

1.	Title of the course	Mathematical Methods for Chemical Engineers
2.	Course number	CH514L
3.	Status of the course	Core
4.	Structure of credits	3-0-0-3
5.	Offered to	PG
6.	New course/modification to	New
7.	To be offered by	Department of Chemical Engineering
8.	To take effect from	January 2023
9.	Prerequisite	CoT
10.	Whether approved by the Department	Yes
11.	Course Objective(s): To apply mathematical techniques for chemical engineering modelling and analysis.	
12.	Course Content: Models in chemical engineering; Vector and vector spaces; Matrices, operators and linear transformations; Partial differential equations; Sturm-Liouville theory; Separation of variables and Fourier transforms; Green's Function; Uniqueness conditions for linear and nonlinear systems; Steady state characteristics of nonlinear dynamical systems; Linear stability and limit cycles; Applications: Material balance for fractionating columns, unsteady heat conduction, quenching.	
13.	Textbook(s): 1. Pushpavanam S, <i>Mathematical Methods in Chemical Engineering</i> , 1st Edition, Prentice Hall India (1998). 2. Varma A and Morbidelli M, <i>Mathematical Methods in Chemical Engineering</i> , 1st Edition, Oxford University Press (1997).	
14.	Reference(s): 1. Arfken G, Weber H and Harris F E, <i>Mathematical Methods for Physicists</i> , 7th Edition, Elsevier (2012). 2. Loney N W, <i>Applied Mathematical Methods for Chemical Engineers</i> , 3rd Edition, CRC Press (2015).	