

**Module 1**

Introduction to Atomization process - Factors influencing spray formation; Sheet and ligament formation and its breakup; Introduction to instability analysis for sheet and ligaments breakup; Drop size distribution – Mass distributions – Empirical Correlation; Secondary atomization - Drop collisions and coalescence; Trajectory of the drop motion and its interaction with surroundings – Interaction of drops pertaining to the applications involving in gas turbines, spray cooling, Different Types of Atomizers

**Module 2**

Evaporation of drop – steady and unsteady effects – convective effects; External spray characteristics - Cone angle - Radial and circumferential mass flux distributions; Measurement techniques - Drop sizing by Malvern and P/DPA - Drop velocity by P/DPA - Mass flux distribution via patternators and P/DPA.

**Module 3**

Simultaneous Heat and Mass Transfer in drops – Effect of change in drop liquid property on droplet size, Modeling and Simulation – Introduction to Numerical Techniques using available software; Reacting Sprays - Effect of environment and rate of reaction on drop size and drop size distribution;

**TEXT BOOK/ REFERENCES:**

1. Lefebvre, A.H., McDonnel, V.G., Atomization and Sprays, 2<sup>nd</sup> Edition, CRC Press, 2017
2. Ashgriz, N., Hand Book of Atomization and Sprays: Theory and Applications, Springer Publishers, 2011
3. L. Bayvel and Z. Orzechowski, Liquid Atomization, Taylor and Francis-Washington DC, 1993
4. Lin, S.P., Breakup of Liquid Sheets and Jets, Cambridge University Press, 2009