

GUJARAT TECHNOLOGICAL UNIVERSITY
M.E.in Energy Engineering
Semester: I

Subject Name: **Advanced Thermal Engineering (Major Elective-I)**
(Mechanical Group)
Subject Code: **713904**

Sr. No	Course content
1.	Basic Definitions & Concepts, Equation of state, Calculation of thermodynamic properties, generalized compressibility charts. Second law analysis, Availability, irreversibility, Maxwell equations, Joule-Thomson coefficient, Thermodynamics of reactive mixtures, Stoichiometry.
2.	IGeneralized conduction equation, Steady and unsteady heat conduction in a slab of finite thickness; Effect of heat generation; Non-zero initial condition, Constant flux and convective boundary conditions, Heat conduction in an inhomogeneous medium; Examples of composite media
3.	Condensation with shear edge on bank of tubes, boiling – pool and flow boiling, Heat exchanger, ϵ – NTU approach, compact heat exchangers.
4.	Radiation heat transfer, Surface properties, Configuration factor, Radiative heat exchange between gray surfaces. Radiation in gases and vapour, Gas radiation and radiation heat transfer in enclosures containing absorbing and emitting media – interaction of radiation with conduction and convection..

Reference Books:

1. P. Sukhatme, “ Heat transfer”, ORIENT LONGMAN.
2. J.P.Holman, “Heat Transfer”, McGraw Hill Book Co. Special Indian 9th Edition, 2008
3. D. S. Kumar, “Heat and Mass Transfer”, S K Kataria & Sons
4. Incropera F.P. and DeWitt. D.P., Fundamentals of Heat & Mass Transfer, John Wiley & Sons, 1996.
5. Ozisik. M.N., Heat Transfer – Basic Approach, McGraw-Hill Co., 1985
6. Schlichting, Gersten, Boundarylayer Theory, Springer, 2000
7. P.K. Nag, Heat Transfer, Tata McGraw-Hill, 2002
8. Rohsenow. W.M., Harnett. J.P., and Ganic. E.N., Handbook of Heat Transfer Applications, McGraw-Hill, NY1985