



**Università
degli Studi
di Palermo**

Rettorato

**CALL FOR APPLICATIONS FOR THE BACHELOR DEGREE
IN NURSING -- L/SNT1 (IN ENGLISH)
SCHOOL OF MEDICINE AND SURGERY -- ACADEMIC YEAR 2021/2022**

THE RECTOR

- GIVEN** the Law n. 241 of August 7, 1990, “*New rules for the administrative procedures and the right of access to the administrative documents*” and subsequent amendments and additions;
- GIVEN** the Law n. 341 of November 19, 1990 “*Reform of University educational regulations*”;
- GIVEN** the Law by Decree of July 25, 1998, n. 286 “*Consolidated text of the provisions concerning immigration regulations and rules on the status of foreigners*”;
- GIVEN** the Law of August 2, 1999, n. 264 “*Rules for the access to University courses*” and subsequent amendments;
- GIVEN** the Decree of the President of the Italian Republic of December 28, 2000, n. 445, “*Consolidated Act of the regulations and legislative provisions regarding the administrative documents*”;
- GIVEN** the Legislative Decree of June 30, 2003, n. 196, “*Code about the protection of personal data*” and, in particular, art. 154, paragraphs 4 and 5;
- GIVEN** the Ministerial Decree of October 22, 2004, n. 270 “*Amendments to the Regulation on the didactic autonomy of Universities*” approved by the Decree of the Minister of University and scientific and technological research of November 3, 1999, n. 509;
- GIVEN** the Ministerial Decrees issued on March 16, 2007, defining the classes of 1st and 2nd cycle degree courses, in accordance with the provisions of the aforementioned decree n. 270/2004;
- GIVEN** the Law of October 8, 2010, n. 170 “*Rules about specific learning disabilities in schools*”;
- GIVEN** the Educational Regulations of the University of Palermo as amended by Rector’s Decree n.341/2019;
- GIVEN** the resolution n. 93/2021, Prot. 15579/2021 of the Board of Directors of the University of Palermo “*Definition of the educational offer 2021/2022*”;
- GIVEN** the MUR note of 30/04/2021 n. 12849 concerning “*the conditional admission of candidates with disabilities or SLDs in possession of an outdated certification - admission tests to 1st and 2nd cycle degree programs with national limited access A.Y. 2021/2022*”;
- GIVEN** the Ministerial Decree of 25 June 2021 n. 730 concerning “*the methods and contents of the admission tests to the single-cycle degree and master's degree courses in Italian with limited access at national level A.Y. 2021/2022*”;
- GIVEN** the Ministerial Decree of 25 June 2021 n. 733 “*places for candidates from non-EU countries residing abroad for access to the degree course and single-cycle master's degree course in Dentistry, Veterinary Medicine, Primary Education and Health Professions A.Y. 2021/2022*”;

DECREES

Article 1

General Provisions

For the academic year 2021/2022, The University of Palermo announces a competitive selection for the three-year 1st cycle Degree Course in **Nursing – in English language (code 2233)** of the School of Medicine and Surgery, class L/SNT-1 class of the Health Professions, for a number of:

- ----- (**pending ministerial definition**) places, intended for candidates from EU and non-EU countries residing in Italy pursuant to art. 39, paragraph 5 of Legislative Decree. 25 July 1998, n. 286.
- **20 (twenty)** places for candidates from non-EU countries residing abroad.

Article 2

Participation requirements

All the holders of an Italian High School diploma, and those who will achieve it by the end of the school year 2020/2021, and who have a knowledge of English language equivalent to Level B2 of the **“Common European framework of reference for languages” (CEFR)** may participate in the admission test.

EU candidates, wherever resident, and non-EU candidates legally residing in Italy, pursuant to art. 39, paragraph 5, of the Legislative Decree 25 July 1998, No. 286, as amended by art. 26 of the Law of July 30, 2002, No. 189, may participate if holding a qualification obtained abroad (at least 12 school years) and recognized as equivalent to the Italian High School Diploma, or achieving it by the end of the School year 2020/2021, by the end of the School year 2020/2021.

The selection is also open to non-EU citizens residing abroad, according to the quota defined in art. 1. Those candidates must hold a qualification obtained abroad (at least 12 school years) and required for the enrolment at the Universities of their Country of origin and acknowledged as equivalent to an Italian High School diploma.

All provisions regarding the access of foreign students can be found by consulting the “Ministerial Rules for Student Access to University Courses for the 2021/2022 academic year” to which reference is made in full, on the MUR website indicated above. Candidates are also invited to read the information published on the institutional website:

<https://www.unipa.it/mobilita/en/new-students/new-students---enrolment/>

Article 3

Applications

The application for the admission test, addressed to the Rector, must be made exclusively online.

To apply online, students must:

1. Enter the page <https://studenti.unipa.it> and register by clicking on the link: “Clicca qui per registrarti al **Portale Studenti UNIPA**”;
2. Log in the personal page on the **Portale Studenti UNIPA**;
3. Select “Domanda di partecipazione a concorso per Corsi di Laurea a numero programmato” and fill in the whole application form;
4. the registration fee for the test is € 55.00 (fifty-five/00). **Payments made are in no case refundable. Online payment must be made without fail by 24 August 2021.**

Candidates are invited to carefully keep the receipt of payment of the participation fee for the competition and, if requested, to show it on the day of the test to the General Coordination Board or to the Classroom Manager.

According to the current legislation on privacy, each candidate will be identified by the **identification number** found on the **pagoPA** payment slip, therefore it will be his/her responsibility to keep this data to verify his/her position in the ranking lists.

In no case can the participation fee for the test be refunded.

By **September 2, 2021**, the list of candidates who have applied for participation, with the options indicated by them, will be published on the institutional website:

<http://www.unipa.it/provediammissione>

Applications drawn up using forms or bulletins other than the official ones, sent in ways other than those described above or whose payment has been made after the deadline indicated, will not be taken into consideration.

With respect to the self-certifications, candidates, in the case of false declarations, will incur the penal sanctions provided for untruthful declarations, the formation or use of false documents, referred to in article 76 of Presidential Decree 28 December 2000 n. 445, as well as the forfeiture of the benefits consequent to the provision possibly issued on the basis of the untruthful declaration, if the verification carried out reveals the falsehood of any of the declarations made (art.75 President's Decree 28 December 2000, no. 445) and will be declared automatically forfeited from the right to enrol.

Applicants are obliged to view this announcement in its entirety; they are solely responsible for the correct indication of the data necessary for the admission procedures to the competitive selection; they also undertake, if winners, to scrupulously comply with the content and procedures relating to the enrolment phase.

Article 4

Procedure for the Disabled

The competition test, referred to in this call, is organized by the University of Palermo taking into account the individual needs of disabled candidates, with disabilities pursuant to art. 16 of the Law n. 104/1992, as well as candidates diagnosed with specific learning disorders (SLD) as per Law no. 170/2010.

Candidates with a certificate of disability, with certification referred to in Law n.104 of 1992 or with a diagnosis of specific learning disorders (SLD) referred to in Law n.170 of 2010, can benefit, in carrying out the test, from specific aids or compensatory measures, as well as of additional time, by making a specific request.

The candidates referred to in paragraph above may be admitted to the test with the medical certification they possess, even if not updated due to the limitation of the activity of the NHS for the COVID-19 emergency, subject to, by part of the University, to subsequently request the integration of the required documentation.

The University of Palermo will provide for the needs related to the request made, adopting all the necessary measures to meet the individual needs expressed by the candidates, considering what is specified in the following points:

a) the candidate with a certificate of disability or with certification as per Law 104 of 1992, must promptly present the part prepared for this purpose at the time of completing the registration on the Student Portal of the University of Palermo, providing the certification - in original or certified copy on plain paper - issued by the competent medical Board, proving the type of disability and/or the degree of disability recognized, to be sent exclusively to the email address of the Disability Operative Unit cud@unipa.it, without fail, by **24 August 2021**. The candidate has the right to an additional time not exceeding 50% more than that foreseen for the performance of the test.

b) the candidate with SLD as per Law 170 of 2010, must promptly fill in the part prepared for this purpose at the time of completing the registration on the Student Portal of the University of Palermo, and provide the relative certification (Diagnosis of SLD in original or authenticated copy on plain paper), to be sent exclusively to the email address of the Disability Operative Unit cud@unipa.it, without fail by **24 August 2021**. In compliance with the provisions of the "guidelines on specific learning disorders" attached to the Ministerial Decree July 12, 2011, protocol no. 5669, candidates with SLD are granted an additional time equal to a maximum of 30% more than that foreseen for the admission test. In the case of particular certified severity of the SLD, the University may allow, in order to guarantee equal

opportunities in the performance of the test itself, the use of the following compensatory tools: non-scientific calculator, video-enlarger or support of a reader chosen by the University with the support of special experts or of the Disabled Service.

In any case, the following tools are not allowed: dictionary and/or vocabulary, formularies, periodic table of elements, concept map, *personal computer, tablet, smartphone* and other similar tools.

The diagnosis of SLD must have been issued to the candidate no more than 3 years ago, if prior to the age of eighteen, or after the eighteenth year of life and must have been issued by Local Public Health Facilities or by organizations and professionals accredited with the Regional Health Service.

Given the protracted reduction of the activities of the NHS clinics and in order to avoid the candidate being unable to request the updated certification and, consequently, the additional times, dispensatory tools and compensatory measures provided for by the reference legislation, the University accepts applications from candidates with disabilities or diagnoses of specific learning disorders (SLD) as per law no. 170/2010 although in possession of older certifications, subject to subsequently requesting, as soon as the activity of the NHS is fully restored, the integration of the documentation provided for therein.

Candidates with invalidity, disability or SLD from EU and non-EU countries, residing abroad, who intend to take advantage of the measures referred to in the preceding paragraphs, must submit the legalized certification, where required by international standards in force, certifying the state of invalidity, disability or SLD issued in the country of residence, accompanied by a sworn translation by an official translator or certified in accordance with the original text by the Italian diplomatic representations, in Italian or in English.

The **Disability Unit of the University of Palermo** is the University body responsible for examining the certifications referred to in the preceding paragraphs, including foreign documents attesting to a condition of invalidity, disability or specific learning disorder recognized by Italian law.

Article 5 Examining Board

The Board, with any Classroom Managers, will be appointed by Rector's Decree, on a proposal from the School of Medicine and Surgery; the composition of the Board will be published on the web page:

<http://www.unipa.it/bandicommissioni>

Article 6 Competition procedure

The admission test to the Degree Course referred to in this announcement will be held at **13:00 on September 7, 2021**

The venues for the test and the assignment of candidates to their respective venues and classrooms will be communicated through publication on the website:

<http://www.unipa.it/provediammissione>

Interested parties will not receive any further communication regarding the test venues.

All candidates will be required to show up at 9:30 in the locations indicated for the recognition procedures.

In consideration of the recent provisions on the containment and management of the epidemiological emergency from COVID-19, valid in the entire national territory, the University of Palermo will ensure, in the phase of access to the premises used for carrying out the tests and in the subsequent phases, the physical and social distancing among candidates themselves as well as the adoption, by the candidates and all the other subjects, of the personal and environmental hygiene measures pursuant to the emergency legislation.

This notice has the value of an official convocation, and the interested parties will not receive any further communication.

The admission test consists of the solution of **60 (sixty) questions in English** with five answer options

each, among which the candidate must identify only one, discarding the incorrect, arbitrary or less probable conclusions, on topics of: general knowledge and logical reasoning; biology; chemistry; physics and mathematics. On the basis of the programs referred to in **Annex A**, an integral part of this decree, the questions will be distributed as follows: twelve (12) general knowledge questions; ten (10) logical reasoning questions; eighteen (18) biology questions; twelve (12) chemistry questions; eight (8) physics and mathematics questions.

A time of 100 minutes is provided for the admission test.

Candidates may be admitted to the admission test upon presentation of a valid personal identity document. If the candidate does not appear on the list of those admitted to the test, a necessary condition for admission, subject to approval, is the presentation of the payment receipt for participating in the competitive selection.

Each classroom Board will personally identify each candidate by annotating the details of the identification document in special registers.

Candidates are prohibited from introducing *mobile phones, palmtops, smartphones, smartwatches, tablets, earphones, webcams* or other similar equipment, manuals, school textbooks and/or partial reproductions of them, handwritten notes and reference material into the classroom. The candidate who is found in possession of any of the above objects during the test will be excluded from the test and expelled from the classroom.

Any bags, backpacks, books, etc. must be left outside the classroom. The custody of the objects will not be guaranteed, and we will not be held responsible for any theft or loss of the same.

At the time of the test, candidates will be provided with:

- A general instruction sheet.
- The registry card.
- An envelope.
- A marker.
- The answer sheet.
- A pair of adhesive bar codes.
- The sealed questionnaire.

Since, for the security, confidentiality and transparency of the operations, the test is printed in several versions differing from one another in the order of the questions and their answers, candidates are recommended to insert in the lower part of the answer sheet **the letter corresponding to the assigned questionnaire.**

In the absence of this indication, being unable to attribute the answers given to the assigned questionnaire, a total score of zero will be given.

The test will be voided if the name is placed on the card or if other signs of possible identification are found.

A maximum of ninety (90) points are awarded for the evaluation of the test and the following criteria are considered:

- 1.5 points for each correct answer;
- minus 0.4 (-0.4) points for each wrong answer;
- 0 points for each omitted answer.

Candidates are only eligible if they have achieved a score greater than zero (0) points. Candidates who have not provided any answer to any question are not included in the ranking.

In the event of a tie, the score obtained by the candidate in the solution, respectively, of the questions relating to the following topics prevails in decreasing order:

- Logical Reasoning and General Knowledge
- Biology
- Chemistry
- Physics and Mathematics

In the event of further equality, the candidate who is younger by age prevails.

In the event of a tie between one or more disabled candidates in possession of a certificate of disability

equal to or greater than 66% or disabled with certification pursuant to law no. 104 of 1992 art. 3, paragraph 3, and one or more candidates not falling within the aforementioned categories, the invalid candidate (s) in possession of a certificate of invalidity equal to or greater than 66% or disabled with certification pursuant to law no. 104 of 1992 art. 3, paragraph 3 will be preferred.

Based on the overall score, two ranking lists will be drawn up, one for EU and foreign candidates residing in Italy, pursuant to art. 26 of the law n. 189/2002, and the other for foreign candidates residing abroad.

The condition of eligibility for admission to the degree course in “Nursing” ons refers only to the selective procedure in place.

Article 7

Additional Educational Duties (OFA)

For the areas of knowledge “Biology” and “Chemistry” the General Coordination Commission will not assign **Additional Educational Duties (OFA)** for candidates reaching a score equal to at least 50% of the maximum score for that area.

No Additional Educational Duties may be attributed for the areas: “General knowledge and logical reasoning” and “Physics and Mathematics”.

Additional educational duties will be fulfilled by the students admitted to the Degree Course according to the indications given by the Degree Course and by the University.

Article 8

Ranking lists and scrolling

The ranking lists will be made available within the terms established by Law 264 of 2 August 1999, through publication, **constituting notification**, on the website

<http://www.unipa.it/graduatorie>

Two ranking lists will be drawn up, one for EU and foreign candidates residing in Italy - as per art. 26 of the law n. 182/2002, and the other for foreign candidates residing abroad.

Candidates who, based on the ranking lists drawn up according to the criteria specified in art. 6 will be included in the number of available places, will have to pay tuition fees as well as the all-inclusive registration fee **by 17 September 2021 through SPID procedure (Public Digital Identity System).**

It is underlined that candidates are obliged to respect this enrolment date. No derogation can be granted in this regard.

Should any places remain available, the list of those entitled to enroll by scrolling will be published **on 22 September 2021**, upon request of the Official in charge, on the page:

<http://www.unipa.it/scorrimenti>

Enrollment must take place no later than **29 September 2021**, under penalty of forfeiture, according to the procedures of art. 9.

Should additional places remain available, the list of those entitled to enroll by scrolling will be published **on 4 October 2021**, upon request of the Official in charge, on the page:

<http://www.unipa.it/scorrimenti>

Enrollment must take place no later than **8 October 2021**, under penalty of forfeiture, according to the provisions of art. 9.

Should additional places remain available, the list of those entitled to enroll by scrolling will be published **on 13 October 2021**, upon request of the Official in charge, on the page:

<http://www.unipa.it/scorrimenti>

Enrollment must take place no later than **18 October 2021**, under penalty of forfeiture, according to the procedures of art. 9.

The vacant places reserved for non-EU residents residing abroad will be reallocated to EU students pursuant to art. 2 paragraph 2, D.M. 733 of 25 June 2021.

Interested parties must, within the days from the publication of the scrolling, under penalty of forfeiture, submit an application for enrollment in accordance with the procedures set out in art. 9. Beyond the aforementioned date, should additional places remain available, the scrolling will be managed by the Administration Secretariat of the Special Service for Teaching and Students, by publishing the decision of the Official in charge, on the page:

<http://www.unipa.it/scorrimenti>

Article 9

Enrolment completion

The winners, included in the ranking list, are obliged to formalize their enrollment, paying the fees and submitting the application online through the **SPID** procedure, within the terms established by this announcement and in the manner described at the web address:

<http://www.unipa.it/accessoprogrammato>

To enroll at the University of Palermo you must:

- Obtain a valid (**University**) ISEE and/or a “ISEE parificato”, in the case of non-EU candidates residing abroad;
- Access the “**Portale Studenti Unipa**” through the address <http://studenti.unipa.it> and log in through your credentials;
- Upload in the “**Portale Studenti Unipa**” a passport photo in jpg format with dimensions of 420x480 pixels and with a weight of less than 200KB;
- Follow the instructions for the “**pratica di immatricolazione**” (enrolment procedure) at the end of which a pdf document will be produced;
- Make the due payments via the **pagoPA** system;
- Carry out the mandatory transmission of online documentation using the specific **Sistema Pubblico di Identità Digitale (SPID)** feature, available on the UNIPA Student Portal.

Candidates who do not enroll, through the payment of fees and taxes, and online delivery of the application for registration, within the deadlines, will be considered to have renounced, regardless of the reasons for the delay.

It is necessary to have a valid (University) ISEE, relating to the services for the Right to University Education, when undertaking the enrolment procedure, and therefore, candidates are invited to request it, at a CAAF or other authorized parties, in good time. In any case, please refer to the Student Contribution Regulations, in force for the A.Y. 2021/22.

Article 10

Final provisions

The Official in charge of the administrative procedure, according to the provisions of art. 4 of the law n. 24 of 7 August 1990, is Gaetano Inserra, Head of the Unit “Concorsi, Immatricolazioni e Carriere Studenti”.

Candidates have the right to access to the proceedings of the competitive selection according to the procedures provided for by the regulations (D.R. 664 of 09 February 2004), pursuant to Law 7 August 1990 n. 241 and of the Presidential Decree 352/92. The requests must be submitted to the Public Relations Office of the Central Administration of the University of Palermo - email urp@unipa.it, telephone number 091/23893666.

As regards the provisions about the protection of personal data, please refer to Legislative Decree 196/2003 of 30 June 2003.

PLEASE NOTE THAT THIS DECREE HAS THE VALUE OF AN OFFICIAL CONVOCATION:

THE INTERESTED PARTIES WILL THEREFORE NOT RECEIVE ANY FURTHER COMMUNICATION.

For anything not expressly contemplated in this announcement, the provisions of the law in force apply.

THE RECTOR

Fabrizio Micari

Annex A

Programs of the admission test

Admission to the courses requires general knowledge, with particular relevance to the literary, historical-philosophical, social and institutional sphere, as well as the ability to analyse written texts of various kinds and the attitude to logical-mathematical reasoning.

The required knowledge and skills refer in any case to the preparation provided by the educational institutions offering educational activities consistent with the national indications for high schools and the guidelines for technical and professional institutes, for the Diploma examinations, which also refer to the scientific disciplines of Biology, Chemistry, Physics and Mathematics.

General knowledge and logical reasoning

Ability to correctly use the Italian language in different contexts and purposes and to logically complete a reasoning, consistent with the premises, which may be proposed in symbolic or verbal form through multiple choice questions formulated also through short propositions, discarding the incorrect, arbitrary or less likely conclusions.

The questions focus on scientific or narrative texts by classic or contemporary authors, or on current texts published in newspapers or in general or specialist magazines; they may also be related to cases or problems, even of an abstract nature, the solution of which requires the adoption of different forms of logical reasoning.

Questions related to the General knowledge issues addressed during high school or present in contemporary public discourse complete this evaluation area.

For the historical context, the questions may concern, among other things, issues characterising the history of the twentieth century and the current world (industrialization and post-industrial society; conquest of fundamental rights; new subjects and movements; welfare state and its crisis; globalization and conflict processes of the global world).

For the social and institutional sphere, in coherence with national indications and guidelines and in relation to the school educational activities related to “Citizenship and Constitution”, the questions may concern, among other things, the Constitutional Charter, communication and mass media, the organization of economics and political life, the different forms of state and government.

Questions relating to general knowledge of the supranational field, on issues addressed during the high school or present in contemporary public discourse, complete this assessment area.

Biology

The chemistry of the living.

The biological importance of weak interactions.

The organic molecules present in organisms and their respective functions. The role of enzymes.

The cell as the basis of life.

Cell theory. Cell size. The prokaryotic and eukaryotic animal and plant cell. The viruses.

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

Cellular structures and their specific functions.

Cell cycle and cell reproduction: mitosis and meiosis - chromosome kit and chromosomal maps.

Bioenergetics.

The energy value of cells: ATP.

Redox reactions in living beings.

Energy processes: photosynthesis, glycolysis, aerobic respiration and fermentation.

Reproduction and Inheritance.

Life cycles. Sexual and asexual reproduction.

Mendelian genetics: Mendel's laws and their applications.

Classical genetics: chromosomal theory of inheritance - inheritance models.

Molecular genetics: DNA structure and duplication, 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; autosomal and X-linked hereditary diseases.

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 humans.

Animal tissues.

Anatomy and physiology of human systems and systems and their interactions.

Homeostasis.

Chemistry

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

Laws about perfect gases.

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

The periodic system of elements: groups and periods; transition elements. Periodic properties of the elements: atomic ray, ionization potential, electronic affinity, metallic character. Relationship between electronic structure, position in the periodic system and element properties.

The chemical bond: ionic bond, covalent and metallic bond. Bond energy. Polarity of bonds. Electronegativity. Intermolecular bonds.

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

Chemical reactions and stoichiometry: atomic and molecular mass, Avogadro number, concept of mole and its application, elementary stoichiometric calculations, balance of simple reactions, the different types of chemical reaction.

The solutions: solvent properties of water, solubility, the main ways of expressing the concentration of the

solutions.

Balances in aqueous solution.

Elements of chemical kinetics and catalysis.

Oxidation and reduction: oxidation number, concept of oxidant and reducing agent. Balancing simple reactions.

Acids and bases: the concept of acid and base. Acidity, neutrality and basicity of aqueous solutions. The pH. Hydrolysis. Buffer solutions.

Principles of organic chemistry: bonds between carbon atoms, raw and structure formulas, isomerism concept. Aliphatic, alicyclic, and aromatic hydrocarbons. Functional groups: alcohols, ethers, amines, aldehydes, ketones, carboxylic acids, esters, amides. Elements of nomenclature.

Physics

The measurements: direct and indirect measurements, fundamental and derived quantities, physical dimensions of the quantities, knowledge of the decimal metric system and of the CGS, Technical (or Practical) (ST) and International (SI) systems, of the units of measurement (names and relationships between fundamental and derived units), multiples and submultiples (names and values).

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

Dynamics: vectors and operations on vectors. Forces, moments of forces with respect to a point. Moment of a pair of forces. Vector composition of forces. Definitions of mass and weight. Gravity acceleration. Density and specific gravity. Universal gravitation law, 1st, 2nd and 3rd principle of dynamics. Work, kinetic energy, potential energies. Energy conservation principle. Pulse and momentum. Momentum conservation principle.

Mechanics of fluids pressure, and their units of measurement (not only in the SI system). Archimedes' principle. Pascal's principle. Stevin's law.

Thermology, thermodynamics: thermometry and calorimetry. Thermic capacity and specific heat. Heat propagation mode. State changes and latent heats. Laws about perfect gases. First and second principle of thermodynamics.

Electrostatics and electrodynamics: Coulomb's law. Field and electric potential. Dielectric constant. Capacitors. Series and parallel capacitors. Direct current. Ohm's law. Kirchhoff principles. 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

Numerical sets and algebra: natural, integer, rational, real numbers. Sorting and comparison; order of magnitude and scientific notation. Operations and their properties. Proportions and percentages. Powers with integer, rational exponent, and their properties. Radicals and their properties. Logarithms (base 10 and base e) and their properties. Elements of combinatorial calculus. Algebraic expressions, polynomials. Notable products, n th power of a binomial, factorization of polynomials. Algebraic fractions. First and second-degree algebraic equations and inequalities. Systems of equations.

Functions: fundamental notions about functions and their graphical representations (domain, codomain, study of the sign, continuity, maxima and minima, growth and decrease, etc.). Elementary functions: integer and fractional algebraic, exponential, logarithmic, protractor. Compound functions and inverse functions. Protractor equations and inequalities.

Geometry: polygons and their properties. Circumference and circle. Measurements of lengths, surfaces, and volumes. Isometries, similarities, and equivalences in the plane. Geometric places. Measurement of angles in degrees and radians. Sine, cosine, tangent of an angle and their remarkable values. Protractor formulas. Resolution of triangles. Cartesian reference system in the plane. Distance of two points and midpoint of a segment. Straight line equation. Parallelism and perpendicularity conditions. Distance of a point from a straight line. Circumference, parabola, hyperbola, ellipse equation and their representation in the Cartesian plane. Pythagorean theorem. Euclid's theorems (first and second).

Probability and statistics: frequency distributions according to the type of character and main graphic representations. Concept of random experiment and event. Probability and frequency.