

**DSE (II.4.4) Insights into Educational Data
Discipline Specific Elective**

1. Credit Distribution of the Course

Course title & Code DSE (II.4.4)	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Insights into Educational Data	4	3	0	1	Undergraduate	-

2. Learning Objectives

The course will develop a sound understanding of fundamental concepts of handling educational data and analysis, and interpretation. Learners will be engaged with key data sources in education from Indian and International data sources. The course will help learners to develop analytical and critical skills to interpret data and utilize data driven insights to inform educational policies and practices.

3. Learning Outcomes

- Identify key sources of Indian and International educational data;
- Apply data extraction, data analyse and data visualization techniques using suitable software tools;
- Analyze and visualize educational data using suitable software tools;
- Interpret data insights for evidence-based recommendations for policy and practices;
- Apply data analytical skills to address contemporary educational challenges.

4. Syllabus

Unit I Nature and Sources of Education Data Analytics - Introduction to Educational Data; Types of Educational Data: Structured vs. Unstructured Data; Sources of Educational Data in India: School education and higher education (UDISE+, NAS, ASER, AISHE, CENSUS, UNESCO, World Bank, PISA, TIMSS); Data Ethics, Privacy, Security Concerns and Policy regulations. **[15 hours]**

Unit II Data Collection and Visualization - Data collection methods (primary/secondary sources; surveys, observations, testing, administrative data); Data clearing and wrangling; Basics of data spreadsheet; Data entry and structures using spreadsheet. **[10 hours]**

Unit III Data Visualization and Dashboard - Quantitative data and qualitative data; Basics of data visualization; Tools for data visualization; Creating Interactive Dashboard . **[8 hours]**

Unit IV Data Analysis and Interpretation - Creating Interactive Dashboard; interpretation of data using basic statistics; Data driven insights and decision for policy recommendations; Challenges and future trends in educational data analytics. **[12 hours]**

5. Illustrative Practical Details **[30 hours]**

- Hands-on practice in refining raw data from educational data from key sources (UDISE+, NAS, ASER, AISHE, CENSUS, UNESCO, World Bank, PISA, TIMSS).
- Arrange and present the data using spreadsheet and data visualization tools.
- Compare multiple educational data sets using appropriate data analytical tools.
- Create Data dashboard and analytical report using data visualization tools.

6. Essential Readings

- Ferguson R. (2017). *The Impact of Big Data on Education: A Comprehensive Guide*. Routledge.
- Selwyn N. (2014). *Data and Education: The Possibilities and Limits of Learning Analytics*. Routledge.
- Clow D. (2013). *An Introduction to Learning Analytics*. Journal of Learning Analytics.

7. Suggestive Reading

- Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2018). *How to design and evaluate research in education* (10th ed.). McGraw-Hill Education.
- Knaflic, C. N. (2015). *Storytelling with data: A data visualization guide for business professionals*. Wiley.
- Yau, N. (2013). *Data points: Visualization that means something*. Wiley.