E.M.G. YADAVA WOMEN'S COLLEGE, MADURAI – 625 014.

(An Autonomous Institution – Affiliated to Madurai Kamaraj University)
Re-accredited **(3rd Cycle)** with Grade **A+** & **CGPA 3.51** by NAAC

DEPARTMENT OF COMPUTER APPLICATIONS

CBCS With OBE

BACHELOR OF SCIENCE

PROGRAMME CODE - J

COURSE STRUCTURE

(w.e.f. 2022 – 2023 Batch onwards)

E.M.G. YADAVA WOMEN'S COLLEGE, MADURAI -14.
(An Autonomous Institution – Affiliated to Madurai Kamaraj University)
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DEPARTMENT OF COMPUTER APPLICATIONS – UG
CBCS with OBE
COURSE STRUCTURE
(w.e.f. 2022 – 2023 Batch onwards)

Semester	Part	Course Code	Title of the Course	Teaching hrs (per week)	Duration of Exam (hrs.)	Marks allotted			Credits
						CIA	S.E	Total	
I	I	22OU1TA1	Tamil	6	3	25	75	100	3
	II	22OU2EN1	English	6	3	25	75	100	3
	III	22OUCA11	**Core :** Programming in C	4	3	25	75	100	4
	III	22OUCA1P	**Core :** Programming in C Lab	5	3	40	60	100	3
	III	22OUCAGECO1	**GEC** : Commerce – Financial Accounting	5	3	25	75	100	5
	IV	22OUCASE1P	**SEC :**Office Automation Lab	2	2	40	60	100	2
	IV	22OUCAID1	**IDC :** Working Principles of Internet	2	2	25	75	100	2
II	I	22OU1TA2	Tamil	6	3	25	75	100	3
	II	22OU2EN2	English	6	3	25	75	100	3
	III	22OUCA21	**Core :** Object Oriented Programming with C++	4	3	25	75	100	4
	III	22OUCA2P	**Core :** Object Oriented Programming with C++ Lab	5	3	40	60	100	3
	III	22OUCAGEMA2	**GEC:** Mathematics - 1-Probability and Statistics	5	3	25	75	100	5
	IV	22OUCASE2P	**SEC :** Multimedia Lab	2	2	40	60	100	2
	IV	22OUCAID2	**IDC :** Web Designing	2	2	25	75	100	2
III	I	22OU1TA3	Tamil	6	3	25	75	100	3
	II	22OU2EN3	English	6	3	25	75	100	3
	III	22OUCA31	**Core :** Java Programming	4	3	25	75	100	3
	III	22OUCA32	**Core:** Relational Database Management System	4	3	25	75	100	4
	III	22OUCA3P	**Core :** Java Programming Lab	3	3	40	60	100	3
	III	22OUCAGEMA3	**GEC** : Mathematics 2 - Numerical Methods	5	3	25	75	100	5
	IV	22OUCASE3P	**SEC :** RDBMS Lab	2	2	40	60	100	2
IV	I	22OU1TA4	Tamil	6	3	25	75	100	3
	II	22OU2EN4	English	6	3	25	75	100	3
	III	22OUCA41	**Core :** Data Structures and Computer Algorithms	4	3	25	75	100	3
	III	22OUCA42	**Core :** Data Communication and Computer Networks	3	3	25	75	100	3
	III	22OUCA4P	**Core :** Data Structures and Computer Algorithms Lab	4	3	40	60	100	4
	III	22OUCAGEMA4	**GEC :** Mathematics – 3- Resource Management Techniques	5	3	25	75	100	5
	IV	22OUCASE4P	**SEC :** Networking Lab	2	2	40	60	100	2

V	III	22OUCA51	**Core :** Python Programming	5	3	25	75	100	4
	III	22OUCA52	**Core :** Operating System	6	3	25	75	100	4
	III	22OUCA53	**Core :** Software Engineering	5	3	25	75	100	4
	III	22OUCA5P	**Core :** Python Programming Lab	5	3	40	60	100	3
	III		**DSEC I**	5	3	25	75	100	5
	IV	22OUCASE5P	**SEC :** Dot NET Programming Lab	2	2	40	60	100	2
	IV	22OUAECEV5	**AECC :** Environmental Studies	2	2	25	75	100	2
VI	III	22OUCA61	**Core :** Web Technology	6	3	25	75	100	4
	III	22OUCA62	**Core :** Big Data Analytics	5	3	25	75	100	4
	III	22OUCA6P	**Core :** Web Technology Lab	5	3	40	60	100	3
	III		**DSEC II**	5	3	25	75	100	5
	III		**DSEC III (Project)**	5	3	20	80	100	5
	IV	22OUCASE6P	**SEC -** Data Mining Lab	2	2	40	60	100	2
	IV	22OUAECVE6	**AECC -** Value Education	2	2	25	75	100	2
	PART V	22OU5NS4 /22OU5PE4	Extension Activities N.S.S / Phy. Education	-	2	25	75	100	1
			Total	180				-	140

DSEC- Discipline Specific Elective Course:
Semester - V

DSEC - I - (Choose any one)
1. Computer Graphics   **- 22OUCADSE5A**
2. Cloud Computing   **- 22OUCADSE5B**

Semester - VI

DSEC – II - (Choose any one)
1. Data Mining   **-22OUCADSE6A**
2. Internet of Things   **-22OUCADSE6B**

DSEC III
1.Project   **- 22OUCADSEPR6**

GEC   – Generic Elective Courses
SEC   – Skill Enhancement Course
IDC   – Inter Disciplinary Course
AECC – Ability Enhancement Compulsory Course
DSEC – Discipline Specific Elective Course

NOTE:

   The students are permitted to obtain additional credits (Optional)

   1.   MOOCs / SWAYAM / NPTEL Courses (Online)

Department of Computer Applications				Class: III B.C.A				
Sem	Category	Course Code	Course Title	Credits	Hours/ Week	CIA	External Exam	Total
V	Core	22OUCA51	**Python Programming**	4	5	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	**Employability Oriented**	**Entrepreneurship oriented**
✔	✔	✔

Course Objectives:

1. Understand the Basics of Python programming
2. Apply the Operators and Expressions to solve the mathematical problems.
3. Analyze different types of Loop Control Statements
4. Studies the concept of Strings.
5. Comprehend the Object-Oriented Programming

Course Content:

Unit-I Introduction to Computer and Python Programming: History of Python – Installing Python in Ubuntu - Executing Python Programs – Commenting in Python – Internal Working of Python – Python Implementations. **Basics of Python programming:** Python Character Set – Token – Python Core Data Type – The print ( ) Function – Assigning Value to a Variable – Multiple Assignments – Writing Simple Program in Python – The input( ) Function – The eval ( ) Function – Formatting Number and Strings – Python Inbuilt Functions.

Unit-II Operators and Expressions: Introduction – Operators and Expressions – Arithmetic Operators Precedence and Associativity – Changing Precedence and Associativity – Translating Mathematical Formulae into Equivalent Python Expressions – Bitwise Operator – The Compound Assignment Operator. **Decision Statements:** Introduction – Boolean Type – Boolean Operators – Using Numbers with Boolean Operators – Using String with Boolean Operators – Boolean Expressions and Relational Operators – Decision Making Statements – Conditional Expressions.

Unit-III Loop Control Statements: Introduction – The while Loop – The range ( ) Function – The for Loop – Nested Loops – The break Statement – The continue Statement. **Functions:** Introduction – Syntax and Basics of a Function – Use of a Function – Parameters and Arguments

in a Function – The Local and Global Scope of a Variable - The return Statement – Recursive Functions.

Unit-IV Strings: Introduction – The str class – The String Operators – String Operations. **Lists:** Introduction – Creating Lists – Accessing the Elements of a List – Negative List Indices – List Slicing [Start: end] – List Slicing with Step Size – Python Inbuilt Functions for Lists – The List Operator

Unit-V Object-Oriented Programming: Class, Object and Inheritance: Introduction – Defining Classes –The Self-parameter and Adding Methods to a Class – Display Class Attributes and Methods – Special Class Attributes – Accessibility – The_init_Method (Constructor) - Passing an Object as Parameter to a Method - _del_( ) (Destructor Method) – Class Membership Tests – Method Overloading in Python – Operator Overloading – Inheritance – Types of Inheritance – Method Overriding. **Tuples, Sets and Dictionaries:** Introduction to Tuples – Sets.

Book for Study:

Ashok Namdev kamthane Amit Ashok Kamthane, Programming and Problem Solving with PYTHON, Published McGraw hill Education (India) Private Limited

Chapters:

Unit- I	**:** 1.2, 1.4 to 1.9, 2.2, to 2.12.
Unit- II	**:** 3.1 to 3.8, 4.1 to 4.8.
Unit- III	**:** 5.1 to 5.7, 6.1 to 6.7.
Unit- IV	**:** 7.1, 7.2, 7.7, 7.8, 8.1, to 8.8
Unit- V	**:**, 10.1 to 10.14, 10.21,11.1,11.2.

Books for References:

1. Charles Dierbach,(2015), "*Introduction to Computer Science using Python*", Wiley.

2. Downey, A. et al., (2015), "*How to think like a Computer Scientist: Learning with Python"*, John Wiley, 2015

3. Sheetal Taneja & Naveen kumar, (2017), Python Programming a Modular approach – A Modular approach with Graphics, Database, Mobile and Web applications, Pearson,

Web Resources/ E.Books:

1. https://cstutorialpoint.com/python-notes/

2. https://www.webpages.uidaho.edu/~stevel/504/Python%20Notes.pdf

3. https://www.rgmcet.edu.in/assets/img/departments/CSE/materials/R19/2-1/Python.pdf

Pedagogy:

Chalk and Talk, PPT, group discussion, quiz, ICT tools and Peer Teaching.

Rationale for nature of Course:

Knowledge and Skill: To make students aware of the role of Programming skill in Python and improve their program writing in Python Programming

Activities to be given: Students shall be allow to write python program in many concepts

Course Learning Outcomes (CLO's):

CLO	Course Outcomes Statement	Knowledge According to Bloom's Taxonomy (Up to K level)
CLO1	Understand the Basics of Python programming	K1 to K3
CLO2	Study the Various in decision Statements	K1 to K3
CLO3	Apply knowledge to develop python Programs by implementing loop Control Statements	K1 to K3
CLO4	Identify Strings used in python programs	K1 to K4
CLO5	Analyze the Concept of Tuples, Sets and Dictionaries.	K1 to K4

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

	PO1	PO2	PO3	PO4	PO5	PO6
CLO1	2	1	1	2	2	2
CLO2	3	3	2	3	2	1
CLO3	3	2	2	3	2	2
CLO4	2	3	2	3	2	1
CLO5	2	2	3	3	2	1

1-Basic Level   2- Intermediate Level   3- Advanced Leve

LESSON PLAN: TOTAL HOURS (75 HRS)

UNIT	DESCRIPTION	HRS	MODE
I	Introduction to Computer and Python Programming: History of Python – Installing Python in Ubuntu - Executing Python Programs – Commenting in Python – Internal Working of Python – Python Implementations. Basics of Python programming: Python Character Set – Token – Python Core Data Type – The print ( ) Function – Assigning Value to a Variable – Multiple Assignments – Writing Simple Program in Python – The input( ) Function – The eval ( ) Function – Formatting Number and Strings – Python Inbuilt Functions.	15	Chalk and Talk, PPT, group discussion , quiz, on the spot test
II	Operators and Expressions: Introduction – Operators and Expressions – Arithmetic Operators Precedence and Associativity – Changing Precedence and Associativity – Translating Mathematical Formulae into Equivalent Python Expressions – Bitwise Operator – The Compound Assignment Operator. Decision Statements: Introduction – Boolean Type – Boolean Operators – Using Numbers with Boolean Operators – Using String with Boolean Operators – Boolean Expressions and Relational Operators – Decision Making Statements – Conditional Expressions.	15	Chalk and Talk, PPT, group discussion, quiz, on the spot test

III	Loop Control Statements: Introduction – The while Loop – The range ( ) Function – The for Loop – Nested Loops – The break Statement – The continue Statement. Functions: Introduction – Syntax and Basics of a Function – Use of a Function – Parameters and Arguments in a Function – The Local and Global Scope of a Variable - The return Statement – Recursive Functions.	15	Chalk and Talk, PPT, group discussion, quiz, on the spot test
IV	Strings: Introduction – The str class – The String Operators – String Operations. Lists: Introduction – Creating Lists – Accessing the Elements of a List – Negative List Indices – List Slicing [Start: end] – List Slicing with Step Size – Python Inbuilt Functions for Lists – The List Operator	16	Chalk and Talk, PPT, group discussion, quiz, on the spot test
V	Object-Oriented Programming: Class, Object and Inheritance: Introduction – Defining Classes –The Self-parameter and Adding Methods to a Class – Display Class Attributes and Methods – Special Class Attributes – Accessibility – The_init_Method (Constructor) - Passing an Object as Parameter to a Method - _del_( ) (Destructor Method) – Class Membership Tests – Method Overloading in Python – Operator Overloading – Inheritance – Types of Inheritance – Method Overriding. Tuples, Sets and Dictionaries: Introduction to Tuples – Sets.	14	Chalk and Talk, PPT, group discussion, quiz, on the spot test

Course Designer

Dr.(Mrs.) S. VIJAYASANKARI

Department of Computer Applications				Class: III B.C.A				
Sem	Category	Course Code	Course Title	Credits	Hours/ Week	CIA	External Exam	Total
V	Core	**22OUCA52**	**Operating System**	4	6	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	**Employability Oriented**	**Entrepreneurship oriented**
✔	✔	

Course Objectives:

1. Understand the basic concepts of Operating system.
2. Study the Process concepts and Threads
3. Analyze different methods of Deadlocks and CPU Scheduling
4. Study the Memory Management concepts
5. Comprehend the File concepts

Course Content:

Unit- I Introduction: What Operating Systems Do-Computer System Organization-Computer System Architecture-Operating System Structure-Operating System Operations-Process Management – Memory management – Storage Management – Protection and Security – Kernal Data structures. **Operating System Structures**: Operating System Services- User Operating System Interface-System Calls-Types of System Calls-System Programs.

Unit- II Processes: Process Concept-Process Scheduling-Operation on process- Inter process communication- Examples of IPC Systems-Communication in Client Server Systems- **Threads**: Overview-Multi Core Programming – Multithreading Models-Thread Libraries.

Unit- III Process Scheduling: Basic concepts- Scheduling Criteria-Scheduling algorithms. Thread Scheduling**. Process Synchronization:** The Critical Section Problem – Peterson's solution- Semaphores- Monitors. **Deadlocks:** Deadlock Characterization – Methods of Handling Deadlocks – Deadlock Prevention – Deadlock Avoidance.

Unit- IV Memory- Management Strategies: Swapping-Contiguous Memory allocation-Segmentation-Paging-Structure of the Page Table. **Virtual Memory Management**: Background-Demand Paging-Copy on Write-Page Replacement-Allocation of Frames – Thrashing.

Unit-V File System Interface: File concepts -Access methods**. Implementing File- Systems:** File System Structure-Allocation Methods-Free Space Management. **Mass Storage Structure:** Overview of Mass Storage Structure-Disk structure- Disk Scheduling-Disk Management-Swap Space Management.

Book for Study:

Silberschatz Galvin, (2011), Operating System Concepts, John Wiley & Sons, New Delhi, 9th Edition.

Chapters:

Unit- I   : 1.1 to 1.10, 2.1 to 2.5

Unit- II   : 3.1 to 3.6, 4.1 to 4.4 .

Unit- III   : 5.1 to 5.4, 6.2,6.3,6.6,6.8,7.2 – 7.5

Unit- IV   : 8.2 to 8.6, 9.1 -9.6

Unit- V   : 10.1, 10.2, 11.1, 11.4, 11.5, 12.1, 12.2,12.4 to 12.6,

Books for References:

1. Achyut Godbole S, (2010), *Operating Systems*, Tata McGraw Hill Education, India, 3rd Edition.
2. Dhamdhere D M, (2010), *Operating systems (A concept- based approach),* Tata McGraw HillEducation, India, 2nd Edition.
3. Milan MilenKovic,(2010).*Operating System-Concepts and Design,* Tata McGraw HillEducation, India, 2nd Edition.

Web Resources/ E.Books:

1. https://www.techtarget.com/whatis/definition/operating-system-OS

2. https://www.scribd.com/document/29399825/7-References

3. https://www.cs.auckland.ac.nz/~alan/courses/os/book/7.References.pdf

Pedagogy:

Chalk and Talk, PPT, group discussion, quiz, ICT tools and Peer Teaching.

Rationale for nature of Course:

Knowledge and Skill: To make students to learn to operating system concepts

Activities to be given: Students shall be allow to operating system concepts and skills is to use a blended approach that combines theory and practice.

Course Learning Outcomes (CLO's):

CLO	Course Outcomes Statement	Knowledge According to Bloom's Taxonomy (Up to K level)
CLO1	Understand the basic concepts of Operating system.	K1 to K3
CLO2	Study the Process concepts and Threads	K1 to K3
CLO3	Apply knowledge to Analyze different methods of Deadlocks and CPU Scheduling	K1 to K4
CLO4	Identify how to create and manage Memory Management concepts	K1 to K4
CLO5	Analyze and Comprehend the File concepts	K1 to K4

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

	PO1	PO2	PO3	PO4	PO5	PO6
CLO1	2	1	1	2	2	2
CLO2	3	3	2	3	2	1
CLO3	3	2	2	3	2	2
CLO4	2	3	2	3	2	1
CLO5	2	2	3	3	2	1

1-Basic Level   2- Intermediate Level   3- Advanced Level

LESSON PLAN: TOTAL HOURS (90 HRS)

UNIT	DESCRIPTION	HRS	MODE
I	Introduction: What Operating Systems Do- Computer System Organization-Computer System Architecture-Operating System Structure-Operating System Operations- Process Management – Memory management – Storage Management – Protection and Security – Kernal Data structures. Operating System Structures: Operating System Services- User Operating System Interface-System Calls- Types of System Calls-System Programs.	18	Chalk and Talk, PPT, group discussion , quiz, on the spot test
II	Processes: Process Concept-Process Scheduling-Operation on process- Inter process communication- Examples of IPC Systems-Communication in Client Server Systems- Threads: Overview- Multi Core Programming – Multithreading Models-Thread Libraries.	18	Chalk and Talk, PPT, group discussion, quiz, on the spot test
III	Process Scheduling: Basic concepts- Scheduling Criteria-Scheduling algorithms. Thread Scheduling. Process Synchronization: The Critical Section Problem – Peterson's solution- Semaphores- Monitors. Deadlocks: Deadlock Characterization – Methods of Handling Deadlocks – Deadlock Prevention – Deadlock Avoidance.	16	Chalk and Talk, Group discussion

IV	Memory- Management Strategies: Swapping-Contiguous Memory allocation- Segmentation-Paging-Structure of the Page Table. Virtual Memory Management: Background-Demand Paging-Copy on Write-Page Replacement-Allocation of Frames – Thrashing.	18	Chalk and Talk, PPT, group discussion, quiz
V	File System Interface: File concepts - Access methods. Implementing File-Systems: File System Structure-Allocation Methods-Free Space Management. Mass Storage Structure: Overview of Mass Storage Structure-Disk structure- Disk Scheduling-Disk Management-Swap Space Management.	20	Seminar

Course Designer
MRS.R. KEERTHANA

Department of Computer Applications				Class: III B.C.A				
Sem	Category	Course Code	Course Title	Credits	Hours/ Week	CIA	External Exam	Total
V	Core	22OUCA53	Software Engineering	4	5	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✔	✔	

Course Objectives:

1. Study the basics of concepts of Software engineering
2. Understand the requirements modeling
3. To Provide Design concepts, Architecture design.
4. Apply the Review Techniques and Software quality assurance
5. Analyze the concept of Project Scheduling, Risk Management.

Course Content:

Unit -I Software and Software Engineering: The Nature of Software – Software Engineering– The Software Process- **Process Models:** A Generic Process Model Process Assessment and Improvement–PrescriptiveProcessModels–SpecializedProcessModels–TheUnifiedProcess – Personal and Team Process Models. **Agile Development:** What is Agility? – Agility and the Cost of Change – What is an Agility process?

Unit-II Understanding Requirements: Requirements Engineering – Establishing the Groundwork -Eliciting Requirements - Developing Use Cases. **Requirements Modeling**: Requirements Analysis – Data Modeling Concepts – Class-Based Modeling.

Unit -III Design Concepts: Design Concepts -The Design Model. **Architectural design**: Architectural Design. **Component–level Design**: What is a Component? –Designing Class-Based Components – Components-Level Design for Web Apps. **User Interface Design:** User Interface Analysis and Design.

Unit- IV Review Techniques: Informal Reviews- Formal Technical Reviews-**Software Quality Assurance:** SQA Tasks, Goals and Metrics-Software Reliability – The ISO 9000 Quality Standards - The SQA Plan. **Software Testing Strategies:** A Strategic Approach to Software Testing –Test Strategies for conventional Software- Validation Testing-System Testing – The Art of Debugging.

Software Configuration Management: Software Configuration Management – The SCM Repository – The SCM Process.

Unit –V Estimation for Software Projects: Software Project Estimation - Empirical Estimation Models. **Project Scheduling:** Project Scheduling – Defining a Task Set for the Software Project – Defining a Task Network – Scheduling. **Risk Management:** Software Risk – Risk Identification – Risk Projection – Risk Refinement–Risk Mitigation, Monitoring and management-The RMMM Plan.

Book for Study:

Roger Pressman S, (2010), Software Engineering: A Practitioner's Approach Mc Graw Hill Education, New Delhi, 6th Edition.

Chapters:

Unit I	**:** 1.1, 1.3, 1.4, 2.1 to 2.6, 3.1 to 3.3.
Unit II	**:** 5.1 to 5.4, 6.1, 6.4, 6.5.
Unit III	**:** 8.3, 8.4, 9.4, 10.1, 10.2, 10.4, 11.2.
Unit IV	**:** 15.5, 15.6, 16.3, 16.6 to 16.8, 17.1, 17.3, 17.6 to 17.8, 22.1 to 22.3
Unit V	**:** 26.5, 26.7, 27.2 to 27.5, 28.3 to 28.7

Books for References:

1. Aggarwal K K & Yogesh Singh, (2007), Software Engineering, New Age International, New Delhi, 2ndEdition.

2. Ian Sommerville,(2009) Software Engineering, Pearson education Asia, Hong Kong, 6thEdition.

3. James Peters F &Witold Pedryez , (2007),Software Engineering – An Engineering Approach, John Wiley and Sons, New Delhi, 2ndEdition.

Web Resources/ E.Books:

1. https://www.vssut.ac.in/lecture_notes/lecture1428551142.pdf

2. https://www.geeksforgeeks.org/software-engineering/

3. https://www.javatpoint.com/software-engineering

Pedagogy:

Chalk and Talk, PPT, group discussion, quiz, ICT tools and Peer Teaching.

Rationale for nature of Course:

Knowledge and Skill: To make students aware of the Software engineers apply engineering principles and knowledge of programming languages to build software solutions for end users.

Activities to be given: Students shall be allow to design and implementation validation.

Course Learning Outcomes (CLO's):

CLO	Course Outcomes Statement	Knowledge According to Bloom's Taxonomy (Up to K level)
CLO1	Understand the Basic concept of Software Engineering	K1 to K3
CLO2	Study the Various Requirements Modeling	K1 to K3
CLO3	Apply Design Concepts, Component – Level Design and User Interface Design	K1 to K4
CLO4	Identify the Review Techniques and Software Testing Strategies	K1 to K4
CLO5	Analyze the Software Projects for estimation and Project Scheduling	K1 to K4

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

	PO1	PO2	PO3	PO4	PO5	PO6
CLO1	2	1	1	2	2	2
CLO2	3	2	2	3	2	1
CLO3	3	2	2	3	2	2
CLO4	2	3	2	3	2	1
CLO5	2	2	3	3	2	1

1-Basic Level   2- Intermediate Level   3- Advanced Level

LESSON PLAN: TOTAL HOURS (75 HRS)

UNIT	DESCRIPTION	HRS	MODE
I	Software and Software Engineering: The Nature of Software – Software Engineering–The Software Process-Process Models: A Generic Process Model Process Assessment and Improvement–Prescriptive Process Models Specialized Process Models–The Unified Process – Personal and Team Process Models. Agile Development: What is Agility? – Agility and the Cost of Change – What is an Agility process?.	15	Chalk and Talk, PPT, group discussion , quiz, on the spot test
II	Understanding Requirements: Requirements Engineering – Establishing the Groundwork -Eliciting Requirements - Developing Use Cases. Requirements Modeling: Requirements Analysis – Data Modeling Concepts – Class-Based Modeling.	14	Chalk and Talk, PPT, group discussion , quiz, on the spot test
III	Design Concepts: Design Concepts -The Design Model. Architectural design: Architectural Design. Component –Level Design: What is a Component?–Designing Class-Based Components – Components-Level Design for Web Apps. User Interface Design: User Interface Analysis and Design.	12	Chalk and Talk, PPT, group discussion , quiz, on the spot test

IV	Review Techniques: Informal Reviews-Formal Technical Reviews-Software Quality Assurance: SQA Tasks, Goals and Metrics-Software Reliability – The ISO 9000 Quality Standards - The SQA Plan. Software Testing Strategies: A Strategic Approach to Software Testing –Test Strategies for conventional Software-Validation Testing-System Testing – The Art of Debugging. Software Configuration Management: Software Configuration Management – The SCM Repository – The SCM Process.	18	Chalk and Talk, PPT, group discussion , quiz, on the spot test
V	Estimation for Software Projects: Software Project Estimation - Empirical Estimation Models. Project Scheduling: Project Scheduling – Defining a Task Set for the Software Project – Defining a Task Network – Scheduling. Risk Management: Software Risk – Risk Identification – Risk Projection – Risk Refinement–Risk Mitigation, Monitoring and management-The RMMM Plan.	16	Chalk and Talk, PPT, group discussion , quiz, on the spot test

Course Designer
MRS. K. KRISHNAVENI

Department of Computer Applications				Class : III B.C.A				
Sem	**Category**	**Course Code**	**Course Title**	**Credits**	**Hours/ Week**	**CIA**	**External Exam**	**Total**
V	Core	**22OUCA5P**	**Python Programming Lab**	3	5	40	60	100

Nature of the Course		
Knowledge and Skill Oriented	**Employability Oriented**	**Entrepreneurship Oriented**
✔	✔	✔

PROGRAM LIST

1. Program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user's choice.

2. Program to calculate total marks, percentage and grade of a student. Marks obtained in each of the five subjects are to be input by user. Assign grades according to the following criteria:
 Grade A: Percentage >=80 Grade B: Percentage >=70 and <80
 Grade C: Percentage >=60 and <70 Grade D: Percentage >=40 and <60
 Grade E: Percentage <40

3. Program, using user-defined function to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.

4. Program to display the first n terms of Fibonacci series.

5. Program to find factorial of the given number.

6. Write a Python program to count the number of even and odd numbers from N numbers.

7. Python function that accepts a string and calculate the number of upper case letters and lower case letters.

8. Python program to reverse a given string and check whether the give string palindrome or not.

9. Write a program to find sum of all items in a dictionary.

10. Write a Python program to construct the following pattern, using a nested loop
1
22
333
4444
55555
666666
7777777
88888888
999999999

11. Print the first 2 and first 3 Characters in a given String using string slicing.

12. Write a program that eliminates duplicates in a list.

13. Implement shallow copy and deep copy of a list.

14. Find the largest of n numbers, using a user defined function largest ().

15. Write a function that capitalizes all vowels in a string.

16. Read a line containing digits and letters. Write a program to give the count of digits and letters.

17. Write a function myReversal() which receives a string as an input and returns the reverse of the string.

18. Use the list comprehension methodology in Python to generate the squares of all odd numbers in a given list

19. Define a class with three methods: readString(), printString(), writeString() The first method should read the contents of a file. The second method should print the contents to the console. The third method should write the contents to a new file.

20. Create a class account which has constructor to input account number, name, balance from user. It must have functionsprint accounts() to display the account details / deposit() to deposit amount /with draw() to withdraw amount

Books for Reference:

1. Comer,(2004), Computer Networks & Internet with Internet Applications, 4th edition Pearson Education, Pearson Prentice Hall, NewDelhi ,

2. Achyut s Godbole , Atul Kahate, (2013) , Data Communications And Networks 2nd Editon, Tata McGraw Hill , 2nd Edition.

3. Simin Haykins S, (2006) , Communication System,4th Edition Tata McGraw- Hill, New Delhi,

Web Resources/ E.Books:

1. https://www.scribd.com/document/531794678/DCN-Lab-Manual-JNUH-Hyderabad

2. http://iotmumbai.bharatividyapeeth.edu/media/pdf/lab_manuals/Manual_CM4I_DCC_22414_120421.pdf

3. https://www.studocu.com/row/document/unknown/data-communication/dcn-lab-manual-data-communication/10436159

Pedagogy

Practical Test with viva voce, Group Discussion, Interaction, Quiz.

LESSON PLAN FOR PRACTICAL: TOTAL HOURS (75 HRS)

CYCLE	DESCRIPTION	HRS	MODE
1	1. Program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user's choice. 2. Program to calculate total marks, percentage and grade of a student. Marks obtained in each of the five subjects are to be input by user. Assign grades according to the following criteria: Grade A: Percentage >=80 Grade B: Percentage >=70 and <80 Grade C: Percentage >=60 and <70 Grade D: Percentage >=40 and <60 Grade E: Percentage <40 3. Program, using user-defined function to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user. 4. Program to display the first n terms of Fibonacci series. 5. Program to find factorial of the given number.	15	Writing and executing the program in a system
2	6. Write a Python program to count the number of even and odd numbers from N numbers. 7. Python function that accepts a string and calculate the number of upper case letters and lower case letters. 8. Python program to reverse a given string and check whether the give string palindrome or not. 9. Write a program to find sum of all items in a dictionary.	15	Writing and executing the program in a system

3	10. Write a Python program to construct the following pattern, using a nested loop 1 22 333 4444 55555 666666 7777777 88888888 999999999 11. Print the first 2 and first 3 Characters in a given String using string slicing. 12. Write a program that eliminates duplicates in a list.	16	Writing and executing the program in a system
4	13. Implement shallow copy and deep copy of a list. 14. Find the largest of n numbers, using a user defined function largest (). 15. Write a function that capitalizes all vowels in a string. 16. Read a line containing digits and letters. Write a program to give the count of digits and letters. 17. Write a function myReversal() which receives a string as an input and returns the reverse of the string.	14	Writing and executing the program in a system
5	18. Use the list comprehension methodology in Python to generate the squares of all odd numbers in a given list 19. Define a class with three methods: readString(), printString(), writeString() The first method should read the contents of a file. The second method should print the contents to the console. The third method should write the contents to a new file.	15	Writing and executing the program in a system

	20. Create a class account which has constructor to input account number, name, balance from user. It must have functionsprint accounts() to display the account details / deposit() to deposit amount /with draw() to withdraw amount		

Course Designer
MRS.G. ALAMELU

EVALUATION (PRACTICAL)
Core Lab / Skill Enhancement Course Lab

Internal (Formative)   : 40 marks

External (Summative)   : 60 marks

Total   : 100 marks

Question Paper Pattern for Internal Practical Examination: 40 Marks

✓ There will be Two Internal Practical Examination.
✓ Duration of Internal Examination will be 2 hours.

S.No	Components	Marks
1.	I – Writing the Program (2x8)	16
2.	II – Test and Debug the Program (2x4)	08
3.	III - Printing the Correct Output (2x4)	08
4.	IV- Viva	03
5.	V –Record book	05
	Total	**40**

Question Paper Pattern for External Practical Examination: 60 Marks
✓ Duration of External Examination will be 3 hours.

S.No	Components	Marks
1.	I – Writing the Program (2x10)	20
2.	II – Test and Debug the Program (2x10)	20
3.	III- Printing the Correct Output (2x5)	10
4.	IV – Viva	5
5.	V - Record book	5
	Total	**60**

Department of Computer Applications				Class: III B.C.A				
Sem	Category	Course Code	Course Title	Credits	Hours/ Week	CIA	External Exam	Total
V	DSEC	**22OUCADSE5A**	**Computer Graphics**	5	5	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	**Employability Oriented**	**Entrepreneurship oriented**
✔	✔	

Course Objectives:

1. Understand the concepts of Graphics system
2. Apply the Output Primitives and Filled area primitives
3. Analyze different types of Attributes of Output Primitives
4. Studies the concept of Two- Dimensional Geometric Transformations
5. Comprehend the Two –Dimensional Viewing

Course Content:

Unit- I   A Survey of computer graphics: Computer –Aided Design – Presentation Graphics – Computer Art – Entertainment – Education and Training – Visualization – Image Processing – Graphical user Interfaces. **Overview of Graphics system:** Video display devices- Refresh Cathode-Ray Tubes, Raster scan Displays, Random-Scan Displays, Color CRT Monitors, Direct-View Storage Tubes, Flat - Panal Displays, Three-Dimensional Viewing Devices, Stereoscopic and Virtual-Reality Systems- Raster-Scan Systems-Random-Scan Display Processor –Graphics Monitors and Workstations-Input Devices-Hard copy devices.

Unit-II Output Primitives: Points and lines-Line Drawing Algorithms: DDA Algorithm, Bresenham's Line Algorithm, Parallel Line Algorithms-Loading the frame buffer-Circle generating algorithms -Fill-Area Functions-Cell Array- Character Generation. **Attributes of Output Primitives:** Line attributes: Line Type, Line Width, Line Color-Color and Grayscale Levels-Area fill Attributes-Character Attributes-Bundled attributes-Antialising: Antialising Area Boundaries.

Unit- III Two- Dimensional Geometric Transformations: Basic Transformations: Translation-Rotation-Scaling-Matrix representations and Homogeneous Coordinates-Composite Transformations: Translations-Rotations-Scaling-General pivot point Rotation-General Scaling Directions-Concatenation Properties – Other Transformations.

Unit IV Two –Dimensional Viewing: The Viewing Pipeline-Window-to-View port Coordinate transformation-Two-Dimensional Viewing functions. Clipping Operations-Point clipping-Line clipping: Cohen-Sutherland Line Clipping, Liang- Barsky Line Clipping, Nicholle-Lee-Nicholl Line Clipping- Line Clipping using Non Rectangular – Clip Windows – Splitting Concave Polygon

Unit- V Polygon Clipping: Sutherland-Hodgeman Polygon Clipping – Weiler Atherton Polygon Clipping - Other Polygon Clipping Algorithms-Curve Clipping-Text clipping –Exterior Clipping.

Three-Dimensional Geometric and Modeling Transformations: Translation – Rotation – Scaling – Other Transformations – Composite Transformations – Three- Dimensional Transformation Functions – Modeling and Coordinate Transformations.

Book for Study:

Donald Hearn & Pauline Baker M (2017), Computer Graphics C version, Pearson Education, India, 2nd Edition.

Chapters:

> **Unit - I :** 1.1 to 1.8, 2.1 to 2.6
> **Unit - II :** 3.1,3.2,3.3, 3.5, 3.12 to 3.14,4.1,4.3,4.5,4.6,4.8
> **Unit - III :** 5.1-5.4.
> **Unit - IV :** 6.1,6.3,6.4,6.5,6.6,6.7
> **Unit - V :** 6.8, 11.1 to 11.7

Books for References:

1. Malay K. Pakhira, Computer Graphics, (2008) Multimedia and Animation –

Prentice Hall Of India Pvt.Ltd. , New Delhi .

2. D. P. Mukherjee,(2009), Fundamentals Of Computer Graphics And Multimedia Prentice Hall Of India Pvt.Ltd. , New Delhi – 1st Edition.

3. Peter Shirley, (2009),Fundamentals of Computer Graphics, A.K. Peters Ltd, Wellesley, United States, 3rd Edition.

Web Resources/ E.Books:

1. https://cstutorialpoint.com/python-notes/

2. https://www.webpages.uidaho.edu/~stevel/504/Python%20Notes.pdf

3. https://www.rgmcet.edu.in/assets/img/departments/CSE/materials/R19/2-1/Python.pdf

Pedagogy:

Chalk and Talk, PPT, group discussion, quiz, ICT tools and Peer Teaching.

Rationale for nature of Course:

Knowledge and Skill: To make students design skills and knowledge, Depending on the domain and application of computer graphics

Activities to be given: Students shall be allow to Create a dynamic 3D environment for a game where players can explore and interact with objects, characters, and surroundings

Course Learning Outcomes (CLO's):

CLO	Course Outcomes Statement	Knowledge According to Bloom's Taxonomy (Up to K level)
CLO1	Understand the Overview of Graphics system	K1 to K3
CLO2	Study the Filled area primitives	K1 to K3
CLO3	Apply knowledge to Attributes of Output Primitives	K1 to K4
CLO4	Identify Two- Dimensional Geometric Transformations	K1 to K4
CLO5	Analyze the Concept of Two –Dimensional Viewing	K1 to K4

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

	PO1	PO2	PO3	PO4	PO5	PO6
CLO1	2	1	1	2	2	2
CLO2	3	3	2	3	2	1
CLO3	3	2	2	3	2	2
CLO4	2	3	2	3	2	1
CLO5	2	2	3	3	2	1

1-Basic Level   2- Intermediate Level   3- Advanced Level

LESSON PLAN: TOTAL HOURS (75 HRS)

UNIT	DESCRIPTION	HRS	MODE
I	A Survey of computer graphics: Computer –Aided Design – Presentation Graphics – Computer Art – Entertainment – Education and Training – Visualization – Image Processing – Graphical user Interfaces. Overview of Graphics system: Video display devices- Refresh Cathode-Ray Tubes, Raster scan Displays, Random-Scan Displays, Color CRT Monitors, Direct-View Storage Tubes, Flat - Panal Displays, Three-Dimensional Viewing Devices, Stereoscopic and Virtual-Reality Systems-Raster-Scan systems-Random-Scan systems –Graphics Monitors and Workstations-Input Devices-Hard copy devices.	15	Chalk and Talk, PPT, group discussion , quiz, on the spot test
II	Output Primitives: Points and lines-Line Drawing Algorithms: DDA Algorithm, Bresenham's Line Algorithm, Parallel Line Algorithms-Loading the frame buffer-Circle generating algorithms -Fill-Area Functions-Cell Array- Character Generation. Attributes of Output Primitives: Line attributes: Line Type, Line Width, Line Color-Color and Grayscale Levels-Area fill Attributes-Character Attributes-Bundled attributes-Antialising: Antialising Area Boundaries.	12	Chalk and Talk, PPT, group discussion, quiz, on the spot test

III	Attributes of Output Primitives: Line attributes: Line Type, Line Width, Line Color-Color and grayscale levels-Area fill attributes-Character attributes-Bundled attributes-Antialising: Antialising Area Boundaries.	14	Chalk and Talk, PPT, group discussion, quiz, on the spot test
IV	Two- Dimensional Geometric Transformations: Basic Transformations: Translation- Rotation-Scaling-Matrix representations and homogeneous coordinates-Composite transformations: Translations-Rotations-Scaling-General pivot point Rotation-General Scaling Directions-Concatenation Properties. Structure & Hierarchical Modeling: Structure Concepts: Basic Structure Functions– Setting Structure Attributes– Editing Structures: Structure Lists and the Element Pointer– Setting the Edit Mode-Inserting Structure Elements-Replacing Structure Elements-Deleting Structure Elements-Labeling Structure Elements. Basic Modeling Concepts: Model Representations- Symbol Hierarchies-Modeling Packages.	18	Chalk and Talk, PPT, group discussion, quiz, on the spot test

V	Two –Dimensional Viewing: The Viewing Pipeline-Window-to-View port Coordinate transformation-Two-Dimensional Viewing functions-Clipping Operations-Point clipping-Line clipping: Cohen-Sutherland Line Clipping, Liang- Barsky Line Clipping, Nicholle-Lee-Nicholl Line Clipping- Line Clipping using Non Rectangular – Clip Windows – Splitting Concave Polygon -Polygon Clipping: Sutherland-Hodgeman Polygon Clipping – Weiler Atherton Polygon Clipping - Other Polygon Clipping Algorithms-Curve Clipping-Text clipping –Exterior Clipping	16	Chalk and Talk, PPT, group discussion, quiz, on the spot test

Course Designer
MRS. G. ALAMELU

Department of Computer Applications				Class: III B.C.A				
Sem	Category	Course Code	Course Title	Credits	Hours/ Week	CIA	External Exam	Total
V	DSEC	**22OUCADSE5B**	**Cloud Computing**	5	5	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	**Employability Oriented**	**Entrepreneurship oriented**
✔	✔	

Course Objectives:

1. To impart the knowledge on Cloud computing services

2. To study the concept of Recent Trends in Cloud Computing and Standards

3. To understand the concepts of the Application Architecture for Cloud

4. To apply the SLA with Cloud Service Providers and Virtualization

5. To design Mobile cloud applications.

Course Content:

Unit I Era of Cloud Computing: Getting to know the Cloud – Components of Cloud Computing – Cloud Types –Private, Public and Hybrid, Cloud Computing Service Delivery Models. **Cloud Computing Services –** Infrastructure as a Service(IaaS) – Platform as a Service(PaaS) – Leveraging PaaS for Productivity – Software as a Service(SaaS) – Database as a Service(DBaaS) – Specialized Cloud Services.

Unit-II Cloud Computing and Business Value : Key Drivers for Cloud Computing – Cloud Computing and Outsourcing – Types of Scalability – Distribution over the Internet. **Recent Trends in Cloud Computing and Standards :** Recent Trends in – Conflict of Interest for Public Cloud and IT Product Providers – Cloud Compliance – BYOD and Encryption Exposures – Cloud Standards – Cloud Ratings – Cloud Computing Trends that are Accelerating Adoption .

Unit-III Application Architecture for Cloud: Cloud Application Requirements – Architecture for Traditional Versus Cloud Applications – Fundamental Requirements for Cloud Application Architecture – Use of Client-Server Architecture for Cloud Applications – Addressing Cloud Application Performance and Scalability –Service Oriented Architecture (SOA) for Cloud Applications – Parallelization within Cloud Applications. **Cloud Programming :** Programming Support for Google Apps Engine – Programming Support for Amazon EC2.

Unit-IV Migrating Applications to the Cloud : Cloud Migration Techniques – Phase during Migration of an Application to the cloud – Cloud emulators and its use for Application Testing and Migration. **SLA with Cloud Service Providers :** The Concept of an SLA , SLA aspects and requirements – Service Availability – Cloud Outages – Credit Calculation for SLA Breaches – Sample SLA .

Unit-V Application Development for Cloud : Developing On-Premise Versus Cloud Applications – Modifying Traditional Application for Deployment in the Cloud – Stages during the Development Process of Cloud Application – Managing a Cloud Application – Using Agile Software Development for Cloud Applications – Static Code Analysis for Cloud Applications – Developing Synchronous and Asynchronous Cloud Applications. **Application Security in the Cloud :** Cloud Application Software Development Lifecycle(SDLC) – Cloud Service Reports by Providers – Application Security in an IaaS Environment - Application Security in an PaaS Environment - Application Security in an SaaS Environment .

Book for Study:

Kailash Jayawal , Jagannath Kallakurchi , Donald J.Houde , Dr. Deven Shah, (2014), Cloud Computing Black Book , Dreamtech Press , 1st Edition .

Chapters:

Unit - I	**:** 1, 3
Unit - II	**:** 4 ,9
Unit - III	**:** 12 , 13
Unit - IV	**:** 16, 18
Unit - V	**:** 24 , 25

Books for References:

1. Thomas Fri, Ricardo Puttini, Zaigham Mahmood, (2013). Cloud Computing: Concepts, Technology & Architecture, PHI.

2. Anthony T. Velte, Toby J. Velte, Robert Elsenpeter , (2009), Cloud Computing "A Practical Approach" Cloud Computing "A Practical Approach", McGraw-Hill Education Pvt Ltd.

3. Arshdeep Dahga , (2016)Vijay Madisetti , Cloud Computing A Hands – on Approach, Universities Press , Reprint.

Web Resources/ E.Books:

1. https://www.simplilearn.com/tutorials/cloud-computing-tutorial/cloud-computing-architecture
2. https://www.snhu.edu/about-us/newsroom/stem/what-is-cloud-computing
3. https://www.comptia.org/content/articles/what-is-cloud-computing

Pedagogy:

Chalk and Talk, PPT, group discussion, quiz, ICT tools and Peer Teaching.

Rationale for nature of Course:

Knowledge and Skill: To make students techniques and Applications of Cloud computing are widely used in programming. It helps to develop Cloud Application Development and Mobile Network.

Activities to be given: Students shall be allow to enabling real-time collaboration from anywhere in the world, cloud computing for education allows students to work together on assignments without physically present in the same classroom.

Course Learning Outcomes (CLO's):

CLO	Course Outcomes Statement	Knowledge According to Bloom's Taxonomy (Up to K level)
CLO1	Study about Introduction of Cloud models	K1 to K4
CLO2	Analysis recent trends in Cloud computing	K1 to K4
CLO3	Analyze concepts of Migrating of Cloud applications	K1 to K4
CLO4	Design and implement SLA service provider and virtualization	K1 to K4
CLO5	Describe the Mobile cloud applications	K1 to K4

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

	PO1	PO2	PO3	PO4	PO5	PO6
CLO1	3	2	3	3	2	1
CLO2	3	3	3	3	2	1
CLO3	3	3	3	2	2	2
CLO4	3	3	3	3	2	2
CLO5	3	3	3	3	2	1

1-Basic Level   2- Intermediate Level   3- Advanced Level

LESSON PLAN: TOTAL HOURS (75 HRS)

UNIT	DESCRIPTION	HRS	MODE
I	Era of Cloud Computing: Getting to know the Cloud – Components of Cloud Computing – Cloud Types –Private, Public and Hybrid, Cloud Computing Service Delivery Models. Cloud Computing Services – Infrastructure as a Service(IaaS) – Platform as a Service(PaaS) – Leveraging PaaS for Productivity – Software as a Service(SaaS) – Database as a Service(DBaaS) – Specialized Cloud Services	15	Chalk and Talk, PPT, group discussion , quiz, on the spot test
II	Cloud Computing and Business Value : Key Drivers for Cloud Computing – Cloud Computing and Outsourcing – Types of Scalability – Distribution over the Internet. Recent Trends in Cloud Computing and Standards : Recent Trends in – Conflict of Interest for Public Cloud and IT Product Providers – Cloud Compliance – BYOD and Encryption Exposures – Cloud Standards – Cloud Ratings – Cloud Computing Trends that are Accelerating Adoption .	14	Chalk and Talk, PPT, group discussion , quiz, on the spot test
III	Application Architecture for Cloud: Cloud Application Requirements – Architecture for Traditional Versus Cloud Applications – Fundamental Requirements for Cloud Application Architecture – Use of Client-Server Architecture for Cloud Applications – Addressing Cloud	12	Chalk and Talk, PPT, group discussion , quiz, on the spot test

	Application Performance and Scalability – Service Oriented Architecture (SOA) for Cloud Applications – Parallelization within Cloud Applications. Cloud Programming : Programming Support for Google Apps Engine – Programming Support for Amazon EC2.		
IV	Migrating Applications to the Cloud : Cloud Migration Techniques – Phase during Migration of an Application to the cloud – Cloud emulators and its use for Application Testing and Migration. SLA with Cloud Service Providers : The Concept of an SLA , SLA aspects and requirements – Service Availability – Cloud Outages – Credit Calculation for SLA Breaches – Sample SLA .	16	Chalk and Talk, PPT, group discussion , quiz, on the spot test
V	Application Development for Cloud : Developing On-Premise Versus Cloud Applications – Modifying Traditional Application for Deployment in the Cloud – Stages during the Development Process of Cloud Application – Managing a Cloud Application – Using Agile Software Development for Cloud Applications – Static Code Analysis for Cloud Applications – Developing Synchronous and Asynchronous Cloud Applications. Application Security in the Cloud : Cloud Application Software Development Lifecycle(SDLC) – Cloud Service Reports by Providers – Application Security in an IaaS Environment - Application Security in	18	Chalk and Talk, PPT, group discussion , quiz, on the spot test

an PaaS Environment - Application Security in an SaaS Environment .		

Course Designer
MRS. K. KRISHNAVENI

Department of Computer Applications				Class : III B.C.A				
Sem	Category	Course Code	Course Title	Credits	Hours/ Week	CIA	External Exam	Total
V	SEC	22OUCASE5P	Dot NET Programming Lab	2	2	40	60	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship Oriented
✓	✔	✔

PROGRAM LIST

Window Applications:
1. Mathematical Functions using ComboBox
2. Change Font and color of text using Dialog Controls
3. Pressure and Sugar level using Track Bar
4. Date of birth Calculation using DateTimePicker
5. Accessing a Web page using LinkLabel
6. Add or Remove Items using ListBox
7. ZoomIn and ZoomOut an image using MouseEvents
8. Word pad Manipulation using MenuStrip
9. Filterdata from Employee Database using OLEDB

Console Applications:
10. Determine Grade value using Control Statements
11. Matrix Summation using Arrays
12. Factorial of odd and even numbers using Functions
13. Display Rectangle Shape using Procedures
14. EB Bill calculation using Structures
15. Checking Password using Properties
16. Tribonacci Series using Inheritance
17. Standard Deviation of given elements using Delegates

Books for Reference:

1. "Programming in C#", E. Balagurusamy, 4th Edition, Tata McGraw-Hill, 2017.

2. "Visual Basic.NET", Shirish Chavan, 3rd Edition, Pearson Education, 2009.

3. "ASP.NET and VB.NET Web Programming", Matt J. Crouch, Edition 2012.

4. "Computing with C# and the .NET Framework", Arthur Gittleman, 2nd Edition, Jones & Bartlett Publishers, 2011

Web Resources/ E.Books:

1. https://ravithanki.wordpress.com/wp-content/uploads/2010/10/complete-reference-vb_net.pdf

2. https://www.vbtutor.net/vb2017/vb2017me_preview.pdf

3.https://online.visualchart.com/contentmanagement/development/manuals/en/vbnet_programming.pdf

Pedagogy

Practical Test with viva voce, Group Discussion, Interaction, Quiz.

LESSON PLAN FOR PRACTICAL: TOTAL HOURS (30 HRS)

CYCLE	DESCRIPTION	HRS	MODE
1	1.Mathematical Functions using ComboBox 2.Change Font and color of text using Dialog Controls 3.Pressure and Sugar level using Track Bar 4.Date of birth Calculation using DateTimePicker	6	Writing and executing the program in a system
2	5.Accessing a Web page using LinkLabel 6.Add or Remove Items using ListBox 7.ZoomIn and ZoomOut an image using MouseEvents 8.Word pad Manipulation using MenuStrip 9.Filterdata from Employee Database using OLEDB	5	Writing and executing the program in a system
3	10.Determine Grade value using Control Statements 11.Matrix Summation using Arrays 12.Factorial of odd and even numbers using Functions	6	Writing and executing the program in a system
4	13.Display Rectangle Shape using Procedures 14.EB Bill calculation using Structures 15.Checking Password using Properties	5	Writing and executing the program in a system
5	16.Tribonacci Series using Inheritance 17.Standard Deviation of given elements using Delegates	8	Writing and executing the program in a system

Course Designer
MRS.G. ALAMELU

EVALUATION (PRACTICAL)
Core Lab / Skill Enhancement Course Lab

Internal (Formative)   : 40 marks

External (Summative)   : 60 marks

Total   : 100 marks

Question Paper Pattern for Internal Practical Examination: 40 Marks

- ✓ There will be Two Internal Practical Examination.
- ✓ Duration of Internal Examination will be 2 hours.

S.No	Components	Marks
1.	I – Writing the Program (2x8)	16
2.	II – Test and Debug the Program (2x4)	08
3.	III - Printing the Correct Output (2x4)	08
4.	IV- Viva	03
5.	V –Record book	05
	Total	**40**

Question Paper Pattern for External Practical Examination: 60 Marks
- ✓ Duration of External Examination will be 3 hours.

S.No	Components	Marks
1.	I – Writing the Program (2x10)	20
2.	II – Test and Debug the Program (2x10)	20
3.	III- Printing the Correct Output (2x5)	10
4.	IV – Viva	5
5.	V - Record book	5
	Total	**60**

Department of Computer Applications				Class: III B.C.A				
Sem	Category	Course Code	Course Title	Credits	Hours/ Week	CIA	External Exam	Total
VI	Core	22OUCA61	Web Technology	4	6	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✔	✔	✔

Course Objectives:

1. Understand the basic concepts of HTML5.
2. Study the concepts and Cascading Style SheetsTM(CSS).
3. Analyze different methods of Scripting.
4. Study the SQL, MySQL, LINQ and Java DB concepts.
5. Comprehend the Simple PHP Program concepts.

Course Content:

Unit-I Introduction to HTML5: Part:1: Introduction-Editing HTML5-First HTML5 Example-W3C HTML5 Validation Service-Headings-Linking - Images: Alt Attribute- Void Elements – Using Images as Hyperlinks -Special Characters and Horizontal Rules-Lists-Tables-Forms-Internal Linking- **Introduction to HTML5: Part:2:** New HTML5 Form input Types.

Unit-II Introduction to Cascading Style SheetsTM(CSS): Part:1: Introduction –Inline Styles-Embedded Style Sheets-Conflicting Styles-Linking External Style Sheets-Positioning Elements: Absolute Positioning, Z-index-Positioning Elements: Relative Positioning, span-Backgrounds-**Introduction to Cascading Style Sheets TM(CSS): Part:2:** Text Shadows-Rounded Corners-Color-Box Shadows-Linear Gradients; Introducing Vendor Prefixes-Radial Gradients – (Optional: WebKit Only)Text Stroke-Multiple Background Images-(Optional: WebKit Only)Reflections-Image Borders-Animation; Selectors-Transitions and Transformations.

Unit-III JavaScript: Introduction to Scripting: Introduction-Your First Script: Displaying a Line of Text with JavaScript in a Web Page- **JavaScript: Functions :** Function Definitions- **JavaScript: Arrays:** Arrays- Declaring and Allocating Arrays- Passing Arrays to Functions-Multidimensional Arrays - **JavaScript: Objects:** String Objects-Date Object-Boolean and Number Objects-Document Object-Using JSON to Represent Objects

Unit-IV Database: SQL, MySQL, LINQ and Java DB : Introduction - Relational Databases - Relational Database Overview: A books Database - SQL - Basic SELECT Query - WHERE Clause - ORDER BY Clause - Merging Data from Multiple Tables: INNER JOIN - INSERT Statement - UPDATE Statement - DELETE Statement - MySQL - Instructions for Setting Up a MySQL User Account - Creating Databases in MySQL.

Unit-V PHP: Introduction-Simple PHP Program-Converting Between Data Types-Arithmetic Operators-Initializing and Manipulating Arrays-String Comparisons-String Processing with Regular Expressions.

Book for Study:

Paul Deitel, Harvey Deitel, Abbey Deitel, (2012), Internet & World Wide Web, How to Program, Pearson Edition, 5th Edition.

Chapters:

Unit - **I :** 2.1-2.12,3.2

Unit - **II :** 4.1-4.8,5.2-5.13

Unit – **III :** 6.1,6.2,9.3,10.2,10.3,10.7,10.10,11.3-11.6,11.8

Unit – **IV :** 18.1-18.5

Unit - **V :** 19.1-19.7

Books for References:

1.Dr. Vaka Murali Mohan , S. Pratap Singh , (2010), The Modern Approach to Web Technologies , Scirech Publication , 1st Edition.

2.Akilandeswari J & Gopalan NP, (2007), TCP/IP to Internet Application Architecture, PHI Publications, New Delhi,2nd Edition.

3.Ivan Bayross, Web Technologies part II, (2007), BPB publications, New Delhi, 2nd Edition.

Web Resources/ E.Books:

1. https://www.dcpehvpm.org/E-Content/BCA/BCA-II/Web%20Technology/the-complete-reference-html-css-fifth-edition.pdf

2. https://www.lpude.in/SLMs/Master%20of%20Computer%20Applications/Sem_2/DECAP 472_WEB_TECHNOLOGIES.pdf

3. http://seu1.org/files/level6/IT230/Book/(web.tech%201st%20book)%20Web%20Technologies%20-%20A%20Computer%20Science%20Perspective.pdf

Pedagogy:

Chalk and Talk, PPT, group discussion, quiz, ICT tools and Peer Teaching.

Rationale for nature of Course:

Knowledge and Skill: To make students to learn to web design, web publishing, web programming, and database management.

Activities to be given: Students shall be allowing to It gives us a way to interact with hosted information, like websites. Web technology involves the use of hypertext markup language (HTML) and cascading style sheets (CSS)

Course Learning Outcomes (CLO's):

CLO	Course Outcomes Statement	Knowledge According to Bloom's Taxonomy (Up to K level)
CLO1	Understand the basic concepts of HTML5.	K1 to K3
CLO2	Study the concepts and Cascading Style SheetsTM(CSS).	K1 to K4
CLO3	Analyze different methods of Scripting.	K1 to K4
CLO4	Study the SQL, MySQL, LINQ and Java DB concepts.	K1 to K4
CLO5	Comprehend the Simple PHP Program concepts.	K1 to K4

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

	PO1	PO2	PO3	PO4	PO5	PO6
CLO1	2	1	1	2	2	2
CLO2	3	3	2	3	2	1
CLO3	3	2	2	3	2	2
CLO4	2	3	2	3	2	1
CLO5	2	2	3	3	2	1

1-Basic Level   2- Intermediate Level   3- Advanced Level

LESSON PLAN: TOTAL HOURS (90 HRS)

UNIT	DESCRIPTION	HRS	MODE
I	Introduction to HTML5: Introduction-Editing HTML5-First HTML5 Example-W3C HTML5 Validation Service-Headings-Linking - Images: Alt Attribute- Void Elements – Using Images as Hyperlinks -Special Characters and Horizontal Rules-Lists-Tables-Forms-Internal Linking-New HTML5 Form input Types.	20	Chalk and Talk, PPT, group discussion , quiz, on the spot test
II	Introduction to Cascading Style SheetsTM (CSS): Introduction –Inline Styles-Embedded Style Sheets-Conflicting Styles-Linking External Style Sheets-Positioning Elements: Absolute Positioning, Z-index-Positioning Elements: Relative Positioning, span-Backgrounds-Text Shadows-Rounded Corners-Color-Box Shadows-Linear Gradients; Introducing Vendor Prefixes-Radial Gradients – (Optional: WebKit Only)Text Stroke-Multiple Background Images-(Optional: WebKit Only)Reflections-Image Borders-Animation; Selectors-Transitions and Transformations.	16	Chalk and Talk, PPT, group discussion, quiz, on the spot test
III	JavaScript: Introduction to Scripting: Introduction-Your First Script: Displaying a Line of Text with JavaScript in a Web Page- JavaScript: Function :	18	Chalk and Talk, Group discussion

	Function Definitions- JavaScript: Arrays: Arrays- Declaring and Allocating Arrays- Passing Arrays to Functions- Multidimensional Arrays - JavaScript: Objects: String Objects-Date Object-Boolean and Number Objects-Document Object-Using JSON to Represent Objects		
IV	Database: SQL, MySQL, LINQ and Java DB : Introduction - Relational Databases - Relational Database Overview: A books Database - SQL - Basic SELECT Query - WHERE Clause - ORDER BY Clause - Merging Data from Multiple Tables: INNER JOIN - INSERT Statement - UPDATE Statement - DELETE Statement - MySQL - Instructions for Setting Up a MySQL User Account - Creating Databases in MySQL.	18	Chalk and Talk, PPT, group discussion, quiz
V	PHP: Introduction-Simple PHP Program-Converting Between Data Types-Arithmetic Operators-Initializing and Manipulating Arrays-String Comparisons-String Processing with Regular Expressions.	18	Seminar

Course Designer
MRS.G.ALAMELU

Department of Computer Applications				Class: III B.C.A				
Sem	Category	Course Code	Course Title	Credits	Hours/ Week	CIA	External Exam	Total
VI	Core	**22OUCA62**	**Big Data Analytics**	4	5	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	**Employability Oriented**	**Entrepreneurship oriented**
✔	✔	

Course Objectives

1. To help companies make better business decisions by allowing scientists and other data users to analyze large volumes of transactional data.

2. To identify Potential Risks in business environment.

3. Big data allows businesses to deliver customized products to their targeted market.

4. Big data allows suppliers to use higher levels of contextual intelligence that is crucial for success.

5. Big data analytics helps organizations harness their data and use it to identify new opportunities.

Course Content:

Unit I Types of Digital Data: Classification of Digital Data – Structured data – Semi-Structured Data – Unstructured Data . **Introduction to Big Data –** Characteristics of Data – Evolution of Big Data – Definition of Big Data – Challenges with Big Data. **Big Data Analytics:** Beginning of Big Data – Concepts of Big Data Analytics–Big Data Analytics uses – Sudden Hype around Big data Analytics – Classification of Analytics - Top challenges facing Big Data – Data Science - Terminologies Used in Big Data Environment.

Unit II The Big Data Technology Landscape - NoSQL – Hadoop . **Introduction to Hadoop :** Introducing Hadoop – Basics of Hadoop – Reason for not using RDBMS - RDBMS versus Hadoop – Distributed Computing Challenges - History of Hadoop - Hadoop Overview - Use case of Hadoop - Hadoop Distributors – HDFS – Processing Data with Hadoop – Managing Resources and Applications with Hadoop YARN – Interacting with Hadoop Ecosystem.

Unit III Introduction to MongoDB: Concepts of MongoDB - Uses of MongoDB – Terms Used in RDBMS and MongoDB –Data Types in MongoDB. MongoDB Query Language Insert Method – Save() Method – Adding a New Field to an Existing Document – Update Method – Removing an Existing Field from an Existing Document – Remove Method – Finding Documents based on search Criteria – Find Method – Dealing with NULL Values – Count , Limit, Sort, and Skip –Arrays – Aggregate Function – Map Reduce Function.

Unit IV   Introduction to MAPREDUCE Programming: Introduction – Mapper – Reducer – Combiner – Partitioner - Searching – Sorting – Compressing. **Introduction to Hive:** Concepts of Hive – Hive Architecture – Hive Data Types – Hive File Format – Hive Query Language(HQL). RCFile Implementation – SerDe – User-Define Function (UDF)

Unit V Introduction to Pig: Basics of Pig - The Anatomy of Pig – Pig on Hadoop – Big Philosophy – Use Case for Big: ETL Processing – Pig Latin Overview - Data Types in Pig – Running Pig – Execution Modes of Pig – HDFS Commands – Relational Operators - Eval Functions – Complex Data Types. **Introduction to Machine Learning:** Introduction to Machine Learning – Machine Learning Algorithm

 Book for Study :

   Seema Acharya , Subhashini Chellappan, (2015), *Big Data and Analytics WILEY,*   Reprint 2018.

   Chapters:
Unit - I	: 1.1, 2.1 - 2.4, 3.1 -3.5, 3.7, 3.10, 3.12
Unit – II	: 4.1 – 4.2, 5.1, - 5.13.
Unit - III	: 6.1 – 6.4, 6.5.1 – 6.5.10
Unit - IV	: 8.1 – 8.8, 9.1 to 9.8
Unit - V	: 10.1- 10.13,12.1,12.2

 Books for Reference :

   1. Venkat Ankam, *Big Data Analytics*, (2016.), Packt Publisher, 1st Edition.

   2. David Loshin, *Big Data Analytics*, (2013.) MK Publisher, 1st Edition.

   3. Jovan Pehcevski, *Big Data Analytics- Methods and Applications,* (2018), Arcler

      Education Incorporated, 1st Edition.

Web Resources/ e-books :

1. https://education.dellemc.com/content/dam/dell-emc/documents/en-us/2015KS_ Mediratta-Big_Data_Terms,_Definitions_and_Applications.pdf
2. http://www.bdbanalytics.ir/media/1121/big-data-analytics_turning-big-data-into-big- money.pdf
3. https://www.immagic.com/eLibrary/ARCHIVES/EBOOKS/I111025E.pdf

Pedagogy :

Chalk and Talk , PowerPoint Presentation , Group Discussion , Student

Seminar ,Spot Test , Practical Labs , Assignments , Quiz.

Rationale for Nature of the course:

Knowledge and Skill:

Communications networks have been used to transmit instructions and data for process

monitoring and control.

Activities to be given:

Students shall be allowed to write the many concepts in Big data.

CLO	Course learning Outcomes (CLO's)	Knowledge (According to Bloom's Taxonomy)
CLO1	Study the Basic Concepts of Big Data Analytics	K1 to K3
CLO2	Get familiarize with Hadoop	K1 to K3
CLO3	Gain Knowledge on MongoDB and Cassendra	K1 to K3
CLO4	Understand MapReduce and Hive	K1 to K3
CLO5	Analyze on Pig and Jaspersoft	K1 to K3

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

	PO1	PO2	PO3	PO4	PO5	PO6
CLO1	2	2	3	2	2	1
CLO2	2	3	3	2	2	2
CLO3	1	2	3	3	3	2
CLO4	3	3	2	3	3	2
CLO5	2	3	3	2	3	2

1-Basic Level   2- Intermediate Level   3- Advanced Level

LESSON PLAN: TOTAL HOURS (75 HRS)

UNIT	DESCRIPTION	HRS	MODE
I	Types of Digital Data: Classification of Digital Data – Structured data – Semi-Structured Data – Unstructured Data . Introduction to Big Data – Characteristics of Data – Evolution of Big Data – Definition of Big Data – Challenges with Big Data. Big Data Analytics: Beginning of Big Data – Concepts of Big Data Analytics–Big Data Analytics uses – Sudden Hype around Big data Analytics – Classification of Analytics - Top challenges facing Big Data – Data Science - Terminologies Used in Big Data Environment.	12	Chalk and Talk, PPT, group discussion ,on the spot test
II	The Big Data Technology Landscape - NoSQL – Hadoop .Introduction to Hadoop : Introducing Hadoop – Basics of Hadoop – Reason for not using RDBMS - RDBMS versus Hadoop – Distributed Computing Challenges - History of Hadoop - Hadoop Overview - Use case of Hadoop - Hadoop Distributors – HDFS – Processing Data with Hadoop – Managing Resources and Applications with Hadoop YARN – Interacting with Hadoop Ecosystem.	15	Chalk and Talk, PPT, quiz, on the spot test
III	Introduction to MongoDB: Concepts of MongoDB - Uses of MongoDB – Terms Used in RDBMS and MongoDB –Data Types in MongoDB . Introduction to Cassandra: Apache Cassandra – An Introduction – Features of Cassandra – Collections – Alter Commands – Import and Export – Querying System Tables.	15	Chalk and Talk, PPT, OHP presentations, quiz, on the spot test

IV	Introduction to MAPREDUCE Programming: Introduction – Mapper – Reducer – Combiner – Partitioner - Searching – Sorting – Compressing. Introduction to Hive: Concepts of Hive – Hive Architecture – Hive Data Types – Hive File Format – Hive Query Language(HQL).	18	Chalk and Talk, PPT
V	Introduction to Pig: Basics of Pig - The Anatomy of Pig – Pig on Hadoop – Big Philosophy – Use Case for Big : ETL Processing – Pig Latin Overview - Data Types in Pig – Running Pig – Execution Modes of Pig – HDFS Commands – Relational Operators - Eval Functions – Complex Data Types – Piggy Bank – User-Defined Functions – Parameter Substitution – Diagnostic Operator – Word Count Example Using Pig – Merits and Demerits of Pig – Pig at Yahoo Pig Versus Hive .JasperReport Using Jaspersoft : Introduction to JasperReports - Connecting to MongoDB NoSQL Database – Connecting to Cassendra NoSQL Database.	15	Seminar

Course Designer

MRS. R.KEERTHANA

Department of Computer Applications				Class : III B.C.A				
Sem	Category	Course Code	Course Title	Credits	Hours/ Week	CIA	External Exam	Total
VI	Core	**22OUCA6P**	Web Technology Lab	3	5	40	60	100

Nature of the Course		
Knowledge and Skill Oriented	**Employability Oriented**	**Entrepreneurship Oriented**
✓	✔	✔

PROGRAM LIST

1. Design the following static web pages required for an online book store web site.

a) HOME PAGE: The static home page must contain three frames.

b) LOGIN PAGE

c) CATOLOGUE PAGE: The catalogue page should contain the details of all the books available in the web site in a table.

d) REGISTRATION PAGE

2. Write JavaScript to validate the following fields of the Registration page.

a) First Name (Name should contains alphabets and the length should not be less than 6 characters).

b) Password (Password should not be less than 6 characters length).

3. Develop and demonstrate the usage of inline, internal and external style sheet using CSS

4. Develop and demonstrate JavaScript with POP-UP boxes and functions for the following problems:

a) Input: Click on Display Date button using onclick( ) function

 Output: Display date in the textbox

b) Input: A number n obtained using prompt

 Output: Factorial of n number using alert

c) Input: A number n obtained using prompt

 Output: A multiplication table of numbers from 1 to 10 of n using alert

d) Input: A number n obtained using prompt and add another number

 using confirm

 Output: Sum of the entire n numbers using alert

 5. Write an HTML page that contains a selection box with a list of 5

countries. When the user selects a country, its capital should be

printed next in the list. Add CSS to customize the properties of the

 font of the capital (color,bold and font size).

6.Write an HTML page including any required JavaScript that takes a number from text field in the range of 0 to 999 and shows it in words. It should not accept four and above digits, alphabets and special characters.

7. Develop and demonstrate PHP Script for the following problems:

a) Write a PHP Script to find out the Sum of the Individual Digits.

b) Write a PHP Script to check whether the given number is Palindrome or not

8. Create an XML document that contains 10 users information. Write a Java Program, which takes
 User Id as input and returns the user details by taking the user information from XML document
 using DOM parser or SAX parser.

9. Implement the following web applications using (a) PHP

 (b) Servlets

 (c) JSP

10. Implement the web applications with Database using

(a) PHP, (b) Servlets and (c) JSP.

11. Modify the above PHP program to use an xml instead of database

12. Write a program to design a simple calculator using (a) JavaScript (b)

PHP (c) Servlet and (d) JSP.

Books for References:

1.Dr. Vaka Murali Mohan , S. Pratap Singh , The Modern Approach to Web Technologies , Scirech Publication , 1st Edition , 2010

2.Akilandeswari J & Gopalan NP, TCP/IP to Internet Application Architecture, PHI Publications, New Delhi,2nd Edition, 2007.

3. Ivan Bayross, Web Technologies part II, BPB publications, NewDelhi, 2nd Edition, 2007.

Web Resources/ E.Books:

1. https://www.dcpehvpm.org/E-Content/BCA/BCA-II/Web%20Technology/the-complete-reference-html-css-fifth-edition.pdf

2. https://www.lpude.in/SLMs/Master%20of%20Computer%20Applications/Sem_2/DECAP472_WEB_TECHNOLOGIES.pdf

3. http://seu1.org/files/level6/IT230/Book/(web.tech%201st%20book)%20Web%20Technologies%20-%20A%20Computer%20Science%20Perspective.pdf

Pedagogy

Practical Test with viva voce, Group Discussion, Interaction, Quiz.

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LESSON PLAN FOR PRACTICAL: TOTAL HOURS (75 HRS)

CYCLE	DESCRIPTION	HRS	MODE
1	1. Design the following static web pages required for an online book store web site. a) HOME PAGE: The static home page must contain three frames. b) LOGIN PAGE c) CATOLOGUE PAGE: The catalogue page should contain the details of all the books available in the web site in a table. d) REGISTRATION PAGE 2. Write JavaScript to validate the following fields of the Registration page. a) First Name (Name should contains alphabets and the length should not be less than 6 characters). 2. Password (Password should not be less than 6 characters length). 3. Develop and demonstrate the usage of inline, internal and external style sheet using CSS	15	Writing and executing the program in a system
2	4. Develop and demonstrate JavaScript with POP-UP boxes and functions for the following problems: a) Input: Click on Display Date button using onclick( ) function Output: Display date in the textbox b) Input: A number n obtained using prompt Output: Factorial of n number using alert c) Input: A number n obtained using prompt Output: A multiplication table of numbers from 1 to 10 of n using alert d) Input: A number n obtained using prompt and add another number using confirm Output: Sum of the entire n numbers using alert	12	Writing and executing the program in a system

	5. Write an HTML page that contains a selection box with a list of 5 countries. When the user selects a country, its capital should be printed next in the list. Add CSS to customize the properties of the font of the capital (color,bold and font size). 6.Write an HTML page including any required JavaScript that takes a number from text field in the range of 0 to 999 and shows it in words. It should not accept four and above digits, alphabets and special characters.		
3	7. Develop and demonstrate PHP Script for the following problems: a) Write a PHP Script to find out the Sum of the Individual Digits. b) Write a PHP Script to check whether the given number is Palindrome or not 8. Create an XML document that contains 10 users information. Write a Java Program, which takes User Id as input and returns the user details by taking the user information from XML document using DOM parser or SAX parser.	15	Writing and executing the program in a system
4	9. Implement the following web applications using (a) PHP (b) Servlets (c) JSP 10. Implement the web applications with Database using (a) PHP, (b) Servlets and (c) JSP.	18	Writing and executing the program in a system
5	11. Modify the above PHP program to use an xml instead of database 12. Write a program to design a simple calculator using (a) JavaScript (b) PHP (c) Servlet and (d) JSP.	15	Writing and executing the program in a system

Course Designer

MRS. G. ALAMELU

EVALUATION (PRACTICAL)
Core Lab / Skill Enhancement Course Lab

Internal (Formative)   : 40 marks

External (Summative)   : 60 marks

Total   : 100 marks

Question Paper Pattern for Internal Practical Examination: 40 Marks

✓ There will be Two Internal Practical Examination.
✓ Duration of Internal Examination will be 2 hours.

S.No	Components	Marks
1.	I – Writing the Program (2x8)	16
2.	II – Test and Debug the Program (2x4)	08
3.	III - Printing the Correct Output (2x4)	08
4.	IV- Viva	03
5.	V –Record book	05
	Total	**40**

Question Paper Pattern for External Practical Examination: 60 Marks

✓ Duration of External Examination will be 3 hours.

S.No	Components	Marks
1.	I – Writing the Program (2x10)	20
2.	II – Test and Debug the Program (2x10)	20
3.	III- Printing the Correct Output (2x5)	10
4.	IV – Viva	5
5.	V - Record book	5
	Total	**60**

Department of Computer Applications				Class: III B.C.A				
Sem	Category	Course Code	Course Title	Credits	Hours/ Week	CIA	External Exam	Total
VI	DSEC	**22OUCADSE6A**	**Data Mining**	5	5	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	**Employability Oriented**	**Entrepreneurship oriented**
✔	✔	

Course Objectives

1. To understand the basic Concepts of Data Mining.

2. To study the Mining Techniques and Classification concepts.

3. To Access the concept of Clustering Algorithms.

4. To Understand the Concept of Web mining.

5. To Identify the Spatial and Temporal Mining

Course Content:

Unit-I Introduction: Basic Data Mining Task –Data Mining Versus Knowledge Discovery in Databases – Data Mining Issues – Social Implications of Data Mining – Data Mining from a Database Perspective. **Related Concepts:** Database / OLTP Systems – Fuzzy Sets and Fuzzy Logic – Information Retrieval – Decision Support Systems – Dimensional Modeling – Data Warehousing – OLAP – Web Search Engines.

Unit-II Data Mining Techniques: Introduction – A Statistical Perspective on Data Mining – Similarity Measures – Decision Tress – Neural Networks – Genetic Algorithms. **Classification:** Introduction – Statistical-Based Algorithms –Distance-Based Algorithms – Neural Network Based Algorithms.

Unit-III Clustering: Introduction – Similarity and Decision Measures – Outliers – Hierarchical Algorithms – Partitional Algorithms – Clustering Large Databases – Clustering with Categorical Attributes.

Unit-IV Association Rules: Introduction – Large Item sets –Basic Algorithms – Parallel and Distributed Algorithms. **Web Mining:** Introduction – Web Content Mining - Web Usage Mining.

Unit-V Spatial Mining: Introduction – Spatial Data Overview – Spatial Data Mining Primitives – Generalization and Specialization – Spatial Classification Algorithms – Spatial Clustering Algorithm. **Temporal Mining:** Introduction – Modeling Temporal Events – Time Series – Pattern Detection.

Book for study:

Margaret H. Dunham, (2004) S.Sridhar,DataMining: Introductory and Advanced Topics, Published by Pearson Education, 1thEdition

Chapters:

> **Unit I** **:** 1.1 to 1.3,1,5, 1.6, 2.1. to 2.8.
>
> **Unit II** **:** 3.1 to 3.6, 4.1 to 4.3,4.5.
>
> **Unit III** **:** 5.1 to 5.7.
>
> **Unit IV** **:** 6.1 to 6.4, 7.1, 7.2, 7.4.
>
> **Unit V** **:** 8.1 to 8.4, 8.6, 8.7, 9.1 to 9.4.

Books for Reference:

1. Arun K.Pujari,*Data Mining Techniques* , Universities press, 3rdEdition, 2013.
2. S.K. Mourya, Shalu Gupta, *Data Mining and Data warehousing* , Narosa PublishingHouse Private Ltd , 1stEdition , 2013.
3. Jiawei Han & Micheline kamber, *Datamining Concepts & Techniques*, Morgon Kaufmann Publishers, San Francisco,USA,2ndEdition,2010.

Web Resources / E.Books:

1. https://myweb.sabanciuniv.edu/rdehkharghani/files/2016/02/The-Morgan-Kaufmann-Series-in-Data-Management-Systems-Jiawei-Han-Micheline-Kamber-Jian-Pei-Data-Mining.-Concepts-and-Techniques-3rd-Edition-Morgan-Kaufmann-2011.pdf
2. https://www.ramauniversity.ac.in/online-study-material/fet/cs/bca/vsemester/dataminingwarehouseing/lecture_4.pdf
3. https://www.researchgate.net/post/How_to_write_an_Introductory_Text_Book_on_Data_Mining

Pedagogy:

Chalk and Talk, PPT, Group discussion, Quiz.

Rationale for nature of Course:

Knowledge and Skill: Data mining is multi-disciplinary and encompasses methods dealing with scaling up for high-dimensional data and high-speed data streams, distributed data mining, mining in a network setting, and many other facets.

Activities to be given: Students shall be allowed to write the many concepts in Data Mining
Course learning Outcomes (CLO's):

CLO	Course learning Outcomes (CLO's)	Knowledge (According to Bloom's Taxonomy)
CLO1	Understand the basic Concepts of Data Mining.	K1 to K3
CLO2	Analyze the Mining Techniques and Classification concepts.	K1 to K3
CLO3	Access the concept of Clustering Algorithms.	K1 to K3
CLO4	Apply the Concept of Web mining.	K1 to K3
CLO5	Identify the Spatial and Temporal Mining	K1 to K3

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

	PO1	PO2	PO3	PO4	PO5	PO6
CLO1	2	2	3	2	2	1
CLO2	2	3	3	2	2	2
CLO3	1	2	3	3	3	2
CLO4	3	3	2	3	3	2
CLO5	2	3	3	2	3	2

1-Basic Level   2- Intermediate Level   3- Advanced Level

LESSON PLAN: TOTAL HOURS (75 HRS)

UNIT	DESCRIPTION	HRS	MODE
I	Introduction: Basic Data Mining Tasks–Data Mining Versus Knowledge Discovery in Databases – Data Mining Issues – Social Implications of Data Mining – Data Mining from a Database Perspective. Related Concepts: Database / OLTP Systems – Fuzzy Sets and Fuzzy Logic – Information Retrieval – Decision Support Systems – Dimensional Modeling – Data Warehousing – OLAP – Web Search Engines.	15	Chalk and Talk, PPT, group discussion ,on the spot test
II	Data Mining Techniques: Introduction – A Statistical Perspective on Data Mining – Similarity Measures – Decision Tress – Neural Networks – Genetic Algorithms. Classification: Introduction – Statistical-Based Algorithms –Distance-Based Algorithms – Neural Network Based Algorithms.	12	Chalk and Talk, PPT, quiz, on the spot test
III	Clustering: Introduction – Similarity and Decision Measures – Outliers – Hierarchical Algorithms – Partitional Algorithms – Clustering Large Databases – Clustering with Categorical Attributes.	15	Chalk and Talk, PPT, OHP presentations, quiz, on the spot test
IV	Association Rules: Introduction – Large Itemsets –Basic Algorithms –	18	Chalk and Talk, PPT

	Parallel and Distributed Algorithms. Web Mining: Introduction – Web Content Mining - Web Usage Mining.		
V	Spatial Mining: Introduction – Spatial Data Overview – Spatial Data Mining Primitives – Generalization and Specialization – Spatial Classification Algorithms – Spatial Clustering Algorithm. Temporal Mining: Introduction – Modeling Temporal Events – Time Series – Pattern Detection.	15	Seminar

Course Designer

MRS.R. KEERTHANA

Department of Computer Applications				Class: III B.C.A				
Sem	Category	Course Code	Course Title	Credits	Hours/ Week	CIA	External Exam	Total
VI	DSEC	**22OUCADSE6B**	**Internet of Things**	5	5	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	**Employability Oriented**	**Entrepreneurship oriented**
✔	✔	

Course Objectives

1.To impart the knowledge on IoT enabling technologies.

2. To study the concept of Domain Specific IoTs and M2M

3. To understand the concepts of NETCONF -YANG

4. To apply the concept into Web Application Framework

 5. To design the Data Analytics and Tools for IoT

Course Content:

Unit : I Introduction to Internet of Things: Introduction – Physical Design of IoT - Logical Design of IoT - IoT Enabling Technologies - IoT Levels & Deployment Templates.

Unit: II Domain Specific IoTs: Introduction – Home Automation - Cities-Environment -Energy –Retail – Logistics – Agriculture – Industry - Healthy & Lifestyle. **IoT and M2M:** Introduction - M2M - Difference between IoT and M2M - SDN and NFV for IoT.

Unit: III IoT System Management with NETCONF-YANG: Need for IoT Systems Management - NETCONF- YANG - IoT Systems Management with NETCONF - YANG. **IoT Platforms Design Methodology:** Introduction – IoT Design Methodology. **Case Studies IoT Design:** Introduction – Home Automation – Cities

Unit : IV IoT Physical Devices & Endpoints: What is an IoT Device-Exemplary Device: Raspberry Pi – About the Board – Linux on Raspberry Pi – Raspberry Pi Interfaces – Other IoT Devices. **IoT Physical Servers & Cloud Offerings:** Introduction to Cloud Storage Models & Communication APIs – WAMP - AutoBahn for IoT . Xively Cloud for IoT - Python Web Application Framework – Django – Amazon Web Services for IoT.

Unit V: Data Analytics for IoT: Introduction – Apache Hadoop – Using Hadoop Map Reduce for Batch Data Analysis. **Tools for IoT:** Introduction – Chef – puppet.

Book for study:

Arshdeep Bahga, Vijay Madisetti., (2017) Internet of Things, UniversitiesPress India Private Ltd,1st Edition.

Chapters:

Unit - I	**:** 1.1 to 1.5	
Unit – II	**:** 2.1 to 2.10, 3.1 to 3.4	
Unit - III	**:** 4.1, 4.4 to 4.6, 5.1, 5.2, 9.1 to 9.3	
Unit – IV	**:** 7.1 to 7.5, 7.7, 8.1 to 8.4, 8.6	
Unit - V	**:** 10.1 to 10.3,11 to 11.2.11.4	

Books for Reference:

1. Jamil Y. Khan and Mehmet R. Yuce, (2019),The Internet of Things, Systems and Applications, Jenny Stanford Publishing , 1st Edition.

2. Pethuraj and Anupama C. Raman, (2017) The Internet of Things, CRC Press, An Auerbach Book.

3. AdrianMcEwen & HakimCassimally, Designing ,(2014), The Internet of Things, Willey Publication, 1st Edition.

Web Resources / E.Books:

1. https://bridgera.com/wp-content/uploads/2018/10/IoTeBook3.pdf

2.https://www.pdfdrive.com/internet-of-things-iot-in-5g-mobiletechnologies-d176075929.html

3. https://www.pdfdrive.com/internet-of-things-iot-technologies-applications-challenges-and-solutions-d158467863.html

Pedagogy:

Chalk and Talk, PPT, Group discussion,Quiz.

Rationale for nature of Course:

Knowledge and Skill: IOT Skills in this domain include understanding communication protocols, such as MQTT, CoAP, and HTTP, and the ability to design networks that facilitate efficient data exchange.

Activities to be given:

IoT devices give students better access to everything from learning materials to communication channels, and they give teachers the ability to measure student learning progress in real-time.

Course learning Outcomes (CLO's):

CLO	Course learning Outcomes (CLO's)	Knowledge (According to Bloom's Taxonomy)
CLO1	Study knowledge on IoT enabling Technologies.	K1 to K3
CLO2	Analysis the Domain Specific IoT's and M2M	K1 to K3
CLO3	Understand the concepts of NETCONF -YANG	K1 to K3
CLO4	Apply the concept into Web Application Framework	K1 to K3
CLO5	Design the Data Analytics and Tools for IoT	K1 to K3

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

	PO1	PO2	PO3	PO4	PO5	PO6
CLO1	3	2	3	3	2	1
CLO2	3	3	3	3	2	1
CLO3	3	3	3	2	2	2
CLO4	3	3	3	3	2	2
CLO5	3	3	3	3	2	1

1-Basic Level   2- Intermediate Level   3- Advanced Level

LESSON PLAN: TOTAL HOURS (75 HRS)

UNIT	DESCRIPTION	HRS	MODE
I	Introduction to Internet of Things: Introduction – Physical Design of IoT - Logical Design of IoT - IoT Enabling Technologies - IoT Levels & Deployment Templates.	15	Chalk and Talk, PPT, group discussion , OHP presentations, quiz, on the spot
II	Domain Specific IoTs: Introduction – Home Automation - Cities-Environment -Energy –Retail – Logistics – Agriculture – Industry - Healthy & Lifestyle. IoT and M2M: Introduction - M2M - Difference between IoT and M2M - SDN and NFV for IoT.	15	Chalk and Talk, PPT, group discussion , OHP presentations, quiz, on the spot test and Virtual Labs.
III	IoT System Management with NETCONF-YANG: Need for IoT Systems Management - NETCONF-YANG - IoT Systems Management with NETCONF - YANG. IoT Platforms Design Methodology: Introduction – IoT Design Methodology. Case Studies IoT Design: Introduction – Home Automation – Cities.	14	Chalk and Talk, PPT, group discussion , OHP presentations, quiz, on the spot test and Virtual Labs
IV	IoT Physical Devices & Endpoints: What is an IoT Device-Exemplary Device: Raspberry Pi – About the Board – Linux on Raspberry Pi – Raspberry Pi Interfaces – Other IoT Devices. IoT Physical Servers & Cloud Offerings: Introduction to Cloud Storage Models & Communication APIs – WAMP - AutoBahn for IoT . Xively	15	Chalk and Talk, PPT, group discussion , OHP presentations, quiz, on the spot test

	Cloud for IoT - Python Web Application Framework – Django – Amazon Web Services for IoT.		
V	Data Analytics for IoT: Introduction – Apache Hadoop – Using Hadoop MapReduce for Batch Data Analysis. Tools for IoT: Introduction – Chef – puppet.	16	Chalk and Talk, PPT, group discussion , OHP presentations, quiz, on the spot test and Virtual Labs

Course Designer

MRS. K. KRISHNAVENI

Department of Computer Applications				Class: III B.C.A				
Sem	Category	Course Code	Course Title	Credits	Hours/ Week	CIA	External Exam	Total
VI	DSEC	22OUCADSEPR6	Project	5	5	20	80	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✔	✔	

       The students are allowed to develop their project within our campus with the help of the internal staff members.

       In the first review the students submit their title of the project and synopsis, and also submit the determination of the modules.

       In the second review 50% of the project is completed and demonstrate the project.

       In the final review the students prepare the PowerPoint presentation. The oral is must for the completion of the project.

       This report will be valuated 80marks for external examiner and 20marks for internal examiner.

Department of Computer Applications				Class : III B.C.A				
Sem	**Category**	**Course Code**	**Course Title**	**Credits**	**Hours/ Week**	**CIA**	**External Exam**	**Total**
VI	SEC	**22OUCASE6P**	**Data Mining Lab**	2	2	40	60	100

Nature of the Course		
Knowledge and Skill Oriented	**Employability Oriented**	**Entrepreneurship Oriented**
✓	✔	✔

PROGRAM LIST

1. Demonstrate the following data preprocessing tasks using python libraries.

   a) Loading the dataset

   b) Identifying the dependent and independent variables

   c) Dealing with missing data

2. Demonstrate the following data preprocessing tasks using python library

   a) Dealing with Categorical Data

   b) Scaling the Features

   c) Splitting Dataset into Training and Training Sets

3. Demonstrate the following Similarity and Dissimilarity Measures using Python

   a) Pearson's Correlation

   b) Cosine Similarity

   c) Jaccard Similarity

4. Build a model using linear regression algorithm on any dataset

5. Build a classification model using Decision Tree algorithm on iris dataset

6. Apply Naive Bayes Classification algorithm on any dataset

7. Generate frequent item sets using Apriori in python and also generate association rules for any market basket data

8. Apply K – means clustering algorithm on any data set.

9. Apply Hierarchical Clustering algorithm on any dataset.

10. Apply DBSCAN Clustering algorithm on any dataset.

Books for Reference:

1. Jiawei Han & Micheline kamber, *Datamining Concepts & Techniques*, Morgon Kaufmann Publishers, San Francisco,USA,2ndEdition,2010.

2. Margaret Dunham H &Sridhar S, *Introductory and Advanced topics in Data Mining*, Pearson Education, New Delhi, 2ndEdition,2016.

3. G. K. Gupta, "*Introduction To Data Mining With Case Studies*", EasternEconomy Edition, Prentice Hall Of India, 2nd Edition 2011.

Web Resources/ E.Books:

1. https://www.scribd.com/document/664834709/data-mining-lab-manual-2-2

2. https://www.studocu.com/in/document/institute-of-aeronautical-engineering/big-data-analytics/data-mining-lab-manual-with-solutions/64361396

3. https://www.studocu.com/in/document/institute-of-aeronautical-engineering/big-data-analytics/data-mining-lab-manual-with-solutions/64361396

Pedagogy

Practical Test with viva voce, Group Discussion, Interaction, Quiz.

LESSON PLAN FOR PRACTICAL: TOTAL HOURS (30 HRS)

CYCLE	DESCRIPTION	HRS	MODE
1	1. Demonstrate the following data preprocessing tasks using python libraries. a) Loading the dataset b) Identifying the dependent and independent variables c) Dealing with missing data 2. Demonstrate the following data preprocessing tasks using python library a) Dealing with Categorical Data b) Scaling the Features c) Splitting Dataset into Training and Training Sets	6	Writing and executing the program in a system
2	3. Demonstrate the following Similarity and Dissimilarity Measures using Python a) Pearson's Correlation b) Cosine Similarity c) Jaccard Similarity 4. Build a model using linear regression algorithm on any dataset	5	Writing and executing the program in a system
3	5. Build a classification model using Decision Tree algorithm on iris dataset 6. Apply Naive Bayes Classification algorithm on any dataset	6	Writing and executing the program in a system
4	7. Generate frequent item sets using Apriori in python and also generate association rules for any market basket data 8. Apply K – means clustering algorithm on any data set.	5	Writing and executing the program in a system
5	9. Apply Hierarchical Clustering algorithm on any dataset. 10. Apply DBSCAN Clustering algorithm on any dataset.	8	Writing and executing the program in a system

Course Designer

MRS. R. KEERTHANA

EVALUATION (PRACTICAL)
Core Lab / Skill Enhancement Course Lab

Internal (Formative)   : 40 marks

External (Summative)   : 60 marks

Total   : 100 marks

Question Paper Pattern for Internal Practical Examination: 40 Marks

- ✓ There will be Two Internal Practical Examination.
- ✓ Duration of Internal Examination will be 2 hours.

S.No	Components	Marks
1.	I – Writing the Program (2x8)	16
2.	II – Test and Debug the Program (2x4)	08
3.	III - Printing the Correct Output (2x4)	08
4.	IV- Viva	03
5.	V –Record book	05
	Total	**40**

Question Paper Pattern for External Practical Examination: 60 Marks

- ✓ Duration of External Examination will be 3 hours.

S.No	Components	Marks
1.	I – Writing the Program (2x10)	20
2.	II – Test and Debug the Program (2x10)	20
3.	III- Printing the Correct Output (2x5)	10
4.	IV – Viva	5
5.	V - Record book	5
	Total	**60**