**Bachelor of Computer Application**
**(Semester – III and Semester - IV)**
**Saurashtra University**
**Effective from June - 2017**

| No | Topics | Details | Marks weight In % | Min Lec. |
|---|---|---|---|---|
| — **CS – 19 PROGRAMMING WITH JAVA** |||||
| 1. | **History, Introduction and Language Basics** | - History and Features of Java<br>- Java Editions<br>- JDK, JVM and JRE<br>- JDK Tools<br>- Compiling and Executing basic Java Program<br>- Java IDE (Netbeans and Eclipse)<br>- Data Type (Integer, Float, Character, Boolean)<br>- Java Tokens (Keyword, Literal, Identifier, Whitespace, Separators, Comments, Operators)<br>- Operators (Arithmetic, Relational, Boolean Logical, Bitwise Logical, Assignment, Unnary, Shift, Special operators)<br>- Type Casting<br>- Decision Statements (if, switch)<br>- Looping Statements (for, while, do..while)<br>- Jumping Statements (break, continue, return)<br>- Array (One Dim., Rectangular, Jagged)<br>- Command Line Argument Array | 10 | 5 |
| 2. | **Classes and Objects** | - OOP Concepts (Class, Object, Encapsulation, Inheritance, Polymorphism)<br>- Creating and using Class with members<br>- Constructor<br>- finalize() method<br>- Static and Non-Static Members<br>- Overloading (Constructor & Method)<br>- VarArgs | 10 | 3 |
| 3. | **Inheritance** | - Universal Class (Object Class)<br>- Access Specifiers (public, private, protected, default, private protected)<br>- Doing Inheritance<br>- Constructors in inheritance | 5 | 5 |

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| | | - Method Overriding | | |
| | | - Interface | | |
| | | - Nested and Inner Class | | |
| | | - Abstract and Final Class | | |
| 4. | **Java Packages** | - Normal import and Static Import<br>- Introduction to Java API Packages and imp. Classes<br>  ○ java.lang<br>  ○ java.util<br>  ○ java.io<br>  ○ java.net<br>  ○ java.awt<br>  ○ java.awt.event<br>  ○ java.applet<br>  ○ java.swing<br>- java.lang Package Classes (Math, Wrapper Classes, String, String Buffer)<br>- java.util Package Classes (Random, Date, GregorianCalendar, Vector, HashTable, StringTokenizer)<br>- Creating and Using UserDefined package and sub-package | 15 | 10 |
| 5. | **Exception Handling and Threading** | - Introduction to exception handling<br>- try, catch, finally, throw, throws<br>- Creating user defined Exception class<br>- Thread and its Life Cycle (Thread States)<br>- Thread Class and its methods<br>- Synchronization in Multiple Threads (Multithreading)<br>- Deamon Thread, Non-Deamon Thread | 10 | 5 |
| 6. | **Streams (Input and Output)** | - Stream and its types (Input, Output, Character, Byte)<br>- File and RandomAccessFile Class<br>- Reading and Writing through Character Stream Classes (FileReader, BufferedReader, FileWriter, BufferedWriter)<br>- Reading and Writing through Byte Stream Classes (InputStream, FileInputStream, BufferedInputStream, DataInputStream, OutputStream, | 10 | 5 |

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| | | FileOutputStream, BufferedOutputStream, DataOutputStream) <br> - StreamTokenizer Class <br> - Piped Streams, Bridge Classes : InputStreamReader and OutputStreamWriter <br> - ObjectInputStream, ObjectOutputStream | | |
| 7. | **Applets** | - Introduction to Applet <br> - Applet Life Cycle <br> - Implement & Executing Applet with Parameters <br> - Graphics class | **5** | **2** |
| 8. | **Layout Managers** | - FlowLayout <br> - BorderLayout <br> - CardLayout <br> - GridLayout <br> - GridBagLayout with GridBagConstraints <br> - Intro. to BoxLayout, SprigLayout, GroupLayout <br> - Using NO LAYOUT Manager | **10** | **5** |
| 9. | **GUI using SWING** | - Introduction to AWT and Swing <br> - Difference Between AWT and Swing Components <br> - Swing Components <br>   o JFrame, JPanel <br>   o JLabel, JButton, JRadioButton, JCheckBox <br>   o JTextField, JPasswordField, JTextArea <br>   o JScrollBar, JComboBox, JList <br>   o Menus (JMenuBar, JMenu, JMenuItem) | **15** | **10** |
| 10. | **Event Handling** | - Introduction to Event Handling <br> - Event Delegation Model <br> - Event Packages <br>   o AWT Event Package <br>   o Swing Event Package <br> - Event Classes (ActionEvent, ItemEvent, FocusEvent, MouseEvent, MouseWheelEvent, TextEvent, WindowEvent, etc.) <br> - Listener Interfaces (ActionListener, ItemListener, FocusListener, KeyListener, MouseListener, | **10** | **10** |

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|---|---|---|---|---|
| | | MoutMotionListener, TextListener, WindowListener, etc.)<br>- Adaptor Classes (FocusAdaptor, KeyAdaptor, MouseAdaptor, MouseMotionAdaptor) | | |
| | | **Total** | **100** | **60** |

Students seminar          - 5 Lectures.
Expert Talk                   - 5 Lectures
Students Test               - 5 Lectures.
**TOTAL LECTURES 60+15=75**

### Reference Books:

1. Java: A Beginner's Guide – Jul 2014 by Herbert Schildt
2. Java Programming (Oracle Press) by Poornachandra Sarang
3. Java The Complete Reference, 8th Edition –by Herbert Schildt
4. Ivor Horton's "Beginning Java 2" JDK 5 Edition, Wiley Computer Publishing.
5. Ken Arnold, James Gosling, David Holmes, "The Java Programming Language", Addison-Wesley Pearson Education.
6. Cay Horstmann, "Big Java", Wiley Computer publishing (2$^{nd}$ edition – 2006).
7. James Gosling, Bill Joy, Guy Steele, Gilad Bracha, "The Java Langauge Specifications", Addison-Wesley Pearson Education (3rd edition) Download at http://docs.oracle.com/javase/specs/