

**CALL FOR APPLICATIONS FOR NON-EU CITIZENS NOT RESIDENT IN ITALY TO THE  
ONECYCLE DEGREE COURSES IN MEDICINE AND SURGERY IN ENGLISH WITH  
LIMITED ACCESS (Class LM-41) AT HUMANITAS UNIVERSITY**

**Academic year 2026/2027**

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## **Art. 1 - Number of available places**

For the academic year 2026/2027, the **number of places available** for NON-EU citizens not resident in Italy is determined as follows:

- 50 for the Degree Course in Medicine and Surgery;
- 20 for the Degree Course in Medicine and Surgery called MEDTEC School.

The number of places may change following the decree of the Ministry of University and Research (M.U.R.), in accordance with Law No. 264 of August 2, 1999. The MUR decree may confirm, increase, or decrease the places specified in this notice.

## **Art. 2 - Admission requirements**

Only candidates who meet the citizenship and educational requirements specified in this article may apply for this notice. Candidates may be admitted to the Single-Cycle Master's Degree Courses in Medicine and Surgery if they have also taken and passed the admission test (Art. 3).

### **2.1 - Citizenship requirements**

Only NON-EU citizens who are at least 17 years old by the beginning of the academic year and who are not resident in Italy are entitled to apply for the present call for application, on penalty of exclusion. Candidates holding either an Italian or a European citizenship may not apply as NON-EU students since they belong to the EU category.

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

### **2.2 - Educational requirements**

Candidates may take the entrance test if, on the test date, they:

- hold a secondary school diploma obtained in Italy or abroad or
- are attending the last or penultimate year of secondary school.

Candidates may also take the test if, on the test date, they hold a secondary school diploma obtained abroad after at least 12 years of schooling and accompanied by a Declaration of Value issued by the Italian diplomatic representation abroad, or if they are attending the final year of secondary school.

If the institution issuing the foreign diploma is not based in Italy, a stay abroad of at least two years is required. If the local school system provides for 11 or 10 years of schooling, the qualification is valid if

supplemented by one or two years of university and the passing of all exams required for the attended years.

**Candidates who, at the beginning of the academic year referred to in this notice, do not hold an appropriate qualification under current legislation lose the right to enroll or are withdrawn from enrollment if already admitted conditionally.**

Regarding the recognition of foreign qualifications, Humanitas University follows the guidelines provided by the Ministry of University and Research in “Procedures for the entry, stay, enrollment of international students and the related recognition of qualifications, for higher education courses in Italy” for the academic year 2025-2026: <http://www.studiare-in-italia.it/studentistranieri>.

### **Art. 3 – HU Admission Test**

Only candidates who have taken and passed the entrance test may be admitted to the first year of the Single-Cycle Master’s Degree Courses in Medicine and Surgery. The test can be taken during two rounds per calendar year, each organized in several sessions, with papers of equal difficulty.

For the academic year 2026/2027, each candidate may take the test up to a maximum of two times: once during a session of the first round and once during a session of the second round.

For candidates holding a secondary school diploma or attending the final year of secondary school, scores obtained in 2026 are valid exclusively for admission to the academic year 2026/2027.

For candidates attending the penultimate year of secondary school, scores obtained in 2026 are valid exclusively for admission to the academic year 2027/2028. These candidates may take the test in two additional rounds in 2027, on dates that will be announced in the subsequent notice, after updating their profile to indicate the final year currently attended (see Art. 4.1).

Rankings will be formed as specified in Art. 8.

The entrance test for admission to the Single-Cycle Degree Courses in Medicine and Surgery, entirely in English, consists of sixty (60) questions with five answer options, of which the candidate must identify only one, discarding incorrect conclusions. The test is conducted remotely from home, as specified in the following articles.

The total duration of the entrance test is set at 120 minutes. Table 1 shows the topics, number of questions, and duration of each section.

The program relating to the content of the questions is specified in Annex A of this Notice.

Table 1

Section	Subject	N° of questions	Duration
SA	Scientific Thinking	10	45 minutes
	Academic Literacy	10	
BC	Biology	10	35 minutes
	Chemistry	10	
MP	Mathematics	10	40 minutes
	Physics	10	

Students who pass the HU Admission Test are exempt from submitting an English-language certificate at level B2 or higher for the purpose of enrollment.

#### Art. 4 - Dates of the Admission Test

The admission test is offered online and can be taken remotely from home on Thursday March 5<sup>th</sup> and Friday March 6<sup>th</sup> 2026 (first round) and on Wednesday March 18<sup>th</sup> and Friday March 20<sup>th</sup> 2026 (second round).

#### First round

- Session 1: **Thursday March 5<sup>th</sup> 2026 at 9:30 CET;**
- Session 2: **Thursday March 5<sup>th</sup> 2026 at 14:30 CET;**
- Session 3: **Friday March 6<sup>th</sup> 2026 at 9:30 CET.**

#### Second round

- Session 1: **Wednesday March 18<sup>th</sup> 2026 at 9:30 CET;**
- Session 2: **Wednesday March 18<sup>th</sup> 2026 at 14:30 CET;**
- Session 3: **Friday March 20<sup>th</sup> 2026 at 9:30 CET.**

If the high number of participants makes it necessary, the University reserves the right to schedule a Session 4 at 14:30 CET for each round.

#### 4.1 - Registration procedure for the Admission Test: deadlines and methods

Registrations for the admission test can be made from November 18<sup>th</sup> 2025 to February 26<sup>th</sup> 2026, at 12:00 CET to take the test in both rounds.

Candidates who register after this deadline, but by March 12<sup>th</sup> 2026, at 12:00 CET, can only take the test in the second round.

The online registration procedure includes the following steps:

1. **Online registration on the Humanitas University Registration Portal** (<https://humanitas-admission.ilmiotest.it>): the candidate must register by entering their name, surname, and email address. After receiving the first email of the Microsoft authentication process, click “Accept invitation” and complete the registration by requesting the one-time access code.

**Note:** For each subsequent access, a new code must be created.

2. **Registration for the admission test:** after completing registration on the portal, the candidate must register for the admission test within the indicated deadlines. After logging in and entering data in the “Update Your Profile” section, click “Register” and select the test “2026 - Medicine and Surgery/MEDTEC School Admission Test.” The candidate must also indicate whether they intend to apply for one or both degree programs covered by this announcement.
3. **Selection of sessions and payment of the registration fee:** the candidate selects preferred sessions for the test and indicates if they need accommodations as regulated in Art. 5 of this document. At the end of the procedure, the candidate must pay, **exclusively by credit card**, the registration fee of € **200.00**. Payment must be made within 15 minutes of registering for the test. Otherwise, the registration procedure must be repeated from the beginning. **The registration fee is non-refundable.**

**Note:** Candidates who register by February 26<sup>th</sup> 2026, at 12:00 CET must register for both rounds. The registration fee does not change even if a candidate registers after February 26<sup>th</sup> 2026, at 12:00 CET.

4. **Completion of registration on the Politecnico Milano website:** after completing online registration on the Humanitas University Registration Portal, the candidate must finalize registration on the Politecnico Milano website, accessed only after clicking “Complete your registration.” The candidate completes registration and receives the personal code and password necessary to take the admission test on the Politecnico portal.

**Note:** Candidates with only Italian citizenship must access the Politecnico portal using their personal SPID or CIE.

5. **Registration receipt:** the applicant receives an email containing the registration receipt. For applicants who register by February 26<sup>th</sup> 2026 at 12:00 CET, two receipts can be downloaded, one for each round. Applicants registered only for the second round will receive only the receipt for the second date.

Registration details, such as the Degree Course for which the test is taken, sessions, and any certification related to disabilities or learning disorders, can only be modified by February 26<sup>th</sup> 2026, at 12:00 CET for candidates registered for both rounds. Candidates registered after this deadline can modify these details by March 12<sup>th</sup> 2026, at 12:00 CET.

#### **Art. 5 - Support for candidates with special education needs**

Candidates with disabilities or Specific Learning Disorders (SLD), based on certified medical documentation, may explicitly request accommodations and/or additional time beyond that established for other candidates, as well as other measures to ensure equal opportunities during the admission test.

For candidates with disabilities, this includes: blind candidates, those with absolute blindness or residual vision not exceeding one-tenth in both eyes; deaf candidates, those with congenital deafness or deafness before language acquisition; candidates with civil disability of 66% or higher; candidates with certification of disability as per Law 104/92 as amended by Law 17/99. These conditions must

be documented by medical certification issued by competent health authorities. Certifications must be issued within the last 3 years and written in Italian or English.

For candidates with SLD, this includes: candidates diagnosed with dyslexia, dysgraphia, dyscalculia, dysorthography, documented by clinical certification issued within the last 3 years by the National Health Service, specialists, or accredited structures, if required by Regions. Additional time granted to candidates with SLD will be 30% more than that defined for admission tests, as per DM 5669/2011.

After clicking “Register” and selecting sessions of interest for the test, candidates must indicate the need for accommodations and attach relevant medical certification, where required.

#### **Art. 6 - Required hardware and software**

To take the admission test, candidates must have:

- A computer or laptop with webcam, microphone, and speakers, equipped with Windows 11 or 10 (version 1803 or newer) or MAC-OS 26, 15, 14, 13, 12, 11 and at least 120 MB of free space in the hard disk;
- A mobile device (phone or tablet) with webcam and microphone;
- A Wi-Fi network with a minimum upload and download speed of 1 Mbps on the PC and an active 4G data network on the mobile device.

Candidates must install *Safe Exam Browser* software on the computer or laptop used for the admission test. The software can only be downloaded from the Politecnico Online Services portal starting February 16<sup>th</sup> 2026.

All the technical details and instructions for using the softwares required to take the Admission test are provided in a technical guide, which can be downloaded from the Humanitas University website. The guide is also sent to candidates by e-mail at the end of the registration process.

#### **6.1 - Security measures to ensure transparency and fairness of test results**

*Safe Exam Browser* locks the candidate’s browser on the test itself, preventing access to other web pages and disabling certain keyboard functions (e.g., copy-paste or screenshots).



The virtual classroom accessed via the Politecnico di Milano Online Services portal also allows the classroom supervisor to monitor candidates' conduct during the admission test.

### **Art. 7 - Procedure for taking the Admission test**

On the day of the admission test, the candidate must access the Politecnico di Milano Online Services portal one hour before the start of the test using both the computer/laptop and the mobile device.

Two links will be visible on the portal:

- a) The link for the virtual classroom;
- b) The link for the admission test.

The candidate will then follow this procedure:

- a) Use the mobile device to access the virtual classroom via a QR code as instructed in the technical guide;
- b) Once admitted to the virtual classroom, show identification to the classroom supervisor (ID card, driver's license, passport);
- c) Access the admission test from the PC when instructed by the classroom supervisor.

The link to access the test will be activated at the scheduled start time. When the test begins, *Safe Exam Browser*, which must have been previously installed on the candidate's computer, will automatically activate.

Candidates who do not access the virtual classroom by the scheduled start time are not admitted and cannot take the **recovery test scheduled for March 24<sup>th</sup> 2026, at 14:30 CET**.

At the end of the admission test, the candidate must click the designated button to conclude the test. In any case, the system will automatically record the candidate's responses.

### **7.1 - Preparation of the computer station and general simulation**

From **February 16<sup>th</sup> and March 4<sup>th</sup> and from March 9<sup>th</sup> to March 17<sup>th</sup> 2026, from 14:00 to 23:59 CET, a Demo session is available** on the Politecnico di Milano Online Services portal to help candidates prepare their computer station and familiarize themselves with the system.

During these periods, a live chat for assistance is also available Monday to Friday, from 14:00 to 18:00 (except on days when admission tests for Politecnico di Milano Degree programs are held, during which the live chat and demo will be available starting at 16:30).

During this phase, candidates can also download the *Safe Exam Browser* application via a link on the Politecnico di Milano Online Services portal.

## **7.2 - Candidate conduct rules during the Admission Test**

Candidates must take the admission test in a well-lit room and must be alone. Bathroom use and leaving the workstation are prohibited.

During the test, candidates may only use their computer/laptop without any additional screen, keyboard, or mouse.

The computer/laptop used on the day of the admission test must be the same as the one used for the simulation and therefore correctly configured.

The webcam and microphone cannot be turned off.

Candidates cannot use earphones or earplugs or speak to anyone. The use of calculators, books, or notes is prohibited.

Communication with classroom supervisors is allowed only via text using the technical support chat, which must be opened only on the computer used for the test. Candidates may use up to five sheets of blank paper and a pen for calculations, subject to verification by the supervisor during identification.

Tests of candidates who do not comply with the above rules will be canceled.

The Commission ensures compliance with the rules and acts accordingly in case of violations.

## **7.3 – Disconnection from the Admission Test: conditions for retaking the test**

In case of disconnections of the exam on-line platform, candidates may be granted the opportunity to retake the test after a preliminary investigation by the relevant Supervision Committee. Possible examples of disconnection include but are not limited to: interruption of the Wi-Fi connection; power outage; technical problems related to candidates' laptop/computer.

**In order to ask to retake the test, the candidate should write an email to [admissions@hunimed.eu](mailto:admissions@hunimed.eu) by 23.59 CET on the same day of the exam session.** The email should include documentation and evidence of the disruption. The Supervision Committee will decide on this matter and the candidates will be informed of the decision via e-mail by 14:00 CET on Tuesday, March 10<sup>th</sup> 2026 (requests related to the first round) and by 14:00 CET on Monday, March 23<sup>rd</sup> 2026 (requests related to the second round).

Authorized candidates will retake the admission test with the same modality as described in this document on **March 24<sup>th</sup> 2026 at 14:30 CET**. The test will have the same level of difficulty as the previous rounds.

In case of disconnection from the exam platform that prevents continuation of the admission test, not attributable to the test provider or the issues described above, the candidate will receive the score obtained at the time of disconnection. In case of disconnection of one or more video devices used for monitoring (e.g., mobile phone), the Commission will decide whether to allow continuation or cancel the test.

For candidates who take the recovery test, the score obtained during the test affected by disconnection will be canceled, and only the score obtained on March 24<sup>th</sup> 2026 will be considered.

## **Art. 8 – Test assessment and rankings**

At the end of the tests, two separate ranking lists are drawn up: one for the Single Cycle Master's Degree in Medicine and Surgery and one for the Single Cycle Master's Degree in Medicine and Surgery called MEDTEC School. Candidates who have expressed their intention to compete for both courses will therefore be included in both rankings.

### **8.1 - Medicine and Surgery**

According to the number of available places, the right to enroll in the Single Cycle Master's Degree in Medicine and Surgery is granted on the basis of the candidates' position in the ranking list drawn up in descending order of points.

**For admission to the academic year 2026/2027**, the highest score obtained in the two rounds of the calendar year 2026 is considered.

Scores obtained in the calendar year 2026 remain valid for admission to the academic year 2027/2028 exclusively for candidates who in 2026 are enrolled in the penultimate year of secondary school, as per Article 3.

At the end of each round, candidates can view their test through a specific link available within the Humanitas University Registration Portal. **No provisional rankings will be drawn up before the publication of the final ranking.**

The score is assigned as follows (Table 2):

Table 2

Section	Subjects	Correct (pts.)	Wrong (pts.)	Omitted (pts.)	Maximum Score	Passing Threshold (pts.)
SA	Scientific Thinking	22	-5,5	0	440	88
	Academic Literacy					
BC	Biology	16	-4	0	320	64
	Chemistry					
MP	Mathematics	10	-2,5	0	200	40
	Physics					

The maximum achievable score, which is a sum of the three sections, is 960 points.

Candidates who score below the passing threshold indicated in the table for one or more sections are not included in the ranking.

**Should two or more candidates obtain the same score**, the following criteria will be applied:

1. Preference is given to the candidate who obtained a better score in the Scientific Thinking and Academic Literacy (SA) section;

2. In case of a further tie, preference is given to the candidate who obtained a better score in the Biology and Chemistry (BC) section;
3. In case of a further tie, preference is given to the younger candidate.

In case of anomalies in one of the questions, the **neutralisation** procedure applies: at the end of the admission test, each candidate must answer six (6) additional reserve questions, one for each subject tested, for which an additional proportional time of 12 minutes is allocated. In case of a critical issue in one of the 60 questions of the entrance test, the person responsible for the procedure, after consulting the commission, decides the neutralisation of the question with the anomaly and its replacement with the reserve question related to the same subject. In the absence of anomalies, the additional reserve questions are not considered for the formation of the ranking.

## 8.2 - MEDTEC School

According to the number of available places, the right to enroll in the Single Cycle Master's Degree in Medicine and Surgery called MEDTEC School is granted on the basis of the candidates' position in the ranking list drawn up in descending order of points.

**For admission to the academic year 2026/2027**, the highest score obtained in the two rounds of the calendar year 2026 is considered.

Scores obtained in the calendar year 2026 remain valid for admission to the academic year 2027/2028 exclusively for candidates who in 2026 are enrolled in the penultimate year of secondary school, as per Article 3.

At the end of each round, candidates can view their test through a specific link available within the Humanitas University Registration Portal. **No provisional rankings will be drawn up before the publication of the final ranking.**

The score is assigned as follows (Table 3):

Table 3

Section	Subjects	Correct (pts.)	Wrong (pts.)	Omitted (pts.)	Maximum Score	Passing Threshold (pts.)
SA	Scientific Thinking	10	-2,5	0	200	40
	Academic Literacy					
BC	Biology	16	-4	0	320	64
	Chemistry					
MP	Mathematics	22	-5,5	0	440	88
	Physics					

The maximum achievable score, which is a sum of the three sections, is 960 points.

Candidates who score below the passing threshold indicated in the table for one or more sections are not included in the ranking.

**Should two or more candidates obtain the same score**, the following criteria will be applied:

1. Preference is given to the candidate who obtained a better score in the Mathematics and Physics (MP) section;
2. In case of a further tie, preference is given to the candidate who obtained a better score in the Biology and Chemistry (BC) section;
3. In case of a further tie, preference is given to the younger candidate.

In case of anomalies in one of the questions, the **neutralisation** procedure applies: at the end of the admission test, each candidate must answer six (6) additional reserve questions, one for each subject tested, for which an additional proportional time of 12 minutes is allocated. In case of a critical issue in one of the 60 questions of the entrance test, the person responsible for the procedure, after consulting the commission, decides the neutralisation of the question with the anomaly and its

replacement with the reserve question related to the same subject. In the absence of anomalies, the additional reserve questions are not considered for the formation of the ranking.

### **Art. 9 - Ranking list publication**

For the academic year 2026/2027, the ranking is published by Humanitas University on March 30<sup>th</sup> 2026 after 12:00, guaranteeing the anonymity of candidates.

The ranking list is drawn up in accordance with Article 8.

Each candidate can view their position in the ranking and their status (admitted; not admitted; rejected if the score is below the minimum threshold) through the university web portal MyPORTAL, by accessing the reserved area and clicking on the “Admission Test” menu item in the “Student Office” section.

Those who have never accessed MyPORTAL can obtain their password by clicking on “Menu” and then “Forgot Password”, entering the same email address used to register on the Humanitas University Registration Portal.

### **Art. 10 – Online enrolment procedures**

Candidates with an adequate position in the ranking for enrolment receive an admission email from [info@hunimed.eu](mailto:info@hunimed.eu) and must complete the enrolment procedure on the University’s web portal MyPORTAL starting from **March 30<sup>th</sup> 2026** and by **April 8<sup>th</sup> 2026, 12:00 CEST**. During this period, the following candidates may enrol:

- Positions 1 to 50 in the Medicine and Surgery ranking;
- Positions 1 to 20 in the MEDTEC ranking.

**By April 8<sup>th</sup> 2026, 12:00 CEST, admitted candidates must, under penalty of exclusion from the ranking, pay the first instalment, the regional tax, and the stamp duty for an amount of €5,206.00 (five thousand two hundred and six euros).**

Any vacant places will be managed, starting from subsequent positions, according to the following procedure:

- Update on the University website of the number of places available due to non-enrolments or withdrawals;
- Sending an email to newly admitted candidates from [info@hunimed.eu](mailto:info@hunimed.eu) containing instructions for enrolment;
- Candidates admitted must complete online enrolment and pay the first instalment within the deadline indicated in the above email.

The procedure is repeated until all available places for both degree courses are covered. During the enrolment procedure, Humanitas University reserves the right to make conditional admissions. The deadline for completing conditional enrolment will be indicated in the admission email received by the candidate.

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

#### **Art. 11 – Reimbursement of the first instalment**

The first instalment worth €5,206.00 (five thousand two hundred and six euros), can only be refunded to those candidates conditionally enrolled for whom it is not possible to confirm enrolment due to the coverage of available places by candidates with a better position in the ranking. The refund is made within 60 days from the date of the request.

Please, note that **in no other conditions will the first instalment be reimbursed.**

The regional university study tax, amounting to €190.00 (one hundred ninety euros), is refunded only to candidates coming from another university where the said tax has already been paid, provided that, having acquired the right to enrolment, they proceed with enrolment in the first year of the course at Humanitas University.

#### **Art. 12 – Enrolment at Humanitas University**

In order to enrol in the first year of the course, candidates must complete a specific online procedure on the University's MyPORTAL.



To complete the procedure, they must:

1. Upload the following documents:
  - A scan of the identity card or passport;
  - A front and back scan of the tax code (if available);
  - A passport-size photograph;
  - The acceptance letter duly signed.
2. Confirm that the secondary school qualification obtained or to be obtained during the calendar year 2026;
3. Fully accept the privacy policy and the financial obligations defined within this announcement and the University Fee Regulations.

Students who have completed the online enrolment procedure and have paid the first instalment, achieve the full enrolment status at Humanitas University. For students holding a foreign secondary school qualification, it is necessary to hand in a copy of that certificate translated in Italian and legalised by the Italian Consulate/Cultural Institutes, together with the Dichiarazione di Valore (Declaration of Value) released by the Consulate.

Once enrolled at Humanitas University, students with previous university courses can submit their curriculum and request the recognition of their prior activities.

The credit recognition application is subject to evaluation by a Committee of Professors, according to the Humanitas University procedure.

### **Art. 13 – Supervision Committee and person responsible for the procedure**

To assure the fairness of the admission test procedure, Humanitas University will appoint a committee, to be formed of at least three members. University and external personnel will help the Committee in the candidate identification and test supervision. The Head of the procedure is Dr. Michelangelo La Torre (Operations Manager of Humanitas University). For further information, candidates can contact the Student Office via phone at +39 02 8224 3777, or via email at [info@hunimed.eu](mailto:info@hunimed.eu).

#### Art. 14 – Table of deadlines

Beginning of admission Test applications	18/11/2025
Deadline for admission Test applications	1 <sup>st</sup> exam round 26/02/2026 at 12:00 CET 2 <sup>nd</sup> exam round 12/03/2026 at 12:00 CET
Admission test	1 <sup>st</sup> round 05-06/03/2026 2 <sup>nd</sup> round 18-20/03/2026
Admission test retake	24/03/2026
Publication of ranking list and start of enrolments	30/03/2026
Deadline for enrolments and payment of first instalment	08/04/2026 at 12:00 CEST

#### Art. 15 – Additional Training Obligation (OFA test)

Enrolled students who do not answer at least 5 out of 10 questions correctly in each subject - Chemistry, Mathematics, Physics, and Biology - are required to complete additional educational requirements (OFA, i.e. remedial courses). These remedial courses are offered by the University during the Induction Weeks, which take place in September, and must be mandatorily attended. At the end of the Induction Weeks, students must sit a final assessment test for any subjects in which they did not meet the OFA requirements.

The final test is administered through the LMS platform. If a student does not pass the test at the end of the Induction Weeks, additional recovery tests will be scheduled on later dates.

Passing the OFA test is mandatory in order to sit the exams included in the study plan.

## **ANNEX A: Structure of the test**

### **Scientific Thinking**

#### **1. Mathematical Thinking**

- Interpret graphs given an example
- Predict changes in variables in simple formulae
- Use formulae by substituting values and calculating the result
- Solve problems with symbols in place of variables, including simultaneous equations
- Put numbers in the correct order, including decimals and negative numbers
- Work with orders of magnitudes and conversions

#### **2. Procedural Thinking**

- Follow a procedure/protocol/algorithm correctly (for example by using a flow chart)
- Predict the outcome of a perturbation in an interconnected system
- Apply the concept of collecting elements from different sets
- Compare a set of data with a scientific theory that can be confirmed or disproved by data
- Select relevant data
- Choose the most effective concept map to summarise a text

#### **3. Visual Thinking**

- Demonstrate three-dimensional thinking ability
- Find complementary shapes
- Recognise mirror images
- Identify different visual patterns, including based on a description or an example
- Demonstrate careful observations, including localising objects in relation to other objects
- Describe a picture or a set of elements

## Academic Literacy

Characteristics of the texts:

- **CEFR level:** C1 and above (text and items)
- **Sources:** adapted from real-world sources, about scientific topics
- **Text length:** approximately 700 words

Abilities tested:

- **Critical Thinking**, e.g. drawing reasoned conclusions and implications from data, statements, principles, judgements, beliefs or opinions.
- **Local expeditious reading**, e.g. scanning and searching for specific details.
- **Global expeditious reading**, e.g. skimming for gist, searching for key ideas.
- **Global careful reading**, e.g. comprehending main ideas, connecting ideas from different paragraphs and understanding how different paragraphs relate to each other.
- **Word- and sentence-level processes**, e.g. word recognition, meaning of a preposition.

## Biology

### 1. The chemistry of living things:

- the biological importance of weak interactions
- organic molecules in organisms and their respective functions
- the role of enzymes

### 2. The cell as the basis of life:

- cell theory and cell size, prokaryotic and eukaryotic cells, animal and plant cells
- viruses
- The structure and function of the cell membrane and transport across the membrane
- Cellular structures and their specific functions
- Cell cycle and cell division: mitosis and meiosis
- Chromosomes and chromosome maps

### 3. Bioenergetics:

- ATP as the energy currency of cells
- Redox reactions in living things
- Photosynthesis
- Glycolysis
- Aerobic respiration
- Fermentation

### 4. Reproduction and Inheritance:

- Life cycles, sexual and asexual reproduction
- Mendelian genetics: Mendel's laws and their applications
- Classical genetics: chromosomal theory of inheritance - inheritance patterns
- Molecular genetics: structure and replication of DNA, the genetic code, protein synthesis.
- Prokaryotic DNA
- Eukaryotic chromosome structure
- Genes and regulation of gene expression
- Human genetics: mono- and multifactorial character transmission; hereditary diseases - autosomal and linked to chromosome X

### 5. Inheritance and environment - Anatomy and physiology of animals and humans:

- Mutations, Natural and artificial selection
- Evolutionary theories, the genetic basis of evolution
- The animal tissues
- Anatomy and physiology of systems in humans and their interactions
- Homeostasis

## Chemistry

### 1. Structure of Matter and Periodic Table

- Atoms, molecules, isotopes, elements, and compounds.
- Atomic number, mass number, quantum numbers, and electronic configuration (Pauli exclusion principle, Hund's rule, Aufbau principle).
- Periodic table: groups, periods, metals/non-metals/metalloids, periodic properties (atomic/ionic radius, ionization energy, electron affinity).
- States of matter, heterogeneous and homogeneous systems.
- Ideal gases and Boyle's, Charles's, Avogadro's, and Dalton's laws.

### 2. Chemical Bonding and Properties of Matter

- Ionic, covalent, and metallic bonds.
- Electronegativity and bond polarity.
- Basic molecular geometry: VSEPR theory.
- Introduction to hybridization ( $sp$ ,  $sp^2$ ,  $sp^3$ ) to understand the geometry of simple molecules.
- Intermolecular forces: dipole-dipole, London dispersion forces, hydrogen bonding.
- Ionic, metallic, covalent, and molecular solids.

### 3. Stoichiometry and Chemical Reactions

- Atomic and molecular mass, Avogadro's number, mole, molar mass, empirical and molecular formula.
- Types of chemical reactions: synthesis, decomposition, substitution, combustion, acid-base.
- Chemical equations and their balancing.
- Reactions in aqueous solution and basic stoichiometric calculations, including concentration calculations.

### 4. Equilibria, Acids-Bases, and Redox Reactions

- Concept of chemical equilibrium.
- Acids and bases according to Arrhenius and Brønsted-Lowry.
- Concept of pH, neutralization, hydrolysis, and buffer solutions.
- Oxidation number, oxidizing and reducing agents.
- Balancing of simple redox reactions.

### 5. Fundamentals of Organic Chemistry

- C–C bonds, structural formulas, and concept of isomerism.
- Classification and nomenclature of hydrocarbons (alkanes, alkenes, alkynes, aromatics).
- Main functional groups: alcohols, ethers, aldehydes, ketones, carboxylic acids, esters, amines, and amides.
- General properties of the main classes of organic compounds and simple characteristic reactions (e.g., combustion, alcohol oxidation).

## Mathematics

### 1. Algebra and Number Sets:

- Number sets: natural, integer, rational, real.
- Operations and their properties; absolute value; proportions and percentages.
- Powers with integer and rational exponents, roots, logarithms (base 10 and e) and their properties.
- Algebraic expressions, special products, expansion of binomial powers, factorization of polynomials.
- Algebraic fractions.
- First- and second-degree equations and inequalities (including rational ones), simple systems of linear equations.

### 2. Functions:

- Concept of a function, domain and codomain, sign, monotonicity, maxima/minima.
- Polynomial and rational functions, exponential, logarithmic, and trigonometric functions.
- Composition and inverse of a function.
- Basic exponential, logarithmic, and trigonometric equations and inequalities.
- Graphical representation of functions and recognition of simple symmetries.

### 3. Geometry and Trigonometry:

- Polygons, circumference, areas, perimeters, surface areas and volumes of simple solids.
- Isometries, similarities, equivalences.
- Measurement of angles in degrees and radians.
- Sine, cosine, tangent functions and notable values.
- Main trigonometric formulas (sum, difference, double angle) and solving triangles.
- Analytic geometry: distance between two points, midpoint of a segment, equation of a straight line, conditions for parallelism and perpendicularity, distance from a point to a line.
- Equation of the circle and parabola (basic notions of ellipse and hyperbola without full treatment).

### 4. Logic and Mathematical Reasoning:

- Basics of propositional calculus: propositions, logical connectives, truth tables.
- Basics of predicate calculus: predicates, quantifiers, and their laws.
- Evaluation of logical expressions.
- Rules of inference.
- Proof by contradiction.

### 5. Probability, Statistics, and Combinatorics:

- Random experiments, events, frequency, and probability.
- Frequency distributions, graphical representations (histograms, bar and pie charts).
- Mean, mode, median; basics of variance and standard deviation.
- Basic counting techniques: simple permutations and combinations.

## Physics

### 1. Measures and Kinematics:

- Direct and indirect measures, fundamental and derived quantities, physical dimensions of quantities, scalars and vectors.
- The CGS System of Units and the International System (SI) of units of measurement, nomenclature of multiples and submultiples.
- Position, displacement, velocity, acceleration.
- Uniform rectilinear and circular motion.
- Uniformly accelerating rectilinear motion.
- Harmonic motion.

### 2. Dynamics:

- Forces and moments.
- Mass, gravitational acceleration, weight, Newton's law of universal gravitation.
- The 1st, 2nd and 3rd law of motion.
- Work, kinetic energy, potential energy, and the principle of conservation of energy; friction.
- Impulse, momentum, and the principle of conservation of momentum.
- Angular momentum and conservation of angular momentum.

### 3. Fluid mechanics and Optics:

- Density, pressure, and their units of measurement (SI and non-SI).
- Pascal's principle and Archimedes' principle.
- Stevino's law and the Bernoulli equation.
- Fermat principle.
- Reflection, refraction and Snell's law.
- Prisms, mirrors and lenses, interference, diffraction.

### 4. Thermodynamics:

- Thermometry and calorimetry, thermal capacity and specific heat capacity.
- Modes of heat propagation, changes of state and latent heats.
- Ideal gas laws.
- First and second laws of thermodynamics.
- Entropy.
- Thermodynamic cycles, efficiency of a thermal machine.

### 5. Electrostatics and Electrodynamics:

- Coulomb's law, electric field, Gauss's law, and potential.
- Capacitors and electrical resistances (in series and in parallel), direct current, Ohm's laws, Kirchhoff's principles.
- Electric generators, work, power, Joule effect.
- Magnetic field, the Lorentz force, the Ampère's law.
- Electromagnetic induction and alternating currents.
- Electromagnetic waves: wavelength, frequency, energy.