English version at the end of this document

Ano Letivo	2019-20
Unidade Curricular	ARQUEOGENÉTICA
Cursos	ARQUEOLOGIA (3.º Ciclo) (*) (*) Curso onde a unidade curricular é opcional
Unidade Orgânica	Faculdade de Ciências Humanas e Sociais
Código da Unidade Curricular	16731042
Área Científica	ARQUEOLOGIA
Sigla	
Línguas de Aprendizagem	English / Inglês
Modalidade de ensino	Theoretical with three computational practical lectures. Seminars and a workshop will be organised on topics chosen by the students.
Docente Responsável	Hugo Rafael Cardoso Oliveira

DOCENTE	TIPO DE AULA	TURMAS	TOTAL HORAS DE CONTACTO (*)
Hugo Rafael Cardoso Oliveira	OT; S	S1; OT1	40S; 5OT

* Para turmas lecionadas conjuntamente, apenas é contabilizada a carga horária de uma delas.

ANO	PERÍODO DE FUNCIONAMENTO*	HORAS DE CONTACTO	HORAS TOTAIS DE TRABALHO	ECTS
1º	S2	40S; 5OT	280	10

* A-Anual;S-Semestral;Q-Quadrimestral;T-Trimestral

Precedências

Sem precedências

Conhecimentos Prévios recomendados

Archaeological theory; Basic computational skills; Middle/High School level knowledge of biology and chemistry.

Objetivos de aprendizagem (conhecimentos, aptidões e competências)

1) To understand genomics data as a proxy to answer archaeological questions.

2) To critically evaluate the use of genomics data in archaeology publications.

3) To learn how to include ancient and modern DNA data on research projects.

Conteúdos programáticos

1. **Basics of Molecular Biology**
2. **DNA sequencing Technologies / Lab Methods in modern and aDNA**
3. **PRACTICAL: Bioinformatics**
4. **Neandertals, Denisovians and Modern Humans**
5. **From the Late Palaeolithic to the Spread of Agriculture in Europe**
6. **PRACTICAL: Visit a Lab to see a PCR prep**
7. **Early Bronze Age "Migrations"**
8. **World Populations / Natural and Social Adaptation**
9. **Plant and Animal Domestication in the Near East**
10. **PRACTICAL: Bioinformatics**
11. **Pathogens / Environmental Archaeology**
12. **Ethics**
13. **Student Seminar**
14. **Workshop: How to use archaeogenetics in a PhD research question**

Demonstração da coerência dos conteúdos programáticos com os objetivos de aprendizagem da unidade curricular

Archaeogenetics(omics) has revolutionised archaeology in the past 20 years, being routinely used to address issues of human evolution, past migrations and social dynamics. The fast pace of these technologies has hindered a sound theoretical grounding and has rekindled debates about the nature and purpose of archaeology. Due to its multi-disciplinary nature, the design of experiments and the interpretation of data is frequently complicated by a lack of dialogue between archaeologists and geneticists.

This course will provide students with the basic knowledge to critically evaluate the use of genetics data to answer archaeological questions. They will discuss ethical and methodological. They will then be able to take informed positions on current debates. They will also learn basic field methods considering the potential of performing genomic studies. Finally, they will come up with ways to potentially use archaeogenetics in their PhD projects.

Metodologias de ensino (avaliação incluída)

1) Lectures

2) Three practical lectures

3) Seminars

4) Workshop: How to use DNA data in a PhD project.

Marks will be based on participation, the seminar and, if the students opt for it, a writen exam.

Demonstração da coerência das metodologias de ensino com os objetivos de aprendizagem da unidade curricular

NA

Bibliografia principal

Brown T & Brown K. 2011. *Biomolecular Archaeology: an introduction.* Wiley-Blackwell.

Reich D. 2018. *Who We Are and How We Got Here: ancient DNA and the new science of the human past.* Oxford University Press.

Archibal JM. 2018. *Genomics: a very short introduction.* Oxford University Press.

Jobling M, Hollox E, Kivisild T, Tyler-Smith C. 2013. *Human Evolutionary Genetics,* 2 nd edition. Garland Science.

Bardill J, Bader AC, Nanibaa' AG, Bolnick DA, Raff JA, Walker A, Malhi RS (2018). Advancing the ethics of paleogenomics. Science, 360(6387), 384-385.

Academic Year	2019-20
Course unit	ARCHAEOGENETICS
Courses	ARCHAEOLOGY (*) (*) Optional course unit for this course
Faculty / School	FACULTY OF HUMAN AND SOCIAL SCIENCES
Main Scientific Area	ARQUEOLOGIA
Acronym	
Language of instruction	English / Inglês
Teaching/Learning modality	Theoretical with three computational practical lectures. Seminars and a workshop will be organised on topics chosen by the students.
Coordinating teacher	Hugo Rafael Cardoso Oliveira

Teaching staff	Type	Classes	Hours (*)
Hugo Rafael Cardoso Oliveira	OT; S	S1; OT1	40S; 5OT

* For classes taught jointly, it is only accounted the workload of one.

Contact hours

T	TP	PL	TC	S	E	OT	O	Total
0	0	0	0	40	0	5	0	280

T - Theoretical; TP - Theoretical and practical ; PL - Practical and laboratorial; TC - Field Work; S - Seminar; E - Training; OT - Tutorial; O - Other

Pre-requisites

no pre-requisites

Prior knowledge and skills

Archaeological theory; Basic computational skills; Middle/High School level knowledge of biology and chemistry.

The students intended learning outcomes (knowledge, skills and competences)

1) To understand genomics data as a proxy to answer archaeological questions.

2) To critically evaluate the use of genomics data in archaeology publications.

3) To learn how to include ancient and modern DNA data on research projects.

Syllabus

1. **Basics of Molecular Biology**
2. **DNA sequencing Technologies / Lab Methods in modern and aDNA**
3. **PRACTICAL: Bioinformatics**
4. **Neandertals, Denisovians and Modern Humans**
5. **From the Late Palaeolithic to the Spread of Agriculture in Europe**
6. **PRACTICAL: Visit a Lab to see a PCR prep**
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9. **Plant and Animal Domestication in the Near East**
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12. **Ethics**
13. **Student Seminar**
14. **Workshop: How to use archaeogenetics in a PhD research question**

Demonstration of the syllabus coherence with the curricular unit's learning objectives

Archaeogenetics(omics) has revolutionised archaeology in the past 20 years, being routinely used to address issues of human evolution, past migrations and social dynamics. The fast pace of these technologies has hindered a sound theoretical grounding and has rekindled debates about the nature and purpose of archaeology. Due to its multi-disciplinary nature, the design of experiments and the interpretation of data is frequently complicated by a lack of dialogue between archaeologists and geneticists.

This course will provide students with the basic knowledge to critically evaluate the use of genetics data to answer archaeological questions. They will discuss ethical and methodological. They will then be able to take informed positions on current debates. They will also learn basic field methods considering the potential of performing genomic studies. Finally, they will come up with ways to potentially use archaeogenetics in their PhD projects.

Teaching methodologies (including evaluation)

1) Lectures

2) Three practical lectures

3) Seminars

4) Workshop: How to use DNA data in a PhD project.

Marks will be based on participation, the seminar and, if the students opt for it, a writen exam.

Demonstration of the coherence between the teaching methodologies and the learning outcomes

NA

Main Bibliography

Brown T & Brown K. 2011. *Biomolecular Archaeology: an introduction.* Wiley-Blackwell.

Reich D. 2018. *Who We Are and How We Got Here: ancient DNA and the new science of the human past.* Oxford University Press.

Archibal JM. 2018. *Genomics: a very short introduction.* Oxford University Press.

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