BAGALKOT UNIVERSITY

Mudhol Road, Jamkhandi-587301 Dist: Bagalkot

PROGRAM /COURSE STRUCTURE AND SYLLABUS
FOR

COMPUTER SCIENCE

as per the Choice Based Credit System (CBCS) designed in
accordance with Learning Outcomes-Based Curriculum
Framework (LOCF)

For

Bachelor of Science
(COMPUTER SCIENCE)

(General Degree)
III Semester

w.e.f.

As per NEP 2020 and adapted from RCU Belagavi applicable from the
Academic Year 2024-25

Curriculum Structure for B.Sc. (Computer Science) III SEM Program of BGKU as per NEP 2020 w.e.f. 2024-25

SEMESTER-III

Category	Course code	Title of the Paper	Marks			Teaching hours/week			Credit	Duration of exams (Hrs)
			IA	SEE	Total	L	T	P		
L5	-------------	-------------	40	60	100	4	-	-	3	2
L6	-------------	-------------	40	60	100	4	-	-	3	2
DSC3	126BSC03CSCDSC03T	Object Oriented Programming in JAVA	40	60	100	4	-	-	4	2
	126BSC03CSCDSC03L	JAVA Lab	25	25	50	-	-	4	2	3
DSC3	Another Department Code	Another Department Course Title with lab	40	60	100	4	-	-	4	2
			25	25	50	-	-	4	2	3
AECC2	126COM03XXXAEC03T	Constitution of India	20	30	50	1	-	2	2	1hr30min
VBC5	126COM03XXXVBC05L	NCC/NSS/R&R(S&G) / Cultural	25	-	25	-	-	2	1	-
VBC6	126COM03XXXVBC06B	Physical Education – Sports	25	-	25	-	-	2	1	-
OEC3	126BSC03CSCOEC03T	Python Programming Concepts	40	60	100	3	-	-	3	2
		Total Marks	700			Semester Credits			25	

Syllabus for BSc III Semesters

Subject: Computer Science

Sem	Discipline Specific Core Courses(DSC)	Hour / Week	
		Theory	Lab
III	**DSC-3:** Object Oriented Programming Concepts and Programming in JAVA	**4**	-
	DSC-3 Lab: JAVA Lab	-	**4**
	OEC: Python Programming Concepts	**3**	**-**

Syllabus for BSc III Semester

Course Title: Object Oriented Programming Concepts and Programming in Java	Course code: 126BSC03CSCDSC03T
Total Contact Hours: 52	Course Credits: 04
Formative Assessment or IA Marks: 40	Duration of SEE/Exam: 02 Hours
Summative Assessment Marks: 60	

Course Outcomes (COs):

At the end of the course, students will be able to:
- Explain the object-oriented concepts and JAVA.
- Write JAVA programs using OOP concepts like Abstraction, Encapsulation, Inheritance and Polymorphism.
- Implement Classes and multithreading using JAVA.
- Demonstrate the basic principles of creating Java applications with GUI.

DSC3: Object Oriented Programming Concepts and Programming in Java

Unit	Description	Hours
1	**Introduction to Java:** Basics of Java programming, Data types, Variables, Operators, Control structures including selection, Looping, Java methods, Overloading, Math class, Arrays in java.	09
2	**Objects and Classes:** Basics of objects and classes in java, Constructors, Finalizer, Visibility modifiers, Methods and objects, Inbuilt classes like String, Character, String Buffer, File, this reference.	10
3	**Inheritance and Polymorphism:** Inheritance in java, Super and sub class, Overriding, Object class, Polymorphism, Dynamic binding, Generic programming, Casting objects, Instance of operator, Abstract class, Interface in java, Package in java, UTIL package.	09
4	**Event and GUI programming:** Event handling in java, Event types, Mouse and key events, GUI Basics, Panels, Frames, Layout Managers: Flow Layout, Border Layout, Grid Layout, GUI components like Buttons, Check Boxes, Radio Buttons, Labels, Text Fields, Text Areas, Combo Boxes, Lists, Scroll Bars, Sliders, Windows, Menus, Dialog Box, Applet and its life cycle, Introduction to swing, Exceptional handling mechanism.	12
5	**I/O programming:** Text and Binary I/O, Binary I/O classes, Object I/O, Random Access Files. Multithreading in java: Thread life cycle and methods, Runnable interface, Thread synchronization, Exception handling with try catch-finally, Collections in java, Introduction to JavaBeans and Network Programming	12

References:

1. Programming with Java, By E Balagurusamy – A Primer, 4th Edition, McGraw Hill Publication.
2. Core Java Volume I – Fundamentals, By Cay S. Horstmann, Prentice Hall.
3. Object Oriented Programming with Java: Somashekara M.T., Guru, D.S., Manjunatha K.S, 1st Edition, PHI Learning 2017.
4. Java 2 - The Complete Reference, Herbert Schildt, 5th Edition, McGraw Hill Publication, 2017.
5. Java - The Complete Reference, Herbert Schildt, 7th Edition, McGraw Hill Publication, 2017.

Year	II	Course Code: 126BSC03CSCDSC03L	Credits	02
Sem.	III	Course Title: JAVA LAB	Hours	40
Course Pre-requisites, ifany:		Knowledge of Programming		
Formative Assessment Marks: 25		Summative Assessment Marks: 25	Duration of ESA: 03 hrs.	

Practice Labs

1. Program to print the following triangle of numbers

    1
    1 2
    1 2 3
    1 2 3 4
    1 2 3 4 5

2. Program to simple java application, to print the message,"Welcome to java"

3. Program to display the month of a year. Months of the yearshould be held in an array.

4. Program to find the area of rectangle.

5. program to demonstrate a division by zero exception

6. Program to create a user defined exception say Pay Out ofBounds.

Part A: Programming Lab – Java Fundamentals – OOPS inJAVA

1. Program to assign two integer values to X and Y. Using the "if"statement the output of the program should display a message whether X is greater than Y.

2. Program to list the factorial of the numbers 1 to 10. Tocalculate the factorial value, use while loop. (Hint: Fact of 4 = 4*3*2*1)

3. Program to find the area and circumference of the circle by accepting the radius from the user.

4. Program to add two integers and two float numbers. When no arguments are supplied, give a default value to calculate the sum. Use function overloading.
Program to perform mathematical operations. Create a class called AddSub with methods to add and subtract. Createanother class called MulDiv that extends from AddSub class to use the member data of the super class. MulDiv should have methods to multiply and divide A main function should access the methods and perform the mathematical operations.

6. Program with class variable that is available for all instancesof a class. Use static variable declaration. Observe the changes that occur in the object"s member variable values.

7. Program to create a student class with following attributes; Enrollment No: Name, Mark of sub1, Mark of sub2, mark ofsub3, Total Marks. Total of the three marks must becalculated only when the student passes in all three subjects.The passing mark for each subject is 50. If a candidate fails inany one of the subjects his total mark must be declared aszero. Using this condition write a constructor for this class.Write separate functions for accepting and displaying studentdetails. In the main

method create an array of three studentobjects and display the details.

8. Write a program to demonstrate multiple inheritance and useof Implementing Interfaces

9. Illustrate creation of thread by

   a) Extending Thread class. b) Implementing RunnableInterfaces

10. Write a program to demonstrate multiple inheritance and use of implementing Interfaces.

PART B: Exception Handling & GUI Programming

1. Program to catch Negative Array Size Exception. This exception is caused when the array size is initialized to negative values.
2. Program to demonstrate exception handling with try, catch and finally.
3. Program which create and displays a message on the window
4. Program to draw several shapes in the created window
5. Programto create a 4×4 grid and fills it in with 15 buttons, each labeled with its index.
6. Program which creates a frame with two buttons father and mother. When we click the father button the name of the father, his age and designation must appear. When we click mother button similar details of mother also appear.
7. Create a frame which displays your personal details with respect to a button click
8. Program to create a window with Text Fields and Buttons. The"ADD" button adds the two integers and display the result. The "CLEAR" button shall clear all the text fields.
9. Program to create a window, when we press M or m, the window displays "Good morning", A or a, the window display's Good Afternoon", E or e, the window displays "Good Evening", N or n, the window displays "Hello".
10. Demonstrate the various mouse handling events using suitable example.

Evaluation Scheme for Java Lab Examination

Assessment Criteria		Marks
Program – 1 from Part A	Writing the Program	03
	Execution and Formatting	07
Program -2 from Part B	Writing the Program	03
	Execution and Formatting	07
Viva Voice		05

Open Elective for III Semester

Course Code: 126BSC03CSCOEC03T Course Title: Python Programming Concepts	Course Credits: 3 (3L+0T+0P)
Semester: III	Duration of SEE: 02 Hour
Total Contact Hours: 42	Summative Assessment Marks : 60 Marks Formative AssessmentMarks: 40 Marks

Course Outcomes (COs):

- Explain the fundamentals of Computers.
- Explain the basic concepts of Python Programming.
- Demonstrate proficiency in the handling of loops and the creation of functions.
- Identify the methods to create and store strings.

Unit I   Fundamentals of Computers   10 Hrs

Introduction to Computers - Computer Definition, Characteristics of Computers, Evolution and History of Computers, Types of Computers, Basic Organization of a Digital Computer; Number Systems – different types, conversion from one number system to another; Computer Codes – BCD, Gray Code, ASCII and Unicode; Boolean Algebra – Boolean Operators with Truth Tables; Types of Software – System Software and Utility Software; Computer Languages - Machine Level, Assembly Level & High Level Languages, Translator Programs – Assembler, Interpreter and Compiler; Planning a Computer Program - Algorithm, Flowchart and Pseudo code with Examples.

Unit II   Python Basics   10 Hrs

Introduction to Features and Applications of Python; Python Versions; Installation of Python; Python Command Line mode and Python IDEs; Simple Python Program. Identifiers; Keywords; Statements and Expressions; Variables; Operators; Precedence and Association; Data Types; Indentation; Comments; Built-in Functions- Console Input and Console Output, Type Conversions; Python Libraries; Importing Libraries with Examples; Illustrative programs.

Unit III   08 Hrs

Python Control Flow: Types of Control Flow; Control Flow Statements- if, else, elif, while loop, break, continue statements, for loop Statement; range () and exit () functions; Illustrativeprograms.

Unit IV   08 Hrs

Python Functions: Types of Functions; Function Definition- Syntax, Function Calling, Passing Parameters/arguments, the return statement; Default Parameters; Command line Arguments; Key Word Arguments; Illustrative programs.

10

Unit V   **06 Hrs**

Strings: Creating and Storing Strings; Accessing Sting Characters; the str() function; Operations on Strings- Concatenation, Comparison, Slicing and Joining, Traversing; Format Specifiers; Escape Sequences; Raw and Unicode Strings; Python String Methods; Illustrative programs.

References
1. Computer Fundamentals (BPB), P. K. Sinha & Priti Sinha
2. Think Python How to Think Like a Computer Scientist, Allen Downey et al., 2nd Edition, Green Tea Press. Freely available online 2015. @https://www.greenteapress.com/thinkpython/thinkCSpy.pdf
3. Introduction to Python Programming, Gowrishankar S et al., CRC Press, 2019.
4. http://www.ibiblio.org/g2swap/byteofpython/read/
5. http://scipy-lectures.org/intro/language/python_language.html
6. https://docs.python.org/3/tutorial/index.html

Semester End Exam Question Paper Pattern

Duration of the examination: 2hour   **Max. Marks:60**

Section A

Answer any TEN from the following, each carries 2 marks: **[10X2=20]**

    1.   -------------------------------------
    2.   -------------------------------------
    3.   -------------------------------------
    4.   -------------------------------------
    5.   -------------------------------------
    6.   -------------------------------------
    7.   -------------------------------------
    8.   -------------------------------------
    9.   -------------------------------------
    10. -------------------------------------
    11. -------------------------------------
    12. -------------------------------------

Section B

Answer any FOUR from the following questions each carries 5 marks.

[4X5=20]

    13. -------------------------------------
    14. -------------------------------------
    15. -------------------------------------
    16. -------------------------------------
    17. -------------------------------------

Section C

Answer Any two from the following questions each carries 10 marks.

(The Question may consist two sub-questions)

[2X10=20]

    18. -------------------------------------
    19. -------------------------------------
    20. -------------------------------------

Theory Paper IA 40 Marks distribution

	C1	C2	Total Marks
First IA	Test-1: 15marks	Assignment/Activity-1: 05Marks	**20**
Second IA	Test-2: 15marks	Assignment/Activity-2 : 05Marks	**20**
	30	**10**	**40**

Theory Paper IA 20 Marks distribution

	C1	C2	Total Marks
First IA	Test-1: 10 marks	---	**10**
Second IA	Test-2: 5marks	Assignment/Activity-2 : 05	**10**
	15	**05**	**20**