

[MGG101] RAILWAY ELECTRIC TRACTION

GENERAL INFORMATION

Studies	UNIVERSITY MASTER IN ENERGY AND POWER ELECTRONICS	Subject	TRACTION APPLICATION
Semester	2	Course	1
Character	COMPULSORY	Mention / Field of specialisation	
Plan	2015	Modality	Adapted Face-to-face
Credits	4,5	Hours/week	3.06
		Language	CASTELLANO
		Total hours	55 class hours + 57.5 non-class hours = 112.5 total hours

PROFESSORS

POZA LOBO, FRANCISCO JAVIER

 TAVERA BAHILLO, TXABER

REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
(No specific previous subjects required)	(No previous knowledge required)

SKILLS

VERIFICA SKILLS

SPECIFIC

MGC16 - Specifying a railway traction unit

BASIC

M_CB10 - To have learning skills and the capacity for self-guided or independent subsequent learning.

M_CB6 - To have and understand knowledge which provides a base or opportunity to be original in the development and/or application of ideas, often in an investigation context

M_CB7 - To know how to apply the acquired knowledge and competencies and the ability to solve problems in new or unfamiliar contexts within wider (or multidisciplinary) environments related to their field of study

M_CB8 - To be able to integrate different types of knowledge and make complex judgements based on information that, in spite of being partial or limited, includes ideas on the social and ethical responsibilities associated with the application of knowledge

M_CB9 - To share knowledge, conclusions and their rationale with specialised and lay audiences in a clear, unambiguous manner

LEARNING RESULTS

RMG134 Sizing railway traction systems

LEARNING ACTIVITIES

	CH	NCH	TH
Presentation of the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	10 h.		10 h.
Individual and/or team computer simulation practice		20 h.	20 h.

EVALUATION SYSTEM

	W
Individual written and oral tests to assess technical skills of the subject	50%
Reports of solving exercises, case studies, computer practices, simulation practices and laboratory practices	50%

Comments: Although it will be tried to carry out the activities and the evaluation in person, it is possible that due to COVID-19 it will have to be switched to an online or blended model.

CH - Class hours: 10 h.

NCH - Non-class hours: 20 h.

TH - Total hours: 30 h.

MAKE-UP MECHANISMS

Individual written and oral tests to assess technical skills of the subject

Reports of solving exercises, case studies, computer practices, simulation practices and laboratory practices

RMG135 By simulation analyzes the behavior of a rail traction system

LEARNING ACTIVITIES

	CH	NCH	TH
Individual study and work, tests and evaluations and check points		14 h.	14 h.

Presentation of the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	6 h.	6 h.
Individual and/or team computer simulation practice	10 h.	10 h.

EVALUATION SYSTEM

W

Individual written and oral tests to assess technical skills of the subject	50%
Reports of solving exercises, case studies, computer practices, simulation practices and laboratory practices	50%

Comments: Although it will be tried to carry out the activities and the evaluation in person, it is possible that due to COVID-19 it will have to be switched to an online or blended model.

MAKE-UP MECHANISMS

Individual written and oral tests to assess technical skills of the subject
Reports of solving exercises, case studies, computer practices, simulation practices and laboratory practices

CH - Class hours: 16 h.
NCH - Non-class hours: 14 h.
TH - Total hours: 30 h.

RMG136 Analyzes railway infrastructure systems

LEARNING ACTIVITIES

CH

NCH

TH

Presentation of the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	16 h.		16 h.
Individual and/or team computer simulation practice	4 h.	10 h.	14 h.

EVALUATION SYSTEM

W

Individual written and oral tests to assess technical skills of the subject	50%
Reports of solving exercises, case studies, computer practices, simulation practices and laboratory practices	50%

Comments: Although it will be tried to carry out the activities and the evaluation in person, it is possible that due to COVID-19 it will have to be switched to an online or blended model.

MAKE-UP MECHANISMS

Individual written and oral tests to assess technical skills of the subject
Reports of solving exercises, case studies, computer practices, simulation practices and laboratory practices

CH - Class hours: 20 h.
NCH - Non-class hours: 10 h.
TH - Total hours: 30 h.

RMG137 Analyzes and simulates the systems and components that are part of an electric railway system

LEARNING ACTIVITIES

CH

NCH

TH

Presentation of the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	4 h.		4 h.
Individual and/or team computer simulation practice	5 h.	13,5 h.	18,5 h.

EVALUATION SYSTEM

W

Individual written and oral tests to assess technical skills of the subject	50%
Reports of solving exercises, case studies, computer practices, simulation practices and laboratory practices	50%

Comments: Although it will be tried to carry out the activities and the evaluation in person, it is possible that due to COVID-19 it will have to be switched to an online or blended model.

MAKE-UP MECHANISMS

Individual written and oral tests to assess technical skills of the subject
Reports of solving exercises, case studies, computer practices, simulation practices and laboratory practices

CH - Class hours: 9 h.
NCH - Non-class hours: 13,5 h.
TH - Total hours: 22,5 h.

CONTENTS

Railway Electric Traction Introduction

Railway electric traction

Power train

Brake system

Collect power system

Rail transport vehicles

Electrified Railway Systems

DC systems

AC systems

Train Dynamic

Rolling resistance

Basic principles

Convertidores de tracción

Semiconductors

Power converters topologies

Sensors

Railway Traction Units control

Traction control

Slip control

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources

Subject notes
Moodle Platform

Bibliography

A. Steimel; Electric Traction: Motive Power and Energy Supply;
Deutscher Industrieverlag GmbH; 2014
J.M. Allenbac, P. Chapas, M. Comte, R. Kaller; Traction électrique;
Presses Polytechniques et Universitaires Romandes; 2008