

[MHD303] INSTALLATIONS

GENERAL INFORMATION

Studies	UNIVERSITY MASTER IN INDUSTRIAL ENGINEERING		Subject	?
Semester	1	Course	1	Mention / Field of specialisation
Character	COMPULSORY		Language	CASTELLANO
Plan	2025	Modality	Face-to-face	Total hours 33 class hours + 42 non-class hours = 75 total hours
Credits	3	Hours/week	1.83	

2030 AGENDA GOALS



PROFESSORS

AIZPURU NAZABAL, AITZIBER
GOMENDIO RUIZ, AMAIA
AZPI-GARCIA SAN JOSE, RICARDO

REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
(No specific previous subjects required)	Fundamentals of Fluid Mechanics Fundamentals of Electrical Technology Fundamentals of Thermodynamics

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
MH2518 - Demonstrate knowledge of construction, building, facilities, infrastructure and urban planning in the field of industrial engineering.		x		0,4
MH2520 - Demonstrate knowledge and skills to project and design facilities electrical and fluids, lighting, air conditioning and ventilation, energy saving and efficiency , acoustics, communications, home automation and intelligent buildings and security installations.		x		1,64
MH2522 - Demonstrate knowledge and skills to perform verification and control of facilities, processes and products.		x		0,24
MH2523 - Demonstrate knowledge and skills to perform certifications, audits, verifications, tests and reports.		x		0,32
MH2526 - Apply acquired knowledge and problem-solving skills in new, unfamiliar or changing environments within broader (or multidisciplinary) contexts related to their area of study.		x		0,08
MH2527 - Demonstrate the ability to integrate knowledge and deal with the complexity of formulate judgments based on incomplete or limited information, including reflections on the SDGs, human rights and fundamental rights, and on social, health and safety, environmental, economic and industrial implications and responsibilities.		x		0,08
MH2528 - Communicate its conclusions and the ultimate knowledge and rationale behind them to specialized and non-specialized audiences in a clear and unambiguous manner.		x		0,08
MH2529 - Possess the learning skills that will enable them to continue studying in a manner that will be largely self-directed or autonomous.		x		0,04
MH2530 - Work with people, involving them and leading them in a dynamic directed towards a common objective that includes reflection on their ethical and social responsibility, with a global vision of the work to be carried out and the characteristics required (quality, deadlines, etc.), assuming responsibility for the decisions taken.		x		0,12

Total: 3

KC: Knowledge or Content / SK: Skills / AB: Abilities

SECONDARY LEARNING RESULTS

RMH109 [!] *Analiza y determina los factores que impliquen algún tipo de riesgo planteando diferentes alternativas que aseguren las condiciones de salubridad, confort y seguridad de los lugares de trabajo correspondientes a actividades industriales o las que son*

LEARNING ACTIVITIES

	CH	NCH	TH
Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams		3 h.	3 h.
Personal study and flexible development of concepts and subjects using active dynamics, to foster more meaningful learning		3 h.	3 h.

Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams		5 h.	5 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	5 h.		5 h.
Carrying out exercises and solving problems individually and/or in teams	2 h.	2 h.	4 h.
Seminars, debates and/or workshops to deepen and/or share experiences.	2 h.	2 h.	4 h.
Carrying out visits and/or learning trips to other university centres, laboratories, companies and/or thermal power plants	1 h.		1 h.

EVALUATION SYSTEM

W

MAKE-UP MECHANISMS

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

30%

(No mechanisms)

Individual written and/or oral tests or individual coding/programming tests

70%

CH - Class hours: 10 h.

NCH - Non-class hours: 15 h.

TH - Total hours: 25 h.

RMH108 [!] *Realiza el diseño de las instalaciones necesarias para la distribución de agua, generación y distribución del calor y energía eléctrica; así como los sistemas de evacuación y recuperación tanto de aguas residuales como del calor generados en el proce*

LEARNING ACTIVITIES

CH

NCH

TH

Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams

2 h.

2 h.

Personal study and flexible development of concepts and subjects using active dynamics, to foster more meaningful learning

2 h.

2 h.

Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints

2 h.

2 h.

Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams

5 h.

5 h.

Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects

5 h.

5 h.

Carrying out exercises and solving problems individually and/or in teams

2 h.

3 h.

5 h.

Carrying out visits and/or learning trips to other university centres, laboratories, companies and/or thermal power plants

1 h.

1 h.

Tutoring sessions and monitoring of training activities

1 h.

2 h.

3 h.

EVALUATION SYSTEM

W

MAKE-UP MECHANISMS

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

30%

(No mechanisms)

Individual written and/or oral tests or individual coding/programming tests

70%

CH - Class hours: 11 h.

NCH - Non-class hours: 14 h.

TH - Total hours: 25 h.

RMH107 [!] *Analiza y cuantifica las necesidades de agua, calor y energía eléctrica de una actividad industrial, urbana o residencial planteando diferentes alternativas que den respuesta a las necesidades teniendo siempre en consideración la sostenibilidad y el*

LEARNING ACTIVITIES

CH

NCH

TH

Personal study and flexible development of concepts and subjects using active dynamics, to foster more meaningful learning

2 h.

2 h.

Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams		5 h.	5 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	6 h.		6 h.
Carrying out exercises and solving problems individually and/or in teams	2 h.	3 h.	5 h.
Carrying out visits and/or learning trips to other university centres, laboratories, companies and/or thermal power plants	2 h.		2 h.
Reading and personal and/or shared analysis of relevant and current publications (books, articles, catalogues, etc.) related to the speciality	2 h.	3 h.	5 h.

EVALUATION SYSTEM

W

MAKE-UP MECHANISMS

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

30%

(No mechanisms)

Individual written and/or oral tests or individual coding/programming tests

70%

CH - Class hours: 12 h.

NCH - Non-class hours: 13 h.

TH - Total hours: 25 h.

CONTENTS

1. INTRODUCTION FACILITIES-Psychrometry-General standards. Regulations-Industrial Buildings-Ecodesign-Thermal Installations2. AIR CONDITIONING INSTALLATIONS-Heating and Cooling Power Calculation-Heating, Cooling and Ventilation3. INSTALLATION OF ACS-Dimensioning and Production of DHW4. CONSUMPTION ESTIMATION-Heating-DHW5. THERMAL PRODUCTION-Heat Production-Cooling Production6. THERMAL TRANSPORT-Piping Classification-Pipe Sizing-Pumps7. FUEL INSTALLATIONS-Liquid Fuels-Gaseous Fuels8. RENEWABLE ENERGIES-EST, Solar Thermal Energy-ESF, Photovoltaic Solar Energy-Biomass-Heat Pumps-Cogeneration

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources

Presentations by external Lecturers
Slides of the subject
Topic related web quires
Moodle Platform
Class presentations
Video projections
Computer practical training
[!] *Traducir Visita empresas (incineradora, depuradora, refinería...)*
[!] *Visita a las instalaciones de la universidad*

Bibliography

Código Técnico de la Edificación. Ministerio de Vivienda y Agencia Urbana. 2024
REBT. Reglamento Electrotécnico para Baja Tensión. Ministerio de Industria y Turismo. 2023
RITE. Reglamento de las Instalaciones Térmicas de los Edificios. Ministerio de Industria, Energía y Turismo. 2007