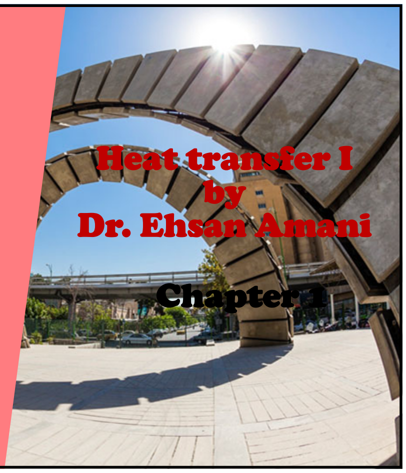
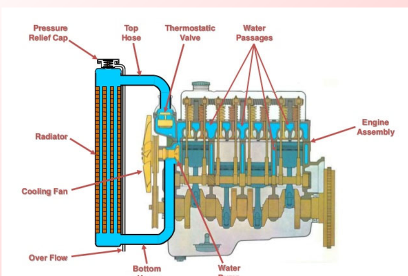


Heat transfer I
by
Dr. Ehsan Amani

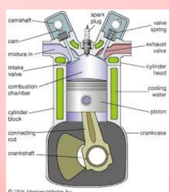
Chapter 1

Importance of heat transfer study

Cooling : ICE engines



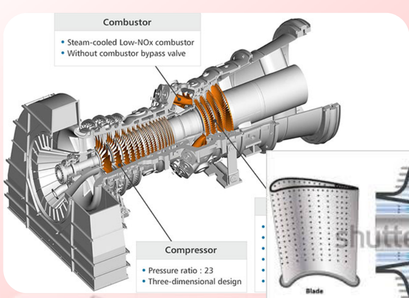
COOLING SYSTEMS – Liquid Cooling

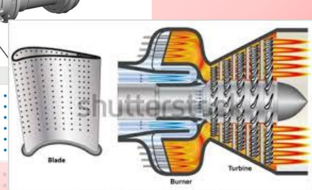


Chapter 1 By E. Amani

Importance of heat transfer study

Cooling : Gas turbine blades

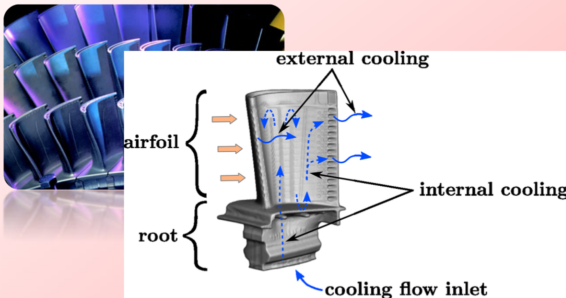




Chapter 1 By E. Amani

Importance of heat transfer study

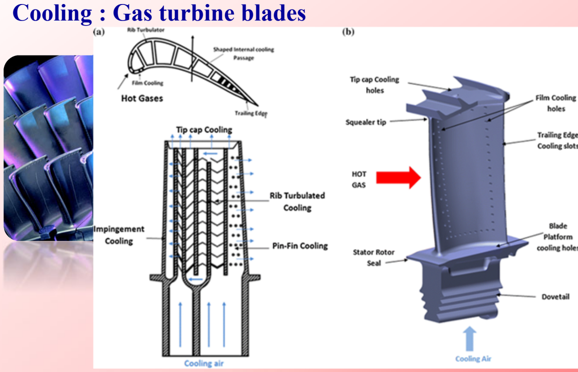
Cooling : Gas turbine blades



Chapter 1 By E. Amani

Importance of heat transfer study

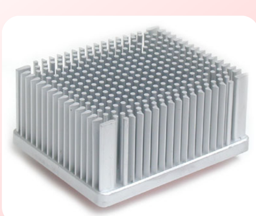
Cooling : Gas turbine blades

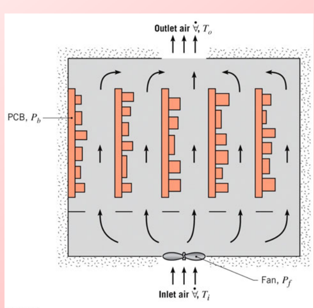


Chapter 1 By E. Amani

Importance of heat transfer study

Cooling : Electronic devices

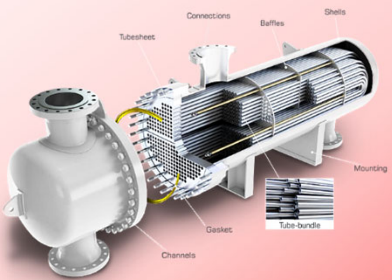




Chapter 1 By E. Amani

Importance of heat transfer study

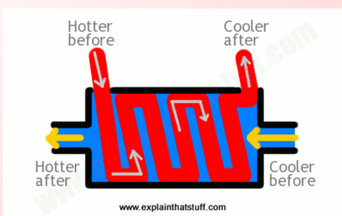
Heat transfer: Heat exchangers



Chapter 1 By E. Amani

Importance of heat transfer study

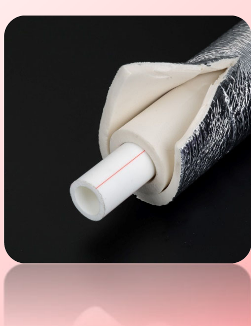
Heat transfer: Heat exchangers



Chapter 1 By E. Amani

Importance of heat transfer study

Insulation



Chapter 1 By E. Amani

Course Overview

I. **Introduction**

II. **Energy equation – thermal energy**

- Modes of heat transfer: conduction, convection, and radiation
- Thermo-mechanical energy equation (0D)

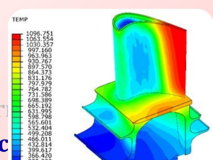
Chapter 1 By E. Amani

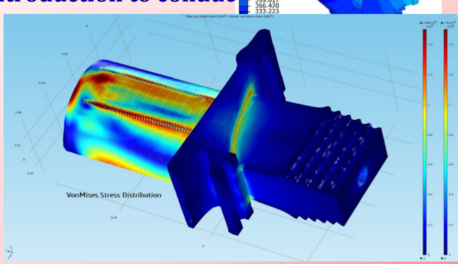
Course Overview

I. Introduction

II. Energy equation – ther

III. **Introduction to conduc**





Chapter 1 By E. Amani

Course Overview

I. Introduction

II. Energy equation – thermal energy

III. Introduction to conduction

IV. **One-dimensional steady-state conduction**

- Heat Transfer from Extended Surfaces (fins)

Chapter 1 By E. Amani

Course Overview

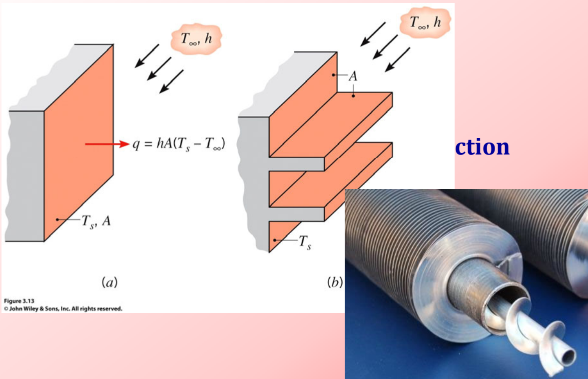


Figure 3.13

ction

Chapter 1 By E. Amani

Course Overview

I. Introduction
II. Energy equation – thermal energy
III. Introduction to conduction
IV. One-dimensional steady-state conduction
V. **Transient conduction (lumped method)**

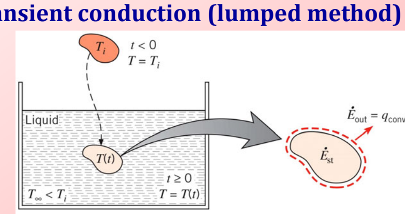


Figure 5.1

Chapter 1 By E. Amani

Course Overview

I. Introdu
II. Energy
III. Introdu
IV. One-dim
V. Transie

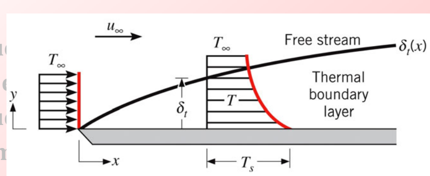


Figure 6.2

VI. **Introduction to convection**
- Transient-3D energy equation for fluid flows
- The Thermal Boundary Layer

Chapter 1 By E. Amani

Course Overview

I. Introduction
II. Energy equation – thermal energy
III. Introduction to conduction
IV. One-dimensional steady-state conduction
V. Transient conduction
VI. Introduction to convection
VII. **Convection – external flow**

Chapter 1 By E. Amani

Course Overview

I. Introdu
II. Energy
III. Introdu
IV. One-di
V. Transi
VI. Introdu
VII. **Convec**

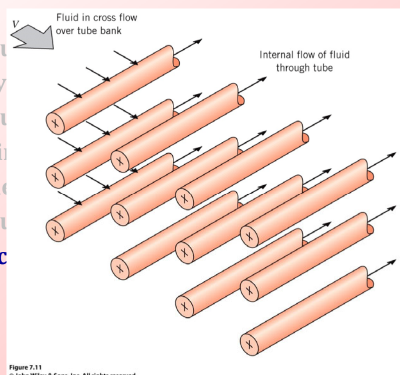
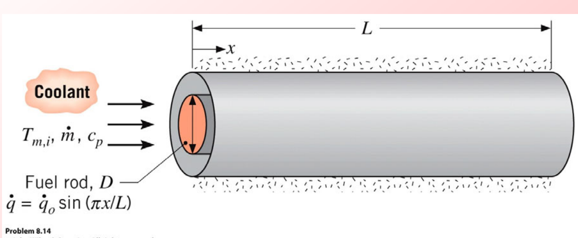


Figure 7.11

Chapter 1 By E. Amani

Course Overview

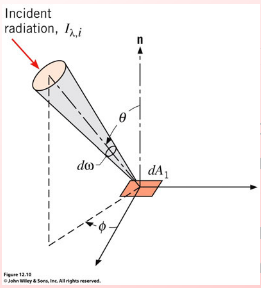


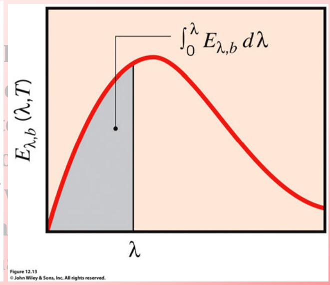
Problem 8.14

VIII. **Convection – internal flow**

Chapter 1 By E. Amani

Course Overview



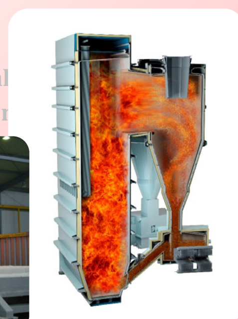


IX. **Radiation: Fundamentals**

Chapter 1 By E. Amani

Course Overview

I. Introduction
II. Energy equation – thermal
III. Introduction to conduction



X. **Radiation between surfaces**

Chapter 1 By E. Amani