POLITECNICO
MILANO 1863

Engineering Science

A new international bachelor's degree bridging science and engineering foundations

First academic year starting in September 2026

School of Industrial and Information Engineering I School of Civil, Environmental and Land Management Engineering

Why Engineering Science?

As technological evolution demands ever more focused expertise, **undergraduate engineering programmes have enforced early specialization**.

The **rapid pace of technological change** is not compatible with the long timescales required to adapt educational programmes.

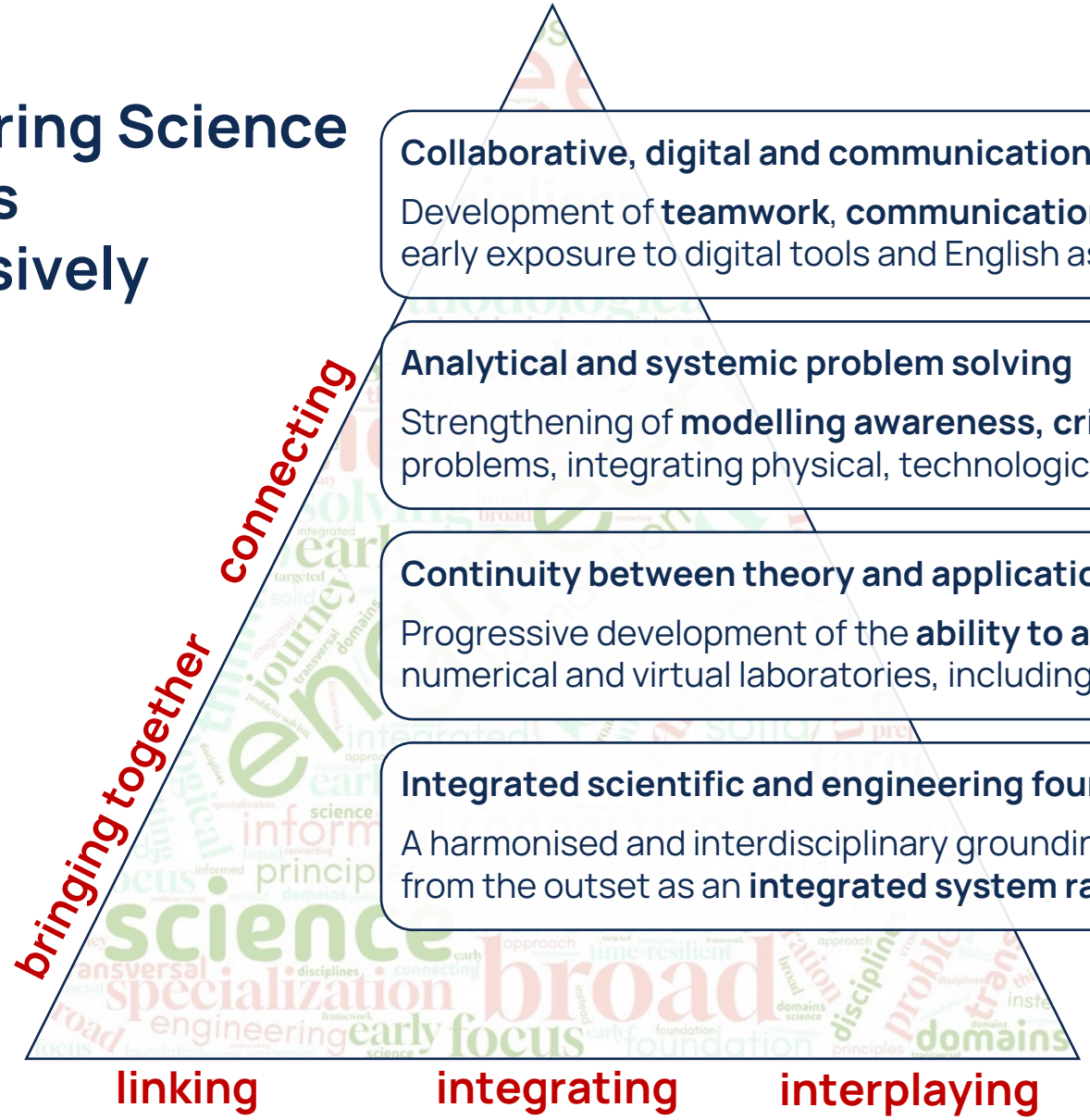
What endures are the scientific principles, engineering reasoning, and integrative capabilities, which allow engineers to understand, evaluate, and guide technological change.

A **strong methodological foundation** helps build on top a robust and long-term **adaptable disciplinary competence**.

What is Engineering Science?

- A solid and **integrated** foundation in science and engineering
- **Broad** and time-resilient preparation instead of early specialization
- A **transversal** approach connecting multiple engineering disciplines
- A **methodological** framework for cross-boundary thinking
- Problem-setting and problem-solving **across** domains
- A journey from foundation to **informed** targeted focus
- A solid **launchpad** for advanced engineering and technological studies

What do Engineering Science students progressively build?



Collaborative, digital and communication skills

Group works and presentations

Development of **teamwork**, **communication** and **adaptability skills** in international contexts, with early exposure to digital tools and English as a working language

Analytical and systemic problem solving

Interdisciplinary projects

Strengthening of **modelling awareness, critical thinking and systemic approaches** to complex problems, integrating physical, technological, economic and environmental perspectives

Continuity between theory and application

Technology Briefs, Virtual Labs

Progressive development of the **ability to apply theoretical concepts** through experimental, numerical and virtual laboratories, including digital and simulation-based environments

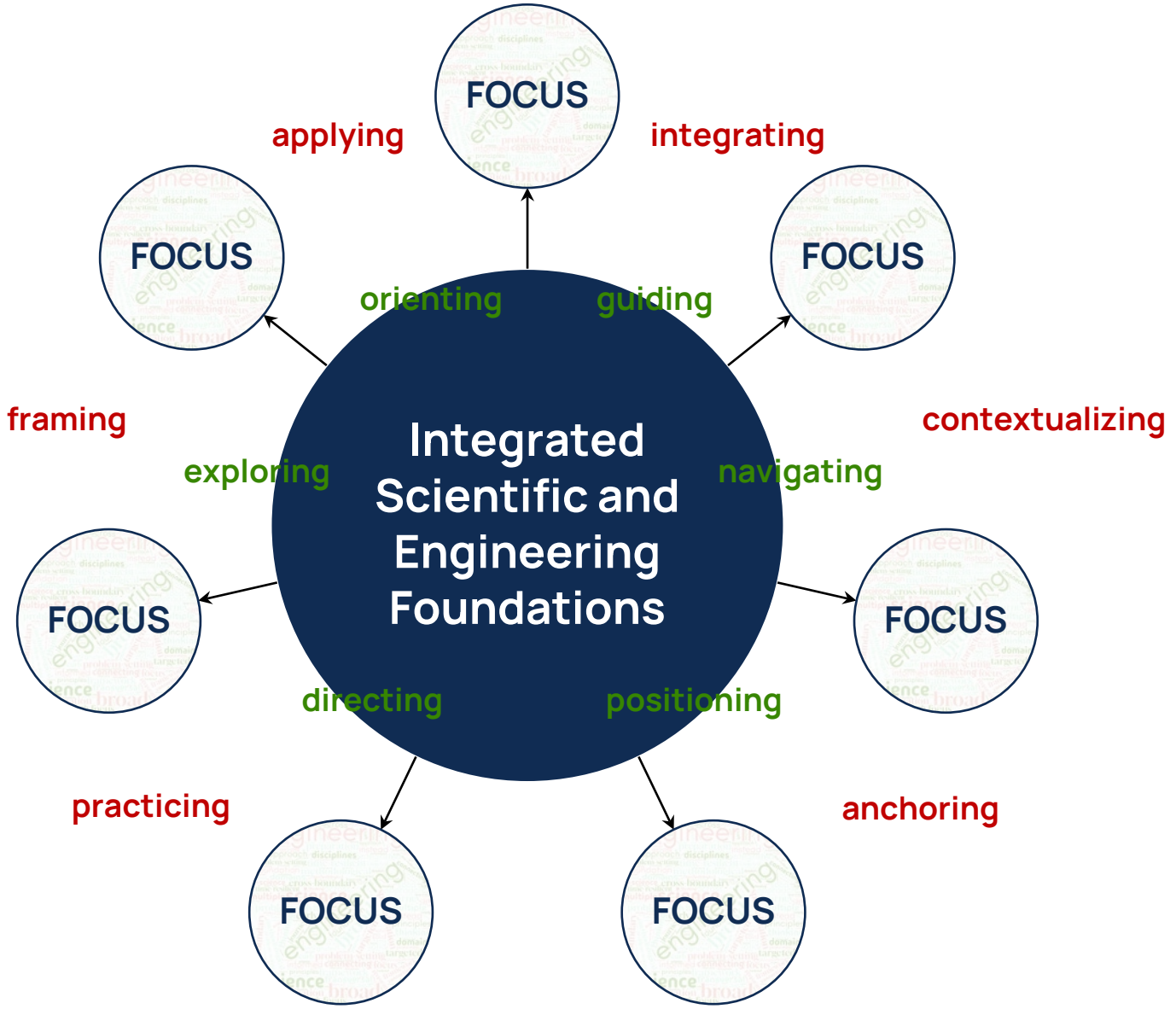
Integrated scientific and engineering foundations

Engineering Corners

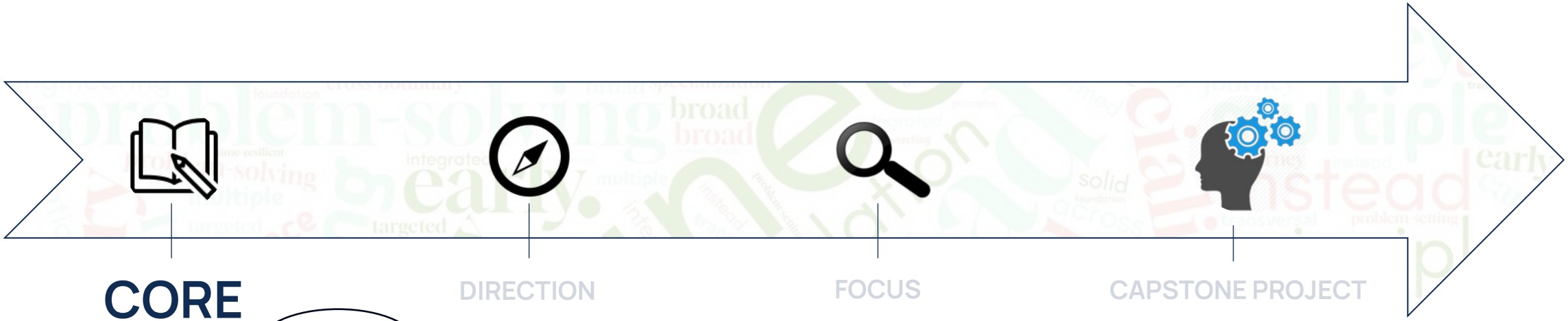
A harmonised and interdisciplinary grounding in math, physics, chemistry and engineering, designed from the outset as an **integrated system rather than as separate sequential disciplines**

From common foundations to informed engineering focus

Building on a **common integrated scientific and engineering foundation**, Engineering Science students can **progressively orient their studies** towards a chosen engineering area (Engineering **Focus**), applying their transversal skills within a **disciplinary context of interest**.



Programme Structure



120 ECTS

Build a **common scientific and engineering foundation** through integrated problem-oriented learning, **linking fundamental sciences with engineering thinking**

Year I

1sem
- MATHEMATICAL ANALYSIS AND LINEAR ALGEBRA I (9 ECTS)
- CHEMISTRY AND MATERIAL SCIENCE I (6 ECTS)
- FUNDAMENTALS OF COMPUTER SCIENCE (9 ECTS)
- DIGITAL MODELLING AND ENGINEERING DRAWING (6 ECTS)

2sem
- MATHEMATICAL ANALYSIS AND LINEAR ALGEBRA II (9 ECTS)
- MECHANICS: PHYSICS AND ENGINEERING I (6 ECTS)
- THERMAL PHYSICS AND ENGINEERING I (3 ECTS)
- FUNDAMENTALS OF MANAGEMENT ENGINEERING (9 ECTS)
- EXPLORING ENGINEERING (3 ECTS)

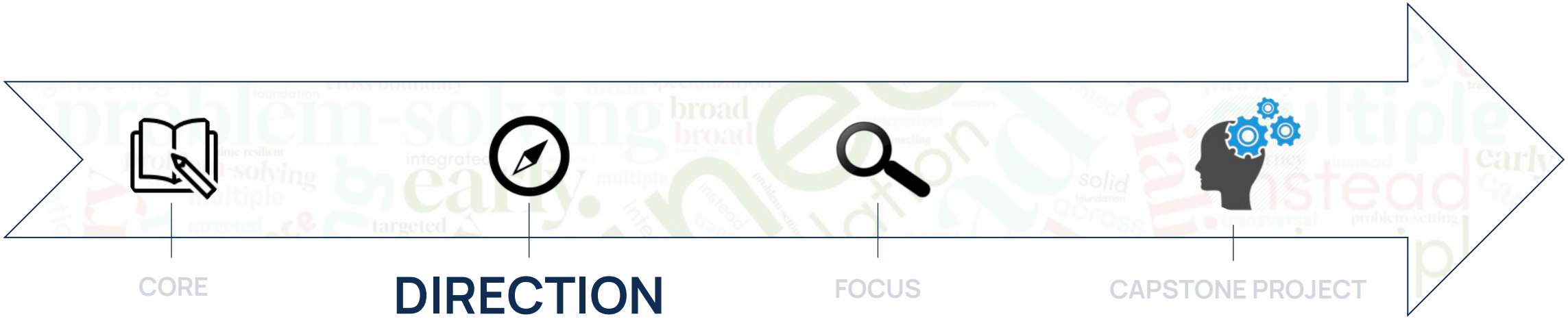
Year II

- COMPLEMENTS OF MATHEMATICAL ANALYSIS
- CHEMISTRY AND MATERIAL SCIENCE II
- MECHANICS: PHYSICS AND ENGINEERING II
- THERMAL PHYSICS AND ENGINEERING II
- PROBABILITY AND STATISTICS FOR ENGINEERING
- ELECTROMAGNETISM AND CIRCUIT THEORY I
- ELECTROMAGNETISM AND CIRCUIT THEORY II

Year III

- SCIENTIFIC COMPUTING AND MACHINE LEARNING

Programme Structure



CORE

DIRECTION

FOCUS

CAPSTONE PROJECT

Transition from a fully shared curriculum to guided exploration: students start orienting their studies toward one or more engineering domains, testing interests and aptitudes within an interconnected framework

18 ECTS

Year II

SOLID MECHANICS

or

FUNDAMENTALS OF ELECTRONICS

Year III

FLUID MECHANICS

or

SYSTEMS AND CONTROL METHODS FOR ENGINEERING

Programme Structure

36 ECTS

Year III – Choose FOCUS on

AEROSPACE
AUTOMATION AND CONTROL
BIOMEDICAL TECHNOLOGIES
CHEMICAL PROCESSES
CIVIL AND INFRASTRUCTURE
COMPUTING SYSTEMS
ELECTRICAL SYSTEMS
ELECTRONICS
ENERGY
PHYSICS
ENVIRONMENTAL AND SUSTAINABLE SYSTEMS
MANAGEMENT
MATHEMATICS
MATERIALS AND NANOTECHNOLOGY
MECHANICS
NUCLEAR SYSTEMS
TELECOMMUNICATION

FOCUS

CAPSTONE PROJECT

Engineering Science students can progressively orient their studies towards a chosen engineering area (Engineering Focus), **applying their transversal skills within a disciplinary context of interest**.

Programme Structure

CORE

DIRECTION

FOCUS

CAPSTONE PROJECT

6 ECTS

Apply and integrate learning in a hands-on, **interdisciplinary project**, tackling real-world engineering problems

Career and future opportunities

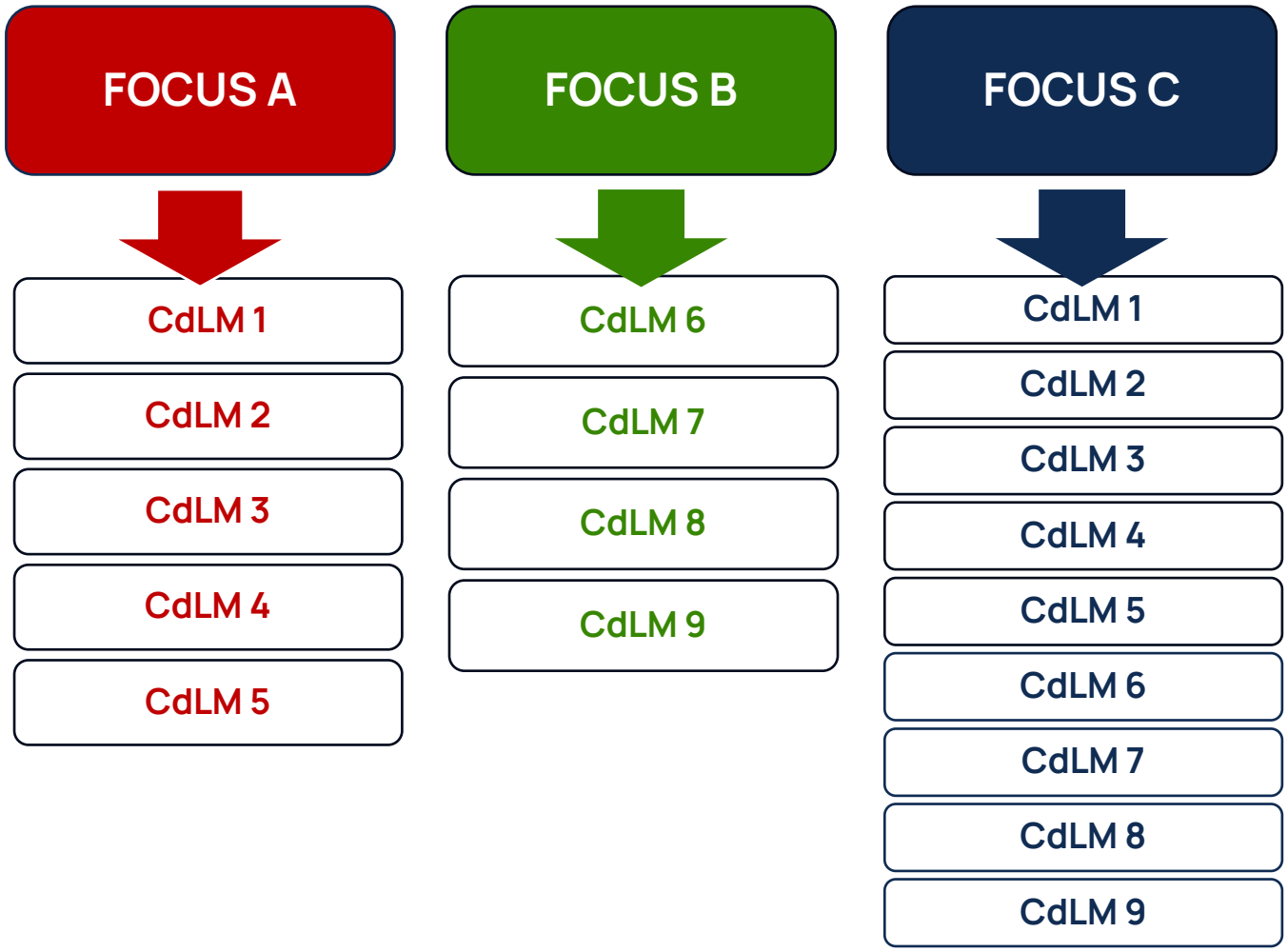
PATHWAYS TO MSc PROGRAMMES

- Access to MSc programmes in engineering and technology
- Strong pathways to English-taught MSc programmes at Politecnico di Milano

PROFESSIONAL PATHWAYS

- Technology and strategic analysis
- Innovation and process development
- Business and technology development
- Digitalisation and data-driven engineering
- Sustainability and technology-market interface

Pathways to POLIMI MSc programmes



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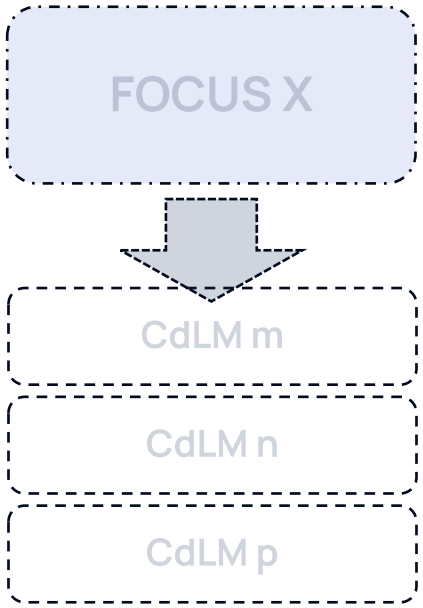


Depending on your chosen Focus, the BSc in Engineering Science allows you to apply for a **wide range of MSc programmes at Politecnico di Milano**.

Teaching for learning

Student-centred approach:

- teaching beyond the mere transmission of information
- active engagement, reflection, autonomy, critical thinking
- instructor as facilitator and mentor

Pedagogical framework (“Three On’s”)

learning progresses through action and reflection

LEAD-ON
(context & motivation)

Highlight relevance and motivation for each topic
Frame problems in realistic engineering contexts

MINDS-ON
(concepts & methods)

Build theoretical knowledge, models, and laws
Derivations and worked examples
Guided exercises, including analytical problem-solving and simulation tasks

HANDS-ON
(application & assessment)

Translate theory into practice
Laboratory experiments (physical or virtual)
Simulation exercises using computational tools
Programming and data analysis tasks
Design projects: individual or group-based

Traditional Teaching and Active Learning

from knowledge transmission to active knowledge construction

Lecture-based teaching: instructor-led teaching focused on providing students with theoretical frameworks, conceptual foundations, and disciplinary language, often through demonstrations, worked examples, or exercises

Lead-on

Minds-on

Interactive teaching

Guided activities that engage students in problem solving, discussion, presentation, and collective reasoning

Hands-on

Lead-on

Minds-on

Laboratory-based teaching

Experimental and computational activities aimed at applying and validating theoretical concepts through direct experience

Hands-on

Minds-on

Project-based teaching

Design- and problem-driven activities leading to concrete outputs, developed progressively and discussed with instructors

Hands-on

Lead-on

Assessment-based teaching

Formative and continuous assessment activities that support reflection, self-evaluation, and feedback-driven learning

Guided Dimension & Active Dimension

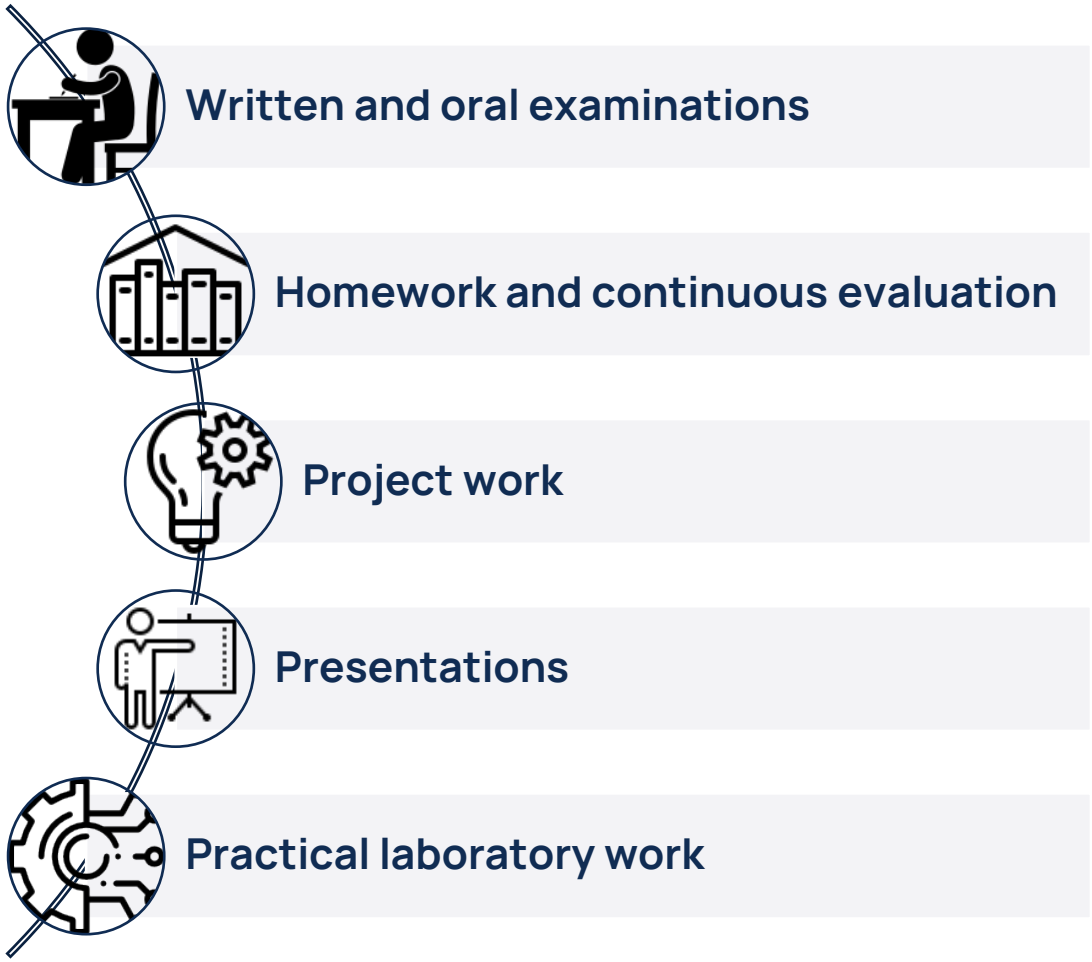
plenary sessions
(context and framing, concepts and models, worked examples)

small group sessions
(exercises, labs/projects, discussion)

Assessment for learning

Assessment formats may vary (tests, projects, lab work, presentations) and are **coherently aligned and harmonized within each semester**.

- technical competence
- problem-solving
- communication
- teamwork



Two campuses, one integrated learning experience

Leonardo Campus
the university's largest and oldest campus
located near Milan's historical centre

Bovisa Campus
set in a former industrial district in northern Milan
– now transformed into a modern academic hub

Polimi Campus Life

Students associations

PoliPsi

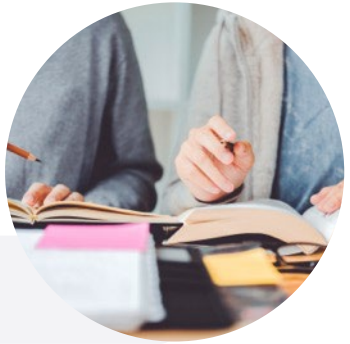
Student Collaborations

Students with Disabilities

Sport and leisure

Equal opportunities

Passion in Action



Tutoring

Students with disabilities or specific learning disorders (SLD)
Polimi offers a support service for admission tests, secretarial practices, accessibility to spaces, equipment and distance learning.

PoliPsi
It is the counseling and psychological and psychotherapeutic support service aimed at students. It offers a place to discuss and receive support in moments of discomfort, uncertainty and difficulties related to study or personal events.

Pari Opportunità (POP)
Polimi is committed to ensuring a study and work environment that respects gender identities, different abilities, cultures and origins.

Entry requirements

https://www.polimi.it/en/prospective-students/how-to-apply/admission-to-laurea-programmes/engineering

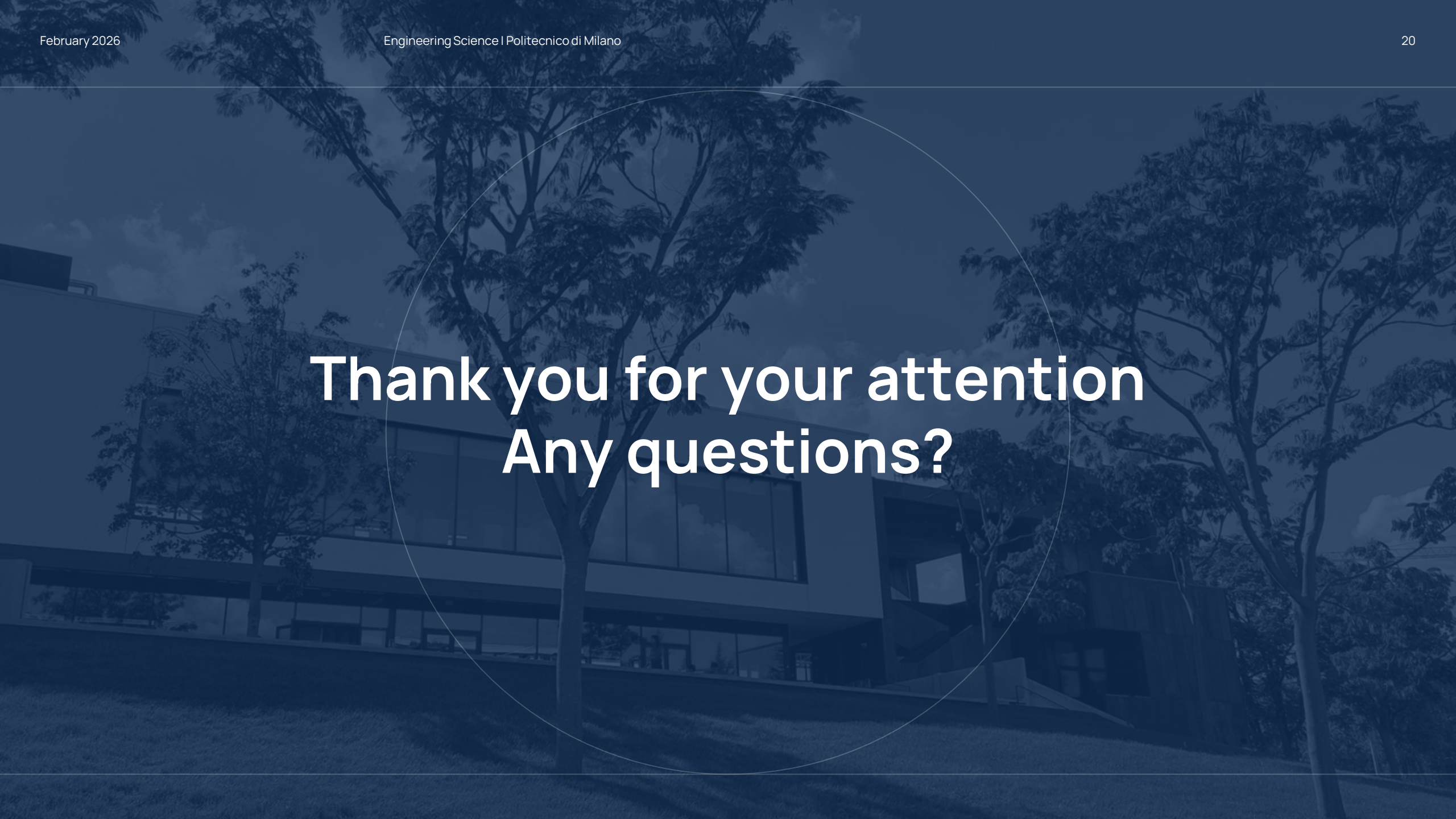
1. Entrance Test

You can enter by taking the TOL (Test on Line) and/or one of the following alternative tests:

- TOL (Test On Line), test in Italian;
- TOLC-I (www.cisiaonline.it), test in Italian;
- CEnT-S (www.cisiaonline.it), test in English;
- SAT (www.collegeboard.org), test in English.

2. Language Skills

Proficiency in the English language prior to enrolment. Proficiency in Italian is not an entry requirement, but you will need to obtain a B2 level in Italian before completing your programme.



Thank you for your attention
Any questions?