

A – General description

Programme title – Archaeology Techniques

Qualification – 1st Cycle undergraduate

Admission requirements– Admission may be obtained through the National application to higher education, special regimes of application or reenrolment and course transfers.

Educational and Professional objectives – This undergraduate degree (1st Cycle) aims to prepare archaeology technicians as per legislative decree and confers general competences in Archaeology.

Access to further studies – This First-Cycle Programme enables application to postgraduate studies (2nd Cycle).

Course structure and credits table (60 per year):

Course	Year	Semester	credits
History of Civilization, from Classic Antiquity to the Contemporary World	1	A (1 st /2 nd)	10
Territory: Geology, Biology, Ecology	1	A (1 st /2 nd)	15
Prehistory and Protohistory	1	A (1 st /2 nd)	7
Archaeological and Ethnographic Materials	1	1 st	6
Option I : Critical speech analysis	1	1 st	4
Informatics	1	1 st	4
Option II: Geography	1	2 nd	4
Cultural Anthropology and Ethnography	1	2 nd	6
Representation Techniques	1	2 nd	4
Historical Archaeology & Urban History of the Portuguese Territory	2	A	10
Option III: Archaeological sites studies	2	3 rd	5
Computer-Aided Design	2	3 rd	4
Inventory, Cataloguing and Impact Evaluation	2	3 rd	6
Quaternary Palaeoecology	2	3 rd	4
Theory and Method	2	3 rd	6
Geomorphology	2	4 th	6
Cartography and Surveying	2	4 th	6

Didactics	2	4 th	4
Option IV: Vertebrate Palaeontology	2	4 th	5
Project	2	4 th	4
Geographical Information Systems	3	A	14
Office and Laboratory Techniques	3	5 th	6
Option V: Introduction to Scientific Research	3	5 th	4
Laboratory Analysis	3	5 th	4
Survey Techniques & Natural Risk and Resources Evaluation	3	5 th	9
Creation and Animation of Cultural Spaces	3	6 th	3
Elective VI: Archaeology as a business	3	6 th	4
Biogeography and Human Ecology	3	6 th	6
Excavation Techniques	3	6 th	5
Seminar / Work placement	3	6 th	5

A – Annual

Final examination, if any– Not applicable

Rules for continuous and final examination – In each curricular unit a minimum of 10 marks on a 0-20 scale will be necessary to obtain a pass mark. Final mark will be calculated from the weighted average from the results obtained in each curricular unit for the three years of the programme and the respective percentage of ECTS credits.

ECTS Departmental Coordinator – Professor Pierluigi Rosina

B – Curricular Units Description

Course Title	History of civilization, from Classic Antiquity to the Contemporary World
Course Code	94671
Type of Course	Annual
Level of Course	NA
Year of Study	1 st
Semester/Trimester	Annual
Number of Credits	10
Name of Lecturer	Alexandra Figueiredo
Course Objectives (preferably expressed in terms of learning outcomes competences)	The subject aims to revive basic knowledge of history, from the factual level towards the conceptual level. The objective is to present several models that characterize the first civilisations and understand their impact in the modern civilizations.
Pre-requisites	NA
Course Contents	Introduction. Sources. History as an identity: from the Bible to Baghdad. Social, economical and political structure of pre-classical civilizations. The world in classical times. Other civilizations. Past and present: what changed?
Recommended Reading	BRAUDEL, Fernand, <i>História e Ciências Sociais</i> , trad. portuguesa, Lisboa, Presença, 1973. COLLINGWOOD, R. G., <i>A Ideia de História</i> , Lisboa, Ed. Presença, 1989 ECO, Umberto <i>Como se Faz uma Tese em Ciências Humanas</i> , 5 ^a ed., Editorial MATTOSON, José, <i>A Escrita da História. Teoria e Métodos</i> , Lisboa, Editorial Estampa, 1997 GARDINER, Patrick, Prefácio do antologista para a edição portuguesa de Teorias da História, F. C. G., Lisboa, 1984, p. XXXVIII
Teaching methods	Theoretical and Practical
Assessment Methods	Continuous: At the end of every semester the students will sit an examination, however assessment also includes assignments, classroom discussion and surprise tests. Final average will be calculated using the following formula: $(A \times 0,3) + (B \times 0,3) + (C \times 0,2) + (D \times 0,1) + (E \times 0,1)$, where A and B represent the exams, C the essays, D the tests and E assiduity and participation. A mark of 10 or higher is required to pass. If results are not achieved a general examination of 100% will be required.
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Territory: Geology, Biology, Ecology
Course Code	94672
Type of Course	Annual
Level of Course	NA
Year of Study	1 st
Semester/Trimester	Annual
Number of Credits	15
Name of Lecturer	Pierluigi Rosina; Luís Santos
Course Objectives (preferably expressed in terms of learning outcomes competences)	Provide basic knowledge of the methodologies and techniques that integrate the several matters covered by this unit. According to this principle, Territory covers such areas as Geology, Biology and Ecology enabling acquisition of knowledge in Geology, Zoology, Botanic, Genetics, Molecular Biology and Microbiology.
Pre-requisites	NA
Course Contents	Methodological basis of Geology. Principles and methods for the recognition and study of the earth's surface. Genesis and classification of minerals. Introduction to mineral resource exploration and its environmental impact. Importance of geological processes in environmental evolution. Relationship between human activity and geological processes. Recognition of fundamental aspects of plant and animal Biology. Basic concepts of general Ecology. Analytic relationship between biotic and abiotic factors in natural ecosystems. Structure, function and evolution of natural ecosystems.
Recommended Reading	Decourt & Paquet (1987). <i>Geologia. Objectos e métodos</i> , Ed. Almedina, Coimbra Burton, Richard F. (2001). <i>Biologia através dos números</i> , Porto Editora. Odum, E.P. (2001). <i>Fundamentos de Ecologia 6.ª Edição</i> , Fundação Calouste Gulbenkian
Teaching methods	Theoretical and practical classes in all areas (Geology, Ecology and Biology).
Assessment Methods	Continuous: Examination (80%); Essays (20%) Final: Exam (100%)
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Prehistory and Protohistory
Course Code	94673
Type of Course	Annual
Level of Course	NA
Year of Study	1 st
Semester/Trimester	Annual
Number of Credits	7
Name of Lecturer	Alexandra Figueiredo
Course Objectives (preferably expressed in terms of learning outcomes competences)	The students are expected to understand human history and the chronological stages of primitive communities. From the Palaeolithic to the Bronze age, subjects will be discussed such as the development of the intelligence, palaeontology, industrial complexes, the habitat, the society, the economy, material culture, the cults and rituals, the politics, the finding of new techniques, and activities, the art and the analogical relationship to other places in the world.
Prerequisites	NA
Course Contents	History, the object and epistemological statute. The various theoretic currents in Archaeology. Techniques and Methodologies in understanding archaeological remains. The process of human occupation. Hunters-Gatherers. Epi-palaeolithic and Mesolithic. The first producers. The Megalithic phenomena (chronology, Distribution, monumental variety), first metallurgic.
Recommended Reading	Alarcão Jorge (1996). <i>Para uma conciliação das arqueologias</i> . Edições Afrontamento Arnaud, J. Morais, (1993). O Mesolítico e a Neolitização: Balanço e perspectivas. <i>O Quaternário em Portugal, Balanço e perspectivas</i> , Lisboa, Colibri, 1993. pp. 173-184 Binford, Lewis R. (1983). <i>Em busca do Passado</i> . Europa América Jorge, S. O. (1999). <i>Domesticar a Terra</i> . Gradiva. Velho, A. (2000). <i>A emergência das sociedades agro-pastoris</i> . CEPBA, Viseu.
Teaching methods	Theoretical and practical.
Assessment Methods	Continuous: At the end of every semester the students will sit an examination, however assessment also includes assignments, classroom discussion and surprise tests. Final average will be calculated using the following formula: $(Ax0,3)+(Bx0,3)+(Cx0,2)+(Dx0,1)+(Ex0,1)$, where A and B represent the exams, C the essays, D the tests and E assiduity and participation. A mark of 10 or higher is required to pass. If results are not achieved a general examination of 100% will be required. Students will be allowed to develop extra practical work to improve the final grade.
Language of Instruction	Portuguese

B – Description of individual course units	
Course Title	Archaeological and Ethnographic Materials
Course Code	94674
Type of Course	One-semester course
Level of Course	NA
Year of Study	1 st
Semester/Trimester	1 st
Number of Credits	6
Name of Lecturer	Gonçalo Velho
Course Objectives (preferably expressed in terms of learning outcomes competences)	Raw materials, transformation systems and basic typologies. Methodologies for their recognition and identification.
Pre-requisites	NA
Course Contents	Actions – beyond subject and object. Ceramics. Stone. Metal. Textile. Notions of material culture.
Recommended Reading	ANDREFSKY, W., (1998) <i>Lithics (Cambridge Manuals in Archaeology)</i> . Cambridge: Cambridge University Press BENITO, LUÍS E BENITO JOSÉ, (1998) <i>Métodos y materias instrumentales en prehistoria y arqueología</i> , Vol I, II e III. Salamanca: Librería Cervantes
Teaching methods	Theoretical and practical.
Assessment Methods	Continuous: Practical essays during the semester and a final Project/essay. The students will pass and will be exempt from final exam if their average mark (0, 6 x final project/essay + 0, 4 the proposed essays) is a minimum of 9, 5. Final work requires a minimum of 7 pages on the themes covered by course content evaluated as follows: references (40%) + basic concepts (30%) + creative thinking (30%). Assessment of final work includes an oral presentation (30%) and a written essay (70%).
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Option I: Critical Analysis of the Speech. (Optional among the subjects available to the Archaeology course and others in the IPT).
Course Code	94675
Type of Course	One-semester course
Level of Course	NA
Year of Study	1 st
Semester/Trimester	1 st
Number of Credits	4
Name of Lecturer	Gonçalo Velho
Course Objectives (preferably expressed in terms of learning outcomes competences)	The subject aims to develop texts reading and critical analysis capabilities, developing simultaneously the ability to think upon the type of message delivered by several media (cinema, video, internet)
Pre-requisites	NA
Course Contents	Critical thinking – introduction to influences and speech. Conceptual mapping – building diagrams and nets. Text as texture – emphasise, read, capture main ideas. Bibliographic references. Writing as creative act (the reader as an author). Media: extensions of the human (video, sound, pod cast, blog, internet). Ideology matter always present.
Recommended Reading	Azevedo, Mário (2000) Teses, relatórios e trabalhos escolares: sugestões para estruturação da escrita. Lisboa: Universidade Católica Editora
Teaching methods	Theoretical and practical.
Assessment Methods	Students that obtain a pass mark during the continuous evaluation are not required to sit in an exam. Continuous evaluation will involve several essays and a final essay. Students will not be required a final examination if the average (0,6 X final essay + 0,4 essays) is superior to 9,5. The final exam will involve an essay following the same rules as the final essay.
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Informatics
Course Code	94676
Type of Course	One-semester course
Level of Course	NA
Year of Study	1 st
Semester/Trimester	1 st
Number of Credits	4
Name of Lecturer	Nuno Madeira
Course Objectives (preferably expressed in terms of learning outcomes competences)	Enable the use of some computer utility software's. Understand the need to correctly elaborate strategies/algorithms. Algorithms, think and understand the problem; Definition and strategies of the problem (algorithms); Development Access and Excel: usage of formulas and functions. Graphs; filters and data extraction; create related tables, and formulas.
Pre-requisites	NA
Course Contents	Theoretical and practical basics in using several informatics applications and operative systems.
Recommended Reading	Course notes supplied by the lecturer and as necessary bibliography recommended by the lecturer and available in the local library.
Teaching methods	Presentations, individual and group work.
Assessment Methods	50% continuous evaluation + 50% computer aided exam.
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Option II: Geography. (Optional among the subjects available to the Archaeology course and others in the IPT).
Course Code	94677
Type of Course	One-semester course
Level of Course	NA
Year of Study	1 st
Semester/Trimester	2 nd
Number of Credits	4
Name of Lecturer	António Rodrigues
Course Objectives (preferably expressed in terms of learning outcomes competences)	The subject aims not to learn the world but to learn how to interpret it. The main objective of the work will emphasise on the national territory, exploring themes such as Geology, Geomorphology, Hydrographs and Vegetation. Students will have to develop work upon a specific region of the country.
Pre-requisites	NA
Course Contents	Classification of the national territory, regarding a set of natural variables: Acidity, altimetry / Hypsometry, biotopes, soil use, hydrographs, lithology, drainage, evapotranspiration, air humidity, rainfall and temperature. Groups will be formed to classify NUTS3 regions.
Recommended Reading	DAVEAU, S., Portugal Geográfico, Lisboa, J. Sá da Costa, 1995 RIBEIRO, O.; LAUTENSACH, H.; DAVEAU, S., Geografia de Portugal, Lisboa, Edições João da Costa. Lecturer's notes.
Teaching methods	Theoretical and practical.
Assessment Methods	Written exam 60%; essays 40%. Students that do not obtain a minimum classification of 10 points will have to sit in a final exam (100%)
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Cultural Anthropology and Ethnography
Course Code	94678
Type of Course	One-semester course
Level of Course	NA
Year of Study	1 st
Semester/Trimester	2 nd
Number of Credits	6
Name of Lecturer	Gonçalo Velho
Course Objectives (preferably expressed in terms of learning outcomes competences)	Understand the main concepts related with anthropology. Understand the subject and the field, methods and articulation with other subjects. Acquire competences concerning the understanding of “the other”, the main objective of anthropology which allows students to develop comprehension of the surrounding world.
Pre-requisites	NA
Course Contents	Fundamental concepts in cultural anthropology. Social systems. Bio-cultural evolution models. Symbolic expressions. Spatial perspective of anthropology. Ethnography as identity basis.
Recommended Reading	Bernard, Alan e Spencer, J. 1997; <i>Encyclopaedia of Social And Cultural Anthropology (Routledge World Reference)</i> ; London, Routledge Hall, Eduart, T., 1997, <i>A Dimensão Oculta</i> , Lisboa, Relógio de Água Ingold, Tim, 1997, <i>Companion Encyclopaedia of Anthropology</i> , London , Routledge Podolefsky, André, Brown, P. e Lavenda, R., 2002, <i>Applying Anthropology: An Introductory Reader</i> , McGraw-Hill Riviere, Claude, 2000, <i>Introdução á Antropologia</i> , Lisba, Edições 70, Coleção Perspectivas do Homem:49
Teaching methods	Theoretical and practical.
Assessment Methods	Exam (50% of the final grade), essays (50% of the final grade). Students whose average - calculated by $F \times 0,5 + T \times 0,5$ (where F is the examination result and T the average of all essays proposed during the semester) - does not total 9,5 will have to sit a final exam (100%).
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Representation techniques
Course Code	94679
Type of Course	One-semester course
Level of Course	NA
Year of Study	1 st
Semester/Trimester	2 nd
Number of Credits	4
Name of Lecturer	Carlos Pedrosa Machado
Course Objectives (preferably expressed in terms of learning outcomes competences)	Representation of any object required in the professional future of the students.
Pre-requisites	NA
Course Contents	The importance of photography, technical drawing and other naturalistic or symbolic forms of expression. Norms of drawing. Drawing material and techniques. Basic notions of geometry. Bi-dimensional and tri-dimensional drawing. Drawing of artefacts, eco-facts and stratigraphy. Graphical documentation for the study and understanding of landscape management for pre-historical and historical societies.
Recommended Reading	Cunha Luís Veiga, DESENHO TÉCNICO. Fundação Calouste Gulbenkian.
Teaching methods	During the semester the students will draw (pencil) several perspectives of different objects. All representation will follow the updated normative used in Portugal.
Assessment Methods	Continuous evaluation – Evaluation of the works carried out during the semester. All students obtaining $\geq 9, 50$ points do not have to sit final examination.
Language of Instruction	Portuguese

	B – Description of individual course units
Course Title	Historical Archaeology & Urban History of the Portuguese Territory
Course Code	946710
Type of Course	Annual
Level of Course	NA
Year of Study	2 nd
Semester/Trimester	Annual
Number of Credits	10
Name of Lecturer	Silvério Figueiredo
Course Objectives (preferably expressed in terms of learning outcomes competences)	Techniques and methods of study; approach Archaeology from the heritage's point of view; Archaeological work from the fieldworks point of view; introduction to the basic concepts of Archaeology in urban environment.
Pre-requisites	NA
Course Contents	Statutes and concept of Archaeology. Theoretical chains of thinking in Archaeology. Archaeology in Portugal. Field and Office Archaeology. Prehistorical and historical Archaeology. Dating methods. Biological, Geological and Geographic evolution of the Portuguese territory. The first human settlements in the Portuguese territory. From proto-history to the Roman control. Moorish presence in Portugal. The History of Portugal from the conquest of the territory to the present days.
Recommended Reading	BONNASSIE, Pierre (dir.) <i>Dicionário de História Medieval</i> , Publicações D. Quixote, Lisboa DJINDJIAN, L. (1991) <i>Méthodes pour l'Archéologie</i> . Arnaud colin, Paris JOEGE, V. & JORGE S. (1996) "Arqueologia Portuguesa no séc. XX: alguns tópicos para um balanço", <i>Trabalhos de Antropologia e Etnologia</i> , 36, pp. 143 – 158 LOPES, Flávio (coordenação), <i>Património Arquitectónico e Arqueológico Classificado</i> (3 vol.), IPPAR, 1993 MOBERG, C.-A. (1981), <i>Introdução à Arqueologia</i> , Ed. 70, Lisboa RENFREW, C. & BAHN, P. (1983) <i>Arqueologia. Teorias. Metodos y práctica</i> , Ed. Akal, Madrid
Teaching methods	Theoretical
Assessment Methods	Continuous evaluation: Two written exams (70%) essay (30%).
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Option III: Archaeological sites studies (Optional among the subjects available to the Archaeology course and others in the IPT).
Course Code	964711
Type of Course	Semester
Level of Course	NA
Year of Study	2 nd
Semester/Trimester	3 rd
Number of Credits	5
Name of Lecturer	José Gomes
Course Objectives (preferably expressed in terms of learning outcomes competences)	Integrated and multidisciplinary study of Archaeological sites. Students will experience direct contact with Archaeological sites of the region.
Pre-requisites	NA
Course Contents	What is an Archaeological site? Location (maps 1:25.000, coordinates, and administrative locations). Context: Geological, environmental, and historical. Description: Topography, stratigraphy, artefacts and interpretation of structures.
Recommended Reading	CRUZ A. R. (1989). <i>Do Campo ao Laboratório</i> , Lab. Pré-História - IPT SOUSA F.(1999). <i>Introdução ao Desenho Arqueológico</i> , Ed: Câmara Municipal De Almada, Almada.
Teaching methods	Theoretical and practical. Laboratory work and field visits.
Assessment Methods	Continuous evaluation, requiring minimum presence. Final report 70%, classroom tasks for each site studied 30%.
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Computer-Aided Design
Course Code	946712
Type of Course	One-semester course
Level of Course	NA
Year of Study	2 nd
Semester/Trimester	3 rd
Number of Credits	4
Name of Lecturer	Carlos Pedrosa Machado
Course Objectives (preferably expressed in terms of learning outcomes competences)	This subject aims to prepare the professional future of the students, in describing and clearly represent (in digital format) any complex object with the aid of AutoCAD programme.
Pre-requisites	NA
Course Contents	Parameterisation of the drawing space. Drawing commands. Editing and modifying commands. Using raster images. 3D drawing.
Recommended Reading	Manual do AutoCAD, Autodesk Inc. O Guia Prático do AutoCAD 2005 a 2D, Centro Atlântico (Portugal). O Guia Prático do AutoCAD 2005 a 3D, Centro Atlântico (Portugal).
Teaching methods	Tutorial and software-based exercises.
Assessment Methods	Continuous evaluation. Appreciation of the proposed work during practical classes. Minimum passing requirements: - Average of practical work > 9.50 - Exam: Usage of software to draw a complex piece.
Language of Instruction	Portuguese

B – Description of individual course units	
Course Title	Inventory, Cataloguing and Impact Evaluation
Course Code	946713
Type of Course	One-semester course
Level of Course	NA
Year of Study	2 nd
Semester/Trimester	3 rd
Number of Credits	6
Name of Lecturer	Silvério Figueiredo
Course Objectives (preferably expressed in terms of learning outcomes competences)	Understanding the fundamental concepts of inventory. Standards concerning information gathering and compiling for inventory of several typologies. Fundamental concepts of cataloguing, specifically for clarity and aimed at technical libraries. Archaeological site evaluation covering impact assessment studies.
Pre-requisites	NA
Course Contents	Organize a bibliographical list. Legislation on Archaeology. Inventory. Definition of Archaeological patrimony. Archaeological sites. Monuments and architectural sets. Cataloguing. Impact evaluation.
Recommended Reading	FRÉDERIC, L., (1981) <i>Manual Prático de Arqueologia</i> , Livraria Almedina, Coimbra LOPES, Flávio (coordenação), <i>Património Arquitectónico e Arqueológico Classificado</i> (3 vol.), IPPAR, 1993 Normas de Inventário, arqueologia, Normas Gerais, IPM, Lisboa, 2000 NUNES, L. F. Como Organizar uma Pequena Biblioteca, BAD, 1987 VARIOS, Estudos de Impacto da Ponte Vasco da Gama, CEMA, Lisboa, 1998
Teaching methods	Theoretical and practical.
Assessment Methods	Exam (50%); two essays (50%). Final exam (100%).
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Quaternary Palaeoecology
Course Code	946714
Type of Course	One-semester course
Level of Course	NA
Year of Study	2 nd
Semester/Trimester	3rd
Number of Credits	4
Name of Lecturer	Pierluigi Rosina; Silvério Figueiredo
Course Objectives (preferably expressed in terms of learning outcomes competences)	Environmental reconstructions of the past. Quaternary evolution of animals and plants. Spatial distribution of environments (biogeography) and temporal variations (bio-strathigraphy). Archaeological methodologies used in the study of organic remains.
Pre-requisites	NA
Course Contents	Quaternary chronology. Continental deposits morphology. Palaeosoils. Climatic variations. Glacial and oceanic episodes. Ecology. Palaeoenvironments and lifestyle. Palaeoautoecologia. Palaeosynecology. Fossils and palaeoclimate. Palaeobiogeography. Faunal units. Palynology and anthracology. Men and environment. Examples from the Iberian Peninsula.
Recommended Reading	Butzer, K.W., <i>Archaeology as human ecology</i> , Cambridge University Press 1982
Teaching methods	Theoretical and practical
Assessment Methods	Continuous: exam (80%); essay (20%). Final exam: (100%)
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Theory and Method
Course Code	946715
Type of Course	One-semester course
Level of Course	NA
Year of Study	2 nd
Semester/Trimester	3 rd
Number of Credits	6
Name of Lecturer	Luiz Oosterbeek; Gonçalo Velho
Course Objectives (preferably expressed in terms of learning outcomes competences)	Epistemological statutes of Archaeology. Theoretical thinking chains. Basic concepts.
Pre-requisites	NA
Course Contents	Notions of the epistemological basis of Archaeology. Main theoretical currents and their context on the 19 th century.
Recommended Reading	CHILDE, V. Gordon - <i>Para uma recuperação do passado: a interpretação dos dados arqueológicos</i> . Amadora: Bertrand, 1969. 183, [5] p.; BINFORD, Lewis R. - <i>Em busca do passado</i> . Lisboa: Europa-América, cop. 1983. 304 p.; ALARCÃO, Jorge de - <i>Para uma conciliação das Arqueologias</i> . Porto: Afrontamento, cop. 1996. 71, [5] p. ; BICHO, Nuno Ferreira – <i>Manual de Arqueologia pré-histórica</i> . Lisboa: Edições 70, 2006. 525, [3] p.; RENFREW, C., BAHN, P. – <i>Archaeology: theories, methods and practice</i> , London, Thames & Hudson
Teaching methods	Theoretical and practical
Assessment Methods	Final evaluation will consider: Classroom participation – 15% Interdisciplinary coordinated essay (From the Theory-method perspective) – 25% Comments to various texts – 25% Exam – 25% Assiduity – 10%
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Geomorphology
Course Code	946716
Type of Course	One-semester course
Level of Course	NA
Year of Study	2 nd
Semester/Trimester	4 th
Number of Credits	6
Name of Lecturer	Pierluigi Rosina
Course Objectives (preferably expressed in terms of learning outcomes competences)	Principles, concepts and study methods of the main morphologic characteristics of the landscape. Introduction to structural, climatic, quantitative and applied geomorphology.
Pre-requisites	NA
Course Contents	Introduction. Processes. Structural forms. Soil and rock decomposition. Slope modelling. Hydrological network problems. Description of the most common morphological occurrences on the Earths surface. Typical processes and forms of large climatic divisions. Man made structures and forms. Topographic profiles. Hydrological basin delimitation.
Recommended Reading	Strahler, A. N., <i>Physical Geography</i> , Wiley 1974
Teaching methods	Theoretical and practical
Assessment Methods	Continuous: Exam (80%); group essay (20%). Final exam (100%)
Language of Instruction	Portuguese

B – Description of individual course units	
Course Title	Cartography and Surveying
Course Code	946717
Type of Course	One-semester course
Level of Course	NA
Year of Study	2 nd
Semester/Trimester	4 th
Number of Credits	6
Name of Lecturer	António Rodrigues
Course Objectives (preferably expressed in terms of learning outcomes competences)	Use, manage and understand topographic and thematic cartography. Methodologies of cartographic and topographic surveying, representation and projection, photometry. Principles of instrumentation usage and measuring operations. Study of geographical space. Principles of geodesics.
Pre-requisites	NA
Course Contents	<p>Theoretical component: what is a map? Cartography, Topography, Geodesics. Earth modelling. Two-dimensional representations of elevation. Coordinates (typology). Geodesic and altimetry data. UTM- Portuguese Military coordinate system. Reference directions. Coordinates transformation. Map legends and symbols information. Topography.</p> <p>Practical component: Scales. Hypsometry. Hypsometric profile/Curves. Brisson's law –representation errors. Hydrologic basins hypsometry. Hillshade. Geographic coordinates. UTM. GAUSS. Slopes / slopes map. Viewshed analysis. GPS.</p>
Recommended Reading	Alves, J; Cruz, J; Norte, C; Topografia (Academia Militar, 1988); Gaspar, J; Cartas e Projecções Cartográficas (Lidel, 2000); Matos, J; Fundamentos de Informação Geográfica (Lidel 2001).
Teaching methods	Theoretical and practical
Assessment Methods	Exam, 60%; essay, 40%. Students that do not achieve a minimum grading of 10 marks will have to sit a final examination (100%).
Language of Instruction	Portuguese

B – Description of individual course units	
Course Title	Didactics
Course Code	946718
Type of Course	Semester
Level of Course	NA
Year of Study	2 nd
Semester/Trimester	4 th
Number of Credits	4
Name of Lecturer	Luiz Oosterbeek
Course Objectives (preferably expressed in terms of learning outcomes competences)	Approach to investigation regarding the generic social sciences. Didactic demonstration of archaeological sites emphasizing Archaeography, ethnography, rural and urban contextualisation.
Pre-requisites	NA
Course Contents	Introduction: Didactic sense of patrimonial education Culture, Territory and Pedagogies: a new paradigm of social responsibility Didactics of material culture: Archaeology Didactics of material and immaterial culture: ethnography Didactic of the man-environment culture: ecology
Recommended Reading	AAVV (2000). Guia didáctica del Museu d'Alcoi. - Alcoi: Ajuntament d'Alcoi. Museu Arqueològic Municipal Camil Visedo Moltó Anderson, David (2003), A educação de adultos e a responsabilidade social dos Museus, <i>In: Boletim Cultural</i> . - Vila Franca de Xira: C. M. - N. 9, p. 15-22 Cruz, Maria das Dores Girão da (1991), A educação nos museus: algumas notas para a elaboração de um projecto de aproveitamento didáctico da sala de arqueologia de um museu local, <i>In: Arqueologia</i> . - Porto: Grupo de Estudos Arqueológicos do Porto. - N. 21, p. 37-46 Filipe, Graça (1999), Museus e educação: a acção educativa e cultural dos museus com colecções de arqueologia, <i>In: O arqueólogo português</i> . - Lisboa: Museu Nacional de Arqueologia. - Sér. 4, vol. 17, p. 155-156 Houart, Jacques (2000), Dança, educação e antropologia: libertar o movimento, <i>In: Antropologia portuguesa</i> . - Coimbra: Universidade de Coimbra. - Vol. 16/17, p. 5-18
Teaching methods	Theoretical and practical
Assessment Methods	Continuous evaluation, face-to-face theoretical and practical classes, intermediate examination, through exams and group assignments; final evaluation through a final exam.
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Option IV: Vertebrate Palaeontology (Optional among the subjects available to the Archaeology course and others in the IPT).
Course Code	946719
Type of Course	One-semester course
Level of Course	NA
Year of Study	2 nd
Semester/Trimester	4 th
Number of Credits	5
Name of Lecturer	Silvério Figueiredo
Course Objectives (preferably expressed in terms of learning outcomes competences)	Know the origin and evolution of vertebrate fauna; know the main groups of vertebrates and their characteristics; skeletal differences between vertebrates; differences in typology of bones; bone physiology; Quaternary vertebrates and their contribution to Archaeology.
Pre-requisites	NA
Course Contents	Definition of Palaeontology, vertebrate's palaeontology, problematic in the palaeontological study of vertebrates. Taxonomy, what are fossils.
Recommended Reading	CARDOSO, J.L. (1993): <i>Contribuição para o conhecimento dos grandes mamíferos do Plistocénico Superior de Portugal</i> . Câmara Municipal de Oeiras, Oeiras. DOMÉNECH, R. & MARTINELL, J. (1996): <i>Introducción a los Fossiles</i> , Masson, Barcelona. MENDES, J. C. (1988), <i>Paleontologia Básica</i> , Ed. Da Universidade de São Paulo, S. Paulo FIGUEIREDO, S. (2008), <i>Os dinossauros de Portugal</i> , Ed. Cosmos, Chamusca.
Teaching methods	Theoretical and practical
Assessment Methods	Exam 60%; practical work 40%
Language of Instruction	Portuguese

B – Description of individual course units	
Course Title	Project
Course Code	946720
Type of Course	One-semester course
Level of Course	NA
Year of Study	2 nd
Semester/Trimester	4 th
Number of Credits	4
Name of Lecturer	Alexandra Figueiredo
Course Objectives (preferably expressed in terms of learning outcomes competences)	Project will enable the students to understand and apply all the necessary steps of developing a project in the areas of Archaeology and heritage. With this in mind, the students will approach such problematic as planning resources, costs, financing, deadlines, documentation, and maintenance among others. The students will develop a Project of their own choice and will be guided according to the topic chosen.
Pre-requisites	NA
Course Contents	Presentation of concepts for execution of Projects: methodology, chronograms, theoretical orientation, progress reports, financing and budget among others. Preparation of a small Project.
Recommended Reading	Bibliography will be presented in the form of scientific articles during the classes and on specific thematic areas.
Teaching methods	Theoretical and practical
Assessment Methods	Oral presentation of projects (45 min.). Written report of the proposed project. Evaluation will be expressed as follows: 50% (planning and conception) + 40% (Practical performance) + 10% (oral presentation). Final exam-100%.
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Geographical Information Systems
Course Code	946721
Type of Course	Annual
Level of Course	NA
Year of Study	3 rd
Semester/Trimester	Annual
Number of Credits	14
Name of Lecturer	Rita Anastácio
Course Objectives (preferably expressed in terms of learning outcomes competences)	Usage of GIS software in practical classes, spatial database creation, data processing techniques and spatial data analysis aiming to diagnose situations, planning and management of problematic situations using GIS.
Pre-requisites	NA
Course Contents	<p>Theoretical: Information systems; Introduction to GIS; Coordinate systems in Portugal; Geographic modelling; Techniques of geographical data production; GIS functionality; Quality of information; Metadata.</p> <p>Practical: Informatics concepts; Software as a GIS component; Introduction to Arc View; Working with tables; Editing shapefiles; Searching and analysing themes; Layout creation.</p>
Recommended Reading	<p>Aronoff, S., (1989). <i>Geographic Information Systems: a management perspective</i>. Ottawa, Canada: WDL Publications.</p> <p>Burrough, P. A. (1994). <i>Principles of Geographical information Systems for Land Resources Assessment</i>. Oxford Science Publications.</p> <p>Maguire, David J.; Goodchild, Michael F. e Rhind, David W. (1992). <i>Geographical Information System</i>. Longman Scientific & Technical.</p> <p>Matos, J. (2001) <i>Fundamentos de Informação Geográfica</i>. Lidel</p>
Teaching methods	Theoretical and Practical
Assessment Methods	<p><i>Practical</i>: 20% continuous evaluation (80% attendance obligatory). Average of the 3 best results in the tests (total 4) 20%. Project preparation of free choice (Groups of 2 students) followed by oral presentation, required script preparation in paper format.</p> <p><i>Theoretical</i>: 15% essay (Groups of 2 students) followed by oral presentation, required script preparation in paper format.</p> <p>Theoretical topic to be assigned. (45%) Mid-term test or Exam – 60% Theoretical Section and 40% Practical Section, minimum mark of 9.</p>
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Office and Laboratory techniques
Course Code	946722
Type of Course	One-semester course
Level of Course	NA
Year of Study	3 rd
Semester/Trimester	5 th
Number of Credits	6
Name of Lecturer	Luís Santos
Course Objectives (preferably expressed in terms of learning outcomes competences)	<p>The curricular objectives expressed in terms of achievement of educational competences are:</p> <ul style="list-style-type: none"> - Questionnaire preparation and analysis; - Survey methods preparation and analysis; - Database conception of gathered data; - Statistical analysis of all components.
Pre-requisites	NA
Course Contents	<p>Field surveys – Characteristics of several areas of knowledge used in Archaeology, Environment, Geology and Biology and their application in field surveys and questionnaires; Gathering samples and sample size; Sorting and analysing results; Statistical analysis and reporting.</p> <p>Practical: Create a questionnaire/field (Excel, Key point); Create a database (Access); Analyse data (Minitab).</p>
Recommended Reading	<p>Babbitt, Bettina A.; Nystrom, Charles O. 1989. <i>Questionnaire Construction Manual Annex. Questionnaires: Literature Survey and Bibliography</i>, ESSEX CORP WESTLAKE VILLAGE CA</p> <p>Jabine, et al. (1984). <i>Cognitive aspects of survey methodology: Building a bridge between disciplines</i>. Washington, DC: National Academy Press.</p> <p>Santos, L. 2005. Handouts prepared by the lecturer, research databases.</p>
Teaching methods	Theoretical and practical
Assessment Methods	Evaluation will involve 3 essay type reports and a final presentation worth 50% of the final result, the remaining 50% will be in exam format. Students that do not achieve the minimum grade of 10 points in continuous assessment will have to sit a final exam (100%).
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Option V: Introduction to Scientific research (Optional among the subjects available to the Archaeology course and others in the IPT).
Course Code	946723
Type of Course	One-semester course
Level of Course	NA
Year of Study	3 rd
Semester/Trimester	5 th
Number of Credits	4
Name of Lecturer	Luiz Oosterbeek; José Gomes
Course Objectives (preferably expressed in terms of learning outcomes competences)	Systematization of the main procedures that structure investigation in Archaeology
Pre-requisites	NA
Course Contents	Preparing a plan and investigation report. Implementation of a study plan and a report of comparative analysis.
Recommended Reading	Umberto Eco, <i>Como se faz uma tese</i> Outra bibliografia adequada a cada projecto individual.
Teaching methods	Theoretical classes, defining individual projects, presentations of case studies.
Assessment Methods	Assessment of individual work presentations and written essay.
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Laboratory Analysis
Course Code	946724
Type of Course	One-semester course
Level of Course	NA
Year of Study	3 rd
Semester/Trimester	5 th
Number of Credits	4
Name of Lecturer	Luís Santos
Course Objectives (preferably expressed in terms of learning outcomes competences)	<p>The curricular objectives expressed in terms of achievement of educational competences are:</p> <ul style="list-style-type: none"> - Produce appropriate laboratory reports; - Soils and sediment analysis; - Palynological analysis; - Dendrochronology; - Archaeology and genetics - Laboratory safety.
Pre-requisites	NA
Course Contents	Collection methods; Soil and sediment processing; Soil and sediment analysis; Granulometry; Palynology; Dendrochronology; Genetics applied to Archaeology.
Recommended Reading	Campbell - Biology 3 rd Edition, 1994 V.Lopez Solanas; 1991; Tecnicas De Laboratorio N.F.Lightfoot; 2003. Analise Microbiologica de Alimentos e água
Teaching methods	Theoretical and laboratory.
Assessment Methods	Evaluation will be as follows: 50% for laboratory reports and 50% for written examination. Students who do not achieve the minimum mark of 10 points in continuous assessment will have to sit a final exam covering both practical and theoretical sections.
Language of Instruction	Portuguese

B – Description of individual course units	
Course Title	Survey Techniques & Natural Risk and Resources Evaluation
Course Code	946725
Type of Course	One-semester course
Level of Course	NA
Year of Study	3 rd
Semester/Trimester	5 th
Number of Credits	9
Name of Lecturer	Pierluigi Rosina; José Gomes
Course Objectives (preferably expressed in terms of learning outcomes competences)	Main techniques currently used in the characterisation of landscape in multiple scales. Aerial recognition, remote sensing. Main concepts used in Geophysics. Surveying instruments. Basic methodologies and techniques for natural risk assessment. Identification, analysis and mitigation of major natural risks.
Pre-requisites	NA
Course Contents	Natural hazards in society; basic concepts; characterisation of risk. Volcanic and seismic hazards; Erosion and soil contamination; Risks associated to fluvial systems and aquifers; Movements of mass and subsidence. Risks associated to wetlands and coastal areas. Field work, basic concepts and methodology.
Recommended Reading	Nicholas K. Coch (1995). <i>Geohazards Natural and Humain</i> , Prentice Hall Englewood Cliffs, New Jersey 07632 Renfrew, A. e Bahn, P. (1996). <i>Archaeology: Theory, Methods and Practice</i> . Thames & Hudson. Cruz, A. R. <i>Do campo ao Laboratório</i> . Laboratório de Pré-história-IPT.
Teaching methods	Theoretical and field classes, the latter require presence minimums.
Assessment Methods	Continuous evaluation: Essay 40%, exam (60%).
Language of Instruction	Portuguese

B – Description of individual course units	
Course Title	Creation and Animation of Cultural Spaces
Course Code	946726
Type of Course	One-semester course
Level of Course	NA
Year of Study	3 rd
Semester/Trimester	6 th
Number of Credits	3
Name of Lecturer	Luiz Oosterbeek
Course Objectives (preferably expressed in terms of learning outcomes competences)	Students will be able to identify different cultural spaces, with special emphasis on cultural heritage. The subject aims to develop a critical approach, producing a mature evaluation of the social function of such equipments as practical capabilities necessary to planning, management and animation of such spaces.
Pre-requisites	NA
Course Contents	Cultural space from leisure and educational points of view. Target audiences. Typology of cultural spaces and animation techniques.
Recommended Reading	<p>AMBROSE, T. (1993) – <i>Managing new museums. A guide to good practice</i>. Edinburgh: HMSO.</p> <p>AMBROSE, T. e RUNYARD, S. (1991) – <i>Forward Planning – a handbook of business, corporate and development planning for museums and galleries</i>, MGC e Routledge, Londres.</p> <p>HEIN, G. E. (1998) – <i>Learning in the museum</i>. London. Routledge.</p> <p>LINDSAY, A. J. (1980) – <i>The curation and management of archaeological collections: a pilot study</i>. Washington: U. S. Department of the Interior.</p> <p>MACDONALD, S. (ed) (1998) – <i>The politics of display: museums, science, culture</i>. London: Routledge.</p> <p>MOORE, Kevin (1994) – <i>Museums Management</i>, Ed. Routledge, Londres.</p> <p>WALSH, K. (1992) – <i>The representation of the past. Museums and heritage in the post-modern world</i>. London: Routledge.</p>
Teaching methods	Theoretical and practical, the latter developing group work articulated with regional cultural spaces.
Assessment Methods	Continuous evaluation through participation on classroom discussions, mid-term exam and final exam.
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Option VI: Archaeology as a business (Optional among the subjects available to the Archaeology course and others in the IPT).
Course Code	946727
Type of Course	One-semester course
Level of Course	NA
Year of Study	3 rd
Semester/Trimester	6 th
Number of Credits	4
Name of Lecturer	Gonçalo Velho
Course Objectives (preferably expressed in terms of learning outcomes competences)	Familiarise students with the context: - Non academically work and organisation of micro-companies within the field of cultural patrimony.
Pre-requisites	NA
Course Contents	Institutions and legislation. Creation of a small or medium enterprise. Deliverables, workplans and reports. Project financing.
Recommended Reading	During the semester, all bibliography and legislation will be made available to the students.
Teaching methods	Theoretical and practical
Assessment Methods	Continuous: Practical essays during the semester and a final Project/essay. The students will pass and will be exempt from final exam if their average mark (0, 6 x final project/essay + 0, 4 the proposed essays) is a minimum of 9, 5. Final exam will assume the same pre-requisites as the final essay.
Language of Instruction	Portuguese

B – Description of individual course units	
Course Title	Biogeography and Human Ecology
Course Code	946728
Type of Course	One-semester course
Level of Course	NA
Year of Study	3 rd
Semester/Trimester	6 th
Number of Credits	6
Name of Lecturer	Luís Santos
Course Objectives (preferably expressed in terms of learning outcomes competences)	<p>The curricular objectives expressed in terms of achievement of educational competences are:</p> <ul style="list-style-type: none"> - Ecological concepts and terminology; - Understand the biogeographical distribution of the natural resources; - Understand Temporal and spatial scales; - Historical turn point events that affected Biogeography; - Human Biogeographic behaviour.
Pre-requisites	NA
Course Contents	Biodiversity; Distribution patterns; Biomes; Island Biogeography; Glacial episodes; Human Ecology.
Recommended Reading	<p>Campbell - <i>Biology</i> 3rd Edition, 1994</p> <p>TYVY, Joy – <i>Biogeography, a study of plants in the ecosphere</i>, L 3^a ed.1998</p> <p>LACOSTE et SALONON – <i>Elements de Biogeographie et Ecologie</i>, 2^o ed 1999</p> <p>MOREIRA-LOPES – <i>Vegetação em Portugal</i>, 1981</p> <p>CAMPBELL, BERNARD- <i>Ecologia Humana</i>, 1983, edições 70 Lda</p>
Teaching methods	Theoretical and practical
Assessment Methods	Continuous evaluation: 60% exam, 40% essay and oral presentation. Students that do not achieve the minimum grade of 10 points in continuous assessment will have to sit an exam (100%).
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Excavation Techniques
Course Code	946729
Type of Course	One-semester course
Level of Course	NA
Year of Study	3 rd
Semester/Trimester	6 th
Number of Credits	5
Name of Lecturer	José Gomes
Course Objectives (preferably expressed in terms of learning outcomes competences)	Understanding and applying field excavation techniques.
Pre-requisites	NA
Course Contents	Field work in one of the excavation sites currently in study.
Recommended Reading	Renfrew, C., Bahn, P. (1996). <i>Archaeology, Theories and methods</i> . London, Thames & Hudson Moberg, C.-A. (s/d). <i>Introdução á Arqueologia</i> . Ed. 70, Lisboa.
Teaching methods	Due to the nature of the subject, this particular course will be taught on the field, hence the intensive and concentrated classes.
Assessment Methods	Students will be required to attend a minimum of 2/3 of the excavation classes and deliver a written an essay. Students that do not achieve a minimum of 10 points will be submitted to a written exam and a practical exam with a minimum of 30 hours of excavation.
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Seminar / Placement In case of placement, this will take place in an external institution, where the function will follow internal regulation parameters.
Course Code	946730
Type of Course	One-semester course
Level of Course	NA
Year of Study	3 rd
Semester/Trimester	6 th
Number of Credits	5
Name of Lecturer	José Gomes
Course Objectives (preferably expressed in terms of learning outcomes competences)	Knowledge of the archaeological reality of the country through direct contact with the main research projects, emergency excavations and national conservation sites. Project covering the study of a small collection of Archaeological artefacts.
Pre-requisites	NA
Course Contents	Definition of objectives; thematic approaches; on-site visits; development of the project; Final presentation.
Recommended Reading	ECO, Umberto <i>Como se Faz uma Tese em Ciências Humanas</i> , 5 ^a ed., Editorial Presença, Lisboa, 1991 Regulamento do Plano Nacional de Trabalhos Arqueológicos.
Teaching methods	Theoretical and practical classes, seminars and study trips.
Assessment Methods	Besides final examination, the students will be required to write a scientific article and present publically their research Project. Final grade will be calculated through the formula $(A \times 0,3) + (B \times 0,4) + (C \times 0,1) + (D \times 0,1) + (E \times 0,1)$, where A - Exam, B- Article, C- on-site visit reports, D- oral presentation and E attendance and continuous evaluation of the students' performance. Students will obtain a pass mark if the result of the formula equals a minimum of 10 points.
Language of Instruction	Portuguese