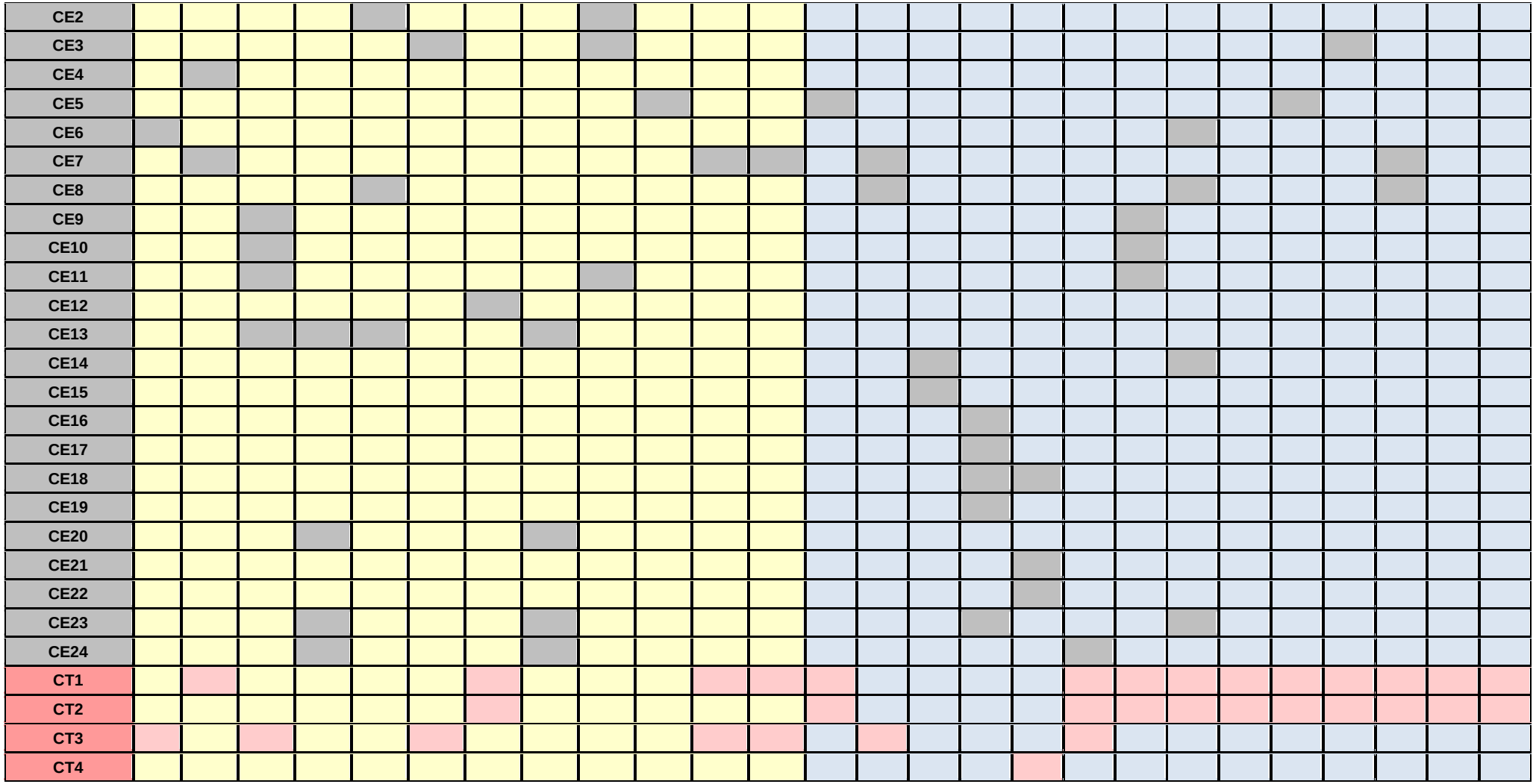
MASTER IN INDUSTRIAL ENGINEERING

The syllabus of the Master in Industrial Engineering is set up in the ministerial file ORDEN CIN/311/2009 that regulates the degrees that enable to practice the profession of Industrial Engineer

Competences	1st course												2nd course															
									Optional Subjects (Option 1 and Option 2)												Optional Subjects (Option 3, Option 4)							
	Generation and Distribution of Energy	Unit Operations of Chemical Processes	Industrial Structures 1	Industrial Organization 1	Advanced Manufacture Systems	Machine Design and Testing 1	Electrical Installations and HVAC Systems	Industrial Organization 2	Structural and mechanic analysis	Thermohydraulics	Systems Engineering	Feedback Control	Thermal and Hydraulic Machines	Electronics and Control Systems Design	Control, Certifications and Auditing	Business Administration	Project and Human Resource Management	Master Thesis	Industrial Structures 2	Dynamic and Control Systems	Electrical Engineering	Heat and Mass Transfer	Machine Design and Testing 2	Industrial instrumentation	Mobility 1	Mobility 2
CB1																												
CB2																												
CB3																												
CB4																												
CB5																												
CG1																												
CG2																												
CG3																												
CG4																												
CG5																												
CG6																												
CG7																												
CG8																												
CG9																												
CG10																												
CG11																												
CG12																												
CG13																												
CE1																												



Basic competences set in Royal decree 861/2010 and Order CIN/311/2009

CB1 To possess and understand knowledge that provides a base or opportunity to be original in the development and/or application of ideas, often in a research context.

CB2 To be able to apply the knowledge gained and to solve problems in new environments in wider contexts (or multidisciplinary) related with the area of study.

CB3 To be able to integrate knowledge and face complexity in order to make judgements from an information that, being incomplete or limited, it would include issues of social and ethical responsibilities directly related to the application of this knowledge and judgements.

CB4 To be able to communicate conclusions –and knowledge and reasons that support them– to either specialized or not specialised publics in a clear way and without ambiguities.

CB5 To possess the skills to continue learning self-directed and freelance.

General competences set in ORDEN CIN/311/2009 and EPS criteri

CG1 Capacity of planning and organizing the personal work.

CG2 Capacity to consider the socioeconomic context as well as the sustainability criteria in the engineering solutions.

CG3 Capacity to convey information, ideas, problems and solutions both to a specialised and no specialised public.

CG4 Capacity to conceive, design and implement projects and/or provide new solutions, using the tools that the engineering offers.

CG5 To be motivated for the quality and the steady improvement.

CG6 To have suitable knowledge of the scientific and technological issues of: mathematical, analytical and numerical methods in engineering, electrical engineering, energetic engineering, chemical engineering, mechanical engineering, mechanics of continuous means, industrial electronics, automation, manufacture, material, quantitative methods of management, industrial computing, urbanism, infrastructures, etc.

CG7 To project, calculate and design products, processes, installations and plants.

CG8 To direct, schedule and supervise multidisciplinary teams.

CG9 To do research, development and innovation in products, processes and methods.

CG10 To make strategic planning and apply it to construction, production and quality systems and to environmental management.

CG11 To manage both technically and economically projects, installations, plants, companies and technological centres.

CG12 To be able to execute functions of general management, technical management and management of R&D projects in plants, companies and technological centres.

CG13 Knowledge, understanding and capacity to apply the necessary legislation in order to practice the profession of Industrial Engineer.

Specific competences set in ORDEN CIN/311/2009

CE1 Knowledge and capacity for the analysis and design of systems of generation, transportation and distribution of electrical energy.

CE2 Knowledge and capacity to project, calculate and design integrated manufacturing systems.

CE3 Capacity for the design and testing of machines.

CE4 Capacity for the analysis and design of chemical processes.

CE5 Knowledge and capacity for the design and analysis of heat engines, hydraulic machines and installations of heat and industrial refrigeration.

CE6 Knowledge and capacities that allow to understand, analyse, exploit and manage the different energy sources.

CE7 Capacity to design electronic and industrial instrumentation systems.

CE8 Capacity to design and project automated production and advanced process control systems.

CE9 Capacity for the design, construction and exploitation of industrial plants.

CE10 Knowledge on construction, building, installations, infrastructures and urbanism in the field of the industrial engineering.

CE11 Knowledge and capacities for the calculation and design of structures.

CE12 Knowledge and capacities to project and design electrical and fluid installations, illumination, heating, ventilation and air conditioning, energetic efficiency, acoustic, communications, domotics, and intelligent buildings and security installations.

CE13 Knowledge on methods and techniques of transportation and industrial maintenance services.

CE14 Knowledge and skills to carry out verification and control of installations, processes and products.

CE15 Knowledge and skills to carry out certifications, audits, verifications, essays and reports.

CE16 Knowledge and skills to organise and manage companies.

CE17 Knowledge, strategy and planning applied to different organisational structures.

CE18 Knowledge of mercantile and labour laws.

CE19 Knowledge of financial and costs accountancy.

CE20 Knowledge of information systems for management, industrial organisation, production and logistical systems and management of quality systems.

CE21 Capacities for work organization and management of human resources. Knowledge on prevention of labour risks.

CE22 Knowledge and skills on integrated management projects.

CE23 Capacity for research development and technological innovation management.

CE24 Execution, presentation and defence, once all the credits of the syllabus are obtained, an original work carried out individually in front of a university court, consisting of an integral project of Industrial Engineering of professional nature in which the competences are synthesized.

Cross-disciplinary competences approved by the Plenary Commission of the Degrees of Industrial Engineering, Computer Engineering and Building Engineering, gathered in June 16th, 2008.

CT1 Appropriate skills in oral and written language.

CT2 Command of a foreign language.

CT3 Mastering ICT's.

CT4 To respect the fundamental rights of equality between men and women, the promotion of the Human Rights and the principles of a culture of peace and democratic values.