1.	Title of the course	Introduction to Microfluidics
2.	Course number	CH521L
3.	Structure of credits (L-T-P-C)	3-0-0-3
4.	New course/modification to	Modified with CH501L/MICROSCALE UNIT OPERATIONS
5.	To be offered by	Chemical Engineering
6.	Prerequisite	CoT
7.	**Course Objective(s):** To discuss the principles of miniaturization and microfluidics. To discuss the applications of microfluidics in chemical processes.	
8.	**Course Content:** Introduction to microfluidics and nanofluidics; Overview of microfabrication techniques; Hydrodynamics of microfluidic systems, Multiphase flow patterns in microchannel; Diffusion, mixing, and separation in microfluidic devices; Reactions in microreactor; Paper-based microfluidics; Experimental techniques of microflows: micro particle imaging velocimetry (MicroPIV); Electrokinetic phenomena: electroosmosis and electrophoresis; Recent trends in microfluidics.	
9.	**Textbook(s):** 1. Nguyen N T, Wereley S and Shaegh S A M, Fundamentals and Applications of Microfluidics, 3rd Edition, Artech House (2018). 2. Kockmann N, Transport Phenomena in Micro Process Engineering (Heat and Mass Transfer), Springer (2007).	
10.	**Reference(s):** 1. Seiffert S, Microfluidics: Theory and Practice for Beginners, De Gruyter (2019). 2. Tabeling P, Introduction to Microfluidics, Oxford University Press (2006). 3. Bhattacharya S, Kumar S, Agarwal A K, Paper Microfluidics: Theory and Applications, Springer Nature (2019). 4. Wirth T, Microreactors in Organic Chemistry and Catalysis, 2nd Edition, Wiley-VCH (2013).	