DSE (II.4.1) Digital Technology in Education
Discipline Specific Elective

1. Credit Distribution of the Course

Course title & Code DSE (II.4.1)	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Digital Technology in Education	4	2	0	2	Undergr aduate	-

2. Learning Objectives

NEP mandates an ICT-embedded pedagogy in education. This paper builds up pedagogical orientation to integrate all types of digital technologies such as hardware, software, online platforms and resources into the mathematics classroom.

3. Learning Outcomes

- Knowledge and expertise in ICT integration in pedagogy
- Knowledge and practice of ICT tools in diverse teaching & learning environments
- Knowledge of online resources, apps, games for enhancing learning
- Expertise in e-content creation

4. Syllabus

Unit I ICT embedded Mathematics Pedagogy - Hardware & Software integration for a smart mathematics classroom. Blended learning paradigm in mathematics pedagogy. Digital resources for enhanced teaching & learning. Learning Management Systems (LMS). **[8 hours]**

Unit II Digital Technology in Mathematics Classroom - ICT tools in the mathematics classroom: Desmos, Geogebra, Scilab, CMAP etc. Augmented Reality (AR), Virtual Reality (VR) and Artificial Intelligence (AI) applications in teaching & learning. Learning Analytics & Adaptive Learning Systems. ICT tools for the inclusive classroom. **[9 hours]**

Unit III Exploring Mathematics through Online Resources - Online learning environment: websites, apps, blogs, virtual classroom, games etc. Collaborative learning. Online assessment. **[7 hours]**

Unit IV Digital Content Development - Preparing E-content/E-resource/E-assessment/web-based classroom (Latex, Beamer, TikZ, HTML, Forms etc.) **[6 hours]**

5. Illustrative Practical Details **[60 hours]**

- Overcoming technology phobia: hardware & software integration for a smart classroom
- Designing Flipped classroom
- Define T in TPACK for an ICT-embedded mathematics pedagogy
- Design Thinking and LMS
- Desmos, Geogebra, Scilab, CMAP exercises
- AI in a mathematics classroom
- Teaching and Learning Analytics using Python
- Gamification of mathematics learning
- Designing an ICT enabled inclusive classroom
- E-content using LaTeX
- E-Assessment using an online form
- Online classroom for collaborative learning

6. Essential Readings

- Oldknow A. (2011). *Mathematics Education with Digital Technology,* Continuum.
- Wilson A.C., Robutti O. & Sinclair N. (Eds.) (2014). *The Mathematics Teacher in the Digital Era* (Vol II), Springer.

7. Suggestive Reading

- Selwyn, N. (2016). *Education and technology: Key issues and debates* (2nd ed.). Bloomsbury Academic.
- Roblyer, M. D., & Hughes, J. E. (2018). *Integrating educational technology into teaching: Transforming learning across disciplines* (8th ed.). Pearson.
- Luckin, R. (2018). *Machine learning and human intelligence: The future of education for the 21st century*. UCL Institute of Education Press.