MA 538- Advanced Heat and Mass Transfer

Course Code:	MA-538
UTAA Credit (Theoretical-Laboratory hours/week):	3(3-0)
ECTS Credit:	6.0
Department:	Mechanical and Aeronautical Engineering
Language of Instruction:	English
Level of Study:	Graduate
Offered Semester:	Fall and Spring Semesters.

Course Objectives

Understanding physical mechanisms and related mathematical models of heat and mass transfer. Understanding the analogy between heat and mass transfer and making use of it. Learning and applying exact and approximate methods for the analysis of heat and mass transfer problems. Application of principles of heat and mass transfer to psychrometric processes

C**ourse Content**

Generalized conservation equation. Analogy between momentum, heat and mass transfer. Basic mechanisms and laws of transport phenomena. Velocity, temperature and concentration distributions in one-dimensional transport phenomena with or without volumetric generation. Exact and approximate solutions to unsteady, two or three dimensional transport phenomena. Interphase transport. Turbulent transport. Natural convection

Course Learning Outcomes

1-Ability of applying conservation principles to engineering problems

2-Ability to build mathematical models of engineering systems.

3-Ability to use analytical methods for the analysis of heat and mass transfer phenomena.

4-Ability to use the analogy between heat and mass transfer in problem solution.