



**CALL FOR APPLICATIONS FOR EU AND EQUATED CITIZENS TO THE ONE-CYCLE DEGREE COURSE IN MEDICINE AND SURGERY WITH LIMITED ACCESS (Class LM-41) IN ENGLISH AT HUMANITAS UNIVERSITY**

**SUMMARY OF THE CALL IN ENGLISH**

**Academic year 2015/2016**

**Foreword**

**The official source of the Call for Applications for EU and equated citizens is “BANDO DI CONCORSO, RISERVATO AI CITTADINI COMUNITARI ED EQUIPARATI, PER L’AMMISSIONE AL CORSO DI LAUREA MAGISTRALE A CICLO UNICO IN MEDICINA E CHIRURGIA (Classe LM-41) IN LINGUA INGLESE DI HUMANITAS UNIVERSITY” in Italian. This document represents a summary of the call.**

**This document is provided for the convenience of international students. In the event of disputes, the parties should refer only to the document in Italian.**

**Admittance to the Degree Course is subject to selection through the University’s admissions test.**

**Art. 1 Number of places available**

For the academic year 2015/16, the number of places available for EU citizens and EU equated citizens (as reported in art. 2) is established as 80.

The number of places available may change in accordance:

- to a later Decree of the Ministry of Education, University and Research (M.I.U.R.), pursuant to the provisions of Law n. 264, August 2, 1999. The Decree of MIUR could confirm, increase or decrease the number of places available;
- to the availability of not covered places from the quota reserved to non-EU citizens non-resident in Italy. Not covered places would increase the number of places available for EU and equated citizens.

**Art. 2 Admission requirements**

Only the following candidates are entitled to apply for the present call of application on penalty of exclusion:

- Citizens of Italy and of European Union member states.
- Citizens holding a European citizenship together with a citizenship of a country not belonging to the European Union.
- The citizens of Norway, Iceland, Liechtenstein, Switzerland, the Republic of San Marino.

- Non-EU citizens holding a residence permit in Italy for employment or self-employment, for family reasons, political asylum, asylum for humanitarian or religious reasons.
- Non-EU citizens legally resident in Italy from at least one year in possession of a Secondary School Diploma obtained in Italy.
- Non-EU citizens, resident anywhere who hold diplomas from Italian schools abroad or foreign or international schools having bilateral agreements or special regulations for the recognition of qualifications and who satisfy the general conditions required to be admitted to study in Italy.
- Refugees.
- Diplomatic personnel accredited to International Organizations in Italy, Italian State, Vatican State and their dependant family members.

**Candidates applying and participating in the test without the possession of the citizenship requirements will not be considered for the ranking.**

To participate to the admissions test, candidates must be already in possession of a Secondary School Diploma.

In order to enrol for the first year of degree course in Medicine and Surgery, a diploma is considered valid if obtained after at least 12 years of education, accompanied by the Declaration of Value issued by the Italian diplomatic authorities.

In the event that the local school system provides for 11 or 10 years of schooling, the title is valid when integrated with one or two years of university, having passed all the required exams for those academic years.

**Candidates not holding valid qualification, according to the requirements of law, will lose the right to enrol. Further, if already enrolled, the candidate's enrolment will be cancelled.**

For the validation of foreign qualifications, Humanitas University will follow Ministry guidelines (nota of March 24 2014, prot. n. 7802) available in Italian at:

[http://www.studiare-in-italia.it/studentistranieri/testo\\_delle\\_norme.html](http://www.studiare-in-italia.it/studentistranieri/testo_delle_norme.html).

### **Art. 3 Application for the admissions test and deadlines**

The application for the Admissions Test is done exclusively online on the University website [www.hunimed.eu](http://www.hunimed.eu) from **May 18, 2015** until **August 28, 2015**.

Online application procedure:

1. **MyPORTAL Online registration at [www.hunimed.eu](http://www.hunimed.eu):** the candidate must register online to receive a username and a password; the username and password will be necessary to access the personal page on Humanitas University MyPORTAL;
2. **Application for the Admissions Test:** the candidate must apply for the admissions test by **August 28, 2015** using his/her username and password.

**In order to be entitled to sit the admissions test, candidates are requested to pay the test fee, which amounts to Euros 160.00. Payment must be made no later than the last day valid for the application for the Admissions Test (August 28, 2015). The amount must be paid by MAV, credit card or bank transfer. In the bank transfer candidate's surname and name must be specified. The test fee shall in no case be reimbursed.**

**The application for the Admissions Test must be done according to the instructions described above, on penalty of exclusion.**

**Please note that the payment of the test fee alone does not mean registration has been completed.**

The Admissions Test for the Degree Course in Medicine and Surgery consists in a quiz test according to the program and procedures described in articles 5, 6 and 7 of the present Call for Applications.

The candidate can sit the examination at a number of selected locations in Italy and abroad reported on the website [www.hunimed.eu](http://www.hunimed.eu) and specified in the Art 14 – “List of test centres”. The location of the test must be selected during the online application procedure.

#### **Art. 4 Candidates with disabilities**

Candidates with any kind of disability in need of extra means of support must formally request the support they will need for this test in relation to the extent of their disability. Candidates with learning disabilities can request the special terms foreseen in the Ministerial Decree DM 5669/2011 to guarantee equal opportunities during the test, including additional time for completing the test.

Among those candidates with disabilities the following should be considered: candidates who are blind, suffering from complete blindness or with vision not exceeding one tenth in both eyes; candidates who are deaf, from birth or before learning to speak; candidates with percentage of civil disability equal to or higher than 66%, candidates with handicap certificate of disability according to Law 104/92 as amended by Law 17/99. Disabilities must be certified by appropriate medical certificate issued by the competent health authorities. Certificates will be accepted only in Italian or in English.

Among the candidates with learning disabilities the following should be considered: candidates affected by dyslexia, dysgraphia, dyscalculia or dysorthography, certified by appropriate medical certificate, issued no earlier than 3 years prior by the National Health Service, by specialists or by accredited medical institutions, if approved by the Regions. The additional time for completing the test for candidates with learning disabilities will be in the measure of 30% compared to the standard time for the test, pursuant to Ministerial Decree DM 5669/2011.

These requests must be specified when applying for the Admissions Test on MyPORTAL and the medical certificates should - **preferably** - be attached in electronic format. Alternatively, the documentation can be sent to the email address [info@hunimed.eu](mailto:info@hunimed.eu) or posted using registered mail delivery (raccomandata RR) by the Admissions Test application deadline to the Student Office in via Manzoni 113 20089 Rozzano (MI).

### **Art. 5 Test subject**

During the Admissions Test, entirely provided into the English language, students are required to answer sixty (60) questions with five response options, of which the candidate will have to choose one only, discarding the wrong, arbitrary or less likely conclusions. On the basis of the programs listed in Annex A, the questions are divided as follows:

- Logical reasoning (23 questions)
- General culture (4 questions)
- Biology (15 questions)
- Chemistry (10 questions)
- Physics and Mathematics (8 questions).

### **Art. 6 Location and procedure for the Admissions Test**

**The Admissions Test, entirely provided into the English language, will be paper-based and will take place on Thursday, September 10, 2015 at the test-centres reported on the website [www.hunimed.eu](http://www.hunimed.eu) and in the Art. 14 “List of test centres” of this competition call.**

**The location of the test must be selected on the online portal. The choice is irrevocable.**

The admission Test for the Degree Course in Medicine and Surgery will be held, in Italy at **MEDIOLANUM FORUM, via Giuseppe Di Vittorio 6 Assago (MILAN)**. In Milan, the test will start at 14.00 pm. Candidates will have 100 minutes to complete the test. Candidates must present at 10.30 am for identification and registration with a valid identity document – identity card, driving license or passport – on penalty of exclusion.

Candidates will be assigned a seat in the different sectors of MEDIOLANUM FORUM according to their age, except for twins.

For those sitting the test in any of the locations abroad, address, time and locations are displayed on Humanitas University website and reported in Art. 14 “List of test centres” of this competition call.

Candidates must arrive to the selected location abroad 30 minutes in advance to complete the registration procedures. Candidates must show their passport or national ID. Candidates who present themselves after the test “start time” indicated on the website [www.hunimed.eu](http://www.hunimed.eu) and reported in Art. 14 “List of test centres” will not be allowed to sit the test. Candidates will have 100 minutes to complete the test.

After the candidates validation process the test will start. Candidates are not allowed to leave the test within the first 60 minutes of the test and within the last 15 minutes of the test.

During the test, candidates will not be allowed to talk to anyone apart from the staff and supervision Committee. Candidates will also not be allowed to keep personal belongings with them such as bags, books or notes, dictionaries, paper, pen, mobile phones, calculators or any electronic device; candidates will be given indications for storing these items in a specific place. Anyone found in possession of the above-mentioned items during the test will be disqualified.

The Supervision Committee will make sure that rules are respected and will act accordingly if any violation occurs.

**art. 7 - Delivery of the admission test**

Each candidate will be given at the beginning of the test a folder containing:

- a) A module to be filled in with the personal details with a univocal barcode;
- b) the questions of the admission test;
- c) two answer sheets, both with the same barcode, which is also the same of the module with the personal details;
- d) an empty windowed envelope;
- e) a sheet with the pre-printed identification code of the test;
- f) During the test, the following rules must be respected:
  - The student must fill in the module with the personal details and sign it;
  - For the compilation of the answer sheet candidates should use a black pen which will be given to each candidate after the identification and registration;
  - candidates are allowed to make one (and only one) correction to each question they have already answered, making sure to completely blacken the previously marked box and

choosing another one: there must be in any case only one mark in only one of the five boxes in order to get the score;

- the answer sheet has, next to the numbers of the questions, a small circular shape that the student must blacken to prove his intention not to answer the question. This indication, once it has been done, is no longer modifiable; if the candidate does not make any sign of response in the answer boxes, even if the circular figure is not blackened, the answer is not valid;
- the candidate must nullify, by marking the entire sheet and blackening the barcode, the second answer sheet which will not be used for correction purposes.
- At the end of the test, the candidate must insert, into the windowed envelope only the answer sheet, **unfolded**, which will be used to determine the score, and must close the envelope when handing it in.
- The candidates must hand in, separately, the second answer sheet, not used and nullified, together with the sheets containing the questions of the test and the module with the personal details to the President or to the Supervisor.

The Supervision Committee will disqualify the candidate if:

- The module with the personal details is inserted into the envelope;
- The envelope containing the answer sheet and the answer sheet itself are signed or marked by the candidate or by a member of the supervision committee.

In those cases, Cambridge Assessment will not correct the test and will not calculate the score.

#### **Art. 8- Test Assessment and rankings**

According to the number of places available for the enrollments, Italian citizens, EU citizens and EU-equated citizens are admitted to the Degree Course in descending order based on their score and provided that they obtained a minimum score of twenty (20) points .

The scores are assigned as follows:

- 1,5 point for each correct answer
- -0,4 points for each incorrect answer
- 0 points for each non-given answer.

The highest achievable score is 90 points.

In case of a draw, the following criteria are applied:

- a) The points scored by the candidates respectively in the logical reasoning, general culture, biology, chemistry, physics and mathematics sections respectively will prevail in descending order.
- b) In case of further draw, the youngest student will prevail.

### **Art. 9 – Publication of the ranking list**

After the test has been corrected, the ranking list will be published by Humanitas University on **September 22, 2015** on the website [www.hunimed.eu](http://www.hunimed.eu), maintaining anonymity. Candidates will be able to see their position in the ranking list through the pre-matriculation number generated during the Admissions Test application procedure. Moreover, using the *username* and *password* obtained during the registration on the portal, candidates can see their score by accessing their personal page.

### **Art. 10 – Online enrolment and reserve list**

Admitted candidates according to the ranking list must enrol online. Online enrolment will be possible between **September 23, 2015** and **October 2, 2015**. **The first instalment in the amount of 2156 € must be paid mandatorily by October 2, 2015 on penalty of exclusion. In case after the enrolment, the student will decide to withdraw, within October 12 2015, the fee of 2.000 € will be reimbursed. The amount of 156 € (regional tax and duty stamp) will be kept by Humanitas University.** Should admitted candidates decide not to enrol to Humanitas University, an e-mail can be sent to [info@hunimed.eu](mailto:info@hunimed.eu) in order to communicate the candidate's decision.

Should candidates in the reserve list decide not to enrol to Humanitas University even if the place becomes available because of candidates' withdrawals, an e-mail can be sent to [info@hunimed.eu](mailto:info@hunimed.eu) in order to communicate the candidate's decision.

Not covered places will be filled according to the following procedure:

- Publication on the website [www.hunimed.eu](http://www.hunimed.eu) of the number of places not covered due to withdrawals. Based on the test ranking, the University will begin the admission of those candidates whose position in test ranking was beyond the number of admissions places available (reserve list).
- Eligible candidates must enrol and pay the first instalment within two working days from the day of publication of each reserve list by 6.00 p.m. of the second day.
- The procedure will be iterated until there are no more places available.

**Candidates who do not comply with the above-mentioned deadlines will lose the right to enrol at Humanitas University.**

**Art.11– Completion of enrolment at Humanitas University**

Candidates who have completed the online enrolment procedure must complete the enrolment procedure by bringing to the Student Office the following documents:

- a) Enrolment Form signed by the student (downloaded from MyPORTAL after online enrolment has been completed);
- b) Photocopy of the payment receipt of the first instalment;
- c) Photocopy of Passport;
- d) Photocopy of tax code (Codice Fiscale);
- e) For students holding a foreign secondary school certificate, a copy of that certificate translated into Italian and legalized by the Italian Consulate/Cultural Institutes, together with the Dichiarazione di Valore (Declaration of Value) released by the Consulate.

The above-mentioned documents can be handed in at Humanitas University Student Office from Monday to Friday, from 9.00 to 13.00 and from 14.00 to 17.00. An appointment is not necessary.

Once enrolled at Humanitas University, students from other universities can submit their curriculum and request the recognition of their prior activities. Recognition is subject to evaluation according to the Humanitas University procedure.

**Art. 12 Supervision committee and person responsible for the procedure**

To assure the fairness of the Admissions Test procedure, Humanitas University will appoint a committee, to be formed of at least three members. University and external personnel will help the commission in the candidate identification and test supervision.

The person in charge of the procedure is Dr. Massimiliano Laganà (Managing Director of Humanitas University), email [info@hunimed.eu](mailto:info@hunimed.eu). For further information, candidates can contact the Student Office by phone at +39 02 8224 3777.

**Art. 13 – Table of deadlines**

Beginning of Admissions Test application	18/05/2015
Deadline of Admissions Test application	28/08/2015
Admission test	10/09/2015
Publication of ranking list	22/09/2015
Beginning of enrolment	23/10/2015
Deadline for enrolment and payment of first instalment	02/10/2015



**Art. 14 – List of test centres**

<b>Centre Number</b>	<b>Country</b>	<b>City</b>	<b>Address</b>	<b>Centre Name</b>	<b>Start time (local time)</b>
IT511	Italy	Milan	via Giuseppe di Vittorio 6 Assago (MILANO)	Humanitas University c/o Mediolanum Forum	14.00
AT040	Austria	Vienna	Siebensterngasse 21 WIEN 1070, Vienna	British Council Vienna	14.00
CY011	Cyprus	Nicosia	177 Kopegchakis Street Lakatamia 2306 Nicosia	Pascal Education Ltd	15.00
CZ003	Czech Republic	Prague	Bitovska 5, 140 00, Praha 4	Akcent International House	14.00
FI001	Finland	Helsinki	Fredrikinkatu 20 A 9 00120 Helsinki	Finnish-British Society	15.00
FR500	France	Paris	38 quai de l'Ecluse 78290 Croissy-sur-Seine	The British School of Paris	14.00
DE007	Germany	Hamburg	Berufliche Medienschule Hamburg Hamburg Wandsbek, Eulenkamp 46 Hamburg 22049	Cambridge Examinations Centre Hamburg	14.00
DE633	Germany	München	Kellerstrasse 6, Munich 81667	Münchner Volkshochschule	14.00
GR804	Greece	Athens	23a Veranzerou Street Omonoia Athens 104 32	Hellenic English Council	15.00
HU001	Hungary	Budapest	Madách Imre út 13-14, B building, IV Floor 1075 Budapest	British Council Hungary	14.00
IS002	Iceland	Reykjavik	Menntavegur 1 101 Reykjavik, Iceland	Reykjavik University	12.00
IE070	Ireland	Dublin	1 Tuansgate, Belgard Sq East, Tallaght Dublin 24	Dublin and Dún Laoghaire ETB	13.00
IL011	Israel	Tel Aviv	Ramat Gan 52900, Israel	Bar-Ilan University Office of the Spokesman	15.00
MT012	Malta	Valletta	The Exchange Buildingd, Republic Street, Valletta VLT 1117	The Malta Chamber of Commerce Enterprise and Industry	14.00
NL032	Netherlands	Alkmaar North Holland	Kruseman van Eltenweg 4 Alkmaar, North Holand 1817 BC	Horizon College	14.00
NO002	Norway	Oslo	Torggata 7, Post Boks 496, Sentrum Oslo 0105	Folkeuniversitetet in OSLO	14.00
PL090	Poland	Warsaw	Al. Niepodległości 217/8 02-087 Warsaw	LANG LTC (Language Training Centre)	14.00
ES439	Spain	Barcelona	Freixa, 5-9, 08021 Barcelona	Exams Catalunya	14.00
SE011	Sweden	Stockholm	Kungstensgatan 45, 113 59, Stockholm	Folkuniversitetet	14.00
CH059	Switzerland	Winterthur Zurich	Zurcher Strasse 46, Winterthur Zurich CH-8400	Cambridge ESOL Examination Centre	14.00
US047	USA	New York City	330 5th Avenue, 7th Floor, New York City, New York 10001	St Giles International NYC	9.00am
10310	United Kingdom	London	55 East Road, London N1 6AH	The City College	13.00
32143	United Kingdom	Manchester	Bromley Cross Road, Bromley Cross, Manchester BL7 9LT	Turton High School Media Arts College	13.00

## Annex A

### **Syllabus regarding the content of the Admissions Test to the one-cycle Degree Course in Medicine and Surgery, in Dentistry, Veterinary Medicine, and the degree courses in other medical professions**

For admission to the courses a general culture in the fields of literature, history, philosophy, social and institutional studies is required, as well as the ability to analyse written texts of various kinds and logical and mathematical reasoning skills.

The knowledge and the skills required are, however, those promoted by educational institutions that organize educational and teaching activities consistent with the Ministerial Programs, especially in view of the State Examinations and also refer to the scientific disciplines of biology, chemistry, physics, and mathematics.

#### **General knowledge and logical reasoning**

Assessment of the ability to properly use the language used in the courses and of logical reasoning in a manner consistent with the premises as set out in symbolic or verbal form through multiple-choice questions formulated with short sentences, discarding the incorrect, arbitrary, or less likely conclusions.

The questions will be based on scientific non-fiction or on fiction by classical or contemporary authors, or on texts appearing in newspapers or in general or specialist magazines. The questions will also focus on cases or problems, including those abstract in nature, whose solution requires the adoption of different forms of logical reasoning.

Questions related to general knowledge, as covered in the study curriculum, complete this field of evaluation.

#### **Biology**

The chemistry of living organisms.

The biological importance of weak interactions.

The organic molecules found in living organisms and their functions.

The role of enzymes.

The cell as the basis of life.

Cell theory. Cell size. The prokaryotic and eukaryotic cell in animals and plants.

Viruses.

The cell membrane: structure and functions - transport through the membrane.

Cellular structures and their specific functions.

Cell cycle and cell division: mitosis and meiosis - chromosomes and chromosome maps.

Bioenergetics.

The energy assessment of cells: ATP.

Redox reactions in living organisms.

The energetic processes: photosynthesis, glycolysis, aerobic respiration and fermentation.

Reproduction and heredity.

Life cycles. Sexual and asexual reproduction.

Mendelian Genetics. Fundamental laws and applications.

Classical genetics: chromosome theory of heredity; patterns of heredity.

Molecular Genetics: structure and replication of DNA, the genetic code, protein synthesis

The DNA of prokaryotes. The structure of the eukaryotic chromosome. Genes and regulation of gene expression.

Human genetics: transmission of mono- and multifactorial characters; hereditary diseases linked to the X chromosome and autosomal

Biotechnology: Recombinant DNA technology and its applications.

Heredity and environment.

Mutations. Natural and artificial selection. Evolutionary theories. The Genetic basis of evolution.

Anatomy and physiology of animals and man

Animal tissues

Anatomy and physiology of systems and equipment in humans and their interactions.

Homeostasis.

## Chemistry

**The constitution of matter:** states of matter; heterogeneous systems and systems homogeneous; compounds and elements.

**Ideal Gas Laws**

**The structure of the atom:** elementary particles; atomic number and mass number, isotopes, electronic structure of atoms of different elements.

**The periodic system of elements:** groups and periods; transition elements; periodic properties of the elements: atomic radius, ionization potential, electron affinity; metallic character. Relations between electronic structures, position in the periodic system of elements and properties.

**Chemical bonding:** ionic bonding, covalent bonding, and metallic bonding. Energy binding. Polarity of bonds. Electronegativity.

**Fundamentals of inorganic chemistry:** nomenclature and main properties of inorganic compounds: oxides, hydroxides, acids, salts.

**The chemical reactions and stoichiometry:** molecular and atomic mass, Avogadro's number, mole concept and its application, stoichiometry elementary balance of simple reactions, the different types of chemical reaction.

**Solutions:** solvent properties of water; solubility; The main ways of expressing the concentration of solutions.

Equilibria in aqueous solution.

Elements of chemical kinetics and catalysis.

**Oxidation and reduction:** oxidation number, the concept of oxidant and reductant.

Balance of simple reactions.

**Acids and bases:** concepts of acid and base; acidity, neutrality or alkalinity of aqueous solutions; the pH. Hydrolysis. Buffer solutions.

**Fundamentals of organic chemistry:** bonds between carbon atoms; formulas and rough texture, concept of isomerism. Aliphatic, alicyclic and aromatic hydrocarbons. Functional groups: alcohols, ethers, amines, aldehydes, ketones, carboxylic acids, esters, amides. Elements of nomenclature.

## Physics

**Measures:** direct and indirect measures, fundamental and derived quantities, physical dimensions of quantities, knowledge of the metric system and the CGS System of Units, Technician (or Practical) (ST) and International (SI) units of measurement (names and relations between fundamental and derived units), and multiples (names and values).

**Kinematics:** kinematic quantities, various motions with particular regard to uniform and uniformly accelerated motion; uniform circular motion; harmonic motion (for all motions: definition and relationship between the kinematic quantities related).

**Dynamic:** vectors and vector operations. Forces, motion of forces around a point. Vector composition of forces. Definitions of mass and weight. Acceleration of gravity. Density and specific gravity. Law of universal gravitation, 1st, 2<sup>nd</sup>, and 3rd laws of motion. Work, kinetic energy, potential energy. Principle of conservation of energy. Impulse and momentum. Principle of conservation of momentum.

**Fluid mechanics:** pressure, and its unit of measure (not only in the SI system). Archimedes' principle, Pascal's and Stevin's laws.

**Thermology and thermodynamics:** thermometry and calorimetry. Specific heat, thermal capacity. Mechanisms of heat propagation. Changes of state and latent heats. Ideal Gas Laws. First and second law of thermodynamics.

**Electrostatics and electrodynamics:** Coulomb's law. Electric field and potential. Dielectric constant. Capacitors. Capacitors in series and in parallel capacitors. Current. Ohm's law. Electrical resistance and resistivity, electrical resistors in series and in parallel. Work, Power, Joule effect. Generators. Electromagnetic induction and alternating currents. Effects of electric currents (thermal, chemical, and magnetic).

## Mathematics

**Sets of numbers and algebra:** natural numbers, integers, rational and real numbers. Sorting and comparison; order of magnitude and scientific notation. Operations and their properties. Proportions and percentages. Powers with integer exponents, rational and their properties. Radicals and their properties. Logarithms (base 10 and base e) and their properties. Elements of combinatorics. Algebraic expressions, polynomials. Major products, n<sup>th</sup> power of a binomial, factoring polynomials. Algebraic fractions. Algebraic equations and inequalities of the first and second grade. Systems of equations.

**Functions:** fundamental notions about the functions and their graphical representations (domain, codomain, sign, maxima and minima, and monotonicity, etc.). Elementary functions: algebraic integer and fractional, exponential, logarithmic, trigonometric. Composite functions and inverse functions. Trigonometric equations and inequalities.

**Geometry:** Polygons and their properties. Circumference and circle. Measurements of lengths, areas, and volumes. Isometries, similarities, and equivalences in the plan. Loci. Measure of angles in degrees and radians. Sine, cosine, tangent of an angle and their significant values. Trigonometric formulas. Solving triangles. Cartesian reference system in the plane. Distance between two points and the midpoint of a segment. Equation of the line. Terms of parallelism and perpendicularity. Distance of a point from a line. Equation of the circle, the parabola, hyperbola, of the ellipse and their representation in the Cartesian plane. Pythagorean Theorem.

**Probability and Statistics:** Frequency distributions depending on the type of character and the main graphical representations. Definition of random experiment and event. Probability and frequency