ECTS Information Package: Degree Programme

Master's degree in

URBAN REHABILITATION

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A - General Description

Programme Title - Mestrado em Reabilitação Urbana

Qualification awarded - Master's degree in Urban Rehabilitation

Level of qualification - Second-cycle degree, EQF Level 7; ISCED Level 5

Specific admission requirements

General

According to the Portuguese Law, the following candidates are eligible for entry to the course of study leading to the *Mestre* degree:

- Holders of a *licenciado* degree or legally equivalent corresponding to the first cycle of higher education;
- Holders of a foreign higher degree awarded on completion of a first-cycle programme organised in the framework of the Bologna Process;
- Holders of a foreign higher degree which is deemed by the Technical-Scientific Committee of ESTT-IPT to meet the requirements of a *licenciado* degree.
- Holders of an academic, scientific or professional curriculum which is deemed by the Technical/Scientific Committee of ESTT-IPT as appropriate to access the programme.

Specific

The candidates who have, in the preceding year, completed the bachelor's degree (licenciatura) in civil engineering offered by the School of Technology-IPT have direct access to the master's degree in Urban Rehabilitation.

Without prejudice to the general admission requirements, the following candidates are also eligible for entry onto the master's programme in Urban Rehabilitation subject to admission quotas:

- Holders of a higher degree (licenciatura) or legally equivalent qualification in civil engineering or related areas;

- Holders of a higher degree (licenciatura) or legally equivalent qualification awarded by another national higher education institution in civil engineering or related areas;

- Holders of a foreign higher degree awarded on completion of a first-cycle programme organised in the framework of the Bologna Process;

- Holders of a foreign higher degree which is deemed by the Technical-Scientific Committee to meet the requirements of the licenciado degree;

- Holders of a bacharel degree in civil engineering and a scientific and professional CV which is deemed by the Technical-Scientific Committee as appropriate to access the master's degree level.

- Holders of an academic, scientific or professional CV deemed by the Technical/scientific Committee as appropriate to access second-cycle programmes.

Specific arrangements for recognition of prior learning (formal, non-formal and informal)

General
Granting of credits from prior learning is regulated by the Portuguese Law taking into account the level of credits and the field of study where they have been earned and is subject to the recognition of ESTT-IPT Technical/Scientific Committee.

- Training undertaken in the context of other higher education programmes of study from national or foreign HE establishments or organised in the framework of the Bologna Process or other prior learning can be credited towards the present programme of study;
- Credits earned from postgraduate studies can also be credited towards this programme of study;
- Professional experience or other training, different from the abovementioned ones, can also be credited towards this programme of study.

Specific

Allocation of credits to individuals holding a licenciado degree in electronics engineering or similar programs prior to the Bologna process with a duration equivalent to 300 ECTS credits (5 years of study) is formally analysed on a case-to-case basis.

Qualification requirements and regulations:
The master's degrees are regulated by Portuguese Law and applicable program regulations established by the School of Technology-IPT.

Profile of the program:
This course of study includes:

- A master's program organised into modules corresponding to 75 ECTS credits;
- An original project or a professional internship including final report corresponding to 45 ECTS credits.

This master's degree was designed so as to develop skills in the following technical-scientific areas: Building (40 compulsory ECTS credits); Structures (10 compulsory ECTS credits); Infrastructures (25 compulsory ECTS credits). Students can choose to undertake a project or internship in one of the technical-scientific areas earning the respective credits.

Key learning outcomes:
Not applicable.

Occupational profiles of graduates with examples:
Graduates from the master's degree in Urban Rehabilitation are expected to perform as: Site managers. Work supervisors. Middle managers in public and private companies. Construction designers or consultants. Promoters.

Access to further studies:
The master's degree in Urban Rehabilitation gives access to third-cycle programmes in civil engineering and architecture.

Course structure diagram with credits

Course Title	Year	Semester	Credits
Built Heritage Characterisation	1	S1	5
Applied Geotechnics	1	S1	5
Building Conservation and Regeneration I	1	S1	5
Pathology of Building Materials	1	S1	5
Structural Assessment Methods	1	S1	5
Technical Installations I	1	S1	5
Building Conservation and Regeneration II	1	S2	5
Methods of Intervention in Building Structures	1	S2	5
Rehabilitation of Urban Pavements	1	S2	5
Sustainability and Environmental Impact Assessment	1	S2	5
Technical Installations II	1	S2	5
Urban Regeneration and Renewal	1	S2	5
Project or Internship	2	A	45
op: Internship	2	A	45
op: Internship/Infrastructures	2	A	45
op: Internship/Structures	2	A	45
op: Project	2	A	45
op: Project/Infrastructures	2	A	45
op: Project/Structures	2	A	45
Energy Efficiency in Buildings	2	S1	5
On-site Management and Coordination	2	S1	5
Rehabilitation of Basic Sewerage Systems	2	S1	5

(*) This course may not be available in certain academic years. Please confirm availability with the Erasmus coordinator.

Examination regulations, assessment and grading

General
Assessment of course units complies with the Academic Regulations in force at ESTT-IPT, except for the Dissertation, Project and Internship, to which apply the provisions set out in the regulations for the master's degrees offered by the ESTT-IPT.

- Dissertation, Project and Internship have only two assessment seasons and the students are free to choose only one.
- The assessment calendar for the Dissertation, Project and Internship is proposed by the Programme Coordinating Committee to the Technical/Scientific Committee at the beginning of each academic year.
- The general grade improvement scheme does not apply to the Dissertation, Project and Internship.

The overall grade of the master's programme is the arithmetic weighted average rounded off to the ones of the number of ECTS credits and the grades of the course units that form part of the programme of study.
The 10-20 mark expressed on a 0-20 scale is converted into its equivalent in the European grading scale with the awards Satisfactory, Good, Very Good or Excellent.

Specific
Not applicable.

Graduation requirements:
Completion of the programme requires a pass in all its constituent course units including public defence of the final project or internship report in order to accumulate 120 ECTS credits.

Mode of study:
Full- or part-time.

The academic calendars try to meet the time preferences for the majority of students enrolled.

Program director or equivalente

Director: Ana Paula Gerardo Machado
Erasmus coordinator: Ana Paula Gerardo Machado
ECTS coordinator: Ana Paula Gerardo Machado

B - Description of individual course units

Course unit title	Built Heritage Characterisation
Course unit code	30061
Type of course unit	Compulsory
Level of Course unit	Second Cycle
Year of Study	First Year
Semester/Trimester when the course unit is delivered	First Semester
Number of ECTS credits allocated	5
Name of Lecturer(s)	Jorge Morarji dos Remédios Dias Mascarenhas Inês Domingues Serrano
Learning outcomes of the course unit	Know the evolution of architectural styles and techniques of vernacular and erudite construction so that the future professional when having to intervene in an urban area or a building understands its construction and respects the cultural values in question
Mode of delivery	Face-to-face
Prerequisites and co-requisites	Not applicable.
Recommended optional programme componentes	Not applicable.
Course contentes	1-Introdution 2-History of cities and urban development 3-Classical architecture styles 4-Portuguese vernacular architecture 5-Traditional building techniques 6-Evolution of some urban systems 7-History of some building materials 8-Architectural Nomenclature
Recommended or required Reading	- Mansel, G.(1997). *Anatomia da Arquitectura*. Rio de Janeiro: Ao Livro Técnico - Nuttgens, P.(2006). *Architecture from the first civilizations to the present day*. Londres: Mitchell Beazley - AA, A.(1988). *Arquitectura Popular Portuguesa*. (Vol. I, II ,III). Lisboa: Associação dos Arquitectos Portugueses - Puig Grau, A.(1990). *Síntese dos Estilos Arquitectónicos*. Lisboa: Plátano
Planned learning activities and teaching methods	Lectures supported by illustrations and data show with an emphasis on the construction processes associated with the socio-economical context.
Assessment Methods and criteria	Assignment preparation and presentation of writing work -Caracterization of vernacular architecture (maximum 40 pages) Examination waiver with a grade equal or higher than 9.5 Exam -Presentation of writing work of caracterization of Portuguese vernacular architecture
Language of Instruction	Portuguese | **Mentoring in** English
Work placement(s)	Not applicable.

B - Description of individual course units

Course unit title	Applied Geotechnics
Course unit code	30064
Type of course unit	Compulsory
Level of Course unit	Second Cycle
Year of Study	First Year
Semester/Trimester when the course unit is delivered	First Semester
Number of ECTS credits allocated	5
Name of Lecturer(s)	Ana Paula Gerardo Machado Fernando Manuel Lino Gonçalves Antunes
Learning outcomes of the course unit	The aim of this course is to provide the students with skills that allows them to: -identify risk situations; -request services and data; -analyse results and make decisions concerning the design, execution and control of rehabilitation works, particularly geotechnics.
Mode of delivery	Face-to-face
Prerequisites and co-requisites	Not applicable.
Recommended optional programme componentes	Not applicable.
Course contentes	General concepts. Standardization and Regulations. Site investigation methods and tests. Project supported by laboratory and field testing. Applied Geotechnics. Slope stability. Retaining walls. Stabilization and reinforcement of soils and rocks. Rehabilitation and reinforcement of foundations. Monitoring.
Recommended or required Reading	- Bowles, J.(1988). *Foundation Analisys and Design*. (pp. 1-1004). Singapura: McGraw- Hill - Coelho, S.(1996). *Tecnologia de Fundações,*. Amadora: EPGE - Actas de Congressos., . *Casos de obra*.. : - Regulamentos e Normas, .. :
Planned learning activities and teaching methods	Theoretical/practical interactive classes with the support of audiovisual resources. Research work and case study. One third of classes is dedicated to practical exercises including calculus.
Assessment Methods and criteria	Continuous Assessment: Written test with two components (T1 and T2) and a research work in T1. Final grade: 0.6*(0.7T1+0.3TR) + 0.4T2, with a min.9,5/20 and min. 40% in T1 and in T2.
Language of Instruction	Portuguese
Work placement(s)	Not applicable.

B - Description of individual course units

Course unit title	Building Conservation and Regeneration I
Course unit code	30062
Type of course unit	Compulsory
Level of Course unit	Second Cycle
Year of Study	First Year
Semester/Trimester when the course unit is delivered	First Semester
Number of ECTS credits allocated	5
Name of Lecturer(s)	Maria de Lurdes Belgas da Costa
Learning outcomes of the course unit	On completion of this unit students should be familiar with the pathologies and physical phenomena affecting building structures and be able to evaluate them. They should also be familiar with the materials and techniques used to maintain,regenerate and reinforce built structures.
Mode of delivery	Face-to-face
Prerequisites and co-requisites	Not applicable
Recommended optional programme componentes	Not applicable.
Course contentes	General mechanisms of degradation of materials and construction elements. Methodologies for inspection and diagnosis of anomalies. Pathologies of materials: concrete and wood. Pathologies and regeneration of the building envelope. Anomalies in coatings and wall finishes. Materials and techniques for the buildings rehabilitation. Presentation of practical cases..
Recommended or required Reading	- Cóias, V. e Abrantes, V. e Serra e Sousa, A. (2007). *Reabilitação Estrutural de Edifícios Antigos ? Alvenaria, Madeira*. (Vol. 1). Lisboa: GECoRPA - Vasconcelos Paiva, J. e Pinho, A. e Jalali, S. e Torgal, F. (2006). *Guia Técnico de Reabilitação Habitacional*. (Vol. 2 Vol.). LNEC: Instituto Nacional da Habitação - Cóias, V. e Rocha, A. e Esgalhado, H. (2006). *Inspecções e Ensaios na Reabilitação de Edifícios*. (Vol. I). Lisboa: IST PRESS - Silva, V. e Fonseca, S. (2004). *Guia Prático para a Conservação de Imóveis*. (Vol. I). Lisboa: Dom Quixote
Planned learning activities and teaching methods	Provision of basic concepts. Presentation of projects and case studies that allow the student's critical intervention. Usage of laboratory equipment available for anomaly detection. Field trips and technical sessions.
Assessment Methods and criteria	Assessment consists in a written test (55%) and a practical project(45%). The project consists of a technical report based on regular on-site visits to regeneration works in course of execution or consists of a survey and study of the pathologies of
Language of Instruction	Portuguese
Work placement(s)	Not applicable.

B - Description of individual course units

Course unit title	Pathology of Building Materials
Course unit code	30063
Type of course unit	Compulsory
Level of Course unit	Second Cycle
Year of Study	First Year
Semester/Trimester when the course unit is delivered	First Semester
Number of ECTS credits allocated	5
Name of Lecturer(s)	Ricardo Pereira Triães
Learning outcomes of the course unit	Achievement of technical-and scientific knowledge in the field of the Pathology of Materials. Identify the causes and mechanisms of degradation of the main building materials. Understand the physical and chemical processes that are in the origin of the materials degradation. Identify the pathologies
Mode of delivery	Face-to-face
Prerequisites and co-requisites	Not applicable.
Recommended optional programme componentes	Not applicable.
Course contentes	1. Concept of cultural heritage 2. Preservation 3. Alteration and alterability 4. Decay and diagnosis of inorganic materials 5. Decay and diagnosis of metallic materials 6. Decay and diagnosis of coating and decoration materials 7. Diagnosis and registration support techniques 8. Cleaning, consolidation and preservation methods
Recommended or required Reading	- , .(2001). *As Rochas dos Monumentos Portugueses, tipologias e patologias*. (Vol. I). Lisboa: IPPAR - , .(2003). *Reabilitação de edifícios antigos. Patologias e tecnologias de intervenção*. S/L: Ed. Orion - , .(2009). *Inspecção e Ensaios na Reabilitação de Edifícios*. Lisboa: IST Press - , .(2010). *Materials for Engineers and Technicians*. Oxford: Elsevier - Aires-Barros, L.(1991). *Alteração e Alterabilidade das rochas*. Lsboa: INIC
Planned learning activities and teaching methods	Lectures for exposition and discussion on the specific themes.Theoretical-practical classes to solve and analyse cases that favour the critical intervention of the students. Classes in the Laboratory to perform characterization tests, and use equipme
Assessment Methods and criteria	Assessment of the UC is made based on three practical works, proposed by each of the teachers, undertaken in class or extra-class.The evaluation results from the average oh the work done. For approval is required to obtain a final result equal to or greater than 9.5 in 20.
Language of Instruction	Portuguese
Work placement(s)	Not applicable.

B - Description of individual course units

Course unit title	Structural Assessment Methods
Course unit code	30066
Type of course unit	Compulsory
Level of Course unit	Second Cycle
Year of Study	First Year
Semester/Trimester when the course unit is delivered	First Semester
Number of ECTS credits allocated	5
Name of Lecturer(s)	Cristina Margarida Rodrigues Costa
Learning outcomes of the course unit	The students should be able to analyse and understand the damage and decay of existing structures and identify the most appropriate techniques to characterise its state of preservation and assess its structural safety conditions.
Mode of delivery	Face-to-face
Prerequisites and co-requisites	Not applicable.
Recommended optional programme componentes	Not applicable.
Course contentes	1 General concepts. 2 Structural damage and decay. 3 Seismic structures. 4 Examination and characterisation of existing structures. 5 Structural assessment of existing constructions.
Recommended or required Reading	- Cóias, V.(2007). *Reabilitação estrutural de edifícios antigos*. Lisboa: Argumentum-GECoRPA - Cóias, V.(2006). *Inspecções e ensaios na reabilitação de edifícios*. Lisboa: IST - Lopes, L.(2008). *Sismos e edifícios*. Lisboa: Edições Orion - Costa, A. e Appleton, J. (1999). *Mecanismos de deterioração das estruturas de betão armado*. Lisboa: IST
Planned learning activities and teaching methods	Classes focus on presentation and analysis of theoretical concepts supported by presentation and discussion of practical examples. Students must undertake assessment of the state of preservation of real structures.
Assessment Methods and criteria	Assessment includes a written exam (50%), with a minimum grade of 9/20 and a practical group assignment(50%).
Language of Instruction	Portuguese
Work placement(s)	Not applicable.

B - Description of individual course units

Course unit title	Technical Installations I
Course unit code	30065
Type of course unit	Compulsory
Level of Course unit	Second Cycle
Year of Study	First Year
Semester/Trimester when the course unit is delivered	First Semester
Number of ECTS credits allocated	5
Name of Lecturer(s)	Mário Helder Rodrigues Gomes Flávio Rodrigues Fernandes Chaves
Learning outcomes of the course unit	On completion of this course unit students should be able to analyse, characterise and design several mechanical infrastructures used in building regeneration. They should also be familiar with indoor air quality requirements.
Mode of delivery	Face-to-face
Prerequisites and co-requisites	Not applicable.
Recommended optional programme componentes	Not applicable.
Course contentes	Electrical Installations in buildings: standards, materials, equipment, design, implementation. Telecommunications infrastructures for buildings: standards, materials, equipment, design, implementation. Indoor Air Quality: Air quality and comfort, technical solutions and typical installations in buildings. Heating, Ventilation and Air Conditioning: equipments, pipes, ducts, etc.
Recommended or required Reading	(0). *Manual ITED (Prescrições e Especificações Técnicas), 3ª Edição*.Acedido em15 de setembro de 2015 em http://www.anacom.pt/render.jsp?contentId=1327353#.VgwBGTPbL6U - República, D.(0). *Decreto-Lei n.º 118/2013*.Acedido em15 de setembro de 2015 em http://www.adene.pt/legislacao/decreto-lei-no-1182013-0 - República, D.(0). *Regras Técnicas das Instalações Elétricas de Baixa Tensão (RTIEBT)*.Acedido em15 de setembro de 2015 em https://dre.pt/home/-/dre/70055488/details/maximized?p_auth=eF1n89PF&serie=I - Gomes, M. e Chaves, F. (0). *Material de apoio fornecido pelos docentes*.Acedido em1 de setembro de 2018 em http://www.e-learning.ipt.pt
Planned learning activities and teaching methods	Theoretical-practical sessions focused on the resolution of practical cases.
Assessment Methods and criteria	Practical assignments (50%) and written exam (50%).
Language of Instruction	Portuguese
Work placement(s)	Not applicable.

B - Description of individual course units

Course unit title	Building Conservation and Regeneration II
Course unit code	30067
Type of course unit	Compulsory
Level of Course unit	Second Cycle
Year of Study	First Year
Semester/Trimester when the course unit is delivered	Second Semester
Number of ECTS credits allocated	5
Name of Lecturer(s)	Jorge Morarji dos Remédios Dias Mascarenhas Maria de Lurdes Belgas da Costa
Learning outcomes of the course unit	On completion of this unit the students should have acquired technical and scientific skills in the field of materials and maintenance, rehabilitation, regeneration and reinforcement techniques.They should also be able to make regeneration proposals and work as part of interdisciplinary teams.
Mode of delivery	Face-to-face
Prerequisites and co-requisites	Not applicable.
Recommended optional programme componentes	Not applicable.
Course contentes	Conservation and rehabilitation techniques: outer walls; inner walls; ceilings, roofs, flat roofs, wall and floor coverings; Spans: outer and inner.Thermal and acoustic rehabilitation of buildings. Different techniques for special interventions for regeneration and reinforcement of buildings. Case studies.
Recommended or required Reading	- Freitas, V. e Abrantes, V. e APICER, A. (2009). *Patorreb 2009*. (Vol. I e II). Porto: FEUP - Mascarenhas, J. e Mascarenhas, J. (2012). *Reabilitação Urbana*. (Vol. XIII). Lisboa: Livros Horizonte - Abrantes, V. e Freitas, V. e Carvalho, A. (2006). *Patorreb 2006*. (Vol. I e II). Porto: FEUP - Freitas, V. e LNEC, L. (2102). *Manual de Apoio à Reabilitação de Edifícios*. Porto: Ordem dos Engenheiros
Planned learning activities and teaching methods	Lectures. Project and practical case presentation with critical analysis by the students. Practical project works focused on the application of rehabilitation techniques.
Assessment Methods and criteria	Assessment consists of a written test (45%) with minimum pass mark of 9.5/20, an oral presentation (15%) an a final project on regeneration techniques (40%).
Language of Instruction	Portuguese
Work placement(s)	Not applicable.

B - Description of individual course units

Course unit title	Methods of Intervention in Building Structures
Course unit code	30069
Type of course unit	Compulsory
Level of Course unit	Second Cycle
Year of Study	First Year
Semester/Trimester when the course unit is delivered	Second Semester
Number of ECTS credits allocated	5
Name of Lecturer(s)	Cristina Margarida Rodrigues Costa
Learning outcomes of the course unit	On completion of this unit students will be able to analyse and understand the methods of intervention, rehabilition, reinforcement and consolidation of built structures, identify the most appropriate solutions and calculate reinforcements.
Mode of delivery	Face-to-face
Prerequisites and co-requisites	Not applicable.
Recommended optional programme componentes	Not applicable.
Course contentes	1 General concepts. 2 Methods of intervention in structures. 3 Design of structural reinforcements for traditional buildings with masonry walls and wood floors and for reinforced concrete structures.
Recommended or required Reading	- Freitas, V.(2006). *2º Encontro nacional sobre patologia e reabilitação de edifícios*. Porto: FEUP - Appleton, J.(2003). *Reabilitação de edifícios antigos*. Lisboa: Orion - FIB, .(1991). *Guide to good practice: Repair and strengthening of structures*. London: Thomas Telford - Costa, A.(2005). *A intervenção no património. Práticas de conservação e reabilitação*. Porto: FEUP
Planned learning activities and teaching methods	Lectures supported by case study analysis. Practical classes focused on structural calculations and resolution of specific problems.
Assessment Methods and criteria	Assessment consists of a written exam (60%) with a minimum grade of 9 and a practical group assignment (40%).
Language of Instruction	Portuguese
Work placement(s)	Not applicable.

B - Description of individual course units

Course unit title	Rehabilitation of Urban Pavements
Course unit code	300611
Type of course unit	Compulsory
Level of Course unit	Second Cycle
Year of Study	First Year
Semester/Trimester when the course unit is delivered	Second Semester
Number of ECTS credits allocated	5
Name of Lecturer(s)	Ana Paula Gerardo Machado Fernando Manuel Lino Gonçalves Antunes
Learning outcomes of the course unit	An overview of materials, equipments, building processes and quality control related with the construction, maintenance and rehabilitation of urban pavements.
Mode of delivery	Face-to-face
Prerequisites and co-requisites	Not applicable.
Recommended optional programme componentes	Not applicable.
Course contentes	1- Classification and characterisation of the different types of pavement 2- Classification and characterisation of materials 3- Standardisation 4- Defects 5- Maintenance procedures 6- Rehabilitation procedures 7- Equipments 8- Building processes 9- Signalling 10-Quality control
Recommended or required Reading	- Santos, L. e Pereira, P. e Branco, F. (2008). *Pavimentos Rodoviários*. Coimbra: Edições Almedina SA - Miranda, V. e Pereira, P. (1999). *Gestão da Conservação dos Pavimentos Rodoviários*. Braga: UM - Pereira, O.(1971). *Pavimentos Rodoviários*. Lisboa: LNEC - II Jornadas Técnicas de Pavimentos Rodoviários, .(2003). *Reciclagem de Pavimentos*. Lisboa: Ed. Maria da Conceição Azevedo; Jaime Ribeiro e Adriano Teixeira
Planned learning activities and teaching methods	Lectures supported by audiovisual resources. Study and analysis of practical cases.
Assessment Methods and criteria	Continuous Assessment: Written test and practical assignment. Final grade: assignment (30%) and written test (70%). Minimum pass mark is 9.5/20 and minino of 40% in test and in practical assignment.
Language of Instruction	Portuguese
Work placement(s)	Not applicable

B - Description of individual course units

Course unit title	Sustainability and Environmental Impact Assessment
Course unit code	300612
Type of course unit	Compulsory
Level of Course unit	Second Cycle
Year of Study	First Year
Semester/Trimester when the course unit is delivered	Second Semester
Number of ECTS credits allocated	5
Name of Lecturer(s)	Natércia Maria Ferreira dos Santos Luis Filipe Neves Carreira dos Santos
Learning outcomes of the course unit	On completion of this unit students should have acquired knowledge in such areas as sustainability, sustainable development and industrial ecology and develop applied solutions.
Mode of delivery	Face-to-face
Prerequisites and co-requisites	Not applicable.
Recommended optional programme componentes	Not applicable.
Course contentes	Part I - Sustainability policies. National strategy for sustainable development - ENDS 2015. LiderA - Voluntary system for the sustainability of built environment. Part II - Environmental Impact Surveys. Environmental assessment stages. EIA in Portugal. Environmental indicators used in EIA.
Recommended or required Reading	- Clini, C. e Gorb, S. e Gullino, M. (2008). *Sustainable Development and Environmental Management - Experiences and Case Studies*. USA: Springer - Dos Reis, L. e Fadigas, E. e Carvalho, C. (2005). *Energia, Recursos Naturais e a Prática do Desenvolvimento Sustentável*. Brasil: Manole - Glasson, J. e Therivel, R. e Andrew, C. (2005). *Introduction to Environmental Impact Assessment*. London: Routledge - Partidário, M. e Jesus, J. (1994). *Avaliação de Impacte Ambiental*. Lisboa: Centro de Estudos de Planeamento e Gestão do Ambiente
Planned learning activities and teaching methods	Lectures supported by case study analysis.
Assessment Methods and criteria	Theoretical assessment: written test. Theoretical-practical assessment: literature reviews and resolution of practical environmental impact cases.
Language of Instruction	Portuguese | **Mentoring in** English
Work placement(s)	Not applicable.

B - Description of individual course units

Course unit title	Technical Installations II
Course unit code	30068
Type of course unit	Compulsory
Level of Course unit	Second Cycle
Year of Study	First Year
Semester/Trimester when the course unit is delivered	Second Semester
Number of ECTS credits allocated	5
Name of Lecturer(s)	Mário Helder Rodrigues Gomes António Manuel Dias Cavalheiro
Learning outcomes of the course unit	On completion of this unit students should be able to read and design electricity and gas network projects for new residential developments, be able to integrate microgeneration in buildings and have enhanced their analysis and interdisciplinary skills.
Mode of delivery	Face-to-face
Prerequisites and co-requisites	Not applicable.
Recommended optional programme componentes	Not applicable.
Course contentes	Electricity distribution networks: standards, transformer stations, cables, boards, grounding, protection, design. Telecommunications infrastructures in residential developments: standards, symbology, installation, materials, design. Microgeneration: sources, technologies, design. Gas facilities: materials, equipment, cutting and setting, implementation, breakdowns, design.
Recommended or required Reading	- Pinto, L.*Guia Técnico MG-Calc*. .: Merlin-Gerin - Solidal, ..(2005). *Guia Técnico Solidal*. .: Solidal Condutores Eléctricos - Decreto Regulamentar n.º90/84, ..(1984). *Regulamento de Segurança de Redes de Distribuição de Energia Eléctrica em Baixa Tensão*. (Vol. .). .: . (0). *Manual ITUR (Prescrições e Especificações Técnicas), 2ª edição*.Acedido em1 de setembro de 2018 em https://www.anacom.pt/render.jsp?contentId=1340703 - Gomes, M. e Cavalheiro, A. (0). *Material de apoio fornecido pelos docentes*.Acedido em1 de setembro de 2018 em http://www.e-learning.ipt.pt
Planned learning activities and teaching methods	Lectures supported by case study analysis.
Assessment Methods and criteria	Practical assignments (50%) and written exam (50%).
Language of Instruction	Portuguese
Work placement(s)	Not applicable.

B - Description of individual course units

Course unit title	Urban Regeneration and Renewal
Course unit code	300610
Type of course unit	Compulsory
Level of Course unit	Second Cycle
Year of Study	First Year
Semester/Trimester when the course unit is delivered	Second Semester
Number of ECTS credits allocated	5
Name of Lecturer(s)	Jorge Morarji dos Remédios Dias Mascarenhas
Learning outcomes of the course unit	Urban rehabilitation in line with the Europe 2020 goals for cities (greater inclusiveness, sustainability and attractiveness (competitive)). It seeks to train to identify the various deficiencies of an urban area, to propose solutions to make the investment more attractive, generate jobs
Mode of delivery	Face-to-face
Prerequisites and co-requisites	Not applicable.
Recommended optional programme componentes	Not applicable.
Course contentes	I-Methodology and intervention criteria II-Diagnostic and intervention III-Understand the cities IV-Identifying conflicts and risks V-The city as an instrument of economic competitiveness VI-Making the urban environment more attractive and sustainable VII-Improving the quality of life VIII-Improving inclusiveness IX-To dynamize the surrounding region X-Sustainability for success.
Recommended or required Reading	- Miller, G.(2006). *ENVIROMENTAL SCIENCE, WORKING WITH THE EARTH*. Victoria 2006: Thomson - McKinney, M.(2003). *ENVIROMENTAL SCIENCE, SYSTEMS AND SOLUTIONS*. London: Jones and Bartlett - Enger, E.(2008). *ENVIROMENTAL SCIENCE, STUDY OF INTERRELATIONSHIPS*. Boston: McGraw-Hill - Mascarenhas, J.(2018). *CIDADES E TERRITÓRIOS, INTELIGENTES SUSTENTÁVEIS, VOL I*. Lisboa: Livros Horizonte
Planned learning activities and teaching methods	Classes will be given using the very illustrated material on what is done best in Europe To be practical the lectures are supported by purpose-made illustrations on the old centre of a town.
Assessment Methods and criteria	Work consisting of 10 forms on different subjects Observation and critical thinking will be evaluated Aproved: remark over 09,5 To Exam: Less than 09,5 Exam:Work consisting of 10 forms ondifferent subjects
Language of Instruction	Portuguese
Work placement(s)	Not applicable.

B - Description of individual course units

Course unit title	Internship
Course unit code	300635
Type of course unit	Optional
Level of Course unit	Second Cycle
Year of Study	Second Year
Semester/Trimester when the course unit is delivered	Anual
Number of ECTS credits allocated	45
Name of Lecturer(s)	Luis Filipe Rocha de Almeida Inês Domingues Serrano Jorge Morarji dos Remédios Dias Mascarenhas Luis Filipe Neves Carreira dos Santos Anabela Mendes Moreira Cristina Margarida Rodrigues Costa Fernando Manuel Lino Gonçalves Antunes Ana Paula Gerardo Machado Maria de Lurdes Belgas da Costa
Learning outcomes of the course unit	Internship is profession-oriented. It is an opportunity for the student to develop a work with scientific and technological goals to complement the skills acquired in the academic component.
Mode of delivery	----
Prerequisites and co-requisites	The requirements are defined by the Regulations established by the School of Technology (ESTT-IPT) for the Masters programmes.
Recommended optional programme componentes	NA
Course contentes	The work plan to be implemented in the internship is designed specifically for each student. The internship area is selected by the student but the internship provider may be proposed by the student or the Coordinating Committee. Internship requires follow-up by an internship tutor from IPT and a supervisor from the host company/organisation.
Recommended or required Reading	
Planned learning activities and teaching methods	During their internship students develop a variety of activities in real context in rehabilitation related areas. This is achieved through articulation between IPT tutor and the supervisor at the host company/organisation.
Assessment Methods and criteria	Internship is regulated by specific regulations established by the School of Technology Tomar (ESTT) for the Master's programmes. At the end of the academic year students must submit a written report for assessment.
Language of Instruction	Portuguese
Work placement(s)	NA

B - Description of individual course units

Course unit title	Internship/Infrastructures
Course unit code	300633
Type of course unit	Optional
Level of Course unit	Second Cycle
Year of Study	Second Year
Semester/Trimester when the course unit is delivered	Anual
Number of ECTS credits allocated	45
Name of Lecturer(s)	Inês Domingues Serrano Jorge Morarji dos Remédios Dias Mascarenhas Luis Filipe Neves Carreira dos Santos Ana Carla Vicente Vieira Anabela Mendes Moreira Cristina Margarida Rodrigues Costa Fernando Manuel Lino Gonçalves Antunes Flávio Rodrigues Fernandes Chaves Ana Paula Gerardo Machado Luis Filipe Rocha de Almeida Mário Helder Rodrigues Gomes
Learning outcomes of the course unit	Internship is profession-oriented. It is an opportunity for the student to develop a work with scientific and technological goals to complement the skills acquired in the academic component.
Mode of delivery	----
Prerequisites and co-requisites	The requirements are defined by the Regulations established by the School of Technology (ESTT-IPT) for the Masters programmes.
Recommended optional programme componentes	NA
Course contentes	The work plan to be implemented in the internship is designed specifically for each student. The internship area is selected by the student but the internship provider may be proposed by the student or the Coordinating Committee. Internship requires follow-up by an internship tutor from IPT and a supervisor from the host company/organisation.
Recommended or required Reading	
Planned learning activities and teaching methods	During their internship students develop a variety of activities in real context in rehabilitation related areas. This is achieved through articulation between IPT tutor and the supervisor at the host company/organisation.
Assessment Methods and criteria	Internship is regulated by specific regulations established by the School of Technology Tomar (ESTT) for the Master's programmes. At the end of the academic year students must submit a written report for assessment.
Language of Instruction	Portuguese
Work placement(s)	NA

B - Description of individual course units

Course unit title	Internship/Structures
Course unit code	300634
Type of course unit	Optional
Level of Course unit	Second Cycle
Year of Study	Second Year
Semester/Trimester when the course unit is delivered	Anual
Number of ECTS credits allocated	45
Name of Lecturer(s)	Inês Domingues Serrano Jorge Morarji dos Remédios Dias Mascarenhas Luis Filipe Neves Carreira dos Santos Anabela Mendes Moreira Cristina Margarida Rodrigues Costa Fernando Manuel Lino Gonçalves Antunes Ana Paula Gerardo Machado Maria de Lurdes Belgas da Costa Luis Filipe Rocha de Almeida
Learning outcomes of the course unit	Internship is profession-oriented. It is an opportunity for the student to develop a work with scientific and technological goals to complement the skills acquired in the academic component.
Mode of delivery	----
Prerequisites and co-requisites	The requirements are defined by the Regulations established by the School of Technology (ESTT-IPT) for the Masters programmes.
Recommended optional programme componentes	NA
Course contentes	The work plan to be implemented in the internship is designed specifically for each student. The internship area is selected by the student but the internship provider may be proposed by the student or the Coordinating Committee. Internship requires follow-up by an internship tutor from IPT and a supervisor from the host company/organisation.
Recommended or required Reading	
Planned learning activities and teaching methods	During their internship students develop a variety of activities in real context in rehabilitation related areas. This is achieved through articulation between IPT tutor and the supervisor at the host company/organisation.
Assessment Methods and criteria	Internship is regulated by specific regulations established by the School of Technology Tomar (ESTT) for the Master's programmes. At the end of the academic year students must submit a written report for assessment.
Language of Instruction	Portuguese
Work placement(s)	NA

B - Description of individual course units

Course unit title	Project
Course unit code	300632
Type of course unit	Optional
Level of Course unit	Second Cycle
Year of Study	Second Year
Semester/Trimester when the course unit is delivered	Anual
Number of ECTS credits allocated	45
Name of Lecturer(s)	Anabela Mendes Moreira Luis Filipe Rocha de Almeida Maria de Lurdes Belgas da Costa Fernando Manuel Lino Gonçalves Antunes
Learning outcomes of the course unit	Project is profession-oriented. Students have the opportunity to develop a scientific and technological work that will apply the skills acquired in the taught component. Project must be an original work.
Mode of delivery	----
Prerequisites and co-requisites	Those set forth in the specific regulations of ESTT-IPT.
Recommended optional programme componentes	NA
Course contentes	The work plan is defined specifically for each student.
Recommended or required Reading	
Planned learning activities and teaching methods	Students develop an original project in an urban rehabilitation related topic with the support of one or more tutors/supervisors. At the end of the academic year, they must submit a final report.
Assessment Methods and criteria	Assessment is defined in the specific regulations for the Masters programmes offered by the School of Technology (ESTT). A final report must be submitted at the end of the academic year that is assessed according to those regulations.
Language of Instruction	Portuguese
Work placement(s)	NA

B - Description of individual course units

Course unit title	Project/Infrastructures
Course unit code	300630
Type of course unit	Optional
Level of Course unit	Second Cycle
Year of Study	Second Year
Semester/Trimester when the course unit is delivered	Anual
Number of ECTS credits allocated	45
Name of Lecturer(s)	Ana Paula Gerardo Machado Fernando Manuel Lino Gonçalves Antunes Mário Helder Rodrigues Gomes Ana Carla Vicente Vieira Flávio Rodrigues Fernandes Chaves
Learning outcomes of the course unit	Project is profession-oriented. Students have the opportunity to develop a scientific and technological work that will apply the skills acquired in the taught component. Project must be an original work.
Mode of delivery	Face-to-face
Prerequisites and co-requisites	Those set forth in the specific regulations of ESTT-IPT.
Recommended optional programme componentes	NA
Course contentes	The work plan is defined specifically for each student.
Recommended or required Reading	
Planned learning activities and teaching methods	Students develop an original project in an urban rehabilitation related topic with the support of one or more tutors/supervisors. At the end of the academic year, they must submit a final report.
Assessment Methods and criteria	Assessment is defined in the specific regulations for the Masters programmes offered by the School of Technology (ESTT). A final report must be submitted at the end of the academic year that is assessed according to those regulations.
Language of Instruction	Portuguese
Work placement(s)	NA

B - Description of individual course units

Course unit title	Project/Structures
Course unit code	300631
Type of course unit	Optional
Level of Course unit	Second Cycle
Year of Study	Second Year
Semester/Trimester when the course unit is delivered	Anual
Number of ECTS credits allocated	45
Name of Lecturer(s)	Luis Filipe Rocha de Almeida Cristina Margarida Rodrigues Costa Fernando Manuel Lino Gonçalves Antunes
Learning outcomes of the course unit	Project is profession-oriented. Students have the opportunity to develop a scientific and technological work that will apply the skills acquired in the taught component. Project must be an original work.
Mode of delivery	----
Prerequisites and co-requisites	Those set forth in the specific regulations of ESTT-IPT.
Recommended optional programme componentes	NA
Course contentes	The work plan is defined specifically for each student.
Recommended or required Reading	
Planned learning activities and teaching methods	Students develop an original project in an urban rehabilitation related topic with the support of one or more tutors/supervisors. At the end of the academic year, they must submit a final report.
Assessment Methods and criteria	Assessment is defined in the specific regulations for the Masters programmes offered by the School of Technology (ESTT). A final report must be submitted at the end of the academic year that is assessed according to those regulations.
Language of Instruction	Portuguese
Work placement(s)	NA

B - Description of individual course units

Course unit title	Energy Efficiency in Buildings
Course unit code	300615
Type of course unit	Compulsory
Level of Course unit	Second Cycle
Year of Study	Second Year
Semester/Trimester when the course unit is delivered	First Semester
Number of ECTS credits allocated	5
Name of Lecturer(s)	Ana Carla Vicente Vieira Maria de Lurdes Belgas da Costa
Learning outcomes of the course unit	Students will be able to: recognise legal and regulatory requirements concerning energy performance and certification; characterise the thermal performance of buildings; project and select acclimatization systems; identify cost-effective measures with potential to enhance buildings enrg performance.
Mode of delivery	Face-to-face
Prerequisites and co-requisites	Not applicable.
Recommended optional programme componentes	Not applicable.
Course contentes	Passive behaviour and bioclimatic design of buildings. Fundamentals of thermodynamics; Ventilation, heat and cold production. Energetic needs and energy and performance certification of buildings. Energy audits. Strategies to improve energy efficiency in buildings. Systems for integration of endogenous resources. Economic feasibility. Case studies.
Recommended or required Reading	- Thumann, *.Energy Conservation in Existing Buildings Deskbook*. -: - - Turner,, W.*Energy Management Handbook*. -: - - Moret, A.(2009). *Térmica de Edifícios*. ISBN 978-972-8620-13-4: Orion - Sá, A.(2008). *Guia de aplicações de gestão de energia e eficiência energética*. Lx: Publindústria - Gonçalves, G.(2004). *Conceitos Bioclimáticos para edifícios em Portugal*. DGEG: ISBN 972-8268-34-3 - Moita, F.(1985). *Energia Solar Passiva – volume 1*. DGE: Imprensa Nacional Casa da Moeda
Planned learning activities and teaching methods	Lectures. Individual or group assignments or projects and team studies. Field trips.
Assessment Methods and criteria	Presentation and discussion of the studies, team projects and practical coursework(mandatory - 60%); Written tests (mandatory - 40%)
Language of Instruction	Portuguese
Work placement(s)	Not applicable.

B - Description of individual course units

Course unit title	On-site Management and Coordination
Course unit code	300613
Type of course unit	Compulsory
Level of Course unit	Second Cycle
Year of Study	Second Year
Semester/Trimester when the course unit is delivered	First Semester
Number of ECTS credits allocated	5
Name of Lecturer(s)	Luis Filipe Rocha de Almeida
Learning outcomes of the course unit	Provide an overview of the construction process, the various players involved, the preparatory stages, the technical activities underpinned by management strategies and also urban regeneration related issues.
Mode of delivery	Face-to-face
Prerequisites and co-requisites	Not applicable.
Recommended optional programme componentes	Not applicable.
Course contentes	Characterisation of the construction works for rehabilitation. The construction process for rehabilitation. The rehabilitation project plan and funding sources. Design and project, techniques for management and coordination of urban rehabilitation projects. Construction quality - aspects specific to building rehabilitation.
Recommended or required Reading	- Abrantes, V.(1994). *Qualidade na construção*. Porto: Faculdade de Engenharia da Universidade do Porto - Lei nº 31/2009.(2009, 3 de julho). *Diário da República Portuguesa*, pp. 4276-4285. - Lei nº 60/2007.(2007, 4 de setembro). *Diário da República Portuguesa*, pp. 6258-6309. - Decreto-Lei nº 18/2008.(2008, 29 de janeiro). *Diário da República Portuguesa*, pp. 753-852.
Planned learning activities and teaching methods	An introduction to the general concepts of the course supported, as possible, by illustrative material. Case studies and seminars. Written assignments based on case studies.
Assessment Methods and criteria	Final grade is the average of an assignment (75%) and a written exam (25%).
Language of Instruction	Portuguese | **Mentoring in** English
Work placement(s)	Not applicable.

B - Description of individual course units

Course unit title	Rehabilitation of Basic Sewerage Systems
Course unit code	300614
Type of course unit	Compulsory
Level of Course unit	Second Cycle
Year of Study	Second Year
Semester/Trimester when the course unit is delivered	First Semester
Number of ECTS credits allocated	5
Name of Lecturer(s)	José Luis A. Bobela Bastos Carreira
Learning outcomes of the course unit	Students should be familiar with the techniques for the rehabilitation of basic sewerage systems and be able to select the best solutions, use the techniques for the control of rainwater sources as well as be aware of the purposes, advantages, limitations and selection criteria.
Mode of delivery	Face-to-face
Prerequisites and co-requisites	Not applicable.
Recommended optional programme componentes	Not applicable.
Course contentes	The need and significance of rehabilitation. The life span of systems. Major types of engineering and management tools for rehabilitation support. System monitoring and operational data analysis. Decision and intervention tools. Criteria used in network rehabilitation. Rainwater source control.
Recommended or required Reading	- Cavalheiro, A.(1996). *Reabilitação de Sistemas de Abastecimento de Água*. Tomar: - LNEC, .(2000). *Estratégias para Beneficiação e Reabilitação de Sistemas Públicos de Drenagem de Águas Pluviais*. Lisboa: LNEC
Planned learning activities and teaching methods	Theoretical interactive sessions and study of pratical cases.
Assessment Methods and criteria	Two theorical (25% each one) and one pratical (50%) works. These conditions are used in all periods.
Language of Instruction	Portuguese
Work placement(s)	Not applicable.