Study Plan

School: Institute for Research and Advanced Training
Degree: Doctorate
Course: Biochemistry (cód. 726)

1st Year - 1st Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
QUI13528D	Biochemical Research I	Biochemistry	12	Semester	312
QUI13529D	Biochemical Research II	Biochemistry	12	Semester	312

***** TRANSLATE ME:Grupo de Optativas de Competências Transversais *****

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
FIL13966D	Epistemology of Science	Philosophy	3	Semester	78
VIS13967D	Communication techniques	Education Sciences Design Linguistics	3	Semester	78
HIS13970D	Open Science and strategies of science communication and dissemination	Design History Informatics	3	Semester	78
LLT13973D	Academic writing skills in English I	Linguistics	3	Semester	78
LLT13974D	Academic writing skills in English II	Linguistics	3	Semester	78
PSI13968D	Personal Career Management	Psychology	3	Semester	78
INF13969D	LaTex Introdution	Informatics	3	Semester	78
GES13975D	Project Planning and Management	Management	3	Semester	78
MAT14055D	Fundamentals of Data Analysis in Environment R	Mathematics	6	Semester	156
FIL13971D	Ethics and Research	Philosophy	3	Semester	78
GES14077D	Start-up PhD	Management	3	Semester	78
MAT15034D	Numerical Tools with Python	Informatics Mathematics	6	Semester	156
FIS15035D	History of Sciences	Physics History	3	Semester	78
HIS15036D	Introduction to automatic bibliographic reference systems	History	3	Semester	78
PSI15037D	Emotions in learning contexts	Psychology	3	Semester	78

1st Year - 2nd Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
QUI09316D	Advanced Subjects in Biochemistry	Biochemistry	3	Semester	78
QUI13530D	Biochemical Research III	Biochemistry	15	Semester	390
QUI09909D	Thesis I	Biochemistry	6	Semester	156

1st Year - 2nd Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
*** TRANSLATE ME:Grupo de Optativas de Competências Transversais ***					

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FIL13966D	Epistemology of Science	Philosophy	3	Semester	78
VIS13967D	Communication techniques	Education Sciences Design Linguistics	3	Semester	78
HIS13970D	Open Science and strategies of science communication and dissemination	Design History Informatics	3	Semester	78
LLT13973D	Academic writing skills in English I	Linguistics	3	Semester	78
LLT13974D	Academic writing skills in English II	Linguistics	3	Semester	78
PSI13968D	Personal Career Management	Psychology	3	Semester	78
INF13969D	LaTex Introdution	Informatics	3	Semester	78
GES13975D	Project Planning and Management	Management	3	Semester	78
MAT14055D	Fundamentals of Data Analysis in Environment R	Mathematics	6	Semester	156
FIL13971D	Ethics and Research	Philosophy	3	Semester	78
GES14077D	Start-up PhD	Management	3	Semester	78
MAT15034D	Numerical Tools with Python	Informatics Mathematics	6	Semester	156
FIS15035D	History of Sciences	Physics History	3	Semester	78
HIS15036D	Introduction to automatic bibliographic reference systems	History	3	Semester	78
PSI15037D	Emotions in learning contexts	Psychology	3	Semester	78

2nd Year - 3rd Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
Thesis					

2nd Year - 4th Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
QUI09575D	Complementary activities to the thesis I	Biochemistry	3	Semester	78
Thesis					

3rd Year - 5th Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
Thesis					

3rd Year - 6th Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
QUI09576D	Complementary activities to the thesis II	Biochemistry	3	Semester	78
*** TRANSLATE ME:Tese ***					

4th Year - 7th Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
Thesis					

4th Year - 8th Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
Thesis					

Conditions for obtaining the Degree:

*** TRANSLATE ME: Para aprovação na componente curricular é necessário a aprovação (através de avaliação ou creditação) das seguintes unidades curriculares:

1º Ano

1º Semestre:

2 UC obrigatórias num total de 24 ECTS

UC optativas livres - Competências transversais num total de 6 ECTS

2º Semestre:

3 UC obrigatórias num total de 24 ECTS

UC optativas livres - Competências transversais num total de 6 ECTS

Para obtenção do grau necessita de obter ainda aprovação a:

2º Ano

2º Semestre

1 uc obrigatórias num total de 3 ects

3º ano:

2º semestre:

1 uc obrigatórias num total de 3 ects{\}newline

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{\}newline

e aprovação nas provas públicas de defesa da Tese com inscrição na mesma a partir do 2º ano{\}newline

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Program Contents

Back

Biochemical Research I (QUI13528D)

Concepts, methodologies and techniques transmitted in a laboratorial environment, data analysis and problem solving through the development of a small project in the field of biochemistry (biochemistry and heritage, agriculture / agri-food, health and well-being and the environment). Students will be part of research teams where they will carry out a small individual work project based on solving a specific problem, within the scope of the research carried out by that team.

Back

Biochemical Research II (QUI13529D)

Concepts, methodologies and techniques transmitted in a laboratorial environment, data analysis and problem solving through the development of a small project in the field of biochemistry (biochemistry and heritage, agriculture / agri-food, health and well-being and the environment). Students will be part of research teams where they will carry out a small individual work project based on solving a specific problem, within the scope of the research carried out by that team.

Back

Epistemology of Science (FIL13966D)

1. Contemporary Epistemology and the contributions of the History and Philosophy of Science, Studies of Science and Technology.
2. The Scientific Revolution and its repercussions. The unit of knowledge and the organization of the disciplines. The problem of demarcation: science and common sense, religion, art and power.
3.Beliefs, methodologies, scientific truths and justification. The epistemological virtues. Normal science, controversies and innovation.
4.The scientific veracity: the logical-formal, empirical and hermeneutic dimensions. Practices and 'trading zones". The logic of discovery and of justification. Personae, objectification and ontologies.
5.Special epistemologies: the epistemologies of the social sciences, of life sciences, of engineering and technologies, of arts. Interdisciplinarity, multidisciplinarity and transdisciplinarity.
6.The dynamics of scientific communities an the challenges of the globalization of science: problems of culture, functioning and scientific et

Back

Communication techniques (VIS13967D)

1. Communication:
- general concepts
- channels, codes, meanings and contexts
- noise and communication facilitators
- style
- verbal and nonverbal communication
- oral and written communication

2. Written communication:
- different types of writing: formal, informal, academic, literary, journalistic, technical, advertising; social media
- subjectivity vs objectivity
- techniques of plain language writing
- typography, layout and graphics
- non-formal science communication writing
- writing press releases
- writing emails
- writing on social media

3. Oral communication:
- different types of oral communication: informative and persuasive
- preparation of an oral presentation
- techniques for facing, captivating and persuading the audience
- the importance of storytelling
- the tone of voice
- nonverbal communication
- visual aids to oral communication - information design
- interviews and press conferences
- debates: the art of disagreeing and arguing
- job interviews

Back

Open Science and strategies of science communication and dissemination (HIS13970D)

1. Fundamental concepts and topics on Open and Citizen Science and their emergent contexts.
2. How to publish?
2.1. The various types of scientific texts and disciplinary areas.
2.2. The peer review.
2.3. Indexed publications and impact factors.
2.4. The h-index.
3. The problems of opening and sharing data: from ethical issues to data intelligibility.
3.1. Copyright and creative commons licenses. Permanent links. The patents.
3.2. The metadata
3.3.The institutional repositories.
4. Open and shareable data requirements: from data management plan to preservation issues
5. Interoperability.
6. Information Representation and Retrieval
7. Data Security
8. Science communication strategies
8.1. The history of science communication and the challenges of modern societies
8.2. How to stimulate the intellectual pleasure of critical and scientific thinking?
8.3. Strategies to attract and build audiences: emotional design

Back

Academic writing skills in English I (LLT13973D)

Unit 1. The writing process: (a) the purpose, types and features of academic writing; (b) types of academic texts; (c) the development of critical reading approaches; (d) planning and brainstorming; key points & note-making; (e) paraphrasing & summarizing; (f) references & quotation; (g) rewriting & proofreading.
Unit 2. Elements of writing: (a) argument and discussion; (b) cause and effect; (c) cohesion; (d) comparison; (e) examples; (f) generalization.

Back

Academic writing skills in English II (LLT13974D)

Unidade 1. Accuracy in writing: (a) academic vocabulary; (b) conjunctions, nouns & adjectives, prepositions; (c) punctuation; (d) verbs: passive, referencing, tenses.
Unidade 2. Writing models: (a) reports, case studies and literature reviews; (b) designing and reporting surveys; (c) essays; (d) the PhD thesis.

Back

Personal Career Management (PSI13968D)

1. Work and career
1.1. The changing nature of work in a globalized society
1.2. The importance of personal career management in globalized societies
1.3. Models and practices of personal career management

2. The development of personal career management skills
2.1. My career
2.2. Identity
2.3. Career adaptability resources
2.4. Barriers and supports to personal career management
2.5. The implementation of personal career management strategies

3. Research on personal career management

Back

LaTex Introdution (INF13969D)

1. Document Organization: Document divisions, Lists.
2. Common Documents: Presentations, Tables and Figures.
3. Academic Publications: Acronyms, Bibliographies & References.
4. Monographs and Books: Multi-File Documents.
5. Advanced Topics: Mathematical Expressions, Hyperlinks, Indexes, Graphics.

Back

Project Planning and Management (GES13975D)

1. Project planning, programming and control
2. Project programming with deterministic durations
3. Project programming with stochastic durations
4. Project planning and financial management
5. Presentation, resolution and discussion of research project exemples

Back

Fundamentals of Data Analysis in Environment R (MAT14055D)

1. Introduction to the R language
i. Installation of R, R Studio and libraries
ii. Use of R as a calculator: mathematical and logical operations
iii. Data storage: variables, vectors, matrices and lists
iv. Object classes and object conversion into different classes
v. Data import, export and storage
vi. Data manipulation: filters, selections, renames, groupings, sorts, etc.
vii. Pipe Operator
2. Graphical data visualization: categorical, discrete and continuous data
i. Static graphs
ii. Dynamic graphs
iii. Recording graphs in several formats
3. Summary measures
i. Location
ii. Dispersion
iii. Form
iv. Association
4. Hypothesis tests
i. Parametric
ii. Non-parametric

Back

Ethics and Research (FIL13971D)

I. INTRODUCTION - THE PLACE OF ETHICAL QUESTIONING IN SCIENTIFIC AND TECHNOLOGICAL RESEARCH
I. 1. Research and Science
I. 2. Science, Technique and Technology
I. 3. Technological development and Ethics
II. CONCEPTS, VALUES AND ETHICAL PRINCIPLES IN RESEARCH
II. 1. Safeguarding human rights by the ethical regulation of research
II. 2. The common heritage of obligations of information professionals and researchers
II. 3. The criteria of freedom and responsibility in research
III. LICITUDE AND LEGALITY IN RESEARCH PROJECTS
III. 1. Issues of authorship - the rights and duties of the researcher
III. 2. Ethics Committees, codes or letters of conduct and personal decision
III. 3. Digital Age and research integrity

Back

Start-up PhD (GES14077D)

I. Navigating the Entrepreneurs' Sea: why are there start-ups that fail and others that are successful?
• What is an entrepreneur and what is entrepreneurship made of?
• Entrepreneurial personality, entrepreneurial skills and entrepreneurship teams.
• The power of innovation and ingredients to innovate.
• Entrepreneurship and critical sense - identify your own weaknesses and threats through SWOT analysis.
II. Designing a Value Proposition
• The validation of needs.
• How to eliminate the problems of a target audience?
• The conceptualization of a solution / prototype.
• Test and get feedback.
III. Minimum Viable Product (MVP): from the commitment of features to rapid prototyping
IV. Lean start-up: an integrated model
• From business strategy to business model: a roadmap for the future.
• The power of business communication.
V. Intellectual Property and Protection of Innovation
VI. Funding Sources: from investment rounds to crowdfunding

Back

Numerical Tools with Python (MAT15034D)

1. Introduction to SageMath software. Installation.
2. SageMath as a calculator: first calculations, elementary functions, Python variables, symbolic variables, first graphs.
3. Representation of floating point numbers: properties, rounding.
4. Programming and data structure: algorithms (loops, conditions and functions), lists and other data structures.
5. Analysis: symbolic expressions and simplifications, elementary mathematical functions, explicit resolution of equations. Sums, limits, sequences, series, derivatives and integrals. Solving differential equations.
6. Linear algebra: vector and matrix computation, solving linear systems, eigenvalues and eigenvectors computation, matrix decomposition.
7. Graphics: graphical representation of functions, parametric curves, curves in polar coordinates, implicitly defined curves, representation of discrete data, representation of the solution of differential equations.

Back

History of Sciences (FIS15035D)

Plurality of approaches in the history and philosophy of science and their interest in pedagogy and integral and humanistic training.
Aristotelian worldview.
Navigations and the preconditions of the Scientific Revolution.
Scientific Revolution: from Copernicus to Newton.
Kant and the theory of knowledge.
Lavoisier: Chemistry and the respiration of animals.
Laplacian Cosmovision and the development of Thermodynamics.
The consilience of inductions.
The Biological transformism and the anthropological model.
Overcoming mechanism, history and epistemology.
Quanta, relativity: overcoming the classical paradigm.
The history of science place.
Homo faber and the educational value of the history of science.
Institutionalization of HFC: creation of magazines and organization of conferences.
The modular structure of scientific theory.
Contemporary technoscience.
Material culture (laboratories, instruments, collections, etc).
The circulation of knowledge.
Science and values. Science and gender

Back

Introduction to automatic bibliographic reference systems (HIS15036D)

Introduction
1. Software installation
2. The importance of state of art and the difficulties in doing it
3. The main text formats used in the academic world
4. Zotero in the context of automatic management systems of bibliographic references
5. University libraries, available databases and the Web of Knowledge
Part I - Using Zotero to create my library
1. Collecting bibliography with Zotero
2. The organization of the library
3. Exploration of reading
4. Searching within the library
Part II - Reading with Zotero
Part III - Using Zotero for writing academic texts
1 Making the notes.
2. Styles
3.Automatically producing the final bibliography and changinge it
Part IV - Sharing with Zotero
1. E-mailing bibliographic references
2.Creating groups and sharing a library

Back

Emotions in learning contexts (PSI15037D)

1- Models and explanatory theories on the relationship between emotion and cognition.
2- Emotions and feelings in learning experiences
3- Emotional regulation in learning contexts

Back

Advanced Subjects in Biochemistry (QUI09316D)

The students are obliged to attend and participate in a minimum of Seminars / Conferences / Congresses about topics in the area of specialization of Biochemistry, organized by the Programme Commission, by the Departments of the School of Sciences and Technology or the Research Centres or Institutes of the University of Évora supporting the PhD programme in Biochemistry or by others, under approval by the Programme Commission.

Back

Biochemical Research III (QUI13530D)

Concepts, methodologies and techniques transmitted in a laboratorial environment, data analysis and problem solving through the development of a small project in the field of biochemistry (biochemistry and heritage, agriculture / agri-food, health and well-being and the environment). Students will be part of research teams where they will carry out a small individual work project based on solving a specific problem, within the scope of the research carried out by that team.

Back

Thesis I (QUI09909D)

Relevant and current topics related to Biochemistry.

Back

Complementary activities to the thesis I (QUI09575D)

Attendance to advanced courses or conferences offered by national or international investigators;
Organization of seminars to the presentation and divulgation of the results for the thesis;
Oral or Poster presentations in scientific meetings or congresses; Monitoring undergraduate courses on Biochemistry or related subjects; Other activities.

Back

Complementary activities to the thesis II (QUI09576D)

Interpretation of scientific diffusion works, like papers, presentation in scientific meetings in areas related with the thesis research work, it presentation and discussion. Working out of scientific works for the spread of relevant results and conclusions of the thesis preliminary research work.