

ACTIVITY REPORT 2022

Index

1 - EXECUTIVE SUMMARY	3
3 – EEUM's NUMBERS.....	5
4 – EDUCATION	7
4.1 – National Competition for Access to Higher Education Results	7
4.2 – 1 st Cycle Courses.....	8
4.3 – 2 nd Cycle Courses.....	11
4.4 – 3 rd Cycle Courses	14
4.5 – Departments' Activities.....	15
4.5.1 – Department of Biological Engineering.....	15
4.5.2 – Department of Civil Engineering.....	18
4.5.3 – Department of Industrial Electronics	21
4.5.4 – Department of Mechanical Engineering.....	24
4.5.6 – Department of Textile Engineering.....	28
4.5.7 – Department of Informatics	32
4.5.8 – Department of Production and Systems	35
4.5.9 – Department of Information Systems	39
5 – RESEARCH.....	43
5.1 – FCT Evaluation.....	43
5.2 – Collaborative Laboratories	43
5.3 – Research Centre Activities	43
5.3.1 – Centre of Textile and Science Technology – 2C2T	43
5.3.2 – ALGORITMI Centre – CALG.....	47
5.3.3 – Centre of Biological Engineering – CEB	51
5.3.4 – Centre for Microelectromechanical Systems – CMEMS.....	55
5.3.5 – Centre for Territory, Environment and Construction– CTAC	59
5.3.6 – High-Assurance Software Laboratory– HASLAB	62
5.3.7 – Institute for Polymers and Composites– IPC.....	65
5.3.8 – Institute for Sustainability and Innovation in Structural Engineering– ISISE.....	69
5.3.9 – Mechanical Engineering and Resource Sustainability Centre– MEtRICS	73
6 – INTERNATIONALISATION	74
6.1 – Student's mobility	74
6.2 – Teaching Staff mobility	74
6.3 – Non-teaching Staff mobility.....	74
6.4 - Community Projects in the field of Education and Mobility.....	74
6.5 - International Partnerships and Protocols.....	77

6.6 – Visits from External Delegations.....	78
7 - INTERACTION WITH SOCIETY	79
7.1 - Initiatives promoted by EEUM.....	79
7.2 - Initiatives promoted by the Rectorate with the collaboration of EEUM	79
7.3 – Image and Communication	80
7.4 – Protocols with national entities	81
8 – HUMAN RESOURCES	82
8.1 – Teaching Staff.....	82
8.2 – Research Staff	82
8.3 – Administrative and Management Technical Staff.....	82

1 - EXECUTIVE SUMMARY

2022 was a year marked by an intense resumption of activities in the School of Engineering, following a slowdown in the Covid-19 pandemic that affected the country and the world in the years 2020 and 2021. This intense activity was noticeable in all the pillars of action of the School of Engineering: in education, in research and in interaction with society.

In terms of Education, in the 2022/2023 academic year, the School of Engineering of the University of Minho (EEUM) was responsible for a total of 86 courses in operation, distributed among 15 Bachelor courses (1st cycle), 14 Integrated Masters (the 1st year of the cycle of studies is not offered in 2022/2023), 37 Masters courses (2nd cycle) and 20 Doctoral/Doctoral Programmes (3rd cycle).

In terms of the number of students per study cycle, this group of courses includes 3333 bachelor students, 1230 Integrated Master's students, 2124 Master's students (2nd cycle) and 1331 PhD students (3rd cycle), for a total of 7818 students.

Comparing the number of students enrolled in 2021/2022 with 2022/2023, there is an increase of 12.89% of the total number of EEUM students, from 6925 to 7818 students.

The figures point to a growing trend that had already been seen in 2019/20, but had reversed in 2020/21 probably due to the pandemic situation, suggesting a clear recovery and a growth in demand for EEUM courses in the different study cycles.

With regard to research 8 EEUM research centres - no data regarding MeTRics - totaled 1057 scientific articles indexed in WoS/Scopus databases (1074 in 2021), and 273 communications at national and international conferences (387 in 2021).

EEUM had 309 research projects underway during 2022 (296 in 2021), with a total budget of 29 M€ (average per year, 36 months projects), including 11 projects under the Erasmus+ Programme (Key Action 2) to which corresponds to a budget of more than 470 k€.

In 2022, 92 PhD theses were completed (65 in 2021). Regarding patents, 27 patent applications were submitted, 11 nationally and 16 internationally, and 8 patents were granted, of which 5 national and 3 international patents.

With regard to internationalisation, the School of Engineering in 2022 saw 14 protocols signed with higher education institutions and entities from various countries. EEUM received the visit of 11 delegations of international institutions, so it is expected new collaborations or strengthening of existing cooperation.

In terms of interaction with society, in 2022 the School of Engineering held 13 sessions with companies within the scope of the *Tomorrow Needs You* agenda, bringing the academic community closer to companies. About 50 companies were present at the Employment Days with 750 job opportunities, numbers that still reflect the consequences of the covid-19 pandemic. As for communication, the growth of followers on social networks, their involvement and the reach of publications is maintained. On the institutional website and on the Engium portal, there is also an increase in the number of visitors and the time spent on these supports. Finally, it is underlined once again that the EngiNews newsletter maintains a click through rate above the average for the Education sector, that is, it has a rate of 9.16% when the average is 2.9%. This metric is commonly used to measure the success of an online advertising campaign for a given website, as well as the effectiveness of email campaigns.

2 – MANAGEMENT BODIES AND OFFICES

Management Bodies:

- School Council
- Scientific Council
- Pedagogical Council
- Management Council

The activity of the management bodies of the School of Engineering in 2022 can be consulted on the institutional website of the School of Engineering, at www.eng.uminho.pt, in the menu School, submenu Institutional Information.

Support services to the Presidency:

- Financial Implementation Support Office
- Informatic Support Office
- Internationalization Office
- Communications Office
- Presidency Secretariat
- School's Secretary
- School's Receptionist

3 – EEUM's NUMBERS

7818 Students Enrolled

1st cycle - 3333 Bachelor students + 1230 Integrated Masters Courses

2nd cycle - 2124 Master's degree students

3rd cycle - 1131 PhD's students

263 PhD Faculty

9 Emeritus Professors

68 Invited Professors

111 Non-Teaching Staff

9 Departments

85 Training Programs (2021/2022)

1st cycle – 15 Bachelor Courses e 14 Integrated Masters Courses

2nd cycle– 36 Masters Degree Courses

3rd cycle - 20 PhD Programs

9 Research Centres

132 Integrated Researchers

8 Centres evaluated as Very Good and Excellent by FCT

92 completed PhD

8 patents granted

309 research projects

29 M€ total funding/year

1057 scientific articles indexed in WoS/Scopus

13 Collaborative Laboratories

INTERNATIONALIZATION

14 Protocols established

11 International visits

171 Mobility Students OUT

66 Mobility Students IN

INTERACTION WITH SOCIETY

35 Protocols established

13 Sessions with Companies

750 Job Opportunities in EEUM's Job Days

22.3K followers on social media

75.8K Institucional Website Unique Visitors

1438 Subscribers of EngiNews (external subscribers)

4 – EDUCATION

4.1 – National Competition for Access to Higher Education Results

An important indicator for the analysis of 1st cycle education at EEUM is the demand for degree courses by students coming from the National Competition for Access to Higher Education (CNAES). At this level, it can be seen (with data always referring to the first phase of access):

- The Degree in Fashion Design and Marketing places 30 students in the 30 places available and increases the grade of the latter to 164.60;
- The Degree in Chemical and Biological Engineering places 42 students in the 42 places available and decreases the grade of the last one to 144.60;
- The Degree in Biomedical Engineering places 65 students in the 65 places available and decreases the score of the last placed student to 172.00;
- The Degree in Civil Engineering places 34 students in the 34 places available and increases the score of the last placed student to 135.00;
- The Degree in Materials Engineering places 27 students in the 27 places available and decreases the grade of the last placed student to 134.00;
- The Degree in Polymer Engineering places 8 students in the 30 available places and increases the grade of the last placed student to 134.40;
- The Degree in Industrial Electronics and Computer Engineering places 67 students in the 88 available places and decreases the grade of the last placed student to 120.80;
- The Degree in Physics Engineering places 35 students in the 35 places available and decreases the grade of the last placed student to 154.80;
- The Degree in Mechanical Engineering places 82 students in the 82 places available and decreases the grade of the last placed student to 161.20;
- The Degree in Textile Engineering places 8 students in the 25 available places and decreases the grade of the last placed student to 117.80;
- The Degree in Industrial Engineering and Management places 68 students in the 68 places available and decreases the grade of the last placed student to 174.20;
- The Degree in Information Systems Engineering and Management places 140 students in the 140 available places and decreases the grade of the last placed student to 120.80;
- The Degree in Computer Engineering places 170 students in the 170 places available and increases the grade of the last placed student to 167.00;
- The Degree in Telecommunications and Computer Engineering places 18 students in the 36 available places and decreases the grade of the last placed student to 118.20.

In general, the 1st cycle education supply maintains the demand, with some variations in the scores, slightly decreasing in most cases the grade of the last placed student, compared to the data of 2021/2022. It is thought that this generalised decrease in marks is a consequence of a worse performance of candidates to

higher education resulting from the learning difficulties due to the pandemic crisis that affected the two previous school years.

In terms of filling vacancies in the 1st stage, in 2022/2023, all the courses filled all the available vacancies in the 1st stage, except for the Degree in Polymer Engineering that left 22 vacancies unfilled; the Degree in Industrial Electronics and Computer Engineering that left 21 vacancies unfilled; the Degree in Textile Engineering that left 17 vacancies unfilled; and the Degree in Telecommunications and Computer Engineering that left 18 vacancies unfilled.

4.2 – 1st Cycle Courses

In the 2022/2023 academic year the School of Engineering offers 15 bachelor's degree courses and 14 integrated master's degree courses (the 1st year of the cycle of studies is not offered in 2022/2023), in which 4563 students are enrolled (3333 bachelor's degree and 1230 integrated master's degree students).

It is important to underline the fact that, in the academic year 2021/2022, all the 14 integrated master's degrees were converted into 14 bachelor's (3 years) and master's (2 years) degrees.

In the 1st cycle, a high demand is confirmed, with the vacancies of the School of Engineering all filled in the majority of its study cycles in the 1st phase of the National Entrance Examination.

After the submission of the proposal for the creation of the Degree in Aerospace Engineering (submitted in October 2021), this new course started in the 2022/2023 academic year, increasing the 1st cycle offer to 15 courses, and it was the course with the highest grade for entry to the University of Minho - 19.98, and with a minimum grade of 18.62, this being the highest minimum grade among the 61 1st cycle courses offered by the UMinho institution.

4.2.1 – Evolution of students enrolled – Bachelor degrees*

1st Cycle	2020	2021	2022
LDMM	101	112	113
LEAE			35
LEBIOM		209	225
LECIV		235	228
LEMAT		56	84
LEPOL		106	78
LETI		118	121
LEGSI		428	495
LEGI		347	275
LEEIC		390	336
LEFIS		154	138
LEINF		812	724
LEMEC		287	277
LEQB		172	129
LETEX		97	75
Total	101	3523	3333

4.2.2 – Evolution of graduate students - Bachelor degrees *

1st Cycle	2020	2021	2022
LDMM	24	28	25
LEAE			
LEBIOM			41
LECIV			47
LEMAT			1
LEPOL			28
METI			9
LEGSI			60
LEGI			138
LEEIC			112
LEFIS			49
LEINF			141
LEMEC			90
LEQB			76
LETEX			36
Total	24	28	853

* Faced with the conversion of Integrated Masters into Bachelor's and Master's study cycles.

4.2.3 – Enrolled Students Total Number – Integrated Masters

Course	2022/2023
Biological Engineering	9
Biomedical Engineering	123
Civil Engineering	31
Materials Engineering	50
Polymer Engineering	36
Telecommunications and Informatics Engineering	74
Engineering and Management of Information System	307
Engineering and Management of Information System (AW)	24
Industrial Management and Engineering	42
Industrial Electronics and Computers Engineering	117
Physics Engineering	22
Informatics Engineering	169
Mechanical Engineering	219
Textile Engineering	7
Total	1230

4.2.4 – Evolution of graduate students – Integrated Masters

Course	2020	2021	2022
Biological Engineering	7	40	34
Biomedical Engineering	27	49	104
Civil Engineering	10	36	28
Telecommunications and Computer Engineering	5	9	13
Industrial Electronics and Computer Engineering	40	34	60
Informatics Engineering	40	78	152
Industrial Engineering and Management	44	73	79
Engineering and Management of Information Systems	43	57	70
Engineering and Management of Information Systems (AW)	6	8	15
Materials Engineering	2	15	20
Polymer Engineering	16	36	35
Mechanical Engineering	27	76	98
Textile Engineering	1	10	34
Total	268	521	742

4.3 – 2nd Cycle Courses

The School of Engineering had 37 Masters courses in operation in the year 2022/2023, with a total of 2124 students enrolled.

In the period under review EEUM submitted 3 proposals for new 2nd cycle courses, in addition to various non-degree specialisation courses:

- Master in Risk Analysis and Management of Civil Infrastructures (submitted in December 2022);
- Master in Earthen Architecture and Construction (submitted in December 2022).

Additionally, 2 EEUM courses were under evaluation:

- Master in Sustainable Management of the Water Cycle: approved to be extinguished in September 2021;
- Master in Micro and Nano Technologies: submitted in December 2021.

With the extinction of the Integrated Masters the School of Engineering had a significant increase in the educational offer at 2nd cycle level that is reflected in the 2022/2023 academic year.

4.3.1 – Total number of students enrolled per course - Master's Degree

Course	2020/21	2021/22	2022/23
Structural Analysis of Monuments and Historical Construction	12	12	21
Bioinformatics	52	74	70
Biotechnology	28	51	60
Sustainable Built Environment	37	25	27
Cities Challenges			6
Fashion Design and Communication	57	61	56
Design and Marketing of Textile Products, Apparel and Accessories	34	40	23
Aerospace Engineering			10
Engineering of Computer Networks and Telematic Services	12	17	13
Systems Engineering	58	63	46
Product Engineering	34	47	54
Structural Engineering	4	0	0
Engineering and Quality Management	50	54	49
Engineering and Operations Management			109
Human Engineering	20	34	15
Industrial Engineering	102	83	11 (2nd year)
Informatics Engineering	112	230	369
Mechatronics Engineering	44	42	26
Urban Engineering	36	26	23
Engineering Project Management	58	70	55
Micro/Nano Technologies	22	19	11

Course	2020/21	2021/22	2022/23
Building Information Modelling - BIM A+	26	14	31
Information Systems	53	68	65
Sustainable Built Environment	11	9	5
Food Science and Technology	76	58	32
Interactive Technologies	10	13	3
Total	954	1110	1190

4.3.2 – Total number of students enrolled per course - Continuing Masters

Course	2021/22	2022/23
Biomedical Engineering	15	79
Civil Engineering	81	92
Materials Engineering		3
Polymer Engineering	17	40
Telecommunications and Computer Engineering	12	16
Textile Engineering	27	55
Engineering and Management of Information Systems	10	82
Industrial Engineering and Management	134	165
Industrial Electronics and Computers Engineering	82	141
Engineering Physics	39	67
Mechanical Engineering	84	121
Chemical and Biological Engineering	61	73
Total	562	934

4.3.3 – Master's Dissertations

Course	Dissertation Admissions			Concluded Dissertations		
	2019/20	2020/21	2021/22	2019/20	2020/21	2021/22
Structural Analysis of Monuments and Historical Construction	10	7	5	9	8	5
Bioinformatics	22	23	24	5	20	24
Biotechnology	20	9	13	4	28	15
Sustainable Built Environment	21	25	8	6	19	16
Fashion Design and Communication	21	26	20	4	20	21
Design and Marketing of Textile Products, Apparel and Accessories	16	14	18	4	18	11
Engineering of Computer Networks and Telematic Services	3	9	6	1	2	5
Systems Engineering	24	21	21	10	18	23
Product Engineering	12	7	21	1	8	6

Course	Dissertation Admissions			Concluded Dissertations		
	2019/20	2020/21	2021/22	2019/20	2020/21	2021/22
Engineering and Quality Management	17	20	22	2	21	18
Human Engineering	7	6	9	2	7	11
Industrial Engineering	48	31	55	14	53	69
Informatics Engineering	33	46	174	6	29	50
Mechatronics Engineering	20	18	18	3	16	14
Urban Engineering	17	18	15	2	19	14
Environmental Management	1	9	3	1	9	8
Engineering Project Management	21	20	18	4	16	12
Micro/Nano Technologies	9	9	6	2	8	10
Building Information Modelling - BIM A+	10	10	13	10	9	17
Information Systems	14	21	16	4	9	7
Sustainable Built Environment	4	7	3	5	4	2
Interactive Technologies		9	1		2	2
Food Science and Technology	12	18	21	7	18	30
Total	362	383	510	106	361	390

4.3.4 – Continuing Master's Dissertations *

Course	Dissertation Admissions	Concluded Dissertations
	2021/22	2021/22
Biomedical Engineering	15	2
Civil Engineering	30	12
Materials Engineering	6	
Polymer Engineering	10	1
Telecommunications and Computer Engineering	8	
Textile Engineering	2	
Engineering and Management of Information Systems	11	
Industrial Engineering and Management	51	22
Industrial Electronics and Computers Engineering	36	
Engineering Physics	10	6
Mechanical Engineering	45	7
Chemical and Biological Engineering	31	20
Total	255	70

* With the transition from Integrated Masters to Undergraduate Degrees, students did not start submitting their dissertation plan until the 2021/2022 academic year.

4.4 – 3rd Cycle Courses

The School of Engineering had 20 Doctoral Programmes/PhD Courses in operation in the year under analysis, with a total of 1131 students enrolled in 22 Doctoral Programmes/PhD Courses (numbers referring to the 2021/2022 academic year as there are still open applications for some courses).

In the Doctoral Programmes (3rd cycle), the vacancies are higher than the demand, with most of the courses not filling all the available places.

An analysis of the enrolled students shows a higher concentration in some of the Doctoral Programmes, such as the Doctoral Programme in Civil Engineering (226), the Doctoral Programme in Electronic and Computer Engineering (123), the Doctoral Program in Chemical and Biological Engineering (114), the Doctoral Programme in Informatics (84) and the Doctoral Program in Industrial and Systems Engineering.

The lower demand may be due to several factors, for example, in the case of foreign students, the difficulty in obtaining visas and funding; in the case of national students, the enrolment in the doctoral programmes is conditioned by the publication of the results of the applications for doctoral grants funded by FCT.

In the 2021/2022 academic year it should be noted that most doctoral programmes in the School of Engineering are now tutorial-based or have a very reduced curricular component, although the impact of these changes is not yet visible in terms of demand for the 3rd cycles.

In 2022 there is an increase in the number of completed PhD theses (92 theses), compared to the previous year (65).

4.4.1 – Total number of students enrolled in 2021/2022

Course	Total Enrolled
	2021/22
Biomedical Engineering	68
Food Science and Technology and Nutrition	40
Civil Engineering	226
Materials Engineering	58
Polymers and Composites Engineering	38
Electronics and Computer Engineering	123
Industrial and Systems Engineering	82
Mechanical Engineering	63
Chemical and Biological Engineering	114
Textile Engineering	25
Solid Waste Management and Treatment	13
Informatics	84
Computer Science (MAP-i)	39
Leaders for Technical Industries	11
Sustainable Built Environment	42
Information Systems and Technology	45
Telecommunications MAP-tel	10

Course	Total Enrolled
	2021/22
Bioengineering	6
Fashion Design	17
Advanced Materials and Processing	1
Advanced Engineering Systems for Industry	17
Direct Digital Manufacturing for Polymer and Tooling Industries	9
Total	1131

4.5 – Departments' Activities

4.5.1 – Department of Biological Engineering

Created in 1993, DEB currently has 6 non-teaching staff and 20 career professors all with doctorates (including two Emeritus Professors). Currently there is a vacancy for an Assistant Professor. DEB promotes daily the access of students to a teaching of international quality, with professors recognized internationally as among the best in their area of research. In this sense, DEB is deeply involved in the Bachelor in Biomedical Engineering, the Bachelor in Chemical and Biological Engineering, and in six Masters (Bioinformatics, Biotechnology, Biomedical Engineering, Chemical and Biological Engineering, Micro/Nanotechnologies, and Food Technology and Science - the latter in partnership with the Faculty of Sciences of the University of Porto).

DEB has partnerships and collaborations with several companies, public institutions and national and foreign higher education entities that allow the exchange and internship of students, providing them with a multicultural and multidisciplinary experience, which highlights the attractiveness of its training offer. DEB also bets on a strong interaction with the exterior participating regularly in forums, fairs, exhibitions and events to promote its courses. DEB's teachers carry out research activities in which they combine fundamental science with engineering sciences to obtain biotechnological products and processes of high added value in the Food, Chemical, Biotechnological and Environmental industries. The natural interaction between research and teaching constitutes an added value for the modernization and updating of the course contents offered at DEB.

Staff

Category	Total
Emeritus professor	2
Full professor	4
Associate professor with Habilitation	6
Associate professor	2
Assistant professor with Habilitation	0
Assistant professor	6
Total	20

Category	Total
Senior technician	1
IT specialist	0
IT technician	0
Technical assistant	3
Operational assistant	2
Total	6

Events

Event	Date	Type
Pequenos Cientistas – 23 alunos da EB 2,3 de Nogueira	27/01/2022	Workshop
A Escola vai ao CEB/DEB - 16 Docentes do programa "We Follow@science" Erasmus/EB 2,3 de Nogueira	11/03/2022	Visit
Cientistas por um dia - 50 alunos Biologia (Escola Secundária Henrique Medina)	29/03/2022	Workshop
Bioinformatics Open Days 2022	3-5/03/2022	Open days
Universidade de Portas Abertas - UPA UMinho - Presencial e digital online em auditório Azurém	07-09/04/2022	Open days
Cientistas por um dia – 30 alunos Química (Escola Secundária Henrique Medina)	26/04/2022	Workshop
“A Escola vai ao CEB/DEB” – 27 alunos e 10 docentes do programa "We eat healthily we live happily" Erasmus/EB 2,3 de Nogueira	10/05/2022	Visit
Pequenos Cientistas – 80 alunos da Casa Menino Deus e da EB2,3 de Nogueira	11-12/05/2022	Workshop
O CEB vai à Escola - Agrupamento de Escolas do Pinheiro, Penafiel	13/05/2022	Conference
Conversas Informais – A Engenharia Química e Biológica e a Engenharia Biomédica uma aposta para o teu futuro – MUSEU NOGUEIRA DA SILVA	23/07/2022	Talks
Verão no Campus 2022	18-22/07/2022	Workshops
Acolhimento aos novos estudantes	16-19/09/2022	Talks
Noite Europeia dos Investigadores	30/09/2022	Demonstrations
A Escola vai ao CEB/DEB –22 alunos do curso Profissional de Controlo da Qualidade Alimentar - ALFACOOOP	07/11/2023	Visit
Semana da Ciência & Tecnologia @ CEB-DEB-UMinho	19-26/11/2022	Open days
Visita de comitiva da Universidade de Debrecen – TecMinho	29-30/11/2022	Visit
Pequenos Cientistas na Escola Básica de Briteiros – 15 alunos	07/12/2022	Workshop

Link to Society Projects

Project	Description
Solfarcos, LTD	Artur Cavaco-Paulo, CSO/CEO Solfarcos, LTD
Aquis, LTD	Artur Cavaco-Paulo, CSO Aquis, LTD
ILSI Europe	Armando Venâncio is Scientific Advisor of the Food Contaminants Task Force (https://ils.eu/scientific-activities/food-safety/process-related-compounds-and-natural-toxins/)

Most relevant 2nd cycle dissertations

Student	Supervisor	Supervisor	Thesis Title	Course	Company Involved
Tiago Moreira Machado	Oscar Dias	Nadine Töpfer	Development and analysis of mathematical models to study metabolic constraints and capacities in different photosynthetic types	Bioinformatics	
Miguel Ângelo Pereira Barros	Miguel Francisco Almeida Pereira da Rocha	Oscar Dias	Development of a deep learning-based computational framework for the classification of protein sequences	Bioinformatics	OmniumAI
José Pedro Silva Freitas	Andreia Filipa Ferreira Salvador		Mining metagenomics datasets for novel plastic-degrading enzymes	Bioinformatics	
Ines Ribau Pereira	Armando Albino Dias Venâncio		Investigating lipid oxidation in mayonnaise & Development of a new plant-based and gluten-free alternative to fish products	Food Science and Technology	Kraft Heinz; Irmãos Monteiro, S.A.
Paulo Jorge Cardoso Pinheiro	Artur Jorge Araújo Magalhães Ribeiro		Implementação da International Featured Standards (IFS) Food numa empresa de Vinho do Porto	Food Science and Technology	Manoel D. Poças Júnior - Vinhos, SA
Ricardo Nave Isaías	António Augusto Martins Oliveira Soares Vicente	Luis Cunha	Caracterização sensorial e reológica de gelados funcionais	Food Science and Technology	Sense Test, Lda
Adriano Miguel Andrade Simões	António Augusto Martins Oliveira Soares Vicente		Application of hydrodynamic cavitation in brewing	Chemical and Biological Engineering	Research Institute of Brewing and Malting, Praga (República Checa)
Diana Isabel Gomes Rodrigues	Lígia Raquel Marona Rodrigues		Characterization of cell factories capable of overproducing phenolic compounds	Chemical and Biological Engineering	SilicoLife Lda

Student	Supervisor	Supervisor	Thesis Title	Course	Company Involved
Matilde Gameiro Vital	José António Couto Teixeira		Development of Cleanroom Suitable Coatings	Chemical and Biological Engineering	CIN - Corporação Industrial do Norte, S.A..
Elsa Afonso	Fernanda Gomes		Endocardite infecciosa associada a <i>Candida tropicalis</i>	Biomedical Engineering	
Eduardo José Vasconcelos Silva	Nuno Rodrigues	Mariana Henriques	Artificial Intelligence Predictive Models for Healthcare demand	Biomedical Engineering	IPCA
Renata Daniela Ferreira da Silva	Lígia Raquel Marona Rodrigues		Validation of a novel delivery system towards breast cancer therapy	Biomedical Engineering	
Cristiana Filipa Leite Oliveira	Cláudia Manuela Cunha Ferreira Botelho	Juan Luis Paris	Personalised Hyaluronic Acid Hydrogel for Dermocosmetics	Biotechnology	Mesosystems
Alexandra Peixoto Ferreira	Ana Cristina Pinheiro		Design of sustainable nano-based delivery systems and evaluation of their behaviour during in vitro digestion	Biotechnology	
Marta Teresa da Silva Gomes	Hugo Alexandre Mendes de Oliveira	Alexandra Gabriel Fraga	Isolation of novel immunogenic protein carriers for vaccine development	Biotechnology	

4.5.2 – Department of Civil Engineering

Civil Engineering is the branch of Engineering that encompasses the design, construction and maintenance of all structures and infrastructures necessary for the well-being and development of society and the preservation of the built and natural environment. Since 1980, the Department of Civil Engineering integrates the School of Engineering of the University of Minho. Its mission is the development of Civil Engineering according to three vectors: graduate and postgraduate teaching, research and development activities, and partnerships with industry and society. The Master in Civil Engineering is the main teaching project and aims to train technicians with appropriate skills for their integration in a job market in permanent change and able to contribute to the wealth of companies in the sector and the country. Its recognition has led to the creation of a scholarship and school merit program supported by companies interested in student success.

Also noteworthy in the training offer are the Masters in Sustainable Construction and Rehabilitation, the Masters in Urban Engineering, Master in Structural Engineering and the three International Masters: Building Information Modelling, Structural Analysis and Design using Composite Materials and Structural Analysis of Historic Monuments and Constructions. The latter is recognised by the European Commission with the "Erasmus Mundus" seal of excellence. The Department also collaborates in the Master in Engineering Project Management. The research and development activities are framed in the Centre for Territory, Environment and Construction and in the Institute for Sustainability and Innovation in Engineering Structures.

Staff

Category	Total
Emeritus professor	2
Full professor	5
Associate professor with Habilitation	7
Associate professor	7
Assistant professor with Habilitation	1
Assistant professor	21
TOTAL	43

Category	Total
Senior technician	5
IT specialist	0
IT technician	1
Technical assistant	4
Operational assistant	0
Technical Coordinator	1
TOTAL	11

Events

Event	Date	Type
Congresso Construção 2022	07/12/2022	Congress
International Society for Intelligent Construction 2022 Conference (ISIC 2022)	09/09/2022	Conference
4º Congresso Português em Building Information Modelling PTBIM	04/05/2022	Conference
Conferência nacional “Construção Sustentável”	9/23/2022	Conference
2º Congresso Internacional sobre Sustentabilidade Urbana e Economia Circular, Vitória, Brasil	14/12/2022	Congress

Link to Society Projects

Project	Description
Preliminary study of feasibility of a new water catchment on the river Ave	Identification of factors and constraints to be considered in the analysis and assessment of alternatives for the implementation of a new water abstraction for human consumption in the municipality of Santo Tirso.
Sustainability report of the new Oporto's bridge	Life cycle analysis of the new bridge D. António Francisco dos Santos (to be built in Porto) and accesses.
Sustainability consultancy to the Comporta Project	Members of the sustainability team that supported decision making towards the improvement of the environmental, social and economy performance of the two new Vanguard's project for Comporta (Terras da Comporta and Dunas)

Project	Description
SAGOA	To create a "Management System of Works of Art", "Carrying out of Inspections" and "Analysis within the Management System" to guarantee the functionality and safety of a park of works of art in the municipality of Viana do Castelo and to know its current state in order to carry out efficient maintenance.
Upgrading Braga's Public Fountains	Cooperation Agreement between Braga City Council, Bracara Augusta Foundation, Braga Parish Councils and the University of Minho regarding the Survey, Characterization, Classification and Dynamization of the "Lavadouros and Irrigation Tanks and Public Fountains

Most relevant 2nd cycle dissertations

Student	Supervisor	Supervisor	Thesis Title	Course	Company Involved
Ana Kontic	Graça Vasconcelos		Influence of air-entrainers on the properties of hydrated lime mortars	Structural Analysis of Monuments and Historical Constructions	
Rita Nogueira Granjo dos Santos	Bruno Figueiredo	Hélder Sousa	From BIM to Asset Management – data-driven guidelines for Operations & Maintenance	BIM A+7: Dissertation	LIMSEN Consulting BIM & VDC Services
Mauricio Morales Yglesias	José Granja	José Carlos Lino	BIM Analytics for QTO and Planning Management during the Construction Phase	BIM A+7: Dissertation	BIMMS
Artur Kuzminykh	Miguel Azenha	José Granja	Integrated Planning and Recording Circularity of Construction Materials through Digital Modelling	BIM A+7: Dissertation	
Francisco Pinto Abreu Mendes Peixoto	Dinis Leitão	Vitor Cunha	Desenvolvimento de soluções para aplicação em pavimentos industriais com recurso à incorporação de fibras recicladas	Civil Engineering	
Clara Sofia Antunes da Silva Vieira	Paulo Ramísio		Resiliência de Infraestruturas de Drenagem Rodoviárias face às Alterações Climáticas: Análise dos Fatores Condicionantes na Estimacão de Caudais de Cheia	Civil Engineering	ASCENDI
João Gil Faria Silva Dias	José Matos	Elisabete Teixeira	Aplicação de modelos BIM e SIG para a análise da degradação e gestão de infraestruturas portuárias	Civil Engineering	
André Vieira Malheiro	Isabel Valente		Estudo da ligação aço-betão para vigas mistas com perfis metálicos enformados a frio	Civil Engineering Integrated Masters	
António Goulão Novais	Rui Ramos		Mobilidade urbana sustentável e o desafio da gestão inteligente, o caso de estudo de Vila Nova de Famalicão	Civil Engineering Integrated Masters	

Student	Supervisor	Supervisor	Thesis Title	Course	Company Involved
Rui Filipe Mendes Vilela Oliveira	Lígia Silva		Medidas de Redução de Ruído em Meio Urbano. O caso da Rotunda de Silvares em Guimarães	Civil Engineering Integrated Masters	
Cláudia de Castro Jacinto	Ricardo Mateus	Sandra Silva	Desenvolvimento de um método para avaliação da qualidade do ambiente interior de edifícios de escritórios em Portugal	Sustainable Built Environment	
Ingried de Aguiar	José Barroso de Aguiar	Sandra Cunha	Desenvolvimento de placas de cimento com incorporação de materiais de mudança de fase (PCM) para revestimento interior	Sustainable Built Environment	
Luana Coeli Santos Castelo Branco	João Pedro Couto		Desenvolvimento de uma ferramenta baseada em BIM para apoiar a Avaliação de Riscos em projetos de construção	Sustainable Built Environment	
Maryam Salati	Luís Bragança	Ricardo Mateus	Adaptação de indicadores de sustentabilidade urbana ao contexto de aplicação de Portugal nas pequenas cidades	Sustainable Built Environment	
Saeed Saadi Kamalabadi	Manuela Lima		Influence of Land Use and Land Cover on Direct Runoff in Albufeira, Portugal	Sustainable Built Environment	
Grigório Ribeiro Soares Neto	Jorge Pais		Aplicação de fibras no reforço de misturas betuminosas	Urban Engineering	
Danilo Cunha de Oliveira	Manuela Lima		Avaliação da disponibilidade e uso de água para reutilização na região norte de Portugal	Urban Engineering	
Águeda Filipa Soares Veloso	Júlia Lourenço	Rui Ramos	Do urbanismo pós-moderno ao pós-contemporâneo, a sustentabilidade no processo de planeamento	Urban Engineering	
Alexandra Peixoto Ferreira	Ana Cristina Pinheiro		Design of sustainable nano-based delivery systems and evaluation of their behaviour during in vitro digestion	Biotechnology	
Marta Teresa da Silva Gomes	Hugo Alexandre Mendes de Oliveira	Alexandra Gabriel Fraga	Isolation of novel immunogenic protein carriers for vaccine development	Biotechnology	

4.5.3 – Department of Industrial Electronics

Created in 1989, the Department of Industrial Electronics (DEI) is a department of the School of Engineering located in the two campuses of the University of Minho (Azurém campus in Guimarães and Gualtar campus in Braga). The DEI is composed of an experienced and highly qualified teaching staff, consisting of 28 PhD Professors who develop activities in close collaboration with the scientific community and the business fabric. The main objective of DEI is to offer high quality teaching and research projects in its four Disciplinary Areas: - Electronic Instrumentation and Microsystems; - Control, Automation and Robotics; - Industrial Informatics and Embedded Systems; - Power and Energy Electronics.

DEI participates in teaching projects of the School of Engineering of the University of Minho that contemplate training in several areas, always with a high practical and laboratorial component, having as fundamental objective to train highly qualified Engineers capable of an autonomous work of development and innovation. The participation of DEI in the training of Engineers contributes to the creation and use of new technologies, which improve competitiveness and sustainability in vast areas such as Industrial and Service Robotics, Factory Automation, Electrical Installations, Energy Efficiency, Electrical Machinery, Renewable Energy, Electrical Mobility, Consumer Electronics, Microtechnologies and Microelectronics, Dedicated Microprocessors and Compilers, Software and Multimedia Industry, Information Systems Security, Mobile Cell Networks, Wireless Sensor Networks, Optical Communications Systems and Automotive Electronics.

Staff

Category	Total
Emeritus professor	1
Full professor	4
Associate professor with Habilitation	3
Associate professor	6
Assistant professor with Habilitation	1
Assistant professor	13
TOTAL	28

Category	Total
Senior technician	0
IT specialist	1
IT technician	1
Technical assistant	3
Operational assistant	0
Technical Coordinator	1
TOTAL	6

Events

Event	Date	Type
EUROPEAN ROBOCUP 2022	01-04/06/2022	Competition
Roboparty	07-09/04/2022	Competition
Jornadas de Engenharia Eletrónica 2022	21-24/02/2022	Days
EAI SESC 2022 – 4th EAI International Conference on Sustainable Energy for Smart Cities	16-18/11/2022	Conference

Link to Society Projects

Project	Description
Adaptation of toys for children with cerebral palsy	Children with special needs have difficulty using traditional toys. The few adapted toys that exist are extremely expensive. Thus, since 2006, the Laboratory of Automation and Robotics at the University of Minho in Guimarães, adapts electronic toys (during the Christmas season), so that they can be used by children with cerebral palsy.
Study visit by CIOR – PROFESSIONAL SCHOOL Teaching Cooperative of Vila Nova de Famalicão, C.R.L.	On October 19, 2022, throughout the morning, the Department of Industrial Electronics received a visit from a group of 17 people – 14 Romanian students + 2 teachers and some representatives and students from the CIOR School – ESCOLA PROFESSIONAL Teaching Cooperative of Vila Nova de Famalicão, C.R.L. The visit took place at the DEI facilities on the Azurém Campus, where the various employees share knowledge and presentations by the various research and teaching laboratories.
Study visit by Barcelinhos School	60 ERASMUS students on 24 February 2022 and on 8 March 2022, visit the Department of Industrial Electronics (DEI), on the Azurém Campus, where the various employees share knowledge and presentations by the various research and teaching laboratories.
Study visit by Anadia School	40 ERASMUS students on 5 March 2022 visit the Department of Industrial Electronics (DEI), on the Azurém Campus, where the various employees share knowledge and presentations by the various research and teaching laboratories.

Most relevant 2nd cycle dissertations

Student	Supervisor	Supervisor	Thesis Title	Course	Company Involved
João Marcelo Mendes Borges	Jorge Cabral		Robust Software Services for IoT Embedded Systems	Integrated Master Industrial Electronics and Computers Engineering	
Nuno José Gomes Rodrigues	João Luiz Afonso	Vitor Monteiro	Development of a Single-Phase Modular Multilevel Converter for Electrical Power Systems	Integrated Master Industrial Electronics and Computers Engineering	
Sérgio Cristiano Neiva Alves Baixo	Fernando Ribeiro	Agostinho Gil Teixeira Lopes	3D Facial Recognition using Deep Learning	Integrated Master Industrial Electronics and Computers Engineering	
Francisco António Andrade Barreira	Graça Minas	João Piteira	High Voltage Switch Design in Standard CMOS Technology for a MEMS Inclinometer	Master in Micro/Nano Technologies	INL - International Iberian Nanotechnology Laboratory
Luís Pedro Bouças Araújo	José Manuel Cabral	Marcos Martins	Communication System for Underwater Environments	Integrated Master Telecommunications and Informatics Engineering	

Student	Supervisor	Supervisor	Thesis Title	Course	Company Involved
Carlos Jorge Teixeira Machado	José Augusto Afonso	José Manuel Cabral	Monitoring of patients biomedical signals based on Internet of Things technologies	Integrated Master Telecommunications and Informatics Engineering	
David José Ressurreição Alves	Sérgio Lopes	José Manuel Cabral	Development of an application to create online stores	Integrated Master Telecommunications and Informatics Engineering	
Diogo Francisco Veiga Baptista	Paulo Mateus Mendes	João Pedro Alpuim	Performance of Radiofrequency Circuits Based on 2D Technology	Integrated Master Engineering Physics	INL - International Iberian Nanotechnology Laboratory
Filipa Carvalho Mota	Alexandre Ferreira Silva	Filipe Serra Alves	Piezoresistive thin film by metal-induced crystallization	Integrated Master Engineering Physics	INL - International Iberian Nanotechnology Laboratory
Bárbara Malainho Pereira	Jaime Fonseca	Sandro Queirós	Automatic Interpretation of Point-of-Care Lung Ultrasound	Integrated Master Biomedical Engineering	
Beatriz Maria Redondo Miranda	Cristina Santos	Sara Moccia	A new approach to study gait impairments in Parkinson's disease based on mixed reality	Integrated Master Biomedical Engineering	
Rita Clarisse da Silva Barbosa	Paulo Mateus Mendes	João Pedro Alpuim	Simulation and design of a photoacoustic nanotechnology-based ultrasound probe for biomedical applications EN	Integrated Master Biomedical Engineering	

4.5.4 – Department of Mechanical Engineering

The Mechanical Engineering Department is a structural sub-unit of the School of Engineering of the University of Minho. Its mission is the development of the main areas of Mechanical Engineering through three vectors: graduate and post-graduate teaching, research and development, partnerships with industry. Its main teaching project is the Integrated Master in Mechanical Engineering which represents approximately 60% of the teaching activity of DEM. It also participates in other relevant projects such as the Integrated Masters in Biomedical Engineering and Materials Engineering.

All these projects are structured according to the Bologna Protocol. The DEM is associated with 3 subject areas: Thermofluidics and Energy Technologies; Design, Automation and Mechanical Technology; Metallurgy and Materials Mechanics. The research activities are framed in the METRICS and CMEMS research centres. The Department collaborates actively with the CVR - Centre for the Valorisation of Waste (the President of the Board of Directors is a professor at DEM - Prof. Cândida Vilarinho) and with TecMinho, hosting and directing the Chemical Analysis Laboratory of the latter institution.

Staff

Category	Total
Emeritus professor	0
Full professor	4
Associate professor with Habilitation	2
Associate professor	5
Assistant professor with Habilitation	1
Assistant professor	17
TOTAL	29

Category	Total
Senior technician	3
IT specialist	0
IT technician	0
Technical assistant	4
Operational assistant	0
Technical Coordinator	
TOTAL	7

Events

Event	Date	Type
SAM 3rd Meeting	21/10/2022	Talks
Race Party 2022	27/05/2022	Competition
VibroDia	14/01/2022	Conference

Most relevant 2nd cycle dissertations

Student	Supervisor	Supervisor	Thesis Title	Course	Company Involved
Bárbara Caldas da Costa	Luis Alves		Specification-based Procedure to Determine the Volume/Weight and Distribution of rubber in the Manufacturing of an Agro Tire	Integrated Master in Mechanical Engineering	Continental
Carlos Alberto Peixoto Borges	Caetano Monteiro	Estela Bicho	Inspection of Deformable Objects via Robotic Manipulation: a Learning from Demonstration Approach	Integrated Master in Mechanical Engineering	
António João Camões Alves	Nuno Peixinho		Study, modelling, and dynamic analysis of construction solutions for doors and windows of buildings	Integrated Master in Mechanical Engineering	
Alberto Gomes Costa	Hélder Puga		Aplicação de vibração ultrassónica no tratamento de metal líquido para fabrico de fundidos em liga de alumínio.	Master in Mechanical Engineering	

Student	Supervisor	Supervisor	Thesis Title	Course	Company Involved
Marco Sanchez Magalhães	Luis Alves		Utilização de ferramentas CAE no projeto do fabrico de um estampado profundo metálico: estudo de caso.	Master in Mechanical Engineering	ETMA
João Rafael Fernandes	Eurico Seabra	José Machado	Study and Optimization of Materials and Structures of Solenoids in Electro Valves	Master in Mechanical Engineering	

4.5.5 – Department of Polymer Engineering

The Polymer Engineering Department (DEP) was founded in 1978 to support the national plastics industry through a specific degree and the creation of a body of experts in polymer engineering. Since then, training actions at various levels have been developed, research on various topics of Polymer Science and Engineering through the Research Centres to which its teachers belong (IPC - Instituto de Polímeros e Compósitos) and cooperation with national and foreign companies. This intense activity has allowed the implementation of well-equipped laboratories dedicated to the characterisation of materials at various scales, processing, measurement of properties, digital manufacturing and numerical modelling.

The global quality and relevance of the activity are recognized nationally and internationally. Currently, the teaching staff is composed of 16 members, all with PhD degrees and belonging to the discipline area Science and Engineering of Polymers and Composites. The activity is supported by 6 administrative/technical staff.

Staff

Category	Total
Emeritus professor	1
Full professor	1
Associate professor with Habilitation	2
Associate professor	4
Assistant professor with Habilitation	2
Assistant professor	6
TOTAL	16

Category	Total
Senior technician	2
IT specialist	0
IT technician	0
Technical assistant	4
Operational assistant	0
TOTAL	6

Events

Event	Date	Type
Jornadas de Engenharia de Polimeros	21-22/04/2022	Days
Dia Aberto do DEP 2022	5 and 22/04/2022	Days

Link to Society Projects

Project	Description
Ciência Viva Clubs with Middle/High Schools	The Department of Polymer Engineering has agreements with almost 20 Middle/High Schools from the North of Portugal to promote joint activities related to Polymer Science and Engineering, and to support their students interested in these areas of knowledge.
F1 in Schools	The F1 in Schools Project is a multidisciplinary international competition in which students compete with each other and the other teams in constructing a miniature Formula 1 car, according to specific regulations, taking into account the success factors of a base company. technology (technologies, additive manufacturing, communication, management, marketing and entrepreneurship). Gives students the chance to experience the latest developments in digital manufacturing technology, and inspires them to use new technologies for learning physics, aerodynamics, design, construction, brand development, graphics, sponsorship, marketing, teamwork/leadership, communication skills and financial strategy, applying them in a practical, imaginative, competitive and exciting way. This project is undertaken in cooperation with the Escola Secundária Camilo Castelo Branco (V.N. Famalicão).

Most relevant 2nd cycle dissertations

Student	Supervisor	Supervisor	Thesis Title	Course	Company Involved
Mariana Raquel Oliveira Ferreira	Paulo Cardoso	António Pontes	Desenvolvimento de um capacete multifuncional para bombeiros	Master in Product Engineering	
João Frederico do Vale de Almeida Martins	Raul Sousa	Demétrio Matos	Countermeasures to Motion Sickness in Automobile Context	Master in Product Engineering	
Daniela Alexandra da Silva Faria	Gustavo Dias		Aplicação de materiais naturais na tecnologia de infusão a vácuo de materiais compósitos para o desenvolvimento de interiores de aeronáutica	Master in Product Engineering	PIEP

Student	Supervisor	Supervisor	Thesis Title	Course	Company Involved
Ana Rita Gomes Dias	Zlatan Zlatev	Nadya Dencheva	Síntese e Caracterização de Pós de Poliamida Adequados para Sinterização Seletiva a Laser	Integrated Master in Materials Engineering	
Gonçalo Filipe Frederico Meneses Moreira	Bernardo Almeida	Rosa Batista	Nanofibras funcionalizadas com perovskites orgânicas e inclusões magnéticas	Integrated Master in Materials Engineering	
Carlos Rafael Peixoto Monteiro	Mário Pereira	José Basto da Silva	Filmes finos ferroelétricos relaxadores para o armazenamento de energia	Integrated Master in Materials Engineering	
João da Costa Teixeira e Castro	João Miguel Nobrega		Computational Modelling of the Selective Laser Sintering Process	Integrated Master in Polymer Engineering	
Hélder Filipe de Oliveira Ferreira Rodrigues	Carla Martins	Manuel Castro	Substituição de terminais sobreinjetados em Zamak em cabos metálicos por material polimérico em componentes para automóveis	Integrated Master in Polymer Engineering	FICOSA
Joana Sofia Abreu Lopes	Carla Martins		Desenvolvimento de produtos espumados por moldação rotacional	Integrated Master in Polymer Engineering	
Beatriz Simões Pereira Gomes	Júlio Viana	João Silva (INEGI)	Desenvolvimento de metodologias produtivas e implementação de novos materiais na produção de componente automóvel com recurso a soluções multimaterial	Integrated Master in Polymer Engineering	INEGI

4.5.6 – Department of Textile Engineering

The Textile Engineering Department (DET) was founded in 1976 with the aim of meeting the needs of the textile sector by training textile engineers capable of dealing with the specificities of the Portuguese textile industry. Up to 2021, the main engineering course offered by DET was the Integrated Master in Textile Engineering. As of the school year 2021/2022, DET offers a degree in Textile Engineering and a Master course in Textile Engineering with two distinct branches.

The courses are tightly connected and include teaching methods based on integrated projects, inspiring students to undertake the development of innovative textile products, using the information provided to them in technological disciplines, with a high scientific basis, to meet the increasingly demanding needs of the sector.

The students leave the courses able to assume responsibility in production, management and quality control, but also to follow and implement the latest developments in the various areas of the textile sector. Another course offered by DET, the degree in Fashion Design and Fashion, enables students to design products in the fashion business. The knowledge of textile technology they acquire allows them to design industrially feasible products. DET is also responsible for the Master courses in Design of Fashion Communication and Design and Marketing of Textile Products, Clothing and Accessories. The department also participates in the Master courses of Micro and Nanotechnologies, Product Engineering, Engineering and Quality Management, Human Engineering, and the degrees in the Industrial Management and Engineering, Product Design, Visual Arts and Chemistry.

Staff

Category	Total
Emeritus professor	0
Full professor	1
Associate professor with Habilitation	0
Associate professor	3
Assistant professor with Habilitation	0
Assistant professor	13
TOTAL	17

Category	Total
Senior technician	3
IT specialist	0
IT technician	0
Technical assistant	3
Operational assistant	0
TOTAL	6

Events

Event	Date	Type
5º Congresso Internacional de Moda e Design - CIMODE 2020+2	04-07/07/2022	Congress
Jornadas DMM 2022	17-19/05/2022	Conference
7ª edição do Umoda	03/06/2022	Presentation

Link to Society Projects

Project	Description
2a edição do Moda (IN)sustentável	Discussing fashion and sustainability and involving Market vendors and employees was the goal of the event and the Square - Braga Municipal Market was the stage for this initiative, promoted by Passeio - Urban Art and Culture Platform (CECS - Center for Communication and Society Studies), in collaboration with the masters in Fashion Communication Design and in Communication, Art and Culture, from the University of Minho, with the aim of publicizing sustainable brands and practices in articulation with the Market's philosophy: small products, selected products.
To-Be-Green e projeto de reciclagem de máscaras contra a Covid-19	In just a year and a half, CTT and To-Be-Green recycled tens of thousands of masks used by the company's employees, contributing to the reduction of waste, with a strong positive impact on the environment. The mask recycling and recovery project coordinated by To-Be-Green, to give a second life to discarded masks usually sent to landfill, was initially implemented in CTT's Production and Logistics Centres in Cabo Ruivo and Maia and in the Logistics and Distribution Centre in Taveiro, and then extended to the Company's headquarters in Lisbon and also to two Express operations centres, MARL and Perafita.
Contextile 2022 - Bienal de Arte Têxtil Contemporânea	Exhibition "Emergências - Ensino Artístico e Criação Têxtil", inserted in Contextile 2022 - Biennial of Contemporary Textile Art 03 Sep to 30 Oct 2022 Guimarães. With the participation of the works from the students of the Master in Design and Marketing of Textile Products, Clothing and Accessories, in the scope of the discipline Design Project II. With the theme reimagining a more sustainable future and based on the concern with the textile discards from the agro-food sector that populate our daily lives, in particular the textile packaging of horticultural products, the students explored various textile techniques within an approach that ranges from artistic creation activity to sustainable surface design based on creative methodologies allied with upcycling.
Mostra trabalhos VESTIR UM CONTO "A Princesa e a Ervilha"	The Interdisciplinary Project in Design I aims, based on the text "The Princess and the Pea" by Hans Christian Andersen and its articulation with a surrounding space of the city of Guimarães, to construct wearable objects of performative nature, which allow them to function as a whole or in particular as individual identity. The intention is not only to create a multidisciplinary work, but also the construction of a collective consciousness of identity and culture in the construction of wearable pieces, exploring the relationship of body/movement, its proportions and interactions. This is the starting point for a creative training, open to the signs of the times (school year 2021/2022)

Project	Description
Mostra trabalhos "Do Lixo ao Luxo" - Edifício Artes Visuais - Campus de Couros	<p>The participation of the Degree in Visual Arts and the Master in Design and Product Marketing in the cross season Guimarães/Clermont Ferrand (Festival Internacional des Textiles Extraordinaires), reflects the work of a semester in the discipline of Technology II and project in Design II.</p> <p>Starting from the concern with the textile discards from the agro-food sector that populate our daily life, in particular the textile packaging of horticultural products, the students explored several textile techniques within an approach that goes from the artistic creation activity to the sustainable surface design based on creative methodologies allied to upcycling.</p> <p>New concepts of dressing, of reading the world and of questioning which bodies move in this network of production, use and reuse of materials and materials are projected.</p> <p>From this research and focus of attention comes a manifesto that aims to reimagine a more sustainable future. A future in which "wearing a textile becomes a political movement of contestation of the productive structure and of the damage to the environment" or just observing the presence of multiple bodies, which cover, cover up, discover and extend themselves, messengers that allow us to rethink exaggerated consumption.</p> <p>This manifesto is illustrated by several fashion coordinates created by integrating upcycling not only of the aforementioned agro-food textile discards, but also of post-consumption clothing discards. As in different performative acts, some bodies denounce themselves as the manifesto itself, as home-bodies, which provoke us to see the body as a possible dwelling-place, an integral part of this future, whatever it may be: "Imagine! From rubbish to luxury".</p>

Most relevant 2nd cycle dissertations

Student	Supervisor	Supervisor	Thesis Title	Course	Company Involved
Isabel João Marques Gomes	Helder Carvalho	Inês Pereira - ISCAP- Politécnico do Porto	Os antecedentes da lealdade à marca no e-commerce	Master in Fashion Design and Communication	
Vivian Yurie Ono	António Marques	Paulo Jorge Salgado - DCC -ICS- UMinho	Os Reflexos do Marketing Experiencial no Consumo Consciente	Master in Fashion Design and Communication	
Catarina Filipa Moura Carvalho	Maria José Abreu		Análise dos Impactos das Ferramentas Tecnológicas, como Inteligência Artificial, Realidade Aumentada e Realidade Virtual, no Setor da Moda/ Têxtil Nacional	Master in Fashion Design and Communication	
Mariana Gonçalves da Silva	Maria José Abreu		Máscara Inteligente com biossensor colorimétrico para ARS-CoV-2 e humidade	Integrated Master in Textile Engineering	Clothius - Tecelagem, LDA

Student	Supervisor	Supervisor	Thesis Title	Course	Company Involved
Ângela Marcela Soares Marques	André Catarino		Design and characterization of weft knitted structures with sustainable raw materials for sportswear	Integrated Master in Textile Engineering	Trimalhas
Fátima Micaela Machado Gomes	Graça Soares		Desenvolvimento de processos de coloração sustentáveis baseados na aplicação de corantes de origem natural	Integrated Master in Textile Engineering	Acatel
Junior de Jesus Costa	Ana Cristina Broega		Materiais Sustentáveis para a Indústria da Moda através do processo de Downcycling	Master in Design and Marketing of Textile Products, Apparel and Accessories	
Marina Hammes de Carvalho	André Catarino		Estudo e desenvolvimento de roupa infantil com dispositivo de salvamento para ambiente aquático	Master in Design and Marketing of Textile Products, Apparel and Accessories	
Beatriz Martins Macedo	Miguel Carvalho		Avaliação do Potencial de Desenvolvimento de Coleções de Moda em Recurso à Tecnologia CAD 3d – Estudo de Caso Clo 3d	Master in Design and Marketing of Textile Products, Apparel and Accessories	

4.5.7 – Department of Informatics

The mission of the Department of Informatics of the University of Minho (DIUM) is the dissemination of knowledge (foundations, methods and applications) in the areas of Computer Science and Software Engineering, with a particular emphasis on Computer Programming, Verification and Security, Intelligent Systems, Distributed and Reliable Systems, High-Performance Computing, Software Engineering, Logic and Formal Methods, and Communications and Computer Networks. It promotes a rigorous approach to computer problem solving based on the adoption of formal models and systematic methods of analysis and development. It fulfills its mission by teaching undergraduate, graduate and postgraduate courses – at master and doctorate levels– and carrying out research and development projects in articulation with different research centers, namely the Center Algoritmi and INESCT TEC.

The Department has a permanent staff of 44 lecturers (all with PhD), 4 administrative collaborators, 3 technical staff and more than four dozen invited lecturers and teaching assistants to reinforce the various lecturing teams. The excellence of the different academic degrees offered by DIUM is witnessed by their ever-increasing attractivity nationwide, as well as by exceptional and continuous demand of DIUM

graduates by national and foreign employers. DIUM degrees are backed by an internationally recognised research record carried on in the reserach structures mentioned above, and several partenrships with external institutions from the International Iberian Nanotechnology Laboratory (INL) to the United Nations University (UNU-EGOV). This makes DIUM a huge training and research ecosystem involving academic staff, researchers, several doctoral students and post-doc fellows. The department is managed by a director and a deputy director, supported by a team of directors of studies and representatives in course directorates, and in close articulation with the students' associations.

Staff

Category	Total
Emeritus professor	2
Full professor	5
Associate professor with Habilitation	9
Associate professor	4
Assistant professor with Habilitation	1
Assistant professor	25
Invited Professor equated to Assistant Professor	18
Invited Assistant	33
TOTAL	97

Category	Total
Senior technician	2
IT specialist	2
IT technician	1
Technical assistant	2
Operational assistant	0
TOTAL	7

Events

Event	Date	Type
SEI – Semana da Engenharia Informática	15-20/02/2022	Days
JOIN (JOrnadas de Informática)	28-30/06/2022	Days

Link to Society Projects

Project	Description
CLAV: Classification and Evaluation of Documentation in Portuguese Public Administration	Computer consulting services for the "M51 Platform - CLAV - Digital Archive: Modular platform for the classification and evaluation of public information"; Contractor: Direção-Geral do Livro, dos Arquivos e das Bibliotecas

Most relevant 2nd cycle dissertations

Student	Supervisor	Supervisor	Thesis Title	Course	Company Involved
Tiago Rafael Ferreira Miranda da Silva	Miguel Pereira Rocha	Vitor Sá Pereira	Development of a recommendation system for scientific literature based on deep learning	Bioinformatics	
Miguel Ângelo Pereira Barros	Miguel Pereira Rocha	Óscar Manuel Dias	Development of a deep learning-based computational framework for the classification of protein sequences	Bioinformatics	
José Pedro Silva Freitas	Miguel Pereira Rocha	Andreia Filipa Salvador	Mining metagenomics datasets for novel plastic - degrading enzymes	Bioinformatics	
Daniel Filipe da Rocha Teixeira	Bruno Alexandre Dias	Ana Aguiar	Opportunistic Wi-Fi network selection in heterogeneous vehicular wireless networks for detecting VRUs through edge computing	Engineering of Computer Networks and Telematic Services	
João Pedro Vasconcelos Cadevez	Pedro Sousa		Desenho e Implementação de Processos de Automação de laas em Ambientes Cloud	Engineering of Computer Networks and Telematic Services	
Rosana Mafalda Vieira Moniz	José Afonso	Helena Lopez	Implantação e Avaliação da Plataforma Open Source MANO (OSM)	Engineering of Computer Networks and Telematic Services	
Diogo Francisco Veiga Baptista	Paulo Mendes	João Alpuim	Performance of Radiofrequency Circuits Based on 2D Technology	Engineering Physics	INL
Filipa Carvalho Mota	Alexandre Silva	Filipe Alves	Piezoresistive thin film by metal-induced crystallization	Engineering Physics	
Rafael Alexandre Antunes Vilarinho	Martim Lopez	Mário Rui Cunha	Natural growth of light harvesting nanostructures from microalgae for bioinspired energy solutions	Engineering Physics	
José Nuno Martins da Costa	Vitor Alves	João Luis Vilaça	Modular framework for a breast biopsy smart navigation system	Informatics Engineering	2Ai-lab IPCA

4.5.8 – Department of Production and Systems

The Production and Systems Department (DPS) is an organic subunit of the School of Engineering of the University of Minho, having its origin in the Production and Systems area created in 1976. DPS has a highly qualified and committed PhD teaching staff that assure the quality of the teaching/learning process. The Production and Systems Area was pioneer in the teaching of Industrial Engineering and Management in Portugal, known at the time as Production Engineering, in courses that had as main objective to train Engineers able to deal with the problems of optimization and rationalization of resources in small and medium size industry. The Department is currently responsible for a first degree in Industrial Engineering and Management followed by a second degree course in the same area. Furthermore, DPS holds four second degree teaching projects, integrates the board of another second cycle teaching project and holds a PhD program in Industrial and Systems Engineering.

At present, the DPS' mission is to generate, disseminate and apply scientific and technological knowledge in the fields of Systems Engineering and Industrial Processes and Management and Technology, thus contributing to the achievement of the mission of the School and the University of Minho. The main objective of the courses taught is to train staff, not only with technical and scientific skills in the area of Industrial Engineering and Management (production organization, production planning and control, quality, logistics, costs, optimization, information systems, hygiene and safety, project management, computer-assisted manufacturing, etc.), but also with transversal skills (team work, leadership, conflict management, communication, etc.), capable of guaranteeing a competitive performance for the productive systems of the companies where they are inserted.

Staff

Category	Total
Emeritus professor	1
Full professor	5
Associate professor with Habilitation	3
Associate professor	10
Assistant Professor with Habilitation	0
Assistant professor	25
TOTAL	44

Category	Total
Senior technician	1
IT specialist	1
IT technician	0
Technical assistant	4
Operational assistant	0
Technical Coordinator	1
TOTAL	7

Events

Event	Date	Type
Workshop Gestão de Projetos	28/01/2022	Workshop
Dia do DPS 2022	30/03/2022	Day
ICQEM 2022	14-15/07/2022	Conference
DPSISE 2022 - Doctoral Program in Industrial and Systems Engineering	31/05/2022	Workshop
COMPETIND 4.0 2022	03/06/2022	Workshop
International Conference on Quality Engineering and Management 2022 (ICQEM22)	13-15/07/2022	Conference

Link to Society Projects

Project	Description
Empresa à Vista	The aim of this event is for students to be exposed to the opportunities offered by the companies that will be present and, in a certain way, to prepare their near future, whether in the context of the dissertation that they will develop or a Summer Internship that they will do whether in the context of another type of collaboration that can be established with the companies present. This event is one more result of the joint work between the Course Management and NEEGIUM.
Verão no Campus 2022	Several activities aimed at high school students to present the department's educational offer, including the activity ONE STEP FORWARD TO SUSTAINABILITY
Portuguese Project Management Observatory (Observatório Português de Gestão de Projetos)	The Portuguese Project Management Observatory (PPMO) is an initiative of the Portuguese Association of Project Management (APOGEP) and is being developed by a team from the University of Minho. PPMO's mission is to promote project management development and scientific knowledge, contributing to the improvement of project management best practices of professionals and organizations.
Seminário "Desmistificando o significado e importância da inovação social"	By bringing together public policy managers, academic researchers and professionals in the field, the seminar represented an opportunity to foster dialogue, exchange opinions, deepen knowledge, find synergies and learn from the experience of social innovators, helping to demystify what social innovation is.
Aprender Ciência Hoje	The goal of this event is to disseminate in high schools the innovation in teaching and learning that UM is introducing. With the presentation of new methodologies and technologies, it is intended to attract students

Most relevant 2nd cycle dissertations

Student	Supervisor	Supervisor	Thesis Title	Course	Company Involved
Ana Lúcia Gadelha de Moura Lima	Nélson da Costa		Ergonomics applied to the development of insoles for protective footwear	Master in Human Engineering	UMinho
Elisa Regina de Lemos Salta Pinto da Silva	Paula Carneiro		Case study of ergonomic conditions of a process in automotive industry	Master in Human Engineering	ZF Vila Nova
Vânia Filipa Fernandes da Silva	Francisco Coelho e Silva	Nelson Costa	Relationship between exposure to potentially toxic elements, including heavy metals, and the most frequent tasks of welders in the Metalworking Industry	Master in Human Engineering	UMinho
Arthur Hartmann Benzaquen Costa	Paulo Sampaio		Organizational and operational efficiency: a case of application	Master in Engineering and Quality Management	UMinho
Ana Francisca Martins	Eusébio Nunes		Identification and evaluation of losses in milk processing	Master in Engineering and Quality Management	Lactogal
Pedro Miguel do Vale Ruivo	Paulo Sampaio		Design and Implementation of a Digital System of Statistical Process Control in an Optical Industry	Master in Engineering and Quality Management	Leica
Ana Cláudia Ribeiro Gonçalves	Ana Maria Rocha	José Telhada	Implementation of a digital management platform in the logistics transversal area in an energy and mobility company	Master in Systems Engineering	Efacec
Fábio Alexandre Bértolo dos Santos	Ana Maria Rocha	Manuel Figueiredo	Machine Learning Algorithms for demand forecasting	Master in Systems Engineering	UMinho
Gonçalo Oliveira da Silva	Ana Maria Rocha		Traffic lights optimization of an intersection through the application of metaheuristics	Master in Systems Engineering	UMinho
João David de Azevedo Alves	José Telhada		Application of Robotic Process Automation technology in pharmaceutical logistics processes	Master in Systems Engineering	Rangel Logistics Solutions

Student	Supervisor	Supervisor	Thesis Title	Course	Company Involved
Fábio Soares Ribeiro	Maria Sameiro Carvalho -	José Oliveira	Space optimization and process improvement in the warehouse of a company that manufactures industrial electric motors	Master in Industrial Engineering and Management	WEGeuro - Indústria Elétrica, S.A.
Márcia Filipa Rocha Galvão	Paulo Sampaio		Growth Strategy For A Technology Start-up	Master in Industrial Engineering and Management	Veniam
Maria Leonor Luzirão Castro Figueira	Senhorinha Teixeira		Study of the accuracy of thermal comfort using the ASHRAE database	Master in Industrial Engineering and Management	
Inês Rafaela Martins Freitas	Anabela Carvalho Alves	João Paulo Gomes	Improving the performance of production planning and control in a cutlery company by applying Lean Thinking principles	Integrated Master in Industrial Engineering and Management	Cutelarias Cristema
Alexandre Daniel da Silva e Cunha	Lino Costa	André Carvalho	Application of Lean Six Sigma in an Automotive Mobility Services Data Analysis Project	Integrated Master in Industrial Engineering and Management	Bosch Car Multimedia Portugal, S.A.
José Paulo Amaral Lemos	Maria Sameiro Carvalho		Improvement and modelling of demand planning and forecasting processes in a paint manufacturer, under a S&OP context.	Integrated Master in Industrial Engineering and Management	Tintas CIN

4.5.9 – Department of Information Systems

The Department of Information Systems offer degree programs and training focused on information systems and technologies. Such programs address competencies for a wide range of professional functions that embrace the three pillars of engineering and management of information systems: information technologies, the information processed by those technologies; and the human and social endeavors and situations that encompass the processing of information.

The emerging complexity of the relevant phenomena and professional activities justify the use of systems thinking and systemic approaches. These approaches, combine with other problem-solving strategies like design thinking, are used for the analysis, understanding and redefinition of human activity situations and for the analysis, design and construction of computer-based artifacts.

The recognition of the quality of the programs offered by the department is evidenced by the large number of their students and by the abundant and continued demand from domestic and foreign employers for their graduates.

The department seeks to contribute to the advancement of the professional practices in engineering and management of information systems through the development of solutions for information systems and technologies problems and challenges, and through the development of approaches, methods, techniques, and tools for addressing those problems and challenges.

Staff

Category	Total
Emeritus professor	0
Full professor	4
Associate professor with Habilitation	6
Associate professor	1
Assistant professor with Habilitation	2
Assistant professor	16
TOTAL	29

Category	Total
Senior technician	1
IT specialist	0
IT technician	1
Technical assistant	3
Operational assistant	0
TOTAL	5

Events

Event	Date	Type
TSI2Market 2022	05-07/04/2022	Days
ICPEC'22-International Computer Programming Education Conference, Barcelos, Portugal	03-04/06/2022	Conference
IKIT 2022-International WorkShop on Information and Knowledge in Internet of Things, Malaga, Spain	04-07/07/2022	Workshops
FiCloud 2022-9th International Conference on Future Internet of Things and Cloud, Rome, Italy	22-24/08/2022	Workshops
AI4IS@EPIA'22-Artificial Intelligence for Industry and Societies, Lisbon, Portugal	31/08/2022-02/09/2022	Thematic Track
AIM@EPIA'22-Artificial Intelligence in Medicine, Lisbon, Portugal	31/08/2022-02/09/2022	Thematic Track

Link to Society Projects

Project	Description
Publication of the book "Sistemas de Informação: Diagnósticos e Prospetivas"	The Portuguese Association for Information Systems (APSI), based at the University of Minho, has launched the book "Information Systems - Diagnosis and Perspectives", with 50 authors summarizing 30 years of teaching and research in this area in Portugal and pointing paths. The work, which may become a reference, is coordinated by professors Isabel Ramos and Rui Dinis Sousa, of the School of Engineering of UMinho (EEUM), and Rui Quaresma, of the University of Evora.
Publication of the book "Sistemas de Informação para Gestores em tempo de Transformação Digital"	Digital transformation is associated with marked metamorphoses in modern society, imposing transfigurations and imperative needs for change in all types of organizations. At the corporate level, management and managers will have to lead and overcome the urgent and uncontrollable challenges posed by the adaptation of information management processes and the transformation of the systems for which they are responsible.
Publication of the book "CYBERSECURITY A Practical Engineering Approach"	introduces the implementation of a secure cyber architecture, beginning with the identification of security risks. It then builds solutions to mitigate risks by considering the technological justification of the solutions as well as their efficiency. The process follows an engineering process model. Each module builds on a subset of the risks, discussing the knowledge necessary to approach a solution, followed by the security control architecture design and the implementation.
Publication of the book "Data Science and Knowledge Discovery"	This book shows a set of emerging topics in Data Science and Knowledge Discovery. This book also presents works using different datasets like Covid-19, e-commerce, text, driving or spatial. This book is essential for anyone (students, professors, researchers, decision-makers) who want to know more about this area, see new findings, and see how to use data science to support the decision process. It can be helpful to open new windows of knowledge or research opportunities in an even more significant area.

Project	Description
Filipe Portela and Ricardo Queirós. Next-Generation Applications and Implementations of Gamification Systems. Premier Reference Source. 281 Pages. ISBN: 179-988-089-3. IGI. (2022). DOI:10.4018/978-1-7998-8089-9	Next-Generation Applications and Implementations of Gamification Systems synthesizes all the trends, best practices, methodologies, languages, and tools that are used to implement gamification. It also discusses how to put gamification in action by linking academic and informatics researchers with professionals who use gamification in their daily work to disseminate and exchange the knowledge, information, and technology provided by the international communities in the area of gamification throughout the 21st century.

Most relevant 2nd cycle dissertations

Student	Supervisor	Supervisor	Thesis Title	Course	Company Involved
Fernando Henrique Duarte Araújo	João Varajão		Information Systems Development with Low-Code	Integrated Master in Engineering and Management of Information System	
Francisca Amélia de Fernandes Barros	Carlos Portela	Manuel Santos	Analytical Dashboards for the Smart Cities Industry	Integrated Master in Engineering and Management of Information System	
Hugo Daniel Silva Carvalho	Paulo Cortez		An Intelligent Decision Support System for the Freight Transport Sector	Integrated Master in Engineering and Management of Information System	
Ana Xavier Silva Gomes Fernandes	Maribel Santos	Ana León Palacio	Hermes – A platform to extract, transform and integrate genomic data	Integrated Master in Engineering and Management of Information System	
Daniel Ireneu Silva Oliveira	Miguel Brito		Inventory Management Architecture for Aluminum and Returnable Profiles	Integrated Master in Engineering and Management of Information System – after-work	
Pedro Miguel Ribeiro da Costa	José Soares		Evaluation of Big Data Information Technology Applications Success	Integrated Master in Engineering and Management of Information System – after-work	
José Carlos Gomes Ribeiro	José Pereira		Design and implementation of a product allocation system	Integrated Master in Engineering and Management of Information System – after-work	

Student	Supervisor	Supervisor	Thesis Title	Course	Company Involved
Inês Catarina Barreira Lopes	Ana Baptista		Map4Scrutiny – A Linked Open Data Solution For Politicians Interest Registers	Master in Information Systems	
Francisco de Brito Coelho da Silva	José Soares		Sino-European Regulatory Frameworks of Information Security in the Exploitation of Information Systems	Master in Information Systems	
Ivo Xavier Silva Vides Fernandes	José Pereira		The Usability and the User Experience of mobile apps: a case study	Mestrado em Sistemas de Informação	
Marcelo António Araújo Alves Pires	Luís Magalhães		Transmission of the touch feeling in a virtual environment: A Case Study	Mestrado em Tecnologias Interativas	
Marcela Silva Kardec	Lia Oliveira		Interactive Emerging Technologies and the Teaching and Learning Process	Mestrado em Tecnologias Interativas	

5 – RESEARCH

5.1 – FCT Evaluation

From the nine School of Engineering's research centres, eight were evaluated with Very Good and Excellent by the Foundation for Science and Technology (FCT)

Excellent – CEB | CMEMS | Excellent

Very Good – 2C2T | ALGORITMI | HasLab | IPC

Good – CTAC

5.2 – Collaborative Laboratories

Through its research centres the School of Engineering of the University of Minho collaborates with 13 collaborative laboratories.

Collaborative Laboratories
BuiltColab
ECOLab
Probiorefinery
CoLab4Food
DTx –Digital Transformation Colab
Vortex
ProChild
Vines&Wines
CoLab for Data Drive Innovation Services
Laboratório Associado para Produção Avançada e Sistemas Inteligentes (ARISE)
Laboratório Associado em Tecnologia Bio/Química/Micro-Nano/Eletromecânica (ALL4TECH)
LABBELS
Laboratório Associado de Sistemas Inteligentes (LASI)

5.3 – Research Centre Activities

5.3.1 – Centre of Textile and Science Technology – 2C2T

The Centre for Textile Science and Technology (2C2T) is a Research Unit established in 1978, working in the area of Fibrous Materials Engineering and Design.

The vision and mission of 2C2T is to be recognized for excellent research in this area, helping society to tackle the biggest and most pressing problems and providing the knowledge base for the continuing viability of the textile value chain for global competition. To accomplish this the Unit defined three strategic goals:

1) Scientific and technological leadership in the field together with a robust interaction research innovation, that will ensure continuing advances and will foster the development of novel materials and technologies, helping the industry to become more competitive, sustainable and improve human condition.

2) Excellent education with a strong research base through the incorporation of innovative attitudes and approaches to provide human resources with the competences needed to address current and future industrial and societal challenges.

3) Strong involvement with industrial partners exploring new opportunities addressed in the National and European strategies to strengthen the national economy and ensure that research outcomes are translated into benefits to society.

Three crosscutting research themes were identified key to generate knowledge and promote innovation to maintain European industrial leadership and economic growth: Nano and Multifunctional Materials, Sustainable and Advanced Processes and Technologies, and Design and Product Engineering.

The research activity is organized in the Fibrous Materials Engineering group and the Fibre based Product Design group.

In the 2019 evaluation carried out by the National Science Foundation (FCT), 2C2T was awarded with the grade of Very Good.

Staff

	Internal	External	Total
PhD full members	27	0	27
PhD associated members	Total 0		
Technical staff	Total 4		

Publications

Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated (@ SCOPUS)	Total
Indexed journals (Scimago quartil)	42	21	11	12	3	89
Indexed proceedings	0					

Books

Type	International	National	Total
Authoring			
Edition			
Book of proceedings	1		1
Outreach book			
Educacional book			
Non-indexed (@SCOPUS) book chapters			

Other publications

Non-indexed journals	9
Non-indexed proceedings	5

PhD

Year	Number of students	Number of doctorates	Number of Pos-Doc
2022	45	3	2

Theses and dissertations	Number
PhD theses completed	3

Achievements

Major achievements	Identification		
Flagship publications	In Situ Synthesis of Copper Nanoparticles on Dielectric Barrier Discharge Plasma-Treated Polyester Fabrics at Different Reaction pHs	Antibacterial and hemostatic capacities of cellulose nanocrystalline-reinforced poly(vinyl alcohol) electrospun mats doped with Tiger 17 and pexiganan peptides for prospective wound healing applications	Development of Multi-Scale Carbon Nanofiber and Nanotube-Based Cementitious Composites for Reliable Sensing of Tensile Stresses
	Behnaz Mehravani, Ana Isabel Ribeiro, Uros Cvelbar, Jorge Padrão, and Andrea Zille, ACS Applied Polymer Materials, 2022, 4 (5), 3908-3918, DOI: 10.1021/acsapm.2c00375	Marta A. Teixeira, Joana C. Antunes, Catarina L. Seabra, Aureliano Fertuzinhos, Shafagh D. Tohidi, Salette Reis, M. Teresa P. Amorim, Diana P. Ferreira, Helena P. Felgueiras, Biomaterials Advances, 2022, 137, DOI: 10.1016/j.bioadv.2022.212830	Parveen, S.; Vilela, B.; Lagido, O.; Rana, S.; Fanguero, R., Nanomaterials, 2022, 12, 1:74, DOI: 10.3390/nano12010074

Major achievements	Identification		
Flagship projects	BE@T – Bioeconomia para Têxtil e Vestuário para Reforço da Bioeconomia Nacional	MEDCOR Antimicrobial and halocromic fiber-based wound dressings using novel pyrimidine-derived molecules	GreenAuto - Airbag - GreenAuto - WP5: I&D e industrialização de novos módulos de airbag
	Projeto pelo desenvolvimento de uma bioeconomia sustentável, procurando a mudança de paradigma para o setor e a criação de produtos de alto valor acrescentado a partir de recursos biológicos, em alternativa às matérias de origem fóssil.	Produzir uma nova geração de pensos inteligentes à base de fibras, incorporando uma nova classe de moléculas derivadas da pirimidina, biocompatíveis e com propriedades halocrómicas e antimicrobianas.	GreenAuto visa transformar a indústria automóvel, no contexto da transição atual para veículos de baixas emissões através o desenvolvimento de tecnologias produtivas, componentes e sistemas inovadores para veículos elétricos.

Scientific recognition	EEUM Diploma of Recognition of Merit for Scientific Publication	World's Top 2% Scientists 2022
	Raúl Manuel Esteves Sousa Fanguero, Andrea Zille and Helena Prado Felgueiras	Andrea Zille and Raul Fanguero are in the list of World's Top 2% Scientists 2022 according to a study of Stanford University and Elsevier.
Scientific leadership	Fibrenamics - Institute of Innovation in Fiber-based Materials and Composites	
	Presidency of Fibrenamics - Institute of Innovation in Fiber-based Materials and Composites	

5.3.2 – ALGORITMI Centre – CALG

The ALGORITMI Research Centre is a Research Unit of the School of Engineering, UMinho, that develops R&D activity in Information and Communications Technology and Electronics (ICT&E), spreading into six major fields: (1) Computer Science and Technology (CST); (2) Information Systems and Technology (IST); (3) Computer Communications and Pervasive Media (CCPM); (4) Industrial Electronics (IE); (5) Industrial Engineering and Management (IEM); (6) Systems Engineering and Operational Research (SEOR). This centre is a multi-disciplinary Research Unit, with a heterogeneous international activity, maintaining active exchange programs with universities and research centres all around the world.

The majority of PhD-level researchers of the Centre are also Faculty members of four departments of the School of Engineering, namely: Industrial Electronics (DEI), Information Systems (DSI), Industrial Engineering & Management (DPS) and Informatics (DI). Furthermore, the MSc and PhD projects supervised by those Faculty members are developed at ALGORITMI. ALGORITMI Research Centre focuses its activity on projects that explore a strong link with the community, namely, the industry and the public administration.

In the 2019 evaluation carried out by the National Science Foundation (FCT), ALGORITMI was awarded the grade of Very Good.

Highlights of achievements:

- Aggregation and organization of human and material resources with the necessary quality and dimension to respond to the specific objectives of national scientific and technological policy.
- Response to public policies and scientific challenges, with innovative, technological, economic, social, environmental and wellbeing-related integrated solutions;
- Response to challenges of industry and organizations combining advanced manufacturing processes, smart technologies.
- Promotion of scientific careers for doctorate holders.
- International boost of science and technology activities

Staff

	Internal	External	Total
PhD full members	99	5	104
PhD associated members	Total		
	135		
Technical staff	Total		
	3		

Publications

Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated (@ SCOPUS)	Total
Indexed journals (Scimago quartil)	102	70	14	5	22	213
Indexed proceedings	250					

Books

Type	International	National	Total
Authoring	17		17
Edition	39		39
Book of proceedings	161		
Outreach book			
Educacional book			
Non-indexed (@SCOPUS) book chapters	4		4

PhD

Year	Number of students	Number of doctorates	Number of Pos-Doc
2022	63	139	3

Theses and dissertations	Number
PhD theses completed	32

Distinctions and dissemination

Scientific dissemination and Knowledge transfer			
National patents	Submitted	Granted	Total
	1	2	3
International patents	Submitted	Granted	Total
	3	1	4

Participation in collaborative laboratories
DTx - Digital Transformation Colab
ProChild
CoLab for Data Drive Innovation Services
CCG - Centro de Computação Gráfica

Achievements

Major achievements	Identification		
Flagship publications	Co-benefits between energy efficiency and demand-response on renewable-based energy systems	An IoT platform for production monitoring in the aerospace manufacturing industry	Hardware-Accelerated Data Decoding and Reconstruction for Automotive LiDAR Sensors
	Dranka, G.; Ferreira, P.; Vaz, I.. Renewable and Sustainable Energy Reviews 169 (2022) (https://doi.org/10.1016/j.rser.2022.112936)	Rodrigues, D.; Carvalho, P.; Lima, S.; Lima, E.; Lopes, N.. Journal of Cleaner Production 368 (2022) (https://doi.org/10.1016/j.jclepro.2022.133264)	Gomes, T.; Roriz, R.; Cunha, L.; Ganal, A.; Soares, N.; Araújo, T.; Monteiro, J.. Appl. Sci. 2022, 12, 13003. (https://doi.org/10.3390/app122413003)
Flagship projects	Be.Neutral	PT SMART RETAIL: Portugal como referência para a nova geração de retalho autónomo e inteligente	(Link4S)ustainability - New generation connectivity system for creation and integration of networks of objects with social networks for new sustainability
	A Agenda BE. Neutral pretende acelerar o desenvolvimento e industrialização de uma nova geração de produtos e serviços de mobilidade carbono zero a partir de Portugal [autocarros carbono zero; veículo leve BEN4Us; Microcarro 6E; veículo de 2 rodas modular], conectados com plataformas de dados e conectividade e sistemas de energia. IR: Ricardo J. Machado, Plano de Recuperação e Resiliência, IAPMEI, 4.974.538,92 €	Visa o desenvolvimento, demonstração e industrialização de tecnologias de suporte a uma nova geração de retalho, com a adoção de soluções de desmaterialização de processos aplicadas ao setor que permitam conferir uma experiência seamless e de ultra comodidade aos seus utilizadores, com relevante eficiência económica e ambiental e um potencial de internacionalização assinalável. IR: Nelson Costa, PRR, IAPMEI, 1.523.454,70 €	O consórcio (Link4S)ustainability, liderado pela NOS em co-promoção com a Wedo, Exatronic, REN, Portgás, Wyze, EVA, CEiiA, DTx-CoLab, INL e UMinho, visa colaborar na geração de novos conhecimentos científicos para projetar, desenvolver, construir e testar uma nova geração de edge connectivity devices e plataformas associadas (comunicação e software), visando a integração de redes de objetos no contexto dos ecossistemas de mobilidade e energia. IR: Jorge Cabral, Portugal2020, ANI, 920.044,62 €

Major achievements	Identification		
Scientific recognition	<p align="center">Sociedade Ibero-Americana de Inteligência Artificial (IBERAMIA)</p>	<p align="center">World's Top 2% Scientists 2022</p>	<p align="center">EEUM Diploma of Recognition of Merit for Scientific Publication</p>
	<p>Paulo Novais was awarded the "Career Recognition Award" by the IBERAMIA, for his scientific contributions to artificial intelligence and to the development of the community in this area.</p>	<p>Anabela Carvalho Alves, João Luís Afonso, Joaquín Torres-Sospedra, Paulo Cortez, Pedro Arezes, Sérgio Pereira e Vítor Monteiro are among the 2% most influential scientists in the world, according to a study by Stanford University (USA) and Elsevier.</p>	<p>Paulo Jorge Freitas Oliveira Novais, Pedro Miguel Ferreira Martins Arezes, João Eduardo Quintela Alves Sousa Varajão, Paulo Alexandre Ribeiro Cortez, Paula Fernanda Varandas Ferreira, Senhorinha Fátima Capela Fortunas Teixeira, Rui Manuel Sá Pereira Lima, Paulo Alexandre Costa Araújo Sampaio, Maria Sameiro Faria Brandão Soares Carvalho, João Luis Afonso, Vítor Duarte Fernandes Monteiro, José Manuel Ferreira Machado, Maria Leonilde Rocha Varela and Estela Guerreiro Silva Bicho Erlhagen</p>
Scientific leadership	<p>MIT Portugal</p>	<p>DTx - Digital Transformation CoLab</p>	<p>Association for Information Systems (AIS)</p>
	<p>Pedro Arezes is the director of MIT Portugal Program</p>	<p>Ricardo J. Machado is Founder & President of the Executive Management Board</p>	<p>Isabel M. P. Ramos is Vice-President of Member Services and Chapters</p>

5.3.3 – Centre of Biological Engineering – CEB

CEB was created 27 years ago at the University of Minho, being recognized as a National reference research unit on Biotechnology and Bioengineering, qualifying as Excellent in the latest research unit evaluation carried out by FCT.

CEB combines key expertise in fundamental science with engineering sciences, covering the molecular, cellular and process scales, to obtain value-added products or processes in the Food, Chemical, Biotech, and Environmental sectors. CEB develops its research activities in 4 Research Thematic Lines:

Industrial Biotechnology & Bioengineering – key area holding the potential to revolutionize the way chemicals and energy are currently produced by employing microorganisms as biocatalysts and industrial by-products and wastes as secondary raw materials.

Food Biotechnology & Bioengineering – aiming to enhance the functionality, quality, safety and nutritional value of food.

Environmental Biotechnology & Bioengineering - focused on remediation processes for contaminated environments and to valorize recalcitrant and bio-waste materials by converting them into liquid and gaseous bioenergy carriers, bioelectricity, bulk chemicals or new catalysts.

Health Biotechnology & Bioengineering - comprises biofilm science, virulence of pathogenic fungi, bioactive peptides/proteins, biomaterials and polymers for drug delivery and regenerative medicine and systems and synthetic biology approaches.

Staff

	Internal	External	Total
PhD full members	92	6	98
PhD associated members	Total		
	32		
Technical staff	Total		
	24		

Publications

Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated (@ SCOPUS)	Total
Indexed journals (Scimago quartil)	191	96	18	2	26	333
Indexed proceedings						

Books

Type	International	National	Total
Authoring			5
Edition	1		
Book of proceedings	4		
Outreach book			
Educacional book			
Non-indexed (@SCOPUS) book chapters			

PhD

Year	Number of students	Number of doctorates	Number of Pos-Doc
2022	134	130	64

Theses and dissertations	Number
PhD theses completed	17

Distinctions and dissemination

Scientific dissemination and Knowledge transfer			
National patents	Submitted	Granted	Total
	4	1	5
International patents	Submitted	Granted	Total
	3	1	4

Participation in collaborative laboratories
ECOLab
Probiorefinery
Vines&Wines
Participation in collaborative laboratories
CoLab4Food
ALL4TECH
LABELS - ASSOCIATE LAB

Achievements

Major achievements	Identification			
Flagship publications	<p>merlin, an improved framework for the reconstruction of high-quality genome-scale metabolic models</p>	<p><i>Phaeodactylum tricornutum</i> extracts as structuring agents for food applications: Physicochemical and functional properties</p>	<p>Negative impacts of cleaning agent DEPTAL MCL® on activated sludge wastewater treatment system</p>	<p>Anti-EFG1 2'-OMethylRNA oligomer inhibits <i>Candida albicans</i> filamentation and attenuates the candidiasis in <i>Galleria mellonella</i></p>
	<p>João Capela, Davide Lagoa, Ruben Rodrigues, Emanuel Cunha, Fernando Cruz, Ana Barbosa, José Bastos, Diogo Lima, Eugénio C Ferreira, Miguel Rocha, Oscar Dias (2022) <i>Nucleic Acids Research</i>, 50(11), 6052-6066</p>	<p>Catarina Castro-Ferreira, Joana S. Gomes-Dias, Pedro Ferreira-Santos, Ricardo N. Pereira, António A. Vicente, Cristina M.R. Rocha (2022) <i>Food Hydrocolloids</i>, 124, Part A (107276)</p>	<p>Jorge Padrão, Vânia Ferreira, Daniela P. Mesquita, Susana Cortez, Nicolina Dias, M. Salomé Duarte, Gonzalo Tortella, Isabel Fernandes, Manuel Mota, Ana Nicolau, (2022) <i>Science of the Total Environment</i>, 838, Part 1(155957)</p>	<p>Daniela Araújo, Dalila Mil-Homens, Mariana Henriques, Sónia Silva, (2022) <i>Molecular Therapy-Nucleic Acids</i>, 27, 517-523</p>

Major achievements	Identification			
Flagship projects	<p>EssenTial - Establishing sustainable bioproduction of lactones from metabolic engineering of industrial cell factory systems: Ashbya gossypii</p>	<p>CBDHighBio - Strategies to modulate the bioavailability of cannabinoids in edible products: in vitro tests, cytotoxicity, and pre-clinical assessment to generate reliable data for regulatory agencies</p>	<p>CM4Methane - Unravelling the role of conductive materials in the acceleration of methane production from waste in anaerobic digestion processes</p>	<p>ARtiST - Understanding antibiotic resistance in coagulase-negative staphylococci: a transcriptomics approach</p>
	<p>This project aims to manipulate the A. gossypii biological pathways that lead to the production of lactones, with the ultimate goal to produce lactones from renewable material sources.</p>	<p>This project aims to provide reliable data about the cannabinoids metabolism after oral ingestion to help regulatory agencies to regulate the market of CE and standardize the consumption indications for these products.</p>	<p>This project aims to investigate the application of tailored conductive materials as a strategy to increase the efficiency of Anaerobic Digestion, coupling wastewater treatment with CH4 production.</p>	<p>This project aims exploring the complex and poorly understood transcriptional regulatory network behind Staphylococcal species resistance to clinically relevant antibiotics.</p>
Scientific recognition	<p>Two researchers among the world's most influential scientists</p>		<p>EEUM Scientific Publication Merit Award</p>	<p>World's Top 2% Scientists 2022</p>
	<p>In the list Highly Cited Researchers 2022, of the North American consultancy Clarivate Analytics, appear for the 5th consecutive year in the areas of agricultural sciences António Vicente and José Teixeira.</p>		<p>Lucília Maria Alves Ribeiro Domingues receives the 2022 EEUM Scientific Publication Merit Award</p>	<p>António Vicente, Artur Cavaco-Paulo, Eduardo Gudiña, Joana Azeredo, José António Teixeira, Lígia Rodrigues, Lucília Domingues, Madalena Alves, Mariana Henriques, Miguel Gama, Nuno Cerca, Rosário Oliveira, Russell Paterson and Sónia Silva are in the list of World's Top 2% Scientists 2022 according to a study of Stanford University and Elsevier.</p>

Major achievements	Identification	
Scientific leadership	<p align="center">pan-European Microbial Resource Research Infrastructure - MIRRI</p>	<p align="center">Leadership of the Foundation for Science and Technology</p>
	<p align="center">CEB hosts the headquarters of the pan-European Microbial Resource Research Infrastructure - MIRRI</p>	<p align="center">Previous CEB director, Madalena Alves, was appointed president of the Foundation for Science and Technology.</p>

5.3.4 – Centre for Microelectromechanical Systems – CMEMS

CMEMS was established in December 2013 and supports a research team with high degree of multidisciplinary members, from different backgrounds (engineering, physics, medical) and from academic and industrial fields. CMEMS members include senior researchers, national and internationally distinguished collaborators, post-doctoral investigators, PhD and Master students, as well industrial partners. The focus is on modelling computation, development and micro/nano fabrication of devices and components for two major domains: industrial applications (automotive, aerospace, energy, textile) and biomedical applications (neuroengineering, microendoscopy, surgery, rehabilitation).

CMEMS mission includes the integration of research teams with national and regional key players for new technological developments, being aware that excellence can only be achieved through international cooperation. In this way, CMEMS supports research at international level with European, American, Asia, Australia, and Brazilian Universities in the field of micro/nano fabrication and biomedical applications, leading to a significant number of published works that are produced with international investigators (approximately 40%), as well as with industrial partners.

The vision of the CMEMS can be stated as being that of an interdisciplinary and multidisciplinary Centre of excellence pioneering high international impact research and innovation in the development of smart microsystems and biomedical systems and maintain active exchange programs with universities, research centres and other laboratories around the world in the field of micro-nano fabrication and biomedical applications.

From 2019, the last evaluation process carried out by the National Science Foundation (FCT), CMEMS was awarded with the grade of Excellent. From 2021, CMEMS became a foundational member of the Associate Laboratory LABBELS, together with CEB.

Staff

	Internal	External	Total
PhD full members	39		39
PhD associated members	Total		
	13		
Technical staff	Total		
	2		

Publications

Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated (@ SCOPUS)	Total
Indexed journals (Scimago quartil)	62	58	15	4	19	158
Indexed proceedings	31					

Books

Type	International	National	Total
Authoring	1		1
Edition			
Book of proceedings			
Outreach book			
Educacional book			
Non-indexed (@SCOPUS) book chapters			

PhD

Year	Number of students	Number of doctorates	Number of Pos-Doc
2022	74	52	1

Theses and dissertations	Number
PhD theses completed	9

Distinctions and dissemination

Scientific dissemination and Knowledge transfer			
National patents	Submitted	Granted	Total
	6	2	8
International patents	Submitted	Granted	Total
	5	1	6

Participation in collaborative laboratories
DTx - Digital Transformation Colab
LABELS - ASSOCIATE LAB

Achievements

Major achievements	Identification		
Flagship publications	Smart Wireless-Powering-Enabling IoT in Inhomogeneous Environments: A Case Study on Biomedical Applications	Biodegradable polymer-based microfluidic membranes for sustainable point-of-care devices	NiTi laser textured implants with improved in vivo osseointegration: An experimental study in rats
	Dinis H., Colmiais I., Mendes P.M., IEEE Internet of Things Journal, Volume 9, Issue 22, November 2022	Brito-Pereira R., Ribeiro C., Lanceros-Méndez S., Fernandes Cardoso V., Chemical engineering, Journal, Volume 44815 November 2022	Costa M.M., Miranda A., Bartolomeu F., Carvalho O, Matos S., Miranda G., Journal of Materials Science and Technology, Volume 114, Pages 120 - 1301 July 2022

Major achievements	Identification		
Flagship projects	ITEC Smart Automation I4.0	DILATO - Dispositivo Inovador de medição de Laxidez Articular do Tornozelo e Ombro	IMPHIB- Development of advanced Hybrid Implants
	This co-promotion R&DT project – Bosch Suppliers Club – aims at the development of technological solutions that will translate into the creation of value in ITEC products, responding to the challenges of Industry 4.0.	This project aims to develop medical devices for measuring ankle and shoulder joint laxity, safer and compatible with magnetic resonance imaging, allowing a more objective and reliable diagnosis and enhance precision medicine.	This project pursues bio-inspired componentes to be incorporated into human engineered components. The goal is to use a gradient of materials to improve the dental implants mechanical resistance, biocompatibility, and aesthetics.
Scientific recognition	World's Top 2% Scientists 2022	EEUM Award for Merit in Scientific Publication	Best oral presentation award 2022
	Fatih Toptan, Flávio Bartolomeu, Filipe Silva, Hélder Puga, Júlio Souza, Paulo Flores e Vanessa Cardoso are among the 2% most influential scientists in the world according to a study of Stanford University and Elsevier.	Hélder Puga, Cristina Santos, Graça Minas, Paulo Mendes, Filipe Silva and Luís Gonçalves were awarded the scientific publication recognition prize by the Chair of the School of Engineering.	Researcher Vipin Richhariya, a PhD student at CMEMS - Mechanical Engineering, was awarded at the IMFAHE's VIII International Conference, Boston, Massachusetts, placed first, as the best oral presentation.
Scientific leadership	LABELS - Associate Laboratory		
	CMEMS, together with CEB, host the Associate Laboratory based at the University of Minho. LABELS will enable both step and leap changes in Biotechnology and Bioengineering, aiming at shaping the future by contributing significantly to the global challenges of securing a Sustainable Bioeconomy.		

5.3.5 – Centre for Territory, Environment and Construction– CTAC

The Centre for Territory, Environment and Construction (CTAC) is a Research Unit of the School of Engineering of UMinho, recognized by the National Science Foundation (FCT), associated to the Department of Civil Engineering (DEC), with whom it shares resources and namely human resources. Currently CTAC aggregates 24 researchers holding a PhD of which 20 are faculty professors of the Civil Engineering Department.

The general objective of the unit is to produce knowledge to support its vision of “Sustainable and Resilient Cities and Territories”, developing innovative materials and technologies and systems in the fields of built environment, systems and infrastructures for transport, water and wastewater and for territory development, contributing to climate-change-resilient buildings and infrastructures, supporting a steady improvement in the quality of life. To fulfil this objective, CTAC combines R&D activities with advanced training, technology transfer, consulting and services, aiming at fostering engineering and construction sectors and environmental entities to support the quality of cities and territories.

CTAC has a dynamic international cooperation through will partnerships covering the development of research projects by participating in international research networks, mainly in the fields of sustainable environment as well as in international projects of knowledge transfer.

The link between research and society constitutes the driving force of intervention of the unit, where, in addition to the contribution for more sustainable built environment, territories, people play the central role, contributing to the improvement of the quality of life.

CTAC is also involved in several masters and doctoral programmes, covering the main research fields of the unit, under the leading principle “to teach what is being investigated”, together with other units’ research, from UMinho and other universities.

Staff

	Internal	External	Total
PhD full members	30		30
PhD associated members	Total		
Technical staff	Total		
	1		

Publications

Journals and proceedings (SCOPUS)

	Q1	Q2	Q3	Q4	Non-rated (@ SCOPUS)	Total
Indexed journals (Scimago quartil)	23	11	7	4	3	48
Indexed proceedings	8					

Books

Type	International	National	Total
Authoring	1	0	1
Edition	1	0	1
Book of proceedings	0	2	2
Outreach book	0	0	0
Educacional book	0	2	2
Non-indexed (@SCOPUS) book chapters	0	0	
			6

Other Publications

Type	Total
Non-indexed journals	5
Non-indexed proceedings	33

PhD

Year	Number of students	Number of doctorates	Number of Pos-Doc
2022	5		

Theses and dissertations	Number
PhD theses completed	7

Distinctions and dissemination

Scientific dissemination and Knowledge transfer			
National patents	Submitted	Granted	Total
	0	0	0
International patents	Submitted	Granted	Total
	1	0	1

Participation in collaborative laboratories
BuiltColab
ECOLab

Achievements

Major achievements	Identification		
Flagship publications	Hydrodynamic Model Ensembles for Climate Change Projections in Estuarine Regions	Towards Zero CO2 Emissions from Public Transport: The Pathway to the Decarbonization of the Portuguese Urban Bus Fleet	Phase change materials composite boards and mortars: Mixture design, physical, mechanical and thermal behavior
	Iglesias, I., Bio, A., Melo, W., Avilez-Valente, P., Pinho, J., Cruz, M., Gomes, A., Vieira, J., Bastos, L., Veloso-Gomes, F., Water (Switzerland), 2022, 14(12), 1966.	Ribeiro, P., Mendes, J., Sustainability (Switzerland), 2022, 14, 9111.	Cunha, S., Aguiar, I., Aguiar, J. B., Journal of Energy Storage, 2022, 53, 105135.
Flagship projects	EscoEnsembles - Estuarine and coastal numerical modeling ensembles for anthropogenic, extreme events and climate change scenarios	GlassCON - Incorporation of glass powder waste into concrete: can it be an alternative to fly ash?	Continental FoF: Continental AA's Factory of the Future
	The project aims to develop a tool based on numerical models that represent the patterns of several Portuguese estuaries, but with international applicability, in the face of human interventions, extreme events and climate change.	The GlassCON project will study using glass powder as a substitute for fly ash in concrete production following the closure of thermal power plants in Portugal, which reduced the availability of fly ash.	The project aims to create new technical-scientific knowledge that will enable the development of new products of high technological intensity, which – integrated – will create the CONTINENTAL AA Factory of the Future.

	World's Top 2% Scientists 2022	EEUM Diploma of Recognition of Merit for Scientific Publication	Mestre Casais Foundation
Scientific recognition	Fernando Pacheco-Torgal among the 2% most influential scientists in the world, according to a study of Stanford University and Elsevier	Paulo Jorge Gomes Ribeiro, Aires Fernando Fernandes Leite Camões Azevedo and Rui António Rodrigues Ramos	José Mendes took office as Executive President of the Mestre Casais Foundation, which is dedicated to Sustainability, including support to Scientific Studies, a Collection of Essays on Sustainability and a Cycle of Conferences.

Major achievements	Identification		
	The International Society for Intelligent Construction 2022 Conference (ISIC 2022)	World Federation of Engineering Organizations (WFEO)	Member of the Directive Board of "International Congress on Polymers in Concrete" (ICPIC)
Scientific leadership	Host of The International Society for Intelligent Construction 2022 Conference	José Vieira took office as President of the World Federation of Engineering Organizations (WFEO), becoming the first Portuguese to occupy this position.	José Luís Barroso Aguiar

5.3.6 – High-Assurance Software Laboratory– HASLAB

The High-Assurance Software Laboratory (HASLab) was founded in early 2011 by researchers at the Department of Informatics of the School of Engineering, of which it is currently a Research Unit. Briefly after its creation, HASLab joined the Institute for Systems and Computer Engineering - Technology and Science (INESC TEC), an Associated Laboratory with researchers from several higher education institutions in the north of Portugal. UMinho is currently one of the shareholders of INESC TEC, being HASLab the pole of INESC TEC at this university. In the last 2019 evaluation carried out by the National Science Foundation (FCT), INESC TEC was ranked as Very Good.

HASLab's mission is focused on the design and implementation of high-assurance software systems: software that is correct by design and resilient to environment faults and malicious attacks. Research Lines HASLab accomplishes its mission by anchoring its research on a rigorous approach to three areas of computer science: Software Engineering, Distributed Systems and Cryptography and Information Security.

Most HASLab members collaborate regularly with key national and international research centres and ICT companies. These collaborations occur mainly in the context of European and consultancy projects, that constitute the main revenue sources of the centre. The strategy for the centre evolution, in particular to attract top post graduate students, is also anchored in these connections. The centre is currently focusing on improving its prototype-level software development tools to production-level open-source tools, targeting a significant user-base and high profile applications. These will enable the centre to consolidate and establish new long term technology transfer collaborations with international giants in ICT, and thus ensure the real-world impact and visibility of its research.

Staff

	Internal	External	Total
PhD full members	21		21
PhD associated members	Total		
	4		
Technical staff	Total		
	0		

Publications

Journals and proceedings (SCOPUS)						
	Q1	Q2	Q3	Q4	Non-rated (@ SCOPUS)	Total
Indexed journals (Scimago quartil)	5	4	1	1	0	11
Indexed proceedings	28					

Other Publications

Type	Total
Non-indexed journals	1
Non-indexed proceedings	1

PhD

Year	Number of students	Number of doctorates	Number of Pos-Doc
2022	16	25	1

Theses and dissertations	Number
PhD theses completed	3

Distinctions and dissemination

Participation in collaborative laboratories
Vortex Colab

Achievements

Major achievements	Identification		
Flagship publications	Compiling Quantamorphisms for the IBM Q Experience	Quantitative relational modelling with Qalloy	A Case for Partitioned Bloom Filters
	Neri, A., Barbosa, R.S., Oliveira, J.N. IEEE Transactions on Software Engineering, 48 (11), 2022	Silva, P., Oliveira, J.N., Macedo, N., Cunha, A. Proceedings of the 30th ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering, 885–896, 2022	Almeida, P.S. IEEE Transactions on Computers, 1 - 11, 2022
Flagship projects	EuroCC - National Competence Centres in the framework of EuroHPC	RISC2 – A network for supporting the coordination of Computing research between Europe and Latin America	Sustainable HPC
	Portuguese Competence Centre for High-Performance Computing (HPC) has the goal to enhance and develop the competences of the Portuguese computational community, making full use of EuroHPC resources and the EuroCC partnership.	The main objective of the RISC2 project is to promote and enhance the relationship between the research and industrial communities of Europe and Latin America, focusing on HPC applications and infrastructure implementation.	The project's main objective is to develop an innovative energy management solution that will make the operation of supercomputers more sustainable, by analysing the degree of emissions from the electricity available, locally generated or not, to meet the needs of the machine, in order to minimise the carbon footprint of the computational process.

Scientific recognition	RISC2 project acknowledged by international journal specialised in advanced computing	EEUM Diploma of Recognition of Merit for Scientific Publication	HASLab researchers acknowledged at Conference on Evaluation of Novel Approaches to Software Engineering.
	The project which aims to promote and improve the relationship between research and innovation communities in Europe and Latin America, won the HPCwire Editor's Choice Awards in the category of Best HPC Collaboration.	Luís Manuel Dias Coelho Soares Barbosa	"Schema-guided Testing of Message-oriented Systems", by Alcino Cunha (UMinho), Nuno Macedo (UPorto), and André Santos, engineer at CoLAB VORTEX, was the winner of the Best Paper Award at the 17th edition of ENASE.

Major achievements	Identification		
Scientific leadership	Luís Soares Barbosa - Chair of the IFIP Technical Committee 1 - Foundations of Computer Science	José Creissac Campos - Steering Committee chair of ACM SIGCHI EICS	Rui Oliveira - Director of the Minho Advanced Computing Centre (MACC)
	The International Federation for Information Processing (IFIP) Technical Committee 1 - Foundations of Computer Science (IFIP TC1), an international committee that aims at the development of the theory and computer science and of its bridges with other domains of knowledge and socially relevant applications.	The ACM SIGCHI Engineering Interactive Computing Systems (EICS) conference is one of the most relevant international conferences devoted to all aspects of engineering usable and effective interactive computing systems.	Minho Advanced Computing Centre (MACC) is a national infrastructure supporting Open Science initiatives on advanced computing, data science and visualisation. MACC offers supercomputing and data management services catering to scientific and industrial communities. It will host the EuroHPC JU supercomputer Deucalion.

5.3.7 – Institute for Polymers and Composites– IPC

IPC is a Research Unit of the Engineering School of UMinho that aims at developing R&D activities in the field of Polymer Science and Engineering. In the 2019 evaluation carried out by the National Science Foundation (FCT), IPC was awarded with the grade of Very Good.

IPC main stated mission is to provide advancements on polymer and composites science and technology for social sustainable development; to generate added value to the polymer, mouldmaking and related industries and, in general, to the society, contributing to the socio-economic growth and to the social wellbeing; and to promote the society awareness of the role and importance of polymeric materials.

IPC is the unique national RU totally devoted to scientific and technological advancements in polymer and composite science and engineering. In this field, IPC adopts a multidisciplinary approach, covering and integrating the scientific disciplines of polymer chemistry, physics, engineering and technology. IPC develops basic research and integrative applied R&D into applications. IPC targets the promotion of scientific excellence and innovation, developing activities at the international leading edge, fostering breakthrough concepts and their practical exploitation.

IPC envisages contributing to the advancement of scientific knowledge in:

1. BASIC KNOWLEDGE R&D AREAS - Advanced materials; Advanced manufacturing technologies; Advanced engineering design.
2. INTEGRATIVE R&D AREAS - Integration of advanced materials Integrative manufacturing; Embedding functions into systems; Immersive engineering.
3. R&D APPLICATIONAL CHALLENGES - Polymers for advanced applications; Circular economy; Digital transformation.

IPC identified 3 main leading themes around which its activities are developed:

1. Sustainability and Eco-efficiency;
2. Smaller, Stronger, Smarter;
3. High-value manufacturing.

Staff

	Internal	External	Total
PhD full members	17	1	18
PhD associated members	Total		
	14		
Technical staff	Total		
	1		

Publications

Journals and proceedings (SCOPUS)						
	Q1	Q2	Q3	Q4	Non-rated (@ SCOPUS)	Total
Indexed journals (Scimago quartil)	38	24	3	1	5	71
Indexed proceedings	12					

Books

Type	International	National	Total
Authoring	0	0	0
Edition	1	0	0
Book of proceedings	1	0	0
Outreach book	0	0	0
Educational book	0	0	0
Non-indexed (@SCOPUS) book chapters	15	15	

Other Publications

Type	Total
Non-indexed journals	3
Non-indexed proceedings	73

PhD

Year	Number of students	Number of doctorates	Number of Pos-Doc
2022	5	26	6

Theses and dissertations	Number
PhD theses completed	2

Distinctions and dissemination

Scientific dissemination and Knowledge transfer			
	Submitted	Granted	Total
National patents	0	0	0
International patents	3	0	3

Participation in collaborative laboratories

DTx - Digital Transformation Colab

LASI- Laboratório Associado de Sistemas Inteligentes

Achievements

Major achievements	Identification		
Flagship publications	Design and Validation of an Innovative 3D Printer Containing a co-Rotating Twin Screw Extrusion	Effect of polymer type on the properties of polypropylene composites with high loads of spent coffee grounds	Mono and multilayer active films containing green tea to extend food shelf life
	J. M. Justino Netto, A. I. Sarouta, A. L. G. Santos, A. Almeida Lucas, M. Aparecido Chinelatto, J. Lino Alves, A. Gaspar-Cunha, J. A. Covas, Z. Castro Silveira. Add Manuf, 59, part B (2022) 103192 DOI: https://doi.org/10.1016/j.addma.2022.103192	Mariana Marques, Luis F.F.F. Gonçalves, Carla I. Martins, Mário Vale, Fernando M. Duarte. Waste Management, Volume 154, 2022, pp 232-244, https://doi.org/10.1016/j.wasman.2022.10.009 Engineering, 885–896, 2022	Dalila M. Vieira; Mariana A. Andrade; Fernanda Vilarinho; Ana Sanches Silva; Pedro V. Rodrigues; M. Cidalia R. Castro; Ana V. Machado. Food Packaging and Shelf Life, DOI: 10.1016/j.fpsl.2022.100918

Major achievements	Identification		
Flagship projects	FEHST AVANTGARDE INTERIORS- Componentes Poliméricos Avançados Com Superfícies Decorativas Funcionais	LEIMSA - Lightweight Electronics by Injection Molding in Seamless Architecture	MARPLAS - Evaluation and Valorization of Plastics and Microplastics in Marine Environment
	Conceber, desenvolver e produzir componentes injetados: - com novos padrões sem necessidade de pintura ou com processo de acabamento muito reduzido; - com combinação de acabamentos: cromados, alto brilho, mate, retroiluminação; - com superfícies táteis com feedback sem recorrer a tecnologias IMD; - com guias de luz incorporadas e, integrar as tecnologias desenvolvidas para produzir componentes injetados com superfícies decorativas funcionais a custo mais reduzido.	Desenvolvimento de componentes disruptivos para o interior do automóvel do futuro, tendo por designio acompanhar as tendências evolutivas de mercado na indústria automóvel e antecipar a materialização das oportunidades que essas tendências geram ao nível do habitáculo auto.	No âmbito da Linha de Investigação 1 (RL1) serão recolhidos e caracterizados resíduos plásticos presentes nas zonas costeiras localizadas no Norte de Portugal, nomeadamente identificação de plástico e distribuição de tamanho, entre outros. Esta iniciativa será aberta a toda a sociedade, mas o público-alvo serão organizações juvenis e ambientais, principalmente localizadas no Norte de Portugal.

	EEUM Diploma of Recognition of Merit for Scientific Publication	Corresponding member of the Micael M. Szwarc Polymer Research Institute, State University of New York, Syracuse, NY, USA	Prémio TecnoMetal 2022
Scientific recognition	José António Colaço Gomes Covas, João Miguel Amorim Novais Costa Nóbrega, Célio Bruno Pinto Fernandes and João Pedro Lourenço Gil Nunes received the EEUM diploma of recognition of merit for scientific publication.	Zlatan Zlatev Denchev	António Gaspar Lopes Cunha, com o tema "Processamento de materiais", título "Mini-extrusor de duplo fuso para aplicação em fabrico aditivo", AIMMAP - Associação dos Industriais Metalúrgicos, Metalomecânicos e Afins de Portugal

Major achievements	Identification
Scientific leadership	Associated Laboratory for Intelligent Systems (LASI)
	The Associated Laboratory for Intelligent Systems (LASI) is led by the Algoritmi Centre and joins the Institute for Polymers and Composites (IPC), with 11 other research centres in the country.

5.3.8 – Institute for Sustainability and Innovation in Structural Engineering– ISISE

ISISE was created in 2007 involving the Civil Engineering Departments from Universities of Minho and Coimbra. The objective is to continually achieve recognition in research, having leading clusters in Structural Engineering, with top quality R&D+I, and active members. The Unit is based on strong leaderships, with a proven record of internationalization, contracted research, cooperation with industry, top level dissemination in the international arena, PhD students and post-doc collaborators. Therefore, outstanding fundamental and applied research is the driving force of ISISE.

In the last evaluation of R&D Units (for the period 2020-2023), FCT rated ISISE as Excellent. ISISE is member of the ARISE Associated Laboratory, funded by the FCT, approved 2021.

The unit is now organized in four Research Groups, namely: Functional Performance (FP), Historical and Masonry Structures (HMS), Structural Composites (SC), and Steel and Mixed Construction Technologies (SMCT).

A Management Board (Directors, Coordinators of each group and of Science Communication and Career Development) manages the unit, with monthly video conferences. The hosting institutions have recent, well-equipped and complementary laboratory facilities, with a total area about 5000 m².

The Unit aims to increase the structural and functional performance of Civil Engineering Works, from a perspective of advanced technology and innovation, from Materials to Life Cycle Performance. The approach includes aspects such as advances in experimental and numerical techniques, product development and technology transfer to the industry, durability and reliability, recycle, reuse, conservation and rehabilitation, condition assessment, and risk assessment. In short, ISISE aims at promoting innovation and sustainability, with a link to the construction industry and an up to date focus on a swiftly changing world.

The information in the following sections concerns only ISISE at UMinho.

Staff

	Internal	External	Total
PhD full members	45	0	45
PhD associated members	Total		
	0		
Technical staff	Total		
	6		

Publications

Journals and proceedings (SCOPUS)						
	Q1	Q2	Q3	Q4	Non-rated (@ SCOPUS)	Total
Indexed journals (Scimago quartil)	111	20	3	0	0	134
Indexed proceedings	0					

Books

Type	International	National	Total
Authoring	1	0	1
Edition	0	0	0
Book of proceedings	0	2	2
Outreach book	0	0	0
Educacional book	0	0	0
Non-indexed (@SCOPUS) book chapters	23		

Other Publications

Type	Total
Non-indexed journals	9
Non-indexed proceedings	129

PhD

Year	Number of students	Number of doctorates	Number of Pos-Doc
2022	126	0	24

Theses and dissertations	Number
PhD theses completed	8

Distinctions and dissemination

Scientific dissemination and Knowledge transfer			
National patents	Submitted	Granted	Total
	0	0	0
International patents	Submitted	Granted	Total
	1	0	1

Participation in collaborative laboratories
BuiltColab
Laboratório Associado para Produção Avançada e Sistemas Inteligentes (ARISE)

Achievements

Major achievements	Identification		
Flagship publications	Finite Element Analysis for Building Assessment: Advanced Use and Practical Recommendations	Durability of bond between NSM CFRP strips and concrete under real-time field and laboratory accelerated conditioning	Environmental performance of a cost-effective energy renovation at the neighbourhood scale – the case for social housing in Braga, Portugal
	Lourenço, P.B., Gaetani, A., Routledge, 2022, 422 pp	Cruz, R., Correia, L., Cabral-Fonseca, S., Sena-Cruz, J. Journal of Composites for Construction, 2022, 26(6): 04022074, 15 pp. 10.1061/(ASCE)CC.1943-5614.0001262	Barbosa, R., Almeida, M., Briones-Llorente, R., Mateus, R. Sustainability, 2022, 14(4): 1947.

Major achievements	Identification		
Flagship projects	<p>SAFEWAY – GIS-Based Infrastructure Management System for Optimized Response to Extreme Events on Terrestrial Transport Networks</p>	<p>ICoSyTec – Innovative construction system for a new generation of high performance buildings</p>	<p>ZeroSkin+ – Development of a 3D printed modular panel for holistic renovation of residential buildings, based on recycled plastic and natural materials</p>
	<p>SAFEWAY's aim is to design, validate and implement holistic methods, strategies, tools and technical interventions to significantly increase the resilience of inland transport infrastructure. Fernandes and João Pedro Lourenço Gil Nunes received the EEUM diploma of recognition of merit for scientific publication.</p>	<p>ICoSyTec combines recent developments in the area of manufacturing 3D systems built from textile fibres and high performance fibre reinforced self-compacting concrete to form a novel construction system.</p>	<p>ZeroSkin+ is focused on developing a modular 3D printing panel system for energy renovation of buildings using recycled plastic as raw material, to enhance the buildings' energy efficiency and structural seismic performance</p>
Scientific recognition	<p>EEUM Diploma of Recognition of Merit for Scientific Publication</p>	<p>World's Top 2% Scientists 2022</p>	<p>2022 Outstanding PhD Dissertation award from the Masonry Society, USA</p>
	<p>Paulo José Brandão Barbosa Lourenço, Joaquim António Oliveira Barros, Daniel Vitorino Castro Oliveira, Ricardo Filipe Mesquita Silva Mateus, Luís Manuel Bragança Miranda Lopes, Nuno Adriano Leite Mendes, João Miguel Pereira and Tiago Filipe Silva Miranda received the EEUM diploma of recognition of merit for scientific publication.</p>	<p>Daniel Oliveira, Joaquim Barros, Luís Ramos and Paulo Lourenço are in the list of the world's top 2% scientists according to a study of Stanford University and Elsevier.</p>	<p>The PhD thesis of Ali Dalalbashi Esfahani entitled "Multi-scale investigation of the durability performance of TRM-strengthened masonry" was supervised by Daniel Oliveira.</p>

Major achievements	Identification		
Scientific leadership	Laboratório Associado para Produção Avançada e Sistemas Inteligentes (ARISE)	EC, New European Bauhaus (NEB) Preparatory Action, Lead Expert in Beautiful / Quality of experience (Paulo Lourenço)	José C. Matos - Chair of Commission 8 – Durability, Federation Internationale du Beton (fib)
	ISISE joins the Laboratório Associado para Produção Avançada e Sistemas Inteligentes (ARISE), with another five national entities.	NEB is an environmental, economic, social and cultural project to combine sustainability, investment, affordability, accessibility and design to help deliver the Green Deal and make EU the world's first 'climate-neutral bloc' by 2050	fib Commission 8 aims to identify concrete-related durability issues, and provide guidance on materials and methods that will assist in optimal durability design of new structures and restoration design of existing structures.

5.3.9 – Mechanical Engineering and Resource Sustainability Centre– MEtRICs

Information not available

6 – INTERNATIONALISATION

6.1 – Student's mobility

	2021/2022	2022/2023
	2.º Semester	1.º Semester + anual
Students OUT	49	122
Students IN	32	34

6.2 – Teaching Staff mobility

	2021/2022	2022/2023
	2.º Semester	1.º Semester + anual
Teaching Staff OUT	35	7
Teaching Staff IN	8	3

6.3 – Non-teaching Staff mobility

	2021/2022	2022/2023
	2.º Semester	1.º Semester + anual
Non-teaching Staff OUT	8	1
Non-teaching Staff IN	6	1

6.4 - Community Projects in the field of Education and Mobility

The School is involved in a large number of projects and networks, within the framework of mobility and educational programmes.

In 2021/2022 14 applications for Erasmus projects were submitted.

The project applications approved in 2022 are presented below.

ERASMUS+ KA2 – Cooperation Partnerships

Application	Programme/Initiative	Coordinating Institution	Project Title	UMinho Participation
2021	KA2 – Cooperation Partnerships	PANEPISTIMIO THESSALIAS [UNIVERSITY OF THESSALY - UTH] (Grécia)	Competences for Resilient Smart Cities (CRISIS)	Isabel Ramos (EE/DSI)
2022	Cooperation Partnerships in VET	UNIVERSIDADE DA CORUNA (Spain)	Artificial Intelligence learning modules to adapt VET to digital transformation in labour market (AI4VET)	Paulo Novais (EE/DI)
2022	Cooperation Partnerships in Higher Education	UNIVERSITAET GRAZ (Austria)	Collaborative development of AI capabilities in SMEs (CoDeAI)	Isabel Ramos (EE/DSI)
2022	Cooperation Partnerships in Higher Education	UNIVERSITY OF NICOSIA (Cyprus)	Open Data City Officer (OPENDCO)	Isabel Ramos (EE/DSI)
2022	Cooperation Partnerships in Higher Education	Universidade do Minho	Framework PBL para formação colaborativa e digital de professores (PBL4COLLABTT)	Rui Lima (EE/DPS)
2022	Cooperation Partnerships in Higher Education	Universidade do Minho	STEAM approaches at higher education for mIGrants, refugees and asylum seekers' emPOWERment (STEAMigPOWER)	António Vicente (EE/Presidência)

ERASMUS+ KA2 – Erasmus Mundus Design Measures

Application	Programme/Initiative	Coordinating Institution	Project Title	UMinho Participation
2021	Erasmus+ - EMDM	Universidade do Minho	International Masters on Risk Assessment and Management of Civil Infrastructures (NORISK)	José Matos (EE/Civil)

ERASMUS+ KA2 – Partnerships for Innovation

Application	Programme/Initiative	Coordinating Institution	Project Title	UMinho Participation
2022	Forward Looking Projects	Universidade do Minho	GEEK4Food – Glocal Ecosystems and Expanded Knowledge for skills and capacity for the next normal in the food sector	António Vicente (EE/Presidência)

Joint Masters Erasmus Mundus

Advanced Structural Analysis and Design using Composite Materials - FRP++

The Department of Civil Engineering (DEC) of EEUM coordinates the European Master in Advanced Structural Analysis and Design using Composite Materials - FRP++ (<https://msc-frp.org/>), which received about 2.7M€ of funding from the ERASMUS+ (Erasmus Mundus Joint Master) Programme to support its operation for 6 academic years, starting in 2022/2023. In addition to supporting management, mobility and integration activities, the funding in question will enable the allocation of around 84 scholarships to students, covering registration and monthly allowance costs. The Master has three partner institutions with funding: the University of Girona (Spain), the University of Naples Federico II (Italy), and the National Institute of Applied Science in Toulouse / University Toulouse III - Paul Sabatier (France). It also has more than 50 associated institutions, mainly from Industry, promoting the integration between the contents taught and the needs for professional practice.

The FRP++ Master has a duration of 1 year, with 60 ECTS, including the completion of six Curricular Units in the first semester and the dissertation in the second semester. The Master is directed by José Sena Cruz, Associate Professor with Aggregation at the DEC, and member of the ISISE Research Unit.

The first edition of the FRP++ Master started on 1 October 2022, with 18 students from 10 different countries. In the first semester of the 2022/2023 academic year, the teaching part of the Master takes place simultaneously at the University of Minho and the University of Girona (approximately the same number of students per institution). In the second semester the students are distributed by the four partners in a sensibly equitable way.

European Master in Building Information Modelling – BIM A

The Department of Civil Engineering of EEUM coordinates the European Master in Building Information Modelling BIM A+ (www.bimaplus.org), which received 2.1M€ of funding from the ERASMUS+ Programme to support its operation during 4 academic years starting in 2019/2020. In addition to supporting management, mobility and integration activities, the funding in question will enable the award of around 80 grants to students, covering registration and monthly allowance costs.

The Master has two partner institutions with funding: the 'Politecnico Di Milano' (Italy) and the University of Ljubljana (Slovenia). It also has more than 39 associated institutions, mainly from Industry, promoting the integration between the contents taught and the needs for professional practice. The 2023-2024 academic year is the first without EACEA funding however it has Consortium scholarships available for the best candidates.

The Master BIM A+ lasts 1 year, with 60 ECTS, including the completion of 6 Curricular Units in the first semester, and the dissertation in the second semester. The supervision of the Master is assured by Miguel Azenha, Assistant Professor at the Civil Engineering Department of EEUM and member of the ISISE Research Unit. In addition to several teachers of the Dept. of Civil Engineering of UM, it should be noted the direct participation of the School of Architecture of UM through Bruno Figueiredo, Assistant Professor at EAUM.

In the editions from 2019/2020 to 2021/2022 95 dissertations were presented, varied in collaboration with associated institutions.

The fourth edition of the Master's Degree began on 3 October 2022, with 37 students from 23 different countries. In the first semester of the academic year 2022/2023 the teaching part of the Master takes place simultaneously at the University of Ljubljana with 11 students and at the University of Minho with 25 students. In the second semester the students are distributed among the three partner universities. The digital nature of the Master's and the permanent contact between students and teachers allowed the coordination to overcome the challenges posed by the pandemic.

SAHC International Master

The 15th edition of the SAHC International Master (2021/2022) had the participation of 15 students from 14 countries (Canada, Ecuador, USA, Ghana, Greece, India, Ireland, Israel, Italy, Mexico, Peru, Serbia, Singapore and the Palestinian Territory), and the students successfully completed their dissertations. The continued participation of students from North America and, for the first time, Ghana, is noteworthy.

The 16th edition of the Master SAHC (2022/2023) is underway with the participation of 21 students from 14 countries (Afghanistan, Brazil, Colombia, Croatia, USA, Philippines, France, Georgia, Greece, Iran, Jordan, Lebanon, Mexico and Turkey). We should highlight the participation for the first time of students from Afghanistan, Philippines and Georgia.

The beginning of the academic year of the Master SAHC is characterised by various activities for integrating the students, which included a presentation and welcome session, a guided tour of the historical centre of Guimarães, an introduction session to scientific information research and a lecture on communication. Every year, visits are made to several emblematic monuments, and in this edition the visit to the works of Ponte Luiz I is worth mentioning.

6.5 - International Partnerships and Protocols

In 2022 the School of Engineering maintained the following international partnerships and programmes: MIT Portugal Program, University of Texas at Austin, CMU Portugal.

With regard to formalising cooperation with higher education institutions and other international entities, 14 protocols were signed in 2022.

6.6 – Visits from External Delegations

In the year 2022 the School of Engineering received the visit of various delegations of international institutions, namely, from the The Islamic University of Gaza, Colombia, ARQUS Alliance (organized by UMinho), and within the scope of the International Week organized by USAI-UMinho, EEUM received representatives from Al-Hussein Bin Talal University (Jordan), University of Pretoria (South Africa) and HUST - Hanoi University of Science and Technology (Vietnam).

The School of Engineering of UMinho also received the following entities/personalities:

29th march - Instituto Federal do Rio Grande do Norte

23rd and 25th may - Haim Levkowitz, Chair of the Computer Science Department at the Massachusetts Lowell University

25th may - United States Army and Navy

27th may – Lisa Lang, entrepreneur, technologist and famous international speaker Lisa Lang, founder of ElektroCouture, OFundamentO and ThePowerHouse, leading FashionTech agencies in smart technologies, clothing and textiles.

28th july – Pernambuco University

7 - INTERACTION WITH SOCIETY

7.1 - Initiatives promoted by EEUM

In 2022 the Presidency of the School of Engineering organised various events with the aim of divulging and promoting the institution's educational offer, bringing the student community closer to the business world and the labour market, as well as initiatives aimed at divulging the research that is carried out internally, and also social responsibility initiatives, bringing together the efforts and commitment of this community, which constitutes almost 1/3 of the University of Minho, for the common good of the society in which we are inserted.

With regard to activities related to employment and integration into the labour market, or the acquisition of other complementary skills, the School of Engineering, under the [Tomorrow Needs You Agenda](#), held 13 sessions with companies and alumni, as well as holding the most important event on this Agenda, the Employment Days, which took place online in 2022, on 14 and 15 February, during which around 750 career opportunities were made available to students by 50 companies.

The 47th anniversary of the School of Engineering was celebrated on the 6th October, in the main auditorium of the University of Minho, in the Azurém campus, addressing this year the theme of sustainability, with the lecture "Who are we talking about when we talk about sustainability", by full professor João Pedro Matos Fernandes. The speaker was Minister of Environment in the XXI Constitutional Government and, later, Minister of Environment and Energy Transition. The programme also included the presentation of diplomas and awards to employees and entities that stood out in their activity and collaboration with EEUM in the last year, as well as the performance of UMinho's Engineering students musical groups.

Also in 2022 took place the investiture of the presidency of the School of Engineering, with the re-election of Professor Pedro Arezes for the 2022-2025 mandate, keeping in the team the vice-president António Vicente, joined by Professors Raúl Figueiro and Professor Lígia Rodrigues who also assumes the position of president of the Pedagogical Council. The inauguration ceremony took place on September 30th, in the B1.10 auditorium of the Azurém campus.

Regarding Science Communication, the 5th edition of "Engenharia: Falar É Fácil?!" was organised in December. This edition aimed to bring the student community closer to the research that is carried out in the UMinho's interfaces that have some connection to the School of Engineering, namely, the PIEP - Polymer Engineering Innovation Pole, the CVR - Centre for waste valorisation, and Fibrenamics, thus also allowing students to get to know these interfaces better and their connection to industry and business.

7.2 - Initiatives promoted by the Rectorate with the collaboration of EEUM

In 2022 the School of Engineering of UMinho collaborate with the rectorate in the main following events:

UPA - Universidade de Portas Abertas – from the 7th to the 9th of April the School of Engineering received around 1100 secondary school students, letting them know the educational offer of the institution.

Verão no Campus 2022 - From the 18th to the 22nd of July, the University of Minho received five hundred senior high school students and developed 7 activities illustrating the teaching areas.

The School of Engineering also participated with the University of Minho in education fairs organized by external entities such as Qualifica, in Porto, and Unlimited Future, in Lisbon.

7.3 – Image and Communication

In 2022, the EEUM Communication and Image Office continued to be committed to closer and wider communication through online communication media. Some results of this strategy are presented here.

- **Social Media Networks**

Facebook

Unique Visitors: 10.7K

Followers: 9.5K

Range: 197K

Instagram

Unique Visitors: 10.9K

Followers: 3.6K

Range: 36K

Linkedin

Unique Visitors: 4.5K

Followers: 9.2K

Range: 242K

YouTube

Views: 8.1K

Live views (livestreaming): 2.1K

Hours seen: 576.8 hours

Range: 93.9K

- **Website ENG.UMINHO.PT**

Unique Visitors: 75.8K

Pages Viewed: 670K

Traffic origin (Countries): Portugal (80%), Brazil (5%), Angola (1.5%), Mozambique (1.4%)

Traffic origin (Districts): Braga (34%), Porto (27%), Lisbon (22%), Aveiro (3%), Viana (3%)

- **Portal ENGIUM.UMINHO.PT**

Unique Visitors: 21.3K

Pages Viewed: 41.3K

- **Newsletter ENGINEWS**

Subscribers (external to the UMinho institution): 1438

Apertures: 42K

Clicks: 3.8K

Click Through Rate (CTR): 9.16% (Education average CTR in 2022 was 2.9%, according to Mailchimp)

7.4 – Protocols with national entities

In 2022, the School of Engineering saw 35 cooperation protocols signed with various entities, with the involvement of almost all of its subunits, 21 of which with secondary schools. These protocols affirm our institution's commitment to society, allowing a great rapprochement with various players at regional and national level.

8 – HUMAN RESOURCES

8.1 – Teaching Staff

263 PhD Faculty and 68 Invited Professors

- 31 Full Professors
- 35 Associate Professors with Habilitation
- 42 Associate Professors
- 8 Assistant Professors with Habilitation
- 139 Assistant Professors
- 8 Assistant Professors with Habilitation

8.2 – Research Staff

132 Integrated Researchers

8.3 – Administrative and Management Technical Staff

111 Non-Teaching Staff

- 58 Higher Technicians
- 5 IT Specialists
- 4 IT Technicians
- 38 Technical Assistants
- 2 Operational Assistants
- 3 Technical Coordinator
- 1 Unit secretary