INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI
PROFORMA FOR NEW COURSE

1.	Title of the Course	Heat and Mass Transfer
2.	Course Number	ME3101
3.	Status of the Course	Core
4.	Structure of Credits	3-1-2-5
5.	Offered To	UG
6.	New Course/Modification to	New
7.	To be Offered by	Department of Mechanical Engineering
8.	To take effect from	July 2018
9.	Prerequisite	
10.	Whether approved by the Department	Yes
11.	**Course Objective:** To Identify, formulate and solve problems for conduction, convection and radiation modes of heat transfer; To analyze, model heat conduction and radiation and be able to apply them for simple heat conduction problems; To analyze and apply empirical correlations in connection with the heat transfer at convection, boiling and condensation; To understand rudiments of mass transfer	
12.	**Course Content:** Introduction to different modes of heat transfer; Steady state conduction in one and two-dimensional systems; One-dimensional unsteady state conduction: analytical and numerical methods; Convection- basic equations, boundary layers, forced convection, external and internal flows, natural convection; Radiation heat transfer- basic laws, properties of the surfaces, view factors, gray-diffuse enclosures; Boiling and condensation; Analysis of heat exchangers; Mass Transfer- Introduction, analogy between heat and mass transfer, mass diffusion, mass convection. Laboratory experiments: Liner and radial heat conduction, transient heat conduction, free and forced convection, thermal radiation,heat exchangers, thermal conductivity measurement, boiling and condensation.	
13.	Text book(s): 1. Cengel Y A and Ghajar A J, *Heat and Mass Transfer: Fundamentals and applications,* 5th Edition, McGraw Hill (2014). 2. Incropera F P, Dewitt D P, Bergman T H and Lavine A S, *Principles of heat and mass transfer,* 7th Edition, Wiley (2016).	
14.	Reference(s): 1. Holman J P and Bhattacharyya S, *Heat Transfer,* 10th Edition, Wiley (2015).	