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1	MCA	MCA116-**C AND DS**	6
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6	MCA	MCA128 **SOFTWARE ENGINEERING**	14
7	MCA	MCA 216 **DATA MINING**	16
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MCA I YEAR I SEMESTER:

Paper No	Paper Title / Subject	Workload Per week (Theory : Lab)	MARKS			Credits
			Internal	External	Total	
MCA111	C and Data Structures	T (4)	20	80	100	4
MCA112	Operating System	T (4)	20	80	100	4
MCA113	Java Programming	T (4)	20	80	100	4
MCA114	Computer Networks	T (4)	20	80	100	4
MCA115	Probability and Statistical Methods	T (4)	20	80	100	4
MCA116	C and DS Lab	L (4)	--	50	50	2
MCA117	OS Lab	L (4)	--	50	50	2
MCA118	Java Programming Lab	L (4)	--	50	50	2
Grand total (Marks and Credits)					**650**	**26**

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MCA IYEAR IISEMESTER

Paper No	Paper Title / Subject	Workload Per week (Theory : Lab)	MARKS			Credits
			Internal	External	Total	
MCA121	Python Programming	T (4)	20	80	100	4
MCA122	Database Management Systems	T (4)	20	80	100	4
MCA123	Software Engineering	T (4)	20	80	100	4
MCA124	Cryptography and Network Security	T (4)	20	80	100	4
MCA125	Principles and Practice of Management	T (4)	20	80	100	4
MCA126	Python Programming lab	L (4)	--	50	50	2
MCA127	DBMS Lab	L (4)	--	50	50	2
MCA128	Software Engineering Lab	L (4)	--	50	50	2
Grand total (marks and credits)					**650**	**26**

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Paper No	Paper Title / Subject	Workload Per week (Theory : Lab)	MARKS			Credits
			Internal	External	Total	
MCA211	Data Mining	T (4)	20	80	100	4
MCA212	Web Technologies	T (4)	20	80	100	4
MCA213	Theory of Computation	T (4)	20	80	100	4
MCA214	Elective – I	T (4)	20	80	100	4
MCA215	Elective – II	T (4)	20	80	100	4
MCA216	Data Mining Lab	L (4)	--	50	50	2
MCA217	Web Technologies Lab	L (4)	--	50	50	2
MCA218	Advanced Programming Lab (with respect to Elective – I)	L (4)	--	50	50	2
Grand total (marks and credits)					**650**	**26**

MCA II YEAR I SEMESTER:

Elective –I

a. Mobile Application Development
b. Cloud Computing
c. R-Programming

Elective – II

a. Internet of Things
b. Big Data Analytics
c. Mobile Computing

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MCA II YEAR II SEMESTER:

Paper No	Paper Title / Subject	Workload Per week (Theory : Lab)	MARKS			Credits
			Internal	External	Total	
MCA221	Artificial Intelligence	T (4)	20	80	100	4
MCA222	Elective-III	T (4)	20	80	100	4
MCA223	Elective-IV	T (4)	20	80	100	4
MCA224	Project	T (8)	50	200	250	10
Grand total (marks and credits)					**550**	**22**

Elective – III

a. Foundations of Block Chain Technologies
b. Cyber Security
c. E-Commerce

Elective – IV

a. Digital Image Processing
b. Machine Learning
c. Language Processors

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Paper No	Paper Title / Subject	Workload Per week (Theory : Lab)	MARKS			Credits
			Internal	External	Total	
MCA111	C and Data Structures	T (4)	20	80	100	4
MCA112	Operating System	T (4)	20	80	100	4
MCA113	Java Programming	T (4)	20	80	100	4
MCA114	Computer Networks	T (4)	20	80	100	4
MCA115	Probability and Statistical Methods	T (4)	20	80	100	4
MCA116	C and DS Lab	L (4)	--	50	50	2
MCA117	OS Lab	L (4)	--	50	50	2
MCA118	Java Programming Lab	L (4)	--	50	50	2
Grand total (Marks and Credits)					**650**	**26**

MCA I YEAR I SEMESTER:

1. Fundamental of Mathematical Statistics-S.C.Gupta and V.K.Kapoor

2. Fundamentals of Applied Statistics -S.C.Gupta and V.K.Kapoor

Reference books

1. Statistical Methods-S.P.Gupta.
2. Fundamental of mathematical statistics by - v k kapoor and guptasc
3. Statistics (phi) by - freud
4. Progability statistics and random process by - r veerarajan (tmh)
5. Introduction to probability & statistics by - j.s. Milton &jcarnold (tmh)
6. Miller &ferunds probability & statistics froenginner by - johnson (pearson)
7. Probability & statistics fro engineers &statisticsts by - walpose (pearson)

MCA116	C and Data Structures Lab	
WORK LOAD: 4 PPW	Credits : 2	EXTERNAL MARKS: 50

1. Write a c-program to find the Reverse of a given number.
2. Write a C program to find the sum of individual digits of a positiveinteger.
3. Write a C-program to find the Fibonacci Series.
4. Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by theuser.
5. Write a C program to find the roots of a quadraticequation.
6. Write a C program to find the factorial of a giveninteger.
7. Write a C program to find the GCD (greatest common divisor) of two givenintegers.
8. WriteaCprogramwhichtakestwointegeroperandsandoneoperatorfromtheuser,performs the operation and then prints the result. (Consider the operators +,-,*, /, % and use Switch Statement)
9. Write a C program to find both the largest and smallest number in a list ofintegers.
10. Write a C program that uses functions to perform thefollowing:
    i) Addition of TwoMatrices
    ii) Multiplication of TwoMatrices
11. Write a C program that uses functions to perform the followingoperations:
    i) To insert a sub-string in to a given main string from a givenposition.
    ii) To delete n Characters from a given position in a givenstring.
12. Write a C program to determine if the given string is a palindrome ornot
13. Write a C program to count the lines, words and characters in a giventext.
14. Write a C program to generate Pascal'striangle.
15. Write a C program that uses functions to perform the followingoperations:
    i) Reading a complexnumber
    ii) Writing a complexnumber
    iii) Addition of two complexnumbers
16. Write a C program which copies one file toanother.
17. i) Write a C program to display the contents of afile.
    ii) Write a C program to merge two files into a third file (i.e., the contents of the first file followed by those of the second are put in the third file)
18. Write a C program that uses functions to perform the following operations on singly linkedlist.
    i) Creation ii)Insertion iii)Deletion iv)Traversal
19. Write C programs that implement stack
20. Write C programs that implement Queue
21. WriteaCprogramthatimplementsthefollowingsortingmethodstosortagivenlistofintegers in ascendingorder
    i) Bubblesort ii) Selectionsort iii) insertion sort
22. Write C programs for Linearsearch and Binarysearch
23. Write C- program for binary search Tree implementation and Traversals
24. Write C-programs on to implement the Graph and Traversal of a Graph

Note:

- All the concepts of syllabus and exercises from Text Book must be translated into programs which must be practiced, executed and written down in the practical record book.
- In the external lab examination, the student has to compile and execute at least two programs.
- External Viva-voce is compulsory.

MCA117	Operating System Lab	
WORK LOAD: 4 PPW	Credits : 2	EXTERNAL MARKS: 50

1. Use vi editor to create a file with some text and save the file.
2. Add and Delete content to the file created above.
3. Write programs that use the following processing utilities.
   i. wc, od, cmp, comm, diff, head, tail, cut, paste, sort, grep, uniq
   ii. Disk backup utilities
   iii. du, df, tar, cpio, ps, who
4. Write a shell script to generate a multiplication table.
5. Write a shell script that copies multiple files to a directory.
6. Write a shell script which counts the number of lines and words present in a given file.
7. Write a shell script which displays the list of all files in the given directory.
8. Write a shell script (of small calculator) that adds, subtracts, multiplies and divides the given two integers.
9. Write a C program that counts the number of blanks in a text file.
   i. Using standard I/O
   ii. Using system calls.
10. Write a C program that illustrates how to execute two commands concurrently with a command pipe.
11. Write a C program that illustrates file locking using semaphores.
12. Write a C program that implements a producer-consumer system with two processes.(using semaphores)
13. Write a C program that illustrates inter process communication using shared memory system calls.
14. Write a C program that illustrates the following.
    i. Creating a message queue
    ii. Writing to a message queue.
    iii. Reading from a message queue.
15. Write C programs to implement the various CPU Scheduling Algorithms
    a. FCFS
    b. SJF
    c. Priority
    d. Round Robin
16. Bankers Algorithm for Deadlock Avoidance
17. Implementation of Deadlock Detection Algorithm
18. Implementation of the following Memory Allocation Methods for fixed partition
    a. First Fit
    b. Worst Fit
    c. Best Fit
19. Implementation of the following Page Replacement Algorithms
    a. FIFO
    b. LRU
    c. LFU
20. Implementation of the following File Allocation Strategies
    a. Sequential
    b. Indexed
    c. Linked

NOTE:

- All the concepts of syllabus and exercises from Text Book must be translated into programs which must be practiced, executed and written down in the practical record book.
- In the external lab examination, the student has to compile and execute at least two programs.
- External Viva-voce is compulsory.

MCA118	Java Programming Lab	
WORK LOAD: 4 PPW	Credits : 2	EXTERNAL MARKS: 50

Case study exercises:

- Creating a Help Class
- Demonstrate Garbage Collection and Finalization
- Improving the Queue Class
- Overloading the Queue Constructor
- The Quicksort
- Extending the Vehicle Class
- Creating a Queue Interface
- Adding Exceptions to the Queue Class
- Extending Thread
- Using the Main Thread
- A Computer-Controlled Traffic Light
- A File Comparison Utility
- Creating a Disk-Based Help System
- Create a Generic Queue
- A Simple Banner Applet
- A Swing-Based File Comparison Utility

NOTE:

- All the concepts of syllabus and exercises from Text Book must be translated into programs which must be practiced, executed and written down in the practical record book.
- In the external lab examination, the student has to compile and execute at least two programs.
- External Viva-voce is compulsory.

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MCA I YEAR II SEMESTER:

Paper No	Paper Title / Subject	Workload Per week (Theory : Lab)	MARKS			Credits
			Internal	External	Total	
MCA121	Python Programming	T (4)	20	80	100	4
MCA122	Database Management Systems	T (4)	20	80	100	4
MCA123	Software Engineering	T (4)	20	80	100	4
MCA124	Cryptography and Network Security	T (4)	20	80	100	4
MCA125	Principles and Practice of Management	T (4)	20	80	100	4

MCA126	Python Programming lab	L (4)	--	50	50	2
MCA127	DBMS Lab	L (4)	--	50	50	2
MCA128	Software Engineering Lab	L (4)	--	50	50	2
	Grand total (marks and credits)				**650**	**26**

1.

MCA126	Python Programming Lab	
WORK LOAD: 4 PPW	Credits : 2	EXTERNAL MARKS: 50

1. Python installation and configuration with windows and Linux
2. Programs for understanding the data types, control flow statements, blocks and loops
3. Programs for understanding functions, use of built in functions, user defined functions
4. Programs to use existing modules, packages and creating modules, packages
5. Programs for implementations of all object-oriented concepts like class, method, inheritance, polymorphism etc. (Real life examples must be covered for the implementation of object oriented concepts)
6. Programs for Pattern finding should be covered.
7. Programs covering all the aspects of Exception handling, user defined exception, Multithreading should be covered.
8. Programs demonstrating the IO operations like reading from file, writing into file from different file types like data file, binary file, etc.
9. Programs to perform searching, adding, updating the content from the file.
10. Basic programs with NumPy as Array, Searching and Sorting, date & time and String handling
11. Programs for series and data frames should be covered.
12. Programs to demonstrate data pre-processing and data handling with data frame
13. Program for data visualization should be covered.

Note:

- All the concepts of syllabus and exercises from Text Book must be translated into programs which must be practiced, executed and written down in the practical record book.
- In the external lab examination, the student has to compile and execute at least two programs.
- External Viva-voce is compulsory.

MCA127	Database Management Systems Lab	
WORK LOAD: 4 PPW	Credits : 2	EXTERNAL MARKS: 50

DDL, DML and DCL Commands, SQL constraints,

MySQL Clauses, Using Joins, Indexes, Creating Views, SQL Transactions,

Aggregate Functions, Programming in PL/SQL, Procedures, Functions

Note:

- All the concepts of syllabus and exercises from Text Book must be translated into programs which must be practiced, executed and written down in the practical record book.
- In the external lab examination, the student has to compile and execute at least two programs.
- External Viva-voce is compulsory.

MCA128	Software Engineering Lab	
WORK LOAD: 4 PPW	Credits : 2	EXTERNAL MARKS: 50

The following Tasks has to be done for various Applications

- To assign the requirement engineering tasks
- To perform the system analysis : Requirement analysis, SRS
- To perform the function oriented diagram : DFD and Structured chart
- Write the software requirement specification Document
- Draw the entity relationship diagram
- To perform the user's view analysis : Use case diagram
- To draw the structural view diagram : Class diagram, object diagram
- To draw the behavioral view diagram : Sequence diagram, Collaboration diagram
- To draw the behavioral view diagram : State-chart diagram, Activity diagram
- To draw the implementation view diagram: Component diagram
- To draw the environmental view diagram : Deployment diagram
- To perform various testing using the testing tool unit testing, integration testing

Note:

- All the concepts of syllabus and exercises from Text Book must be translated into programs which must be practiced, executed and written down in the practical record book.
- In the external lab examination, the student has to compile and execute at least two programs.
- External Viva-voce is compulsory.

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MCA IIYEAR ISEM

Paper No	Paper Title / Subject	Workload Per week (Theory : Lab)	MARKS			Credits
			Internal	External	Total	
MCA211	Data Mining	T (4)	20	80	100	4
MCA212	Web Technologies	T (4)	20	80	100	4
MCA213	Theory of Computation	T (4)	20	80	100	4
MCA214	Elective – I	T (4)	20	80	100	4
MCA215	Elective – II	T (4)	20	80	100	4
MCA216	Data Mining Lab	L (4)	--	50	50	2
MCA217	Web Technologies Lab	L (4)	--	50	50	2
MCA218	Advanced Programming Lab (with respect to Elective – I)	L (4)	--	50	50	2
Grand total (marks and credits)					**650**	**26**

Elective –I

a. Mobile Application Development
b. Cloud Computing
c. R-Programming

Elective – II

a. Internet of Things
b. Big Data Analytics
c. Mobile Computing

5.

MCA216	Data Mining Lab	
WORK LOAD: 4 PPW	Credits : 2	EXTERNAL MARKS: 50

All the mining concepts discussed as a part of the course should be implemented using a mining package like WEKA or packages of Programming Languages like Python.

Note:

- All the concepts of syllabus and exercises from Text Book must be translated into programs which must be practiced, executed and written down in the practical record book.
- In the external lab examination, the student has to compile and execute at least two programs.
- External Viva-voce is compulsory.

MCA217	Web Technologies Lab	
WORK LOAD: 4 PPW	Credits : 2	EXTERNAL MARKS: 50

Note:

- All the concepts of syllabus and exercises from Text Book must be translated into programs which must be practiced, executed and written down in the practical record book.
- In the external lab examination, the student has to compile and execute at least two programs.
- External Viva-voce is compulsory.

MCA218	Elective – I – Lab (Mobile Application Development)	
WORK LOAD: 4 PPW	Credits : 2	EXTERNAL MARKS: 50

Note:

- All the concepts of syllabus and exercises from Text Book must be translated into programs which must be practiced, executed and written down in the practical record book.
- In the external lab examination, the student has to compile and execute at least two programs.
- External Viva-voce is compulsory.

1. Write a program to implement and display a greeting message on MIDlet.
2. Write a program to design and implement Multiple MIDlets on MIDlet.
3. Write a program to implement MIDlet Life Cycle Contraction operations.
4. Write a program to design and implement MENU creation using Command<class> on Mobile Information Device Profile.
5. Write a program to implement LogIn<Form> on MIDlet.
6. Write a program to design and implement Phone Book MIDlet.
7. Write a program to design and implement CheckBoxMIDlet.
8. Write a program to display the current date and time.
9. Write a program to display the Calendar of current month.
10. Write a program to design and implement different types of Alert Messages.
11. Write a program to design and implement List of Radio Buttons.
12. Write a program to design and implement Ticker<class> on MIDlet.
13. Write a program to design and implement non-interactive for Mobile Signal status usin Gauge<class>.
14. Write a program to design and implement Draw Arc on MIDlet.
15. Write a program to design and implement KeyCode actions on MIDlet.
16. Write a program to design and implement interactive Mobile Volume Bar using Gauge<class>.
17. Write a program to design and implement Clipping Region on MIDlet.
18. Write a program to design and implement Image Slide show on MIDlet.

19. Write a program to design and implement which examine the Phone Number should be 6 - 8 numbers in telephone number with (+area code: 040, 041, 050, 0400, 044) on MIDlet.

20. Write a program to design and implement Sample Quiz for user on MIDlet.

21. Write a program to design and implement the Draw Bar Graph on MIDlet by passing the input values.

22. Write a program to design and implement the RMS Listener.

23. Write a program to design and implement the RMS Sorting

24. Write a program to design and implement the RSM Search.

25. Write a program to design and implement Login process with help of Users (uname, password) table in login database in MySQL.

MCA218	Elective-I – Lab : Cloud Computing	
WORK LOAD: 4 PPW	Credits : 2	EXTERNAL MARKS: 50

Note:

- All the concepts of syllabus and exercises from Text Book must be translated into programs which must be practiced, executed and written down in the practical record book.
- In the external lab examination, the student has to compile and execute at least two programs.
- External Viva-voce is compulsory.

1. Installation and configuration of Virtual Machine using VMware.
2. Study and Implementation of Infrastructure as a Service.
3. Installation and Configuration using Microsoft Azure Virtual Machine.
4. Install Google App Engine. Create hello world app and other simple web applications using Python/Java.
5. Create an Amazon EC2 Instance and Set up a Web Server on the Instance and Associate IP Address with the Instance.
6. Create a Database Instance in the Cloud using RDS.
7. Create a Database Instance in the Cloud using Google Cloud SQL.
8. Register with AWS and Create Windows/Linux Instance.
9. Create a S3 Storage Bucket and Store documents in Bucket.
10. Create a Static Web Hosting on S3 with name kakatiyauniversity.
11. Build a Serverless Web Application on AWS Cloud to GET KU employee details with email id only.
12. Build a Serverless Web Application on AWS Cloud to POST KU employee details with email id only.

MCA218	Elective-I – Lab : R-Programming	
WORK LOAD: 4 PPW	Credits : 2	EXTERNAL MARKS: 50

Note:

- All the concepts of syllabus and exercises from Text Book must be translated into programs which must be practiced, executed and written down in the practical record book.

- In the external lab examination, the student has to compile and execute at least two programs.
- External Viva-voce is compulsory.

Paper No	Paper Title / Subject	Workload Per week (Theory : Lab)	MARKS			Credits
			Internal	External	Total	
MCA221	Artificial Intelligence	T (4)	20	80	100	4
MCA222	Elective-III	T (4)	20	80	100	4
MCA223	Elective-IV	T (4)	20	80	100	4
MCA224	Project	T (8)	50	200	250	10
Grand total (marks and credits)					**550**	**22**

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MCA II YEAR II SEMESTER:

Elective – III

a. Foundations of Block Chain Technologies
b. Cyber Security
c. E-Commerce

Elective – IV

a. Digital Image Processing
b. Language Processors
c. Machine Learning

MCA224	Project		Proj
WORK LOAD: 8 PPW	Credits: 10	INTERNAL MARKS: 50	EXTERNAL MARKS: 200

Note:

- **The project work should be carried out by the Student groups and the number of students in each group should not exceed three.**
- **Two Seminars must be delivered by all the student groups before the final project viva, one on the design part and the other on the implementation.**
- The Project work, being the vital component of this professional programme, needs to be carried out with due care and dedication by all the student groups.
- The project workis not just the partial fulfilment of the course requirements, but it provides a mechanism to demonstrate the ASK (Attitude, Skills, and Knowledge) elements with specialization.
- The students are expected to work on a real-time project on latest platforms preferably in some industrial unit/ R&D Laboratories / Educational Institution / Software Company.
- Students are encouraged to work in their interested area.
- The student groups can formulate a project problem by a thorough interaction with his / her Guide of the concerned college.
- Approval of the project proposal is mandatory by his/her Guide, then only the student group is expected to commence working on and complete it.
- The student groups must make use of the latest software packages for the development of the project.
- The problem domain and the specifications chosen should be genuine and feasible for the implementation.