCIATION	
FRI	<-----AA LAB----->		BDA		AC-II	-----PROJECT WITH SEMINAR-----	

COURSE CODE	COURSE TITLE	FACULTY NAME
Professional Core-III	Advanced Algorithms	Dr. A PRABHU
Professional Core-IV	Advanced Computer Architecture	Dr. Punyaban Patel
Professional Elective-III	IOT	B P DEEPAK KUMAR
Professional Elective-IV	BIG DATA ANALYTICS	Dr K MAHESWARI
Lab-III	Advanced Algorithms Lab	Dr. A PRABHU
Lab-IV	IOT LAB	B P DEEPAK KUMAR
	Mini Project With Seminar	NUTHANAKANTI BHASKAR
Audit Course-II	English for Research Paper Writing	SUMA

Tech Coordinator : Mr N Bhakar

Time Table I/C	HOD CSE	DIRECTOR
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**22CS203PC: ADVANCED ALGORITHMS LAB (Lab - III)****M.Tech II SEM**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

**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 Force method
2. Perform multiplication of long integers using divide and conquer method.
3. Implement solution for knapsack problem using Greedy method.
4. Implement Gaussian elimination method.
5. Implement LU decomposition
6. Implement Warshall algorithm
7. Implement Rabin Karp algorithm.
8. Implement KMP algorithm.
9. Implement Harspool algorithm
10. Implement max-flow problem.

**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,PHIPvt. Ltd./ Pearson Education.
2. Fundamentals of Computer Algorithms, Ellis Horowitz, SatrajSahni and Rajasekharam, Universities Press.
3. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearson education.

## INTERNET OF THINGS LAB (Professional Elective - I)

M.Tech II SEM.

L T P C

0 0 2 1

**Subject Code: 22CS222PL**

### Course Objectives:

1. To Introduce the Raspberry PI Platform, that is widely used in IoT applications.
2. To understand the implementation of distance sensor on IoT Devices.
3. To describe the basic functionality of LED's, LDR and Sensors.
4. To explore the usage of Arduino and Node MCU with distance sensor, LED and Temperature sensor.
5. To know about DJANGO framework, MySQL and REST API .

### Course Outcomes:

After completion of this course, the students will be able to:

1. Perform the concept of M2M with necessary protocols.
2. Implement distance sensor applications.
3. Write python programming for IoT Devices.
4. Develop models with connecting distance sensors, LED's, Temperature sensors and other sensors with Arduino Board and Node MCU.
5. Configure MySQL with DJANGO framework to create DJANGO project.

### List of Experiments:

1. Using Raspberry pi
  - a. Calculate the distance using a distance sensor.
  - b. Interface an LED and switch with Raspberry pi.
  - c. Interface an LDR with Raspberry Pi.
2. Using Arduino
  - a. Calculate the distance using a distance sensor.
  - b. Interface an LED and switch with Aurdino.
  - c. Interface an LDR with Aurdino
  - d. Calculate temperature using a temperature sensor.
3. Using Node MCU
  - a. Calculate the distance using a distance sensor.
  - b. Interface an LED and switch with Raspberry pi.
  - c. Interface an LDR with Node MCU
  - d. Calculate temperature using a temperature sensor.
4. Installing OS on Raspberry Pi
  - a) Installation using PiImager
  - b) Installation using image file
    - Downloading an Image
    - Writing the image to an SD card
    - using Linux
    - using Windows
    - Booting up Follow the instructions given in the URL

## 5. Accessing GPIO pins using Python

a) Installing GPIO Zero library.

update your repositories list:

install the package for Python 3:

b) Blinking an LED connected to one of the GPIO pin

c) Adjusting the brightness of an LED Adjust the brightness of an LED (0 to 100, where 100 means maximum brightness) using the in-built PWM wavelength.

6. Create a DJANGO project and an app.

7. Create a DJANGO view for weather station REST API.

8. Create DJANGO template.

9. Configure MYSQL with DJANGO framework

## TEXT BOOKS:

1. Arshdeep Bahga and Vijay Madisetti, Internet of Things - A Hands-on Approach, Universities Press, 2015.

2. Matt Richardson & Shawn Wallace, Getting Started with Raspberry Pi, O'Reilly (SPD), 2014.

## REFERENCE BOOKS:

1. Bernd Scholz-Reiter, Florian Michahelles, “Architecting the Internet of Things”, Springer, 2016.

2. N.Ida, Sensors, Actuators and Their Interfaces, Scitech Publishers, 2014.

3. Michael Miller, The Internet of Things: How Smart TVs, Smart Cars, Smart Homes, and Smart Cities Are Changing the World, QUE, 2015.

## WEB LINKS:

1. <https://elearn.nptel.ac.in/shop/iit-workshops/completed/lab-workshop-on-internet-of-things-iot/>

2. <https://www.coursera.org/learn/iot-devices-il>

3. <https://www.udemy.com/user/internet-of-things-lab/>

4. <https://www.iotlab.eu/>

5. <https://www.tinkercad.com>