AIB551 Natural Language Processing

Level: 5

Credit Units: 5 Credit Units

Language: ENGLISH

Presentation Pattern: EVERY REGULAR SEMESTER

Synopsis:

This course AIB551 Natural Language Processing provides an introduction to novel and effective machine learning techniques to understand and analyse human language for business applications. The module will explain the key approaches of acquiring and handling natural textual information using Python. Students will learn to pre-process and transform unstructured/semi-structured textual data into analysable format. Next, students will learn advanced data science solutions created for Natural Language Processing (NLP) including word, sentence and document embeddings, word clouds, Named Entity Recognition (NER), sentiment analysis, topic modelling, and influencer/topic network analysis enabled by supervised, unsupervised and deep machine learning techniques. Real-world examples, hands-on class exercises and assignments will be designed to help students to prepare and analyse data by harnessing Python's libraries and using NLP techniques to extract new knowledge being integrated into data analysis workflows and improve business performance.

Topics:

- Basics of Natural Language Processing (NLP)
- Build NLP Vocabulary Using Python
- Bag-of-Words (BoW) and TF-IDF Vectors
- Pre-trained Word2vec Model
- Venture into Doc2vec, Sent2Vec and Universal Sentence Encoder
- Word Cloud Analysis
- Standard and Customised Sentiment Analyser
- Entity Recognition Techniques
- Evaluation Metrics of Classifier
- Topic Modelling Techniques
- Topic and Influencer Network
- State of the Art in NLP - Artificial Neural Networks (ANNs), Convolutional Neural Networks (CNNs) and Recurrent Neural Networks (RNNs)

Textbooks:

Hands-On Python Natural Language Processing: Explore tools and techniques to analyse and process text with a view to building real-world NLP applications 2020 Kedia, A. & Rasu, M. Packt Publishing ISBN-13: 9781838982584

Learning Outcome:

- Develop know-how of the applications of AI tools and technologies in areas of NLP
- Assess the possibilities and implications of NLP in different industries
- Formulate NLP analytics strategies
- Prepare unstructured/semi-structured data into analysable format
- Design NLP solutions through supervised, unsupervised and deep machine learning techniques
- Revise data analysis workflows by integrating NLP solutions to improve business performance

Assessment Strategies - Regular Semester (Evening Class):

Components	**Description**	**Weightage Allocation (%)**
Overall Continuous Assessment	PRE-CLASS QUIZ 1	10
	PARTICIPATION 1	15
	GROUP BASED ASSIGNMENT 1	25
Overall Examinable Components	ECA	50
Total		**100**

*The information listed is subject to review and change.