

Course Syllabi

1. CCFF-00034 HEAT TRANSFER

2. 96 credits hours.

3. Bibliography

- Fundamentals of heat and mass transfer, Incropera, F. DeWitt, D. Bergman, T. Lavine, A., 2008
- Transferencia de calor y masa, Yunes A. Cengel, 2011

4. Specific Course Information

- Industry has many processes that involve heat transfer. Therefore, it is necessary for an Industrial Engineer to be prepared to understand its basic principles, and to be able to carry out the approach and resolution of problems that involve this type of transfer. The purpose of the course is to support the student to understand the theoretical foundations of the different heat transfer mechanisms that are: Driving, Convection and Radiation. In addition, it will allow the student to study • to be able to calculate and design thermal systems or equipment such as heat exchangers. The subject provides in the ABET indicator as detailed below: RA1. Troubleshooting
- Prerequisites:
 - CCFF-00033 THERMODYNAMICS
 - MAES-00087 DIFFERENTIAL EQUATIONS
 - INGE-00016 ELECTRICAL ENGINEERING AND TECHNOLOGY

5. Learning Objectives of the Course

- Identify, understand and differentiate the three types of heat transfer: conduction, convection and radiation; as well as their interaction and application in industry.
 - Describe and differentiate the different mechanisms of heat transfer (driving, convection and radiation).
 - Identify the laws that govern the three types of heat transfer: conduction, convection and radiation; and apply them to problem solving.
 - Know, raise and apply the main laws and correlations for the calculation of heat transfer coefficients.
- Learning Outcomes
 - Ra1. identify and solve driving problems on a stationary and non-stationary basis.
 - Ra1. identify basic concepts of heat transfer.
 - Ra1. to raise and solve engineering problems relating to radiation.
 - Ra1. to raise and solve engineering problems relating to radiation.
 - Ra1. identify and solve driving problems on a stationary and non-stationary basis.
 - Ra1. to raise and solve engineering problems concerning heat exchangers.
 - Ra1. to raise and solve engineering problems relating to radiation.
 - Ra1. identify basic concepts of heat transfer.
 - Ra1. identify and solve forced (internal and external) and natural convection problems.
 - Ra1. identify and solve forced (internal and external) and natural convection problems.
 - Ra1. identify and solve driving problems on a stationary and non-stationary basis.
 - Ra1. to raise and solve engineering problems concerning heat exchangers.

6. Course Topics

- Introduction
- Transfer of heat by driving

- Natural and stretching convection
- Heat exchange
- Radiation