Course Number: 28082

Course Name: Two Phase Flow

Course Type: Theory	Type & Max Unit: Constant 3
Prerequisite: Fluid Mechanics 2	Corequisite: -
Level: Graduate	First Presentation: 2017-1
Group: Energy Conversion	Last Edition: 2017-1

Objectives:

The main goal of this course is to present the basic principles and explain different models of two phase flow. It will covers basic models, empirical models, pool and flow boiling, heat transfer and pressure drop in subcooled boiling and saturated boiling, condensation and instabilities in two phase flow.

Topics:

- **Introduction:** a review of two phase flow definitions, different methods of analyzing two phase flow, flow patterns
- **Basic Models of Two phase Flow:** General equations, homoigeneous model, separated model, correlations for the above mentioned models
- **Epirical Models of Two Phase Flow**
- **Pool Boiling and Flow Boiling**
- **Heat Transfer and Pressure Drop in Subcooled Boiling**
- **Void Fraction**
- **Heat Transfer and Pressure Drop In Saturated Boiling**
- **Condensation**
- **Instability in Two Phase Flow:** Helmholtz- Kelvin Instability, Taylor Instability
- **Dilute Liquids:** Colloids, Emulsions, Suspensions

References:

1- J. G. Collier, J.R. Thome, "Convective Boiling and Condensation", Clarendon press,1996
2- V.P. Carey, "Liquid-Vapor Phase-Change phenomena", Second Ed. CRC Press, 2007
3- L S Tong, Y S Tang, Boiling Heat Transfer And Two-Phase Flow", CRC Press,1997
4. K., Stephen, "Heat Transfer in Condensation and Boiling", Springer- Verlag, 2014
5. J.R., Thome, " Enhanced Boiling Heat Transfer, Taylor and Fraencic, 1990
6. R.L., Webb, "Principles of Enhanced Heat Transfer", John Wiley & Sons, 1994