

# EVOLUTION OF CIVIL ENGINEERING DEGREES IN SPAIN UP TO THE PRESENT AND ON-GOING CHANGES AT THE CIVIL ENGINEERING SCHOOL OF A CORUÑA

ACACIA NAVES\*, ISABEL MARTÍNEZ, PABLO RODRÍGUEZ-VELLANDO,  
VICTOR BARRIENTOS, ANA M. VÁQUEZ AND PILAR ROEL

Civil Engineering School of University of A Coruña  
Campus de Elviña s/n, 15071, A Coruña (Spain)  
[acacia.naves@udc.es](mailto:acacia.naves@udc.es)

**Key words:** Education, Civil Engineering, Curriculum Evolution, Civil Engineering Programs

**Abstract.** The transformation of civil engineering education in Spain is presented, particularly following the implementation of the European Higher Education Area reforms in 2010 (Bologna Plan). Historically, Civil engineering studies were structured around two main qualifications: the Technical Engineer in Public Works and the Civil Engineer. After 2010, a new model was introduced comprising a Bachelor's degree that confers technical engineering competencies, followed by a two-year Master's programme that grants full accreditation as an Engineer for Roads, Canals and Ports. Currently, the civil engineering Bachelor's degrees are offered at 27 nationwide, with progressive growth between 1996 and 2012. Sixteen universities currently offer the qualifying Master's programme, reflecting significant growth since the Bologna reforms. The qualifying Master's programs are available at 16 universities, with a marked increase in offerings after the Bologna reforms. Spanish regulations require all accredited degrees to guarantee core professional competencies, ensuring a unified qualification framework while allowing up to 50% curricular differentiation between universities. Degree programmes typically include specializations in the areas of civil construction, hydrology and environmental engineering, or transportation and urban infrastructure. A newly proposed curriculum from the University of A Coruña maintains that general structural pattern but emphasizes mathematics and IT.

## 1 INTRODUCTION TO CIVIL ENGINEERING DEGREES IN SPAIN

The history of civil engineering schools in Spain is closely linked to the development of civil engineering itself and the need to train professionals specialized in the construction of infrastructure such as roads, bridges, canals, and railways. Their tradition dates to the 19th century, and they have played a crucial role in the country's development, and their evolution since then reflects the technological, social, and educational transformations of each era.

In the 18th century, Spain began modernizing its infrastructure under the influence of Enlightenment ideals. However, there was no formal education in civil engineering. King Charles IV established the *Corps of Engineers of Roads* in 1802, aiming to improve communications and public works across the country, and founded the first civil engineering school in Madrid called *School of Engineers of Roads and Canals*. Its creation was led by

Agustín de Betancourt, a Spanish engineer and scientist, who modelled the institution after the *École Nationale des Ponts et Chaussées* in Paris [1, 2, 3]. The school officially began operating in 1803 [4]. Its activity was interrupted during the Peninsular War (1808–1814) and the absolutist reigns of Ferdinand VII (1814–1820 and 1823–1834). The school's early curriculum was intensive and practical, covering subjects such as mechanics, hydraulics, descriptive geometry, and construction techniques.

The school assumed responsibilities related to seaports from 1835 and was renamed the *School of Engineers of Roads, Canals, and Ports*. In 1836, formal regulation defined the structure and duration of studies. By 1853, the *Revista de Obras Públicas (Journal of Public Works)* was launched, becoming a key scientific outlet. The curriculum expanded and adapted to the growing complexity of infrastructure projects. The early engineers trained at this institution designed and oversaw major infrastructure projects such as the Canal de Isabel II [5, 6] and the development of Spain's railway system [7, 8]. This educational centre remained under state administration until 1926, when it was granted political and economic autonomy, fostering its modernization, teaching quality, and research activities [9].

In parallel, the *School of Public Works Assistants* was established in Madrid in 1857 as a special school under the Ministry of Public Works, aimed at training civil servants admitted to the *Corps of Public Works Assistants*, a government-dependent body. This institution experienced several closures and re-openings but has operated continuously since 1939.

In 1957, under Franco's dictatorship, a law was enacted to reorganize technical education (Law of July 20, 1957), with the goal of increasing the number of technicians to support Spain's industrialization efforts. The so-called *Plan 57* required a revision of the organization and teaching methods [10], integrating technical engineering schools into the public university structure under the Ministry of Education and Science [9]. A subsequent law in 1964, the *Law on the Reorganization of Technical Education* (Law 2/1964) restructured studies into two levels: *Higher Technical Schools of Engineering*, which awarded the title of *civil engineer*, and *Technical Engineering Schools*, which awarded the title of *public works expert (equivalent to public works assistant) or technical civil engineer* (from 1969 onward). The engineering degree consisted of five academic years, while the technical engineering degree required three years of study.

The School of Civil Engineering in Madrid held a monopoly on the training of civil engineers for over a century, from its foundation. The growing demand for specialized engineers due to Spain's economic growth throughout the 20th century and the need to decentralize technical education led to the establishment of new civil engineering schools across the country. A School of Civil Engineering was established in Santander in 1963. It was followed by those in Valencia in 1968, Barcelona in 1973, Granada in 1988, A Coruña in 1991 and Ciudad Real and Burgos in 1998. The degree was offered in eight centers within public universities [11] and in the Alfonso X el Sabio University from 1996, a private university located near Madrid.

The curricula of the civil engineering degree in those 9 centers were initially modeled on the 1964 Madrid curriculum, with minor modifications to adapt to regional needs and to the changes established in the different university education laws [9]. The Decree of July 30, 1975 (*Plan 75*) extended the duration of higher technical education programs to six academic years, which consisted of a redistribution of existing subjects. Throughout the 1980s and 1990s, all engineering schools gradually introduced changes to their curricula, updating the contents and adopting a five-year structure except for that in Madrid [12]. For instance, the University of

Cantabria introduced changes in 1987 and launched a new five-year curriculum in the 1999–2000 academic year.

The profession of civil engineer, known as *Engineer of Roads, Canals, and Ports* (ICCP) is legally regulated in Spain, and access to it requires the completion of university curricula which must be designed according to ministerial order which ensure that graduates acquire a comprehensive set of scientific, technical, and methodological competencies essential for professional practice. The current Ministerial Order for civil engineering curriculum is the CIN/309/2009. These legally mandated competencies shape the core content of all accredited programs and ensure a consistent professional profile across institutions, despite the flexibility allowed in elective and institution-specific courses.

The program of *Public Works Assistants* or *Technical Civil Engineer*, initially provided at the *School of Public Works Assistants* in Madrid, began to be progressively implemented in an increasing number of institutions throughout the country. They are responsible for delivering programs that combine theoretical instruction with practical training, in accordance with national academic standards and professional requirements established in the ministerial order for civil engineering curriculum (currently CIN/307/2009). The school of Burgos has worked since 1967. Subsequently, additional centers have joined in cities such as Cáceres (1979), Barcelona (1988), Algeciras (1988), Alicante (1991), Valencia (1991), Zamora (1991), Linares in Jaén (1993), Ávila (1995), Sevilla (1999), Bélmez in Córdoba (1999), Santander (1999), Cartagena (2000), La Laguna in Tenerife (2001), Las Palmas (2002), Barakaldo in Bilbao (2003), A Coruña (2004), La Almunia in Zaragoza (2005), Granada (2009), Lugo (2011) and Mieres in Asturias (2012). By the early 2000s, technical civil engineering programs were being offered in more than 20 public institutions across Spain and two private universities.

The construction of the European Higher Education Area (EHEA) began in 1999 with the signature of a foundational document, known as the Bologna Declaration. Their purpose is to undertake a comprehensive restructuring of European higher education [13, 14] aiming a unified academic framework which would promote convergence and facilitate professional mobility among countries [15, 16] previously challenging due to the diverse professional regulations traditionally required [17]. The agreements reached at the UE level were incorporated into Spanish legislation in 2003 (RD 1125/2003), which established that academic programs leading to official university degrees in Spain must be structured using the *European Credit Transfer and Accumulation System* (ECTS) and considering distinct levels: Bachelor's, Master's, and doctorate. Bachelor's degrees comprise 240 ECTS credits and are designed to provide broad-based education and equip students with the skills necessary for professional practice. Master's degrees involve a one- to two-year specialization period following the completion of undergraduate studies. Each European country implemented those changes in engineering education according to its national tradition and the existing status of the profession. Negotiations between the Spain government, the universities and the professional associations of engineers, agreed that engineering studies were converted into a Bachelor's degree in civil engineering that gave the attributions of *Technical Engineer* plus a 2-year Master's degree that allowed the acquisition of the title of *Civil Engineer* allowing access to the *State Corps of Civil Engineers for Roads, Canals, and Ports*. Then, new Bachelor's and Master's degrees offered by universities only need to have in common the requirements established by the law about the exercise of the regulated professions of *Public Works Technical Engineer* and *Civil Engineer*. Since 2010, universities have progressively restructured engineering and technical engineering

degrees into Bachelor's and Master's programs. From then, only some of them have modified their curricula to modernize contents and skills, aiming more attractive degrees to compete for students.

## 2 THE CURRENT OFFERING OF CIVIL ENGINEERING PROGRAMS IN SPAIN

The titles and academic orientation of the Bachelor's degrees in civil engineering in Spain since 2010 vary depending on the university. Some programs take a scientific and generalist approach, while others are designed to emphasize professional skills and specialization. In general, engineering schools that previously offered only the degree in technical engineering and recently established schools, adopted a Bachelor's degree typically titled with *Civil Engineering*.

More traditional schools—such as those in Madrid, Valencia, Barcelona, and A Coruña—initially offered two distinct bachelor's programs in civil engineering. In contrast, some of the more traditional engineering schools such those in Madrid, Valencia, Barcelona or A Coruña, initially offered two different Bachelor's programs in civil engineering: one with a more generalist and scientific orientation, and another more closely aligned with professional practice. Both Bachelor's programs, which resemble the pre-Bologna qualifications, were recognized as providing the same professional rights and grant access to the Master's degree. Their titles, which did not always include the words *civil engineering*, often lead to confusion. Furthermore, it is difficult for prospective students to understand the differences between them. Over the years, those schools have gradually merged the two programs into a single degree that explicitly includes the term *civil engineering* in its title. The School of Civil Engineering in A Coruña is currently the only institution that has not yet unified its bachelor programs. In parallel, the *Master's Degree in Engineering for Roads, Canals, and Ports* is being offered at all universities where the former Civil Engineering program was taught prior to 2010, and also at several other engineering schools.

Comprehensive data were collected on all officially recognized Bachelor's and Master's programs in civil engineering currently available in Spain. Table 1 lists the public universities that offer both qualifications, providing details about their respective locations and the years when these programs were established. In cases where the former civil engineering program or the Master's program in civil engineering began several years after a former technical engineering degree or a Bachelor's in Civil Engineering had already been established, two dates are provided to indicate the starting year of each respective program. Table 2 lists the private universities also offering both Bachelor's and Master's degrees. Last, Table 3 lists those universities offering only Bachelor's degrees.

Nowadays, it is possible to study a civil engineering Bachelor's degree in 27 engineering schools scattered throughout Spain. The number was progressively increasing especially from 1996 to 2012 (Figure 1). On the other hand, the qualifying Master's degree in civil engineering can be studied at 12 public and 4 private universities. The number of these postgraduate courses increased slightly until the Bologna Plan was approved in 2010 (Figure 1) and sharply increase after. The large increase of the number of civil engineering programs coincided with the construction crisis that severely affected Spain, reaching its worst point around 2011, caused a dramatical drop of the number of students in many engineering schools. With the recovery of the sector, there is a gradual increase in the number of students. In the case of Master's

programs, the number of students in public institutions is still low due to the new possibility of taking an online Master's degree at a private university to combine it with a job as a technical engineer.

There are also other civil engineering degrees beyond those that qualify graduates to engineering practice in Spain, such as the possibility of combining a degree in civil engineering with another degree (double Bachelor's degree). Examples include the double Bachelor's degree in civil engineering and business administration at the University of Madrid [18], Granada [22] or Córdoba [40], or the double degree in civil engineering and technical architecture at the University of the Basque Country [43]. There is also the possibility of combining the engineering degree with another equivalent degree at a foreign university. This is the case at the Polytechnic University of Valencia, where it is possible to simultaneously obtain a degree from the *École des Ponts*-Paris Tech in France, the *Università degli Studi di Trento* in Italy, or the Illinois Institute of Technology in the USA. In addition, Spanish universities offer a multitude of non-qualifying postgraduate studies in specific subjects, such as Erasmus Mundus Joint Master Degree in Coastal Hazards - Risks, Climate Change Impacts and Adaptation offered by the University of Cantabria [19] or the Master's degree in Sustainable Management of Water offered by the University of A Coruña [23].

**Table 1:** Compilation of public universities offering both Bachelor's and Master's degrees in civil engineering, including the city where each program is taught and the year when such programs were first introduced. In cases where the former civil engineering program or the Master's program in civil engineering began several years after a former technical engineering degree or a Bachelor's in civil engineering had already been established, two dates are provided to indicate the starting year of each respective program.

University	City	From	Current Programs
Polytechnic University Madrid [18]	Madrid	1802	Bachelor's degree in civil and territorial engineering Double bachelor's degree in civil and territorial engineering and business administration Master's degree in civil engineering
University of Cantabria [19]	Santander	1963	Bachelor's degree in civil engineering Master's degree in engineering for roads, canals and ports
Polytechnic University of Valencia [20]	Valencia	1968	Bachelor's degree in civil engineering Bachelor's degree in public works engineering (currently being discontinued) Master's degree in engineering for roads, canals and ports
Polytechnic University of Catalunya [21]	Barcelona	1973	Bachelor's degree in civil engineering Double Bachelor's degree in civil engineering and architectural technology and building construction Master's degree in engineering for roads, canals and ports
University of Granada [22]	Granada	1988	Bachelor's degree in civil engineering Double Bachelor's degree in civil engineering and business administration Master's degree in engineering for roads, canals and ports
University of A Coruña [23]	A Coruña	1991	Bachelor's degree in public works engineering Bachelor's degree in civil engineering technology Master's degree in engineering for roads, canals and ports
University of Castilla La Mancha [24]	Ciudad Real	1998	Bachelor's degree in civil and territorial engineering Master's degree in engineering for roads, canals and ports
University of Burgos [25]	Burgos	1967 1998	Bachelor's degree in civil engineering Double Bachelor's degree in civil engineering and Building

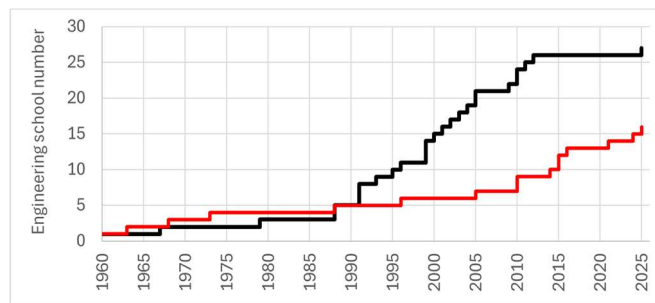
			Engineering Master's degree in engineering for roads, canals and ports
Polytechnic University of Cartagena [26]	Cartagena	2000 2014	Bachelor's degree in civil engineering Master's degree in engineering for roads, canals and ports
University of Cádiz [27]	Algeciras	1988 2015	Bachelor's degree in civil engineering Master's degree in engineering for roads, canals and ports
University of Seville [28]	Sevilla	1999 2010	Bachelor's degree in civil engineering Master's degree in engineering for roads, canals and ports
University of Oviedo [29]	Mieres	2012 2016	Bachelor's degree in civil engineering Double Bachelor's degree in civil engineering and mining & energy resources engineering Master's degree in engineering for roads, canals and ports
University of Alicante [30]	Alicante	1991 2015	Bachelor's degree in civil engineering Master's degree in engineering for roads, canals and ports
University of Extremadura [31]	Cáceres	1979 2021	Bachelor's degree in civil engineering Master's degree in engineering for roads, canals and ports
Univ. Las Palmas de Gran Canaria [32]	Las Palmas	2002 2024	Bachelor's degree in civil engineering Master's degree in engineering for roads, canals and ports

**Table 2:** Compilation of private universities offering degrees in civil engineering, including the city where each program is taught and the year when such programs were first introduced.

University	City	From	Current Academic Programs
Alfonso X el Sabio University [33]	Madrid	1996	Bachelor's degree in civil engineering Master's degree in civil engineering
Universidad Europea de Madrid [34]	Madrid Semipresencial	2005	Bachelor's degree in civil engineering Master's degree in civil engineering
Universidad Católica San Antonio de Murcia [35]	Murcia	2010	Bachelor's degree in civil engineering Master's degree in civil engineering
Universidad Nebrija [36]	Madrid Semipresencial	2025	Bachelor's degree in civil engineering Master's degree in civil engineering

**Table 3:** Compilation of public universities offering only Bachelor's degrees in civil engineering, including the city where each program is taught and the year when such program was first introduced

University	City	From	Current Academic Programs
University of Salamanca [37]	Zamora	1991	Bachelor's degree in civil engineering
University of Jaén [38]	Linares	1993	Bachelor's degree in civil engineering
University of Salamanca [39]	Ávila	1995	Bachelor's degree in civil engineering
University of Córdoba [40]	Belmez	1999	Bachelor's degree in civil engineering Double Bachelor's degree in civil engineering and energy and mineral resources engineering Double Bachelor's degree in civil engineering and business administration and management
University of La Laguna [41]	La Laguna	2001	Bachelor's degree in civil engineering
University of Zaragoza [42]	La Almunia	2005	Bachelor's degree in civil engineering
University of Basque Country [43]	Barakaldo - Donostia	2003 2010	Bachelor's degree in civil engineering
Univ. of Santiago de Compostela [44]	Lugo	2011	Bachelor's degree in civil engineering



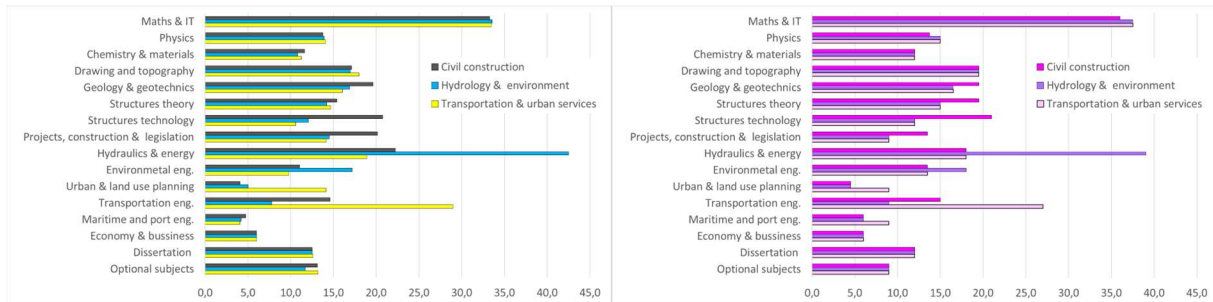
**Figure 1:** Time evolution of the number of engineering schools where Bachelor's and Master's degrees in civil engineering are offered.

### 3 CURRICULA OF THE BACHELOR'S DEGREE IN CIVIL ENGINEERING

The qualification as technical civil engineer is given by all those degrees which include a comprehensive set of competencies listed in the Ministerial Order CIN/307/2009. The curricula of any Bachelor's degree in civil engineering should include the ability to plan, design, manage, and supervise civil engineering projects; apply relevant legislation; conduct structural and geotechnical analysis; engage in research and innovation; and understand the environmental and societal impact of engineering solutions. These legally mandated competencies shape the core content of all accredited programs and ensure a consistent professional profile across institutions, although each degree may vary more than 50% between universities. Furthermore, students are allowed to pursue different specializations or branches within the degree program: civil construction, hydrology and environment, transportation and urban services.

A new curriculum of a civil engineering Bachelor's degree of the University of A Coruña (UDC) has been recently designed which it is nowadays being evaluated at the Spanish Administration. It merges the two civil engineering degrees currently offered with a revamped curriculum. Previously, the engineering school has analyzed the curricula offered at other engineering schools in Spain. All existing degrees are called "Bachelor's degree in civil engineering," except for those at the Universities of Madrid and Castilla la Mancha, which are called "degree in civil and territorial engineering." This avoids previous confusion in which these names were mixed with others that included technology or public works. The in-depth analysis of the contents of each study has been limited to the analysis of those public universities that offer both Bachelor's and Master's degrees due to the similarity of their tradition and circumstances. The analysis was carried out separately for each specialization program, bearing in mind that not all specializations are offered at analyzed universities. Figure 2 shows the average distribution of the 240 ECTS of the Bachelor's degree into categories defined by subject matter for each of the three specializations. The basic engineering contents, such as maths, IT, physics or chemistry, are similar in all of them. Civil construction mentions intensifies contents on structures technology and projects and construction. Hydrology and environment mentions intensifies hydraulics, energy and environmental engineering. Last, transportation and urban services mention focuses on transportation engineering and urban and land use planning. Figure 2 also presents the distribution of the contents of the future civil engineering Bachelor's degree proposed by the Civil Engineering School of UDC which follows in general the same distribution pattern than the rest of Spanish degrees. The UDC plan contains a greater number of ECTS in mathematics and IT and fewer about projects, construction, and legislation. The

content on maritime and port engineering is also higher, due to the importance of this sector in the city and the region. In the hydrology and environment specialization, the content on hydrology and energy is slightly lower than at other universities, while the content on the environment is slightly higher. Finally, the content on land use planning is lower at the UDC for the transport and urban services specialization.



**Figure 2:** Distribution of the 240 ECTS of the Bachelor’s degree into categories defined by subject matter. On the left, the average distribution is presented, calculated from the curricula the degrees taught at public universities offering both Bachelor’s and Master’s degrees for each of the three specializations. On the right, the proposed distribution for each of the specializations of the future degree at the UDC is presented.

#### 4 CONCLUSIONS

This paper reviews the history of civil engineering degrees in Spain, focusing on changes brought about by the 2010 adoption of the Bologna Plan within the EHEA framework. It compiles information on qualifications that have historically permitted the practice of regulated professions such as public works technical engineer and civil engineer, including the evolution over time of where those degrees can be studied. The traditional civil engineering studies were restructured into a Bachelor’s degree that provides technical engineering competencies, followed by a two-year Master’s degree required for full professional accreditation as Engineer for Roads, Canals, and Ports. Nowadays, 27 engineering schools across Spain offer the undergraduate program, with a progressive expansion between 1996 and 2012. The qualifying Master’s degree is available at 16 institutions, being 4 of them private institutions, with a modest rise before 2010 and a pronounced increase thereafter.

The analysis of the curricula offered by Spanish Bachelor’s degrees has been performed identifying the distribution of the 240 ECTS into categories defined by subject matter. The basic engineering contents, such as maths, IT, physics or chemistry, are similar in all of them. The curricula show specialization-specific intensifications: structural and construction technologies for civil construction, hydraulics and environmental engineering for hydrology, and transport systems and urban planning for the transportation branch. An analysis of Bachelor’s degree curricula shows that basic engineering subjects such as mathematics, IT, physics, and chemistry are similar across programs. However, each specialization includes intensified coursework in its focus area: structural and construction technologies for civil construction, hydraulics and environmental engineering for hydrology, and transport systems and urban planning for transportation.

A new civil engineering Bachelor’s curriculum has been recently designed at the University of A Coruña and is currently under evaluation by Spanish educational authorities. It broadly

follows the established distribution of subjects but allocates more credits to mathematics and IT while reducing those for projects, construction, and legislation.

## REFERENCES

- [1] I. González Tascón. *Agustín de Betancourt, los inicios de la ingeniería moderna en Europa*. CEHOPU Ed., Madrid, 1996, ISBN: 9788477902393.
- [2] O. Erogoval, M. Ceccarelli, J.L. Cuadrado, C.S. Lopez-Cajun and V.E. Pavlov, “*Agustin Betancourt: An Early Modern Scientist and Engineer in TMM.*”, in ASME 2006 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference, 2006, DETC2006-99198,m pp. 301-310; <https://doi.org/10.1115/DETC2006-99198>
- [3] M. Ferri Ramírez. *El ejército de la paz: Los ingenieros de caminos en la instauración del liberalismo en España (1833-1868)*. Universitat de València Ed., Valencia, 2015, ISBN: 9788437097756.
- [4] A. Romeu de Armas. *Ciencia y tecnología en la España ilustrada. La Escuela de Caminos y Canales*. Ed. Turner, Madrid, 1980 ISBN: 8475060110.
- [5] M. Ramírez. *El Canal de Castilla, el sueño de la meseta castellana por alcanzar el mar*. Revista Técnica Industrial, 2020, vol. 327, 26-30.
- [6] C.J. Pardo and J. Fernández. *The castilla canal: water heritage resource and prospects for use and tourism innovation*. Cuadernos de Turismo, 2022, vol. 50, 435-439, Universidad de Murcia Ed.
- [7] X. Franch, M. Morillas-Torné and J. Martí-Henneberg. *Railways as a Factor of Change in the Distribution of Population in Spain, 1900–1970*. Historical Methods: A Journal of Quantitative and Interdisciplinary History, 2013, 46(3), 144–156. <https://doi.org/10.1080/01615440.2013.803414>
- [8] J. Martí-Romero J., A. San-José and J. Martí-Henneberg. *The Radiality of the Railway Network in Spain during its Early Stages (1830–67): An Assessment of its Territorial Coherence*. Social Science History, 2021, 45(2), 363-389. <https://doi.org/10.1017/ssh.2021.3>
- [9] V. Yepes. *La ingeniería de caminos en el siglo XXI ¿quo vadis?* Poliblogs of Universidad Politécnica de Valencia, <https://victoryepes.blogs.upv.es>, 2016. Accessed on February 8, 2025.
- [10] G. Barceló. *La formación de los ingenieros en el Plan 57*. Blog Physics and Engineering, Tendencias21, 2025. Available online: [https://www.tendencias21.es/fisica/LA-FORMACION-DE-LOS-INGENIEROS-EN-EL-PLAN-57\\_a46.html](https://www.tendencias21.es/fisica/LA-FORMACION-DE-LOS-INGENIEROS-EN-EL-PLAN-57_a46.html) Accessed on February 9, 2025.
- [11] G. Barceló. *La formación de los ingenieros en el Plan 57*. Blog Physics and Engineering, Tendencias21, 2025. Available online: [https://www.tendencias21.es/fisica/LA-FORMACION-DE-LOS-INGENIEROS-EN-EL-PLAN-57\\_a46.html](https://www.tendencias21.es/fisica/LA-FORMACION-DE-LOS-INGENIEROS-EN-EL-PLAN-57_a46.html) Accessed on February 9, 2025.
- [12] J.L. Juan-Aracil and X. Sanchez-Vila. *The civil engineering education in Spain. Chapter included*, in: Manoliu, I. (Ed.), *Civil engineering education in Europe – 2004: Socrates – Erasmus thematic network project (4th Vol)*. European Civil Engineering Education and Training (EUCEET), Independent Film, Bucarest (Rumania), 2004, ISBN 973-85112-7-5.

- [13] F. De Asís, A. Meneses, E. Cobo. *European Higher Education Area: The Good and the Bad*. Journal of Professional Issues in Engineering Education and Practice, 136(4), 183-187, 2010, [https://doi.org/10.1061/\(ASCE\)EI.1943-5541.0000028](https://doi.org/10.1061/(ASCE)EI.1943-5541.0000028).
- [14] P. Rodríguez-Vellando. *La enseñanza de la ingeniería civil en Europa y su adaptación a Bolonia. El caso español*. Ingeniería y Territorio, 87, 32-37, 2009.
- [15] K. Hernaut. *European engineers: unity of diversity*. Journal of Engineering Education, 83(1), 35–40, 2004. <https://doi.org/10.1002/j.2168-9830.1994.tb00115.x>
- [16] O. Kivinen and Nurmi J. *Unifying Higher Education for Different Kinds of Europeans. Higher Education and Work: a comparison of ten countries*. Comparative Education, 39 (1), 83–103, 2003, <http://www.jstor.org/stable/3099632>.
- [17] F. Maffioli and G. Augusti. Turning engineering education into the European higher education orchestra. European Journal of Engineering Education, 28 (3), 251-273, 2003. <https://doi.org/10.1080/0304379031000098832>
- [18] Universidad Politécnica de Madrid. *Universidad Politécnica de Madrid. Studies and Degrees*. Available online: <https://www.upm.es/internacional/Students/StudiesDegrees>. Accessed on July 20, 2025
- [19] Universidad de Cantabria. *University of Cantabria. Academic offer*. Available online: <https://web.unican.es/en/Studying/academic-offer>. Accessed on July 20, 2025
- [20] Universitat Politècnica de Valencia. *Studies and Degrees*. Available online: <https://www.upv.es/>. Accessed on July 20, 2025
- [21] Universitat Politècnica de Catalunya. *Universitat Politècnica de Catalunya. Barcelona Tech*. Available online: <https://www.upc.edu/en>. Accessed on July 20, 2025
- [22] Universidad de Granada. *Universidad de Granada. Study*. Available online: <https://www.ugr.es/en/study>. Accessed on July 20, 2025.
- [23] Universidade da Coruña. *University of A Coruña, what are you going to study*. Available online: <https://acortar.link/35CBUX>. Accessed on July 20, 2025.
- [24] Universidad de Castilla La Mancha. *UCLM. School of civil Engineering*. Available online: <https://www.uclm.es/ciudad-real/caminos> . Accessed on July 20, 2025.
- [25] Universidad de Burgos. *Universidad de Burgos, English version*. Available online: <https://www.ubu.es/english-version> Accessed on July 20, 2025.
- [26] Universidad Politécnica de Cartagena. *Estudiar en la Universidad Politécnica de Cartagena*. Available online: <https://estudios.upct.es/> Accessed on July 20, 2025.
- [27] Universidad Cádiz. *Escuela Técnica Superior de Ingeniería de Algeciras*. Available online: <https://etsingenieria.uca.es/>. Accessed on July 20, 2025.
- [28] Universidad de Sevilla. *Escuela Técnica Superior de Ingeniería de Sevilla*. Available online: <https://appsetsi.us.es/master/miccp>. Accessed on July 20, 2025.
- [29] Universidad de Oviedo. *Escuela Politécnica Superior de Mieres*. Available online: <https://epm.uniovi.es/inicio>. Accessed on July 20, 2025.
- [30] Universidad de Alicante. *Universidad de Alicante, Escuela Politécnica Superior*. Available online: <https://eps.ua.es/es/>. Accessed on July 20, 2025.
- [31] Universidad de Extremadura. *Universidad de Extremadura, Escuela Politécnica*. Available online: <https://acortar.link/AWk1A4>. Accessed on July 20, 2025.
- [32] Universidad de Las Palmas de Gran Canaria. *Escuela de Ingenierías Industriales y Civiles. Oferta educativa*. Available online: <https://eiic.ulpgc.es/oferta-educativa/>. Accessed on July 23, 2025.

- [33] Universidad Alfonso X el Sabio. *Universidad Alfonso X el Sabio, academic offering*. Available online: <https://www.uax.com/oferta-academica>. Accessed on July 22, 2025.
- [34] Universidad Europea de Madrid. *Private University in Madrid*. Available online: <https://universidadeuropea.com/en/about-ue/madrid/> Accessed on July 22, 2025.
- [35] Universidad Nebrija. *Universidad Nebrija, Escuela Politécnica Superior*. Available online: <https://shre.ink/tok8>. Accessed on July 22, 2025.
- [36] Universidad Nebrija. *Universidad Nebrija, Escuela Politécnica Superior*. Available online: <https://shre.ink/tok8>. Accessed on July 22, 2025.
- [37] Universidad de Salamanca. *Grado en Ingeniería Civil. Mención en Construcciones Civiles (E.P.S. de Zamora)*. Available online: <https://smurl.es/ivDzVy>. Accessed on July 23, 2025.
- [38] Universidad de Jaen. *Grado en Ingeniería Civil (E.P.S. de Linares)*. Available online: <https://smurl.es/ixi8n6>. Accessed on July 23, 2025.
- [39] Universidad de Salamanca. *Grado en Ingeniería Civil. Mención en Hidrología (E.P.S. de Ávila)*. Available online: <https://smurl.es/iwenmU>. Accessed on July 23, 2025.
- [40] Universidad de Córdoba. *Escuela Politécnica Superior de Belmez*. Available online: <https://www.uco.es/politecnica-belmez/es/>. Accessed on July 23, 2025.
- [41] Universidad de La Laguna. *Escuela Politécnica Superior de Ingeniería. Campus Central y Santa Cruz. Titulaciones*. Available online: <https://smurl.es/iyPWbZ>. Accessed on July 23, 2025.
- [42] Universidad de Zaragoza. *Escuela Politécnica - La Almunia. Grado en ingeniería Civil*. Available online: <https://smurl.es/izZIE1>. Accessed on July 23, 2025.
- [43] Universidad del País Vasco. *Escuela de Ingeniería de Guipuzkoa*. Available online: <https://smurl.es/iAAUNN>. Accessed on July 23, 2025.
- [44] Universidade de Santiago de Compostela. *Higher Polytechnic Engineering School*. Available online: <https://smurl.es/iBqOaS>. Accessed on July 23, 2025.