

**RVCE-HPCC Systems****Center of Excellence in Cognitive Intelligent Systems  
for Sustainable Solutions [CISSS]****Internship Modules for Engineering students****Module 1: Introduction to Data Science and Machine Learning**

Types of data: Structured, semi structured, unstructured , Data Pre-processing: Data cleaning, Data Integration, Data Reduction, Data Transformation and discretization, data cleaning, validation, modifications, enhancements. Supervised and Unsupervised machine learning algorithms. Hands-on Session: Data pre-processing using python

**Module 2: High Performance Computing Techniques for Big Data Analytics**

Need for High performance computing, HPCC Systems Architecture, Introduction to ECL parallel declarative programming language. Hands-on Session: Reading up a dataset and simple statistics on it, Datasets and Records, Pre- Processing-Sorting, Deduplication & Normalization, Dataset Shuffling, Dataset Splitting, Embedding, python in ECL code, Visualization, ML Core Bundles.

**Module 3: Visualization Tools**

Installation of visualization bundles, PowerBI ,Tableau & Distributed visualization tools, Explanation with examples.

**Module 4: Natural Language Processing (NLP).**

NLP Introduction, Corpus, Text analytics, Feature extraction, NLP Library. Sample Interdisciplinary Projects to be carried-out: Behavioural Analysis of Bit Coin Transaction, Structural Health Monitoring and Prediction, Production Plant Condition Monitoring, Concrete Compressive Strength Prediction, Network Anomaly Detection System for Software Defined Networks, Visualization and Potability determination of Surface Water, Astronomical Data Analysis and Visualization, Air Quality Monitoring and Prediction, Adhaar Enabled Water Monitoring and Distribution, Thin Cloud Removal from Satellite Images, Fog removal from SAR images, Smart Energy Resource Management , IoT Analytics for Smart City, Intelligent Transportation Systems, Underwater Object( Naval Mine) Detection

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