SYLLABUS FOR

THE FOUR-YEAR UNDERGRADUATE PROGRAMME (FYUGP)

As per provision of NEP-2020 to be implemented from Academic Year 2022 onwards

DEPARTMENT OF COMPUTER SCIENCE

GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE, RAJNANDGAON (C.G.)

B. SC. (Multiple Major) – DEGREE COURSE (Session 2024-25)
Major – Computer Science

	SEMESTER	COURSE TYPE	Theory/ Practical	COURSE CODE	PAPER TITLE	CREDIT			Max Marks	ESE	IA
						L	T	P			
THIRD YEAR	V	DSC-VA	Theory		Programming in JAVA	3	0	0	100	80	20
		DSC-VA	Practical		Programming in JAVA - LAB	0	0	1	50	40	10
		DSE-IIIA	Theory		Software Engineering	3	1	0	100	80	20
		GE –IIIA	Theory		E-Commerce & Applications	3	1	0	100	80	20
		SEC-VA	Theory		(Choose from SEC Pool) PHP & MySQL - I	2	0	0	50	40	10
	VI	DSC-VIA	Theory		Mobile Application Development	3	0	0	100	80	20
		DSC-VIA	Practical		Mobile Application Development - LAB	0	0	1	50	40	10
		DSE-IVA	Theory		Internet of Things	3	1	0	100	80	20
		GE- IVA	Theory		Basic IOT	3	1	0	100	80	20
		SEC – VI A	Practical		(Choose from SEC Pool) PHP & MySQL - II	0	0	2	50	40	10

ESE- End Semester Exam, IA-Internal Assessment

Instruction for Question paper setting

End Semester Exam (ESE) for DSC, DSE and GE

There will be 03 sections of question of 80 marks

Section A- section A will be very short answer type questions consisting 8 questions of 2 marks, two questions from each unit.

Section B- section B will be short answer type questions consisting 4 questions of 6 marks each, one question from each unit with internal choice.

Section C- section B will be long answer (Descriptive) type questions consisting 4 questions of 10 marks each, one question from each unit with internal choice.

End Semester Exam (ESE) for SEC-There will be 8 questions of 8 marks each, out of which any 5 question to be answer. Total marks will be 40.

Minimum Pass Marks 40%

Section	Maximum Marks (80)		Maximum Marks (40)	
A	2 x 8 = 16	Very short answer type questions consisting 8 Questions of 2 marks, two question from each unit.	8 x 5 = 40	8 questions of 8 mark each, out of which any 5 question to be answer.

B	6 x 4 = 24	Short answer type questions consisting 4 questions of 6 marks each, one question from each unit with internal choice.		
C	10 x 4 = 40	long answer (Descriptive) type questions consisting 4 questions of 10 marks each, one question from each unit with internal choice		

Program Objective

Po1-   It is to give foundation knowledge for the students to understand advance Computer Science including applied aspect for the same.

Po2-   It is to develop enhanced quantitive skills and pursuing higher Computer Science and research as well as.

Po3-   Students will be able to develop software as well as operating knowledge computer application.

Po4–   Students will become employable in various governments, public and private sectors.

Po5-   Scientific tempers in general and computer temper in particular will the developed in students.

Po6-   Sufficient subject matter competence and enable students to prepare for various competitive examinations such as GATE, UGC-CSIR, NET/JRF and Civil Services Examinations.

Program Specific Outcome (PSO)

PSO1-   Student should be able to understand the Programming knowledge of JAVA Programming Language.

PSO2-   Student should be able to know the Software engineering.

PSO3-   Student under stand and programming knowledge of Mobile Application for Android OS..

PSO4-   Student should be able to working in IOT.

PSO5-   Student should be able to website development using PHP and MySQL..

PSO6-   Student should be able to know functions and applications of E-Commerce.

FYUGP (CBCS/LOCF Course)
Department – Computer Science

Session: **2024-25**	Program: **B.Sc. (Maths)**
Semester: **V**	Subject: **Computer Science**
Course Type: **DSC**	Course Code:
Course Title:	**Programming in JAVA**
Credit: **4 (3 Theory + 1 Practical)**	Lecture: **60**
M.M. 100 = **Theory (ESE 80 + IA 20)** (Theory)	Minimum Passing Marks: **40%**
M.M. 50 = **50 (Internal 10 + Practical Record – 20 + Practical 10 + Viva 10)** (Practical)	Minimum Passing Marks: **40%**

Title	Programming in JAVA
Course Learning Outcome:	• Knowledge of the structure and model of the Java programming language, • Use the Java programming language for various programming technologies • Develop software in the Java programming language, • Evaluate user requirements for software functionality required to decide whether the • Java programming language can meet user requirements

Units	Lectures	Lectures (15 x 3 = 45)	Credits
I	**15**	Genesis of java, importance to the Internet, overview of features. OOP features, data types, control structures, arrays, methods and classes, nested & inner classes, string and String Buffer class, Wrapper Class, vectors	**1**
II		Inheritance : Basics type,method Override, using abstract and final classes, using super. Packages and Interfaces : Defined CLASSPATH, importing packages, implementing interface.	
III	**15**	Input/Output : Basic Streams, Byte and Character Stream, predefined streams, reading and writing from console and files. Using standard Java Packages (lang,util,io) Networking :Nasecs. TCP/IP client & server sockets, URL connection.JDBC: Setting the JDBC connectivity with backend database.	**1**
IV	**15**	Applets : Fundamentals, life cycle, overriding update, HTML APPLET tag, Passing parameters. Developing single applets. Introduction to AWT : Window fundamentals, creating windowed, programs waking with graphics, using AWT controls, menus. Delegation event model, handling mouse and keyboard events.	**1**

BOOKS RECOMMENDED:

TEXT BOOKS

    E Balaguruswamy, Programming with JAVA, A Primer (5e), Kindle Edition

REFERENCE BOOKS

1.   Bruce Eckel, Thinking in Java (4e)
2.   Herbert Schildt, Java: The Complete Reference (9e)
3.   Y. Daniel Liang, Introduction to Java Programming (10e)
4.   Paul Deitel, Harvey Deitel, Java: How To Program (10e)
5.   Cay S. Horsttnann, Core Java Volume I –Fundamentals (10e)

Practical - Programming in JAVA - LAB   Credit = 1

Max Mark: 50   **Min Marks: 40%**

Note: The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice. Only Simple calculators allowed not scientific calculator. The consent teacher may modify the assignment questions as required.

1. In every program there should be comment for each coded line or block of code.
2. Practical files should contain printed program with name of author, date,path of program, unit no and printed output.
3. All the following programs or a similar type of programs should be prepared.

List of Pratical
Note: This is tantative list, consultant teacher may add or remove assignments as required.

1   WAP that implements the Concept of Encapsulation.

2   WAP to demonstrate concept of Polymorphism (function Overloading and constructor Overloading).

3   WAP the use boolean data type and print the Prime number Series up to 50.

4   WAP to print first 10 number of the following Series using Do---While Loops 0, 1, 1, 2, 3, 5, 8,11..................

5   WAP to sort the element of One Dimensional Array in Ascending order.

6   WAP for matrix multiplication using input/output Stream.

7   WAP to add the elements of Vector as arguments of main method (Run time) and rearrange them, and copy it into an Array.

8   WAP to check that the given String is palindrome or not.

9   WAP to arrange the String in alphabetical order.

10   WAP for StringBuffer class which perform the all methods of that class.

11   WAP to calculate Simple Interest using the Wrapper Class.

12   WAP to calculate Area of various geometrical figures using the abstract class.

13   WAP where Single class implements more than one interfaces and with help of interface reference variable user call the methods.

14   WAP that use the multiple catch statements within the try-catch mechanism.

15   WAP where user will create a self-Exception using the "throw" keyword.

16   WAP for multithread using the isAlive(), join() and synchronized() methods of Thread class.

17   WAP to create a package using command and one package will import another package.

18   WAP for AWT to create Menu and Popup Menu for Frame.

19   WAP for Applet that handle the KeyBoard Events.

20   WAP, which support the TCP/IP protocol, where client gives the message and server will receive the message.

21   WAP to illustrate the use of all methods of URL class.

22   WAP for JDBC to insert the values into the existing table by using prepared Statement.

23   WAP for JDBC to display the records from the existing table.

24   WAP to demonstrate the Border Layout using applet.

25   WAP for Applet who generate the MouseMotionListener Event.

26   WAP for display the checkboxes, Labels and TextFields on an AWT.

GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE, RAJNANDGAON (C.G.)
FYUGP (CBCS/LOCF Course)
Department: -Computer Science

Session: **2024-25**	Program: **B.Sc.(Maths)**
Semester: **V**	Subject: **Computer Science**
Course Type: **DSE**	Course Code:
Course Title:	**Software Engineering**
Credit: **4 (Theory)**	Lecture: **60**
M.M. 100 **= (ESE 80+IA 20)**	Minimum Passing Marks: **40%**

Title	Software Engineering
Course Learning Outcome:	• Basic knowledge and understanding of the analysis and design of complex systems. • Ability to apply software engineering principles and techniques. • To produce efficient, reliable, robust and cost-effective software solutions. • Ability to work as an effective member or leader of software engineering teams. • To manage time, processes and resources effectively by prioritising competing • demands to achieve personal and team goals Identify and analyzes the common threats in each domain.

Units	Lectures	Lectures (15 x 4 = 60)	Credits
I	**15**	Software Development Approaches: Introduction; Evolving Role of Software; Software Characteristics; Software Applications. Software Design Processes: Introduction; What is Meant by Software Engineering?, Definitions of Software Engineering; The Serial or Linear Sequential Development Model; Iterative Development Model; The incremental Development Model	1
II	**15**	Software Design Principles: Introduction, System Models: Data -flow Models, Semantic Data Models, Object Models, Inheritance Models, Object Aggregation, Service Usage Models, Data Dictionaries; Software Design: The Design Process, Design Methods, Design description, Design Strategies, Design Quality; Architectural Design: System Structuring, The Repository Model, The Client–Server Model, The Abstract Machine Model	1
III	**15**	Object Oriented Design: Introduction; Object Oriented Design: Objects, Object Classes & Inheritance,	1

		Inheritance, Object Identification, An Object -Oriented Design Example , An Assessment of Process Life-Cycle Models: Introduction; Overview of the Assessment of Process; The Dimension of Time; The Need for a Business Model in Software Engineering	
IV	**15**	Software Testing Techniques: Introduction; Software Testing Fundamental; Testing Principles; White Box Testing; Control Structure Testing; Black Box Testing; Boundary Value Analysis; Testing GUIs; Testing Documentation and Help Facilities; Software Testing Strategies: Introduction; Organizing for Software Testing; Software Testing Strategy, Unit Testing: Unit Test Considerations, Top -Down Integration, Bottom-Up Integration.	1

Reference Book

- R. G. Pressman – Software Engineering, TMH

- Sommerville, Ian, Software Engineering, Pearson Education

- Pankaj Jalote – An Integrated Approach to Software Engineering, Narosa Publications.

- Pfleeger, Shari Lawrence, Software Engineering Theory and Practice, second edition. Prentice- Hall

- Object Oriented & Classical Software Engineering (Fifth Edition), SCHACH,TMH

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Department – Computer Science

Session: **2024-25**	Program: B.Sc.
Semester: **V**	Subject: **Computer Science**
Course Type: **GE**	Course Code: **.......................................**
Course Title:	**E-Commerce & Applications**
Credit: **4 (Theory)**	Lecture: **60**
M.M. 50 = **(ESE 80+IA 20)**	Minimum Passing Marks: **40%**

Title	E-Commerce & Applications
Course Learning Outcome:	• After completion of course the students will able to:- • Analyze the impact of E-commerce on business models and strategy. • Describe the major types of E-commerce. • Explain the process that should be followed in building an E-commerce presence. • Identify the key security threats in the E-commerce environment.

Units	Lectures	Lectures (15 x 4 = 60)	Credits
I	**15**	Introduction of E commerce, electronic market, Electronic data interchange, EC Framework and EC Classification , EC Business Models, Benefits and Limitations of EC E Marketplace, Types of E Marketplace, Intermediation in E-Commerce, EC Market Mechanisms – Electronic Catalog and Auctions, Impact of EC on Business Processes and Organizations	1
II	**15**	Internet Marketing and Electronic Retailing, E-Tailing Business Models, Problems and Issues in E-Tailing, Web Advertising, Advertising Methods, Advertising Strategies B2B E-Commerce: Concepts, Characteristics and Models One to Many: Sell Side EMarketplaces, Selling via Intermediaries, Selling via Auctions	1
III	**15**	Electronic Payments Systems: Payment Revolution, Using Payment Cards Online, Smart Cards, Stored Value Cards, E-Micropayments, E Checking, Electronic Bill Presentment and Payment, B2B Electronic Payments	1
IV	**15**	Mobile Commerce: Mobile Computing, Mobile Commerce, Pervasive Computing Legal, Ethical and Social Impacts of EC: Legal Issues versus Ethical Issues, Privacy, Intellectual Property Rights, EC Fraud and Consumer and Seller Protection.	1

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FYUGP (CBCS/LOCF Course)
Department – Computer Science

Session: **2024-25**	Program: B.A./B.Sc./B.Com/BCA
Semester: **V**	Subject: **Computer Science**
Course Type: **SEC**	Course Code: **......................................**
Course Title:	**PHP & MySQL - I**
Credit: **2**	Lecture: **30**
M.M. 50 = **(ESE 40 + IA 10)**	Minimum Passing Marks: **40%**

Title	PHP & MySQL - I
Course Learning Outcome:	After completion of course the students will able to:- • To implement PHP script using Decisions and Loops • To develop PHP applications using Strings, Arrays and Functions. • To design object-oriented programming (OOP) principles for PHP and use HTML form elements that work with any server-side language. To display and insert data using PHP and MySQL

Units	Lectures	Lectures (15 x 2 = 30)	Credits
I	**15**	Embedding PHP in web pages, redirecting output to browser, data types, expressions, control structures; Functions– Creation, passing arguments ,default argument values, returning values, recursive functions; Arrays-Creating,processing,sorting, merging, slicing, splicing, and dissecting arrays. Constructors, static class members, auto loading objects, inheritance, interfaces, abstract classes, error logging,	1
II	**15**	exceptional handling; Strings - regular expressions and other string functions. Introduction to MySQL - Data types, attributes, working with databases, working with tables, altering table structure; Database Connectivity- Using the MYSQLI extension, setting up the connection, handling errors, querying the database, working with prepared statements, auto commit mode, committing and rolling back a transaction.	1

Session: **2024-25**	Program: **.B.Sc (Maths)**
Semester: **VI**	Subject: **Computer Science**
Course Type: **DSC**	Course Code: **..**
Course Title:	**Mobile Application Development**
Credit: **4 (3 Lecture + 1 Practical)**	Lecture: **60**
M.M. 100 = **Theory (ESE 80 + IA 20) (Theory)**	Minimum Passing Marks: **40%**
M.M. 50 = **50 (Internal 10 + Practical (Practical) Record – 20 + Practical 10 + Viva 10)**	Minimum Passing Marks: **40%**

Title	Mobile Application Development
Course Learning Outcome:	• To understand Android platform and its architecture. • To learn about mobile devices types and different modern mobile operating systems. • To learn activity creation and Android User Interface designing. • To learn basics of Intent, Broadcast and Internet services. • To learn about different wireless mobile data transmission standards. • To understand and learn how to integrate basic phone features, multimedia, • camera and Location based services in Android Application. • To learn about different systems for mobile application development, • deployment and distribution in Mobile market place (Android, IoS). • To understand and carry out functional test strategies for mobile applications.

Units	Lectures	Lectures (15 x 3 = 45)	Credits
I	**15**	(Introduction) What is Android, Android Versions and its Feature Set, Various Android Devices on the Market, Android Market Application Store, Android Development Environment System Requirements, Android SDK, Installing Java, and ADT bundle - Eclipse Integrated Development Environment (IDE), Creating Android Virtual Devices (AVDs)	1
II		(Android Architecture Overview and Application) Android Software Stack, The Linux Kernel, Android Runtime - Dalvik Virtual Machine, Android Runtime – Core Libraries, Dalvik VM Specific Libraries, Java Interoperability Libraries, Android Libraries, Application Framework, Creating a New Android Project ,Defining the Project Name	

		and SDK Settings, Project Configuration Settings, Configuring the Launcher Icon, Creating an Activity, Running the Application in the AVD, Stopping a Running Application, Modifying the Example Application, Reviewing the Layout and Resource Files,	
III	15	(Android Software Development Platform and Framework) Understanding Java SE and the Dalvik Virtual Machine, The Directory Structure of an Android Project, Common Default Resources Folders, The Values Folder, Leveraging Android XML, Screen Sizes , Launching Mobile Application: The Android Manifest.xml File, Android Application Components, Android Activities: Defining the UI, Android Service s: Processing in the Background, Broadcast Receivers: Announcements and Notifications Content Providers: Data Management, Android Intent Objects: Messaging for Components, Android Manifest XML: Declaring Your Components	1
IV	15	(Understanding Android User Interfaces, Views and Layouts) Designing for Different Android Devices, Views and View Groups, Android Layout Managers, The View Hierarchy, Designing an Android User Interface using the Graphical Layout Tool Displaying Text with TextView, Retrieving Data from Users, Using Buttons, Check Boxes and Radio Groups, Getting Dates and Times from Users, Using Indicators to Display Data to Users, Adjusting Progress with Seek Bar, Working with Menus using views, Gallery, Image Switcher, Grid View, and Image View views to display images, Creating Animation	1

TEXTBOOKS
● Android Programming Unleashed (1 st Edition) by Harwani.
● Beginning Mobile Application Development in the Cloud (2011), Richard Rodger.

Practical : Mobile Application Development LAB   Credit = 1

1. In every program there should be comment for each coded line or block of code.
2. Practical files should contain printed program with name of author, date, path of program, unit no and printed output.
3. All the following programs or a similar type of programs should be prepared.

List of Practical
Note: This is tentative list. consultant teacher may add or remove assignments as required.

1. Download and setup Android Environment.
2. Using the Development environment.

   i. Create a new Project using wizard
   ii. Add source and resource files.
   iii. Import existing projects into workspace
   iv. Create testing Emulator
   v. Compile and run the project
   vi. Debug the project
   vii. Debug on android device.

3. Write a program to print hello message using Toast.

4. Write a program to add two integer values.

5. Write a program to demonstrate CheckBox.

6. Write a program to demonstrate RadioButton.

7. Write a program to demonstrate ListView.

8. Write a program for navigation between two activities.

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Department: - Computer Science

Session: **2024-25**	Program: **B.Sc.**
Semester: **VI**	Subject: **.Computer Science**
Course Type: **DSE**	Course Code: **.......................................**
Course Title:	**Internet of Things**
Credit: **4 (Theory)**	Lecture: **60**
M.M. 100 = **(ESE 80 + IA 20)**	Minimum Passing Marks: **40%**

Title	Internet of Things
Course Learning Outcome:	After completion of course the students will able to:- • Identify the level of IOT stack and be familiar with the key technologies & protocol. • Apply the knowledge & skills acquired during the course to build and test a complete. • Working IOT system involving prototyping, programming and data analysis.

Title		Internet of Things	
Units	**Lectures**	**Lectures (15 x 4 = 60)**	**Credits**
I	**15**	Fundamentals of IoT: Introduction, Definitions & Characteristics of IoT, IoT Architectures, Physical & Logical Design of IoT, Enabling Technologies in IoT, History of IoT, M2M and IOT technology fundamental -Device, gateways, local & wide area network, Everything as a service(Xaas),	1
II	**15**	IOT Architecture: Introduction state of Art, Refrence Model& architecture, IOT refrence architecture, functional view, information view, deployment & operational view, PHY/MAC layer(3GPP MTC, IEEE802.11,IEEE 802.15), Z wave, Bluetooth, Zigbee smart energy, DASH7- Network layer-IPv4,IPv6, 6LoWPAN, DHCP,ICMP, RPL.	1
III	**15**	Data Handling& Analytics: Introduction, Bigdata, Types of data, Characteristics of Big data, Data handling Technologies, Flow of data, Data acquisition, Data Storage, Introduction to Hadoop. Introduction to data Analytics, Types of Data analytics, Local Analytics, Cloud analytics and applications	1

IV	15	One M2M, European telecommunication , standard institute(ETSI), M2M(machine to machine) , OMA, BBF- security in IOT protocol – Mac 802.15.4, Routing protocol for low power & lossy network, Application layer, Applications of IoT.	1

FYUGP (CBCS/LOCF Course)

Department: -.Computer Science

Session: **2024-25**	Program: **B.Sc.**
Semester: **VI**	Subject: **Computer Science**
Course Type: **GE**	Course Code: **........................**
Course Title:	**Basic of IOT**
Credit: **4 (Theory)**	Lecture: **60**
M.M. 50 = **(ESE 80 + IA 20)**	Minimum Passing Marks: **40%**

Title	Basic of IOT
Course Learning Outcome:	After completion of course the students will able to:- • Understanding of various IOT application development tools. • implementation for IOT applications. • ability to develop problem solving skills through programming techniques for addressing real life problems.

Units	Lectures	Lectures (15 x 4 = 60)	Credits
I	**15**	Fundamentals of IoT: Introduction, Definitions & Characteristics of IoT, IoT Architectures, Physical & Logical Design of IoT, Enabling Technologies in IoT, History of IoT, About Things in IoT, The Identifiers in IoT, About the Internet in IoT, IoT frameworks, IoT and M2M.	1
II	**15**	Sensors Networks : Definition, Types of Sensors, Types of Actuators, Examples and Working, IoT Development Boards: Arduino IDE and Board Types, RaspberriPi Development Kit, RFID Principles and components, Wireless Sensor Networks: History and Context, The node, Connecting nodes, Networking Nodes, WSN and IoT	1
III	**15**	Data Handling& Analytics: Introduction, Bigdata, Types of data, Characteristics of Big data, Data handling Technologies, Flow of data, Data acquisition, Data Storage, Introduction to Hadoop. Introduction to data Analytics, Types of Data analytics, Local Analytics, Cloud analytics and applications	1
IV	**15**	Applications of IoT: Home Automation, Smart Cities, Energy, Retail Management, Logistics, Agriculture, Health and Lifestyle, Industrial IoT, Legal challenges, IoT design Ethics, IoT in Environmental Protection.	1

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FYUGP (CBCS/LOCF Course)
Department – Computer Science

Session: **2024-25**	Program: B.A./B.Sc./B.Com/BCA
Semester: **VI**	Subject: **Computer Science**
Course Type: **SEC**	Course Code: **......................................**
Course Title:	**PHP & MySQL - II**
Credit: **2**	Lecture: **30**
M.M. 50 = (Internal 10 + Practical Record – 20 + Practical 10 + Viva 10)	Minimum Passing Marks: **40%**

Title	PHP & MySQL - II
Course Learning Outcome:	.After completion of course the students will able to:- • To implement PHP script using Decisions and Loops • To develop PHP applications using Strings, Arrays and Functions. • To design object-oriented programming (OOP) principles for PHP and use HTML form elements that work with any server-side language. • To display and insert data using PHP and MySQL

Units	Lectures	Lectures (15 x 2 = 30)	Credits
I	**15**	**Introduction to MySQL** - Data types, attributes, working with databases, working with tables, altering table structure; Database Connectivity-Using the MYSQLI extension, setting up the connection, handling errors, querying the database, working with prepared statements, auto commit mode, committing and rolling back a transaction.	1
II	**15**	**List of Practical :-** 1. Creating web pages using different XHTML elements like lists ,images, tables, frames , form. 2. Formatting web pages using cascading style sheets 3. Creating dynamic web pages using form elements 4. Implementing various control structures using PHP script 5. OOP exercises using PHP	1

		6. PHP application to handle forms 7. Database connectivity using PHP 8. CRUD operations on database using PHP **Note:** List of Practicals may be changed by the concerned teacher.	