FACULTY OF SCIENCE

Effective from Academic Batch: 2024-25

Programme: **Master of Science (Information Technology)**

Semester: **I**

Course Code: **101410131**

Course Title: **Java – beginner to professional**

Course Group: **CORE COURSES**

Course Objectives:

a) To learn computer programming using the Java programming language and the Java Platform, Standard Edition (Java SE).
b) To learn the fundamentals of object-oriented programming.
c) Learning to write object-oriented programs in Java. Knowledge of important features of the Java SE platform
d) Learning to develop graphical programs using Java.

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
				Theory		J/V/P*		Total
Lecture	Tutorial	Practical		Internal	External	Internal	External	
4	--	--	4	50/20	50/20	--	--	100/40

* **J**: Jury; **V**: Viva; **P**: Practical

Detailed Syllabus:

Sr.	Contents	Hours
1	**Concepts of Object Oriented Programming (OOP):** Object and Class, Encapsulation, Data Abstraction, Inheritance, Polymorphism, Dynamic Binding, Message Communication, Benefits of OOP, Applications of OOP . **Introduction to Java :** History of Java, Salient features of Java, How Java Differs from C, Java and Internet, Java and World Wide Web, Java Development Kit, Using JDK's Command-line tools, Application Programming Interface. A Simple Java Program, Identifying a Class, Using predefined classes, Defining your own Class, Object Construction, Access Specifiers, Data types, Variables and Constants, Operators, Strings & String Buffer, Input & Output, Control Flow, Arrays, Conversions, Static Fields & Methods, Constructors, Packages, Documentation Comments	15

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2	**Introduction to Object-Oriented Programming :**Classes, Super Classes & Subclasses, Object – The Universal Superclass, Wrapper Classes, Inheritance and polymorphism, method overriding - Final and abstract classes, abstract methods, Interface Concept, Properties of Interfaces, Interfaces and Abstract Classes, Static and Private Methods, Default Methods, Interfaces and Callbacks, Object Cloning, The Comparator Interface, Generics, enumeration, Inner classes and anonymous classes , Class loaders, class path	**15**
3	**More Features of the Java Platform :**Java Collection Framework: Separating Collection Interfaces and Implementations, Exception handling ,Input-output and file handling, Multithreading, Lambda Expression: Why Lambdas?, Syntax Of Lambda Expression, Functional Interfaces, Method References, Constructor References, Variable Scope, Processing Lambda Expressions	**15**
4	**Developing Graphical Programs:** An introduction to graphics in Java ,Brief introduction to AWT, The Swing library , Writing graphical programs using Swing , Using various Swing components , Managing layout using Swing , Event handling using Swing **Java Networking :** Introduction to Networking, Introduction to Client/Server Programming, Introduction to Socket Programming.	**15**

Reference Books:

1	**Java the complete reference, 8th edition by Herbert Schildt**
2	**E Balagurusamy, Programming with Java; Tata McGraw Hill**
3	**Y. Danial Liang, Introduction to Java Programming; Pearson**
4	**Rajkumar Buyya, Object Oriented Programming with Java; Tata McGraw Hill**
5	**Cays Horstmann, Gary Cornell, Core Java volume I & II; 11th ed.; Pearson Education**

Supplementary learning Material:	
1	**www.javatpoint.com**
2	**https://docs.oracle.com/javaee/6/tutorial/doc/bnafd.html**
3	**www.tutorialspoint.com**
4	**www.geeksforgeeks.org/java**
5	**https://www.edureka.co/blog/advanced-java-tutorial**

Pedagogy:

At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
The assessment and evaluation process will be broadly classified with the following 02 components viz.,:

1. In- Semester continuous Internal assessment and evaluation, and
2. End- Semester final examination

The weightage of internal assessment for theory/practical course will be 40%.
However, the remaining 60% weightage for theory/practical courses will be for End-Semester final examination, both evaluation two (02) hours duration for theory and three (03) hours for practical.

In-Semester Continuous internal evaluation:

1. One Internal exam will be conducted as a part of internal theory/practical evaluation.

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2. Assignments based on the course content will be given to the students for each unit and will be evaluated at regular interval evaluation.
3. Weekly Tests/Quizzes/Seminar/Attendance will be considered in the overall internal evaluation.
4. Presentation/Online Course Work/Research Paper are part of the internal evaluation.

Suggested Specification table with Marks (Theory) (Revised Bloom's Taxonomy):

Distribution of Theory Marks in %						**R**: Remembering; **U**: Understanding; **A**: Applying; **N**: Analyzing; **E**: Evaluating; **C**: Creating
R	**U**	**A**	**N**	**E**	**C**	
10	**40**	**20**	**10**	**10**	**10**	

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes (CO):

Sr.	Course Outcome Statements	%weightage
CO-1	**Develop computer programs using the Java programming language and the Java SE platform.**	**25**
CO-2	**Gain an understanding of fundamental object-oriented programming concepts. Develop object-oriented software in java.**	**25**
CO-3	**Display knowledge of multithreading, file handling and network programming in Java**	**25**
CO-4	**Develop GUI programs in Java.**	**25**

Curriculum Revision:	
Version:	1
Drafted on (Month-Year):	December 2023
Last Reviewed on (Month-Year):	January 2024
Next Review on (Month-Year):	January 2025

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FACULTY OF SCIENCE

Effective from Academic Batch: 2024-25

Programme: **Master of Science (Information Technology)**

Semester: **I**

Course Code: **101410132**

Course Title: **Python – Beginner to Professional**

Course Group: **CORE COURSES**

Course Objectives:

1. To test and debug code written in python
2. To be able to understand the various data structures available in Python programming language and apply them in solving computational problems.
3. To perform file operations to read and write data in files; To perform object oriented programming and build up python programs.
4. To be able to draw various kinds of data visualization techniques using Numpy, Pandas and matplotlib

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
				Theory		J/V/P*		Total
Lecture	Tutorial	Practical		Internal	External	Internal	External	
4	--	--	4	50/20	50/20	--	--	100/40

* **J**: Jury; **V**: Viva; **P**: Practical

Detailed Syllabus:

Sr.	Contents	Hours
1	**Introduction to Python Programming:** Getting Familiar with Python Overview; Installing Python on Windows; Anaconda and Jupyter Notebooks; Comments; Python Syntax; Line Structure; Joining Lines; Multiple Statements on a Single Line; Indentation; **Basic Data Types:** Basic Data Types Overview; String Overview; String Manipulation; String Indexing; String Slicing; Printing; Python Variables; Integers and Floats; Booleans **Python Operators:** Python Operators Overview ; Comparison Operators; Arithmetic Operators; Assignment Operators; Logical Operators; Identity Operators; Membership Operators; Bitwise Operators	15

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2	**Advanced Data Types :**Python Advanced Data Types Overview; Sets; List Overview; List Slicing and Indexing; Tuples; Dictionaries Control Flow Part: Intro to Control Flow; Conditional Statements; For Loops; While Loops; Break Statements; Continue Statements; List Comprehension **Python Functions:** Introduction to Functions; Python help Function; Defining Functions; Variable Scope; Lambda Functions; Functions args; Iterators; Map Function; Filter Function; **User Input & Error Handling:** Introduction to Error handling; User input; Syntax Errors; Exceptions;	**15**
3	**Python File Handling:** Python Read Files; Python Write/Create Files; Python Delete Files **Python OOP Programming:** Python OOPs Concepts; Python Classes and Objects; Constructors in Python; Destructors in Python; Inheritance in Python; Types of inheritance Python; Encapsulation in Python; Polymorphism in Python; Class or Static Variables in Python; Class method vs Static method in Python; Python Polymorphism	**13**
4	**Modules & Packages:** Working with Modules; Working with Packages; Data Science and Data Visualization using Python **Python Libraries:** Standard Libraries; Third Party Libraries **Introduction to Numpy;** Use of Numpy; NumPy Creating Arrays; NumPy Array; Indexing; NumPy Array Slicing; NumPy Data Types; NumPy Array Shape; NumPy Array Reshape; NumPy Array Iterating; NumPy Array Join; NumPy Array Split; NumPy Array Search; NumPy Array Sort; NumPy Array Filter **Introduction to Pandas;** Use of Pandas; Pandas Series; Pandas DataFrames; Pandas Read CSV; Pandas Analyzing Data Cleaning ; Cleaning Empty Cells; Cleaning Wrong Format; Cleaning Wrong Data; Removing Duplicates; Pandas Plotting **Introduction to Matplotlib:** Use of IntroMatplotlib; Get StartedMatplotlib Pyplot; Matplotlib Plotting; Matplotlib Markers; Matplotlib Line; Matplotlib Labels; Matplotlib Grid; Matplotlib Subplot; Matplotlib Scatter; Matplotlib Bars; Matplotlib Histograms; Matplotlib Pie Charts	**17**

Reference Books:

1	John V Guttag. “Introduction to Computation and Programming Using Python”, Prentice Hall of India
2	Wesley J. Chun. “Core Python Programming - Second Edition”, Prentice Hall
3	Kenneth A. Lambert, “Fundamentals of Python – First Programs”, CENGAGE Publication
4	Luke Sneeringer, “Professional Python”, Wrox
5	Daniel Y Chen, Pandas for Everyone: Python Data Analysis, 1st Edition, Pearson Eduction

Supplementary learning Material:	
1	Charles Severance, Python for informatics: www.pythonlearn.com
2	Swaroop C H. "A Byte of Python", http://www.swaroopch.com/notes/python
3	"Python Programming", http://en.wikibooks.org/wiki/Python_Programming
4	"The Python Tutorial", http://docs.python.org/release/3.0.1/tutorial/
5	"Learn Python the Hard way", http://learnpythonthehardway.org/
6	Dive into Python 3: http://www.diveintopython.net/

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Pedagogy:

At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.

The assessment and evaluation process will be broadly classified with the following 02 components viz.,:

1. In- Semester continuous Internal assessment and evaluation, and
2. End- Semester final examination

The weightage of internal assessment for theory/practical course will be 50%.

However, the remaining 50% weightage for theory/practical courses will be for End-Semester final examination, both evaluation two (02) hours duration for theory and three (03) hours for practical.

In-Semester Continuous internal evaluation:

1. One Internal exam will be conducted as a part of internal theory/practical evaluation.
2. Assignments based on the course content will be given to the students for each unit and will be evaluated at regular interval evaluation.
3. Weekly Tests/Quizzes/Seminar/Attendance will be considered in the overall internal evaluation.
4. Presentation/Online Course Work/Research Papers are part of the internal evaluation.

Suggested Specification table with Marks (Theory) (Revised Bloom's Taxonomy):

Distribution of Theory Marks in %					
R	**U**	**A**	**N**	**E**	**C**
20	40	15	15	5	5

R: Remembering; **U**: Understanding; **A**: Applying; **N**: Analyzing; **E**: Evaluating; **C**: Creating

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes (CO):

Sr.	Course Outcome Statements	%weightage
CO-1	Ability to create robust applications using the Python programming language	**25**
CO-2	Ability to create applications for solving computational problems using the Python Programming Language	**25**
CO-3	Ability to perform file operations to read and write data in files; To apply object oriented programming concepts and build up python programs.	**25**
CO-4	Ability to apply Data Science and Data Visualization using Python	**25**

Curriculum Revision:	
Version:	1
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FACULTY OF SCIENCE

Effective from Academic Batch: 2024-25

Programme: **Master of Science (Information Technology)**

Semester: **I**

Course Code: **101410133**

Course Title: **Computer Network**

Course Group: **CORE COURSES**

Course Objectives:

Understanding of Computer Network concepts like:

1. To develop an understanding of computer networking basics.
2. Understand the concepts of data communication and networks, TCP/IP and OSI reference models.
3. Understand, describe, analyse and evaluate the services of network layer, Link layer, Transport layer and application layer.

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
				Theory		J/V/P*		Total
Lecture	Tutorial	Practical		Internal	External	Internal	External	
4	--	--	4	50/20	50/20	--	--	100/40

* **J**: Jury; **V**: Viva; **P**: Practical

Detailed Syllabus:

Sr.	Contents	Hours
1	**Introduction to computer networks and Internet**: Understanding of network and Internet, The network edge, The network core, Understanding of Delay, Loss and Throughput in the packet switching network, protocols layers and their service model, History of the computer network **Application Layer:** Principles of computer applications, Web and HTTP, E-mail, DNS, Socket programming with TCP and UDP	**20**
2	**Transport Layer:** Introduction and transport layer services, Multiplexing and Demultiplexing, Connectionless transport (UDP), Principles of reliable data transfer, Connection-oriented transport (TCP), Congestion control, TCP congestion control	**20**
3	**Network Layer:** Introduction to forwarding and routing, Network Service models, Virtual and Datagram networks, study of router, IP protocol and addressing in the Internet, Routing algorithms, Broadcast and Multicast routing	**10**

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4	**The Link layer and Local area networks:** Introduction to link layer services, error-detection and correction techniques, Multiple access protocols, addressing, Ethernet, switches, VLAN	**10**

Reference Books:

1	**Computer Networking- A Top-Down approach (6th edition), Kurose and Ross, Pearson**
2	**Computer Networks- A Top-Down approach, Behrouz Forouzan, McGraw Hill**
3	**Computer Networks, Andrew Tanenbaum, Prentice Hall**
4	**TCP/IP Protocol Suite (4th edition), Behrouz Forouzan, McGraw Hill**
5	**Computer Networks: A Systems Approach Book by Bruce S. Davie and Larry L. Peterson**

Supplementary learning Material:	
1	**https://www.coursera.org/learn/fundamentals-network-communications**
2	**https://nptel.ac.in/courses/106105080**
3	**https://www.tutorialspoint.com/computer_fundamentals/computer_networking.htm**

Pedagogy:

At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
The assessment and evaluation process will be broadly classified with the following 02 components viz.,:

1. In- Semester continuous Internal assessment and evaluation, and
2. End- Semester final examination

The weightage of internal assessment for theory/practical course will be 50%.
However, the remaining 50% weightage for theory/practical courses will be for End-Semester final examination, both evaluation two (02) hours duration for theory and three (03) hours for practical.

In-Semester Continuous internal evaluation:

1. One Internal exam will be conducted as a part of internal theory/practical evaluation.
2. Assignments based on the course content will be given to the students for each unit and will be evaluated at regular interval evaluation.
3. Weekly Tests/Quizzes/Seminar/Attendance will be considered in the overall internal evaluation.
4. Presentation/Online Course Work/Research Papers are part of the internal evaluation.

Suggested Specification table with Marks (Theory) (Revised Bloom's Taxonomy):

Distribution of Theory Marks in %						**R**: Remembering; **U**: Understanding; **A**: Applying; **N**: Analyzing; **E**: Evaluating; **C**: Creating
R	**U**	**A**	**N**	**E**	**C**	
20	**40**	**15**	**15**	**5**	**5**	

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes (CO):

Sr.	Course Outcome Statements	%weightage
CO-1	**Understand the basics of computer networks and Internet. Also understand Application Layer in detail.**	**25**
CO-2	**Understand the Transport Layer**	**25**
CO-3	**Understand the Network Layer**	**25**

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CO-4	**Understand the Link layer and Local area networks**	**25**

Curriculum Revision:	
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CVM UNIVERSITY
Aegis: Charutar Vidya Mandal (Estd.1945)

FACULTY OF SCIENCE

Effective from Academic Batch: 2024-25

Programme: **Master of Science (Information Technology)**

Semester: **I**

Course Code: **101410134**

Course Title: Practical based on Java – Beginner to Professional

Course Group: **CORE COURSES**

Course Objectives:

1. To prepare students to become familiar with the Standard Java technologies of J2SE and OOPs concepts.
2. To provide Students with a solid foundation in Core Java to Advanced Java.
3. To train Students with good java programming breadth so as to comprehend, analyze, design and create novel products and solutions for the real life problems.
4. To inculcate in students professional and ethical attitude, multidisciplinary approach and an ability to relate java programming issues to broader application context.
5. To provide student with an academic environment aware of excellence, written ethical codes and guidelines and lifelong learning needed for a successful professional career.

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
				Theory		J/V/P*		Total
Lecture	Tutorial	Practical		Internal	External	Internal	External	
--	--	8	4	--	--	50/20	50/20	100/40

* **J**: Jury; **V**: Viva; **P**: Practical

List of Practicals / Tutorials:

To practice basic problem definitions, refer "w3schools" learning portal. More problem definitions will be assigned for practice during theory / practical / tutorial sessions. Students should maintain records for all the problem definitions either in digital or hard-copy format.

Reference Books:

1	Java the complete reference, 8th edition by Herbert Schildt
2	E Balagurusamy, Programming with Java; Tata McGraw Hill
3	Y. Danial Liang, Introduction to Java Programming; Pearson
4	Rajkumar Buyya, Object Oriented Programming with Java; Tata McGraw Hill
5	Cays Horstmann, Gary Cornell, Core Java volume I & II; 11th ed.; Pearson Education

Supplementary learning Material:	
1	https://www.w3schools.com/java
2	https://docs.oracle.com/javaee/6/tutorial/doc/bnafd.html
3	www.tutorialspoint.com
4	www.javatpoint.com
5	https://www.edureka.co/blog/advanced-java-tutorial

Pedagogy:

At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.

The assessment and evaluation process will be broadly classified with the following 02 components viz.,:

1. In- Semester continuous Internal assessment and evaluation, and
2. End- Semester final examination

The weightage of internal assessment for theory/practical course will be 50%.

However, the remaining 50% weightage for theory/practical courses will be for End-Semester final examination, both evaluation two (02) hours duration for theory and three (03) hours for practical.

In-Semester Continuous internal evaluation:

1. One Internal exam will be conducted as a part of internal theory/practical evaluation.
2. Assignments based on the course content will be given to the students for each unit and will be evaluated at regular interval evaluation.
3. Weekly Tests/Quizzes/Seminar/Attendance will be considered in the overall internal evaluation.
4. Presentation/Online Course Work/Research Paper are part of the internal evaluation.
5. The course includes a laboratory, where students have an opportunity to build a lab index for the concepts being taught in lectures/lab demonstrations.

Suggested Specification table with Marks (Theory) (Revised Bloom's Taxonomy):

Distribution of Theory Marks in %						**R**: Remembering; **U**: Understanding; **A**: Applying; **N**: Analyzing; **E**: Evaluating; **C**: Creating
R	**U**	**A**	**N**	**E**	**C**	
5	15	20	10	20	30	

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes (CO):

Sr.	Course Outcome Statements	%weightage
CO-1	Implement Java programs using the Java Programming language	**20**
CO-2	Gain an understanding of fundamental object-oriented programming concepts. Develop object-oriented software in java.	**40**
CO-3	Demonstrate multithreading, file handling, network programming, exception handling etc.	**25**
CO-4	Develop GUI programs in Java.	**15**

Curriculum Revision:	
Version:	1
Drafted on (Month-Year):	December – 2023
Last Reviewed on (Month-Year):	January – 2024
Next Review on (Month-Year):	January - 2025

CVM UNIVERSITY
Aegis: Charutar Vidya Mandal (Estd.1945)

FACULTY OF SCIENCE

Effective from Academic Batch:2024-25

Programme: **Master of Science (Information Technology)**

Semester: **I**

Course Code: **101410135**

Course Title: **Practical Based on Python – Beginner to Professional**

Course Group: **CORE COURSES**

Course Objectives:

- Strong foundation in the Python Programming
- To test and debug code written in python
- To be able to understand the various data structures available in Python programming language and apply them in solving computational problems.
- To perform file operations to read and write data in files; To perform object oriented programming and build up python programs.
- To be able to draw various kinds of data visualization techniques using Numpy, Pandas and matplotlib

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
				Theory		J/V/P*		Total
Lecture	Tutorial	Practical		Internal	External	Internal	External	
--	--	6	3	--	--	50/20	50/20	100/40

* **J**: Jury; **V**: Viva; **P**:Practical

List of Practical:

To practice https://www.python.org/doc/. More problem definitions will be assigned for practice during theory / practical / tutorial sessions. Students should maintain records for all the problem definitions either in digital or hard-copy format.

Reference Books:	
1	Beginning Python, wrox
2	Let Us Python, YashavantKanetkar and Aditya Kanetkar, bpb
3	Programming in Python 3- A Complete Introduction to Python Language, Mark Addition-Wesley
Supplementary learning Material:	
1	https://www.python.org/doc/
2	https://www.coursera.org/
3	https://nptel.ac.in/courses/106106145
Pedagogy:	

- Explain / justify all the Program Definitions and correlate to real world problems and solution
- Assignments / Quiz / Presentation / Participation for continuous evaluation and assessment
- Internal / External Examination as per the norms of CVM University

Suggested Specification table with Marks (Practical) (Revised Bloom's Taxonomy):

Distribution of Theory Marks in %						**R**: Remembering; **U**: Understanding; **A**: Applying; **N**: Analyzing; **E**: Evaluating; **C**: Creating
R	**U**	**A**	**N**	**E**	**C**	
5	15	20	10	20	30	

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes (CO):

Sr.	Course Outcome Statements	%weightage
CO-1	Basic Python Programming & different models of Programming. Understand and implement identifiers, keyword, variables, Data types and Input / Output	**25**
CO-2	Understanding and able to implement: String and their operations, Flow Control Programs, Built-in & User-defined function with or without recursion.	**25**
CO-3	Learn application and implementation File handling and OOPS concepts.	**25**
CO-4	Able to understand and use built-in modules and packages, and efficiently Practice for namespace.	**25**

Curriculum Revision:	
Version:	1
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Last Reviewed on (Month-Year):	January 2024
Next Review on (Month-Year):	January 2025

Aegis: Charutar Vidya Mandal (Estd.1945)

FACULTY OF SCIENCE

Effective from Academic Batch: 2024-25

Programme: **Master of Computer Application (MCA)**

Semester: **I**

Course Code: **101410136**

Course Title: **WEB PROGRAMMING CONCEPTS - BEGINNER TO PROFESSIONAL**

Course Group: **CORE COURSES**

Course Objectives:

a) Understand the various concepts of the javascript at client side operation managing. Use the JavaScript to develop the validation in web pages.

b) Understanding the jQuery – A javascript library with its various concepts like event, effects, callback, chaining and etc.

c) Use server side scripting with PHP to generate the web pages dynamically using the database connectivity.

d) Understands the Advanced PHP and implement the cookies, sessions and OOP concepts.

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
				Theory		J/V/P*		Total
Lecture	Tutorial	Practical		Internal	External	Internal	External	
4	--	--	4	50/20	50/20	--	--	100/40

* **J**: Jury; **V**: Viva; **P**:Practical

Detailed Syllabus:

Sr.	Contents	Hours
1	**Introduction to JavaScript**: Features, DOM, Methods to Implement JavaScript, Arrays, Functions, Dialogue Boxes, Events, Methods and Validations in JavaScript **Introduction to jQuery**: jQuery Intro, jQuery Syntax, jQuery Selectors **jQuery Events:** mouse events, key events, other event	12
2	**jQuery HTML/CSS:** html(), text(), val(), css(), attr(), prepend(), append(), insert(), remove() **jQuery Effects:** hide, show, fade, slide, animate, callback, chaining	15
3	**Server Side Programming with PHP** : Introduction to Open Source , Advantages and Capabilities of Open Source , Introduction to PHP ,Data Types, Variables, Constants, Operators, Flow Control and Looping ,Strings, Arrays, Functions ,Working with Forms **PHP and MySQL**: Introduction to MySQL: Features, Connection to Server, Creating Database, Selecting A Database, Listing Database, Listing Table Names, Creating a Table, Inserting Data, Altering Tables, Queries, Deleting Database, Deleting Data and Tables, PHP Myadmin And Database Bugs	18

4	**Advanced PHP:** Cookies: Creating Cookies, Reading from Cookies, Adding Parameters to a Cookie, Deleting a Cookie Sessions: Creating a Session, Accessing Session Variables, Deleting a Session, File Handling, Error Handling, Exception	**15**

Reference Books:	
1	Beginning PHP6, Apache, MySQL Web development, wrox – Wiley India Pvt. Ltd.
2	Professional PHP Programming, wrox – Wiley India Pvt. Ltd.
3	PHP and MySQL Create – Modify – Reuse, wrox – Wiley India Pvt. Ltd.
4	jQuery Cookbook – O' reily – Shroff Publishers & Distributers Pvt. Ltd.
5	Web Development with jQuery, wrox – Wiley India Pvt. Ltd.
Supplementary learning Material:	
1	https://www.w3schools.com/php/default.asp
2	https://spoken-tutorial.org/tutorial-search/?search_foss=PHP+and+MySQL&search_language=English
3	https://www.javatpoint.com/php-tutorial
4	https://www.javatpoint.com/jquery-tutorial

Pedagogy:

- Justify all the topics unit-wise
- Assignments / Quiz / Presentation / Participation for continuous evaluation and assessment
- Internal / External Examination as per the norms of CVM University

Suggested Specification table with Marks (Theory) (Revised Bloom's Taxonomy):

Distribution of Theory Marks in %						**R**: Remembering; **U**: Understanding; **A**: Applying; **N**: Analyzing; **E**: Evaluating; **C**: Creating
R	**U**	**A**	**N**	**E**	**C**	
20	40	15	15	5	5	

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes (CO):

Sr.	Course Outcome Statements	%weightage
CO-1	Applying JavaScript in web design principles to make pages effective at client side operations.	**25**
CO-2	Developing interactive web page applying the various techniques and concepts of the jQuey(javascript library).	**25**
CO-3	Develop the server side PHP scripts using various features for creating customized web applications using database connectivity.	**25**
CO-4	Develop a web application using advanced web programming features.	**25**

Curriculum Revision:	
Version:	1.0
Drafted on (Month-Year):	December-2023
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Next Review on (Month-Year):	April-2024

CVM UNIVERSITY
Aegis: Charutar Vidya Mandal (Estd.1945)

FACULTY OF SCIENCE

Effective from Academic Batch: 2024-25

Programme: **Master of Science (Information Technology)**

Semester: **I**

Course Code: **101410137**

Course Title: **PRACTICAL BASED ON WEB PROGRAMMING CONCEPTS - BEGINNER TO PROFESSIONAL**

Course Group: **CORE COURSES**

Course Objectives:

- Understand the various concepts of the javascript at client side operation managing. Use the JavaScript to develop the validation in web pages.
- Understanding the jQuery – A javascript library with its various concepts like event, effects, callback, chaining and etc.
- Use server side scripting with PHP to generate the web pages dynamically using the database connectivity.
- Understands the Advanced PHP and implement the cookies, sessions and OOP concepts.

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
				Theory		J/V/P*		Total
Lecture	Tutorial	Practical		Internal	External	Internal	External	
--	--	6	3	--	--	50/20	50/20	100/40

* **J**: Jury; **V**: Viva; **P**:Practical

List of Practical:

Below mentioned problem definitions are for basic practice. More problem definitions will be assigned for practice during theory / practical / tutorial sessions. Students should maintain records for all the problem definitions either in digital or hard-copy format.

1	To implement an arrays in JavaScript.
2	To implement functions in JavaScript.
3	Develop and demonstrate JavaScript with POP-UP boxes.
4	Write the HTML and JavaScript code to validate the required items using regular expression only.
5	To implement an events in JavaScript.
6	Alert the appropriate message when document is fully loaded and in ready state.
7	Hide all the <p> elements immediately after document loaded.
8	Hide all the tag whose id is “selected” when document is loaded (Take different tab with same id like h2,h3,p, etc.).
9	Hide all the tag whose class is “selected” when document is loaded (Take different tab with same class like h2,h3,p, etc.).
10	Change the text of <p> tag whose id is “msg” when document is loaded.

11	Change the text of <p> tag whose class is “msg” when document is loaded.
12	Change the text of <p> tag when button is clicked.
13	Swap the value of two <p> tags when button is clicked.
14	Set any value in input box when document is loaded.
15	Set any value in input box when user got focus on it (focus()).
16	Take value from the user in input box and display it in the <p> tag when text box lost the focus (blur()).
17	Demonstrate the function of three buttons for three different selectors (like element, id, class). First button is for hide elements, second is for hide ids, and third is for hide class.
18	Take any element as value in input box and hide all that elements when user clicked.
19	Take color as a value from user in input box and change background color when user clicked the button.
20	Change the background color as per selection of radio button among four radio button as red, blue, green, none (white).
21	To Install and configure PHP, web server and MYSQL.
22	To implement the data types in PHP.
23	To implement a PHP program to demonstrate the use of Decision making control structures using a. If statement b. If-else statement c. Switch statement
24	To implement a PHP program to demonstrate the use of Looping structures using a. While statement b. Do-while statement c. For statement d. Foreach statement
25	To implement a PHP program for creating and manipulating a. Indexed array b. Associative array c. Multidimensional array
26	To implement a Registration form and apply validation in PHP
27	To Implement the web applications with Database using (a) PHP
28	To implement the cookies in PHP program.
29	To implement the session in PHP program.
30	To implement an object oriented programming in PHP.

Reference Books:	
1	Beginning PHP6, Apache, MySQL Web development, wrox – Wiley India Pvt. Ltd.
2	Professional PHP Programming, wrox – Wiley India Pvt. Ltd.
3	PHP and MySQL Create – Modify – Reuse, wrox – Wiley India Pvt. Ltd.
Supplementary learning Material:	
1	https://www.w3schools.com/php/default.asp
2	https://spoken-tutorial.org/tutorial-search/?search_foss=PHP+and+MySQL&search_language=English
3	https://www.javatpoint.com/php-tutorial
4	https://www.w3schools.com/css/default.asp
5	https://www.w3schools.com/js/default.asp

Pedagogy:
• Explain / justify all the Program Definitions and correlate to real world problems and solution • Assignments / Quiz / Presentation / Participation for continuous evaluation and assessment • Internal / External Examination as per the norms of CVM University

Suggested Specification table with Marks (Practical) (Revised Bloom's Taxonomy):

Distribution of Theory Marks in %						**R**: Remembering; **U**: Understanding; **A**: Applying; **N**: Analyzing; **E**: Evaluating; **C**: Creating
R	**U**	**A**	**N**	**E**	**C**	
5	15	20	10	20	30	

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes (CO):

Sr.	Course Outcome Statements	%weightage
CO-1	Applying JavaScript in web design principles to make pages effective at client side operations.	**25**
CO-2	Developing interactive web page applying the various techniques and concepts of the jQuey(javascript library).	**25**
CO-3	Develop the server side PHP scripts using various features for creating customized web applications using database connectivity.	**25**
CO-4	Develop a web application using advanced web programming features.	**25**

Curriculum Revision:	
Version:	1
Drafted on (Month-Year):	December 2023
Last Reviewed on (Month-Year):	January 2024
Next Review on (Month-Year):	January 2025

FACULTY OF SCIENCE

Effective from Academic Batch: 2024-25

Programme: **Master of Science(Information Technology)**

Semester: **I**

Course Code: **101410138**

Course Title: **R Programming**

Course Group: **ELECTIVE**

Course Objectives:

a) This course introduces R, which is a popular statistical programming language.
b) The course covers data reading and its manipulation using R, which is widely used for data analysis internationally.
c) The course also covers different control structures and design of user-defined functions.
d) Loading, installing and building packages are covered.

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
				Theory		J/V/P*		Total
Lecture	Tutorial	Practical		Internal	External	Internal	External	
4	--	--	4	50/20	50/20	--	--	100/40

* **J**: Jury; **V**: Viva; **P**: Practical

Detailed Syllabus:

Sr.	Contents	Hours
1	**Introduction**: R interpreter, Introduction to major R data structures like vectors, list, matrices, arrays, factors and data frames, Control Structures, vectorized if and multiple selection, functions.	15
2	**Installing, loading and using packages:** Read/write data from/in files, extracting data from web-sites, Clean data, Transform data by sorting, adding/removing new/existing columns, centring, scaling and normalizing the data values, converting types of values, using string in-built functions, Statistical analysis of data for summarizing and understanding data, Visualizing data using scatter plot, line plot, bar chart, histogram and box plot	15
3	**Designing GUI:** Building interactive application and connecting it with database.	15
4	**Building Packages**	15

Reference Books:

Opp. Shastri Maidan, Beside BVM College, Vallabh Vidyanagar, Dist: Anand, Gujarat - 388120
(O): 02692-238001 | Email: adminoffice@cvmu.edu.in | www.cvmu.edu.in

1	Cotton, R., Learning R: a step by step function guide to data analysis. 1st edition. O'reilly Media Inc.
2	Gardener, M.(2017). Beginning R: The statistical programming language, WILEY.
3	Lawrence, M., & Verzani, J. (2016). Programming Graphical User Interfaces in R. CRC press. (ebook)

Supplementary learning Material:	
1	https://www.w3schools.com/r/
2	https://www.r-project.org/
3	https://cran.r-project.org/
4	https://www.tutorialspoint.com/r/index.htm
5	https://www.javatpoint.com/r-tutorial

Pedagogy:

At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
The assessment and evaluation process will be broadly classified with the following 02 components viz.,:

1. In- Semester continuous Internal assessment and evaluation, and
2. End- Semester final examination

The weightage of internal assessment for theory/practical course will be 50%.
However, the remaining 50% weightage for theory/practical courses will be for End-Semester final examination, both evaluation two (02) hours duration for theory and three (03) hours for practical.

In-Semester Continuous internal evaluation:

1. One Internal exam will be conducted as a part of internal theory/practical evaluation.
2. Assignments based on the course content will be given to the students for each unit and will be evaluated at regular interval evaluation.
3. Weekly Tests/Quizzes/Seminar/Attendance will be considered in the overall internal evaluation.
4. Presentation/Online Course Work/Research Paper are part of the internal evaluation.

Suggested Specification table with Marks (Theory) (Revised Bloom's Taxonomy):

Distribution of Theory Marks in %						**R**: Remembering; **U**: Understanding; **A**: Applying; **N**: Analyzing; **E**: Evaluating; **C**: Creating
R	**U**	**A**	**N**	**E**	**C**	
10	40	20	10	10	10	

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes (CO):

Sr.	Course Outcome Statements	%weightage
CO-1	Develop an R script and execute it.	**25**
CO-2	Install, load and deploy the required packages, and build new packages for sharing and reusability.	**25**
CO-3	Extract data from different sources using API and use it for data analysis. Visualize and summarize the data.	**25**

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CO-4	Design application with database connectivity for data analysis.	**25**

Curriculum Revision:	
Version:	1
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Last Reviewed on (Month-Year):	January 2024
Next Review on (Month-Year):	January 2025

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FACULTY OF SCIENCE

Effective from Academic Batch: 2024-25

Programme: **Master of Science(Information Technology)**

Semester: **I**

Course Code: **101410139**

Course Title: **Practical based on R Programming**

Course Group: **ELECTIVE**

Course Objectives:

1. This course introduces R, which is a popular statistical programming language.
2. The course covers data reading and its manipulation using R, which is widely used for data analysis internationally.
3. To train Students with good R programming breadth so as to comprehend, analyze, design and create novel products and solutions for the real life problems.
4. To inculcate in students professional and ethical attitude, multidisciplinary approach and an ability to relate R programming issues to broader application context.
5. To provide student with an academic environment aware of excellence, written ethical codes and guidelines and lifelong learning needed for a successful professional career.

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
				Theory		J/V/P*		Total
Lecture	Tutorial	Practical		Internal	External	Internal	External	
--	--	8	4	--	--	50/20	50/20	100/40

* **J**: Jury; **V**: Viva; **P**: Practical

List of Practicals / Tutorials:

To practice basic problem definitions, refer "w3schools" learning portal. More problem definitions will be assigned for practice during theory / practical / tutorial sessions. Students should maintain records for all the problem definitions either in digital or hard-copy format.

Reference Books:

1	Cotton, R., Learning R: a step by step function guide to data analysis. 1st edition. O'reilly Media Inc.
2	Gardener, M.(2017). Beginning R: The statistical programming language, WILEY.
3	Lawrence, M., & Verzani, J. (2016). Programming Graphical User Interfaces in R. CRC press. (ebook)

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Supplementary learning Material:	
1	https://www.w3schools.com/r/
2	https://www.r-project.org/
3	https://cran.r-project.org/
4	https://www.tutorialspoint.com/r/index.htm
5	https://www.javatpoint.com/r-tutorial

Pedagogy:

- Explain / justify all the Program Definitions and correlate to real world problems and solution
- Assignments / Quiz / Presentation / Participation for continuous evaluation and assessment Internal / External Examination as per the norms of CVM University
  The course includes a laboratory, where students have an opportunity to build a lab index for the concepts being taught in lectures/lab demonstrations.

Suggested Specification table with Marks (Theory) (Revised Bloom's Taxonomy):

Distribution of Theory Marks in %						**R**: Remembering; **U**: Understanding; **A**: Applying; **N**: Analyzing; **E**: Evaluating; **C**: Creating
R	**U**	**A**	**N**	**E**	**C**	
5	15	20	10	20	30	

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes (CO):

Sr.	**Course Outcome Statements**	**%weightage**
CO-1	Implement R script and execute it.	**20**
CO-2	Install, load and deploy the required packages, and build new packages for sharing and reusability.	**40**
CO-3	Extract data from different sources using API and use it for data analysis. Visualize and summarize the data.	**25**
CO-4	Design application with database connectivity for data analysis.	**15**

Curriculum Revision:	
Version:	1
Drafted on (Month-Year):	December 2023
Last Reviewed on (Month-Year):	January 2024
Next Review on (Month-Year):	January 2025

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