



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

**Academic years  
2024/2025 and 2025/2026**

**Foreword**

**The official source of the Call for Applications for EU and EU - 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 Italian document.**

## **SUMMARY**

**Art. 1 Number of places available**

**Art. 2 Admission requirements**

**2.1 Citizenship Requirements**

**2.2 Educational Requirements**

**Art. 3 HUMAT admission test**

**Art. 4 Application for the admission test: deadlines and modalities**

**4.1 Testing dates and sessions**

**4.2 Delivery of the admission test**

**4.3 Required hardware and software**

**4.4 Disconnection from the admission test: conditions for retaking the test**

**Art. 5 Candidates with special education needs**

**Art. 6 Test assessment and rankings**

**6.1 Submission of the test score to be included in the ranking list**

**Art. 7 Ranking list publication**

**Art. 8 Online enrolment and reserve list a.y. 2024/2025**

**Art. 9 Reimbursement of the first instalment**

**Art. 10 Enrolment at Humanitas University**

**Art. 11 Supervision committee and person responsible for the procedure**

**Art. 12 Table of deadlines**

**Art. 13 Additional Training Obligation (OFA test)**

**ANNEX A: Structure of the test**

**Admittance to the Medicine and Surgery Degree Course is subject to selection through the University's admission test.**

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

For both the academic years 2024/25 and 2025/2026, the number of places available for EU citizens and EU-equated citizens (as reported in art. 2) is established as **140**.

The number of places available may change in accordance with a later Decree of the Ministry of University and Research (M.U.R.), pursuant to the provisions of Law n. 264, August 2, 1999. The Decree of MUR could confirm, increase, or decrease the number of places available.

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

Only candidates holding citizenship and educational requirements reported in this article are entitled to apply.

Only candidates who have also taken and passed the HUMAT admission test (Art. 3) may be admitted to the one-cycle degree course in Medicine and Surgery.

#### **2.1 Citizenship Requirements**

Candidates must meet one of the following requirements:

- Citizens of Italy or of European Union member states.
- Citizens holding a European citizenship together with a citizenship of a country not belonging to the European Union.
- Citizens of Norway, Iceland, Liechtenstein, Switzerland, 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, or study reasons if regularly enrolled in another Degree Course and permanently residing in Italy from at least one year.
- Non-EU citizens legally resident in Italy for 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 as well as 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 by International Organizations in Italy, Italian State, Vatican State, and their dependent family members.

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

## 2.2 Educational Requirements

Candidates eligible to take part in the admission test are those who, on the date of the test:

- are in possession of a secondary school (High School) diploma or
- are attending the last year of secondary school (High School) and will be graduating in 2024 or
- are attending the second-to-last year of secondary school (High School) and will be graduating in 2025.

For candidates who have obtained/will obtain a High School diploma outside of Italy or in an international secondary school, the diploma is considered valid if obtained after at least 12 years of schooling, in addition to being accompanied by the Declaration of Value issued by the Italian diplomatic authorities.

If the local school system offers 10 or 11 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 the law, will lose the right to enrol.** If the candidate is already enrolled, the candidate's enrolment will be canceled.

For the validation of foreign qualifications, Humanitas University will follow Ministry guidelines for the academic year 2023-24 available in English at [Circolare 2023 2024 EN.pdf \(studiare-in-italia.it\)](#).

### Art. 3 HUMAT admission test

Only candidates who have taken and passed the HUMAT admission test are admitted to the first year of the one-cycle degree course in Medicine and Surgery.

The test is delivered in two exam rounds per calendar year. Each exam round is organised in two sessions with papers of equal difficulty.

For the **academic year 2024/2025**, each candidate can take up to a maximum of two sessions, one during the exam round scheduled in February 2024 and one during the exam round scheduled in March 2024. For candidates who took the test in the calendar year 2023, the scores obtained in the tests taken in February 2023 and March 2023 are also considered.

For the **academic year 2024/2025**, each candidate can participate in a maximum of four sessions, one during the exam round scheduled in February 2024, one during the exam round scheduled in March 2024 and further two sessions in the calendar year 2025. The dates of 2025 exams will be communicated in the next call for applications.

The ranking lists will be drawn up as specified in Article 6.

The admission test is conducted entirely in English. Candidates are required to answer sixty (60) multiple choice questions. There will be 4 response options, of which only one is correct. The test is **home-based**, as per the articles below.

Based on the programs listed in Annex A at the end of this document, the questions are divided as

follows:

- **Scientific Thinking** (30 questions)
  - Procedural Thinking (10 questions)
  - Mathematical Thinking (10 questions)
  - Visual Thinking (10 questions)
- **Academic Literacy** (30 questions)

#### **Art. 4 Application for the admission test: deadlines and modalities**

Registrations for the admission test open on **October 30<sup>th</sup> 2023**.

**By January 24<sup>th</sup> 2024, 18.00 CET**, candidates may book two sessions, registering singularly for the exam round scheduled in February and the exam round scheduled in March.

Candidates who register after this deadline, yet before **February 28<sup>th</sup> 2024, 18.00 CET**, may only take one session in the exam round scheduled in March.

#### **4.1 Testing dates and sessions**

**The admission test is home-based and takes place on Friday, February 2<sup>nd</sup> 2024 (first exam round) and on Friday, March 8<sup>th</sup> 2024 (second exam round).**

There are 2 dates for the test and 4 sessions:

##### **1<sup>st</sup> Exam round**

**Friday, February 2<sup>nd</sup>**

First Session: at 10.30 CET

Second Session: at 13.30 CET

##### **2<sup>nd</sup> Exam round**

**Friday, March 8<sup>th</sup>**

First Session: at 10.30 CET

Second Session: at 13.30 CET

**The online registration procedures consist of the following steps:**

1. **On-line registration to the Humanitas University Registration Portal** (<https://humanitas-admission.ilmiotest.it>): the candidate must register to the web portal by entering his/her name, surname and e-mail address. After receiving the first e-mail of the Microsoft authentication process, it is necessary to click on "Accept invitation" and complete the registration by requesting the single-use access code.

**N.B.** candidates have to request a single-use access code for each access;

2. **Registration for the admission test:** after completing the registration to the portal, the candidate must register for the admission test by the deadline mentioned above. The candidate must log in, enter the required data in the "Personal Details" section, click on the menu item "Apply" and select the Medicine and Surgery 2024 admission test;
3. **Choice of sessions and payment of the registration fee:** the candidate selects the sessions, one for each round, in which they prefer to take the test, indicates whether they require accommodations for special education needs as specified in Article 5 of this document and completes the payment of the registration fee to secure their place.

At the end of the first registration time window (**18.00 CET on January 24<sup>th</sup> 2024**), **no later than 18:00 CET on January 26<sup>th</sup>**, candidates receive a confirmation email with instructions for accessing the first exam round (see art. 4.2).

After the deadline on February 28<sup>th</sup> 2024, **by 18:00 CET on March 1<sup>st</sup> 2024**, candidates receive a confirmation e-mail with instructions for accessing the second exam round (see section 4.2).

**Should candidate not receive the above-mentioned e-mail, please contact the Helpdesk Staff at [convocazioni@ilmiotest.it](mailto:convocazioni@ilmiotest.it).**

**Fee:** The registration fee for the admission test is **€ 180,00**, valid for taking a **maximum of two tests**. This amount, which is the same regardless of the number of tests a candidate registers for, must be paid by January 24<sup>th</sup> 2024, 18.00 CET, in order to take the test in the February round and by February 28<sup>th</sup> 2024, 18.00 CET, in order to take the test in the March round. The payment must be completed **exclusively via credit card**. Candidates who complete the payment in time to book the test in the first round will book the test in the second round free of charge.

For candidates who took the test in the calendar year 2023, registration for the admission test has a cost of **€ 50.00**, valid for taking a maximum of two tests. The above terms and conditions are also applied in this case.

The registration fee for the tests which will take place in the calendar year 2025 is € 50,00 for all candidates who registered for the test in the calendar year 2024.

The registration procedure for the test is completed once the registration fee is paid.

**The registration fee is not refundable under any circumstances.**

#### **Art. 4.2 Delivery of the admission test**

The registration confirmation e-mail, which is sent to all candidates at the end of registration, contains indications on how to complete the computer set up for the test.

Candidates are required to:

1. **Install the Proctor Exam Google Chrome plugin**, necessary to guarantee appropriate invigilation during the exam.
2. **Complete a system check**, which verifies that the video, audio, and internet connection is adequate for access to the exam.

When completing the above-mentioned steps – **at least 48 hours prior the test day**

- candidates will receive a second e-mail containing the link to access the exam and instructions on how to complete their identification, which will be scheduled in the hour before the test session set time, and the environmental check to allow invigilation. Any official photo ID can be used for identification (passport, national ID card, driving license). The link to access the exam will be activated at the test session scheduled time.

During the test, invigilators will monitor candidate behaviour via webcam.

The time allowed to complete the test is 120 minutes and it is divided in two parts:

- Part 1: 60 minutes for the Scientific Thinking questions;
- Part 2: 60 minutes for Academic Literacy questions.

During the test, candidates should be aware of the following rules:

- Candidates who do not complete the identification before the test session scheduled time will not be allowed to sit the test.
- Once the candidate submits Part 1 of the test or the time expires, the candidate will not be able to access that part of the test again.
- Candidates must be always visible on their webcams. Going to the bathroom during the test is forbidden.
- Candidates are allowed to use blank paper and a pen to make calculations – invigilators will require candidates to show them before the beginning of the test.
- Candidates may not wear headphones. Speaking to anyone during the test is prohibited.
- Candidates are strictly forbidden from using phones, books, notes or any other additional devices during the test.
- Candidates must be in a bright room and clearly visible for the entire duration of the test.
- Nobody else is allowed in the room during the test.

Candidates are aware that brief interruptions (within a time frame of ten minutes), due to problems with their devices or weak internet connection, will involve an assessment by the Supervision Committee about the possibility to continue the exam. On this purpose, the test platform is equipped with a timer

that allows the automatic reintegration of the time lost in brief interruptions. Candidates **will be always monitored** while taking the test. Those who do not comply with the above rules will be **disqualified**. The Supervision Committee will ensure that all rules are respected and will act accordingly if any violation should occur.

#### **Art. 4.3 Required hardware and software**

In order to take the admission test online, candidates **must** have the following hardware and software available:

##### **Hardware:**

- A computer or laptop with webcam, microphone and speakers.
- A smartphone or tablet.

Please note that **both** a computer/laptop **and** a smartphone/tablet are necessary to take the test.

##### **Software and internet connection:**

- Operating system: Windows 8 or later
- MacOS 10.14 or later
- Browser: it is mandatory to use **Google Chrome** (Version 81.0 or later);
- Internet connection: minimum upload and download speed of 1,5 Mbps. It is highly recommended that candidates use a wired internet connection for the test.
- Smartphone or tablet (Android min v.4.1 – iOS min. v.8) equipped with a video camera.

Candidates will also be requested to download an App on their smartphone/tablet (34MB) from Google Play or App Store.

#### **Art. 4.4 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.

**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 Tuesday, February 6<sup>th</sup> 2024, 18:00 CET (first exam round) and by Monday, March 11<sup>th</sup> 2024, 18:00 CET (second exam round).

In case a candidate does not finish the test due to disconnection from the exam platform, not attributable to the test provider, they **will be assigned the test score acquired at the time of disconnection**.

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 case of video disconnection from the virtual classroom, the Commission will assess whether the candidate can continue the test or whether the test is invalidated.



Authorized candidates will retake the admission test on **March 13<sup>th</sup> 2024 at 14.30 CET** with the same modality as described in this document at art. 4.2. The exam paper will be of the same level of difficulty. The retake of the admission test will lead to the cancellation of the result obtained **during the exam round when the candidate experienced disconnection problems. It will be considered only the result obtained on March 13<sup>th</sup> 2024.**

#### **Art. 5 Candidates with special education needs**

Candidates with any kind of disability are invited to make a formal request for the support they need in order to complete the test. Candidates with learning disabilities may 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 either 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 verified by appropriate medical certificate issued by the competent health authorities. Certificates will be accepted in Italian or in English.

Among the candidates with learning disabilities the following should be considered: candidates affected by dyslexia, dysgraphia, dyscalculia or dysorthographia, verified by appropriate medical certificates, 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.

**Candidates with disabilities or learning disabilities may only take the test in sessions with the scheduled start time of 13.30 CET.**

After clicking on “Apply” and selecting the afternoon session for the test, candidates must indicate the need to receive and use accommodations and attach the relevant medical certification where required. Candidates who incorrectly select the morning session **will be automatically reallocated** to the afternoon session.

#### **Art. 6 Test assessment and rankings**

According to the number of available places, the right to enrol in the one-cycle degree course 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 2024/2025 academic year**, the highest score obtained during the exam rounds taken in the calendar years 2023 and 2024 **will be submitted**.

**For admission to the 2025/2026 academic year**, the highest score obtained during the exam rounds taken in the calendar years 2024 and 2025 **will be submitted**.

At the end of each test, candidates may consult their results via the link and credentials received in the second e-mail referred to in Article 4.2. **No provisional ranking will be drawn up before the publication of the final ranking list.**

The scores are assigned as follows:

- 3 points for each correct answer;
- -1 point for each incorrect answer;
- 0 points for each non-given answer.

The highest achievable score is 180 points.

Candidates who do not obtain at least 20 points in each of the test parts will not be considered for enrolment.

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

1. The higher-ranking position will be assigned to the candidate who has obtained a minor score difference, in absolute value, between the Scientific Thinking section and the Academic Literacy section.
2. In case of further equal scores, the higher-ranking position will be assigned to the candidate who has obtained the highest score in the Scientific Thinking section.
3. In case of further equal scores, the higher-ranking position will be assigned to the candidate who has obtained the highest score respectively in the Scientific Thinking subsections of Procedural Thinking, Visual Thinking, Mathematical Thinking.
4. In case of further equal scores, priority will be given to the younger candidate.

In the event of anomalies in one of the questions, the neutralisation procedure applies: at the end of the admission test, each candidate must answer nine (9) additional reserve questions, three for the Scientific Thinking section and six for the Academic Literacy section, for which a further proportionate amount of time is allocated. In the event of an anomaly in one of the questions, the Head of the procedure, having consulted the Committee, shall decide to neutralise the question in which the anomaly is present and replace it with the reserve question relating to the same subject. If there are no anomalies, the additional reserve questions shall not be taken into consideration for the formation of the ranking list.

## 6.1 Submission of the test score to be included in the ranking list

Between **March 15<sup>th</sup> and March 20<sup>th</sup> 2024** candidates will visualise in the Humanitas University Registration Portal the scores obtained during any tests taken in the calendar years 2023 and 2024. Within this time window **each candidate is required to select and submit the highest score** in order to access the final ranking for admission to the Degree Course in Medicine and Surgery for the academic year 2024/2025.

**Candidates who do not complete this procedure by March 20<sup>th</sup> 2024 are peremptorily excluded from the final ranking.**

### Art. 7 Ranking list publication

The ranking list is drawn up in accordance with Article 6.

Each candidate may visualize their own ranking position and relative status (admitted/not admitted/rejected) through the University web portal MyPORTAL, by accessing the reserved area and clicking on the menu item "Admission tests" from the "Student Office" section.

For the 2024/2025 academic year, the ranking list is published by Humanitas University **on 27<sup>th</sup> March 2024** on the web portal [www.hunimed.eu](http://www.hunimed.eu), guaranteeing the anonymity of candidates.

### Art. 8 Online enrolment and reserve list for the a.y. 2024/2025

Enrolment - to be completed exclusively online - will be possible between **March 27<sup>th</sup> 2024 and April 2<sup>nd</sup> 2024**. In this time window:

- Candidates with a ranking position from n. 1 to position n. 140 are entitled to enroll.
- Candidates with a ranking position from n. 141 to position n. 170 are entitled to a conditional enrolment. Conditional enrolments will be confirmed, following the ranking order, based on the places available due to withdrawals of students placed from position n. 1 to position n. 140. Confirmations will be sent by e-mail on April 3<sup>rd</sup> 2024.

**At the latest by April 2<sup>nd</sup> 2024**, both admitted candidates (from position 1 to position 140 of the ranking) and conditionally admitted candidates (from position 141 to position 170 of the ranking) **must complete the payment of the first instalment, which amounts to € 5.156,00, on penalty of exclusion.**

Free places, for candidates from position 171 in the ranking, will be assigned 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 and according to the number of available places, the University will begin the admission of candidates who ranked from position 171 onwards (reserve list).

- Eligible candidates must enrol and pay the first instalment (€ 5.156,00) by the deadline reported into the admission e-mail they will receive from the University.
- The procedure will be repeated until there are no more places available.

Even candidates in the reserve list might be invited to complete a conditional enrolment. The deadline will be specified in the conditional admission e-mail they will receive from the University.

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

#### **Art.9 Reimbursement of the first instalment**

First instalment (of an amount of € **5.156,00**) will be reimbursed only to conditionally admitted candidates (from position n. 141 to position n. 170) if enrolment cannot be confirmed.

This condition will occur if available places are occupied by other candidates with a higher position in the ranking. Those candidates will be reimbursed within 60 days of being notified.

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

The regional tax (amounting to € 140,00) will be reimbursed only to candidates transferring from an Italian University, having passed the HUMAT admission test and already paid the regional tax to the incoming university for year 2024/2025.

#### **Art.10 Enrolment at Humanitas University**

Candidates who have been invited to enrol must finalize the on-line enrolment procedure by:

1. Uploading the following documents to the online portal (MyPORTAL):
  - Photocopy of Passport.
  - Photocopy of tax code (Codice Fiscale).
  - Passport photo.
2. Providing a self-declaration of High School qualification obtained or to be obtained.
3. Fully accepting the privacy policy and economic conditions specified in the Call for Application and in the University Fee Regulation.

Students completing the online enrolment procedure, having 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. Recognition is subject to evaluation, according to the Humanitas University procedure.

#### **Art. 11 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 Commission in the candidate identification and test supervision.

The Head of the procedure is Dr. Massimiliano Laganà (Managing Director 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. 12 – Table of deadlines**

Beginning of admission Test applications	30/10/2023
Deadline for admission Test applications	1 <sup>st</sup> Exam round 24/01/2024 2 <sup>nd</sup> Exam round 28/02/2024
Admission test	1 <sup>st</sup> Exam 02/02/2024 2 <sup>nd</sup> Exam 08/03/2024
Admission test retake	13/03/2023
<b>Submission of the highest score</b>	<b>From 15/03/2024 to 20/03/2024</b>
Publication of ranking list	27/03/2024
Start of enrolments	27/03/2024
Deadline for enrolments and payment of first instalment	02/04/2024
Start of enrolments from the reserve list	03/04/2024

### **Art. 13 – Additional Training Obligation (OFA test)**

In addition to the admission test, whose purpose is to evaluate the fundamental skills required of candidates for the Degree Course in Medicine and Surgery, the University also considers appropriate to establish whether there are any educational gaps in topics considered prerequisite for the first year. If any such educational gaps exist, the University will help enrolled students to fill these gaps.

All enrolled students will undergo a mandatory evaluation test (which is different from the admission test) to evaluate their knowledge from previous study related to the disciplines of Chemistry, Physics, Mathematics, and Biology.

If the score obtained on the evaluation test is less than 50% in any of the test subjects, the enrolled student will be required to take a recovery course (Additional Training Obligation, OFA), for each discipline not passed. The recovery courses are offered during the *Induction Weeks*.

Students required to take Additional Training Obligation, OFA, will be retested at the end of the Induction Weeks. The final test will cover the individual discipline on which the recovery course was attended. The test will be written online through the University's platform. The date and the modalities of the evaluation test will be communicated after the student's enrolment.

If the test is not passed at the end of the Induction Weeks course, further recovery tests will be provided on later dates.

Passing the OFA test is mandatory to take the exams of the Medicine study plan.

## **ANNEX A**

### **Scientific Thinking**

**Mathematical Thinking** measures these abilities:

1. interpret graphs given an example
2. predict changes in variables in simple formulae
3. use formulae by substituting values and calculating the result
4. solve problems with symbols in place of variables, including simultaneous equations
5. put numbers in the correct order, including decimals and negative numbers
6. work with orders of magnitudes and conversions

### **Syllabus of expected Mathematical Knowledge**

Basics of set theory:

- empty set, union, intersection, difference
- complementary set
- subset

Arithmetic:

- natural numbers
- operations (addition, subtraction, multiplication, division) and their properties
- priority of operations
- multiples and sub-multiples
- prime numbers and decomposition into prime factors
- greatest common divisor and least common multiple of two natural numbers
- integer numbers
- absolute value
- rational numbers as fractions
- conversion of fractions into finite or periodic decimal numbers
- use of ‘.’ and ‘,’ in the English convention
- meaning of hundred, thousand, million, billion, and trillion, as well as tenth, hundredth, etc.
- rounding a number
- percentages and proportions
- definition of a power with integer exponent
- properties of powers
- scientific notation
- square and cubic roots
- order of numbers, properties and powers

#### Algebra:

- variables, monomials, and polynomials
- special products
- substituting values into variables
- identities and equations
- addition and multiplication rules for equations
- linear and quadratic equations in one variable
- verifying solutions
- simultaneous linear equations with two or three variables
- addition and multiplication rules for inequations
- linear and quadratic inequations in one variable

#### Basics of geometry:

- formulae for the perimeter and area of squares, rectangles, triangles, parallelograms, circles

#### Analytic geometry:

- representation of numbers on a straight line
- coordinates of a point
- straight lines: vertical, horizontal, oblique
- equation of a straight line
- slope and intercept
- finding intersections between straight lines or between a straight line and the axes

#### Graphs:

- reading a graph
- finding quantities represented on the x- and y-axis, together with their units of measurement
- identifying the trend of a graph
- finding maxima and minima graphically
- comparing two graphs using the same x- or y-scale

#### Quantities:

- time (seconds, minutes, hours)
- dates (days, weeks, months, years)
- money (€, \$)
- length (meters and its multiples/submultiples)
- mass (grams and its multiples/submultiples)
- area
- volume (m<sup>3</sup> and litres, and their multiples and submultiples)
- conversion of a unit of measurement into its multiples or submultiples

#### **Procedural Thinking** measures these abilities:

1. follow a procedure/protocol/algorithm correctly (for example by using a flow chart)
2. predict the outcome of a perturbation in an interconnected system



3. apply the concept of collecting elements from different sets

4. compare a set of data with a scientific theory that can be confirmed or disproved by data
5. select relevant data and discard/ignore useless data
6. choose the most effective concept map to summarise a text

**Visual Thinking** measures these abilities:

1. demonstrate three-dimensional thinking ability
2. find complementary shapes
3. recognise mirror images
4. identify different visual patterns, including based on a description or an example
5. demonstrate careful observations, including localising objects in relation to other objects
6. describe a picture or a set of elements

### **Academic Literacy – Critical**

- 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 texts and understanding how different texts relate to each other.
- Word- and sentence-level processes, e.g. word recognition, meaning of a preposition.