

Syllabus for B.Tech – Energy Engineering

Course Number & Title: EN206 - Heat and Mass Transfer	
L-T-P-C: 3-1-0-8	
Offered in (Odd/ Even / Any): Semester IV	
Pre-Requisite: Nil	
Preamble / Objectives (Optional): This course provides the basic principles of heat and mass transfer with a knowledge of real-world problems or examples. Demonstrate a knowledge of the basic technical and operational aspects of heat and mass transfer and applications mainly focusing on energy.	
Course Content/ Syllabus: Different modes of heat transfer, Conduction: Fourier's law, heat diffusion equation, 1-D steady state conduction in extended surfaces, heat generation, lumped capacitance and 1D transient models; convection: forced and free convection, mass, momentum and energy conservation equations, thermal boundary layers, heat transfer in external and internal, laminar and turbulent flows, and use of correlations, boiling and condensation: physical phenomena and correlations, heat exchanger types and analysis: LMTD and effectiveness-NTU method, Radiation: properties, Laws, view factor, gas radiation. Mass transfer: diffusion and types, concept of mass transfer coefficients, physical and thermodynamic principles of mass transfer.	
Books (In case UG compulsory courses, please give it as "Text books" and "Reference books". Otherwise give it as "References".	
Text Books: (Format: Authors, <i>Book Title in Italics font</i> , Volume/Series, Edition Number, Publisher, Year.)	
1.	F P Incropera, D P Dewitt, Theodore L Bergman and Adrienne S Lavine, <i>Fundamentals of Heat and Mass Transfer</i> , 8 th Edition, John Wiley & Sons, 2018.
2.	Y Cengel and A J Ghajar. <i>Heat and Mass Transfer: Fundamentals and Applications</i> , 6 th Edition, McGraw Hill, 2020.
Reference Books: (Format: Authors, <i>Book Title in Italics font</i> , Volume/Series, Edition Number, Publisher, Year.)	
1.	J P Holman, <i>Heat Transfer</i> , 10 th Edition, McGraw-Hill Education, 2010.
2.	J H Lienhard IV, J H Lienhard V, <i>A Heat Transfer Textbook</i> , 5 th Edition, Phlogiston Press, 2020.
3.	M N Ozisik, <i>Heat Transfer: A Basic Approach</i> , McGraw-Hill, 1985.