

**M.L. Dahanukar College of Commerce**

**Teaching Plan: 2024 - 2025**

**Department: I.T.**

**Class: S.Y.B.Sc.(I.T.)**

**Semester: IV**

**Subject: JAVA PROGRAMMING**

**Name of the Faculty: Snehal S. Borlikar**

| <b>Month</b> | <b>Topics to be Covered</b>  | <b>Internal Assessment</b> | <b>Number of Lectures</b> |
|--------------|--|----------------------------|---------------------------|
| November     | Unit 1: Introduction, Classes<br>Unit 2: Inheritance, Interface          |                            | 15                        |
| December     | Unit 3: Exceptions<br>Unit 3: Multithreading, Packages                   |                            | 10                        |
| January      | Unit 4: Introduction to JFC and Swing<br>Unit 4: Layouts, Event Handling |                            | 15                        |
| February     | Unit 4: Layouts, Event Handling<br>Unit 5: Advance Swing Control, JDBC   |                            | 10                        |

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## M.L. Dahanukar College of Commerce

### Teaching Plan: 2024 - 25

Department: I.T.

Class: B.Sc.(I.T.)

Semester: IV

Subject: Introduction To Embedded Systems

Name of the Faculty: Amit Bane

| Month    | Topics to be Covered  | Internal Assessment | Number of Lectures |
|----------|---|---------------------|--------------------|
| November | PIC MICROCONTROLLER: Architecture – memory organization – addressing modes – instruction set – PIC programming in Assembly & C –I/O port, Data Conversion, RAM & ROM Allocation, Timer programming  |                     | 10                 |
| December | Advanced ARM Controllers: Introduction to ARM and its Features, Architecture – memory organization – addressing modes –The ARM Programmer's model -Registers – Pipeline - Interrupts – Coprocessors – Interrupt Structure. Wi-Fi and RFID. Understanding Serial, Communication, Bluetooth Communication, SPI Interface ZigBee, Wi-Fi, I2C, Infrared, RFID, GSM, GPS, PDH/SDH/Ethernet.  |                     | 15                 |
| January  | Getting Started with Arduino: Introduction, Arduino Variants, Install the Drivers, Arduino IDE Basic Functions: Overview, Structure, Digital I/O Functions, Analog I/O Functions, Advanced I/O Functions, Timer Functions, Communication Functions, Interrupt Functions, Math Functions, Programming Language Reference   |                     | 20                 |
| February | Using Sensors with the Arduino: Light Sensitive Sensors, Temperature Sensors, Temperature and Humidity Sensor, Line Tracking Sensor, Ultrasonic Sensors, Digital Infrared Motion Sensor, Joystick Module, Gas Sensor, Hall Sensor, Color Sensor, Digital Tilt Sensor, Triple Axis Acceleration Sensor, Analog Sound Sensor, Voice Recognition Module, Digital Vibration Sensor, Flame Sensor, Capacitive Touch Sensor Electromechanical Control Using the Arduino: DC Motor, Stepper Motor, Servo Motor |                     | 10                 |
| March    | Wireless Control Using the Arduino: Infrared Transmitter and Receiver, Wireless Radio Frequency, Bluetooth, GSM/GPRS, Wi-Fi Case Studies: • Air Quality Monitor Using Arduino • A Fire-Fighting Robot Using Arduino • Intelligent Lock System Using Arduino   |                     | 05                 |

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**M.L. Dahanukar College of Commerce**

**Teaching Plan: 2024 - 25**

**Department: IT**

**Class: B.Sc.(IT.)**

**Semester: IV**

**Subject: Computer Oriented Statistical Techniques**

**Name of the Faculty: Manisha Warekar**

| <b>Month</b>    | <b>Topics to be Covered</b>  | <b>Internal Assessment</b> | <b>Number of Lectures</b> |
|-----------------|--|----------------------------|---------------------------|
| <b>November</b> | <b>Measures of central Tendency:</b> Mean, Median & Mode                           |                            | 5                         |
|                 | <b>Measures of Dispersion:</b> Absolute Measures & Relative Measures of Dispersion |                            | 5                         |
|                 | <b>Correlation:</b> Scatter Diagram, Karl Pearson's Correlation Coefficient        |                            | 2                         |
|                 | <b>Regression</b>  |                            | 3                         |
| <b>December</b> | Moments, Skewness & Kurtosis   |                            | 4                         |
|                 | Probability Theory   |                            | 2                         |
|                 | Probability Distribution   |                            | 4                         |
|                 | Large Sample Tests   |                            | 5                         |
| <b>January</b>  | Large Sample Tests   |                            | 5                         |
|                 | Small Sample Tests   |                            | 6                         |
|                 | Chi-Square Test  |                            | 4                         |
| <b>February</b> | Time Series Analysis   |                            | 2                         |
|                 | Curve Fitting  |                            | 3                         |

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## M.L. Dahanukar College of Commerce

### Teaching Plan: 2024 - 25

Department: I.T.

Class: B.Sc.(I.T.)

Semester: IV

Subject: Software Engineering

Name of the Faculty: Priyanka Kathale

| Month    | Topics to be Covered  | Internal Assessment | Number of Lectures |
|----------|---|---------------------|--------------------|
| November | Introduction: What is software engineering? Software Development Life Cycle, Requirements Analysis, Software Design, Coding, Testing, Maintenance etc.<br>Software Development Process Models. • Waterfall Model. • Prototyping. • Iterative Development. • Rational Unified Process. • The RAD Model • Time boxing Model.  |                     | 05                 |
| December | Software Requirements: Functional and Non-functional requirements, User Requirements, System Requirements, Interface Specification, Documentation of the software requirements.<br>Process and Project, Component Software Processes. Agile software development: Agile methods, Plan-driven and agile development, Extreme programming, Agile project management, Scaling agile methods.<br>Socio-technical system: Essential characteristics of socio technical systems, Emergent System Properties, Systems Engineering, Components of system such as organization, people and computers, Dealing Legacy Systems. Critical system: Types of critical system, A simple safety critical system, Dependability of a system, Availability and Reliability, Safety and Security of Software systems. 12 45 Requirements Engineering Processes: Feasibility study, Requirements elicitation and analysis, Requirements Validations, Requirements Management. |                     | 15                 |
| January  | System Models: Models and its types, Context Models, Behavioural Models, Data Models, Object Models, Structured Methods. III Architectural Design: Architectural Design Decisions, System Organisation, Modular Decomposition Styles, Control Styles, Reference Architectures. User Interface Design: Need of UI design, Design issues, The UI design Process, User analysis, User Interface Prototyping, Interface Evaluation. Evaluation. Project Management Software Project Management, Management activities, Project Planning, Project Scheduling, Risk Management.   |                     | 15                 |

|          |  |  |    |
|----------|--|--|----|
|          | Quality Management: Process and Product Quality, Quality assurance and Standards, Quality Planning, Quality Control, Software Measurement and Metrics.   |  |    |
| February | Verification and Validation: Planning Verification and Validation, Software Inspections, Automated Static Analysis, Verification and Formal Methods. Software Testing: System Testing, Component Testing, Test Case Design, Test Automation. Software Measurement: Size-Oriented Metrics, Function-Oriented Metrics, Extended Function Point Metrics Software Cost Estimation: Software Productivity, Estimation Techniques, Algorithmic Cost Modelling, Project Duration and Staffing. Process Improvement: Process and product quality, Process Classification, Process Measurement, Process Analysis and Modeling, Process Change, The CMMI Process Improvement Framework. Service Oriented Software Engineering: Services as reusable components, Service Engineering, Software Development with Services. |  | 12 |
| March    | Software reuse: The reuse landscape, Application frameworks, Software product lines, COTS product reuse. Distributed software engineering: Distributed systems issues, Client server computing, Architectural patterns for distributed systems, Software as a service  |  | 03 |

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## ML Dahanukar College

### Teaching Plan: 2024 - 25

Department: I.T.

Class: S.Y.BSc.(I.T.)

Semester: IV

Subject: Computer Graphics and Animation

Name of the Faculty: Ms. Rasika Sawant

| Month    | Topics to be Covered  | Internal Assessment | Number of Lectures |
|----------|---|---------------------|--------------------|
| November | <b>Unit 1: Introduction to Computer Graphics:</b><br>Overview of Computer Graphics, Computer Graphics Application and Software, Description of some graphics devices, Input Devices for Operator Interaction, Active and Passive Graphics Devices Display Technologies, Storage Tube, Calligraphic Refresh, Raster Refresh (Raster-Scan) Graphics Displays, Cathode Ray Tube Basics, Color CRT Raster Scan Basics, Video Basics, The Video Controller, Random-Scan Display Processor, LCD displays.<br><b>Scan conversion</b> – Digital Differential Analyzer (DDA) algorithm, Bresenham's Line drawing algorithm. Bresenham's method of Circle drawing, Midpoint Circle Algorithm, Midpoint Ellipse Algorithm, Mid-point criteria, Problems of Aliasing, end-point ordering and clipping lines, Scan Converting Circles, Clipping Lines algorithms– Cyrus-Beck, Cohen-Sutherland and Liang-Barsky, Clipping Polygons, problem with multiple components.  |                     | 12                 |
| December | <b>Unit 2: Two-Dimensional Transformations:</b><br>Transformations and Matrices, Transformation Conventions, 2D Transformations, Homogeneous Coordinates and Matrix Representation of 2D Transformations, Translations and Homogeneous Coordinates, Rotation, Reflection, Scaling, Combined Transformation, Transformation of Points, Transformation of The Unit Square, Solid Body Transformations, Rotation About an Arbitrary Point, Reflection through an Arbitrary Line, A Geometric Interpretation of Homogeneous Coordinates, The Window-to-Viewport Transformations.<br><b>Three-Dimensional Transformations:</b><br>Three-Dimensional Scaling, Shearing, Rotation, Reflection, Translation, Multiple Transformation, Rotation about an Arbitrary Axis in Space, Reflection through an Arbitrary Plane, Matrix Representation of 3D Transformations, Composition of 3D Transformations, Affine and Perspective Geometry, Perspective Transformations, Techniques for Generating Perspective Views, Vanishing Points, the Perspective Geometry and camera models, Orthographic Projections, Axonometric Projections, Oblique Projections, View volumes for projections |                     | 12                 |

|                 |   |  |    |
|-----------------|---|--|----|
| <b>January</b>  | <p><b>Unit 3: Viewing in 3D</b><br/> Stages in 3D viewing, Canonical View Volume (CVV), Specifying an Arbitrary 3D View, Examples of 3D Viewing, The Mathematics of Planar Geometric Projections, Combined transformation matrices for projections and viewing, Coordinate Systems and matrices, camera model and viewing pyramid.<br/> <b>Light:</b> Radiometry, Transport, Equation, Photometry<br/> <b>Color:</b> Colorimetry, Color Spaces, Chromatic Adaptation, Color Appearance<br/> <b>Unit 4: Visible-Surface Determination:</b><br/> Techniques for efficient Visible-Surface Algorithms, Categories of algorithms, Back face removal, The z-Buffer Algorithm, Scan-line method, Painter's algorithms (depth sorting), Area sub-division method, BSP trees, Visible-Surface Ray Tracing, comparison of the methods.</p> |  | 16 |
| <b>February</b> | <p><b>Plane Curves and Surfaces:</b><br/> Curve Representation, Nonparametric Curves, Parametric Curves, Parametric Representation of a Circle, an Ellipse, Parabola, Hyperbola, Space Curves, Cubic Splines, Bezier Curves, B-spline Curves, B-spline Curve Fit, B-spline Curve Subdivision, Parametric Cubic Curves, Quadric Surfaces. Bezier Surfaces.<br/> <b>Unit 5: Computer Animation:</b><br/> Principles of Animation, Key framing, Deformations, Character Animation, Physics-Based Animation, Procedural Techniques, Groups of Objects.<br/> <b>Image Manipulation and Storage:</b><br/> What is an Image? Digital image file formats, Image compression standard – JPEG, Image Processing - Digital image enhancement, contrast stretching, Histogram Equalization, smoothing and median Filtering.</p>               |  | 10 |

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