

ACTIVITY REPORT 2023

1 - EXECUTIVE SUMMARY.....	2
2 – MANAGEMENT BODIES AND OFFICES.....	3
3 – EEUM’s NUMBERS.....	4
4 – EDUCATION	5
4.1 – National Competition for Access to Higher Education Results	5
4.2 – 1 st Cycle Programs.....	6
4.3 – 2 nd Cycle Programs	8
4.4 – 3 rd Cycle Programs	13
4.5 – Departments' Activities	14
4.5.1 – Department of Biological Engineering.....	14
4.5.2 – Department of Civil Engineering.....	17
4.5.3 – Department of Industrial Electronics	21
4.5.4 – Department of Mechanical Engineering.....	25
4.5.5 – Department of Polymer Engineering.....	26
4.5.6 – Department of Textile Engineering.....	31
4.5.7 – Department of Informatics	34
4.5.8 – Department of Production and Systems	37
4.5.9 – Department of Information Systems.....	42
5 – INNOVATION AND RESEARCH	47
5.1 – FCT Evaluation.....	47
5.2 – Collaborative Laboratories	47
5.3 – Research Centre Activities	47
5.3.1 – Centre of Textile and Science Technology – 2C2T	47
5.3.2 – ALGORITMI Centre – CALG.....	50
5.3.3 – Centre of Biological Engineering – CEB.....	54
5.3.4 – Centre for Microelectromechanical Systems – CMEMS.....	57
5.3.5 – Centre for Territory, Environment and Construction– CTAC.....	60
5.3.6 – High-Assurance Software Laboratory– HASLAB	63
5.3.7 – Institute for Polymers and Composites– IPC.....	66
5.3.8 – Institute for Sustainability and Innovation in Structural Engineering– ISISE.....	69
5.3.9 – Mechanical Engineering and Resource Sustainability Centre– METRICs.....	72
6 – INTERNATIONALISATION	73
6.1 – Student mobility	73
6.2 – Teaching Staff mobility	73
6.3 - Non-teaching Staff mobility	73
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 and International Representation.....	77
7 - INTERACTION WITH SOCIETY	78
7.1 - Initiatives promoted by EEUM	78
7.2 - Initiatives promoted by the Rectorate with the collaboration of EEUM.....	78
7.3 – Image and Communication.....	79
7.4 – National Partnerships and Protocols	80
8 – HUMAN RESOURCES	80
8.1 – Teaching Staff.....	80
8.2 – Research Staff.....	80
8.3 – Administrative and Management Technical Staff	81

1 - EXECUTIVE SUMMARY

The year of 2023 was a year marked by an intense resumption of activities at the School of Engineering, which began in 2022, after a slowdown in the Covid-19 pandemic that affected the country and the world in 2020 and 2021. This intense activity was evident in all of the School of Engineering's pillars: education, research and interaction with society.

In terms of Education, in the 2023/2024 academic year, the School of Engineering of the University of Minho (EEUM) was responsible for a total of 89 programs in operation, distributed among 15 Bachelor courses (1st cycle), 14 Integrated Masters (the 1st year of the cycle of studies is not offered since 2022/2023), 38 Masters courses (2nd cycle) and 22 Doctoral/Doctoral Programmes (3rd cycle).

In terms of the number of students per study cycle, this group of courses includes 3372 bachelor students, 758 Integrated Master's students, 2383 Master's students (2nd cycle) and 749 PhD students (3rd cycle), for a total of 7262 students.

Comparing the number of students enrolled in 2022/2023 with 2023/2024, there is a decrease of 7.37% of the total number of EEUM students, from 7818 students to 7262, although the total number of applicants for some 2nd and 3rd cycle courses is yet to be determined, as they have different application stages.

With regard to research, the research centers of EEUM¹ totaled 1004 scientific articles indexed in WoS/Scopus databases (1057 in 2022), and 420 communications at national and international conferences (273 in 2022).

EEUM had 251 research projects underway during 2023 (309 in 2022), with a total budget of 32M€ (average per year, 36 months projects), including 16 projects under the Erasmus+ Programme (Key Action 2) to which corresponds to a budget of more than 1.8M€.

In 2023, 72 PhD theses were completed (92 in 2022). Regarding patents, 13 patent applications were submitted, 5 nationally and 8 internationally, and 27 patents were granted, all of them internationally.

With regard to internationalisation, the School of Engineering in 2023 saw 31 agreements of different kinds and purposes signed with higher education institutions and entities from various countries. EEUM received the visit of 8 delegations of international institutions, so it is expected new collaborations or strengthening of existing cooperation.

In terms of interaction with society, in 2023 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 75 companies were present at the Employment Days with 4000 job opportunities, a record number in the 10th edition of this event. As for communication on social networks there is an increase in engagement. On the institutional website and on the Engium portal, metrics are not 100% accurate due to changes in Google Analytics tool in the middle of the year 2023, but there is also an increase in the number of unique visitors in the institutional website. 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 7.84% 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. There was also an increase of the number of subscribers.

¹ METRICS data not included in this report

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

Students

7162 Students

1st cycle - 3272 Bachelor students + 758 Integrated Masters students

2nd cycle – 2383 Master's degree students

3rd cycle – 749 PhD's students (at the time)

School Staff

266 PhD Faculty

9 Emeritus Professors

61 ETI Invited Faculty Professors

112 Non-Teaching Staff

Departaments

9 Departments

89 Training Programs (2023/2024)

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

2nd cycle– 38 Masters Degree Programs

3rd cycle - 22 PhD Programs

Research Centres/Units

9 Research Centres

121 Integrated Researchers

8 Centres evaluated as Very Good and Excellent by FCT

72 Completed PhD

27 Patents granted

251 Research projects

32 M€ Total funding/year

1004 Scientific articles indexed in WoS/Scopus

14 Collaborative Laboratories

Internationalization

31 Agreements established

8 International visits

93 Mobility Students OUT

58 Mobility Students IN

Interaction With Society

20 Protocols established

4000 Job Opportunities in EEUM's Job Days

26.6K Followers on social media

93K Institucional Website Unique Visitors

1587 Subscribers of EngiNews (external subscribers)

4 – EDUCATION

4.1 – National Competition for Access to Higher Education Results

With regard to the 1st cycle and the 1st placement phase for 2023/2024, the School of Engineering had 91.6 per cent of its vacancies (888) filled in the first phase of the National Competition for Access to Higher Education (see table 4.1.1).

The programs that saw their number of vacancies reduced in 2023 were Polymer Engineering, Textile Engineering, and Chemical and Biological Engineering. The programs that didn't fill all the vacancies available in the first phase of the competition were Industrial Electronics and Computer Engineering, Telecommunications and Informatics, Polymers and Textiles.

In the 1st cycle, it is also important to analyse in a little more detail the demand from students coming from the National Access Competition.

Programs with the most 1st choice vacancies (with data referring to the 1st access phase):

- 55% Mechanics
- 60% Biomedical
- 70% Computer Science
- 73% Civil
- 75% Fashion Design and Marketing
- 85% Aerospace

Programs that did not fill vacancies (which are also the ones with the fewest first-choice candidates, and this had already happened in 2022):

- Industrial and Computer Electronics
- Telecommunications and Computer Science
- Textiles
- Polymers

All EEUM programs with applicants above the vacancies and with an even distribution between the options. The program with the highest increase in demand for 1st choice were Aerospace Engineering and Civil Engineering.

The program that saw the greatest reduction in demand for 1st choice was Fashion Design and Marketing. Still on this subject, the highest access classifications were in the programs Aerospace Engineering (188.6 - highest national score); Industrial Engineering and Management (173.8) and Biomedical Engineering (171.2).

Some EEUM programs with the highest marks compared to other engineering schools were Chemical and Biological Engineering (140.8) and Civil Engineering (140.6).

4.1.1 – National Competition for Access to Higher Education Results

Programme	Initial vacancies	Placed	Last place score (general contingent)	Remaining vacancies for 2nd phase
Civil Engineering	34	34	140.6	0
Materials Engineering	27	27	136.8	0
Telecommunications and Informatics Engineering	36	21	116.4	15
Industrial Engineering and Management	68	68	173.8	0
Engineering Physics	35	35	148.4	0
Informatics Engineering	170	170	165.6	0
Mechanical Engineering	82	82	164.8	0
Chemical and Biological Engineering	41	41	140.8	0
Textile Engineering	20	5	123.4	15
Biomedical Engineering	65	65	171.2	0
Fashion Design and Marketing	30	30	164.0	0
Engineering and Management of Information Systems	141	141	142.0	0
Industrial Electronics and Computers Engineering	88	60	114.8	28
Aerospace Engineering	31	31	188.6	0
Polymer Engineering	20	11	127.4	9
Total	888	821	-	67

4.2 – 1st Cycle Programs

In the 2023/2024 academic year the School of Engineering offers 15 bachelor's degree programs and 14 integrated master's degree programs (the 1st year of the cycle of studies was not offered in 2022/2023), in which 4130 students are enrolled (3372 bachelor's degree and 758 integrated master's degree students).

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 Competition for Access to Higher Education. However, four 1st cycle programs did not fill the available places.

4.2.1 – Evolution of students enrolled – Bachelor degrees*

1st Cycle	2021	2022	2023
Fashion Design and Marketing	112	113	109
Aerospace Engineering		35	70
Biomedical Engineering	209	225	235
Civil Engineering	235	228	234
Materials Engineering	56	84	83
Polymer Engineering	106	78	68
Telecommunications and Informatics Engineering	118	121	121
Engineering and Management of Information Systems	428	495	495
Industrial Engineering and Management	347	275	275
Industrial Electronics and Computers Engineering	390	336	336
Engineering Physics	154	138	139
Informatics Engineering	812	724	726
Mechanical Engineering	287	277	277
Chemical and Biological Engineering	172	129	129
Textile Engineering	97	75	75
Total	3523	3333	3372

4.2.2 – Evolution of graduate students - Bachelor degrees *

1st Cycle	2021	2022	2023
Fashion Design and Marketing	28	25	26
Aerospace Engineering			
Biomedical Engineering		41	59
Civil Engineering		47	39
Materials Engineering		1	19
Polymer Engineering		28	18
Telecommunications and Informatics Engineering		9	13
Engineering and Management of Information Systems		60	106
Industrial Engineering and Management		138	71
Industrial Electronics and Computers Engineering		112	71
Engineering Physics		49	25
Informatics Engineering		141	125
Mechanical Engineering		90	38
Chemical and Biological Engineering		76	33
Textile Engineering		36	24
Total	28	853	667

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

4.2.3 – Enrolled Students Total Number – Integrated Masters

Program	2023/2024
Biological Engineering	4
Biomedical Engineering	58
Civil Engineering	19
Materials Engineering	35
Polymer Engineering	19
Telecommunications and Informatics Engineering	60
Engineering and Management of Information System	206
Engineering and Management of Information System (AW)	0
Industrial Management and Engineering	18
Industrial Electronics and Computers Engineering	58
Physics Engineering	15
Informatics Engineering	105
Mechanical Engineering	158
Textile Engineering	3
Total	758

4.2.4 – Evolution of graduate students – Integrated Masters

Program	2021	2022	2023
Biological Engineering	40	34	1
Biomedical Engineering	49	104	28
Civil Engineering	36	28	2
Telecommunications and Computer Engineering	9	13	8
Industrial Electronics and Computer Engineering	34	60	50
Informatics Engineering	78	152	37
Industrial Management and Engineering	73	79	29
Engineering and Management of Information Systems	57	70	58
Engineering and Management of Information Systems (AW)	8	15	9
Materials Engineering	15	20	10
Polymer Engineering	36	35	7
Mechanical Engineering	76	98	43
Textile Engineering	10	34	5
Physics Engineering	9	12	5
Total	530	754	292

4.3 – 2nd Cycle Programs

The School of Engineering had 38 Masters programs in operation in the year 2023/2024, with a total of 2383 students enrolled.

In the period under review EEUM developed five proposals for new 2nd cycle programs, in addition to various non-degree specialisation programs:

- Master in Cibersecurity
- Master in Advanced Computing
- Master in Data Science and Engineering
- Master in Artificial Intelligence
- Master in Integrated Design of Timber Constructions

These five proposals of new programs will be submitted to A3ES at the beginning of 2024.

Additionally, 8 EEUM programs were under evaluation (submitted between November 2023 and January 2024):

- Master in Urban Engineering
- Master in Structural Analysis of Monuments and Historical Construction
- Master in Sustainable Construction and Rehabilitation
- Master in Sustainable Built Environment
- Master in Structural Engineering
- Master in Building Information Modeling - BIM A+
- PHD in Civil Engineering
- PHD in Sustainable Built Environment

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

Program	2020/21	2021/22	2022/23	2023/24
Structural Analysis of Monuments and Historical Construction	12	12	21	12
Bioinformatics	52	74	70	58
Biotechnology	28	51	60	50
Sustainable Built Environment	37	25	27	7
Cities Challenges			6	28
Fashion Design and Communication	57	61	56	41
Design and Marketing of Textile Products, Apparel and Accessories	34	40	23	18
Aerospace Engineering			10	23
Engineering of Computer Networks and Telematic Services	12	17	13	6
Systems Engineering	58	63	46	36
Product Engineering	34	47	54	46
Structural Engineering	4	0	0	6
Engineering and Quality Management	50	54	49	32
Engineering and Operations Management			109	134
Human Engineering	20	34	15	18
Industrial Engineering	102	83	11 (2nd year)	
Informatics Engineering	112	230	369	405
Mechatronics Engineering	44	42	26	221
Urban Engineering	36	26	23	20
Engineering Project Management	58	70	55	52
Micro/Nano Technologies	22	19	11	2
Information Systems	53	68	65	56
Building Information Modelling - BIM A+	26	14	31	18
Sustainable Built Environment	11	9	5	1
Food Science and Technology	76	58	32	20
Interactive Technologies	10	13	3	
Advanced Structural Analysis and Design using Composite Materials - FRP++*			10	
Total	954	1110	1200	1310

* There are no students enrolled for the 1st semester of 2023/2024

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

Program	2021/22	2022/23	2023/24
Biomedical Engineering	15	79	102
Civil Engineering	81	92	91
Materials Engineering		3	16
Polymer Engineering	17	40	43
Telecommunications and Computer Engineering	12	16	30
Textile Engineering	27	55	54
Engineering and Management of Information Systems	10	82	171
Industrial Engineering and Management	134	165	138
Industrial Electronics and Computers Engineering	82	141	181
Engineering Physics	39	67	73
Mechanical Engineering	84	121	109
Chemical and Biological Engineering	61	73	65
Total	562	934	1073

4.3.3 – Master's Dissertations

Program	Dissertation Admissions			Concluded Dissertations		
	2020/21	2021/22	2022/23	2020/21	2021/22	2022/23
Structural Analysis of Monuments and Historical Construction	7	5	7	8	5	5
Bioinformatics	23	24	31	20	24	18
Biotechnology	9	13	33	28	15	33
Sustainable Construction and Rehabilitation	25	8	9	19	16	10
Fashion Design and Communication	26	20	21	20	21	15
Design and Marketing of Textile Products, Apparel and Accessories	14	18	11	18	11	9
Engineering of Computer Networks and Telematic Services	9	6	8	2	5	1
Systems Engineering	21	21	19	18	23	16
Product Engineering	7	21	23	8	6	13
Engineering and Quality Management	20	22	20	21	18	19
Human Engineering	6	9	10	7	11	5
Engineering and Operations Management			35			17
Industrial Engineering	31	55		53	69	5
Informatics Engineering	46	174	14	29	50	83
Mechatronics Engineering	18	18	5	16	14	5
Urban Engineering	18	15		19	14	6
Environmental Management	9	3		9	8	1
Engineering Project Management	20	18	25	16	12	4
Micro/Nano Technologies	9	6	4	8	10	4
Building Information Modelling - BIM A+	10	13	10	9	17	10
Information Systems	21	16	17	9	7	10
Sustainable Built Environment	7	3		4	2	
Interactive Technologies	9	1		2	2	2
Food Science and Technology	18	21	8	18	30	7
Advanced Structural Analysis and Design using Composite Materials - FRP++			3			3
Total	383	510	276	361	390	301

4.3.4 – Continuing Master's Dissertations *

Program	Dissertation Admissions		Concluded Dissertations	
	2021/22	2022/23	2021/22	2022/23
Chemical and Biological Engineering	31	1	20	26
Biomedical Engineering	15	56	2	7
Civil Engineering	30	6	12	19
Materials Engineering	6	16		
Polymer Engineering	10	12	1	9
Telecommunications and Computer Engineering	8	7		4
Textile Engineering	2	3		18
Engineering and Management of Information Systems	11	113		2
Industrial Engineering and Management	51	5	22	66
Industrial Electronics and Computers Engineering	36	12		10
Engineering Physics	10	2	6	15
Mechanical Engineering	45	30	7	34
Total	255	263	70	208

* 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 Programs

The School of Engineering had 20 Doctoral Programmes/PhD Programs in operation in the academic year 2022/2023, with a total of 749 students enrolled.

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

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 often conditioned by the publication of the results of the applications for doctoral grants funded by FCT.

In the 2022/2023 academic year it should be noted that five of the twenty doctoral programmes in the School of Engineering are now tutorial-based, and have four permanent application phases, so the number of applicants registered for these programs is the number obtained by the end of the calendar year 2023.

In 2023 there is a decrease in the number of completed PhD theses (72), compared to the previous year (92 theses).

4.4.1 – Total number of students enrolled in 2022/2023

Program	Total Enrolled
	2022/23
Biomedical Engineering	44
Food Science and Technology and Nutrition	30
Civil Engineering	138
Materials Engineering	44
Polymers and Composites Engineering	24
Electronics and Computer Engineering	70
Industrial and Systems Engineering	54
Mechanical Engineering	55
Chemical and Biological Engineering	58
Textile Engineering	23
Solid Waste Management and Treatment	12
Informatics	54
Computer Science (MAP-i)	29
Leaders for Technical Industries	2
Sustainable Built Environment	28
Information Systems and Technology	48
Telecommunications MAP-tel	4
Fashion Design	27
Advanced Engineering Systems for Industry	4
Direct Digital Manufacturing for Polymer and Tooling Industries	1
Total	749

4.5 – Departments' Activities

4.5.1 – Department of Biological Engineering

Created in 1993, DEB currently has 5 employees and 19 career teachers all with doctorates (including two Emeritus Professors). 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 association 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 programs. 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	1
Assistant professor	4
Total	19

** 2 professors on external service

Category	Total
Senior technician	0
IT specialist	0
IT technician	0
Technical assistant	3
Operational assistant	2
Total	5

Events

Event	Date	Type
Bioinformatics Open Days 2023	16-18/03/2023	Open days
Semana da Biotecnologia de Braga - Braga Biotechnology Week	17-21/04/2023	Open Days
Expobiotec 2023	19-20/04/2023	Expo
5th international practical Biofilm course and symposium	25/09/2023	Symposium
Semana da Ciência & Tecnologia @ CEB-DEB-UMinho	20-25/11/2023	Open days

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/food-contaminants/)

Most relevant 2nd cycle dissertations

Student	Supervisor 1	Supervisor 2	Thesis Title	Program	Company Involved
Beatriz Rodrigues Ferreira	Ana Cristina Pinheiro	Nadine Töpfer	Estudos de vida útil em pescado	Food Technology and Science	Brasmar Group
Maria Luisa Ferreira Duque	Armando Venâncio	Oscar Dias	Development of free from (gluten, wheat, lactose, milk, palm and soy free) bread and cake preparations, with less added additives and clean label)	Food Technology and Science	Germen – Moagem de Cereais, S.A.
Diogo André Torres Martins	Tatiana Aguiar	Juliana Oliveira	Eco-innovative bio-based inks for smart applications	Biotechnology	CeNTI - Centro de Nanotecnologia e Materiais Técnicos, Funcionais e Inteligentes
Lúcio Casimiro Teixeira Pinto da Silva	Michele Michelin	Miguel Cerqueira	Lignin nanoparticles for the development of flexible films for food packaging	Biotechnology	INL - International Iberian Nanotechnology Laboratory
Nuno Filipe Campelos Leite	Mariana Henriques	Lúcia Lacerda	Sphingolipid and acylcarnitine analysis in locally advanced rectal cancer	Biotechnology	CGMJM - Centro de Genética Médica Jacinto Magalhães
Maria Beatriz Vieira de Carvalho	Ana Margarida Sousa		Aptamer-targeted for Pseudomonas aeruginosa biofilms formed in cystic fibrosis airways for early diagnosis	Integrated Master in Biomedical Engineering - Clinical Engineering branch	
Inês Adelaide Mota Cardoso	Lígia Rodrigues	Helder Santos	Desenvolvimento de nanossistemas de Estrutura Metalo-Orgânica com forma ajustável para imunoterapia do cancro	Integrated Master in Biomedical Engineering - Clinical Engineering branch	
Tatiana Vilaça	Artur Ribeiro	Carla Silva	Novel Asparaginases for the treatment of Acute Lymphoblastic Leukemia (ALL)	Integrated Master in Biomedical Engineering - Clinical Engineering branch	
Mónica Rafaela Machado Leiras	Oscar Dias	Vitor Pereira	Development of a serious game for learning the basic concepts of genome-scale metabolic models	Bioinformatics	
Roberto Costa Bullitta	Miguel Rocha		Developing an automated machine learning framework for protein classification	Bioinformatics	OmniumAI

Student	Supervisor 1	Supervisor 2	Thesis Title	Program	Company Involved
Tiago Rafael Ferreira Miranda da Silva	Miguel Rocha	Vitor Pereira	Development of a recommendation system for scientific literature based on deep learning	Bioinformatics	OmniumAI
Patrícia Dinis Neves	Maria Alcina Pereira		Optimization of BES by unravelling the storing mechanisms of electro-active bacteria	Chemical and Biological Engineering	Wetsus
Beatriz Pereira Lima	Lígia Rodrigues	Juliana Dias	Desenvolvimento de biocompósitos de celulose sustentáveis para aplicação têxtil	Chemical and Biological Engineering	CITEVE
Isabel Cristina Cibrão Freitas	Maria Olívia Pereira	Lucas Pereira do Nascimento	Sustentabilidade ambiental na indústria das carnes: avaliação de ciclo de vida e estudo da pegada de carbono como ferramentas de apoio à decisão de lançamento de novos produtos	Chemical and Biological Engineering	CARNES CAMPICARN S.A.

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	3
Associate professor with Habilitation	8
Associate professor	6
Assistant professor with Habilitation	2
Assistant professor	19
TOTAL	40

Category	Total
Senior technician	5
IT specialist	0
IT technician	1
Technical assistant	3
Operational assistant	0
Technical Coordinator	1
TOTAL	10

Link to Society Projects

Project	Description
NBSINFRA	CityNature-Based Solutions Integration to Local Urban Infrastructure Protection for a Climate Resilient Society, European project worth approximately five million euros that is looking for natural-based technological solutions to protect critical infrastructures. It involves five European cities, including Aveiro, and aims to minimise the effects of climate change.
Recube	The European project REcube - REthink, REvive, REuse aims to develop and transmit the knowledge necessary for a sustainable, integrated and holistic approach to the conservation and renovation of reinforced concrete heritage buildings in Europe. The students took part in the Regenerate Workshop and developed solutions.
Agressividade da água	Parecer sobre agressividade da água a conduzir em tubos de betão pré-esforçado com alma de aço / Angola.
Mestre Casais - Mobilidade em Mudança	Professors José Mendes has participated in the Executive Program "Mobilidade em Mudança: Tendências e Oportunidades num Contexto de Descarbonização", organised by the Mestre Casais Foundation and CEiiA, in September (Matosinhos), October (Cascais) and November (Olhão) 2023.
Patologia em fachadas e painéis dem fachadas	Peritagem sobre apoio das palas da CAID – Cooperativa de Apoio à Integração do Deficiente & Ensaios de painéis à compressão e flexão em diversas obras.

Events

Event	Date	Type
NORISK Erasmus+ Workshop	30/03/2023	Congress
CIHCLB 4º Congresso Internacional de História da Construção Luso-Brasileira	7/9/2023	Congress
Wastes 2023 – Sessão Indústria “Incorporação de Resíduos na Pavimentação”	6/9/2023	Conference
Cerimónia de lançamento da plataforma TMOB-HUB	30/03/2023	Launch Ceremony
Construir com Madeira	6/7/2023	Seminar

Most relevant 2nd cycle dissertations

Student	Supervisor 1	Supervisor 2	Thesis Title	Program	Company Involved
Jorge Gustavo Guimarães Fernandes	João Maia Couto		Building Information Modeling como ferramenta do Sistema de Informação para gestão de projetos de construção no Brasil	Engineering Project Management	
Ana Cláudia da Silva Pereira	Anabela Pereira Tereso	Pedro Ribeiro	Integração da Sustentabilidade com recurso à Framework Green Software na Gestão de Projetos de Sistemas de Informação: caso de uma consultora tecnológica em Portugal	Engineering Project Management	
Fábio Torres Ferreira	Carina Oliveira Pimentel		Consolidating suppliers and identifying purchasing strategies for stamped metal parts	Engineering Project Management	Bosch
Sandra Alberta Macedo Oliveira	Nuno Mendes		Reduction of the seismic vulnerability of masonry buildings through viscoelastic devices	Civil Engineering	
Dylan de Oliveira Pereira	Jorge Branco	Nuno Neves	Design of CLT elements in slab systems	Civil Engineering	Bysteel
Luana Mafalda Rodrigues Lages	Hugo Silva	Elisabete Teixeira	Design and performance evaluation of innovative and sustainable bio-based asphalt	Civil Engineering	

Student	Supervisor 1	Supervisor 2	Thesis Title	Program	Company Involved
			binders modified with polymers		
Aryadne Gomes de Macedo	Ricardo Mateus		Resilience of Earth-Based Construction Systems to Climate Changes	Integrated Master in Civil Engineering	Aryadne Gomes de Macedo
João Pedro Nunes Barrote	Hugo Silva		Characterization of bituminous mixtures applied to the parking lot of a logistics platform	Integrated Master in Civil Engineering	
Adriana Faria Salles	Luís Bragança		Integrating Urban Sustainability in the City Information Modelling concept	Sustainable Construction and Rehabilitation	
Bruno Souza Muniz	Miguel Azenha	José Granja	BIM platform to execute automated compliance checks in building permit processes	Sustainable Construction and Rehabilitation	
Othon de Oliveira Moreira Junior	Aires Camões	Raphaele Malheiro	High-performance concrete with large incorporations of glass powder	Sustainable Construction and Rehabilitation	
Rayssa Leal Ribeiro	Rui Ramos	Daniel Rodrigues	Study of emerging practices in the city planning process: the case study of Divinópolis (MG, Brazil)	Urban Engineering	
Diana Filipa Matos de Oliveira	Paulo Ribeiro		The 15-minute city concept applied to clusters of small dimension: The case of Vila das Taipas	Urban Engineering	
Alexandra Afonso Rodrigues	Hugo Silva	Fernando Fonseca	Impact of sidewalk surface condition on pedestrian circulation conditions	Urban Engineering	
Marin Ljuban	José Duarte Granja	José Lino	Compliance checking for construction project data with linked data	Building Information Modelling - BIM A+	
Andrijana Djukic	Hélder da Silva e Sousa	José Lino	Integrated Quality Assurance and Control Framework for BIM Models during Design, Construction and Operation	Building Information Modelling - BIM A+	

Student	Supervisor 1	Supervisor 2	Thesis Title	Program	Company Involved
Laura Gomes de Almeida	Miguel Azenha		Contribution to the Revision of the Portuguese Rules of Measurement Towards a Standardized BIM-Based Industry	Building Information Modelling - BIM A+	
Arezu Feizollahbeigi	Rafael Alvarez de Lara		Seismic assessment of dome structures with extra masses such as minarets around in seismic prone zones. Case study: Soltaniyeh Dome in Iran	Structural Analysis of Monuments and Historic Constructions	
Glynnis Flaum	Graça Vasconcelos	Amélia Dionísio	Assessment of salt crystallization induced damage in stone granite	Structural Analysis of Monuments and Historic Constructions	
Houman Mehralian	José Sena Cruz		Enhanced seismic performance of reinforced concrete structures with innovative systems	Structural Analysis of Monuments and Historic Constructions	

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 29 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; and 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	5
Associate professor	5
Assistant professor with Habilitation	1
Assistant professor	13
TOTAL	29

* 1 professor on external service

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
Jornadas de Engenharia Eletrónica 2023	27/02/2023 a 02/03/2023	Days
Roboparty	30/03-01/04/2022	Competition
XII edição do Simpósio do Grupo de Eletrónica de Potência e Energia	29/06/2023	Symposium
2º Simpósio do Doutoramento em Engenharia Eletrónica e de Computadores (DEEC)	3/11/2023	Symposium
Robot Charmie atende no Bar de Engenharia I no campus de Azurém	20/11/2023	Demonstration

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.
Visita do Agrupamento de Escolas da Trofa + Projeto Erasmus: "Novas tecnologias, novos mundos"	On 10 May 2023, throughout the morning, the DEI received a visit from the Trofa School Group + Erasmus Project: "New technologies, new worlds", made up of 26 students from Italy, Greece, Spain and Romania, 12 teachers and 14 students from the Trofa School Group.

Most relevant 2nd cycle dissertations

Student	Supervisor 1	Supervisor 2	Thesis Title	Program
Inês Alcântara Ribeiro	Gil Lopes	Jorge Cabral	Autonomous Driving by Neural Networks	Integrated Master in Industrial Electronics and Computers Engineering
João Diogo Santos Correia	Luis Louro		Navigation Control and Docking Manoeuvres of Autonomous Mobile Manipulators in Internal Logistics Environments	Integrated Master in Industrial Electronics and Computers Engineering
Beatriz da Silva Simões	Vitor Monteiro	Tiago Viegas	Electrical Monitoring of Renewable Energy Installations: Wind and Solar Photovoltaic Systems	Industrial Electronics and Computer Engineering
João Pedro Dias Miranda	Gabriel Pinto		Development of a modular BMS with active balancing	Industrial Electronics and Computer Engineering
Inês Alcântara Ribeiro	Gil Lopes	Jorge Cabral	Autonomous Driving by Neural Networks	Integrated Master in Industrial Electronics and Computers Engineering
João Diogo Santos Correia	Luis Louro		Navigation Control and Docking Manoeuvres of Autonomous Mobile Manipulators in Internal Logistics Environments	Integrated Master in Industrial Electronics and Computers Engineering
Beatriz da Silva Simões	Vitor Monteiro	Tiago Viegas	Electrical Monitoring of Renewable Energy Installations: Wind and Solar Photovoltaic Systems	Industrial Electronics and Computer Engineering
João Pedro Dias Miranda	Gabriel Pinto		Development of a modular BMS with active balancing	Industrial Electronics and Computer Engineering

Student	Supervisor 1	Supervisor 2	Thesis Title	Program
Diogo Renato Dias Martins	Cristina Santos		Deep Learning-based Posture Recognition for a Holistic Ergonomic Assessment Framework	Integrated Master in Biomedical Engineering - Medical Electronics
Elsa Patrícia Marques Ferreira	Carlos Silva	Adriano Pinto	Fibrosis Segmentation in Cardiac Resonance Imaging	Integrated Master in Biomedical Engineering - Medical Electronics
João Emanuel Lavinas Gomes Lopes	Carlos Lima		Segmentation of surgical tools from laparoscopy images	Integrated Master in Biomedical Engineering - Medical Electronics
Pedro António Ribeiro da Costa Sampaio	Vitor Gomes Correia	Liliana Afonso Truta	Development of sustainable flexible batteries for wearables	Engineering Physics
Clarisse Rodrigues Ribeiro	Luís Valente Gonçalves		Microplastics sensor for oceans	Engineering Physics
Florival Moura da Cunha	Manuel Ribeiro da Silva		Assembly and installation of an atomic layer deposition (ALD) system and deposition of AL ₂ O ₃ and SiO ₂ films for different applications	Engineering Physics
José Pedro Vilela Bravo	José Cabral	Sérgio Lopes	Framework for creating online stores	Integrated Master in Telecommunications and Informatics Engineering
João Miguel Cerca Alves	José Cabral	Sérgio Lopes	Transforming Melodic Diggers: A full stack solution for a unified user experience	Telecommunications and Informatics Engineering
Joana Ramalho Querido	José Cabral	Sérgio Lopes	Generation of online stores oriented towards a Framework – Product management functionality	Integrated Master in Telecommunications and Informatics Engineering
Sara Daniela da Silva Coelho	António Fernando Ribeiro	Agostinho Teixeira Lopes	Vehicle detection in parking lots using machine learning	Integrated Master in Telecommunications and Informatics Engineering
Tiago José Macedo Leite	Vitor Monteiro		Development of a DC-DC Converter for Interfacing a Renewable Energy	Mechatronics Engineering
Tiago Rafael Cunha Magalhães	Vitor Monteiro	Luís Martins	Project of a Collective Electrical Installation using Home Automation and Energy Efficiency	Mechatronics 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	5
Associate professor with Habilitation	1
Associate professor	6
Assistant professor with Habilitation	2
Assistant professor	13
TOTAL	27

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

Events

Event	Date	Type
Mechanical Engineering Inaugural Class 2023	12/2/2023	Class
Virtual Product Development Days	2/6/2023	Competition
Nanotecnologia Aplicada à Engenharia Mecânica	11/10/2023	Talk
Race Party 2023	12/10/2023	Competition
Industrialisation Seminars	October/Novembre 2023	Seminars

Link to Society Projects

Project	Description
IRREFLEXOS - Engenharia e Arte	The School of Engineering of the University of Minho (EEUM) presented the "Engineering and Art" cultural initiative on July and November at the B-Lounge Spaces of the Libraries of UMinho. The event was part of UMinho's 50th anniversary programme and was supported by the Documentation and Library Services Unit. "IRREFLEXOS" is an exhibition by the author Leonor Lapa, a senior technician in the Mechanical Engineering Department, who brought a selection of photographs she has taken since 2009 at UMinho events and spaces.
Formula Student	On 31 July, the University of Minho made its debut in Formula Student, which is contested annually by higher education students on circuits around the world. The debut was in a European context, at the Castelo Branco kart track, and in class 2 (virtual prototype). The FSUMinho team was created by mechanical engineering students and is currently made up of students from various engineering disciplines.

Most relevant 2nd cycle dissertations

Student	Supervisor 1	Supervisor 2	Thesis Title	Program	Company Involved
Inês Azevedo Mendes	Nuno Peixinho	João Cardoso	Desenvolvimento conceptual de um satélite para operar em VLEO	Mechanical Engineering – Integrated Design in Mechanical Construction	INEGI
Samuel Leite Gomes	Hélder Puga	Vitor Carneiro	Alívio de Tensões Residuais por Vibração Ultrassónica	Mechanical Engineering - – Integrated Design in Mechanical Construction	
Leonardo Beckhauser Mazzitelli	José Machado	José Teixeira	Small Aircraft Fuel System Model Analysis	Mechanical Engineering – Mechatronic Systems	CeiiA
Sara Gonçalves Gören	Nuno Dourado		Caraterização à fratura em modo I de juntas adesivas formadas por placas de circuito impresso e componentes poliméricos: estudo numérico-experimental	Mechanical Engineering – Advance3d Manufacturing	Preh Portugal

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 Polimeros 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	3
Associate professor	3
Assistant professor with Habilitation	2
Assistant professor	7
TOTAL	16

*1 professor on external service

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 Polímeros	11-12/04/2023	Days
Dia Aberto do DEP 2023	29/03 and 19/04/2023	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. 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 1	Supervisor 2	Thesis Title	Program	Company Involved
José Miguel Moreira Azevedo Ribeiro Barbosa	Conceição Paiva	Ana Silva	Preparação de compósitos de poli(éter-éter-cetona) e nanopartículas de carbono para multifilamentos condutores	Integrated Master in Polymer Engineering	CeNTI - Centro de Nanotecnologia e Materiais Técnicos, Funcionais e Inteligentes
Mário Filipe Santos Pinto	Conceição Paiva	Eunice Cunha	Compósitos híbridos de fibras e nanotubos de carbono em resina epóxico	Integrated Master in Polymer Engineering	INEGI - Instituto de Ciência e Inovação em Engenharia Mecânica e Engenharia Industrial
Carolina Dinis de Campos	Conceição Paiva	Ana Lima	Study of interactions between a surface protection polymer and materials used in Bosch Car Multimedia products	Integrated Master in Polymer Engineering	Bosch Car Multimédia Portugal, S.A.
João Duarte Alves de Sousa	José Covas		Experimental Validation of a Microextruder and In-line Rheological Characterization of Polymeric Systems for FDM	Integrated Master in Materials Engineering	
Diogo Miguel de Albuquerque e Almeida	António Brito	Marta Pimenta	Desenvolvimento de um "Bubble deck" por moldação por injeção	Integrated Master in Materials Engineering	Lucemplast
Marta Claudia Baptista Oliveira	João Miguel Nóbrega		Development of an utility in OpenFOAM to predict fiber orientation in fiber reinforced thermoplastic materials armazenamento de energia	Integrated Master in Materials Engineering	
Gabriel Carvalho Cerqueira	António Vilela Pontes	João Oliveira Cortez	Estudo e otimização dos processos de injeção e pintura de um produto fabricado em PBT reforçado para a área automóvel	Integrated Master in Polymer Engineering	Celoplás, Plásticos para a Indústria S.A

Student	Supervisor 1	Supervisor 2	Thesis Title	Program	Company Involved
Márcia Dinis Albuquerque	António Cunha	Agnieszka Rocha	Estudo do efeito das condições de processamento da moldação por injeção e da soldadura por laser de transmissão usando polímeros com fibras de vidro	Integrated Master in Polymer Engineering	PIEP
Ivo Miguel Pereira Macedo	Olga Carneiro		Influência dos Parâmetros de Impressão 3D na Recuperação de Polímeros de Memória de Forma (SMP)	Integrated Master in Polymer Engineering	
Tomás Ramos Ribeiro	Conceição Paiva	Ana Silva	Production of melt-spinning fibers with heat conduction properties	Integrated Master in Polymer Engineering	CeNTI
Catarina Isabel Oliveira Faria	Júlio Viana	Sílvia da Cruz	Influência das condições do processo IME na produção de componentes funcionais	Integrated Master in Polymer Engineering	PIEP
Jorge Filipe Costa Alves	Fernando Duarte	Mafalda Costa	Otimização do processo de pintura monocura UV com tinta reciclada	Integrated Master in Polymer Engineering	Fehst Componentes
Diana Sofia Ribeiro de Sousa	António Cunha		Estudo da processabilidade de misturas de Polietileno reciclado para a produção de filmes	Integrated Master in Polymer Engineering	
Ana Francisca Gomes Costa	Fernando Duarte	Renato Reis	Termoformação de biocompósitos de resíduos agroalimentares com fragrâncias	Integrated Master in Polymer Engineering	PIEP
Lucas Manuel Ferreira Azevedo	António Brito		Definição de métricas para a previsão de defeitos estéticos através de simulação	Polymer Engineering	

Student	Supervisor 1	Supervisor 2	Thesis Title	Program	Company Involved
Inês Filipa da Costa Rodrigues	Júlio Viana	Vasco Araújo	Estudo e comparação de diferentes abordagens para a simulação numérica do processo de injeção	Polymer Engineering	InovePlastika
Sara Daniela Gomes Borges	Júlio Viana	Ana Moreira	Incorporação de material reciclado de peças pintadas	Polymer Engineering	Fehst Componentes
Nhlapo Thutswana Victor	João Nunes	Paulo Antunes	Circularity of Thermoplastic Matrix	Polymer Engineering	PIEP
Mariana Guerreiro da Silva	Fernando Duarte	Susana Gonçalves	Desenvolvimento de embalagem de origem natural para contacto alimentar pelo processo de termoformação	Polymer Engineering	Intraplás S.A.
Ana Rita Ferreira Gonçalves	Fernando Duarte		Termoformabilidade de substratos de Policarbonato com tintas funcionais para In-Mold Electronics	Polymer Engineering	
Ana Catarina Fernandes Pereira	Conceição Paiva	Silvia Santos	Study of the behaviour of an epoxy resin with graphene nanoplatelets in a film capacitor	Polymer Engineering	Vishay Electrónica Portugal
Cristiana Patrícia Marques da Costa	Carla Martins	João Cortez	Behaviour of core and cavity inserts in injection moulding of high -performance polymers	Polymer Engineering	Celoplás
Maria João Rocha Simão	Carla Martins	Tiago Barbosa	Análise de circularidade do produto em diferentes estágios de conceção e produção no setor automóvel	Polymer Engineering	Fehst Componentes
Marta Daniela Marcos Freitas	Carla Martins	Sílvia Vilaça	Indicadores para monitorizar a competitividade económica e ambiental em contexto de empresa	Polymer Engineering	InovePlastika

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 2022/2023, 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	4*
Assistant professor with Habilitation	0
Assistant professor	12
TOTAL	17

*1 professor on external service

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

Events

Event	Date	Type
Jornadas DMM 2023	12-13/04/2023	Days
8ª edição do UModa	2/6/2023	Presentation
Jornadas Têxteis	20-22/03/2023	Days
Workshop de Moda, Emoção e Circularidade - Um projeto de Upcycling (bachelor students)	22/02/2023; 01-08/03/2023	Workshop
Workshop Cor Sustentável (bachelor students)	20-21/06/2023	Workshop

Link to Society Projects

Project	Description
Partnership with Academia Sénior de Nine	The Senior Academy of Nine in Famalicão, in partnership with the Master's Degree in Design and Innovation of Textile Products at the University of Minho, will produce a collection of women's clothing centred on the over-75s.
Collaboration with Escola Profissional de Gaia	The project, which took place from the 13th to the 15th of December 2023, was promoted by the Escola Profissional de Gaia under the theme "Pensar Design/To Think Design", proposed to present and debate with teachers from various levels of design education and professionals the perspective "The freedom of Design and Design and Freedom". EPG students and teachers, together with a panel of guests, debated the importance of freedom in creativity and design activities. A central element was to provide a deeper understanding of the impact that the implementation of the democratic regime on April 25, 1974 in Portugal had on the dissemination of freedom of thought and creation. This action began with the conference and debate held by DET professor, Graça Guedes on December 13th.
Collaboration with ISMAT from Portimão for a design conference	Moderação da Mesa Redonda "Marketing e Marcas de Moda: Tendências, perspetivas e necessidades de formação". Intervenientes: Mónica Lipes – Marketing director da Interopticcuss; Daniela Neto – Brand Coordinator da Salsa, Valentim Quaresma – Fashion Brand, Helder Rosendo – Business Manager, TMG Textiles, Susana Marques – Diretora criativa da Lords & Fools, Simpósio Moda e ITV – Formação de Talentos para a Fileira da Moda, 20 de janeiro de 2023, ISMAT, Portimão.
Partnership with Escola Artística Soares dos Reis - Porto and support from Associação FABLABs Portugal	Workshop with the theme Sustainability: The New Idea and its Positioning in the Market - Studies, held on March 6, 2023. The action was attended by three speakers and facilitators of the workshop, Rita Carvalhas representing EASR, Nuno Vilela in representation of the Fablabs Association and Graça Guedes representing DET/2C2T. The recipients were teachers and students of Product Design courses (includes the Textile Product Branch). The central objective was to mobilize participants around the need to associate design, invention and creation, as a way of stimulating the circular economy, and allowing the development and consumption of new truly sustainable products.
Collaboration at the invitation of RTP 2, with the Programme Sociedade Civil	The Sociedade Civil program, nº 60, on RTP 2, on April 10, 2023, focused on the textile sector in its multiple aspects. Among the various participants, who debated and presented their experiences and perspectives on the subject of teaching and its central role in the system, the guest was Graça Guedes, from DET, who participated from the RTP studios in Lisbon.

Most relevant 2nd cycle dissertations

Student	Supervisor 1	Supervisor 2	Thesis Title	Program	Company Involved
Sofia de Castro Ferreira Bordonhos	Inês do Amaral		A Arte na comunicação de moda: Estudo de caso da Purificacion Garcia	Fashion Design and Communication	
Diana Vidal Soa	Inês do Amaral		A comunicação digital no processo de internacionalização de uma marca de moda: adaptação a um novo mercado – o estudo de caso da Frambooesas	Fashion Design and Communication	
Miriam Loureiro de Sousa	Inês do Amaral	Joana Cunha	Moda sustentável e comunicação digital: caso prático do evento Fashion-Alive	Fashion Design and Communication	
Tiago Jorge Mendonça Pinto Azevedo	Diana Ferreira	Raúl Fangueiro	Desenvolvimento de têxteis multifuncionais para o desenvolvimento de equipamentos de proteção: o efeito sinérgico entre as estruturas fibrosas e os nanomateriais	Textile Engineering - Advanced Materials and Technologies	Universidade do Minho/IDEPA
Maria João Alves Carneiro	Andrea Zille		Acabamento Antimicrobiano de Têxteis-Lar pela Aplicação de Nanopartículas de Óxido de Cobre, Recorrendo ao Processo Sol-Gel	Textile Engineering - Functional Materials and Finishings	Universidade do Minho/Mundotêxtil – Indústrias Têxteis S.A.
Francisco Manuel Monteiro Machado	Jorge Gomes Santos		Desenvolvimento e otimização de um processo de tingimento por impregnação de fibras celulósicas com corantes reativos	Textile Engineering - Advanced Materials and Technologies	Universidade do Minho/J. F. Almeida S.A.
Anny Karolinny Santos Simões	Maria José Abreu		Materiais Sustentáveis para a Indústria da Moda através do processo de Downcycling	Design and Marketing of Textile Products, Apparel and Accessories	
Melanie Raquel Alves Rodrigues	Maria Guedes		Impacto da Estética do Vestuário Interior no Consumidor	Design and Marketing of Textile Products, Apparel and Accessories	

Student	Supervisor 1	Supervisor 2	Thesis Title	Program	Company Involved
Ivis de Aguiar Souza	Diana Conceição		Design de estruturas fibrosas implantáveis para tratamento de lesões da medula espinhal	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, Artificial Intelligence, Distributed and Reliable Systems, Information Security and Cryptography, High-Performance Computing, Software Engineering, Logic and Formal Methods, Data Science, Intelligent Systems, 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 49 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 research structures mentioned above, and several partnerships 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	6
Associate professor with Habilitation	9
Associate professor	4
Assistant professor with Habilitation	2
Assistant professor	28
TOTAL	51

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

Events

Event	Date	Type
Seminário do DI: "Software 2.0: vamos deixar de programar?"	01/2/2023	Seminar
SEI – Semana da Engenharia Informática	14-17/02/2023	Days
DojoCon – CoderDojo Braga	24-25/03/2023	Talks
JOIN (Jornadas de Informática)	05-07/06/2023	Days
12ª Edição das Jornadas COMUNICA+	16-17/05/2023	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 1	Supervisor 2	Thesis Title	Program	Company Involved
Pedro Miguel da Silva Paiva António	Paulo Carvalho	João Paulo	Support for Cloud and Kubernetes environments and evolution towards SaaS	Informatics Engineering	Altice Labs
Eduardo Benjamim Lopes Coelho	Victor Alves	Hugo Peixoto	Edge-Enabled Multi-Agent System Architecture for Multimodal Machine Learning	Informatics Engineering	
Angélica Soares Cunha	Pedro Henriques		Computational Thinking Training Resource for Visually Impaired Individuals	Informatics Engineering	

Student	Supervisor 1	Supervisor 2	Thesis Title	Program	Company Involved
Rui Pedro da Cunha Monteiro	João Silva	Fábio Coelho	An environment to support energy-aware networks developments	Integrated Master in Informatics Engineering	
Eduardo Lourenço da Conceição	José Pereira	Ana Alonso	Approximate Distributed Agreement Toolkit	Integrated Master in Informatics Engineering	
André Rodrigues Soares	João Fernandes	André Ferreira	A Deep-learning approach to detect scratches in vehicles	Integrated Master in Informatics Engineering	BOSCH CAR MULTIMEDIA S.A
Irving Leander Reascos Valencia	Nuno Peres	Joaquim Rossier	Quantum Simulation of spin systems on Quantum Computers	Engineering Physics	
Magda Mendes Duarte	Nuno Castro	Raúl Pereira	Muon tomography: application of image reconstruction algorithms within the LouMu project	Engineering Physics	
Rodrigo da Silva Gomes Peres Coelho	Luís Santos	André Sequeira	Tradeoff between moving targets, gradient magnitude and performance in quantum variational Q-Learning	Engineering Physics	
Diogo Duarte Pinto Macedo	Miguel Rocha		Development of Deep Learning Models for scRNA data analysis	Bioinformatics Engineering	
Mónica Rafaela Machado Leiras	Óscar Dias	Vitor Pereira	Development of a serious game to stimulate the learning of genome-scale metabolic modeling concepts	Bioinformatics Engineering	OmniumAI
Daniela Filipa Machado Lemos	Ana Braga		Regressão não linear em curvas de crescimento para parâmetros placentares em R	Bioinformatics Engineering	
Eduardo José de Sá Pousa	António Costa	Vinicius Ferreira	Monitorização de Infraestruturas TI	Integrated Master in Telecommunications and Informatics Engineering	
Henrique Miguel Cardoso Matos	Henrique Santos		Multi-people tracking using a distributed camera network: application to a University Campus	Integrated Master in Telecommunications and Informatics Engineering	

Student	Supervisor 1	Supervisor 2	Thesis Title	Program	Company Involved
Hugo Daniel da Costa Machado	Bruno Dias		Otimização de protocolo para distribuição sincronizada de áudio multicanal em redes sem fios	Integrated Master in Telecommunications and Informatics Engineering	

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	5
Associate professor	10*
Assistant Professor with Habilitation	2
Assistant professor	22
TOTAL	45

*1 professor on external service

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

Events

Event	Date	Type
Workshop Gestão de Projetos 2023	20/01/2023	Workshop
Doctoral Program in Industrial and Systems Engineering (DPISE) Workshop	31/05/2023	Workshop
Summer School on Quality and Organizational Excellence - Digital Quality	14-16/06/2023	Summer
CISPÉE2023 - 5th International Conference of the Portuguese Society for Engineering Education	05-07/07/2023	Conference
International Symposium on Occupational Safety na Higiene (SHO 2023)	20-21/07/2023	Conference

Link to Society Projects

Project	Description
Evento Competind 4.0 2023	Engineering Project Management Master's students continue to organise this event that brings the business world closer to the university.
JORNADAS MES 2023	The Master's in Systems Engineering Conference, held on 15 February, with the theme "Data-driven Industry", is an annual event that aims to promote interaction between students on the Master's in Systems Engineering (MES) course and the business community.
"Voluntariado na UMinho – UMinho em Campo: Juntos na Transformação"	Member of the UMinho Volunteering Implementation Committee. This Committee's primary purpose will be to organize the first teacher training session in 2023 on Service-Learning, promote the activity of Volunteering, create a new Curriculum Unit in the UMinho Option to be implemented in the academic year 2024/2025, recruit partner entities through communication actions, and promote the actions deemed necessary for the accreditation of volunteer activities.
EGITalks2023	Two sessions in a Roundtable format organized in partnership with NEEGIUM: - November, 20: "Como um Engenheiro e Gestor Industrial enquanto Gestor de Pessoas" - December, 06: "A Engenharia e Gestão Industrial na Saúde"
Participação dos alunos do 1º ano PBL no "ACA Innovation Challenge"	ACA Innovation Student award: https://grupo-aca.com/acao/aca-innovation-challenge

Most relevant 2nd cycle dissertations

Student	Supervisor 1	Supervisor 2	Thesis Title	Program	Company Involved
Bruno da Silva Barbosa	Anabela Alves	Marcelo Henriques	Desenvolvimento de uma abordagem à utilização de modelos de simulação no projeto/reconfiguração de sistemas de produção de um fornecedor da indústria automóvel	Industrial Engineering and Management	Bosch
Sara Raquel Oliveira Sá	Sameiro Carvalho	João Gonçalves	Definição de Stocks de Segurança de Materiais em Contextos de Incerteza	Industrial Engineering and Management	COINDU, S.A.
Mariana da Silva Relvas	Paulo Sampaio	André Carvalho	Cultura Organizacional e Teletrabalho: um estudo sobre o impacto deste novo paradigma do mundo laboral	Industrial Engineering and Management	
Catarina Pereira Soares Novais dos Santos	Carina Pimentel		Uma Abordagem de Otimização para o Planeamento Tático da Produção numa Empresa de Enchimento	Industrial Engineering and Management	LTPlabs
Joana de Fátima Nunes da Silva	Anabela Alves		Melhoria de uma célula de produção aplicando princípios Lean Thinking numa empresa de material elétrico	Integrated Master in Industrial Management and Engineering	Gewiss
Ana Rita Silva Dias	Paulo Sampaio		From Concept to Application: Implementation of a Capability Roadmap towards Quality 4.0	Engineering and Quality Management	
Ana Margarida Dâmaso Gomes Dias	Paulo Sampaio		A Capability Roadmap Towards Quality 4.0	Engineering and Quality Management	

Student	Supervisor 1	Supervisor 2	Thesis Title	Program	Company Involved
Ana Francisca Martins	Cristina Rodrigues		Identificação e avaliação de perdas no processamento de leite	Engineering and Quality Management	
Joana Pinto Barbosa	Nelson Costa	Susana Costa	Avaliação de Ferramentas Tecnológicas para o Ensino de Ergonomia, Saúde e Segurança	Human Engineering	
Ana Catarina Alves Pinto	Paula Carneiro	Ana Colim	Implementação de ergonomia participativa para prevenção de LMERT numa empresa de engarrafamento de águas	Human Engineering	SuperBock Group
Aline Paganine Gomes	Paula Carneiro	Ana Colim	Aplicação de ergonomia para a melhoria de uma linha de costura de assentos automóveis	Human Engineering	
Inês Sofia Paiva Bastos	Teresa Monteiro	Luís Santos	Visualização de Dados: Fatores Críticos de Sucesso	Systems Engineering	JTA Consulting
Maria Inês da Costa Marques	Maria Varela	Cátia Alves	Aplicação de ferramentas Lean num processo de produção com vista à redução das principais improdutividades	Systems Engineering	Solidal – Condutores Eléctricos, S.A
Francisca Lopes Costa Santos	Carina Pimentel		Workforce Management at Bosch Termotechnology	Systems Engineering	Bosch Termotechnology
Jorge Gustavo Guimarães Fernandes	João Couto (DEC)		Building Information Modeling como ferramenta do Sistema de Informação para gestão de projetos de construção no Brasil	Engineering Project Management	

Student	Supervisor 1	Supervisor 2	Thesis Title	Program	Company Involved
Ana Cláudia da Silva Pereira	Anabela Tereso	Pedro Ribeiro (DSI)	Integração da Sustentabilidade com recurso à Framework Green Software na Gestão de Projetos de Sistemas de Informação: caso de uma consultora tecnológica em Portugal	Engineering Project Management	Ana Cláudia da Silva Pereira
Fábio Torres Ferreira	Carina Pimentel		Consolidating suppliers and identifying purchasing strategies for stamped metal parts	Engineering Project Management	Bosch
Catarina Alves Pedro	Eusébio Nunes	Sérgio Sousa	Balanceamento entre Parametrizações de Funcionamento de Dois Equipamentos em Série, Raio X e SVE, no Processo de Produção de Rolhas Naturais	Engineering and Operations Management	Amorim Cork S.A.
João Miguel Sousa Cardoso	Anabela Alves		Melhoria de Processos Aplicando Princípios Lean Thinking numa Empresa de Componentes Eletrónicos para a Indústria Automóvel	Engineering and Operations Management	AptivPort Services S.A.
Mónica Gonçalves Pereira	José Moreira		Desenvolvimento de uma Metodologia de Recolha e Análise de Tempos de Ciclo de Processos Produtivos para a Indústria Automóvel	Engineering and Operations Management	Bosch Car Multimedia, S.A.

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	7
Associate professor	2**
Assistant professor with Habilitation	1
Assistant professor	16***
TOTAL	30

*1 professor on external service;

** 1 professor on external service;

*** 2 professors on external service.

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

Events

Event	Date	Type
TSI2MARKET'23	18-20/04/2023	Days
Simpósio do PDTSI - Doctoral Program on Information Systems and Technology	21/06/2023	Symposium
AAUM Torneio eSports [temporary exhibition at the Computer Museum]	04-07/07/2022	Temporary Exhibition
Utilização de AutoML pelas PMEs	14/07/2023	Workshop
AI4IS@EPIA'2023 - Artificial Intelligence for Industry and Society, Azores, Portugal, (Co)Chair Prof. Filipe Portela.	05-08/09/2023	Conference

Link to Society Projects

Project	Description
Comunidade de Prática em Engenharia Software (CPES)	Software Engineering integrates several interconnected and complementary areas (among others, Requirements, Architecture, Construction, Quality, Design). Currently, there are several UCs, from various courses, at various levels of education, originating from different departments, which address Software Engineering themes
Museu de Informática - Informatics MuseUM	The mission of the Informatics MuseUM is to preserve and disseminate the history of computing (mainly in Portugal). It seeks to contribute to society in several ways: through the preservation of history; the execution of activities for multiple audiences; and research.
Museu do Smartphone - Smartphone MuseUM	The mission of Smartphone MuseUM is to preserve and disseminate the art and history of (smart)phones and associated equipments, particularly considering their adoption, utilization, and replacement. It seeks to contribute to society in several ways: through the preservation of history; the execution of activities for multiple audiences; and research.
European PAFSE project	The UMINHO's PAFSE subproject is focused on integrating STEM education subjects and low-code development, thereby promoting both STEM and digital literacy.
STVgoDIGITAL: Digitalização da cadeia de valor do Setor Têxtil e Vestuário (projeto mobilizador)	Its aim is to encompass a set of R&D initiatives, with the central involvement of companies in the Textile and Clothing sector and other complementary sectors, which will boost the adoption and transition to the new paradigm of Industry 4.0 and the digital transition, with an emphasis on information and communication technologies.

Most relevant 2nd cycle dissertations

Student	Supervisor 1	Supervisor 2	Thesis Title	Program	Company Involved
Beatriz Rodrigues da Silva	Manuel Santos	António Abelha	Clinical Decision Support based on Open Data Standards and Decision Models	Integrated Master in Engineering and Management of Information System	Centro Hospitalar Universitário de Santo António
Nicolas Ribeiro Pires de Sousa	João Varajão		Method for Supporting the Definition of Information Systems Action Plans	Integrated Master in Engineering and Management of Information System	ANI - National Innovation Agency (Portugal)
Márcia Filipa Teixeira Veloso	João Varajão		Selection of Methods in Information Systems	Integrated Master in Engineering and Management of Information System	
Carla Maria Leite Rebelo	João Varajão		Ethics in IST: Challenges and Directions for Practice and Research	Integrated Master in Engineering and Management of Information System	
Cátia Videira Pires	João Varajão		IT Outsourcing Success Management	Integrated Master in Engineering and Management of Information System	Thales Raytheon Systems (France)
Paula Cristina Martins Dias	Paulo Cortez	Luís Matos	Comparação de Abordagens de Machine Learning para Detecção e Antecipação de Movimentos de Risco em Trabalhadores de Costura	Integrated Master in Engineering and Management of Information System	CITEVE, CCG, Universidade do Minho
Diogo Miguel Pinto Rio	Adriano Moreira	Filipe Meneses	Seguimento de objectos em ambiente industrial	Integrated Master in Informatics Engineering	
Miguel Angelo Moreira Nunes	Telmo Adão	Pedro Branco	Case study with Augmented Reality mobile application	Interactive Technologies	

Student	Supervisor 1	Supervisor 2	Thesis Title	Program	Company Involved
Ana Cláudia da Silva Pereira	Anabela Tereso (DPS)	Pedro Ribeiro (DSI)	Integração da Sustentabilidade com recurso à Framework Green Software na Gestão de Projetos de Sistemas de Informação: caso de uma consultora tecnológica em Portugal	Engineering Project Management	
João Miguel Cerca Alves	Sérgio Lopes	José Cabral	Transforming Melodic Diggers: A full stack solution for a unified user experience	Telecommunications and Informatics Engineering	
Tiago João Pereira Ferreira	Maria João Pinto	António Costa	A Virtual Traffic Light Solution Based on the Fog Computing Paradigm	Telecommunications and Informatics Engineering	
Rui Filipe Ribeiro Freitas	Maria João Pinto	António Costa	Detection and positioning of vulnerable road users in vehicular networks	Telecommunications and Informatics Engineering	
Carlos Miguel Correia de Oliveira	António Costa	Maria João Nicolau Pinto	Quizzero: a Quiz application for the Zerzero website	Telecommunications and Informatics Engineering	
Pedro Rui Pereira Guimarães	Maribel Santos	Ana Palacio	An Automated Patterns-based Model-to-Model Mapping and Transformation System for Labeled Property Graphs	Systems Engineering	
Pedro Miguel Pereira Lopes	Ricardo Machado		Prototyping the CityCatalyst Project's Data Federation Platform Based on the Fiware Reference	Systems Engineering	

Student	Supervisor 1	Supervisor 2	Thesis Title	Program	Company Involved
José Filipe de Queiroz Miranda	José Soares		Cyber Risks in Information Technology Enterprises: Challenges and Recommendations	Systems Engineering	
Inês de Mesquita Ramalho de Castro Fernandes	José Soares	Anabela Tereso	Development of the Governance Model of the Portuguese Project Management Observatory	Systems Engineering	

5 – INNOVATION AND 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 | ISISE

Very Good – 2C2T | ALGORITMI | HASLAB | IPC | METRICS

Good – CTAC

5.2 – Collaborative Laboratories

Through its research centres the School of Engineering of the University of Minho collaborates with 14 collaborative laboratories.

Collaborative Laboratories
ADVID - Vines&Wines
ARISE - Laboratório Associado para Produção Avançada e Sistemas Inteligentes
BIOREF
BuiltColab
CCG - Centro de Computação Gráfica
CoLab for Data Drive Innovation Services
CoLab4Food
CoLAB VORTEX
DTx - Digital Transformation Colab
ECOLab
LABELLS - ASSOCIATE LAB
Laboratório Associado de Sistemas Inteligentes (LASI)
ProChild
RAIL COLAB

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

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

Publications

Journals and proceedings (SCOPUS)

Indexed journals (Scimago quartil)	Q1	Q2	Q3	Q4	Non-rated (@ SCOPUS)	Total
	32	13	5	2	13	65
Indexed proceedings	0					

Other publications

Non-indexed journals	0
Non-indexed proceedings	20

PhD

Year	Number of students	Number of doctorates	Number of Pos-Doc
2023	41	3	2

Theses and dissertations	Number
PhD theses completed	3

Achievements

Major achievements	Identification		
Flagship publications	<p>Carbon Nanotube – Polyurethane Composite Sheets for Flexible Thermoelectric Materials</p>	<p>Halochromic Silk Fabric as a Reversible pH-Sensor Based on a Novel 2-Aminoimidazole Azo Dye</p>	<p>Application of self-sensing cement-stabilized sand for damage detection</p>
	<p>Antonio J. Paleo, Yadienka Martinez-Rubi, Beate Krause, Petra Pötschke, Michael B. Jakubinek, Behnam Ashrafi and Christopher Kingston. ACS Applied Nano Materials. 2023. 6(19).</p>	<p>Ribeiro, A.I.; Vieira, B.; Alves, C.; Silva, B.; Pinto, E.; Cerqueira, F.; Silva, R.; Remião, F.; Shvalya, V.; Cvelbar, U.; et al. Polymers 2023, 15, 1730.</p>	<p>Mohammad Jawed Roshan, Mohammadmahdi Abedi, António Gomes Correia, Raul Figueiro. Construction and Building Materials, 2023. 403, 133080.</p>
Flagship projects	<p>Projeto Lusitano: Agenda Mobilizadora para a Inovação Empresarial da Indústria Têxtil e do Vestuário de Portugal</p>	<p>AGENDA GREENAUTO - GREEN INNOVATION FOR THE AUTOMOTIVE INDUSTRY</p>	<p>BE@T – Bioeconomia para Têxtil e Vestuário para Reforço da Bioeconomia Nacional</p>
	<p>To develop ecological and functional filiform structures from the recycling and recovery of fibrous textile waste. The aim of this project is also to study the functionalisation of the sustainable filiform structures to be developed, with the aim of providing them with additional functional performance characteristics.</p>	<p>Aims to transform the national automotive industry in the context of the current transition to low-emission vehicles. The University of Minho's participation is aimed at developing technical textiles, airbag modules and HMI steering wheels for the vehicle.</p>	<p>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.</p>
Scientific recognition	<p>EEUM Diploma of Recognition of Merit for Scientific Publication</p>	<p>World's Top 2% Scientists 2023</p>	
	<p>Raúl Manuel Esteves Sousa Figueiro, Andrea Zille and António Jose Paleo Veito</p>	<p>Andrea Zille, Helena Felgueiras, and Raul Figueiro are in the list of World's Top 2% Scientists 2023 according to a study of Stanford University and Elsevier.</p>	
Scientific leadership	<p>Fibrenamics - Institute of Innovation in Fiber-based Materials and Composites</p>	<p>T-MOB HUB</p>	<p>AUTEX</p>
	<p>Presidency of Fibrenamics - Institute of Innovation in Fiber-based Materials and Composites</p>	<p>This platform covers the main transportation modes. UMinho research centres involved are Algoritmi, CTAC, IPC, ISISE, CMEMS, METRICs and 2C2T.</p>	<p>2C2T is an active member of AUTEX. It currently has 45 members from 29 countries. Raul Figueiro is the Editor in Chief of the AUTEX Research Journal.</p>

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

PhD full members	Internal	External	Total
	96	8	104
PhD associated members	Total		
	158		
Technical staff	Total		
	3		

Publications

Journals and proceedings (SCOPUS)

Indexed journals (Scimago quartil)	Q1	Q2	Q3	Q4	Non-rated (@ SCOPUS)	Total
	65	83	6	3	78	
Indexed proceedings	239					

Books

Type	International	National	Total	
Authoring	31	-	31	38
Edition	7	-	7	
Book of proceedings	-	-		
Outreach book	-	-		
Educacional book	-	-		
Non-indexed (@SCOPUS) book chapters	24	-	24	

PhD

Year	Number of students	Number of doctorates	Number of Pos-Doc
2023	50	262	4

Theses and dissertations	Number
PhD theses completed	14

Distinctions and dissemination

Scientific dissemination and Knowledge transfer			
National patents	Submitted	Granted	Total
	0	0	0
International patents	Submitted	Granted	Total
	0	25	25

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	<p>A data-driven intelligent decision support system that combines predictive and prescriptive analytics for the design of new textile fabrics</p>	<p>Validation of a development methodology and tool for IoT-based systems through a case study for visually impaired people</p>	<p>Perceptions of the academic community on the performance of sustainable development initiatives in higher education</p>
	<p>Ribeiro, R.; Pilastrri, A.; Moura, C.; Morgado, J.; Cortez, P.. Neural Computing and Applications, Volume 35 (2023) (https://doi.org/10.1007/s00521-023-08596-9)</p>	<p>Guerrero-Ulloa, G.; Fernández-Loor, A.; Moreira, F.; Novais, P.. Internet of Things, Volume 23 (2023) (https://doi.org/10.1016/j.iot.2023.100900)</p>	<p>Filho, W.; Vasconcelos, C.; Ferreira, P.; Araújo, M.. Sustainable Development Volume 31, Issue 5 (2023) (https://doi.org/10.1002/sd.2633)</p>
Flagship projects	<p>Be.Neutral</p>	<p>PT SMART RETAIL: Portugal como referência para a nova geração de retalho autónomo e inteligente</p>	<p>ATE - Aliança para a Transição Energética</p>
	<p>The BE. Neutral Agenda aims to accelerate the development and industrialisation of a new generation of zero carbon mobility products and services from Portugal [zero carbon buses; BEN4Us light vehicle; 6E Microcar; modular 2-wheel vehicle], connected with data and connectivity platforms and energy systems.</p>	<p>This Agenda is aimed at developing, demonstrating and industrialising technologies to support a new generation of retail, with the adoption of process dematerialisation solutions applied to the sector that provide a seamless and ultra-comfortable experience for its users, with significant economic and environmental efficiency and considerable internationalisation potential.</p>	<p>Development of power electronics solutions, specifically laboratory prototypes and digital control systems, which will be articulated in agreement with the other project partners.</p>
Scientific recognition	<p>EEUM Recognition Award of Merit for Scientific Publication</p>	<p>World's Top 2% Scientists 2023</p>	<p>EEUM Diploma of Recognition of Merit for Scientific Publication 2023</p>
	<p>João Luíz Afonso receives Scientific Publication Merit Recognition Award 2023</p>	<p>João Afonso, João Varajão, Joaquín Torres-Sospedra, Leonilde Varela, Paulo Cortez, Sandro Pinto and Vítor Monteiro are among the 2% most influential scientists in the world, according to a study by Stanford University (USA) and Elsevier.</p>	<p>João Varajão; Sandro Pinto; Tiago Gomes; Pedro Arezes; José F. Machado; Rui P. Lima; Paulo Cortez; Paula Ferreira; Joaquín Sospedra; Cristiano Pendão; Ivo Silva; João Afonso; Vítor Monteiro.</p>

Major achievements	Identification		
Scientific leadership	MIT Portugal	DTx - Digital Transformation CoLab	Laboratório Associado de Sistemas Inteligentes (LASI)
	Pedro Arezes is the director of MIT Portugal Program.	Ricardo J. Machado is Founder & President of the Executive Management Board.	The Associated Laboratory for Intelligent Systems (LASI) is led by Paulo Novais, of the Algoritmi Centre, and joins the Institute for Polymers and Composites (IPC), with 11 other research centres in the country.

5.3.3 – Centre of Biological Engineering – CEB

CEB was created 28 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

PhD full members	Internal	External	Total
	83	24	107
PhD associated members	Total		
	3		
Technical staff	Total		
	15		

Publications

Journals and proceedings (SCOPUS)

Indexed journals (Scimago quartil)	Q1	Q2	Q3	Q4	Non-rated (@ SCOPUS)	Total
	206	44	7	0	8	265
Indexed proceedings	1					

Books

Type	International	National	Total	
Authoring	20	0	20	23
Edition	1	0	1	
Book of proceedings	1	1	2	
Outreach book	-	-	-	
Educational book	-	-	-	
Non-indexed (@SCOPUS) book chapters	1	1	25	

Other publications

Non-indexed journals	1
Non-indexed proceedings	74

PhD

Year	Number of students	Number of doctorates	Number of Pos-Doc
2023	91	110	34

Theses and dissertations	Number
PhD theses completed	28

Distinctions and dissemination

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

Participation in collaborative laboratories
ECOLab
BIOREF
ADVID - Vines&Wines
CoLab4Food
LABELS - ASSOCIATE LAB

Achievements

Major achievements	Identification		
Flagship publications	<p>Incorporation of curcumin-loaded lipid-based nano delivery systems into food: Release behavior in food simulants and a case study of application in a beverage</p>	<p>Environmental remediation promoted by silver nanoparticles biosynthesized by eucalyptus leaves extract</p>	<p>Lignin recovery from a mixture of SIX lignocellulosic biomasses within a biorefinery scheme based on a sequential process of autohydrolysis and organosolv</p>
	<p>Raquel F.S. Gonçalves, António A. Vicente, Ana C. Pinheiro (2023) Food Chemistry, Volume 405, Part A, 134740. https://doi.org/10.1016/j.foodchem.2022.134740</p>	<p>Verónica Rocha, Pedro Ferreira-Santos, Zlatina Genisheva, Eduardo Coelho, Isabel C. Neves, Teresa Tavares (2023) Journal of Water Process Engineering, 56(104431). https://doi.org/10.1016/j.jwpe.2023.104431</p>	<p>Rita Pontes, Michele Michelin, Aloia Romani, Alice M. Dias, José A. Teixeira, João Nunes (2023) Separation and Purification Technology, 325(124663). https://doi.org/10.1016/j.seppur.2023.124663</p>
Flagship projects	<p>VIIAFOOD - Plataforma de Valorização, Industrialização e Inovação comercial para o AgroAlimentar</p>	<p>Optimisation of methane production and biodegradation of persistent organic pollutants by adding nanomaterials</p>	<p>SMARTgNOSTICS - Global Testing & Diagnostics Solutions for antimicrobial resistances</p>
	<p>Search for more sustainable and healthier solutions for the agri-food sector, by developing new formulations with alternative protein sources; reducing the fat or sugar content in some processed foods; improving the sustainability of the food chain.</p>	<p>The biodegradation of organic waste is carried out by anaerobic microorganisms in a biotechnological process called anaerobic digestion. The end product of the digestion process is biogas, which consists of a mixture of carbon dioxide and methane. These processes can be time-consuming and CEB/UM is investigating various ways of optimising and speeding up anaerobic reactions.</p>	<p>The project will provide reliable data for analysing pathogenic bacteria and their resistance in order to prevent their spread in the 4 pillars of the antimicrobial resistance cycle: Human Health, Animal Health, Environment and Food Safety.</p>
Scientific recognition	<p>Two researchers among the world's most influential scientists</p>	<p>EEUM Diploma of Recognition of Merit for Scientific Publication</p>	<p>World's Top 2% Scientists 2023</p>
	<p>In the list Highly Cited Researchers 2023, of the North American consultancy Clarivate Analytics, appear for the 6th consecutive year in the areas of agricultural sciences António Vicente and José Teixeira.</p>	<p>José Teixeira; Lígia Rodrigues; Lucília Domingues; António Vicente; Mariana Henriques; Isabel Belo; Nuno Cerca; Miguel Rocha; Ângela França; Joana Rodrigues; Pedro Santos; Ana Pinheiro; Maria Madalena Alves; Artur Cavaco Paulo; Cristina Vicente.</p>	<p>António Vicente, Artur Cavaco-Paulo, Eduardo Gudiña, Joana Azeredo, José Teixeira, Lígia Rodrigues, Lucília Domingues, Madalena Alves, Mariana Henriques, Miguel Gama, Nuno Cerca, Ricardo Pereira, Russell Paterson and Sónia Silva are in the list of World's Top 2% Scientists 2023 according to a study of Stanford University and Elsevier.</p>

Major achievements	Identification		
Scientific leadership	pan-European Microbial Resource Research Infrastructure - MIRRI	Leadership of the Foundation for Science and Technology	Biodata.pt
	CEB hosts the headquarters of the pan-European Microbial Resource Research Infrastructure - MIRRI	Previous CEB director, Madalena Alves, was appointed president of the Foundation for Science and Technology.	Miguel Rocha is the president of the Administration Council.

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 LBBELS, together with CEB.

Staff

PhD full members	Internal	External	Total
	40	-	40
PhD associated members	Total		
	12		
Technical staff	Total		
	2		

Publications

Journals and proceedings (SCOPUS)

Indexed journals (Scimago quartil)	Q1	Q2	Q3	Q4	Non-rated (@ SCOPUS)	Total
	74	37	3	-	6	120
Indexed proceedings	-					

PhD

Year	Number of students	Number of doctorates	Number of Pos-Doc
2023	80	-	-

Theses and dissertations	Number
PhD theses completed	6

Distinctions and dissemination

Scientific dissemination and Knowledge transfer			
National patents	Submitted	Granted	Total
	2	-	2
International patents	Submitted	Granted	Total
	5	-	5

Participation in collaborative laboratories
RAIL COLAB
LABELS - ASSOCIATE LAB

Achievements

Major achievements	Identification		
Flagship publications	<p>Disentangling the Role of the SnO Layer on the Pyro-Phototronic Effect in ZnO-Based Self-Powered Photodetectors</p>	<p>Shielding AZ91D-1%Ca from corrosion through ultrasound melt treatment: A study for stent design</p>	<p>High-performance and self-powered visible light photodetector using multiple coupled synergetic effects</p>
	<p>Vieira, Eliana M. F.; Silva, José P. B.; Gwozdz, Katarzyna; Kaim, Adrian; Gomes, Nuno M.; Chahboun, Adil; Gomes, Maria J. M.; Correia, José H., Small, Volume 19, Issue 329 August 2023 Article number 2300607</p>	<p>Gomes I.V.; Pacheco M.; Nienaber M.; Mei D.; Barros A.; Reis R.L.; Alves J.L.; Puga H., Journal of Magnesium and Alloys, 2023, 11</p>	<p>Silva, José P. B.; Vieira, Eliana M. F.; Gwozdz, Katarzyna; Silva, Nuno E.; Kaim, Adrian; Istrate, Marian C.; Ghica, Corneliu; Correia, José H.; Pereira, Mario; Marques, Luis; MacManus-Driscoll, Judith L.; Hoye, Robert L. Z., Materials Horizons</p>
Flagship projects	<p>Advanced agroformulations enabling nano/bio-delivery of novel biopesticides and biofertilisers for circular and sustainable viticulture</p>	<p>Multiplexed micro(bio)sensors array integrated into an organ-on-a-chip device for assessing cancer therapy</p>	<p>PROMETHEUS - PocketQube Framework Designed for Research and Educational Access to Space</p>
	<p>VINNY's main objective is to develop sustainable, low-cost nanoformulated biopesticides and biofertilisers for more resilient vineyard systems. The application of VINNY nanoformulations will contribute to the transition from intensive viticulture to sustainable viticulture on a global scale.</p>	<p>This project envisions the creation of a disruptive preclinical tool with the ability to precisely monitor and predict the therapeutic effect of cancer by integrated an array of multiplexed micro(bio)sensors in an organ-on-a-chip device.</p>	<p>The PROMETHEUS project aims at providing easy access to space for the research and education (R&E) community, by serving as an open-source PocketQube platform. A PocketQube is a small satellite in a 5 cm cube form factor, an ideal size for R&E.</p>
Scientific recognition	<p>World's Top 2% Scientists 2023</p>	<p>EEUM Award for Merit in Scientific Publication</p>	<p>Best Student Paper Award 2023 ENBENG</p>
	<p>Bruno Henriques, Fatih Toptan, Flávio Bartolomeu, Filipe Samuel Silva, Hélder Puga, Júlio Souza, Paulo Flores are among the 2% most influential scientists in the world according to a study of Stanford University and Elsevier.</p>	<p>Graça Maria Henriques Minas, João Paulo Flores Fernandes, and Cristina Manuela Peixoto Santos were awarded the scientific publication recognition prize by the Chair of the School of Engineering.</p>	<p>Vitor Magalhães, a PhD student at the CMEMS won the "Best Student Paper Award" at the 7th IEEE Portuguese Meeting on Bioengineering (ENBENG 2023) Conference, which took place on 22 and 23 June at the Serralves Foundation and the Faculty of Engineering of the University of Porto (FEUP) - Porto.</p>
Scientific leadership	<p>LABBELS - Associate Laboratory</p>		
	<p>CMEMS, together with CEB, host the Associate Laboratory based at the University of Minho. LABBELS 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.</p>		

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 University of Minho (UMinho), recognised by the “FCT – Fundação para a Ciência e Tecnologia” (Foundation for Science and Technology), associated to the Department of Civil Engineering (DEC), with whom it shares resources and namely human resources.

Currently CTAC aggregates 25 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 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 constitute 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	6	-	6
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)	25	12	0	3	9	49
Indexed proceedings	7					

Books

Type	International	National	Total
Authoring	2	-	2
Edition	-	1	1
Book of proceedings	-	-	-
Outreach book	-	-	-
Educacional book	-	-	-
Non-indexed (@SCOPUS) book chapters	2	2	4

Other Publications

Type	Total
Non-indexed journals	4
Non-indexed proceedings	18

PhD

Year	Number of students	Number of doctorates	Number of Pos-Doc
2023	23	-	1

Theses and dissertations	Number
PhD theses completed	3

Distinctions and dissemination

Scientific dissemination and Knowledge transfer			
National patents	Submitted	Granted	Total
	-	-	-
International patents	Submitted	Granted	Total
	-	-	-

Participation in collaborative laboratories
BuiltColab
ECOLab

Achievements

Major achievements	Identification		
Flagship publications	Coastal morphodynamic emulator for early warning short-term forecasts	Calibration Assessment of Low-Cost Carbon Dioxide Sensors Using the Extremely Randomized Trees Algorithm	Fiber-Reinforced Alkali-Activated Cements from Ceramic Waste and Ladle Furnace Slag without Thermal Curing
	Melo, W.W., Pinho, J., Iglesias, I. Environmental Modelling & Software, 2023, 165, 105729	Araújo, T., Silva, L., Aguiar, A., Moreira, A. Sensors, 2023, 23(13), 6153	Gaibor, N., Leitão, D., Miranda, T., Cristelo, N., Fernandes, L., Pereira, E., Cunha, V.M.C.F. Journal of Materials in Civil Engineering, 2023, 35(9), 04023271
Flagship projects	EscoEnsembles - Estuarine and coastal numerical modeling ensembles for anthropogenic, extreme events and climate change scenarios	GlassCON	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.
Scientific recognition	World's Top 2% Scientists 2023	EEUM Diploma of Recognition of Merit for Scientific Publication	Editorial Coordinator
	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 Rui António Rodrigues Ramos José Luís Barroso Aguiar	José Mendes is the Editorial Coordinator of the "Collection of Essays on Sustainability", an ongoing collection of books addressing topics on sustainability. So far, four books have been published.
Scientific leadership	Mestre Casais Foundation	World Federation of Engineering Organizations (WFEO)	T-MOB HUB
	José Mendes is the 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.	José Vieira took office as President of the World Federation of Engineering Organizations (WFEO), becoming the first Portuguese to occupy this position.	This platform covers the main transportation modes and intends to cooperate intensively with the main national actors in the area, along with several international partners.

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

PhD full members	Internal	External	Total
	24	-	24
PhD associated members	Total		
	3		
Technical staff	Total		
	0		

Publications

Journals and proceedings (SCOPUS)						
	Q1	Q2	Q3	Q4	Non-rated (@SCOPUS)	Total
Indexed journals (Scimago quartil)	6	2	3	0	0	11
Indexed proceedings	28					

Books

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

PhD

Year	Number of students	Number of doctorates	Number of Pos-Doc
2023	24	38	0

Theses and dissertations	Number
PhD theses completed	2

Distinctions and dissemination

Participation in collaborative laboratories
Vortex Colab

Achievements

Major achievements	Identification		
Flagship publications	A Case for Partitioned Bloom Filters	Formally verifying Kyber Episode IV: Implementation correctness	TiQuE: Improving the Transactional Performance of Analytical Systems for True Hybrid Workloads
	Paulo Sérgio Almeida. IEEE Trans. Computers 72(6): 1681-1691 (2023)	José Bacelar Almeida, Manuel Barbosa, Gilles Barthe, Benjamin Grégoire, Vincent Laporte, Jean-Christophe L�chenet, Tiago Oliveira, Hugo Pacheco, Miguel Quaresma, Peter Schwabe, Antoine S�r�, Pierre-Yves Strub. IACR Trans. Cryptogr. Hardw. Embed. Syst. 2023(3): 164-193 (2023)	Nuno Faria, Jos� Pereira, Ana Nunes Alonso, Ricardo Vila�a, Yunus Koning, Niels Nes. Proc. VLDB Endow. 16(9): 2274-2288 (2023)

Major achievements	Identification		
Flagship projects	IDINA	FLEXCOMM	InterConnect
	<p>The IDINA - Inclusive Non-Authoritative Digital Identity project aims to 'map' social trust relationships to create a non-authoritative identification system, allowing representatives of schools, health institutions or local authorities to certify the birth of these citizens.</p>	<p>The project contributes to reducing the energy impact, and therefore the environmental impact, caused by the growing volume of data carried by communication networks. The innovative factor of this project is the integration (and operational cooperation) between the communication and power distribution infrastructures.</p>	<p>InterConnect aims to develop solutions for the digitalisation of the electricity system based on Internet of Things (IoT) architectures that, through different digital platforms and using a universal ontology called SAREF, ensure interoperability between devices and systems, while guaranteeing the privacy and cybersecurity of the data of different users.</p>
Scientific recognition	Reference from Amazon's CTO and VP		
	<p>As part of the AWS re:Invent 2023 event, Amazon CTO and VP Dr. Werner Vogels described the research Ranking Programming Languages by Energy Efficiency, developed by HASLab researchers Rui Pereira, Rui Rua, Marco Couto, Francisco Ribeiro, Jácome Cunha and João Saraiva, as "brilliant". The reference was made when discussing the energy use of each programming language, with Vogels highlighting the fact that this work is an exception in a topic on which there is little research - also pointing out the progress made by the researchers since 2017, in a first version of the paper, to the latest, more in-depth one.</p>		
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	José Nuno Fonseca Oliveira - FME Awards Committee Chair
	<p>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.</p>	<p>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.</p>	<p>The FME Awards are a Formal Methods Europe honour that aims to award the FME Fellowship every three years during an FME symposium to researchers and practitioners of formal methods.</p>

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		
	16		
Technical staff	Total		
	2		

Publications

Journals and proceedings (SCOPUS)						
Indexed journals (Scimago quartil)	Q1	Q2	Q3	Q4	Non-rated (@ SCOPUS)	Total
		34	29	2	1	-
Indexed proceedings	7					

Books

Type	International	National	Total
Authoring	-	-	-
Edition	-	-	-
Book of proceedings	-	-	-
Outreach book	-	-	-
Educational book	-	-	-
Non-indexed (@SCOPUS) book chapters	3		3

Other Publications

Type	Total
Non-indexed journals	-
Non-indexed proceedings	112

PhD

Year	Number of students	Number of doctorates	Number of Pos-Doc
2023	34	30	4

Theses and dissertations	Number
PhD theses completed	2

Distinctions and dissemination

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

Participation in collaborative laboratories
DTx - Digital Transformation Colab
LASI- Laboratório Associado de Sistemas Inteligentes

Achievements

Major achievements	Identification		
Flagship publications	A novel sustainable PHA downstream method	Practical application of circularity micro-indicators to automotive plastic parts in an industrial context	Graphene/polyurethane nanocomposite coatings – Enhancing the mechanical properties and environmental resistance of natural fibers for masonry retrofit
	S. Mondal, U.T. Syed, C. Gil, L. Hilliou, A.F. Duque, M.A.M. Reis, C. Brazinha. (2023). Green Chemistry, 25, 1137-1149. DOI https://doi.org/10.1039/D2GC0426	Joana Matos, Sara Santos, Carla L. Simões, Carla I. Martins, Ricardo Simoes. Sustainable Production and Consumption 43 (2023) 155–167 https://doi.org/10.1016/j.spc.2023.11.009	A. Abbass, M. C. Paiva, D. V. Oliveira, P. B. Lourenço, R. Figueiro. Composites Part A, 2023, 166, 107379. DOI: 10.1016/j.compositesa.2022.107379
Flagship projects	New Generation Storage	INOV.AM – Inovação em Fabricação Aditiva	EMBALAGEM DO FUTURO + Ecológica + Digital + INCLUSIVA
	The New Generation Storage (NGS) project is fully aligned with the European Union's energy transition strategy up to 2040 and the call for the complete electrification of mobility by 2035.	This project aims to develop and disseminate technologies and materials for additive manufacturing, with a view to their application in a wide range of application areas, enabling the production of customized products with high added value.	The project envisages the creation of new products, services and production lines capable of producing sustainable packaging, from raw materials to product design, engineering, molds and tools, processing and manufacturing, information systems and digital transition, social marketing, collection and recycling.
Scientific recognition	EEUM Diploma of Recognition of Merit for Scientific Publication	World's Top 2% Scientists 2023	2023 Best Additive Manufacturing Modeling Systems and 3D Prototyping
	José Covas Loic Hilliou António Gaspar Cunha received the EEUM diploma of recognition of merit for scientific publication	Loic Hilliou	For the article “Design for the combination of additive manufacturing parts with products already developed – An hybrid approach”, by Human Factors and Ergonomics Society, to Antonio Pontes.

Major achievements	Identification	
Scientific leadership	Associated Laboratory for Intelligent Systems (LASI)	T-MOB HUB
	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.	This platform covers the main transportation modes and intends to cooperate intensively with the main national actors in the area, along with several international partners. UMinho research centres involved in the project are Algoritmi, CTAC, IPC, ISISE, CMEMS, MEtRICs and 2C2T.

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, Career Development, and Cluster Management) 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

PhD full members	Internal	External	Total
	47	1	48
PhD associated members	Total		
	0		
Technical staff	Total		
	2		

Publications

Journals and proceedings (SCOPUS)						
Indexed journals (Scimago quartil)	Q1	Q2	Q3	Q4	Non-rated (@ SCOPUS)	Total
		123	57	3	0	13
Indexed proceedings	6					

Books

Type	International	National	Total	
Authoring	-	-	-	25
Edition	3	1	4	
Book of proceedings	6	1	7	
Outreach book	10	4	14	
Educational book	-	-	-	
Non-indexed (@SCOPUS) book chapters	12	1	38	

Other Publications

Type	Total
Non-indexed journals	13
Non-indexed proceedings	131

PhD

Year	Number of students	Number of doctorates	Number of Pos-Doc
2023	36	57	23

Theses and dissertations	Number
PhD theses completed	13

Distinctions and dissemination

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

Achievements

Major achievements	Identification		
Flagship publications	Real-time structural stability of domes through limit analysis: Application to St. Peter's dome	Unified Compressive Strength and Strain Ductility Models for Fully and Partially FRP Confined Circular, Square and Rectangular Concrete Columns	Creating a Roadmap Towards Circularity in the Built Environment
	Funari, M.F., Silva, L.C., Mousavian, E., Lourenço, P.B., International Journal of Architectural Heritage, 17(6), p. 915-937 (2023).	Shayanfar, J.; Barros, J.A.O.; Abedi, M.; Rezazadeh, M., Composites for Construction Journal, 2023, 27(6): 04023053. https://orcid.org/0000-0002-8331-2434	Bragança L, Cvetkovska M., Askar R., Ungureanu V. (Edt). Springer Tracts in Civil Engineering. Springer Cham. https://doi.org/10.1007/978-3-031-45980-1
Flagship projects	RoboShot@FRC - Robotized system for the shotcrete of optimized fibre reinforced concrete in railway tunnels	CircularB - Implementation of Circular Economy in the Built Environment	NBSINFRA - Citynature-based Solutions Integration To Local Urban Infrastructure Protection For A Climate Resilient Society
	A novel shotcrete technology capable of applying, autonomously and in real time, fibre reinforced shotcrete with tailored properties regarding the optimum structural strengthening of railway tunnels.	The CircularB project's main mission is to drive the transformation of the construction industry through the adoption of circular economy principles.	NBSINFRA supports the enhancement of the local urban critical infrastructures protection against natural and manmade hazards through the Nature-based solutions (NBS) co-design and co-creation for a climate change resilient society.
Scientific recognition	EEUM Diploma of Recognition of Merit for Scientific Publication	World's Top 2% Scientists 2023	Honourable mention - Best PhD Thesis 2023 in Urban Rehabilitation and Heritage" - APRUPP 2023
	Paulo Lourenço, Joaquim Barros, Ricardo Mateus, José Matos, Nathanaël Savalle, Daniel Oliveira received the EEUM diploma of recognition of merit for scientific publication.	Joaquim Barros, José Sena-Cruz, Mayank Mishra, Paulo Lourenço are in the list of the world's top 2% scientists according to a study of Stanford University and Elsevier.	Thesis title: "Conservation of earth heritage: An approach for a new methodology". Supervisor in ISISE: Daniel Oliveira

Major achievements	Identification		
Scientific leadership	Laboratório Associado para Produção Avançada e Sistemas Inteligentes (ARISE)	Leading the fib committee WP2.4.1 - Modelling of Fibre Reinforced Concrete (FRC) Structures	ICOMOS ISCARSAH Presidency
	ISISE joins the Laboratório Associado para Produção Avançada e Sistemas Inteligentes (ARISE), with another five national entities.	A committee formed by some of the most reputed scientists on the development of models implemented in software based on the finite element method for the analysis and design of FRC structures.	Paulo Lourenço elected President of Int. Scientific Committee on the Analysis and Restoration of Structures of Architectural Heritage (ISCARSAH) from Int. Council on Monuments and Sites (ICOMOS).

5.3.9 – Mechanical Engineering and Resource Sustainability Centre– MEtRICs

Information not available

6 – INTERNATIONALISATION

6.1 – Student mobility

	2021/2022	2022/2023	2022/2023	2023/2024
	2.º Semester	1.º Semester + anual	2.º Semester	1.º Semester + anual
Students OUT	49	122	49	93
Students IN	32	34	26	58

6.2 – Teaching Staff mobility

	2021/2022	2022/2023	2022/2023	2023/2024
	2.º Semester	1.º Semester + anual	2.º Semester	1.º Semester + anual
Teaching Staff OUT	35	7	36	5
Teaching Staff IN	8	3	9	3

6.3 - Non-teaching Staff mobility

	2021/2022	2022/2023	2022/2023	2023/2024
	2.º Semester	1.º Semester + anual	2.º Semester	1.º Semester + anual
Non-teaching Staff OUT	8	1	14	1
Non-teaching Staff IN	6	1	3	0

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 2022/2023 17 applications for Erasmus projects were submitted and 11 approved.

The project applications approved in 2023 are presented below.

ERASMUS+ KA2 – Cooperation Partnerships

Application	Programme/Initiative	Coordinating Institution	Project Title	UMinho Participation
2023	Cooperation partnerships	AALBORG UNIVERSITET	EGALITARIAN - Education, digitalisation and collaboration for sustainability	Rui Lima (EE/DPS)
2023	Cooperation partnerships	UNIVERSITAET GRAZ	Collaborative development of AI capabilities in SMEs (CoDeAI)	Isabel Ramos (EE/DSI)
2023	Cooperation Partnerships	UNIVERSITAET GRAZ	Open Data City Officer (OPENDCO)	Isabel Ramos (EE/DSI)
2023	Cooperation Partnerships	Universidade da Coruña	Artificial Intelligence learning modules to adapt VET to labour market needs (AI4VET)	Paulo Jorge Oliveira Novais (EE/DI)
2023	Strategic Partnerships	Universidade do Minho (UMinho)	Assessing and evaluating remote learning practices in STEM	Paulo Alexandre Araújo Sampaio (EE/DPS)
2023	Strategic Partnerships	Politecnico di Milano	REcube: REthink, REvive, REuse - Transmitting the knowledge for the green regeneration of the European Concrete Heritage	Joaquim António Oliveira Barros (EE/DPS)
2023	Capacity Building	Universidade do Minho	Internet and collaborative based learning methodologies toolbox for digital transformation and sustainable growth (ICoLearn)	Goran Putnik (EE/DPS)

ERASMUS+ KA2 – Erasmus Mundus Joint Masters

Application	Programme/Initiative	Coordinating Institution	Project Title	UMinho Participation
2023	Erasmus Mundus Joint Masters	Universidade do Minho	International Masters on Risk Assessment and Management of Civil Infrastructures (NORISK)	José Matos (EE/DEC)

ERASMUS+ KA2 – Erasmus Mundus Design Measures

Application	Programme/Initiative	Coordinating Institution	Project Title	UMinho Participation
2023	Erasmus Mundus Design Measures	Universidade do Minho	European Master's in Integrated Design of Timber Constructions (TiMBER)	Jorge Manuel Gonçalves Branco (EE/DEC)

ERASMUS+ KA2 – Partnerships for Innovation

Application	Programme/Initiative	Coordinating Institution	Project Title	UMinho Participation
2023	Partnership for Innovation	Universita degli studi de Teramo	GEEK4FOOD - Glocal Ecosystems and Expanded Knowledge for skills and capability for the next normal in the food sector	António Augusto Martins Oliveira Soares Vicente (EE/DEB)
2023	Partnership for Innovation	GEOIMAGING LIMITED - Cyprus	Innovation alliance to infuse Extended Reality skills into Higher education and vocational training (Alliance4XR)	José António Matos (EE/DEC)

Joint Masters Erasmus Mundus

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

EEUM's Civil Engineering Department (DEC) coordinates the European Master's degree Advanced Structural Analysis and Design using Composite Materials - FRP++ (<https://msc-frp.org/>), which received around €2.7M in funding from the ERASMUS+ Programme (Erasmus Mundus Joint Master) 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 around 84 scholarships to be awarded to students, covering enrolment costs and monthly allowances.

The Master's programme has three funded partner institutions: the University of Girona (UdG), Spain, the University of Naples Federico II, UNINA, Italy, and the National Institute of Applied Science in Toulouse / University Toulouse III - Paul Sabatier, INSA/UT3, France. It also has more than 50 associated institutions,

mainly from industry, promoting integration between the contents taught and the needs of professional practice. The FRP++ Master's programme lasts one year, with 60 ECTS, including six course units in the first semester and a dissertation in the second semester. The Master's programme is directed by José Sena Cruz, Associate Professor with tenure at the DEC, and a member of the ISISE Research Unit.

The first edition of the FRP++ Master's Degree began on 1 October 2022 and included 16 students from 10 different countries. In the first semester of the 2022/2023 academic year, the teaching part of the master's took place simultaneously at UMinho and UdG. In turn, the students carried out their master's dissertations at the four partner institutions. All the students successfully completed the FRP++ programme in the 2022/2023 edition. The second edition (2023/2024) is currently underway, with 18 students from 15 different countries. The teaching part is taking place simultaneously at UNINA and INSA/UT3, with the dissertation taking place in the partner quarters.

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 from 2019 to 2023. In addition to supporting management, mobility and integration activities, the funding in question enabled the award of around 70 grants to students, covering registration and monthly allowance costs. The Master has two partner institutions: the University of Minho (Portugal) 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 and Industry 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, Associate Professor with Habilitation 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 EAAD. In the editions from 2019/2020 to 2022/2023 131 dissertations were presented, varied in collaboration with associated institutions. The fifth edition of the Master's Degree began on 2 October 2023, with 32 students from 18 different countries. In the first semester of the academic year 2023/2024 the teaching part of the Master takes place simultaneously at the University of Ljubljana with 14 students and at the University of Minho with 18 students. In the second semester the students are distributed among the two partner universities.

SAHC International Master

The 16th edition of the SAHC International Master's programme (2022/2023) was attended by 21 students from 14 countries (Afghanistan, Brazil, Colombia, Croatia, USA, Philippines, France, Georgia, Greece, Iran, Jordan, Lebanon, Mexico and Turkey), and the students successfully completed their dissertations. Of particular note was the continued participation of students from North America and, for the first time, Afghanistan.

The 17th edition of the SAHC Master's programme (2023/2024) is underway with the participation of 12 students from 7 countries (Afghanistan, Belgium, Canada, the Philippines, Italy, Mongolia and Pakistan). Of particular note is the participation for the first time of a student from Mongolia.

The start of the SAHC Master's academic year is characterised by various activities to integrate the students, including a presentation and welcome session, a guided tour of the historic centre of Guimarães, an introductory session on researching scientific information and a lecture on communication. Every year, visits are made to various emblematic monuments, and this year's edition included a visit to the Palácio da Bolsa construction site in Porto.

6.5 - International Partnerships and Protocols

In 2023 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, 31 agreements were signed in 2023, namely 13 memoranda of understanding, 6 addenda, 2 non-disclosure agreements, and 10 material transfer agreements.

6.6 – Visits from External Delegations and International Representation

In the year 2023 the School of Engineering received the following international entities/personalities:

27th february - Professor Gong Ke, former Rector of Nankai University and former President of the World Federation of Professional Engineering Associations (visit organized by UMinho);

7th march - Professor Herlandí de Souza Andrade, President of the Undergraduate Commission of the Lorena School of Engineering/University of S. Paulo – Brazil;

14th to 21st April - Universidade Massachusetts Lowell: Staying of Professor Supriya Chakrabarti, under the MOVE(ME) program;

19th September - STUBA University, visit as part of an ERASMUS action, coordinated by Professor Paulo Afonso, DPS;

17th October - Rector of the United Nations University received at the School of Engineering;

5th November - Hungarian-Portuguese Space Industrial Workshop Program at EEUM;

20th November – Lund University delegation;

4th December - Hungarian Ambassador Dr. Emília Fábrián, and Budapest University of Technology and Economics (BME) delegation;

Also in 2023, members of the School of Engineering's presidency represented the institution in visits to the following organizations:

26th April - Participation in the ORP Congress, Bilbao;

From 26th May to 9th June – visit to Wuhan Textile University and other textile sector organizations in China;

From 29th June to 8th July – visit to Zhejiang Chinese Medical University, Center for Language Education and Cooperation in Beijing, Universidade de Shanghai, with representatives from various Schools and the UMinho Rectory, organized by the Confucius Institute UMinho.

7 - INTERACTION WITH SOCIETY

7.1 - Initiatives promoted by EEUM

In 2023 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 from 28th February to 1st March. The 10th edition of this event brought more than 4000 career opportunities (record number) to the School of Engineering students and alumni, provided by 75 companies/entities registered at the event, from the most varied sectors of activity.

The 48th anniversary of the School of Engineering was celebrated on the 4th October, in the main auditorium of the University of Minho, in the Azurém campus. The ceremony was marked with tributes, prizes and awards to teachers, researchers, administrative and management staff, retirees, as well as recognition awards to the company Accenture and the José Neves Foundation. The programme also included the participation of Minister Ana Abrunhosa, who, unable to attend, sent a message to the academic community congratulating the School of Engineering, its impact on the region and the country, as well as the school's most recent achievements.

As part of the celebrations for the 50th anniversary of the University of Minho, the School of Engineering proposed several initiatives to mark this important moment for our Academy, including the UMinho Spin-Offs and Interfaces Exhibition linked to Engineering "Engineering at the service of Society", which took place on 27 September at the Azurém campus. The event showcased the breadth and diversity of areas of activity, products and services of UMinho Spin-offs, Interfaces and Co-Labs, whose socio-economic impact on the region is undeniable. The former Minister of the Economy, Pedro Siza Vieira, was at the opening of the exhibition, visiting all the stands of all the participants, and in his speech he congratulated the University of Minho for its impact in terms of innovation, but also at a social and economic level.

The School of Engineering of the University of Minho also presented the cultural initiative "Engineering and Art" on 23 November at the B-Lounge of the General Library on the Azurém campus in Guimarães. The event was also part of UMinho's 50th anniversary programme and was supported by the Documentation and Library Services Unit, having already been presented in July of 2023 at the Gualtar campus in Braga.

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

In 2023 the School of Engineering of UMinho collaborate with the rectorate in the main following events:

UPA - Universidade de Portas Abertas – from the 30th March to the 1st of April the School of Engineering received around 2500 secondary school students, letting them know the educational offer of the institution.

Verão no Campus 2023 - 323 secondary school students, from Brazil, Italy and Luxembourg, but also from Caminha to the Azores, participated in another edition of Summer on Campus, at the University of Minho, between 17 and 21 July. The participants were distributed among 25 scientific and recreational activities organised by the various Schools and Institutes of UMinho, on the campuses of Gualtar and Azurém, with the School of Engineering receiving 110 students from 9th to 12th grade.

“VEM 2023 – Come and try UMinho” programme, reformed from the old “Best Student” programme, VEM brought together 160 students, selected by secondary schools in the Braga and Viana do Castelo region, with the best grade 11 and 12 averages, 29 of whom chose the School of Engineering for this experience, with the motto “Engineering for a better Future”.

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 2023, 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: 20.3K

Followers: 9.7K

Reach: 167K

Instagram

Unique Visitors: 13.7K

Followers: 4.3K

Reach: 22K

Linkedin

Unique Visitors: 3.2K

Followers: 10.5K

Reach: 206K

YouTube

Views: 5.7K

Live views (livestreaming): 907K

Hours seen: 258.9 hours

Reach: 47.7K

- **Website ENG.UMINHO.PT**

Unique Visitors: 40K+53K (metrics are not 100% accurate due to changes in Google Analytics tool in the middle of the year 2023, thus we have metrics from the first six months separated from the last six months)

Pages Viewed: 322K+358K (metrics are not 100% accurate due to changes in Google Analytics tool in the middle of the year 2023, thus we have metrics from the first six months separated from the last six months)

Traffic origin (Countries): Portugal (82%), Brazil (3.8%), USA(1.7), Angola (1.4%), Mozambique (1 %)

Traffic origin (Districts): Braga (32%), Lisbon (26%), Porto (22%), Setubal (6.8%), Aveiro (3%), Viana (2.4%)

- **Portal ENGIUM.UMINHO.PT**

Unique Visitors: 10K+7.5K (metrics are not 100% accurate due to changes in Google Analytics tool in the middle of the year 2023, thus we have metrics from the first six months separated from the last six months)

Pages Viewed: 20K+13K (metrics are not 100% accurate due to changes in Google Analytics tool in the middle of the year 2023, thus we have metrics from the first six months separated from the last six months)

- **Newsletter ENGINEWS**

Subscribers (external to the UMinho institution): 1587

Apertures: 57K

Clicks: 3.8K

Click Through Rate (CTR): 7.84% (Education average CTR in 2023 was 2.9%, according to Mailchimp)

7.4 – National Partnerships and Protocols

In 2023, the School of Engineering saw 20 cooperation protocols signed with various entities, with the involvement of almost all of its subunits, 13 of which with educational institutions. 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

258 PhD Faculty and 61 Invited Professors

- 31 Full Professors

- 35 Associate Professors with Habilitation

- 39 Associate Professors

- 12 Assistant Professors with Habilitation

- 132 Assistant Professors

- 9 Emeritus Professors

8.2 – Research Staff

121 Integrated Researchers

8.3 – Administrative and Management Technical Staff

112 Non-Teaching Staff

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