

M.L. Dahanukar College of Commerce

Teaching Plan: 2023 - 2024

Department: I.T.

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

Semester: **IV**

Subject: Core Java

Name of the Faculty: Snehal S. Borlikar

Month	Topics to be Covered	Internal Assessment	Number of Lectures
November	Unit 1: Introduction ,Classes		4
December	Unit 2: Inheritance, Interface Unit 3: Exceptions		11
January	Unit 3: Multithreading, Packages Unit 4: Introduction to JFC and Swing		20
February	Unit 4:Layouts,Event Handing Unit 5:Advance Swing		15
March	Unit 5:Advance Swing Control, JDBC		10

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M.L. Dahanukar College of Commerce

Teaching Plan: 2023 - 24

Department: I.T.

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

Semester:IV

Subject: Embedded System

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		06
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		14
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: 2023-24

Department: I.T

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

Semester: IV

Subject: COST

Name of Faculty: Mohammad Tahir Ansari

Month	Topics to be covered	Internal Assessment	Number of Lectures
December	UNIT I Averages, or Measures of Central Tendency, The Arithmetic Mean, The Weighted Arithmetic Mean, Properties of the Arithmetic Mean, The Arithmetic Mean Computed from Grouped Data, The Median, The Mode, The Empirical Relation Between the Mean, Median, and Mode, The Geometric Mean G, The Harmonic Mean H, The Relation Between the Arithmetic, Geometric, and Harmonic Means, The Root Mean Square, Quartiles, Deciles, and Percentiles, Software and Measures of Central Tendency.		10
January	UNIT I The Range, The Mean Deviation, The Semi Interquartile Range, The 10–90 Percentile Range, The Standard Deviation, The Variance, Short Methods for Computing the Standard Deviation, Properties of the Standard Deviation, Charlie’s Check, Sheppard’s Correction for Variance, Empirical Relations Between Measures of Dispersion, Absolute and Relative Dispersion; Coefficient of Variation, Standardized Variable; Standard Scores, Software and Measures of Dispersion. Introduction to R: Basic syntax, data types, variables, operators, control statements, R-functions, R –Vectors, R – lists, R Arrays. UNIT II Moments, Moments for Grouped Data, Relations Between Moments, Computation of Moments for Grouped Data, Charlie’s Check and Sheppard’s Corrections, Moments in Dimensionless Form, Skewness, Kurtosis, Population Moments, Skewness, and Kurtosis, Software Computation of Skewness and Kurtosis.		16
February	UNIT II Sampling Theory, Random Samples and Random Numbers, Sampling With and Without Replacement, Sampling Distributions, Sampling Distribution of Means, Sampling Distribution of Proportions, Sampling Distributions of Differences and Sums, Standard Errors, Software Demonstration of Elementary Sampling Theory. UNIT III Estimation of Parameters, Unbiased Estimates, Efficient Estimates, Point Estimates and Interval Estimates; Their Reliability, Confidence-Interval Estimates of Population Parameters, Probable Error.		16

	<p>Statistical Decision Theory: Statistical Decisions, Statistical Hypotheses, Tests of Hypotheses and Significance, or Decision Rules, Type I and Type II Errors, Level of Significance, Tests Involving Normal Distributions, Two-Tailed and One-Tailed Tests, Special Tests, Operating-Characteristic Curves; the Power of a Test, p</p> <p>Values for Hypotheses Tests, Control Charts, Tests Involving Sample Differences, Tests Involving Binomial Distributions.</p> <p>Statistics in R: mean, median, mode, Normal Distribution, Binomial Distribution, Frequency Distribution in R.</p>		
March	<p>UNIT IV</p> <p>Small Sampling Theory: Small Samples, Student's t Distribution, Confidence Intervals, Tests of Hypotheses and Significance, The Chi Square Distribution, Confidence Intervals for Sigma, Degrees of Freedom, The F Distribution.</p> <p>The Chi-Square Test: Observed and Theoretical Frequencies, Definition of chi-square, Significance Tests, The Chi-Square Test for Goodness of Fit, Contingency Tables, Yates' Correction for Continuity, Simple Formulas for Computing chi-square, Coefficient of Contingency, Correlation of Attributes, Additive Property of chi square.</p> <p>UNIT V</p> <p>Curve Fitting and the Method of Least Squares: Relationship Between Variables, Curve Fitting, Equations of Approximating Curves, Freehand Method of Curve Fitting, The Straight Line, The Method of Least Squares, The Least-Squares Line, Nonlinear Relationships, The Least-Squares Parabola, Regression, Applications to Time Series, Problems Involving More Than Two Variables.</p> <p>Correlation Theory: Correlation and Regression, Linear Correlation, Measures of Correlation, The Least-Squares Regression Lines, Standard Error of Estimate, Explained and Unexplained Variation, Coefficient of Correlation, Remarks Concerning the Correlation Coefficient, Product-Moment Formula for the Linear Correlation Coefficient, Short Computational Formulas, Regression Lines and the Linear Correlation Coefficient, Correlation of Time Series, Correlation of Attributes, Sampling Theory of Correlation,</p>		18

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M.L.Dahanukar College of Commerce

Teaching Plan: 2023 – 2024
Department: Information Technology

Class: S.Y.B.Sc.(I.T.) – Semester IV

Subject: Software Engineering

Name of the Faculty: Prof. Supritha Bhandary

Month	Topics to be Covered	Internal Assessment	Number of Lectures
Nov	Introduction, Difference between hardware and software, SDLC, software requirements, software processes,		04
Dec	Waterfall model, prototyping model, iterative model, RUP, RAD model, Agile software development. Socio-Technical System: Characteristics, legacy systems, critical systems. security of software systems, Requirements engineering processes, feasibility study, systems models, context model, behavioural model, data model, object model Architectural design, modular decomposition styles, control styles, User Interface design.		22
Jan	Need of UI, Design issues, user analysis. Project Management Quality Management: quality planning, quality control, software measurement and metrics, Verification and validation software inspections, Software Testing		26
Feb	system testing, project duration and staffing, Process improvement, software reuse, distributed software engineering.		08

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Teaching Plan: 2023 - 24

Department: I.T.

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

Semester: IV

Subject: Software Engineering

Name of the Faculty: Ms. Rasika Sawant

Month	Topics to be Covered	Internal Assessment	Number of Lectures
November	Unit 1: Introduction: What is software engineering? Software Development Life Cycle, Requirements Analysis, Software Design, Coding, Testing, Maintenance etc.		04
December	Software Requirements: Functional and Non functional requirements, User Requirements, System Requirements, Interface Specification, Documentation of the software requirements. Software Processes: Process and Project, Component Software Processes. Software Development Process Models. <ul style="list-style-type: none">• Waterfall Model.• Prototyping.• Iterative Development.• Rational Unified Process.• The RAD Model• Time boxing Model. Agile software development: Agile methods, Plan-driven and agile development, Extreme programming, Agile project management, Scaling agile methods. Unit 2: 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.		14
January	Critical system: Types of critical system, A simple safety critical system, Dependability of a system, Availability and Reliability, Safety and Security of Software systems. Requirements Engineering Processes: Feasibility study, Requirements elicitation and analysis, Requirements Validations, Requirements Management. System Models: Models and its types, Context Models, Behavioural Models, Data Models, Object Models, Structured Methods		18

	<p>Unit 3: Architectural Design: Architectural Design Decisions, System Organisation, Modular Decomposition Styles, Control Styles, Reference Architectures.</p>		
February	<p>User Interface Design: Need of UI design, Design issues, The UI design Process, User analysis, User Interface Prototyping, Interface Evaluation. Project Management Software Project Management, Management activities, Project Planning, Project Scheduling, Risk Management.</p> <p>Quality Management: Process and Product Quality, Quality assurance and Standards, Quality Planning, Quality Control, Software Measurement and Metrics.</p> <p>Unit 4: 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.</p>		12
March	<p>Software Measurement: Size-Oriented Metrics, Function-Oriented Metrics, Extended Function Point Metrics</p> <p>Software Cost Estimation: Software Productivity, Estimation Techniques, Algorithmic Cost Modelling, Project Duration and Staffing</p> <p>Unit 5: Process Improvement: Process and product quality, Process Classification, Process Measurement, Process Analysis and Modeling, Process Change, The CMMI Process Improvement Framework.</p> <p>Service Oriented Software Engineering: Services as reusable components, Service Engineering, Software Development with Services.</p> <p>Software reuse: The reuse landscape, Application frameworks, Software product lines, COTS product reuse.</p> <p>Distributed software engineering: Distributed systems issues, Client-server computing, Architectural patterns for distributed systems, Software as a service</p>		12

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Teaching Plan: 2023 - 24

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	Unit 1: Introduction to Computer Graphics: Overview of Computer Graphics, Computer Graphics Application and Software, Description of some graphics devices, Input Devices for Operator Interaction, Active and Passive Graphics Devices		04
December	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. Scan conversion – 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. Unit 2: Two-Dimensional Transformations: 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.		14
January	Three-Dimensional Transformations: 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		18

	<p>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</p> <p>Unit 3: Viewing in 3D</p> <p>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.</p> <p>Light: Radiometry, Transport, Equation, Photometry</p> <p>Color: Colorimetry, Color Spaces, Chromatic Adaptation, Color Appearance</p>		
February	<p>Unit 4: Visible-Surface Determination:</p> <p>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> <p>Plane Curves and Surfaces:</p> <p>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.</p>		12
March	<p>Unit 5: Computer Animation:</p> <p>Principles of Animation, Key framing, Deformations, Character Animation, Physics-Based Animation, Procedural Techniques, Groups of Objects.</p> <p>Image Manipulation and Storage:</p> <p>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>		12

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