Unit IV: Advanced Applications of Business Analytics: Data analytics for digital and social media strategy, including content optimization, Innovation and entrepreneurship supported by analytics-driven insights, Operational analytics for supply chain management, logistics, and resource allocation. (9 hours)

Essential/recommended readings

1. Sherman, R. (2014). Business intelligence guidebook: From data integration to analytics. Newnes.
2. Negash, S., & Gray, P. (2008). Business intelligence. *Handbook on decision support systems 2*, 175-193.
3. Moss, L. T., & Atre, S. (2003). Business intelligence roadmap: the complete project lifecycle for decision-support applications. Addison-Wesley Professional.
4. Chaudhuri, S., Dayal, U., & Narasayya, V. (2011). An overview of business intelligence technology. *Communications of the ACM*, *54*(8), 88-98.
5. Minelli, M., Chambers, M., & Dhiraj, A. (2013). *Big data, big analytics: emerging business intelligence and analytic trends for today's businesses* (Vol. 578). John Wiley & Sons.

DISCIPLINE SPECIFIC ELECTIVE COURSE (DSE):

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Natural Language Processing (DSE)	**4**	**3**	**1**	**0**	**Class XII pass**	**Database management system and Artificial intelligence**

Learning Objectives

This course objective is to train students in advanced understanding of NLP, Deep learning approaches and their implementation. In addition, the course introduces deep learning frameworks such as TensorFlow and solves real-world problems through projects on sentiment analysis, sentence classification, and speech recognition.

Learning outcomes

After completing this course, students should be able to;

- Will have a deep and advanced understanding of Natural Language Processing concepts.
- Will have experiment-level knowledge of Deep learning approaches.

- Will have understanding of real-world projects on NLP in text, audio or video.
- Will have understanding of NLP applications in Emotional recognition, Speech recognition, translation, etc.

SYLLABUS

Unit I: Advanced Concepts in NLP – Deep Learning Approaches: Exploration of deep learning methods for Natural Language Processing (NLP), Overview of key techniques and models, including word embeddings and neural network architectures for NLP tasks. (9 hours)

Unit II: Word Representations and Named Entity Recognition: Simple and advanced word vector representations, such as Word2Vec and GloVe, Introduction to named entity recognition (NER) and its applications in text processing, Basic overview of TensorFlow and its use in language modelling and NLP tasks. (15 hours)

Unit III: Machine Translation, Parsing, and Sentiment Analysis: Deep learning techniques for machine translation and syntactic parsing, Implementing sentiment analysis using neural networks for text classification. (10 hours)

Unit IV: Sentence Classification, Speech Recognition, and Advanced Translation: Methods for sentence classification tasks, including text categorization, Introduction to speech recognition models and applications, and Advanced techniques for improving machine translation systems.

(9 hours)

Essential/recommended readings

1. Foundations of statistical natural language processing, Manning, C. D., Manning, C. D., & Schütze, MIT Press, 1999.
2. Speech and language processing: An introduction to natural language processing. Computational linguistics, and speech recognition, Jurafsky, D, 2010.
3. Deep Learning (Adaptive Computation and Machine Learning), Ian Goodfellow, Yoshua Bengio , Aaron Courville, Francis Bach, 2016.
4. Deep Learning for Computer Vision with Python, Adrian Rosebrock, 2018.

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.

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Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		