ME 667 Sorption Cooling and Heating Systems (3-0-0-6)

Introduction: Classification of sorption systems, Absorption and adsorption systems, Dry and wet types; Working principles of sorption refrigeration system, heat pump and heat transformer; Wet absorption systems; Refrigerant absorbent combination: LiBr-H2O and NH3-H2O solution thermodynamics, Pressure - concentration - temperature / enthalpy relations and charts; Analysis of single stage, multistage and hybrid systems; Types and design considerations for components such as absorbers, generators and rectifiers; Working principle of pumpless absorption systems; Dry absorption / adsorption systems; Refrigerant / Sorbent combinations and their properties; Metal hydride based systems; Heat and mass transfer in sorption beds; Analysis of metal hydride based refrigerator, heat pump and heat transformer; Selection of metal hydride alloys for various engineering applications.

Textbooks/References:

[1] W. B. Gosney, *Principles of Refrigeration*, Cambridge University Press, 1982

[2] K. E. Herold, R. Radermacher and S. A. Keli, *Absorption Chillers and Heat Pumps*, CRC Press, 1996.

[3] M. V. C. Sastri, B. Viswanathan and S. S. Murthy, *Metal Hydrides*, Narosa Publishing House, 1998.