SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE
(An Autonomous Institution)
(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)
(Accredited by NBA-AICTE, New Delhi, ISO 9001:2000 Certified Institution &
Accredited by NAAC with "A" Grade)
Madagadipet, Puducherry - 605 107

SCHOOL OF ARTS AND SCIENCE

Department of Computational Studies

Bachelor of Computer Application

Minutes of 4th meeting of Board of Studies

Venue

Department of Computational Studies
First Floor, SAS Block

Date & Time

26-02-2022 & 11.00 am to 1.00 pm

School of Arts and Science

Department of Computational Studies

Minutes of Board of Studies Meeting for BCA

The Fourth meeting of Board of Studies for the course BCA was held on 26-02-2022 at 11:00 am to 1.00 pm through online in the Department of Computational Studies, School of Arts and Science, Sri Manakula Vinayagar Engineering College with the Head of the Department in the Chair.

The following members were present for the Fourth Meeting of Board of Studies.

Sl. No.	Name of the Member	Designation
Head of the Department (Chairman)		
1	**Mr. M. SHANMUGAM** Associate Professor, Specialization: Augmented Reality and Virtual Reality, Years of Experience:17 years Sri Manakula Vinayagar Engineering College E-mail: shanmugam.muthalu@gmail.com Mobile: 9444370963	Chairman
External Expert Members		
2	**Dr. N. VIJAYALAKSHMI** Associate Prof, Department of Computer Science, SRM Institute of Science and Technology (Autonomous) email: vijinatarajan23@gmail.com,Mobile: 9941202829,	Pondicherry University Nominee
3	**Dr. A. MARTIN** Asst. Prof, Department of Computer Science, School of Mathematics and Computer Science, Central University of Tamil Nadu, Thiruvarur. Specialization: Business Intelligence, Information Science and Engineering email:martin@cutn.ac.in Mobile: 8903756380,	Subject Expert (Academic Council Nominee)
4	**Dr. S. BEHIN SAM** Associate Prof, Department of Computer Science, Dr. Ambedkar Arts and Science College Viyasarpadi, Chennai. Specialization:Data Mining, Artificial Intelligence. email:behinsam@gmail.com Mobile: 9176667525,	Subject Expert (Academic Council Nominee)
5	**Mr. C. VIMAL RAJ** Systems Architect, TCS, Chennai. Email:vimalraj_c@gmail.com Mobile: 9952578333	Member (Industry representative)

Internal Members		
6	**Mr. S. VISU** Assistant Professor, Specialization: Data Mining Years of Experience: 13 years Sri Manakula Vinayagar Engineering College E-mail: visucs@smvec.ac.in Mobile: 9791966297	Member
7	**Dr. A. ANTHONY PAUL RAJ** Assistant Professor, Specialization: Network Security & Data Science Years of Experience: 15 years Sri Manakula Vinayagar Engineering College E-mail: anthonypaulrajsas@smvec.ac.in Mobile: 9942531512	Member
8	**Mrs. S. DIVYA** Assistant Professor, Specialization: RDBMS Years of Experience: 5 years Sri Manakula Vinayagar Engineering College E-mail: divyacs.sas@smvec.ac.in Mobile: 9791456258	Member
9	**Mr. N. VELAN** Assistant Professor, Specialization: Computer Network Years of Experience: 6 Months Sri Manakula Vinayagar Engineering College E-mail: velancs.sas@smvec.ac.in Mobile: 8344577751	Member
10	**Mrs. A. SHAMSATH BEGUM** Assistant Professor, Specialization: Networking Years of Experience: 1 Month Sri Manakula Vinayagar Engineering College E-mail: shamsathbegum.sas@smvec.ac.in Mobile: 9500399774	Member

Agenda of the Meeting

Item No.: BOS/2022/SAS/UG/CA/4.1	Welcome Address, Introduction about the Institution, Department and BoS Members.
Item No.: BOS/2022/SAS/UG/CA/4.2	Confirmation of minutes of the Third meeting of the Board of Studies. The Head of the Department appraised the Board regarding the Minutes of the Third Meeting of BoS
Item No.: BOS/2022/SAS/UG/CA/4.3	To discuss and approve the improvisations in the Curriculum Structure of the Bachelor of Computer Application Programme for R-2020.
Item No.: BOS/2022/SAS/UG/CA/4.4	To discuss the modifications in the Syllabi for the Second and Third Year courses under R-2020 regulations for the BCA students admitted in the Year 2020-2021 and in the 2021-22.
Item No.: BOS/2022/SAS/UG/CA/4.5	To consider any other item with the permission of the Chair.

Minutes of Meeting

Item No.: BOS/2022/SAS/UG/CA/4.1

Mr. M. Shanmugam, Chairman, welcomed all the external and internal members. The meeting thereafter deliberated on agenda items that had been approved by the Chairman.

Item No.: BOS/2022/SAS/UG/CA/4.2

Chairman, BoS, appraised the minutes of 3rd meeting of BoS and its implementation and then it is confirmed with the approval of BoS expertise.

Item No.: BOS/2022/SAS/UG/CA/4.3

- The Curriculum was discussed and recommended to Academic Council with the following improvisations.

Sl.No.	Regulation	Semester	Couse Title with Course Code	Unit No.	Particulars
1	R 2020	III	Python Language and its Applications – A20CAT305	Unit V	• The course title was changed from Python Programming into **Python Language and its Applications** due to the common course in B. Sc(CS). • We have added some content regarding the specialization of BCA (Page 15)
2	R 2020	IV	Operating System Concepts - A20CAT407	The Complete Course	• The course title was changed from Operating System into **Operating System Concepts** due to the common course in B. Sc(CS). • We have added some content regarding the specialization of BCA (Page 16)
3	R 2020	IV	Data Base Management Systems Concepts – A20CAT408	Unit V	• The course title was changed from Data Base Management Systems into **Data Base Management Systems Concepts** due to the common course in B. Sc(CS). • We have added some content regarding the specialization of BCA (Page 17)
4	R 2020	IV	Unix Lab - A20CAL407	The Complete Course	• The course title was changed from Operating System Lab into **Unix Lab** due to the common course in B. Sc(CS). • We have added some content regarding the specialization of BCA (Page 18)
5	R 2020	IV	RDBMS Lab - A20CAL408	The Complete Course	• The course title was changed from DBMS Lab into **RDBMS Lab** due to the common course in B. Sc(CS). • We have added some content regarding the specialization of BCA (Page 19)
6	R 2020	IV	Office Automation Techniques - A20CAS404	Unit V	• The course title was changed from Office Automation Tools into **Office Automation Techniques** due to the common course in B. Sc(CS). • We have added some content regarding the specialization of BCA (Page 20)
7	R 2020	IV	Mysql DBA - A20CAC404	The Complete Course	• The Mysql DBA course was newly introduced instead of RDBMS Because the board members insisted to provide the database Certification

The above corrections have been made in the curriculum and the details are given in Annexure- I

Item No.: BOS/2022/SAS/UG/CA/4.4

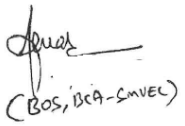
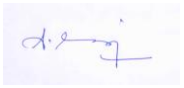
Sl.No.	Regulation	Semester	Couse Title with Course Code	Unit No.	Particulars
1	R 2020	III	Python Language and its Applications – A20CAT305	Unit V	• The experts suggested add topics in unit V, according to that there are some changes in the previous units. (Page 15)
2	R 2020	IV	Operating Systems Concepts - A20CAT407	The Complete Course	• The Board members have suggested to reduce the contents in all the units. (Page 16)
3	R 2020	IV	Data Base Management Systems Concepts – A20CAT408	Unit V	• The Board members have suggested to reduce the contents in all the units. (Page 17)
4	R 2020	IV	Unix Lab - A20CAL407	The Complete Course	• The Board members have suggested to change course for Operating System Lab into Unix Lab (Page 18)
5	R 2020	IV	RDBMS Lab - A20CAL408	The Complete Course	• The Board members have suggested to change course for DBMS Lab into RDBMS Lab (Page 19)
6	R 2020	IV	Office Automation Techniques - A20CAS404	Unit V	• The Board members have suggested to reduce the contents in all the units. (Page 20)
7	R 2020	IV	Mysql DBA - A20CAC404	The Complete Course	• As per the experts' suggestion, we have change the syllabus instead of RDBMS
8	R 2020	VI	Research Methodology Concepts – A20CAS606	Unit V	• As per the experts' suggestion, we have added the carrier topics in unit V (Page 32)

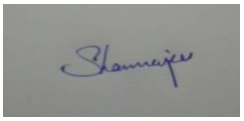
The above corrections have been made in the Syllabus and the details are given in Annexure- II.

Item No.: BOS/2022/SAS/UG/CA/4.5

Sl.No.	Regulation	Semester	Couse Title with Course Code	Unit No.	Particulars
1	R 2020	III,IV,V & VI	All Discipline Specific Electives Courses	The Complete Course	• The Expert members appreciated for the way of preparing the courses of Discipline Specific Electives

The above list of Discipline Specific Elective Courses listed in Annexure III.

No.	Name of the Member with Designation and official Address	Responsibility in the BoS	Signature
1	**Mr. M. SHANMUGAM** Associate Professor and Head, Department of Computational Studies, School of Arts and Science, SMVEC Email : shanmugam.muthalu@gmail.com,Mobile : 9444370963	Chairman	
2	**Dr. N. VIJAYALAKSHMI** Associate Prof, Department of Computer Science, SRM Institute of Science and Technology (Autonomous) email: vijinatarajan23@gmail.com,Mobile: 9941202829,	University Nominee	
3	**Dr. A. MARTIN** Asst. Prof, Department of Computer Science, School of Mathematics and Computer Science, Central University of Tamil Nadu, Thiruvarur. E-mail: martin@cutn.ac.in,Mobile: 8903756380,	Subject Expert (Academic Council Nominee)	
4	**Dr. S. BEHIN SAM** Associate Prof, Department of Computer Science, Dr. Ambedkar Arts and Science College Viyasarpadi, Chennai. E-mail:behinsam@gmail.com,Mobile: 9176667525,	Subject Expert (Academic Council Nominee)	
5	**Mr. C. VIMAL RAJ** Systems Architect, TCS, Chennai. Email:vimal06vishwa@gmail.com,Mobile: 9952578333	Industry Expert	
6	**Mr. S. VISU** Assistant Professor, Department of Computational Studies, School of Arts and Science , SMVEC. Email: visucs@smvec.ac.in,Mobile: 9791966297	Internal member	
7	**Dr. A. ANTHONY PAUL RAJ** Assistant Professor, Specialization: Network Security & Data Science Years of Experience: 15 years Sri Manakula Vinayagar Engineering College E-mail: anthonypaulrajsas@smvec.ac.in Mobile: 9942531512	Internal member	
8	**Mrs. S. DIVYA** Assistant Professor, Specialization: RDBMS Years of Experience: 5 years Sri Manakula Vinayagar Engineering College E-mail: divyacs.sas@smvec.ac.in Mobile: 9791456258	Internal member	
9	**Mr. N. VELAN** Assistant Professor, Specialization: Computer Network Years of Experience: 6 Months Sri Manakula Vinayagar Engineering College E-mail: velancs.sas@smvec.ac.in Mobile: 8344577751	Internal member	

10	**Mrs. A. SHAMSATH BEGUM** Assistant Professor, Specialization: Networking Years of Experience: 1 Month Sri Manakula Vinayagar Engineering College E-mail: shamsathbegum.sas@smvec.ac.in Mobile: 9500399774	Internal member	

The meeting was concluded at 1:00 PM with vote of thanks by **Mr. M. Shanmugam**, Head of the Department, Department of Computational Studies.

Mr. M. Shanmugam,

HOD / Dept. of Computational Studies,
Chairman-BoS (BCA)

Dean SAS
[Dr. S. Muthulakshmi]

SCHOOL OF ARTS AND SCIENCE

Department of Computational Studies

Bachelor of Computer Application

Minutes of 4th meeting of Board of Studies

Annexure - I

Annexure – I

SEMESTER – III										
S. No	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	A20CAT305	Python Language and its Applications	DSC	4	0	0	4	25	75	100
2	A20CAT306	Computer Networks	DSC	4	0	0	4	25	75	100
3	A20CAE3XX	Discipline Specific Elective – I	DSE	3	0	0	3	25	75	100
4	A20CMD311	Financial and Management Accounting - I	IDC	3	1	0	4	25	75	100
5	A20XXO3XX	Open Elective – I	OE	2	0	0	2	25	75	100
Practical Python Programming Lab										
6	A20CAL305	Python and Network Programming Lab	DSC	0	0	4	2	50	50	100
7	A20CML312	Accounting Software Lab	IDC	0	0	4	2	50	50	100
Skill Enhancement Course										
8	A20CAS303	Android App Development	SEC	0	0	4	2	100	0	100
Employment Enhancement Course										
9	A20CAC303	Mobile Application Development	EEC	0	0	4	0	100	0	100
							23	**425**	**475**	**900**

SEMESTER – IV										
S. No	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	A20CAT407	Operating Systems Concepts	DSC	4	0	0	4	25	75	100
2	A20CAT408	Data Base Management Systems Concepts	DSC	4	0	0	4	25	75	100
3	A20CAE4XX	Discipline Specific Elective– II	DSE	4	0	0	3	25	75	100
4	A20CMD413	Financial and Management Accounting – II	IDC	3	0	0	4	25	75	100
5	A20XXO4XX	Open Elective – II	OE	2	0	0	2	25	75	100
Practical										
6	A20CAL407	Unix Lab	DSC	0	0	4	2	50	50	100
7	A20CAL408	RDBMS Lab	IDC	0	0	4	2	50	50	100
Skill Enhancement Course										
8	A20CAS404	Office Automation Techniques	SEC	0	0	2	2	100	0	100
Employment Enhancement Course										
9	A20CAC404	Mysql DBA	EEC	-	-	4	-	100	-	100
							23	**425**	**475**	**900**

SEMESTER – V										
S. No	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	A20CAT509	Web Technology	DSC	4	0	0	4	25	75	100
2	A20CAT510	Software Engineering Concepts	DSC	4	0	0	4	25	75	100
4	A20CAT511	Artificial Intelligence and its Applications	DSC	3	0	0	3	25	75	100
5	A20CAE5XX	Discipline Specific Elective–III	DSE	3	0	0	3	25	75	100
Practical										
6	A20CAL509	Web Technology Lab	DSC	0	0	4	2	50	50	100
7	A20CAP501	Mini Project(Java/Python/Web)	DSC	0	0	4	2	50	50	100
Skill Enhancement Course										
8	A20CMS514	Entrepreneurial Skills	SEC	0	0	4	2	100	0	100
Online Certification Course										
9	A20CAO501	NPTEL	OCC	0	0	0	2	0	0	0
Employment Enhancement Course										
10	A20CAC505	Angular JS	EEC	0	0	4	0	100	0	100
							22	**300**	**400**	**800**

SEMESTER – VI										
S.No	**Course Code**	**Course Title**	**Category**	**Periods**			**Credits**	**Max. Marks**		
				L	**T**	**P**		**CAM**	**ESM**	**Total**
Theory										
1	A20CAT612	Block chain Technology	DSC	**3**	0	0	3	25	75	100
2	A20CAT613	Internet of Things	DSC	**3**	0	0	3	25	75	100
3	A20CAT614	.Net Framework	DSC	**3**	0	0	3	25	75	100
4	A20CAE6XX	Discipline Specific Elective –IV	DSE	**3**	0	0	3	25	75	100
Practical										
5	A20CAP602	Project Work& Viva-voce	DSC	**0**	0	10	5	40	60	100
Skill Enhancement Course										
6	A20CAS606	Research Methodology and opportunities	SEC	**0**	0	4	2	100	0	100
Employment Enhancement Course										
7	A20CAC606	Data Science	EEC	0	0	4	0	100	0	100
							19	**340**	**360**	**700**

SCHOOL OF ARTS AND SCIENCE

Department of Computational Studies

Bachelor of Computer Application

Minutes of 4th meeting of Board of Studies

Annexure - II

Annexure – II

A20CAT305	PYTHON LANGUAGE AND ITS APPLICATIONS	L	T	P	C	Hrs
		4	0	0	4	60

Course Objectives

- To acquire programming skill in core python.
- To learn the basic looping and functions.
- To learn how to design python program and applications.
- To acquire the basic packages.
- To develop the object oriented programming.

Course Outcomes

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

CO1 – Define the structure and components of a python program.
CO2 – Illustrate the concepts of Python decision statements.
CO3 – Use list, tuple, Set and dictionary in python program.
CO4 – Read / write data from/to files and structure a program using Exceptions and Modules.
CO5 – Knowing the basic oops concepts.

UNIT I INTRODUCTION TO PYTHON PROGRAMMING LANGUAGE (10 Hrs)

Introduction to Python Language –- Strengths and Weaknesses – IDLE – Operators – Data Types – Introduction List , Tuple, Set, Dictionary. String : Slicing, Basic operations on strings- Built in methods -

UNIT II DECISION MAKING ,LOOPING & FUNCTIONS (16 Hrs)

Control Flow: Introduction – Control Flow and Syntax – Indenting – Relational Expressions – Logical Expressions – If Statement – If else – elif – Nested if. Loop: The while Loop– Nested while Loop – For Loop – Nested for Loop- –Break and continue Functions: parameters – Return values – Local and global scope – Function composition – Recursion and lambda functions.

UNIT III LIST, TUPLE, SET, DICTIONARY AND ARRAYS (12 Hrs)

Lists: List operations – List slices – List methods – List loop – Mutability – Aliasing – Cloning lists – List parameters – Tuples: Tuple assignment – Tuple as return value – Advanced list processing – List comprehension – Sets – Dictionaries: Operations and methods – Arrays.

UNIT IV FILES, EXCEPTIONS, MODULES AND PACKAGES (12 Hrs)

Built In Functions. Files and Exception: Text Files – Reading and writing files – Format operator – Command line arguments – Errors and exceptions – Handling exceptions – Modules – Standard modules – Packages.

UNIT V DATABASE CONNECTIVITY WITH PYTHON (10 Hrs)

Introduction to SQL – Basic SQL Queries – Introduction to GUI using TKinter – Inserting and Updating the records in the table – ASED processes based on TKinter.

Text Books

1. Martin C Brown, “Python The Complete Reference”, McGraw-Hill Education, 4th Edition,2018
2. Allen B. Downey, “Think Python: How to Think Like a Computer Scientist‘‘, Shroff/O‘Reilly Publishers, 2nd edition, 2016(http://greenteapress.com/wp/thinkpython/).
3. ReemaThareja, “Python Programming Using Problem Solving Approach”, ISBN:9780199480173, Oxford University Press, First edition, 2017.

Reference Books

1. Robert Sedgewick, “Kevin Wayne, Robert Dondero – Introduction to Programming in Python: An Inter-disciplinary Approach”, Pearson India Education Services Pvt. 2016.
2. Timothy A. Budd, “Exploring Python”, Mc-Graw Hill Education (India) Private Ltd.,2015.
3. Ben Stephenson, “The Python Workbook A Brief Introduction with Exercises and Solutions”, Springer International Publishing, Switzerland2014.

Web References

1. https://www.learnpython.org/
2. https://pythonprogramming.net/introduction-learn-python-3-tutorials/
3. https://www.codecademy.com/learn/learn-python
4. https://nptel.ac.in/courses/106/106/106106182/

A20CAT407	OPERATING SYSTEM CONCEPTS	L	T	P	C	Hrs
		4	0	0	4	60

Course Objectives

- To grasp a fundamental understanding of operating systems and processes
- To learn the concepts of CPU scheduling and deadlock
- To understand synchronization and memory management concepts in OS
- Understand the concepts of file systems and secondary storage structure
- To learn the features of commercial operating systems

Course Outcomes

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

CO1 – Define the concepts of operating systems operations, processes and threads.
CO2 – Apply the concepts of CPU scheduling and deadlock techniques.
CO3 – Simulate the principles of memory management.
CO4 – Identify appropriate file system and disk organizations for a variety of computing scenario.
CO5 – Examine the features of various open source operating systems.

UNIT I INTRODUCTION AND PROCESS MANAGEMENT (12Hrs)

Operating system structure – Operating system operations – Process management – Memory management – Storage management – Protection and Security – System structures: Operating system services – System calls – Types of system calls – System programs.

UNIT II CPU SCHEDULING AND DEADLOCK (12Hrs)

Overview of threads – Multithreading models – Threading issues – Basic concepts of process scheduling – Scheduling criteria – Scheduling algorithms – Multiple processor scheduling, Dead Lock: Characterization – Prevention Detection

UNIT III CONCURRENT PROCESSES AND MEMORY MANAGEMENT (12Hrs)

Process synchronization: The Critical Section Problem – Peterson's solution – Synchronization Hardware – Semaphores – Classic problems of Synchronization – Monitors. Memory Management: Swapping – Contiguous memory allocation – Paging – Structure of the Page Table – Segmentation, Demand Paging – Page Replacement

UNIT IV FILE SYSTEMS AND SECONDARY STORAGE STRUCTURE (12Hrs)

File Concept – Access Methods – Directory structure – File system mounting – File sharing – Protection–Free-space management. Disk structure – Disk Scheduling – Disk Management – Swap-Space management.

UNIT V I/O BASED LINUX (12Hrs)

LINUX System: Basic Concepts – Components of Linux System – Architecture - System administration – Requirements for Linux System Administrator – Setting up a LINUX multifunction server – Domain Name System

Text Books

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, "Operating System Concepts", John Wiley & Sons Ninth Edition, 2017.
2. Andrew S. Tanenbaum, "Modern Operating Systems", Prentice Hall of India, 3rd Edition, 2015.
3. Gary Nutt, "Operating Systems - A Modern Perspective", Pearson Education, Second Edition, 2013.

Reference Books

1. William Stallings, "Operating System", Prentice Hall of India, 6th Edition, 2015.
2. Thomas Anderson and Michael Dahlin, "Operating Systems principles and practice", Wiley, 2nd Edition, 2014.
3. Harvey M. Deitel, "Operating Systems", Pearson Education, Third Edition, 2013.
4. Silberschatz, Galvin, "Operating System Concepts", Wiley, Student Edition, 2006.
5. William Stallings, "Operating System: Internals and design Principles", New Edition (7), Pearson Education India.

Web References

1. https://nptel.ac.in/courses/106108101/
2. http://www.tcyonline.com/tests/operating-system-concepts
3. http://www.galvin.info/history-of-operating-system-concepts-textbook
4. https://www.cse.iitb.ac.in/~mythili/teaching/cs347_autumn2016/index.html
5. https://www.cse.iitk.ac.in/pages/CS330.html

A20CAT408 DATA BASE MANAGEMENT SYSTEMS CONCEPTS

L	T	P	C	Hrs
4	0	0	4	60

Course Objectives

- To learn about Database Structure and Data Models.
- To study SQL Commands for storing and retrieving data into the database.
- To study the Relational database system design
- To understand the concept of Transactions
- To understand the concept of Concurrency Control and Recovery System

Course Outcomes

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

CO1 – Design conceptual data model using Entity Relationship Diagram.
CO2 – Design conceptual and logical database models for an application.
CO3 – Normalize relational database design of an application.
CO4 – Explain the need for Indexing, Hashing in database**.**
CO5 – Understand the strategies for Transactions and Management.

UNIT I INTRODUCTION (12Hrs)

Database System Application – Purpose of Database Systems – View of Data – Database Languages – Relational Database – Database Design – System Structure – Database Architecture. Database Design and E-R Model: Overview of the Design Process – The E-R Model – Constraints – E-R Diagrams- E-R Design Issues

UNIT II RELATIONAL MODEL (12Hrs)

Structure of Relational Database – Fundamental Relational Algebra Operations– Modification of the Database. Structured Query Language: Introduction – Basic Structure of SQL Queries – Set Operations – Additional Basic Operations – Aggregate Functions – Null Values – Nested Sub queries.

UNIT III RELATIONAL DATABASE DESIGN (12Hrs)

Features of Good Relational Designs – 1NF – 2NF – 3NF and 4NF with Examples. Atomic Domains and first Normal form – Decomposition using Functional Dependencies – Functional Dependency Theory – Algorithm for Decomposition –

UNIT IV INDEXING , HASHING & PL/SQL (12Hrs)

Basic Concepts – Ordered Indices – B+ Tree Index Files – B-Tree Files – Multiples – Key Access – Static Hashing – Dynamic Hashing - PL/SQL - Basic programs – Functions Cursor- Trigger

UNIT V TRANSACTION MANAGEMENT (12Hrs)

Transaction Management: Transaction concept – Storage Structure – Transaction Atomicity and Durability – Transaction Isolation and Atomicity – Serializability – Recoverability – Transaction Isolation Levels

Text Books

1. Abraham Silberschatz, Henry F Korth, S Sudharshan, “Database System Concepts”, McGraw-Hill, 7th Edition, 2019.
2. RamezElmasri and ShamkantNavathe, Durvasula V L N Somayajulu, Shyam K Gupta, “Fundamentals of Database Systems”, Pearson Education, 2018.
3. Hector Garcia-Molina, Jeffrey D. Ullman, Jennifer Widom, “Database Systems The Complete Book” Prentice Hall, 2nd Edition, 2014.

Reference Books

1. Raghu Ramakrishna, Johannes Gehrke, “Database Management Systems”, McGraw Hill, 3rdEdition,2014.
2. G.K.Gupta,"Database Management Systems”, Tata McGraw Hill, 2011.
3. Date CJ, Kannan A, Swamynathan S, “An Introduction to Database System”, Pearson Education, 8thEdition,2006.
4. Paul Beynon-Davies, “Database Systems”, Palgrave Macmillan, 3rdEdition, 2003.
5. Mukesh Chandra Negi, “Fundamentals of Database Management Systems”, BPB Publications, 2019.

Web References

1. https://docs.oracle.com/cd/E11882_01/server.112/e41084/toc.htm MySQL Online Documentation
2. http://dev.mysql.com/doc/
3. http://www.rjspm.com/PDF/BCA-428%20Oracle.pdf
4. https://nptel.ac.in/courses/106/106/106106095/
5. https://www.tutorialspoint.com/dbms/index.htm

A20CAL407 **UNIX LAB**

L	T	P	C	Hrs
4	0	0	4	60

Course Objectives

- To learn basic UNIX / LINUX commands
- To develop programs in Linux environment using system calls.
- To implement the CPU scheduling algorithms.
- To implement Deadlock handling algorithm.
- To develop solutions for synchronization problems using semaphores

Course Outcomes

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

CO1 – Understand the basic commands for UNIX / Linux.
CO2 – Develop simple shell programs**.**
CO3 – Implement different Scheduling Algorithms.
CO4 – Apply the basic concepts of Deadlock Handling procedures.
CO5 – Simulate Critical Section problem using Semaphore.

List of Exercises

1. Study of basic UNIX / Linux commands
2. Shell Programming - I
    (a) To Write a Shell program to count the number of words in a file.
    (b) To Write a Shell program to calculate the factorial of a given number.
    (c) To write a Shell program to generate Fibonacci series.
    (d) Write a Shell Program to wish the user based on the login time.
3. Shell Programming - II
    (a) Loops
    (b) Patterns
    (c) Expansions
    (d) Substitutions
4. Programs using the following system calls of UNIX/Linux operating system: fork, exec, getpid, exit, wait, close, stat, open dir, read dir.
5. To write a program to simulate cat command.
6. To write a program to simulate head and tail commands.
7. Simulate UNIX commands like ls, grep.
8. Process Scheduling- FCFS, SJF, Priority and Round robin.
9. Implementation of Banker's algorithm.
10. Producer and Consumer problem using semaphores.

Reference Books

1. William Stallings, "Operating System", Pearson Education, Sixth edition, 2015.
2. Andrew S. Tanenbaum, Modern Operating Systems,3rd edition Prentice Hall of India Pvt. Ltd, 2015.
3. Harvey M. Deitel, "Operating Systems", Pearson Education Pvt, Third Edition, 2013
4. William Stallings, "Operating System: Internals and design Principles", Old Edition(7), Pearson Education,2013.
5. Silberschatz, Galvin, "Operating System Concepts", Wiley, Student Edition,2006.

Web References

1. https://www.geeksforgeeks.org
2. http://avanthioslab.blogspot.com/2016/08/file-organization-techniques.html
3. https://www.programming9.com/programs/c-programs/285-page-replacement-programs-in-c

A20CAL408	RDBMS LAB	L	T	P	C	Hrs
		0	0	4	2	30

Course Objectives

- To learn and understand DDL & DML.
- To learn and understand DCL.
- To implement Basic SQL commands.
- To execute PL/SQL programs.
- To develop GUI applications in any platform.

Course Outcomes

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

CO1 – Implement DDL and DML commands.
CO2 – Implement DCL commands.
CO3 – Analyze PL/SQL programs.
CO4 – Understand PL/SQL programs.
CO5 – Develop GUI applications in their known platform.

List of Exercises

1. Create Table using Data Definition Language (DDL).
2. Modify Table using Data Manipulation Language (DML).
3. Store and Retrieve data through Data Control Language (DCL).
4. Implement Constraints and Built-in functions in various tables.
5. Perform Joins and Group-by functions.
6. Implement Simple Programs in PL/SQL.
7. Create PL/SQL programs using functions.
8. Create PL/SQL programs using Cursor.
9. Create PL/SQL programs using triggers.
10. Developing GUI applications.
    - Student Information System.
    - Inventory Management.
    - Payroll Processing.

Reference Books

1. Ramez Elmasri, Durvasul VLN Somyazulu, Shamkant B Navathe, Shyam K Gupta, Fundamentals of Database Systems, Pearson Education, 7th Edition, 2016.
2. Raghu Ramakrishna, Johannes Gehrke, Database Management Systems, McGraw Hill,3rd Edition, 2014.
3. Abraham Silberschatz, Henry F Korth, S Sudharshan, Database System Concepts", McGraw-Hill Indian Edition, 7th Edition, 2013.
4. Kuhn,"RMAN Recipes for Oracle Database", Apress, 2nd Edition,2013.
5. Date CJ, Kannan A, Swamynathan S, An Introduction to Database System, Pearson Education, 8th Edition, 2006.

Web References

1. https://docs.oracle.com/cd/E11882_01/server.112/e41084/toc.htm MySQL Online Documentation
2. http://dev.mysql.com/doc/
3. http://www.rjspm.com/PDF/BCA-428%20Oracle.pdf

		L	T	P	C	Hrs
A20CAS404	**OFFICE AUTOMATION TECHNIQUES**	**0**	**0**	**4**	**2**	**30**

Course Objectives

- To practice the MS Word application.
- To practice the MS Excel application.
- To practice the MS Power point application.
- To practice the MS Access application.
- To practice the MS Picture Manager application.

Course Outcomes

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

CO 1 - Creating a document in MS Word.
CO 2 - Creating a spread sheet in MS Excel.
CO 3 - Creating a presentation in MS Power Point.
CO 4 - Creatinga database in MS Access
CO 5 - Editing a picture in MS Picture Manager.

UNIT I MS WORD (6 Hrs)

Introduction – Working with MS Word- Creating a New Document-Different Page Views and layouts - Working with Styles - Text Attributes - Paragraph and Page Formatting - Text editing using variousfeatures –Header and Footer – Inserting – Page Numbers, Pictures,Files, Auto texts, Symbols - Working with Columns, Tabs & Indents - Creation &Working with Tables -

UNIT II MS EXCEL (6 Hrs)

Introduction –Working with MS Excel - Concepts of Workbook & Worksheets - Working with Data & Ranges - Different Views of Worksheets - Column Freezing, Labels, Hiding, Splitting -Using different features with Data and Text - Use of Formulas, Calculations & Functions-Cell Formatting including Borders & Shading - Working with Different Chart Types

UNIT III MS POWERPOINT (6 Hrs)

Introduction – Creating and Viewing Presentations – Editing a Presentation – Inserting styles – Working with Presentation- Animations

UNIT IV MS ACCESS (6 Hrs)

Introduction – Creating database, table, fields & its properties - Data types - Adding primary key into table – Relationship - Adding/Editing data – Sorting – Indexing - Designing queries.

UNIT V ADOBE PHOTOSHOP (6 Hrs)

Introduction – Creating custom work spaces – Opening images – Image magnification – Moving the image – Bitmap images – Vector images – Color modes and models.

Text Books

1. Archana Kumar, “Computer Basics with Office Automation”, Dream tech Press,Wiley Publisher, 2019.
2. Dr. P. Rizwan Ahmed, “Office Automation”, Margham Publications, 2016.
3. Omani Kellogg , “Adobe Photoshop For Beginners: 2021”

Reference Books

1. Dinesh Maidasani , Straight to the Point – MS Office 2010, Laxmi Publications, 2010.
2. Sherry Kinkoph Gunter, Master Visually Microsoft Office 2010, WILEY, 2010.
3. hector grant , “adobe photoshop for beginners 2021: learn the amazing features of photoshop”

Web References

1. https://www.tutorialspoint.com/word/index.htm
2. https://en.wikipedia.org/wiki/Office_automation
3. https://www.tutorialspoint.com/excel/index.htm
4. https://www.tutorialspoint.com/powerpoint/index.htm
5. https://www.tutorialspoint.com/ms_access/index.htm
6. https://www.groovypost.com/howto/stop-yahoo-scanning-your-email-to-sell-data/
7. https://www.guru99.com/photoshop-tutorials.html

A20CAS606	RESEARCH METHODOLOGY AND OPPORTUNITIES	L	T	P	C	Hrs
		0	0	4	2	30

Course Objectives

- To facilitate science and research
- To introduce research and methodology concepts
- To inculcate data collection
- To implement the scientific writing
- To construct the basic ethics

Course Outcomes

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

CO 1 - Identify various concepts science and research
CO 2 - Describing research and methodology concepts
CO 3 - Utilize the data collection
CO 4 - Managing the scientific writing
CO 5 - Deploy the basic ethics.

UNIT I SCIENCE AND RESEARCH (6 Hrs)

Definition – History – Evolution of Scientific Inquiry, Scientific Research: Definition, Characteristics, types, need of research. Identification of the problem, assessing the status of the problem, formulating the objectives

UNIT II INTRODUCTION TO RESEARCH METHODOLOGY (6 Hrs)

Meaning and importance of Research – Types of Research – Selection and formulation of Research Problem Research Design – Need – Features – Inductive, Deductive and Development of models Developing a Research Plan .

UNITIII DATA COLLECTION AND ANALYSIS (6 Hrs)

Sources of Data – Primary, Secondary and Teritary – Types of Data – Categorical, nominal & Ordinal. Methods of Collecting Data : Observation, field investigations, Direct studies – Reports, Records or Experimental observations. Sampling methods – Data Processing and Analysis strategies

UNIT IV SCIENTIFIC WRITING (6 Hrs)

Structure and components of Scientific Reports – types of Report – Technical Reports and Thesis – Significance – Different steps in the preparation – Layout, structure and Language of typical reports - Illustrations and tables – Bibliography, Referencing and foot notes –Importance of Effective Communication.

UNIT V ETHICS (6 Hrs)

Ethical Issues – Ethical Committees – Commercialization – copy right – royalty – Intellectual Property rights and patent law – Track Related aspects of intellectual property Rights – Reproduction of published material – Plagiarism .

Text Books

1. Garg.B.L., Karadia, R., Agarwal,F. and Agarwal, U.K., 2002. An introduction to Research Methodology, RBSA Publishers.
2. Kothari, C.R.(2008). Research Methodology: Methods and Techniques. Second Edition. New Age International Publishers, New Delhi.
3. Sinha, S.C. and Dhiman, A.K., 2002. Research Methodology, Ess Ess Publications. 2 volumes.

Reference Books

1. Gupta S.P. (2008). Statistical Methods. 37 th ed. (Rev)Sultan Chand and Sons. New Delhi. 1470 p.
2. Leon & Leon (2202). Internet for everyone, Vikas Publishing House.
3. Wadehra, B.L.2000. Law relating to patents, trade marks, copyright designs and geographical indications. Universal Law Publishing.
4. Research Methodology Dr P M Bulakh,Dr P. S. Patki and Dr A S Chodhary 2010 Published by Expert Trading Corporation Dahisar West, Mumbai 400068

Web References

1. https://gradcoach.com/what-is-research-methodology/
2. https://www.guide2research.com/research/how-to-write-research-methodology
3. https://www.tutorialspoint.com/thematic_apperception_test/thematic_apperception_test_research_methods.htm
4. https://www.wisdomjobs.com/e-university/research-methodology-tutorial-355.html

COMPLETE SYLLABUS FOR SEMESTER V AND VI

		L	T	P	C	Hrs
A20CAT509	**WEB TECHNOLOGY**	**4**	**0**	**0**	**4**	**60**

Course Objectives

- Understand basic concepts and terminology of Internet
- To help students to gain a basic understanding of style sheet
- To inculcate working knowledge of Java script
- To learn the angular js concepts.
- To connect to mysql data sources and managing them effectively.

Course Outcomes

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

CO 1 – Identify various concepts of Internet
CO 2 – Critique css style sheet on their design pros and cons
CO 3 – Utilize rapid prototyping techniques to design and develop webpages.
CO 4 – Utilize java script with objects
CO 5 – Design and develop webpages and connect with mysql.

UNIT I INTERNET BASICS (12 Hrs)

Basic Concepts – History of Internet – Applications of internet – Internet Domains – IP Address – TCP/IP Protocol – The WWW – Introduction to HTML: Web server – Web client / browser - Tags – Graphics to HTML Doc – Lists – Tables – Linking Documents.

UNIT II STYLE SHEET (12 Hrs)

Style sheet - Style sheet basic - Add style to document - Creating Style sheet rules - Style sheet properties - Font - Text - Color and background color - Box - Display properties.

UNIT III JAVASCRIPT (12 Hrs)

JavaScript: JavaScript in Web Pages – The Advantages of JavaScript –Writing JavaScript into HTML – Syntax – Operators and Expressions –Constructs and conditional checking – Functions – Placing text in a browser– Dialog Boxes – Form object's methods – Built in objects – user defined objects.

UNIT IV ANGULARJS (12 Hrs)

Overview – MVC architecture – First application – Directives – Expressions – Controllers – Filters – Tables – Modules – Forms – Includes - AJAX

UNIT V MYSQL (12 Hrs)

Introduction – MySQL Databases – Table and Views – MySQL queries – MySQL Indexes – MySQL Clauses – MySQL Conditions – MySQL Joins – Aggregate functions – Database Connection

Text Books

1. "Web Enabled Commercial Application Development Using HTML, DHTML, JavaScript, Perl CGI", Ivan Bayross, BPB Publication.
2. Jon Dukett - Fundamentals of Web Development 1/e Paperback
3. Randy Connolly - JavaScript and JQuery: Interactive Front–End Web Development Paperback

Reference Books

1. XML Bible", Elliotte Rusty Harold, 2nd Edition, Wrox Publication.
2. "Beginning Java Server Pages", Vivek Chopra, Sing Li, Rupert Jones, Jon Eaves, John T. Bell, Wrox Publications.
3. "Practical ASP", Ivan Bayross, BPB Publication.

Web References

1. https://www.tutorialspoint.com/angularjs/index.htm
2. https://www.tutorialspoint.com/spring_boot/index.htm
3. https://www.tutorialspoint.com/mysql/index.htm
4. https://www.javatpoint.com/mysql-tutorial

A20CAT510	SOFTWARE ENGINEERING CONCEPTS	L	T	P	C	Hrs
		3	1	0	4	60

Course Objectives

- To understand the various models and methods.
- To gain about software development life cycle models.
- To develop the software design.
- To connect the coding techniques.
- To learn the testing of software.

Course Outcomes

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

CO1 - Learn about the various models and methods.
CO2 - Develop and implement the software life cycle models.
CO3 - Design the software models.
CO4 - Analyze the coding techniques.
CO5 – Explore the testing of software.

UNIT I INTRODUCTION (12 Hrs)

Introduction to Software Engineering – evolving role of software – defining software engineering –changing nature of software – software myths – terminologies – role of software development –software life cycle models – build & fix model – waterfall model – incremental model – evolutionary model– unified model – selection of a life cycle model.

UNIT II SOFTWARE REQUIREMENTS (12 Hrs)

Software Cost Estimation: Software cost factors - Software Cost Estimation Techniques –StaffinglevelEstimation -Estimating Software Maintenance Costs -The Software Requirements specification -Formal Specification Techniques - Languages and Processors for Requirements Specification. COCOMO I & II Model

UNIT III SOFTWARE DESIGN (12 Hrs)

Software Design: Fundamental Design Concepts - Modules and Modularization Criteria -Design Notations –Design Techniques -Detailed Design Considerations -Real-Time and Distributed System Design -Test Plans -Milestones, walkthroughs, and Inspections

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UNIT IV SOFTWARE TESTING (12 Hrs)

Software testing –functional Testing – structural testing – levels of testing – validation testing Testing Principles - Testability - Test case Design-White Box Testing - Basic path testing-Control Structure Testing-Black Box Testing.

UNIT V PROJECT MANAGEMENT (12 Hrs)

Project Scheduling – Scheduling, Earned Value Analysis Planning – Project Plan, Planning Process, RFP Risk Management – Identification, Projection - Risk Management-Risk Identification-RMMM Plan-CASE TOOLS

Text Books

1. R. Fairley, “Software Engineering Concepts”, Tata McGraw Hill Edition -2017.
2. Roger S. Pressman, “Software Engineering: A Practitioner’s Approach”, McGraw Hill, 7th edition, 2010. (Module 1 & Module 5)
3. Software Engineering , Tenth Edition , Pearson by Ian Sommerville

Reference Books

1. Software Engineering: A Practitioner’s Approach by Bruce R. Maxim
2. Pankaj Jalote's Software Engineering: A Precise Approach
3. Software Engineering 0th Edition, Kindle Edition by Suraiya Hussain

Web References

1. https://www.sitesbay.com/software-engineering/index
2. https://www.sitesbay.com/software-engineering/se-software-project-management-tools
3. https://www.sitesbay.com/software-engineering/se-risk-management-in-software-engineering
4. https://www.tutorialspoint.com/software_engineering/index.htm

A20CAT511 ARTIFICIAL INTELLIGENCE AND ITS APPLICATIONS

L	T	P	C	Hrs
3	1	0	4	60

Course Objectives

- To understand the basic concepts of AI.
- To understand the functionalities of predicate logic.
- To learn the basic concepts of Heuristic search techniques
- To understand various developments of Game playing.
- To understand the Expert systems

Course Outcomes

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

CO1- Know about the of artificial intelligence.
CO2 - Determine the predicate logic and knowledge based systems.
CO3 - Very good knowledge in Heuristic search techniques.
CO4- Describe the knowledge about Game playing
CO5- Analysis the Experts Systems

UNIT I INTRODUCTION (12Hrs)

Artificial Intelligence- definition-Underlying Assumption A.I. Technique space search Production systems-Control Strategies-Heuristic search Problem characteristics-Production system characteristics.

UNIT II PREDICATE LOGIC (12Hrs)

Predicate logic: Representing simple facts in logic-representing Instance and Is a relationship Computable functions -Predicates Resolution. Frames strong slot and filler structures: Conceptual Dependency Scripts. -Advanced Problem Solving System.

UNIT III HEURISTIC SEARCH TECHNIQUES (12Hrs)

Heuristic search Techniques: Generate and test Hill climbing- Breadth First Search Breadth First Search Problem reduction -constraint satisfaction Means ends analysis Knowledge representation issues - Representation and Mapping Approaches to Knowledge representation.

UNIT IV GAME PLAYING (12Hrs)

Game playing-The minimax search Procedure-Adding Alpha-Beta cut offs Planning Overview-An Example Domain: The Blocks World Components of Planning-Nonlinear planning Using Constraint Posting Hierarchical Planning Other planning Techniques

UNIT V EXPERT SYSTEMS (12Hrs)

Experts Systems Definition-Expert Systems Characteristics -Expert Systems Architecture Expert Systems role of expert system knowledge acquisition- Expert system advantages -limitation of expert system

TEXT BOOK

1.Elaine Rich, Kevin Knight , Artificial intelligence , Mc.GrawHill edition.
2.S.Janakiraman, K. Sarukesi, GopalKrishnan.P, Foundations of Artificial intelligence and expert systems , Macmillan Series.
3. N. J. Nilsson, Artificial Intelligence – A New Synthesis, Morgan Kaufmann, 1998.

Reference Books

1. E. Rich, K. Knight, S.B. Nair, Artificial Intelligence, 3/e, TMH, 2008.
2. S.J. Russel, P. Norvig Artificial Intelligence: A Modern Approach, 3 /e, PrenticeHall, 2009.
3. Ivan Bratka, “PROLOG Programming for Artificial Intelligence”, Addison
4. Artificial Intelligence - Elaine Rich, Kevin Knight, ShivasankarB.Nair–Thirdedition- McGraw Hill- 2017
5. Stuart Russel, Peter Norvig “AI – A Modern Approach”, 2nd edition, PearsonEducation, 2007

Web References

1. https://www.sitesbay.com/ai/artificial-intelligence-types-of-artificial-intelligence
2. https://www.tutorialspoint.com/artificial_intelligence/index.htm
3. https://tutorialspoint.dev/computer-science/machine-learning/artificial-intelligence-an-introduction
4. https://www.javatpoint.com/artificial-intelligence-tutorial
5. https://www.tutorialandexample.com/artificial-intelligence-tutorial/

A20CAL509	WEB TECHNOLOGY LAB	L	T	P	C	Hrs
		0	0	4	2	30

Course Objectives

- To facilitate students to understand HTML
- To help students to gain a basic understanding of java script and web development
- To inculcate working knowledge and validate the data

List of Programs

1. Write an HTML code to display your education details in a tabular format.
2. Write an HTML code to display your CV on a web page.
3. Write an HTML code to create your Institute website, Department Website and Tutorial website for specific subject.
4. Write an HTML code to illustrate the usage of the following:
    - Ordered List
    - Unordered List
    - Definition List
5. Write a script to create an array of 10 elements and display its contents.
6. Write a function in Java script that takes a string and looks at it character by character.
7. Create a simple calculator using form fields. Have two fields for number entry & one field for the result. Allow the user to be able to use plus, minus, multiply and divide.
8. Write an angularJS code to demonstrate Upload File application.
9. Write a Java script to prompt for users name and display it on the screen.
10. Write an HTML program to design an entry form of student details and send it to store at database server like SQL, Oracle or MS Access.

Text Books

1. "Web Enabled Commercial Application Development Using HTML, DHTML,JavaScript, Perl CGI", Ivan Bayross, BPB Publication.
2. Jon Dukett - Fundamentals of Web Development 1/e Paperback
3. Randy Connolly - JavaScript and JQuery: Interactive Front–End Web Development Paperback

Reference Books

1. XML Bible", Elliotte Rusty Harold, 2nd Edition, Wrox Publication.
2. "Beginning Java Server Pages", Vivek Chopra, Sing Li, Rupert Jones, Jon Eaves,
    a. John T. Bell, Wrox Publications.
3. "Practical ASP", Ivan Bayross, BPB Publication.

Web References

1. https://www.tutorialspoint.com/angularjs/index.htm
2. https://www.tutorialspoint.com/spring_boot/index.htm
3. https://www.tutorialspoint.com/mysql/index.htm
4. https://www.javatpoint.com/mysql-tutorial

Table:10 CAM & ESM break-up for Mini Project

Sl. No	Description			Weightage
1	**Continuous Assessment Marks**			
a	Review1(Internship / InPlant Training)	Review Committee#	5	10
		Report for Internship	5	
b	Review2	Review Committee#	5	10
		Guide	5	
c	Review3	Review Committee#	15	30
		Guide	15	
	Total CAM			50
2	**End Semester Marks**			
a	Evaluation of Mini Project report	Internal Examiner	20	40
		External Examiner	20	
b	Outcome*	Conference Presentations /Publication of papers /prototypes/patents etc	10	10
	Total ESM			**50**
	Total Marks			**100**

A20CAT612	BLOCKCHAIN TECHNOLOGY	L	T	P	C	HRS
		3	0	0	3	60

Course Objective

- To define the fundamental ideas behind Block Chain..
- To know about Bitcoin Fundamentals.
- To understand about the Developing knowledge in Bitcoin.
- To understand the Ripple Blockchain.
- To Understand DigiByte Techniques.

Course Outcome

After completion of the course, the students should be able to

CO1 - To get the knowledge in principles of Block Chain.
CO2 - To get the knowledge in Bitcoin Fundamentals.
CO3 - To get the knowledge in in Bitcoin.
CO4 – To get the knowledge in Ripple Blockchain**.**
CO5 - To get the knowledge in Digibyte**.**

UNIT I INTRODUCTION (12 Hrs)

Introducing Block Chain – The structure of Block Chains – Block chain Applications – Block chain Lifecycle – Block chains in use.

UNIT II PICKING A BLOCK CHAIN (12 Hrs)

Where Block Chains Add Substance – Choosing a Solution – Dividing into Bitcoin Blockchain – Using Smart Contracts with Bitcoin.

UNIT III DEVELOPING YOUR KNOWLEDGE (12 Hrs)

Getting a Brief History of the Bitcoin Blockchain – Debunking Some Common Bitcoin Misconceptions- Mining for Bitcoins – Bitcoin The New Wild West.

UNIT IV RIPPLE BLOCKCHAIN (12 Hrs)

Getting a Brief History of the Ripple Blockchain – How Ripples differs from all other Blockchain – Unleasing the Full Power of Ripple .

UNIT V DIGI BYTE (12 Hrs)

The Fast Blockchain – Mining on Digibyte – Signing Documents on DigiByte's Digu Sign – Earning Digibytes While Gaming.

Text books

1. Tiana Laurence, "Blockchain Dummies", A Wiley Brand.
2. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, "Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction", Princeton University Press, Kindle Edition, 2016.
3. Imran Bashir, "Mastering Blockchain: Deeper insights into decentralization, cryptography", Packet Publishing Ltd, Kindle Edition, 2017.
4. Douglas Robert Stinson and Maura Paterson,"Cryptography: Theory and Practice", CRC press, 2018.

Reference books

1.Andreas M. Antonopoulos, "Mastering Bitcoin: Unlocking Digital Cryptocurrencies", O'Reilly Media; 2nd Edition,2017.
2. Dr.Gavin Wood, "ETHEREUM: A Secure Decentralized Transaction Ledger," Yellow paper.2014.
3. Neil Hoffman,"Cryptocurrency: The Insider's Guide to Blockchain Technology, Bitcoin Mining, Investing and Trading Cryptocurrencies (Crypto Trading and Investing Secrets)", Karma Publishing House,1st Edition,2017
4. Jonathan Katz,yehuda Lindell, "Introduction to Modern Cryptography",1st Edition,Taylor& Francis,2014.
5. Maura B. Paterson Douglas R. Stinson,"Cryptography: Theory and Practice",1st Edition,CRC Press,2018.

Web resources

1.http://chimera.labs.oreilly.com/books/1234000001802/ch08.html
2. https://bitcoin.org/bitcoin.pdf
3.https://www.geeksforgeeks.org/introduction-to-crypto-terminologies/
4. https://blockgeeks.com/guides/cryptocurrencies-cryptography/
5. https://cointelegraph.com/bitcoin-for-beginners/what-are-cryptocurrencies.

A20CAT613	INTERNET OF THINGS	L	T	P	C	Hrs
		3	0	0	3	45

Course Objectives

- To assess the vision and use of Devices in IoT Technology
- To Understand IoT Market perspective.
- To classify Real World IoT Design Constraints using Raspberry Pi.
- To learn about the introduction to Edge Computing
- To know about Physical Servers and Cloud Offerings

Course Outcomes

After completion of the course, students will be able to

CO1 **–** Interpret the vision of IoT from a global context along with the uses of IOT devices.
CO2 **–** Determine the Market perspective of IoT
CO3 **–** Design a portable IoT using Raspberry Pi.
CO4 **–** Describe the importance of edge computing
CO5 **–** Illustrate the applications in Industrial Automation and identify Real World Design Constraints.

UNIT I INTRODUCTION & ENABLING TECHNOLOGIES (12 Hrs)

Evolution of Internet of Things – IoT Architectures: IoT World Forum (IoTWF) – Enabling Technologies – Simplified IoT Architecture - Sensors, Actuators, Smart Objects and Connecting Smart Objects.

UNIT II IOT PROTOCOLS (12 Hrs)

IoT Access Technologies: Physical and MAC layers, topology – Network Layer: IP versions, Constrained Nodes and Constrained Networks – Application Transport Methods: Supervisory Control and Data Acquisition – Application Layer Protocols.

UNIT III IOT PLATFORMS DESIGN METHODOLOGY (12 Hrs)

IoT Physical Devices and Endpoints– Introduction to Raspberry PI-Interfaces (serial, SPI, I2C) Programming – Python program with Raspberry PI with focus of interfacing external gadgets, controlling output, reading input from pins.

UNIT IV DATA ANALYTICS AND SUPPORTING SERVICES (12 Hrs)

Structured Vs Unstructured – Data No SQL Databases – Hadoop Ecosystem – Apache Kafka, Apache Spark – Python Web Application Framework – Django – AWS for IoT

UNIT V CASE STUDIES/INDUSTRIAL APPLICATIONS (12 Hrs)

Cisco IoT system – IBM Watson IoT platform – mart and Connected Cities: Layered architecture, Smart Lighting, Smart Parking Architecture and Smart Traffic Control.

Text Books

1. Vijay Madisetti and ArshdeepBahga, “Internet of Things: A Hands-On Approach”, VPT edition1, 2014.
2. David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Rob Barton and Jerome Henry, —IoT Fundamentals: Networking Technologies, Protocols and Use Cases for Internet of Things, Cisco Press, 2017

Reference Books

1. Jonathan Follett, “Designing for Emerging - UX for Genomics, Robotics, and the Internet of Things Technologies”, O’Reilly, 2014.
2. CharalamposDoukas, — “Building Internet of Things with the Arduinoll, Create space”, April 2012..
3. Donald Norris, —”The Internet of Things: Do-It-Yourself at Home Projects for Arduino, Raspberry Pi and BeagleBone Blackll”,Mc.Graw Hill,2015..

Web References

1. https://www.wired.co.uk/article/internet-of-things-what-is-explained-iot
2. https://www.ibm.com/blogs/internet-of-things/what-is-the-iot/
3. https://www.geeksforgeeks.org/edge-computing/
4. https://www.i-scoop.eu/internet-of-things-guide/edge-computing-iot/

A20CAT614 **.NET FRAMEWORK**

L	T	P	C	Hrs
3	0	0	3	60

Course Objectives

- To understand the fundamentals of developing modular application by using object oriented concepts.
- To utilize the .NET framework to build distributed enterprise applications.
- To develop Console Application, Windows Application and Web Applications.
- To connect to multiple data sources and managing them effectively.
- To learn the product development.

Course Outcomes

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

CO1 - Learn about MS.NET framework developed by Microsoft.
CO2 - Develop and implement Applications with different controls.
CO3 - Design the interface for application development.
CO4 - Understand the .NET framework and deployment in the .NET.
CO5 - Explore Assemblies and Deployment in .NET enterprise applications.

UNIT I INTRODUCTION (12 Hrs)

Introduction to .NET Framework – Evolution of .NET – Benefits of .NET – Overview of .NET - .NET overview: Exploring new features of .NET – Common language Runtime (CLR) – Common Type System (CTS) – Common language Specification (CLS) – Compilation process.

UNIT II FORM AND CONTROLS (12 Hrs)

Controls: HTML Server Controls – Web Server Controls – Form validation: Client side validation – Server side validation – Validation Controls: Required Field Comparison Range – Calendar Control – Ad rotator Control – Internet Explorer Control – Cookies,

UNIT III DATABASE PROGRAMMING (12 Hrs)

Data Access with ADO.NET – Architecture – Data reader – Data Adapter – Command – Connection – Data set – Data binding – Data Grid Control.

UNIT IV XML In .NET (12 Hrs)

XML In .NET: XML Basics- Attributes- Fundamentals of XML Classes: Document- Text Writer – Text Reader- XML Validations – XML in ADO.NET – Data Document

UNIT V WEB SERVICES (12 Hrs)

Web Services: Introduction – State Management – View State – Session State – Application State – Service Description Language – Building & Consuming A Web Service – Web Application Development – Caching – Threading Concepts – Creating Threads In .NET

Text Books

1. David Chappell, “Understanding .NET – A Tutorial and Analysis”, Addison Wesley, 2002.
2. Herbert Schildt, “C# 3.0 The Complete Reference”, McGraw-Hill Professional, Third Edition, 2009.
3. Keogh, “J2EE The Complete Reference”, Tata McGraw-Hill, 2015.
4. Dreamtech Press, “ASP.NET 2.0 Black Book”, Dreamtech Press; 2007th edition (6 July 2006).
5. Introduction to .NET framework - Wrox publication.

Reference Books

1. Andrew Troelsen, Pro C# 5.0 and the .NET 4.5 Framework, Sixth edition, A Press, 2012.
2. Joh Skeet, C# in depth, Manning publications, Third Edition, 2014. .
3. AdrewStellman and Jennifer Greene, Head First C#, Third Edition, O’Reilly, 2013.

Web References

1. https://www.c-sharpcorner.com/csharp-tutorials
2. https://www.guru99.com/c-sharp-tutorial.html

A20CAP602	PROJECT WORK & VIVA VOCE	L	T	P	C	Hrs
		0	0	1	5	75

The Project work is to be evaluated as follows:

1. The internal assessment (40 marks) is awarded as follows:

15 marks is awarded based on two internal project reviews conducted in periodic intervals by a panel comprising of members of the Department during the tenure of the project.

The student's project guide awards 15 marks for the project work and 10 marks for attendance (attendance marks as specified in the Pondicherry University UG CBCS regulations).

2. The End Semester Examination assessment (60 marks) is evaluated under two aspects

i)Project Work – (40 marks)
ii)Project Report and Viva-Voce(20 marks)

CAM &ESM break-up for Project work

Sl. No	Description			Weightage
1	**Continuous Assessment Marks**			
a	Review1	Review Committee#	5	10
		Guide	5	
b	Review2	Review Committee#	5	10
		Guide	5	
c	Review3	Review Committee#	10	20
		Guide	10	
			Total CAM	40
2	**End Semester Marks**			
a	Evaluation of final report and Viva-voce	Internal Examiner	25	50
		External Examiner	25	
b	Outcome*	Conference Presentations /Publication of papers /prototypes/patents etc	10	10
			Total ESM	**60**
			Total Marks	**100**

A20CAS606	RESEARCH METHODOLOGY AND OPPORTUNITIES	L	T	P	C	Hrs
		0	0	4	2	30

Course Objectives

- To facilitate science and research
- To introduce research and methodology concepts
- To inculcate data collection
- To implement the scientific writing
- To construct the basic ethics

Course Outcomes

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

CO 1 - Identify various concepts science and research
CO 2 – Describing research and methodology concepts
CO 3 - Utilize the data collection
CO 4– Managing the scientific writing
CO 5 – Deploy the basic ethics.

UNIT I SCIENCE AND RESEARCH (6 Hrs)

Definition – History – Evolution of Scientific Inquiry, Scientific Research: Definition, Characteristics, types, need of research. Identification of the problem, assessing the status of the problem, formulating the objectives

UNIT II INTRODUCTION TO RESEARCH METHODOLOGY (6 Hrs)

Meaning and importance of Research – Types of Research – Selection and formulation of Research Problem Research Design – Need – Features – Inductive, Deductive and Development of models Developing a Research Plan .

UNITIII DATA COLLECTION AND ANALYSIS (6 Hrs)

Sources of Data – Primary, Secondary and Teritary – Types of Data – Categorical, nominal & Ordinal. Methods of Collecting Data : Observation, field investigations, Direct studies – Reports, Records or Experimental observations. Sampling methods – Data Processing and Analysis strategies

UNIT IV SCIENTIFIC WRITING (6 Hrs)

Structure and components of Scientific Reports – types of Report – Technical Reports and Thesis – Significance – Different steps in the preparation – Layout, structure and Language of typical reports - Illustrations and tables – Bibliography, Referencing and foot notes –Importance of Effective Communication.

UNIT V ETHICS (6 Hrs)

Ethical Issues – Ethical Committees – Commercialization – copy right – royalty – Intellectual Property rights and patent law – Track Related aspects of intellectual property Rights – Reproduction of published material – Plagiarism .

Text Books

1. Garg.B.L., Karadia, R., Agarwal,F. and Agarwal, U.K., 2002. An introduction to Research Methodology, RBSA Publishers.
2. Kothari, C.R.(2008). Research Methodology: Methods and Techniques. Second Edition. New Age International Publishers, New Delhi.
3. Sinha, S.C. and Dhiman, A.K., 2002. Research Methodology, Ess Ess Publications. 2 volumes.

Reference Books

1. Gupta S.P. (2008). Statistical Methods. 37 th ed. (Rev)Sultan Chand and Sons. New Delhi. 1470 p.
2. Leon & Leon (2202). Internet for everyone, Vikas Publishing House.
3. Wadehra, B.L.2000. Law relating to patents, trade marks, copyright designs and geographical indications. Universal Law Publishing.
4. Research Methodology Dr P M Bulakh,Dr P. S. Patki and Dr A S Chodhary 2010 Published by Expert Trading Corporation Dahisar West, Mumbai 400068

Web References

1. https://gradcoach.com/what-is-research-methodology/
2. https://www.guide2research.com/research/how-to-write-research-methodology
3. https://www.tutorialspoint.com/thematic_apperception_test/thematic_apperception_test_research_methods.htm
4. https://www.wisdomjobs.com/e-university/research-methodology-tutorial-355.html

SCHOOL OF ARTS AND SCIENCE

Department of Computational Studies

Bachelor of Computer Application

Minutes of 4th meeting of Board of Studies

Annexure - III

DISCIPLINE SPECIFIC ELECTIVE COURSES

DISCIPLINE SPECIFIC ELECTIVE COURSES										
Sl. No	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Discipline Specific Elective (DSE - I) – offered in Third Semester										
1	A20CPE301	Introduction to Data Science using Hadoop	DSE	3	-	-	3	25	75	100
2	A20CAE302	Data Mining and Warehousing	DSE	3	-	-	3	25	75	100
3	A20CAE303	Computer Graphics And Multimedia	DSE	3	-	-	3	25	75	100
Discipline Specific Elective (DSE - II) – offered in Fourth Semester										
1	A20CAE404	MANET	DSE	3	-	-	3	25	75	100
2	A20CAE405	Data Science and Analytics	DSE	3	-	-	3	25	75	100
3	A20CAE406	Animations and Game Development	DSE	3	-	-	3	25	75	100
Discipline Specific Elective (DSE - III) – offered in Fifth Semester										
1	A20CAE507	E- Commerce	DSE	3	-	-	3	25	75	100
2	A20CAE508	Cloud Computing Fundamentals	DSE	3	-	-	3	25	75	100
3	A20CAE509	Cyber Security and Digital Forensics	DSE	3	-	-	3	25	75	100
Discipline Specific Elective (DSE - IV) – offered in Sixth Semester										
1	A20CAE610	Python for Data Science	DSE	3	-	-	3	25	75	100
2	A20CAE611	Wireless Sensor Networks	DSE	3	-	-	3	25	75	100
3	A20CAE612	Computer Hardware and Network Trouble Shooting	DSE	3	-	-	3	25	75	100