



**Seth Jai Parkash Mukand Lal Institute of Engineering & Technology (JMIT), Radaur, Yamunanagar**

**Department of Computer Science and Applications**

**Lesson Plan**

| <b>Name of the Faculty:</b>                          |                    | <b>Er. Deepti Chauhan</b>                                                                      |                                                                             |
|------------------------------------------------------|--------------------|------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| <b>Discipline:</b>                                   |                    | <b>BCA</b>                                                                                     |                                                                             |
| <b>Semester:</b>                                     |                    | <b>5<sup>th</sup></b>                                                                          |                                                                             |
| <b>Subject:</b>                                      |                    | <b>Software Engineering ( B23-CAP-501)</b>                                                     |                                                                             |
| <b>WorkLoad(Lecture/Practical) perweek(Inhours):</b> |                    | <b>Lecture-4</b>                                                                               |                                                                             |
| <b>S.No</b>                                          | <b>Lecture No.</b> | <b>Theory</b>                                                                                  |                                                                             |
|                                                      |                    | <b>Topic(IncludingAssignment/Test/Quiz)</b>                                                    | <b>Pedagogy ( PPT/Chalk and Board/Video Recording /Activity/Case Study)</b> |
| 1.                                                   | L1.                | <b>UNIT 1:</b> Introduction: Program vs. Software, Software Engineering, Programming paradigms | PPT, Chalk and Board                                                        |
| 2.                                                   | L2.                | Software Crisis – Problem and Causes                                                           | PPT, Chalk and Board                                                        |
| 3.                                                   | L3.                | Phases in Software development: Requirement Analysis                                           | PPT, Chalk and Board                                                        |
| 4.                                                   | L4.                | Software Design, Coding                                                                        | PPT, Chalk and Board                                                        |
| 5.                                                   | L5.                | Testing, Maintenance                                                                           | PPT, Chalk and Board                                                        |
| 6.                                                   | L6.                | Software Development Process Models: Waterfall                                                 | PPT, Chalk and Board                                                        |
| 7.                                                   | L7.                | Prototype, Evolutionary                                                                        | PPT, Chalk and Board                                                        |
| 8.                                                   | L8.                | Spiral models                                                                                  | PPT, Chalk and Board                                                        |
| 9.                                                   | L9.                | Comparison of Models                                                                           | PPT, Chalk and Board                                                        |
| 10.                                                  | L10.               | Revision of unit-1                                                                             | PPT, Chalk and Board                                                        |
| 11.                                                  | L11.               | Class Test                                                                                     | PPT, Chalk and Board                                                        |



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|     |      | <b>Assignment 1</b>                                   | On Paper             |
|-----|------|-------------------------------------------------------|----------------------|
| 12. | L12. | <b>Unit 2:</b> Feasibility Study                      | PPT, Chalk and Board |
| 13. | L13. | Software Requirement Analysis and Specifications: SRS | PPT, Chalk and Board |
| 14. | L14. | Need for SRS                                          | PPT, Chalk and Board |
| 15. | L15. | Characteristics of an SRS                             | PPT, Chalk and Board |
| 16. | L16. | Components of an SRS                                  | PPT, Chalk and Board |
| 17. | L17. | Problem Analysis                                      | PPT, Chalk and Board |
| 18. | L18. | Information gathering tools                           | PPT, Chalk and Board |
| 19. | L19. | Requirement specification                             | PPT, Chalk and Board |
| 20. | L20. | validation and metrics                                | PPT, Chalk and Board |
| 21. | L21. | Structured Analysis and Tools: Data Flow Diagram      | PPT, Chalk and Board |
| 22. | L22. | Data Dictionary, Decision table                       | PPT, Chalk and Board |
| 23. | L23. | Decision trees, Structured English,                   | PPT, Chalk and Board |
| 24. | L24. | Entity-Relationship diagrams                          | PPT, Chalk and Board |
|     |      | <b>Class test/ Assignment 2</b>                       | On Paper             |
| 25. | L25. | <b>Unit 3:</b> Software Project PlanningStaffing      | PPT, Chalk and Board |
| 26. | L26. | Cost estimation: COCOMO model                         | PPT, Chalk and Board |
| 27. | L27. | Project scheduling                                    | PPT, Chalk and Board |
| 28. | L28. | Personnel planning,Team structure                     | PPT, Chalk and Board |



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|     |      |                                                          |                      |
|-----|------|----------------------------------------------------------|----------------------|
| 29. | L29. | Software configuration management                        | PPT, Chalk and Board |
| 30. | L30  | Quality assurance plans                                  | PPT, Chalk and Board |
| 31. | L31. | Project monitoring plans                                 | PPT, Chalk and Board |
| 32. | L32. | Risk Management                                          | PPT, Chalk and Board |
| 33. | L33. | Software Design: Design fundamentals                     | PPT, Chalk and Board |
| 34  | L34. | Problem partitioning, and abstraction                    | PPT, Chalk and Board |
| 35. | L35. | Design methodology, Cohesion                             | PPT, Chalk and Board |
| 36. | L36  | Coupling.                                                | PPT, Chalk and Board |
|     |      | <b>Class Test/Assignment 3</b>                           | On Paper             |
| 37. | L37  | <b>Unit 4:</b> Software testing strategies: Unit testing | PPT, Chalk and Board |
| 38. | L38  | Integration testing                                      | PPT, Chalk and Board |
| 39. | L39  | Validation testing                                       | PPT, Chalk and Board |
| 40. | L40  | System testing                                           | PPT, Chalk and Board |
| 41. | L41  | Alpha and Beta testing                                   | PPT, Chalk and Board |
| 42. | L42  | Software Maintenance: Type of maintenance                | PPT, Chalk and Board |
| 43. | L43  | Management of Maintenance                                | PPT, Chalk and Board |
| 44. | L44  | Maintenance Process                                      | PPT, Chalk and Board |
| 45. | L45  | Maintenance characteristics.                             | PPT, Chalk and Board |
|     |      | <b>Class Test/Assignment 4</b>                           |                      |



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**Lesson Plan**

| <b>Name of the Faculty:</b>                             |                    | <b>Mr Sumit Saini</b>                                               |                                                                             |
|---------------------------------------------------------|--------------------|---------------------------------------------------------------------|-----------------------------------------------------------------------------|
| <b>Discipline:</b>                                      |                    | <b>BCA</b>                                                          |                                                                             |
| <b>Semester:</b>                                        |                    | <b>5<sup>th</sup></b>                                               |                                                                             |
| <b>Subject:</b>                                         |                    | <b>Back-End Development( B23-CAP-502)</b>                           |                                                                             |
| <b>Work Load(Lecture/Practical) per week(In hours):</b> |                    | <b>Lecture-4</b>                                                    |                                                                             |
| <b>S.No</b>                                             | <b>Lecture No.</b> | <b>Theory</b>                                                       |                                                                             |
|                                                         |                    | <b>Topic(Including Assignment/Test/Quiz)</b>                        | <b>Pedagogy ( PPT/Chalk and Board/Video Recording /Activity/Case Study)</b> |
| 1                                                       | L1.                | Introduction to Back-End Development and Course Overview            | Chalk and Board                                                             |
| 2                                                       | L2.                | Frontend vs Backend Development, Roles and Responsibilities         | Chalk and Board                                                             |
| 3                                                       | L3.                | Client-Server Architecture and Request-Response Model               | Chalk and Board, PPT                                                        |
| 4                                                       | L4.                | HTTP/HTTPS Protocol, Web Browsers, and Web Servers                  | Chalk and Board, PPT                                                        |
| 5                                                       | L5.                | Introduction to Web Servers (Apache, Nginx, Node.js Server)         | Chalk and Board, PPT                                                        |
| 6                                                       | L6.                | Introduction to Databases and Database Concepts                     | Chalk and Board, PPT                                                        |
| 7                                                       | L7.                | Introduction to Node.js and Server-Side JavaScript                  | Chalk and Board, PPT                                                        |
| 8                                                       | L8.                | Installing Node.js, npm, and Development Environment                | PPT                                                                         |
| 9                                                       | L9.                | Node.js Syntax and Basic Program Structure                          | PPT                                                                         |
| 10                                                      | L10.               | Variables, Data Types, Operators, and Control Statements in Node.js | PPT                                                                         |
| 11                                                      | L11.               | Functions, Modules, and Package Management (npm)                    | PPT                                                                         |



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|----|------|-----------------------------------------------------------------|-------------------------|
| 12 | L12. | Practical Session: Writing and Executing Basic Node.js Programs | PPT                     |
| 13 |      | <b>Assignment 1</b>                                             | On Paper                |
| 14 | L13. | Introduction to Version Control and Git                         | Chalk and Board and PPT |
| 15 | L14. | Git Installation, Repository Creation, Git Commands             | PPT                     |
| 16 | L15. | Git Branching, Merging, and GitHub Basics                       | PPT                     |
| 17 | L16. | Introduction to IDEs (VS Code) and Extensions                   | PPT                     |
| 18 | L17. | Writing and Executing Server-Side Scripts                       | PPT                     |
| 19 | L18. | File System Module in Node.js                                   | PPT                     |
| 20 | L19. | Asynchronous Programming, Callbacks, Promises                   | Chalk and Board and PPT |
| 21 | L20. | Async/Await and Error Handling                                  | Chalk and Board and PPT |
| 22 | L21. | Introduction to Performance Optimization                        | Chalk and Board and PPT |
| 23 | L22. | Caching Strategies and Types of Caching                         | Chalk and Board and PPT |
| 24 | L23. | Database Query Optimization Techniques                          | Chalk and Board and PPT |
| 25 | L24. | Practical Session: Git Workflow and Performance Optimization    | PPT                     |
| 26 |      | <b>Assignment 2</b>                                             | On Paper                |
| 27 | L25. | Introduction to Database Management Systems                     | Chalk and Board and PPT |
| 28 | L26. | SQL vs NoSQL Databases                                          | Chalk and Board and PPT |
| 29 | L27. | Database Design and Schema Creation                             | Chalk and Board and PPT |
| 30 | L28. | Introduction to MySQL/MariaDB and SQL Commands                  | Chalk and Board         |
| 31 | L29. | CRUD Operations using SQL                                       | Chalk and Board and PPT |
| 32 | L30. | Introduction to MongoDB and Collections                         | Chalk and Board and PPT |
| 33 | L31. | CRUD Operations in MongoDB                                      | Chalk and Board         |
| 34 | L32. | Connecting Node.js with MySQL                                   | PPT                     |
| 35 | L33. | Connecting Node.js with MongoDB (Mongoose)                      | PPT                     |
| 36 | L34. | Building Database-Driven Applications                           | PPT                     |
| 37 | L35. | Error Handling and Validation in Database Operations            | PPT                     |
| 38 | L36. | Practical Session: CRUD-Based Mini Application                  | PPT                     |
| 39 |      | <b>Assignment 3</b>                                             | On Paper                |
| 40 | L37. | Introduction to Express.js Framework                            | PPT                     |



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|----|------|------------------------------------------------------|----------------------|
| 41 | L38. | Creating an Express.js Application                   | PPT                  |
| 42 | L39. | Routing and Middleware in Express.js                 | PPT                  |
| 43 | L40  | Serving Static Files and Template Basics             | PPT                  |
| 44 | L41  | Building RESTful APIs using Express.js               | PPT                  |
| 45 | L42  | API Testing with Postman                             | PPT                  |
| 46 | L43  | API Documentation and REST Best Practices            | PPT                  |
| 47 | L44  | Authentication Basics (JWT, Sessions)                | PPT                  |
| 48 | L45  | Authorization Concepts and Role-Based Access Control | Chalk and Board      |
| 49 | L46  | Web Security: SQL Injection Prevention               | Chalk and Board      |
| 50 | L47  | Web Security: XSS, CSRF, and Secure Coding Practices | Chalk and Board, PPT |



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## Lesson Plan

|                                       |                                                                                  |
|---------------------------------------|----------------------------------------------------------------------------------|
| <b>Name of the Faculty:</b>           | <b>Er. Savedna</b>                                                               |
| <b>Discipline:</b>                    | <b>BCA</b>                                                                       |
| <b>Semester:</b>                      | <b>5<sup>th</sup></b>                                                            |
| <b>Subject:</b>                       | <b>Network Infrastructure and Data Communication Technologies( B23-CAP-503 )</b> |
| <b>Subject Code:</b>                  | <b>Lecture-4</b>                                                                 |
| <b>Work Load per week (In hours):</b> | <b>Er. Savedna</b>                                                               |

| SI No. | Lecture No. | Theory                                                                                             | Pedagogy (PPT & Chalk-Board and Board/Video Recording /Activity/Case Study) |
|--------|-------------|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
|        |             | Topic (Including Assignment/Test/Quiz)                                                             |                                                                             |
| 1      | L1          | <b>Unit 1-</b> Introduction to Data Communication and Computer Networks, Uses of Computer Networks | PPT & Chalk-Board                                                           |
| 2      | L2          | Types of Computer Networks and their Topologies                                                    | PPT & Chalk-Board                                                           |
| 3      | L3          | Network Hardware Components: Connectors, Transceivers, Repeaters, Hubs,                            | PPT & Chalk-Board                                                           |
| 4      | L4          | Network Interface Cards and PC Cards                                                               | PPT & Chalk-Board                                                           |
| 5      | L5          | Bridges, Switches, Routers, Gateways                                                               | PPT & Chalk-Board                                                           |
| 6      | L6          | Network Software: Network Design issues and protocols                                              | PPT & Chalk-Board                                                           |
| 7      | L7          | Connection oriented and connectionless services                                                    | PPT & Chalk-Board                                                           |
| 8      | L8          | OSI Reference Model                                                                                | PPT & Chalk-Board                                                           |
| 9      | L9          | TCP/IP Model                                                                                       | PPT & Chalk-Board                                                           |



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|----|-----|-----------------------------------------------------------------------------------------------|-------------------|
| 10 |     | <b>Query Session Unit-1</b>                                                                   | Offline           |
| 11 |     | <b>Assignment -1</b>                                                                          | Offline           |
| 12 | L10 | <b>Unit-2-</b> Analog and digital communication concepts: Analog and Digital data and signals | PPT & Chalk-Board |
| 13 | L11 | Bandwidth and Data Rate, Capacity, Baud Rate                                                  | PPT & Chalk-Board |
| 14 | L12 | Guided Transmission Media                                                                     | PPT & Chalk-Board |
| 15 | L13 | Wireless Transmission Media                                                                   | PPT & Chalk-Board |
| 16 | L14 | Communication Satellites                                                                      | PPT & Chalk-Board |
| 17 | L15 | Switching                                                                                     | PPT & Chalk-Board |
| 18 | L16 | Multiplexing                                                                                  | PPT & Chalk-Board |
| 19 | L17 | Modems                                                                                        | PPT & Chalk-Board |
| 20 | L18 | Modulation techniques                                                                         | PPT & Chalk-Board |
| 21 |     | <b>Query Session Unit-2</b>                                                                   | Offline           |
| 22 |     | <b>Class Test Unit 2</b>                                                                      | Offline           |
| 23 | L19 | <b>Unit-3 -</b> Data Link Layer Design issues                                                 | PPT & Chalk-Board |
| 24 | L20 | Error Detection and Correction methods                                                        | PPT & Chalk-Board |
| 25 | L21 | Hamming Code                                                                                  | PPT & Chalk-Board |
| 26 | L22 | Sliding Window Protocols: One-bit                                                             | PPT & Chalk-Board |
| 27 | L23 | Go Back N and Selective Repeat                                                                | PPT & Chalk-Board |
| 28 | L24 | Media Access Control: ALOHA                                                                   | PPT & Chalk-Board |
| 29 | L25 | Slotted ALOHA, CSMA                                                                           | PPT & Chalk-Board |
| 30 | L26 | Collision free protocols                                                                      | PPT & Chalk-Board |
| 31 | L27 | Introduction to LAN technologies: Ethernet, Switched Ethernet                                 | PPT & Chalk-Board |
| 32 | L28 | Fast Ethernet, Gigabit Ethernet                                                               | PPT & Chalk-Board |
| 33 | L29 | Token Ring                                                                                    | PPT & Chalk-Board |
| 34 | L30 | Introduction to Wireless LANs and Bluetooth                                                   | PPT & Chalk-Board |
| 35 |     | <b>Query Session Unit-3</b>                                                                   | Offline           |



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|    |     |                                             |                   |
|----|-----|---------------------------------------------|-------------------|
| 36 | L31 | <b>Unit-4-</b> Routing Algorithms: Flooding | PPT & Chalk-Board |
| 37 | L32 | Shortest Path Routing                       | PPT & Chalk-Board |
| 38 | L33 | Distance Vector Routing                     | PPT & Chalk-Board |
| 39 | L34 | Link State Routing                          | PPT & Chalk-Board |
| 40 | L35 | Hierarchical Routing                        | PPT & Chalk-Board |
| 41 | L36 | Congestion Control, Traffic shaping         | PPT & Chalk-Board |
| 42 | L37 | Choke packets; Load shedding                | PPT & Chalk-Board |
| 43 | L38 | Application Layer: Introduction to DNS      | PPT & Chalk-Board |
| 44 | L39 | E-mail and WWW Services                     | PPT & Chalk-Board |
| 45 | L40 | Network Security Issues: Security attacks   | PPT & Chalk-Board |
| 46 | L41 | Encryption methods                          | PPT & Chalk-Board |
| 47 | L42 | Firewalls and Digital Signatures            | PPT & Chalk-Board |
| 48 |     | <b>Query Session Unit-4</b>                 | Offline           |
| 49 |     | <b>Assignment -2</b>                        | Offline           |



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### Lesson Plan

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|----------------------------------------------------------|---------------------------------------------------|
| <b>Name of the Faculty:</b>                              | <b>Dr. Navdeep Kumar Chopra</b>                   |
| <b>Discipline:</b>                                       | <b>BCA</b>                                        |
| <b>Semester:</b>                                         | <b>5<sup>th</sup></b>                             |
| <b>Subject:</b>                                          | <b>Computer Hardware Maintenance(B23-VOC-107)</b> |
| <b>Work Load(Lecture/Practical) per week (In hours):</b> | <b>Lecture-3</b>                                  |

| S.No | Lecture No. | Theory                                           |                                                                      |
|------|-------------|--------------------------------------------------|----------------------------------------------------------------------|
|      |             | Topic(Including Assignment/Test/Quiz)            | Pedagogy ( PPT/Chalk and Board/Video Recording /Activity/Case Study) |
| 1    | L1          | <b>Unit 1:</b> Fundamentals of computer hardware | PPT, Chalk and Board                                                 |
| 2    | L2          | Types of Computer Systems                        | PPT, Chalk and Board                                                 |
| 3    | L3          | Evolution of Computers                           | PPT, Chalk and Board                                                 |
| 4    | L4          | Hardware vs Software                             | PPT, Chalk and Board                                                 |
| 5    | L5          | Computer Motherboard                             | PPT, Chalk and Board                                                 |
| 6    | L6          | Motherboard Types                                | PPT, Chalk and Board                                                 |
| 7    | L7          | Motherboard Form Factors                         | PPT, Chalk and Board                                                 |
| 8    | L8          | Chipsets                                         | PPT, Chalk and Board                                                 |
| 9    | L9          | Computer Buses                                   | PPT, Chalk and Board                                                 |
| 10   | L10         | PCI, SATA and USB                                | PPT, Chalk and Board                                                 |
| 11   | L11         | Class Test                                       | PPT, Chalk and Board                                                 |



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| 12 |     | Assignment                                          | On paper             |
|----|-----|-----------------------------------------------------|----------------------|
| 13 | L13 | <b>Unit II:</b> Introduction to computer components | PPT, Chalk and Board |
| 14 | L13 | CPU components                                      | PPT, Chalk and Board |
| 15 | L14 | CPU Performance                                     | PPT, Chalk and Board |
| 16 | L15 | RAM                                                 | PPT, Chalk and Board |
| 17 | L16 | Types of RAM                                        | PPT, Chalk and Board |
| 18 | L17 | RAM Installation                                    | PPT, Chalk and Board |
| 19 | L18 | SMPS                                                | PPT, Chalk and Board |
| 20 | L19 | SMPS Connectors                                     | PPT, Chalk and Board |
| 21 | L20 | Storage Devices – HDD                               | PPT, Chalk and Board |
| 22 | L21 | Storage Devices – SSD & NVMe                        | PPT, Chalk and Board |
| 23 | L22 | Input/output Devices & Ports                        | PPT, Chalk and Board |
| 24 |     | Assignment                                          | <b>On Paper</b>      |
| 25 | L23 | <b>Unit III:</b> Introduction to PC Assembly        | PPT, Chalk and Board |
| 26 | L24 | ESD and Safety Precautions                          | PPT, Chalk and Board |
| 27 | L25 | Tools for PC Assembly                               | PPT, Chalk and Board |
| 28 | L26 | Preparing the Cabinet                               | PPT, Chalk and Board |
| 29 | L27 | Installing the CPU                                  | PPT, Chalk and Board |
| 30 | L28 | CPU Cooler Installation                             | PPT, Chalk and Board |
| 31 | L29 | Installing RAM                                      | PPT, Chalk and Board |
| 32 | L30 | Installing Storage                                  | PPT, Chalk and Board |
| 33 | L31 | Mounting Motherboard                                | PPT, Chalk and Board |



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|----|-----|-------------------------------------------------|----------------------|
| 34 | L32 | Connecting Power Supply                         | PPT, Chalk and Board |
| 35 | L33 | POST, BIOS/UEFI & Boot Configuration            | PPT, Chalk and Board |
| 36 |     | <b>Class Test/Assignment</b>                    | <b>On Paper</b>      |
| 37 | L34 | <b>Unit IV: Introduction to Troubleshooting</b> | PPT, Chalk and Board |
| 38 | L35 | Common Hardware Problems                        | PPT, Chalk and Board |
| 39 | L36 | Boot Errors                                     | PPT, Chalk and Board |
| 40 | L37 | Diagnostic Tools                                | PPT, Chalk and Board |
| 41 | L38 | Software Troubleshooting                        | PPT, Chalk and Board |
| 42 | L39 | BSOD                                            | PPT, Chalk and Board |
| 43 | L40 | Driver Issues                                   | PPT, Chalk and Board |
| 44 | L41 | Malware & Security Problems                     | PPT, Chalk and Board |
| 45 | L42 | Preventive Maintenance                          | PPT, Chalk and Board |
| 46 | L43 | Upgrading RAM & Storage                         | PPT, Chalk and Board |
| 47 | L44 | Upgrading GPU                                   | PPT, Chalk and Board |
| 48 | L45 | Complete Troubleshooting & Revision             | PPT, Chalk and Board |
| 49 |     | <b>CLASS TEST/ASSIGNMENT</b>                    | <b>On Paper</b>      |