

Course: Heat Transfer

Course Code: noc20-ch21

Session: 2019-20

Duration: 12 Weeks

Assessment procedures: Weekly Assignment (25%) + proctored certification Exam (75%)

Curriculum of the Course:

Week 1 : Physical Origins and Rate Equations, Units and Dimensions, Relevance, Analysis of Heat Transfer Problems: Methodology, Introduction to Conduction, The Conduction Rate Equation, The Thermal Properties of Matter,

Week 2 : The Heat Diffusion Equation, Boundary and Initial Conditions, One-Dimensional, Steady-State Conduction, The Plane Wall, Radial Systems,

Week 3 : Conduction with Thermal Energy Generation, Heat Transfer from Extended Surfaces, Introduction to Two-Dimensional, Steady-State Conduction

Week 4 : Transient Conduction, The Lumped Capacitance Method, The Plane Wall with Convection, Radial Systems with Convection, The Semi-Infinite Solid

Week 5 : The Convection Boundary Layers, Local and Average Convection Coefficients, Laminar and Turbulent Flow, Thermal Boundary Layer Equations and Similarity, The Normalized Boundary Layer Equations, Boundary Layer Analogies

Week 6 : External Flow, Convection Calculations, The Flat Plate in Parallel Flow, The Cylinder in Cross Flow, Flow Across Banks of Tubes

Week 7 : Internal Flow, Laminar Flow in Circular Tubes: Thermal Analysis and Convection Correlations for Turbulent Flow in Circular, Non-Circular and Concentric Tube Annulus

Week 8 : Free Convection, The Governing Equations for Laminar Boundary Layers, Laminar Free Convection on a Vertical Surface, The Effects of Turbulence, Empirical Correlations for External Free Convection Flows and Within Parallel Plate Channels, Combined Free and Forced Convection

Week 9 : Boiling and Condensation, Boiling Modes, Forced Convection Boiling, Condensation - laminar and Turbulent Film in Different Geometries, Dropwise Condensation

Week 10 : Heat Exchangers, The Overall Heat Transfer Coefficient, Heat Exchanger Analysis: Use of the Log Mean Temperature Difference, Heat Exchanger Analysis: The Effectiveness–NTU Method, Heat Exchanger Design and Performance Calculations

Week 11 : Radiation, Fundamental Concepts, Blackbody Radiation, Absorption, Reflection, and Transmission by Real Surfaces, Kirchhoff's Law, The Gray Surface

Week 12 : Radiation Exchange Between Surfaces - The View Factor, Blackbody Radiation Exchange, Radiation Exchange Between Opaque, Diffuse, Gray Surfaces in an Enclosure, Radiation Exchange with Participating Media

List of students enrolled

1	Himanshu Gothwal
2	Hritik Maratha
3	Jatin Dhyawana
4	Prakhar Bhardwaj

5	Rajkumar gangwar
6	Yogendra Singh
7	Vikas Kumar tank