



**NATIONAL UNIVERSITY**  
of Computer & Emerging Sciences, Lahore

## Department of AI and Data Science

### **Data Analysis and Visualization**

**FALL 2024**

**Instructor Name:** EESHA TUR RAZIA ABBAR

**TA:** TBD

**Email address:** razia.babar@lhr.nu.edu.pk

**Office Location/Number:** CS New Building, First Floor, First Corridor, First Office

**Class Meeting:** Time: 2:30 to 3:50, Venue: NB 304

**Office Hours:** Mon/Wed 10am – 11:30am

### **Course Information**

**Program:** BSDS **Credit Hours:** 3 **Type:** Core

**Course Website (if any):** Google Classroom Code (TBD)

### **Tentative Course Outline**

	Topics	Material
Week 1	Introduction to Data Analysis and Visualization, Introduction to Data Scrapping	
Week 2	Data Scrapping tools and techniques with demo lecture using selenium	
Week 3	Data Wrangling Methods (Missing Value, Outlier Detection, Normalization)	<b>Chapter 3</b> , Data Mining by Micheline Kambers
Week 4	Feature Extraction using deep learning methods (Correlations, Convolutions) w.r.t to Images and Signals	Chapter 5, Digital Image Processing by Gonzalez
Week 5	Embeddings (Bag of Words, TFIDF) w.r.t textual dataset.	

Week 6	Sessional 1	
Week 7	N-Grams	
Week 8	Logistic Regression and Regularization, linear and nonlinear lasso regression	
Week 9	R Language	
Week 10	Demo and Examples on Neural Network, Forward Pass in Convolutional Neural Networks (CNN)	Deep Learning by Ian Goodfellow
Week 11	Applications of CNN and RNN, Inference Mechanism of CNN and RNN	Deep Learning by Ian Goodfellow
Week 12	Sessional 2	
Week 13	Support Vector Machine (SVM), Overview, a bit of mathematics about SVM and its applications.	Machine Learning in Action by Peter Harrington
Week 14	Professional tools and techniques for data visualization (Power BI or <b>Tableau</b> )	
Week 15	Interactive Demo Session	-do-
Week 16	Presentations	
Week 17-19	Final Term Exam	

Assessments	Weightage
Quizzes	10 %
Project	10 %
Sessional 1 & 2	30 %
Final Term	40 %
Class Participation	5 %
Assignments	5 %
Total	100 %

## **Class Rules:**

- Quizzes can be planned or surprised.
- Phones must remain switched off during the class session and must be kept in your bags.
- If you are more than 10 minutes late for the class, automatically consider yourself absent.
- Any sort of misbehavior and misconduct will be directly reported to the DC committee.
- All assignments and coursework must be done individually.
- No Late Submissions
- No Makeup Quizzes.
- 80% attendance is required for appearing in the Final exams.
- Plagiarism in any work (Labs, Quizzes, Assignments, Midterms, and Final Exams) from any source, or a student may result in F grade or deduction of absolute marks.