

**Data Science Tools and Technique LAB**

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| **Department:** | Department of Computer Science and Engineering | | |
| **Course Name:**  **Data Science Tools and Tech Lab** | **Course Code** | L-T-P | Credits |
| **SEC - 040** | 2-0-1 | 2 |
| **Type of Course:** | Major | | |

**Proposed Lab Experiments**

**Defined Course Outcomes**

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| CO1. | Implement a public cloud instance using a public cloud service provider. |
| C02. | Explain the core concepts of the cloud computing paradigm: how and why this paradigm shift came about, the characteristics, advantages and challenges brought about by the various models and services in cloud computing. |
| CO3. | Apply the fundamental concepts in data centers to understand the trade-offs in power, efficiency and cost. |
| CO4 | Apply trust-based security model to different layers. |
| CO5 | Develop a risk-management strategy for moving to the Cloud. |
| CO6 | Describe big data and use cases from selected business domains. |
| CO7 | Identify resource management fundamentals, i.e. resource abstraction, sharing and sandboxing and outline their role in managing infrastructure in cloud computing. |
| CO8 | Analyze various cloud programming models and apply them to solve problems on the cloud. |



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| **EXPERIMENT NO.** | **EXPERIMENT TITLE** | **MAPPED CO/PO** |
| **SEC - 040** | **Data Science Tools and Tech Lab** |  |
| 1 | Install and configure the Scala programming environment, including Scala REPL, and test Scala commands on different operating systems. | CO1 |
| 2 | Explain the core principles of Scala, including Object-Oriented and Functional Programming, and compare it with Java and its role in Apache Spark. | CO2 |
| 3 | Apply fundamental concepts of Scala variables, data types, and immutability to ensure type safety and effective memory management. | CO3 |
| 4 | Implement functions, code blocks, and various collections such as Lists, Sets, Maps, and Tuples to manage and manipulate data efficiently. | CO4 |
| 5 | Utilize control statements, loops, and pattern matching to develop structured and efficient Scala programs. | CO5 |
| 6 | Design and develop Scala classes, objects, case classes, and packages while ensuring modularity and avoiding namespace conflicts. | CO6 |
| 7 | Identify and apply exception handling mechanisms in Scala, including try-catch-finally blocks, to ensure robust application development. | CO7 |
| 8 | Analyze and utilize Scala programming models in real-world applications, including Apache Spark, to solve data processing and analytics problems.   |  | | --- | |  | | CO8 |

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