1.	Title of the course	Microscale Unit Operations
2.	Course number	CH501L
3.	Structure of credits	3-0-0-3
4.	Offered to	UG
5.	New course/modification to	Modification To CH5021/14
6.	To be offered by	Department of Chemical Engineering
7.	To take effect from	July 2022
8.	Prerequisite	CoT
9.	**Course Objective(s):** To introduce the principles of miniaturization, microfluidics and lab-on-a-chip modules.	
10.	**Course Content:** Introduction to forces of microscopic origin; Physics of miniaturization of mechanical, thermal and chemical systems; Fluid dynamics in microchannels: flow of liquids with and without slip, capillarity, two phase flow, preparation of microemulsions; Microreactor; Mixing and separation at microscale; Application to chromatography; Examples of microfluidic structures, connectors, valves and pumps; Fabrication methods and applications of microdevices.	
11.	**Textbook(s):** 1. Nguyen N T, Wereley S and Shaegh S A M, *Fundamentals and Applications of Microfluidics*, 3rd Edition, Artech House (2018). 2. Tabeling P, *Introduction to Microfluidics*, 1st Edition, Oxford University Press (2006).	
12.	**Reference(s):** 1. Gad-el-Huk M, *MEMS: Applications*, 1st Edition, CRC Press (2005). 2. McGuire F, *Microfluidics Handbook*, 1st Edition, NY Research Press (2015). 3. Seiffert S, *Microfluidics: Theory and Practice for Beginners*, 1st Edition, De Gruyter (2019). 4. Wirth T, *Microreactors in Organic Chemistry and Catalysis*, 2nd Edition, Wiley-VCH (2013).	