SUBJECT TEACHING GUIDE

1128 - Fluid mechanics and heat transmission

Master's Degree in mining engineering
Master's Degree in mining engineering

Academic year 2023-2024

1. IDENTIFYING DATA				
Degree	Master's Degree in mining engineering Master's Degree in mining engineering		Type and Year	Compulsory. Year 1 Compulsory. Year 1
Faculty	School of Mines and Energy Engineering			
Discipline	SCIENTIFIC EXPANSION			
Course unit title and code	1128 - Fluid mechanics and heat transmission			
Number of ECTS credits allocated	4,5	Term	Semester based (1)	
Web				
Language of instruction	Spanish	English Friendly	Yes	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	JOSE SALMON GARCIA

3.1 LEARNING OUTCOMES
- Specialized understanding and resolution of problems in fluid mechanics and heat transfer.

4. OBJECTIVES
Understanding the physical principles and mathematical tools for the study of fluid mechanics and heat transfer
Solve specific problems of fluid mechanics.
Formulate and solve complex problems of heat transfer by conduction, convection and radiation.

6. COURSE ORGANIZATION

	CONTENTS
1	PART I: CONDUCTION HEAT TRANSFER I.1. steady state conduction. I.2. extended surfaces.
2	PART II: CONVECTION HEAT TRANSFER II.1. Introduction to convection. Natural and forced convection II.2. Heat exchangers
3	PART III: RADIATION HEAT TRANSFER III.1. Radiation: processes and properties. III.2. Radiation exchange between surfaces.
4	PART IV: NUMERICAL HEAT TRANSFER IV.1. Numerical Methods in Heat Conduction. IV.2. Numerical Heat Transfer Software.
5	PART V: DIMENSIONAL ANALYSIS AND SIMILARITY V.1. Buckingham pi theorem. V.2. Common dimensionless parameters.
6	PART VI: BOUNDARY LAYER VI.1. Introduction. VI.2. laminar and turbulent boundary layer on flat plate. VI.3. Thickness and boundary layer flow.
7	PART VII: HOLES AND LANDFILLS VII.1. Classification. VII.2 Spending coefficient. VII.3. Holes and thin and thick wall landfills.

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
practical and theoretical exercises	Others	No	Yes	30,00
Final exam	Written exam	Yes	Yes	35,00
Mid-term exam	Written exam	Yes	Yes	35,00
TOTAL				100,00
Observations				
In case of not reaching the minimum score asigned to the exams, the final mark will be the lower value between 4,9 and the average score.				
Observations for part-time students				
Part-time students will take a final exam over 100% of the total score.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC
Mecánica de fluidos aplicada; R. MOTT; ED. PRENTICE HALL
Fundamentos de Transferencia de Calor y de Masa; F. INCROPERA, D. DEWITT; ED. PEARSON EDUCACION