SUBJECT TEACHING GUIDE

G1501 - Heat Transfer and Two-Phase Flow

BILINGUAL UC-CU CIVIL ENGINEERING PROGRAM

Academic year 2024-2025

1. IDENTIFYING DATA					
Degree	BILINGUAL UC-CU CIVIL ENGINEERING PROGRAM			Type and Year	Compulsory. Year 1
Faculty	School of civil Engineering				
Discipline	Obligatory Subjects				
Course unit title and code	G1501 - Heat Transfer and Two-Phase Flow				
Number of ECTS credits allocated	6	Term		Semester based (2)	
Web					
Language of instruction	English	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. INGENIERIA ELECTRICA Y ENERGETICA
Name of lecturer	PABLO BERNARDO CASTRO ALONSO
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Other lecturers	

3.1 LEARNING OUTCOMES

- • Knowledge of the heat transfer processes: conduction, convection and radiation.
  • Ability to solve heat exchangers and extended surfaces problems .
  • Obtain the necessary skills to carry out engineering design involving heat transfer.

4. OBJECTIVES

• To obtain a deep view of the heat transfer processes, in steady and unsteady conditions and in one and more dimensions.

• To learn about the theory and different practical approaches of the sources of heat transfer : conduction, convection and radiation.

• To design facilities to exchange heat, as extended surfaces and heat exchangers.

6. SUBJECT PROGRAM

CONTENTS	
1	PART I: CONDUCTION HEAT TRANSFER I.1. Steady Heat Conduction. I.2. Heat Transfer with Extended Surfaces (Fins). I.3. Transient Heat Conduction.
2	PART II: CONVECTION HEAT TRANSFER II.1. Forced and Natural Convection. Internal and external flows. II.2. Heat Exchangers.
3	PART III: RADIATION HEAT TRANSFER III.1. Introduction to Radiation. III.2. Radiation Between Surfaces.
4	PART IV: NUMERICAL HEAT TRANSFER IV.1. Numerical Methods in Heat Conduction. IV.2. Numerical Heat Transfer Software.

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Mid-term exam 1	Written exam	No	Yes	40,00
Mid-term exam 2	Written exam	Yes	Yes	40,00
Classwork	Work	No	Yes	20,00
TOTAL				100,00

Observations

To pass the subject through continuous assessment is necessary to achieve simultaneously :
-To attend to 80% of the class activities.
-To obtain more than 30% of the maximum score in the mid-term exams.
-To obtain a final average score of 50% or more of the maximum score.

Observations for part-time students

Part-time students must take an exam of all the contents of the subject in the ordinary or extraordinary call.

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Heat Transfer: a Practical Approach
Yunus A. Cengel
ISBN: 978-0072458930
Publisher: Higher Education; 2nd Ed
896 pages

Introduction to Heat Transfer
Frank P. Incropera, David P. DeWitt, Theodore L. Bergman, Adrienne S. Lavine
ISBN: 978-0471457275
Publisher: John Wiley & Sons; 5th Edition edition
912 Pages
Published 2006