

SPECIAL CALLS FOR APPLICATION FOR INTERNATIONAL STUDENTS

ENTRANCE EXAM - HISTORY

Admission to the degree programmes in:

- Conservation and Restoration;
- Photography;
- Tourism and Cultural Heritage Management;
- Media Studies;
- Documentary Cinema.

Objectives

1. Understand the evolution of the course of human societies from Prehistory to Contemporary times;
2. Identify events, agents, institutions and spatial and temporal frameworks concerning historical reality
3. Establish connections between conditioning factors and several aspects of historical reality.

Content

We are only providing the general topics covered on the exam rather than exhaustively outlining the required History syllabus (which is based on the Portuguese secondary education syllabus):

1. General notions of History of Pre-Classical Civilizations and Classical Antiquity - political, economic, social and cultural aspects;
2. General notions of European History from the High Middle Ages to the Contemporary Era - political, economic and socio-cultural context;
3. General notions of Portuguese History in the above mentioned aspects

Maria Teresa Desterro

(Associate Professor)

SPECIAL CALLS FOR APPLICATION FOR INTERNATIONAL STUDENTS

ENTRANCE EXAM - ART HISTORY AND VISUAL CULTURE

Admission to the degree programmes in:

- Conservation and Restoration;
- Photography;
- Design and Graphic Arts Technology;
- Documentary Cinema;

Objectives

1. Understand the emergence of artistic movements from Classical Antiquity to Modern Times;
2. Characterize the artistic evolution over the centuries, identifying styles and movements and their most prominent representatives;
3. Understand the artistic and aesthetic evolution in Portugal since the origins of nationality until the twentieth century.

Content

We are only providing the general topics covered on the exam rather than exhaustively outlining the required Art History syllabus (which is based on the Portuguese secondary education syllabus):

1. General notions of Ancient Civilizations and Classical Antiquity;
2. General notions of European Art History from the High Middle Ages to the Contemporary Era;
3. General notions of Portuguese Art History, from the Middle Ages to the twentieth century.

Maria Teresa Desterro

(Associate Professor)

SPECIAL CALLS FOR APPLICATION FOR INTERNATIONAL STUDENTS

ENTRANCE EXAM - GEOGRAPHY

Admission to the degree programmes in:

- Business Administration;
- Media Studies.

Areas of knowledge

Chapter Description:

1. Portugal's position in Europe and in the world;
2. The population - consumer of resources and organiser of spaces;
3. The population: evolution and regional differences;
4. The natural resources available to the population: uses, limits and potential;
5. The spaces organised by the population;
6. The population, how it moves and how it communicates;
7. The integration of Portugal in the European Union: new challenges, new opportunities.

Recommended Reading

Any 10th and 11th grade Geography A textbook.

Note

Applicants must bring an elementary scientific calculator to the test.

Cláudia Pires da Silva
(Associate Professor)

SPECIAL CALLS FOR APPLICATION FOR INTERNATIONAL STUDENTS

ENTRANCE EXAM – ECONOMICS

Admission to the degree programmes in:

- Building and Construction Management;
- Accounting;
- Business Administration;
- Human Resources Management and Organisational Behaviour;
- Tourism and Cultural Heritage Management;
- Computing and Multimedia Technologies.

Areas of Knowledge

Chapter Description

1. Economic Activity and Economic Science
2. Key Aspects of Economic Activity
 - 2.1. Consumer needs
 - 2.2. The production of goods and services
 - 2.3. Commerce and currency
 - 2.4. Prices and markets
 - 2.5. Income and income distribution
 - 2.6. Savings and investment
3. The Accounting of Economic Activity
 - 3.1. The economic players and the economic circuit
 - 3.2. National Accounting
4. The Economic Organisation of Societies
 - 4.1. Economic relations with the rest of the world
 - 4.2. State intervention in economy
 - 4.3. Portuguese economy in the context of the European Union

Recommended Reading

Any 10th and 11th grade Economics A textbook.

Note

Applicants must bring an elementary scientific calculator to the test.

Cláudia Pires da Silva
(Associate Professor)

SPECIAL CALLS FOR APPLICATION FOR INTERNATIONAL STUDENTS

ENTRANCE EXAM - DRAWING

Admission to the degree programmes in:

- Photography;
- Design and Graphic Arts Technology;
- Documentary Cinema.

Key areas covered in the test

- Analytical, representational and interpretative drawing;
- Line drawing simplification.

General Objectives

1. Demonstrate analysis skills;
2. Demonstrate representation skills;
3. Develop creative solutions;
4. Be able to simplify line drawings;
5. Explore expressive procedures of plastic language;
6. Have a good command of the means of representation and explore their potential.

Material required for the exam

- | | |
|--|--|
| ▪ A3 sheets of drawing paper (or similar); | ▪ Square and ruler; |
| ▪ Paintbrushes; | ▪ Black markers, with tip of different thickness (0.1; 0.5; 0.8 and larger); |
| ▪ Chinese ink; | ▪ Eraser; |
| ▪ Plastic paint cups; | ▪ Mechanical pencil 0.5mm |
| ▪ Graphite pencil (normal, hard and soft); | |

Note

Applicants must have a pad or loose sheets of tracing paper.

João Costa Rosa
(Associate Professor)

SPECIAL CALLS FOR APPLICATION FOR INTERNATIONAL STUDENTS

ENTRANCE EXAM - DESCRIPTIVE GEOMETRY

Admission to the degree programmes in:

- Computer Engineering;
- Conservation and Restoration;
- Photography;
- Design and Graphic Arts Technology;
- Documentary Cinema;

Dual orthogonal projection system (Monge's Method)

1. Dot projections;
2. Representation of the straight line; determination of its features;
3. Representation of the plane and determination of its features;
4. Intersection between planes defined by their features;

Material required for the exam

- Compass;
- Set square;
- Pencil;
- Rubber.

Jorge Mascarenhas
(Full Professor)

SPECIAL CALLS FOR APPLICATION FOR INTERNATIONAL STUDENTS

ENTRANCE EXAM - MATHEMATICS

Admission to the degree programmes in:

- Building and Construction Management;
- Chemical Technology;
- Electrotechnical and Computer Engineering;
- Computer Engineering;
- Photography;
- Accounting;
- Business Administration;
- Mechanical Engineering;
- Informatics and Multimedia Technologies.

Areas of Knowledge

1. Geometry in the plane: solving problems involving the notion of:
 - 1.1. distance between points in the plane;
 - 1.2. Cartesian equations and inequalities of subsets in the plane.
2. Algebraic calculus:
 - 2.1. Generalities about number systems;
 - 2.2. Polynomial and rational fractional expressions;
 - 2.3. Solving equations and inequalities;
 - 2.4. Systems of linear equations;
 - 2.5. Trigonometry: trigonometric ratios of acute angles and trigonometric formulae.
3. Functions and Differential Calculus:
 - 3.1. Concept of function, domain, codomain, zeros, monotonicity and graphical representation;
 - 3.2. Affine and quadratic functions;
 - 3.3. Polynomial, rational and irrational functions;
 - 3.4. Exponential and logarithmic functions;
 - 3.5. Trigonometric functions;
 - 3.6. Average rate of change and instantaneous rate of change. Derivative of a function at a point.

- 3.7. Geometric interpretation of the derivative of a function at a point (equation of the tangent line);
- 3.8. Derivatives and their applications (relative extrema and monotonicity, concavities and inflection points);
4. Probabilities and combinatorial analysis:
 - 4.1. Combinatorial Analysis: arrangements, permutations, combinations and Newton's binomial;
 - 4.2. Probability Calculus: probability laws, conditional probabilities, independent events, theorem of total probability and Bayes theorem.

Recommended Reading

- Any high school Mathematics A textbook;
- Calculus - Volume 1 (8th Edition), Ron Larson, Bruce H. Edwards and Robert P. Hostetler (only the chapters that integrate the contents under assessment).

Notes

- The test is closed book. The necessary formulas will be provided on the test paper;
- The use of mobile phones, pencils and correction fluid is not allowed during the test;
- During the test the student may not leave the room;
- The presentation of an identification document is compulsory,
- Only elementary scientific calculators are allowed;
- A student who wishes to withdraw from the test must state so in writing on the test sheet but may only leave the room thirty minutes after the test has begun.

Ana Nata
(Associate Professor)

SPECIAL CALLS FOR APPLICATION FOR INTERNATIONAL STUDENTS

ENTRANCE EXAM - PHYSICS AND CHEMISTRY

Admission to the degree programmes in:

- Chemical Technology;
- Electrotechnical and Computer Engineering;
- Computer Engineering;
- Photography;
- Mechanical Engineering.

Areas of Knowledge

Part 1 - Physics

The written test will cover the subjects taught in the 10th, 11th and 12th grade syllabus taking mainly the following aspects into account:

1. Material point and system mechanics
 - 1.1. Kinematics and dynamics of particles moving in more than one direction: referential; position and displacement vectors; velocity and acceleration vectors (average and instantaneous); normal and tangential components of acceleration and radius of curvature; description of the motion of a particle from a_n and a_t ; law of velocities; law of motion;
 - 1.2. Motion under the action of a constant resultant force: initial conditions of motion and types of trajectory; parametric equations of motion and of the trajectory of motions subjected to the action of a constant resultant force with different direction from the initial velocity, projectiles;
 - 1.3. Motion of connected bodies: applied forces and connection forces, frictional forces; static and kinetic friction between solids; applications of Newton's Second Law to connected bodies; conical pendulum; gravitational pendulum; motion of a particle travelling in a circular path in a vertical plane;
 - 1.4. Oscillatory motion: Hooke's law and simple harmonic motion equation; characteristics of a simple harmonic oscillator: period, frequency and angular frequency; elongation and amplitude; velocity and acceleration of a simple harmonic oscillator; energy of a simple harmonic oscillator;
 - 1.5. Centre of mass and linear momentum of a system of particles: Systems of particles and rigid body; Centre of mass; Velocity and acceleration of the centre of mass; Linear momentum of a particle and a system of particles; Fundamental law of

- dynamics for a system of particles; Law of conservation of linear momentum; Elastic and inelastic collisions; coefficient of restitution.
2. Gravitational field and electrostatic field
 - 2.1. Law of Universal Gravitation; Cavendish's experiment and its interest; gravitational mass and inertial mass;
 - 2.2. Principle of conservation of electric charge; law of electrostatic actions or Coulomb's law; permittivity of the medium;
 - 2.3. Similarities and differences between Coulomb's and Newton's law; Concept of force field; Gravitational field and electrostatic field; Gravitational/electrostatic fields created by a stationary point mass/charge; Field lines - their properties; Uniform gravitational/electrostatic field; Work of the gravitational/electrical force; Gravitational/electrostatic fields as conservative fields; Expression of potential energy corresponding to the systems gravitational field/mass and electric field/charge; Gravitational potential/electric potential; Analytic expression of the function $V = V(R)$ for a radial gravitational/electrostatic field; Equipotential surfaces; Relationship between the modulus of the electric field vector and the potential difference in a uniform electrostatic field; Unit S. I. of the electric field magnitude.

Rosa Brígida Almeida de Quadros Fernandes
(Associate Professor)

Part 2 - Chemistry

1. Structure of matter
 - 1.1. Atomic structure and electronic configuration. The Periodic Table and variation of periodic properties of elements;
 - 1.2. Chemical bonding and molecular structure. Ionic and covalent bonds. Lewis structures. Molecular geometry;
 - 1.3. Physical states of matter. The gaseous state. Intermolecular forces, liquids and solids. Phase changes. Physical properties of solutions;
 - 1.4. Saturated, unsaturated and aromatic hydrocarbons. Functional groups.
2. Chemical reactions
 - 2.1. Chemical reactions and stoichiometry of chemical reactions.
 - 2.2. Chemical equilibrium. Law of mass action and equilibrium constant.
 - 2.3. Acid-base reactions. Ionization constants of acids and bases. The pH scale.
 - 2.4. Redox reactions. Spontaneity of redox reactions.
 - 2.5. Precipitation reactions and solubility of ionic compounds.

Recommended Reading

- Chang, R., Goldsby, K., Chemistry, 12th ed., McGraw-Hill, 2016

Valentim Nunes
(Associate Professor)

SPECIAL CALLS FOR APPLICATION FOR INTERNATIONAL STUDENTS

ENTRANCE EXAM - BIOLOGY AND GEOLOGY

Admission to the degree programme in:

- Chemical Technology

Areas of Knowledge

Part 1 - Biology

Based on the guidelines for designing Biology syllabuses (10th, 11th grades Earth and Life Sciences and 12th grade Biology) prepared by the Ministry of Education - Department of Secondary Education, the following topics have been considered of basic importance:

1. The cell
 - 1.1 Cellular organization
 - 1.2 Function and functioning of cellular organelles
2. Living systems and energy
 - 2.1. Origin of energy - production and mobilization of ATP
 - 2.2 Energy flow in ecosystems
3. Inheritance and biological information
 - 3.1 Genetic information and transfer
 - 3.2 Inheritance
4. Diversity and origin of species
 - 4.1. Fixism and Evolutionism
 - 4.2. Evolution of populations and formation of new species
5. Diversification of life - evolutionary perspective
 - 5.1. Systematics and classification
 - 5.2. Prokaryotes and Eukaryotes
6. Plant Biology
 - 6.1. Growth and development
 - 6.2. Transport
7. Animal Biology
 - 7.1. Growth and development
 - 7.2. Transport
8. Environmental Biology
 - 8.1. Ecosystems and population ecology
 - 8.2. Human Ecosystem and Environment

Luís Filipe Neves Carreira dos Santos
(Associate Professor)

Part 2 – Geology

Based on the guidelines for designing Biology syllabuses (10th, 11th grades Earth and Life Sciences and 12th grade Biology) prepared by the Ministry of Education - Department of Secondary Education, the following topics have been considered of basic importance:

1. Seismology and the Earth's Internal Structure
Earthquake origin. Seismic waves and discontinuities. Location of epicentres. Magnitude. Earthquake forecasting. The seismic zones in the several zones of the globe. Seismic risk minimization. Structure and composition of the Earth. Physical properties of the interior of the Earth.
2. Lithosphere dynamics - Plate tectonics
Manifestations of the Earth's internal heat. Wegener and continental drift. Seabed expansion. Theory of Plate Tectonics. Divergent margins. Paleomagnetism and plate speeds. Seabed topography. Convergent margins. Transforming faults.
3. Rock genesis and composition:
 - 3.1. Minerals in rocks. Composition and internal structure. Physical properties;
 - 3.2. Igneous rocks. Origin and evolution of magma. Magma properties. Texture and types of deposits. Classification. Volcanism. Types of volcanism and landscapes;
 - 3.3. Metamorphic rocks. Factors and types of metamorphism. Textures and structures of metamorphic rocks. Classification of metamorphic rocks;
 - 3.4. Sedimentary rocks. Weathering. Susceptibility of rocks to alteration. Transport. Deposition. Diagenesis. Classification of sedimentary rocks. Sedimentary structures;
 - 3.5. rock cycle.
4. Rock masses structure and deformation
Deformability of rock masses. Stress-strain relationships. Main types of folds. Faults. Diaclases.
5. Measurement of geologic time and Earth History
Concept of time. Relative dating. Geologic time scale. Radiometric dating and absolute age.
6. External Geodynamics:
 - 6.1. River basins. Main characteristics of river systems. Basin and hydrographic network. Dynamics of river flow. Longitudinal and transversal profile. Sediment transport and deposition;
 - 6.2. Coastal areas. Coastline: cliffs and beaches. Morphology and processes. Morphodynamics of sandy beaches. Coastal risks. Stability of the coastline: natural and anthropic factors;
 - 6.3. Slope zones. Factors and types of mass movements;
 - 6.4. Geological risk. Anthropic occupation and land use planning. Contribution of Geology in the prevention of geological risk.

7. Man as an agent of environmental change
Global warming. Sustainable exploitation of natural resources. Soil and water contamination.
8. Geological mapping
Reading and interpretation of geological maps.

Recommended Reading

- It is recommended to have a look at the secondary school Geology textbooks.

Ana Paula Gerardo Machado
(Associate Professor)

SPECIAL CALLS FOR APPLICATION FOR INTERNATIONAL STUDENTS

ENTRANCE EXAM - PHILOSOPHY

Admission to the degree programme in:

- Media Studies

Areas of Knowledge

1. Concept of myth, self and rhetoric;
2. The Socratic method - Irony and Maieutics - Sensible World and Intelligible World;
3. The theory of the superman in Nietzsche;
4. The confrontation between philosophy, science and religion in Galileo Galilei;
5. Sartre's existentialism

Silvio Manuel Brito
(Associate Professor)

SPECIAL CALLS FOR APPLICATION FOR INTERNATIONAL STUDENTS

ENTRANCE EXAM - PORTUGUESE

Admission to the degree programmes in:

- Building and Construction Management;
- Accounting;
- Human Resources Management and Organisational Behaviour;
- Tourism and Cultural Heritage Management
- Media Studies;
- Computing and Multimedia Technologies;
- Documentary Cinema.

Areas of Knowledge

PART 1

- Articles (Definite and Indefinite);
- Nouns;
- Adjectives and Adverbs;
- Demonstrative Pronouns;
- Personal Pronouns;
- Relative Pronouns;
- Possessive Pronouns and Possessive Adjectives;
- Declarative, Negative, Interrogative and Exclamatory Phrases;
- All and Everything; Both and Each;
- The prepositions *Por* and *Para*;
- Prepositions;
- Affixes, Prefixes and suffixes;
- Numerals;
- Idioms;

PART 2

- The indicative, conjunctive, imperative and conditional tenses;
- Reflexive and reciprocal pronoun conjugations;
- The conjunctive tense;
- The use of the conjunctive tense;
- Irregular verbs;
- *Ser, Estar, Ficar*;
- *Ter* and *Haver*;
- Passive voice;
- The personal infinitive and the impersonal infinitive;
- Prepositional phrases
- Common verbs

PART 3

- The Portuguese Language and the cultures of the huge Portuguese-speaking community.

Recommended Reading

Cunha, C. & Cintra L. F. L. (1986). *Nova Gramática do Português Contemporâneo* (3ª ed.). Lisboa: Edições Sá da Costa.

Vilela, M.(1995). *Léxico e Gramática*. Coimbra: Livraria Almedina

NOTE: The language level to be assessed in the exam will be B2 according to the Common European Framework of Reference for Languages.

Herminia Sol
(Associate Professor)

SPECIAL CALLS FOR APPLICATION FOR INTERNATIONAL STUDENTS

ENTRANCE EXAM - MATHS FOR SOCIAL SCIENCES

Admission to the degree programme in:

- Human Resources Management and Organisational Behaviour

Areas of Knowledge

1. Algebraic Calculus:
 - 1.1. Generalities about numbers;
 - 1.2. Polynomial and rational fractional expressions;
 - 1.3. Solving equations and inequalities;
 - 1.4. Systems of linear equations.
2. Mathematical Modelling:
 - 2.1. Population growth models (linear and non-linear);
 - 2.2. Financial Models.
3. Descriptive Geometry:
 - 3.1. Data classification;
 - 3.2. Building frequency tables. Adequate graphical representations for each type of data considered;
 - 3.3. Calculation and interpretation of statistics: measures of central tendency and order, measures of symmetry and measures of dispersion.
4. Probabilities and combinatorial analysis
 - 4.1. Combinatorial analysis: combinations, arrangements, permutations. Newton's binomial;
 - 4.2. Random events. Probabilities. Laplace's rule;
 - 4.3. Conditional probability. Probability trees. Independent events;
 - 4.4. Total Probability. Bayes' rule.

Recommended Reading

- Any textbook of Applied Mathematics for the Social Sciences covering the subject matter described above.

NOTES

- The test is closed book. The necessary formulas will be provided on the test paper;
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- The presentation of an identification document is compulsory,
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Ana Nata
(Associate Professor)