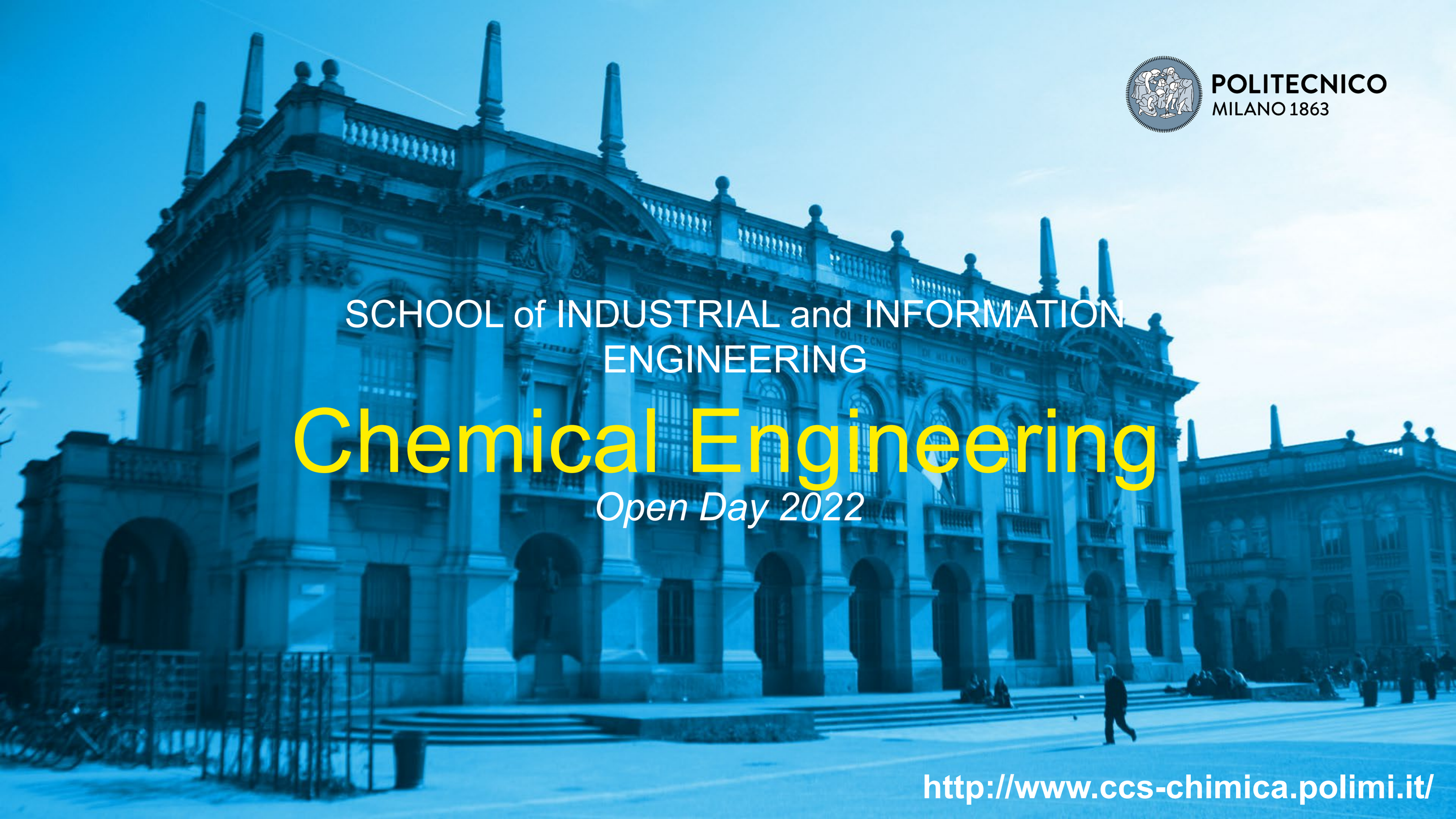

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SCHOOL of INDUSTRIAL and INFORMATION ENGINEERING

Chemical Engineering

Open Day 2022

http://www.ccs-chimica.polimi.it/

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Chemical Engineering: *Context and Challenges*

Sustainable Development Goals

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SDG and Chemical Engineering

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SDG and Chemical Engineering

- **Fertilizers**
- **Food & Beverage**: sustainable products and processes
- **Packaging** and packaging **recycle**

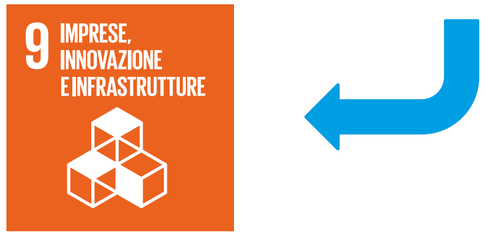
- **Water treatment** technologies
- **Desalting** of ocean water
- Optimization of **water consumption** in production processes

- **Hydrogen** production and use
- **Batteries** and fuel cells
- **Sustainable fuels** production (E-fuels, bio-fuels, ammonia)
- **Wastes conversion, biogas** production

- **Waste materials recycle** (plastics)
- **Bio-polymers** and bio-plastics production
- **Optimization** of processes (to include recycling capabilities)

- **Pollutants reduction** and **abatement**
- Carbon capture sequestration, utilization and storage **(CCSU)**
- Design and optimization of **cleaner processes**

- **Vaccines** and drugs availability
- **Process intensification** and flow chemistry
- **Process adaptation** and flexibility
- **Job creation** from new markets



Chemical industry: the big picture

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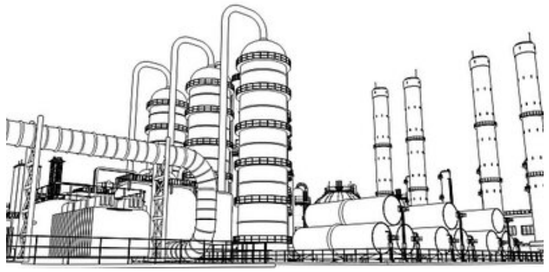
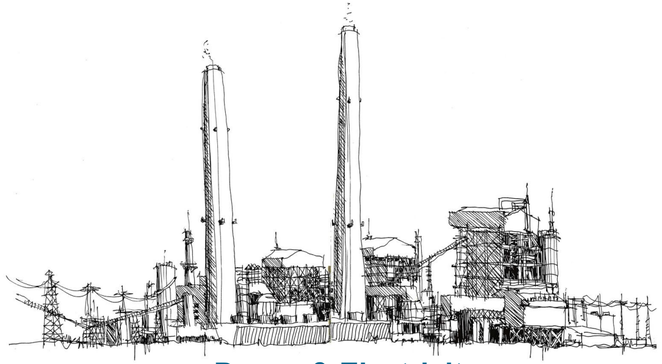
Chimica 1.0 → Chimica del carbone

Chimica 2.0 → Petrolchimica

Chimica 3.0 → Globalizzazione e specializzazione



Chemicals, Fuels, Commodities, Materials



Power & Electricity

Chimica 4.0

Fonte: VCI (Verband der Chemischen Industrie) & Deloitte, Federchimica; anno 2017, ultimo anno disponibile

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Chemical Engineering @POLIMI

Some numbers

International Rankings

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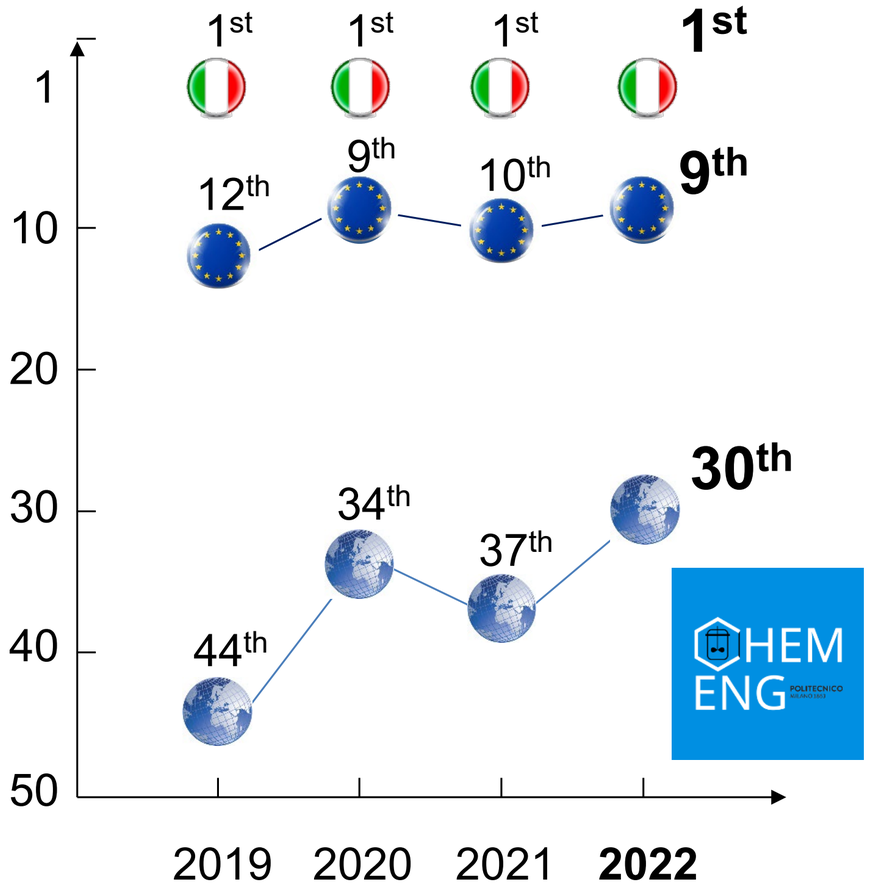
PoliMi, an Italian, European and World leading university



Master Degree in Chemical Engineering

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https://www.ccs-chimica.polimi.it/

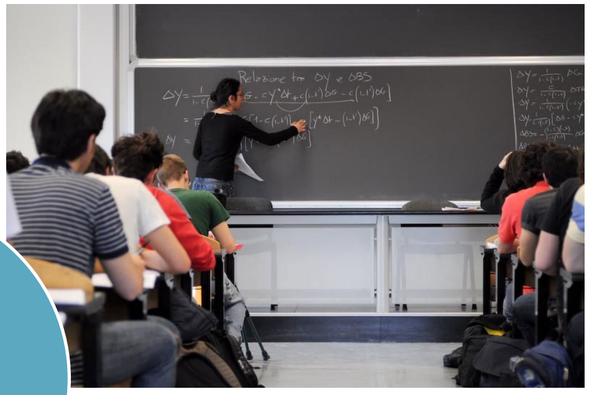
58 Faculties

>80 Courses

>140 Students

>15% Foreign Students

35-50% Female Students



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Excellence in Research (Areas)

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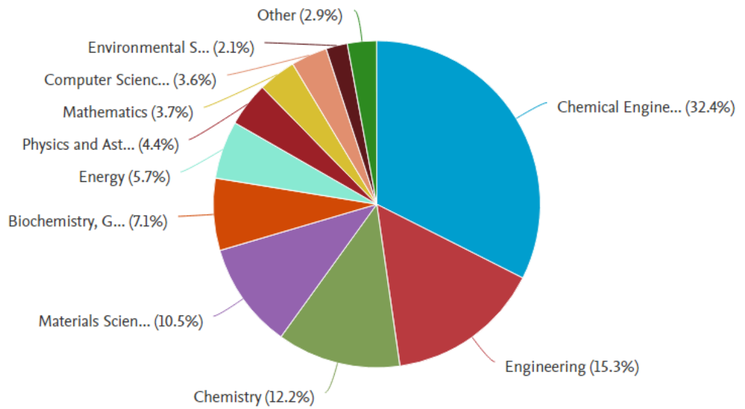
Keywords

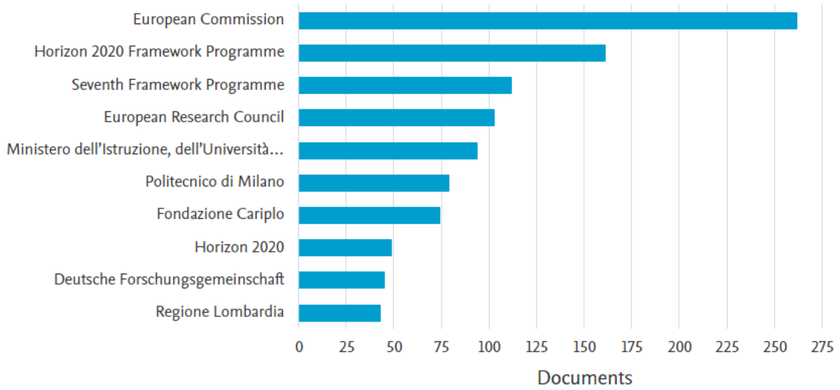
- Chemical process design and optimization
- Industrial separation processes
- Hetereogeneous catalysis
- Homogeneous catalysis
- Sustainable process design
- Energy
- Renewable energy
- Circular economy processes
- Environment and pollution mitigation
- Chemical reaction engineering
- Applied physical chemistry
- Polymers chemistry
- Applied chemical kinetics
- Odour monitoring and modelling
- Drug delivery
- Risk and safety in process industry
- Nanomaterials
- Materials
- Organic and inorganic chemistry
- Analytical chemistry
- Surface chemistry
- Electrochemistry

Documents by subject area

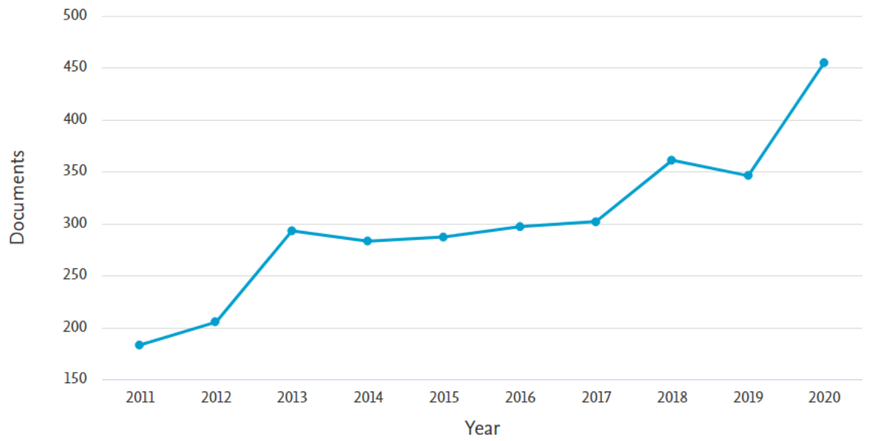


Documents by funding sponsor

Compare the document counts for up to 15 funding sponsors.



Documents by year



Source: scopus.com
Years: 2011-2020
Num. Documents: 3012

Scopus®

Dept. of Chemistry, Materials and Chemical Engineering (https://www.cmic.polimi.it/en/) | Dept. of Energy (https://www.energia.polimi.it/en/energy-department/)

What do students say about us?

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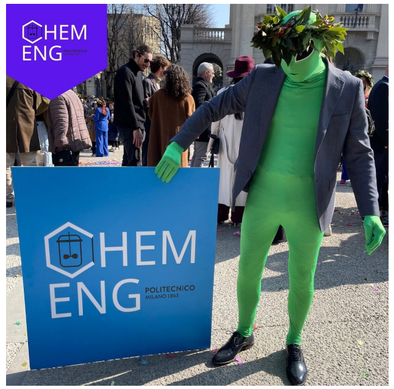
Graduated students in Chemical Engineering

- **~94%** is completely satisfied by the education career
- **97% «Degree fits work»** rating (among the highest at PoliMi)
- **~90%** would chose PoliMi again



On average, our graduates are more satisfied about their education compared to other PoliMi students!

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Chemical Engineering @POLIMI

Job Opportunities and Employability

Job opportunities

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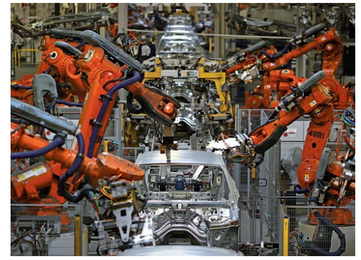
- **Chemical Industry**
- **Pharmaceutical Industry**
- **Energy Industry**
- **Materials industry**
- **Transport Industry**
- **Safety**
- **Research**
- **Petrochemical Industry**
- **Oil&Gas Industry**
- **Cosmetics Industry**
- **Textile Industry**
- **Food&Beverage Industry**
- **Metals Industry**
- **Environment**



Chemical engineering is the **process engineering**: you learn methodologies of **chemico-physical transformation of matter**, aimed at the production of material goods, supply of services, risk prevention, reduction of environmental impact, ….

Stakeholders and Employers

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wood.

CASALE

P&G

lyondellbasell

tenova

Shell

TECHINT

ExxonMobil
Energy lives here™

Schlumberger

JACOBS®

KraftHeinz

DOW®

SIAD

and many others…

Employment Statistics (2021)

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CHEMICAL ENGINEERING

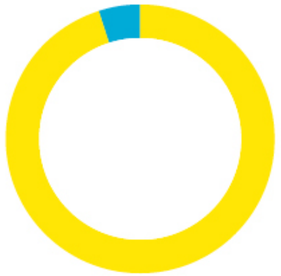
EMPLOYMENT STATISTICS 2021 - MASTER OF SCIENCE GRADUATES

In 2019 153 students (126 Italian and 27 international) obtained the Master's degree in Chemical Engineering.
Total respondents to the annual employment survey were 119 (coverage rate 78%).

EMPLOYED*	EMPLOYED WITHIN 6 MONTHS*	NET MONTHLY SALARY
96%	91%	€1,550
* 1 year after graduation, except students	* calculated on employed	

CareerService
www.careerservice.polimi.it

EMPLOYMENT STATUS



Employee	95%
Self-employed	5%

CONTRACT TYPE

Permanent	41%
Fixed-term	16%
Apprenticeship	32%
Internship	7%
Other*	4%

* project based/occasional collaboration

COMPANY SIZE

1-250	55%
251-1000	12%
+1000	33%

WHERE THEY WORK

Italian graduates working abroad	4%
International graduated working in Italy	60%

TOP 5 SECTORS

Oil&gas	18%
Chemistry	14%
Business Consultancy	11%
Mechanics and Installation	11%
Petrolchemical Industry	9%

TOP 5 AREAS OF EXPERTISE

Design	65%
Research and Development	31%
Operations	26%
Planning	24%
Quality and Control	14%

…5 Years After (2015 graduates)

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WHAT IS THE EMPLOYMENT SITUATION OF CHEMICAL ENGINEERING GRADUATES **5 YEARS AFTER GRADUATION?**

The following data has been extracted from the 2021 Employment Survey on 2015 Graduates, interviewed 5 years from graduation. Full details on the website http://cm.careerservice.polimi.it/en/employment-statistics/
In 2015, 113 Italian students obtained a Master's degree in Chemical Engineering at Politecnico di Milano. Total respondents to the survey were 65 (coverage rate 57%).

EMPLOYMENT RATE

100% HAS INCREASED BY 10%*

NET MONTHLY SALARY

€2,087**

HAS INCREASED BY €617*

PERMANENT CONTRACT

98% HAS INCREASED BY 57%*

WORK IN ITALY

89% HAS DECREASED BY 9%*

SATISFIED WITH SPECIFIC DEGREE: 94%
Education and training acquired at the university is adequate for the current job

DEGREE FITS WORK: 97%
In order to carry out their job, they need their qualification or an equivalent one

* Compared to data from survey submitted 1 year from graduation
** Standard deviation 586

WHAT HAVE CHEMICAL ENGINEERING GRADUATES DONE IN THESE **5 YEARS?**

20%
HAVE WORKED ABROAD FOR AT LEAST 6 MONTHS (GERMANY, SWITZERLAND)

15%
HAVE OBTAINED A NEW DEGREE WHILE WORKING OR BEFORE
9% POST MASTER DEGREE | 6% PHD

2%
HAVE FOUNDED A START-UP

THEY HAVE CHANGED THEIR JOB AN AVERAGE OF 1.7 TIMES

MAIN REASONS:

- TO CHANGE SECTOR/ PROFESSION — 30%
- DISSATISFACTION WITH WORK ENVIRONMENT — 20%
- PROFESSIONAL GROWTH — 18%

THEY HAVE IMPROVED THEIR PROFESSIONAL SITUATION:

- BY DEVELOPING SOFT SKILLS
- ECONOMICALLY
- BY ACCESSING A BETTER POSITION IN THE ORGANIZATION

CHEM ENG

University Report (Job Pricing 2021)

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Tabella 6.1. Retribuzione media fissa (RAL) per tipologia di università, anno 2020 (euro)

TIPOLOGIA DI UNIVERSITÀ	RAL
Università private	43.045
Università statali	38.350
Politecnici	42.369

Figura 7.1. Retribuzione media fissa (RAL) dei laureati per la classe di età 25-34 per ateneo e scostamento dalla media dei laureati della medesima classe di età, anno 2020 (euro e percentuale)

		Scostamento da RAL media nazionale (30.000 €)
Università Commerciale Luigi Bocconi	34.662	15,8
Politecnico di Milano	32.308	7,9
LUISS Libera università internazionale degli studi sociali Guido Carli	31.870	6,5
Università Cattolica del Sacro Cuore	31.735	6,0
Università degli Studi di Siena	31.108	3,9
Politecnico di Torino	31.088	3,9

Job Pricing All About Rewards

HEM ENG

University Report (Job Pricing 2021)

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Tabella 7.1. Retribuzione media fissa (RAL) dei laureati per classe di età e ateneo e tasso di crescita tra la prima e l'ultima classe considerata, anno 2020 (migliaia di euro e percentuale)

ATENEO	25-34 anni	35-44 anni	45-54 anni	da 25-34 a 45-54
Università Cattolica del Sacro Cuore	31,7	42,0	58,0	82,8
LUISS Libera università internazionale degli studi sociali Guido Carli	31,9	42,2	57,1	79,0
Università Commerciale Luigi Bocconi	34,7	44,8	59,3	71,2
Politecnico di Torino	31,1	41,2	52,8	69,7
Università degli Studi di Perugia	29,0	37,4	48,9	68,6
Università degli Studi di Verona	29,7	37,7	49,8	67,6
Politecnico di Milano	32,3	41,7	53,7	66,2

Figura 6.2. Tasso di crescita della RAL tra la classe di età 25-34 e 45-54, anno 2020 (percentuale)

Job Pricing All About Rewards

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ChemEng@PoliMi

Programme structure

ChemEng @ PoliMi

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Others

Laurea – Bachelor of Science *Ingegneria Chimica* (3 anni, 180 CFU)

Laurea Magistrale – Master of Science *Chemical Engineering* (2 anni, 120 CFU)

Dottorato di Ricerca – Doctor of Philosophy (PhD) *Industrial Chemistry and Chemical Engineering* (3 anni)

- In English since 2014
- **NEW structure!!!!!!!**

How did we come up with the new structure of the Master of Science in Chemical Engineering?

ChemEng @ PoliMi

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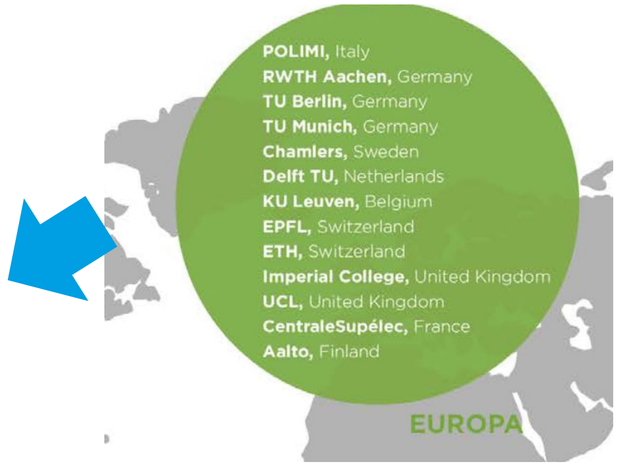
1. SDG & EU Green Deal related challenges and objectives

2. Market needs: new skills, professionals and technologies

eni, wood., snam, CASALE, P&G, lyondellbasell, tenova, Maire Tecnimont, SOLVAY (asking more from chemistry®), SAIPEM, BASF (The Chemical Company), Shell, ExxonMobil (Energy lives here), Schlumberger, TECHINT, JACOBS, Air Liquide (creative oxygen), KraftHeinz, DOW, SIAD

CHEM ENG POLITECNICO MILANO 1863

3. Looking at other EU excellent university and partners



- **New courses and topics**
- **Strenghtned laboratory activities** (experimental, computational, projects)
- **Innovative teaching,** including lectures and seminars from industry representatives

ChemEng @ PoliMi: structure

POLITECNICO MILANO 1863

1st Year, 60 CFU

	Course (mandatory)	CFU
I Sem	Chemical and Catalytic Reaction Engineering	10
I Sem	Advanced Transport Phenomena	10
I Sem	Applied Physical Chemistry	10
II Sem	Chemical Plants and Process Operations Management	10
II Sem	Process Systems Engineering A Process Systems Engineering B	5 + 5
II Sem	Processes of the Organic Chemical Industry	10
		60

ChemEng @ PoliMi: structure

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2nd Year, 40 CFU (+ 20 CFU Master Thesis)

Environment & Energy

Process Design

4 Tracks

Biochemical & Pharma

Research & Development for Industrial Applications

25 CFU of Mandatory courses + 15 CFU to be freely chosen

Environment and Energy

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Learning objectives:

- To provide the knowledge and tools related to the key role of chemical engineering in the context of environmental protection and energy production technologies
- The knowledge must cover both standard technologies (e.g. oil and gas industry) and those related to the energy transition (green chemistry, sustainability, etc.)

Mandatory courses (25 CFU)

		Scientific Sector (SSD)
• 5 CFU.	Catalysis for Energy & Environment	- ING-IND/27
• 5 CFU.	Thermochem. Proc. for Carbon Neutral En. Transfor.	- ING-IND/25
• 5 CFU.	Electrochem. Tech. for Energy Production and Storage	- ING-IND/23
• 5 CFU.	Life Cycle Assessment of Materials and Processes	- ING-IND/22
• 5 CFU.	Environmental Impacts	- ING-IND/23

Process Design

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Learning Objectives:

- To provide the knowledge and tools required by the many and different areas of chemical processes engineering
- The knowledge inclused the design of facilities and equipments, of chemical plants, their simulation, control and operation, together with economic and management aspects.

Mandatory Courses (25 CFU)

		Scientific Sector
• 5 CFU.	Sust. process design for nat. gas and energy carriers	- ING-IND/25
• 5 CFU.	Proc. Control & Instrum. Lab.	- ING-IND/27
• 5 CFU.	Dynamics and Control of Chem. Processes	- ING-IND/26
• 5 CFU.	Process Design: Principles and Methods	- ING-IND/25
• 5 CFU.	Mechanical Systems Dynamics	- ING-IND/13

Biochemical and Pharma

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Learning objectives

- To provide the knowledge and tools required by the many areas related to biotechnologies, healt and care and in particular of the pharmaceutical and biotechnology industry
- The knowledge includes: processes and equipments of the pharmaceutical industry, DS/DP and packaging, regulatory aspects, process development and technology transfer

Mandatory Courses (25 CFU)

		Scientific Sector
5 CFU.	Flow Chemistry	- ING-IND/25
5 CFU.	Formulation Engineering	- ING-IND/23
5 CFU.	Manufacturing of Biopharmaceuticals	- ING-IND/23
5 CFU.	Pharmaceutical Chemistry Technology	- CHIM/07
5 CFU.	Nanomedicine and Pharmaceutical Innovation	- ING-IND/23

R&D for industrial applications

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Learning Objectives:

- To provide the advanced knowledge of chemical engineering fundamental aspects required by industrial research practices
- The knowledge covers both methodological approaches and specific contents related to chemical kinetics, catalysis, mathematics, chemistry and advanced separation processes

Mandatory Courses (25 CFU)

		Scientific Sector
• 5 CFU.	Advanced Mathematical analysis	- MAT/05
• 5 CFU.	Methods for Catal. Kinetic Investigation	- ING-IND/27
• 5 CFU.	Chemical Kinetics and Dynamics: Theory and App.	- ING-IND/24
• 5 CFU.	Applied Chemistry for Technologies	- CHIM/07
• 5 CFU.	Adsorption and Membrane Separations	- ING-IND/23

Other courses (15 CFU)

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Codice	Attività formative	SSD	Denominazione Insegnamento	Sem	CFU
056262	B	ING-IND/22	CORROSION ENGINEERING	1	5,0 [1,0]
099309	B	ING-IND/25	ENTERPRISE RISK MANAGEMENT (ERM)	1	5,0
051191	B	ING-IND/22	FOOD PACKAGING MATERIALS	1	5,0
055571	B	ING-IND/27	FUNCTIONAL CERAMIC MATERIALS PRODUCTION	1	5,0
096125	C	CHIM/07	INTRODUCTION TO GREEN AND SUSTAINABLE CHEMISTRY	1	5,0
096218	B	ING-IND/22	MICROSTRUCTURAL CHARACTERISATION OF MATERIALS	1	5,0
054187	B	ING-IND/22	PRINCIPLES OF POLYMER CHEMISTRY[(a)]	1	5,0 [1,0]
057854	B	ING-IND/25	PROCESSES OF FOOD INDUSTRY	1	5,0
099302	C	CHIM/07	PRODOTTI DA RISORSE RINNOVABILI	1	5,0
055562	B	ING-IND/27	SPECIAL CHEMICAL TECHNOLOGIES: RENEWABLE RAW MATERIALS	1	5,0 [2,0]
097621	C	FIS/03	STATISTICAL PHYSICS	1	10,0
054262	B	ING-IND/17 ING-IND/25	CHEMICAL PROJECTS ENGINEERING AND MANAGEMENT	1	10,0 [5,0]
099306	C	ING-IND/23	APPLIED ELECTROCHEMISTRY	2	5,0
057980	C	ING-IND/13	APPLIED MECHANICS	2	5,0
058039	C	ING-IND/23	BIOTECHNOLOGY AND CLINICAL MANUFACTURING	2	5,0 [1,0]
058011	C	ING-IND/23	MANUFACTURING OF BIOPHARMACEUTICALS	1	5,0 [1,0]
057975	B	ING-IND/27	CATALYTIC TECHNOLOGIES FOR EMISSION CONTROL	2	5,0

[Innovative Teaching]
[Didattica Innovativa]

Other courses (15 CFU)

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Codice	Attività formative	SSD	Denominazione Insegnamento	Sem	CFU
057977	B	ING-IND/22	CHEMISTRY AND MATERIALS FOR ENERGY	2	5,0
057979	C	CHIM/07	CHEMISTRY AND TECHNOLOGY FLUORINATED MATERIALS	2	5,0
056270	C	CHIM/07	CHEMISTRY FOR SUSTAINABLE POLYMERS	2	5,0
096284	C	ING-IND/23	ELECTROCHEMISTRY OF MATERIALS	2	5,0
052581	--	M-FIL/02	ETHICS FOR TECHNOLOGY[(b)]	2	5,0 [5,0]
054179	--	IUS/07	IMPLICAZIONI LEGALI DELL'ESERCIZIO DELLA PROFESSIONE (LE RESPONSABILITA' DELL'INGEGNERE)	2	5,0 [5,0]
057983	B	ING-IND/24	MOLECULAR MODELING IN PROCESS ENGINEERING	2	5,0 [3,0]
057984	--	MAT/08	NUMERICAL METHODS FOR MOLECULAR SIMULATION	2	5,0 [2,0]
057978	B	ING-IND/27	PROCESSES FOR HYDROGEN AND ENERGY TRANSITION	2	5,0
054248	--	ING-IND/19	RELIABILITY ENGINEERING AND QUANTITATIVE RISK ANALYSIS A+B	2	10,0 [2,0]
057976	C	ING-IND/23	SCIENZA E INGEGNERIA DELL'ODORE	2	5,0 [2,0]
089650	B	ING-IND/24	SICUREZZA DEI PROCESSI DISCONTINUI	2	5,0
096131	B	ING-IND/24	SICUREZZA DEI REATTORI DISCONTINUI	2	5,0
099300	C	FIS/03	SOFT MATTER: THE STRUCTURE AND RHEOLOGY OF COMPLEX FLUIDS	2	5,0
052583	--	ING-IND/10	SUSTAINABLE DEVELOPMENT[(c)]	2	5,0 [5,0]
055583	B	ING-IND/24 MAT/08	COMPUTATIONAL TECHNIQUES FOR MOLECULAR MODELING	2	10,0 [5,0]

Other courses (15 CFU)

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Codice	Attività formative	SSD	Denominazione Insegnamento	Sem	CFU
093555	B	ING-IND/27	MICROBIOLOGIA INDUSTRIALE	2	5,0
089653	B	ING-IND/24	TECNOLOGIE DI PRESIDIO PER I PROCESSI INDUSTRIALI A+B	2	5,0
058041	C	ING-IND/23	ELECTROCHEMICAL TECHNOLOGIES FOR WATER AND WASTEWATER TREATMENT	2	5,0
057901	B	ING-IND/22	MOLECULAR MODELING OF MATERIALS	2	5,0

International Mobility

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Course (Mandatory)	CFU
Chemical and Catalytic Reaction Engineering A	5
Advanced Transport Phenomena A	5
Applied Physical Chemistry A	5
Chemical Plants and Process Operations Management	5
Processes of the Organic Chemical Industry A	5

Course (Mandatory)	CFU
Chemical and Catalytic Reaction Engineering B	5
Advanced Transport Phenomena B	5
Applied Physical Chemistry B	5
Chemical Plants and Process Operations Management	5
Processes of the Organic Chemical Industry B	5

For students participating to **international mobility programs** the mandatory courses (10 CFU) can be subsituted by corresponding 5+5CFU courses.

Excellence in Research (MSc Thesis)

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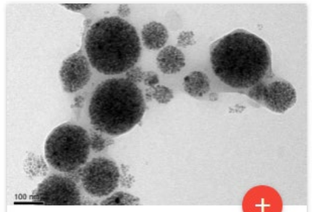
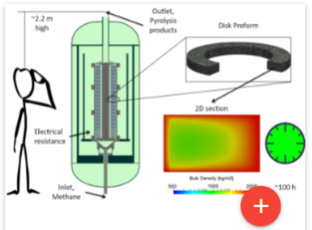
AOCL
Applied Organic Chemistry Laboratory

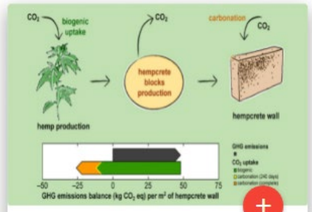
BiocatLab
Laboratorio di Biocatalisi per la Sintesi Organica



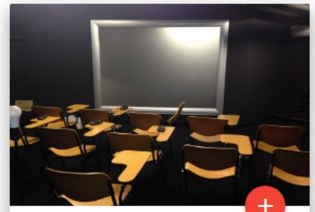
CFALab
Laboratorio di Chimica Fisica Applicata



CRECK
Chemical Reaction Engineering and Chemical Kinetics Group



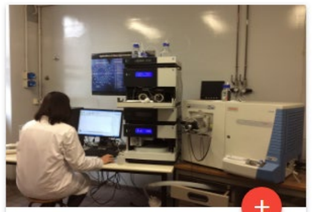
Mat4En2
Materiali per l'Energia e l'Ambiente



eRAM Lab
experimental Risk Assessment and Management Lab

Fluoritech
Fluoritech Laboratory

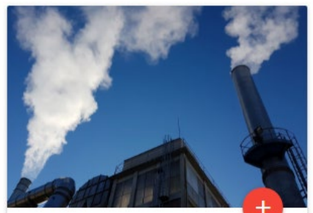
GASP
Group on Advanced Separation Processes & GAS Processing



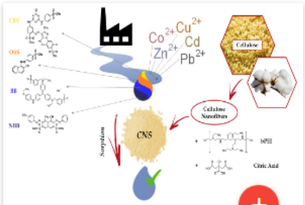
ISCaMaP
Innovative Sustainable Chemistry and Materials and Proteomics

Laboratory of Catalysis and Catalytic Processes LCCP

NMR Group
NMR Group



Olfattometrico
Laboratorio Olfattometrico

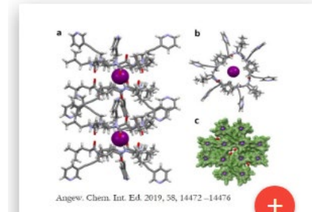


OrganicSCM Lab
Organic Synthesis, Catalysis, and Materials Laboratory

SEE lab
Surface and Electrochemical Engineering Laboratory

Soft Matter
Laboratorio Soft Matter

SuPER TEAM
Sustainable Process Engineering Research Team



SupraBioNanoLab
Laboratory of Supramolecular and Bio-Nanomaterials

SurfaceLAB
Laboratorio di Ingegneria delle Superfici ed Elettrochimica Applicata "Roberto Piontelli"

Dept. of Chemistry, Materials and Chemical Engineering (https://www.cmic.polimi.it/en/) | Dept. of Energy (https://www.energia.polimi.it/en/energy-department/)

How to enroll? Evaluation process

POLITECNICO MILANO 1863

- The admission to the Master of Science degree in Chemical Engineering at Politecnico di Milano undergoes an **evaluation process based upon curriculum requirements and an assessment of the preparation of the student aimed to determine the eligibility of the applicant.** (“Educational Rules”, “Enrolement”, point 6, www.ingindinf.polimi.it)

- The **final decision** about the admission to the Master of Science degree shall be taken by an **Evaluation Commission** set up by the Board of Studies

Access Requirements (D.M. 22/10/2004 n. 270 art 6, D.M. 16/3/2007)

1. **Bachelor of Science (BSc, Laurea) or higher degree (MSc, Laurea Magistrale).**

   Note: The evaluation can be carried out under reserve also for students enrolled in Politecnico di Milano or other Universities BSc, if they are candidates in a Graduation session scheduled not later than 6 months, and not later than the deadline for the enrolment to the MSc program. The reserve is lifted when the BSc is earned. If the BSc is not earned before the deadline for the enrolment to the MSc program, the evaluation is lost and a new application for admission must be submitted.

How to enroll? Access requirements

POLITECNICO MILANO 1863

2. Additional requirements:

a1) only for Politecnico di Milano Bachelor students, who comes from a BSc program in "Ingegneria Chimica", at least 105 CFU must be gained with an average grade >= 25/30 before the end of the fall semester (primo semestre) of the second year and the Bachelor of Science Degree (Laurea) must be earned in 4 years maximum from the enrolment.

or

a2) for any student, graduation at the BSc no later than 31 October of the 6th year (12 semesters) after the first enrolment in any Italian university.
e.g. first enrolment in 09/2019: BSc should be obtained before 31/10/2025
Note: does not apply for candidates having a MSc.

b) Weighted Average (WA) not below the "adjusted" admission Score (SC),
defined as SC = 22 + (min(6,N) - 4)
N=number of years (i.e. 0.5 x semesters) passed from the year of first enrolment in any University to the achievement of the BSc Graduation (semesters end at April 30th or October 31st).
Note: does not apply if requirement a1 is satisfied.

How to enroll? Access requirements

c) certification of the English language proficiency, level as stated by the Politecnico's Academic Policies (see Politecnico website)

d) further subjects and knowledge not required.

Applicants can be admitted to the MSc in Chemical Engineering when their BSc degree programme is evaluated as being "consistent" with the study programme of the MSc degree course.

The Evaluation Commission verifies the requirements, also ascertaining the need of imposing any prerequisite (i.e. additional compulsory modules) to fill possible gaps.

An applicant who has been assigned any prerequisites may attend "**Individual Courses**" in the period before the enrolment to the MSc (max 80 credits). The following opportunities exist:

- *earn credits related to the additional compulsory modules*. These credits shall be not accounted within the 120 credits required for the MSc degree;
- *earn credits by passing courses at the Master of Science level*. These credits (max 32), will be accepted to be part of the 120 credits necessary for the Master of Science degree. Credits in excess of 32 could be only accepted as 'over-limit exams'.

If an applicant does not pass the exams assigned as compulsory prerequisites within 18 months, he or she forfeits his/her right to admission totally and completely.

How to enroll? Evaluation process

POLITECNICO MILANO 1863

- **Candidates with a BSc in Chemical Engineering issued by any Italian universities, who meet the requirements stated above, are automatically admitted to the Master of Science degree course.**

- **For candidates with other BSc (not in Chemical Engineering), in addition to meeting the above requirements, admission is subject to examination by Evaluation Commission.**

- **If the requirements stated at either point a) [TIMING] or b) [AVERAGE] of the above list are not satisfied, the Commission will not admit the applicant to the Master of Science degree course, unless documentation testifying a proven exceptional case can be presented.**
  The Commission may take into account a valid documentation showing **clear exceptional conditions**, justifying the non-compliance of the mentioned criteria and showing that the student has an adequate background. Such a documentation shall be attached to the admission application.

How to enroll? Evaluation process

POLITECNICO MILANO 1863

- **If the requirements stated at either point c) [ENGLISH] or d) [CONSISTENCY] of the above list are not satisfied, the applicant <u>will be accepted</u> to the Master of Science degree course <u>and enrolled, after having satisfied these conditions</u>, by demonstrating his/her proficiency in English and/or obtaining the necessary prerequisites identified and communicated by the Commission.**

Note: if the applicant is admitted, compulsory additional subjects shall be communicated together with the admission and before enrolment, in order to provide students with the necessary information for a transparent and rational choice.


POLITECNICO
MILANO 1863
Teaching innovation,
PhD,
internationalization,
campus life

PoliMI Ambassador in Green Technologies

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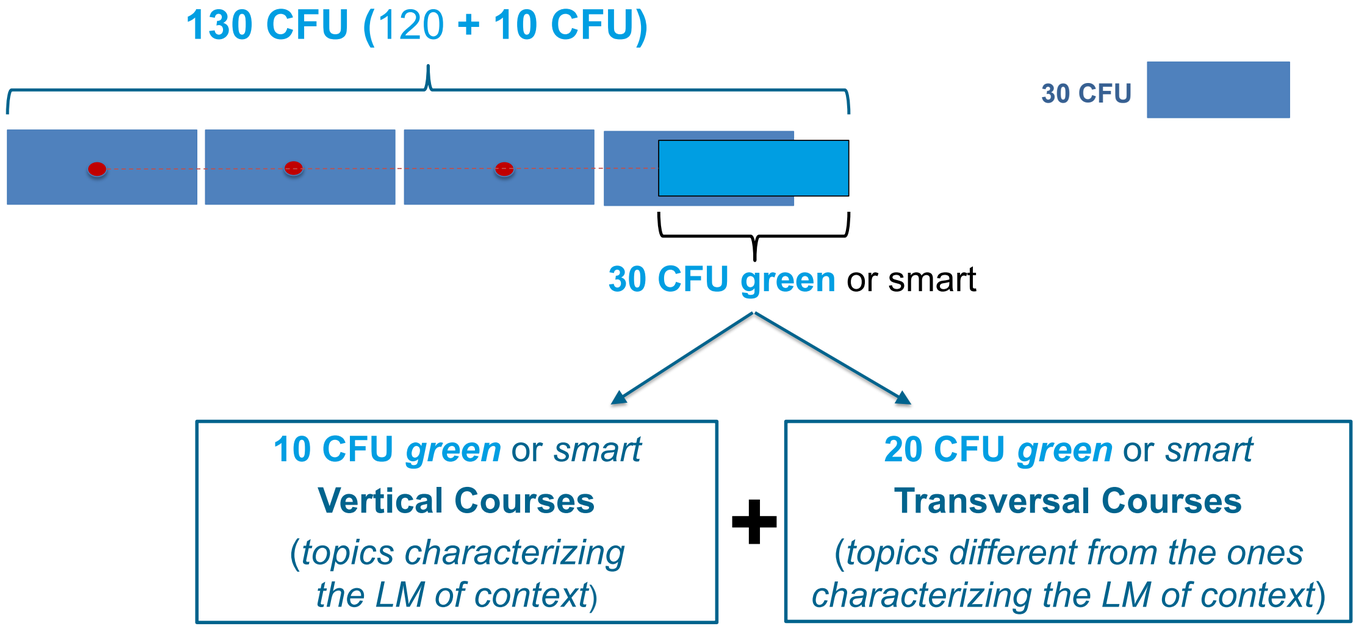
https://www.ingindinf.polimi.it/en/

Starting in AY 21-22, PoliMi activated **high-level training courses** to create professionals in the area of ***Green Technologies*** and *Smart Infrastructures* that:

- have skills in specific areas consistently with the training project (**green**/smart)
- acquire digital enabling technologies in line with the profile
- master **interdisciplinary tools**, **methods**, and **aptitude** for a **systemic vision**
- **develop talents** to operate in interdisciplinary and multisectoral contexts acquired through exposure, even in teams, to case studies and challenges

POLIMI AMBASSADOR GREEN TECHNOLOGIES

The ***PoliMI Ambassador in Green Technologies certification*** will be reported in the Student's Diploma Supplement and an electronic badge will be issued by Politecnico di Milano.



www.polimi.it/en/polimi-ambassador

Honours Programme in Scientific Research in Industrial Engineering - CHEMICAL

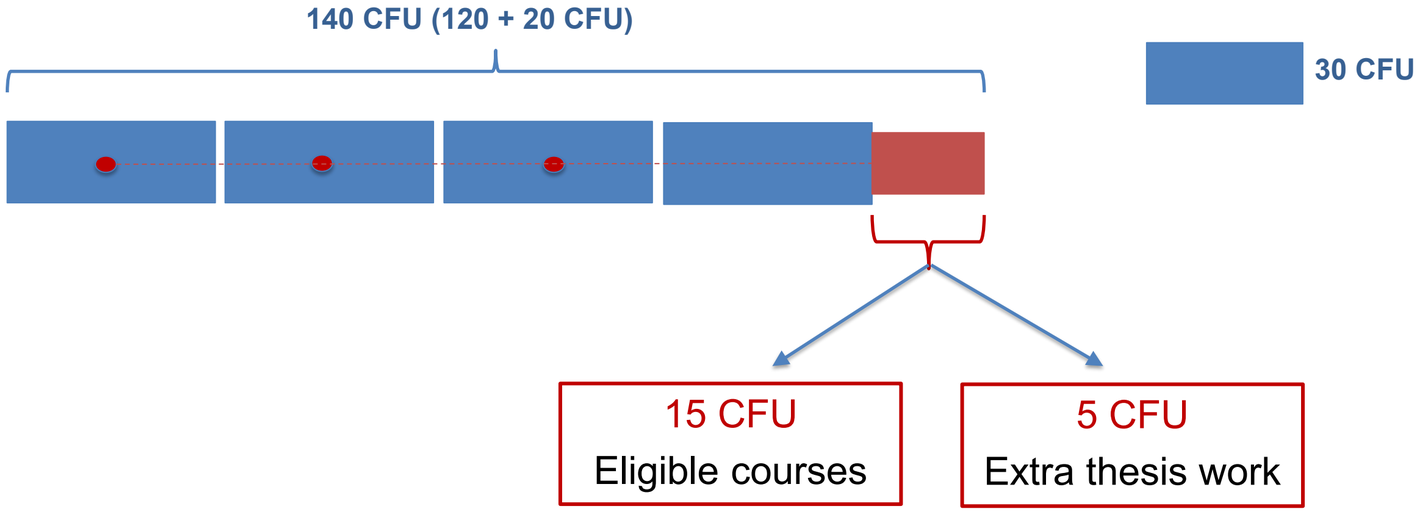
POLITECNICO MILANO 1863

https://www.ingindinf.polimi.it/en/

An educational path that is part of the **Politecnico di Milano high education training strategy** and is targeted to students with a strong predisposition for **study and research**, with the aim to improve these skills and **train industrial engineers who can enter the fields of scientific and technological research**

It includes:
- additional in-depth training activities
- carrying out an in-depth analysis on the laurea magistrale final work with significant scientific research results.

The ***Honours Programme in SCIENTIFIC RESEARCH IN INDUSTRIAL ENGINEERING*** will be reported in the Student's Diploma Supplement



https://www.polimi.it/corsi/percorsi-di-alta-formazione/honours-programme-scientific-research-in-industrial-engineering/

3I School beyond curricular teaching

POLITECNICO MILANO 1863

https://www.ingindinf.polimi.it/en/

Soft skills development and teaching innovation is something we really care about…

https://www.polimi.it/en/programmes/innovative-teaching/

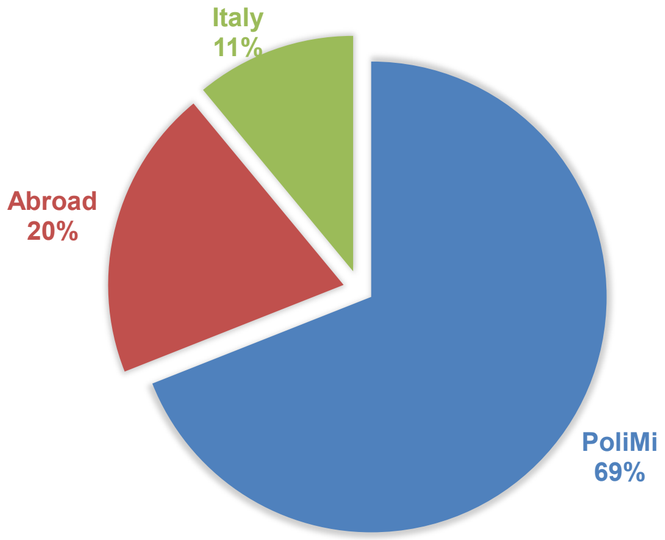
- Strengthen **laboratory courses**:
  - Experimental
  - Modeling
  - Project-work
- **Innovative teaching methodologies in curricular courses**:
  - Flipped classrooms
  - New spaces
  - Technology integration
  - Seminars series
- **Soft skills**:
  - Communication
  - Team-work
  - Organisation
  - Leadership…

https://www.polimi.it/corsi/passion-in-action/

International Mobility (3I)

POLITECNICO MILANO 1863

Where are PoliMi Master Students from?



Some number on «Exchange programs»

	incoming	outgoing
Erasmus+	938	730
	Incoming	outgoing
Extra EU Bilateral Agreements	487	263
	incoming	outgoing
Double Degrees	288	142

IDEA League
leading European education and research in science and technology
TU Delft · ETH Zürich · CHALMERS UNIVERSITY OF TECHNOLOGY · RWTH AACHEN UNIVERSITY · POLITECNICO MILANO 1863

ALLIANCE 4 TECH
CentraleSupélec · Technische Universität Berlin · UCL · POLITECNICO MILANO 1863

Strategic networks of European Technical Universities

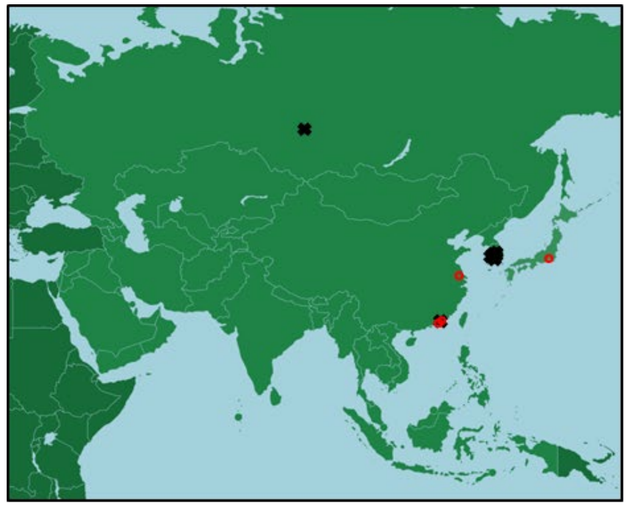
清華大學 Tsinghua University · 上海交通大學 Shanghai Jiao Tong University · 北京航空航天大學 Beihang University · 西安交通大學 Xi'an Jiaotong University · 香港科技大學 The Hong Kong University of Science and Technology

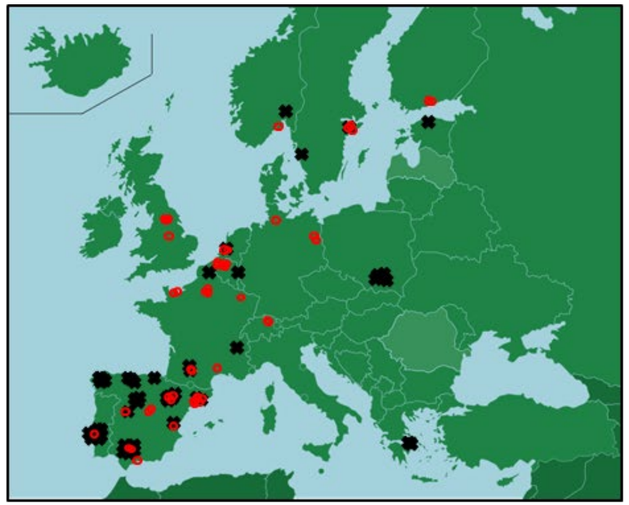
Strategic agreements with top Chinese Universities

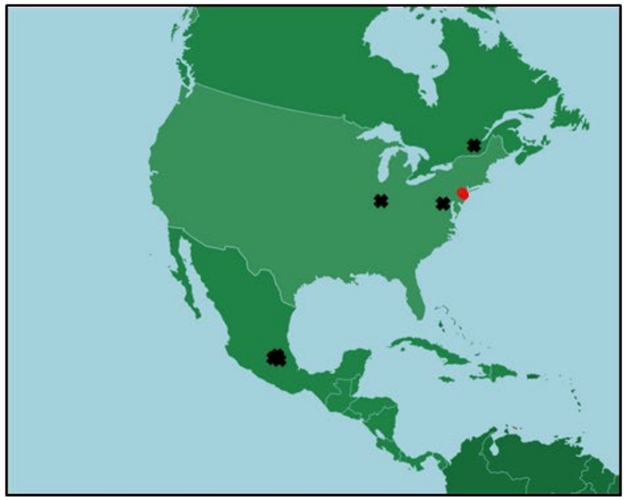
International Mobility (ChemEng)

POLITECNICO MILANO 1863

An international and multicultural environment…







✖ Incoming students Chemical Engineering

○ Outgoing students Chemical Engineering

Why an experience abroad?

✓To learn a new language

✓To benefit from cultural diversity

✓To become citizens of the World

✓To deepen your knowledge

✓To share your knowledge and your culture

Exchange Programs @ PoliMi

✓Erasmus

✓Bilateral Agreements (UE and Extra-UE)

✓Double Degree (UE and Extra-UE)

Time range: 2014-2017 Source: International Affairs Office POLIMI

PhD in Industrial Chemistry and Chemical Engineering

POLITECNICO MILANO 1863

http://phd.chem.polimi.it/

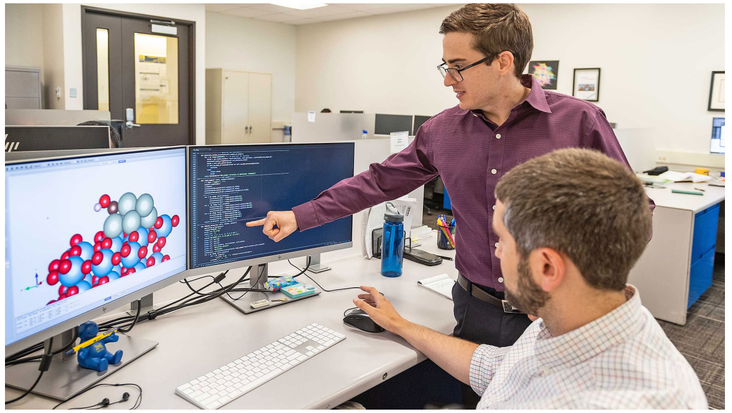
http://www.dottorato.polimi.it/

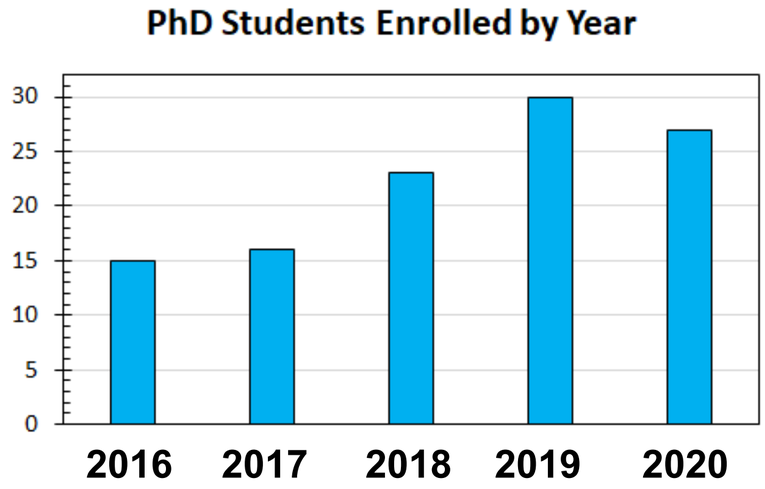
The **Ph.D. Programme in Industrial Chemistry and Chemical Engineering** offers students and executives opportunities to **develop solutions to global challenges by performing cutting-edge research** in three main areas:

- **Energy, Safety and Environment**
- **Health and Life Sciences**
- **Smart and Sustainable Industry**

Research activities span from the **nano/micro scale up to the macro scale** and cover any fields of Industrial Chemistry and Chemical Engineering: from **chemical synthesis** to the characterization and transformation of matter, the development of **new materials**, to safe and **innovative technologies** for **sustainable process development** and design, from **experimental research to numerical modelling** of chemical processes and phenomena.

The Doctoral Programme... a strategic resource for Industry





Life on Campus

POLITECNICO MILANO 1863

Students Associations

www.polimi.it/rappresentanti-associazioni

- **> 20** Associations
- **3** official lists of students representatives
- **Many activities:**
  - Theater
  - Radio
  - Travels
  - Movies
  - Music
  - …
- **Active Participation in PoliMi Governance**

SPORT PoliMi

https://www.sport.polimi.it/

- **Brand new stadium and sport center** (Giuriati, Campus Leonardo)
- **Proprietary and affiliated sport centers**
- **Many Events:**
  - PolimiRun Winter
  - PolimiRun Spring
  - Soccer, Basketball and Volleyball tournaments
- **Dual Career program**

Waged Collaboration

www.polimi.it/150-ore

Part-time collaboration activities:

- Libraries
- Events logistics and security

POLIPSI

www.polimi.it/polipsi

Free psychological and psychotherapeutic support for PoliMi students

POP

www.polimi.it/polipsi

«Politecnico Equal Opportunities Program» guarantees a study and work environment that respects gender identity, disability, culture and background

DISABLED STUDENTS SUPPORT

www.disabilita.polimi.it

PoliMi supports students with disabilities in:

- Admission procedure
- Bureocratic processes
- Accessibility to spaces
- Dedicated facilities and distance learning

Giuriati Sports Center

Life on Campus (Leonardo)

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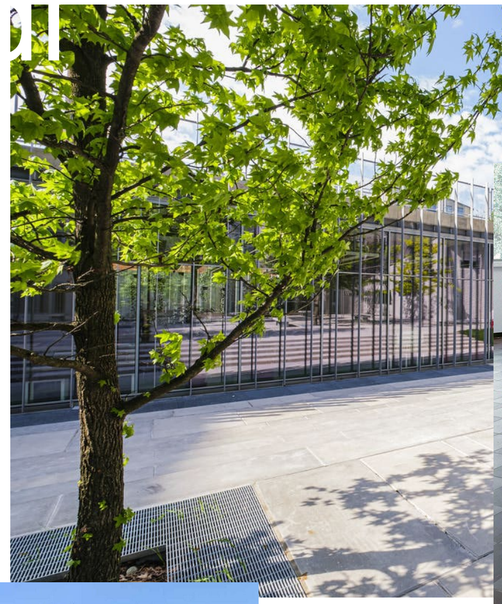

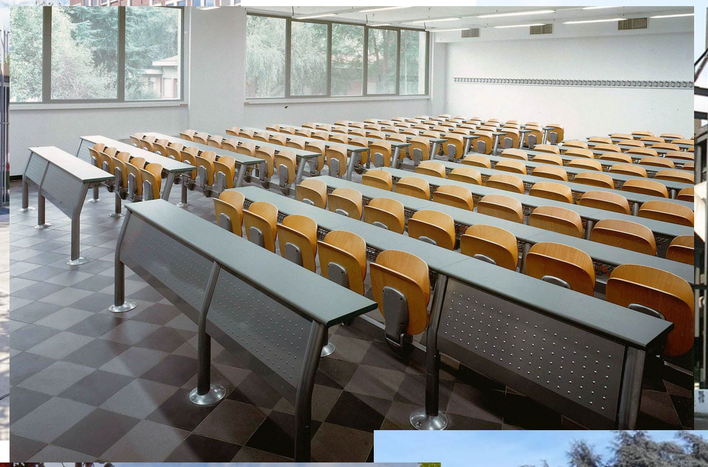

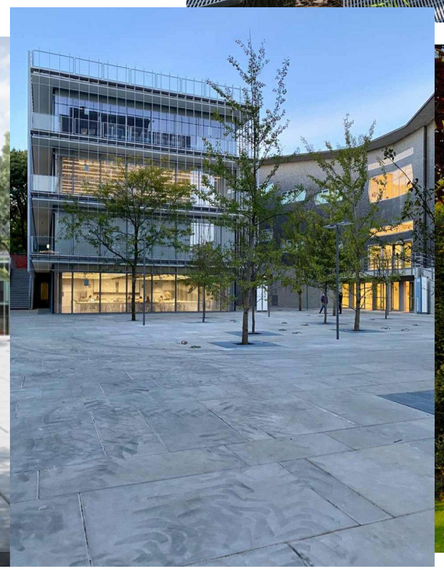

Life on Campus (Bovisa)

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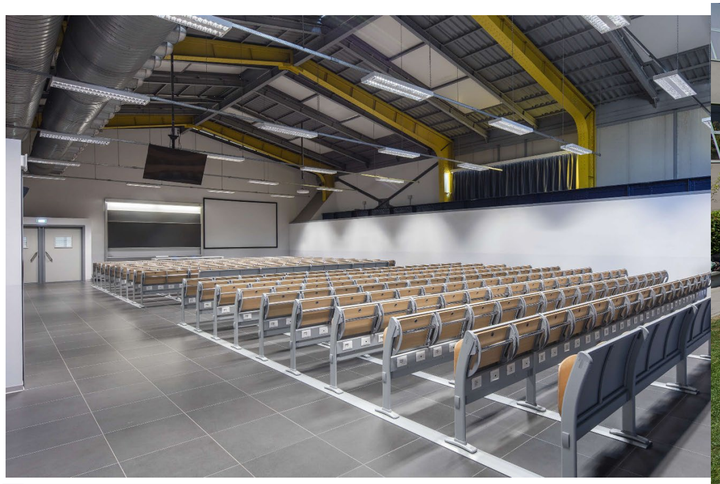
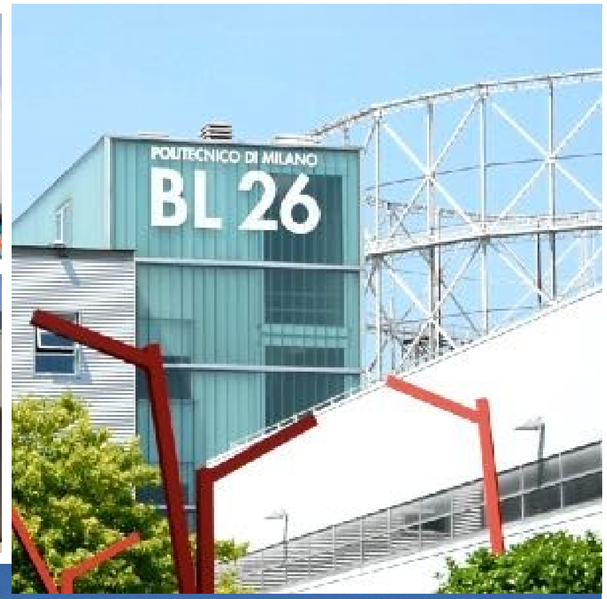
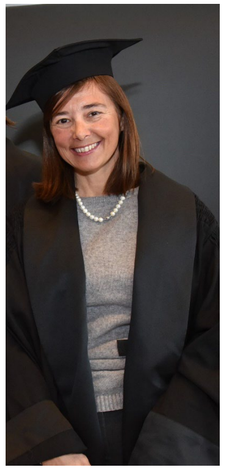




Info e Contatti

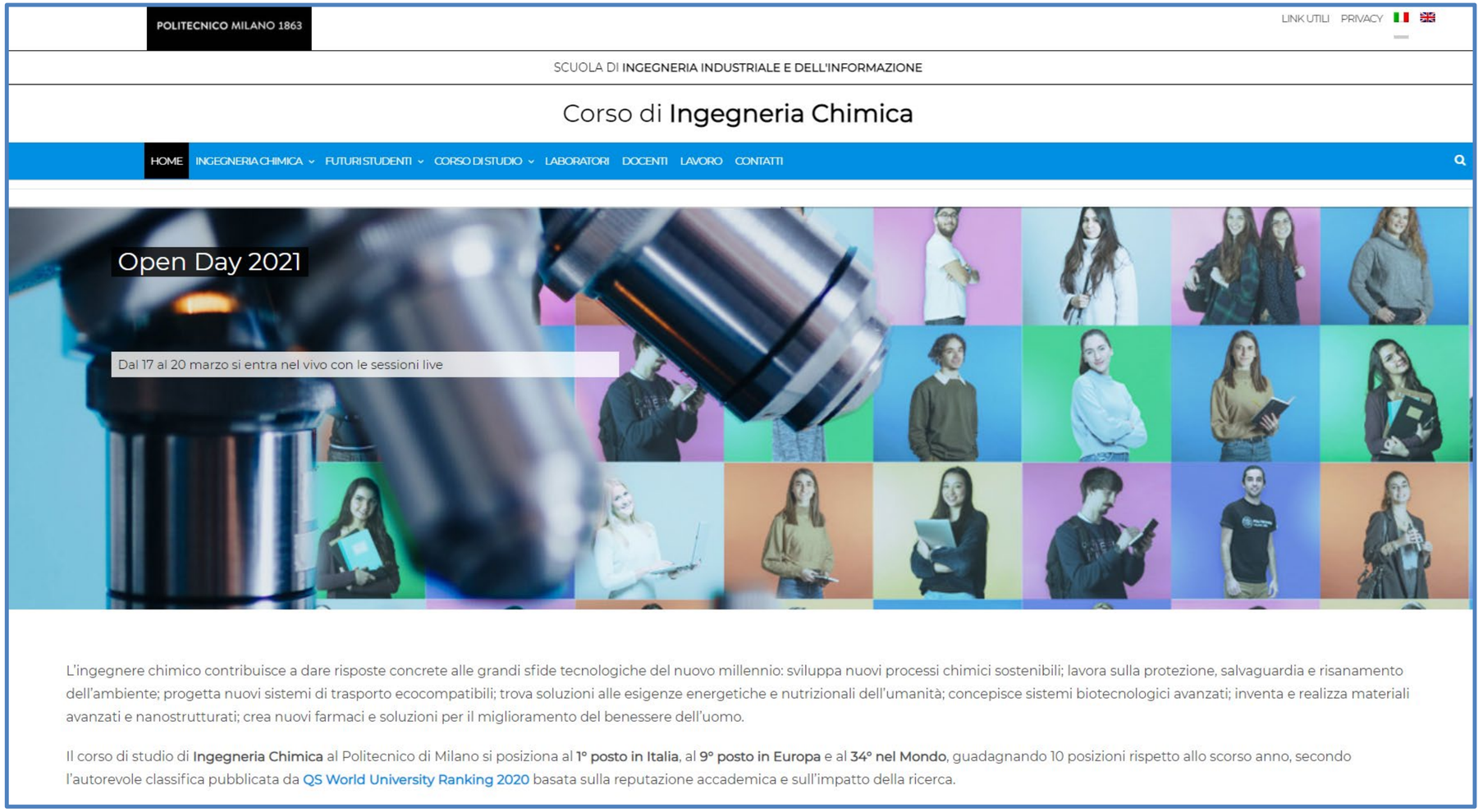


Presidente CCS

Prof. Isabella Nova

Email: isabella.nova@polimi.it

http://www.ccs-chimica.polimi.it/



Info e Contatti

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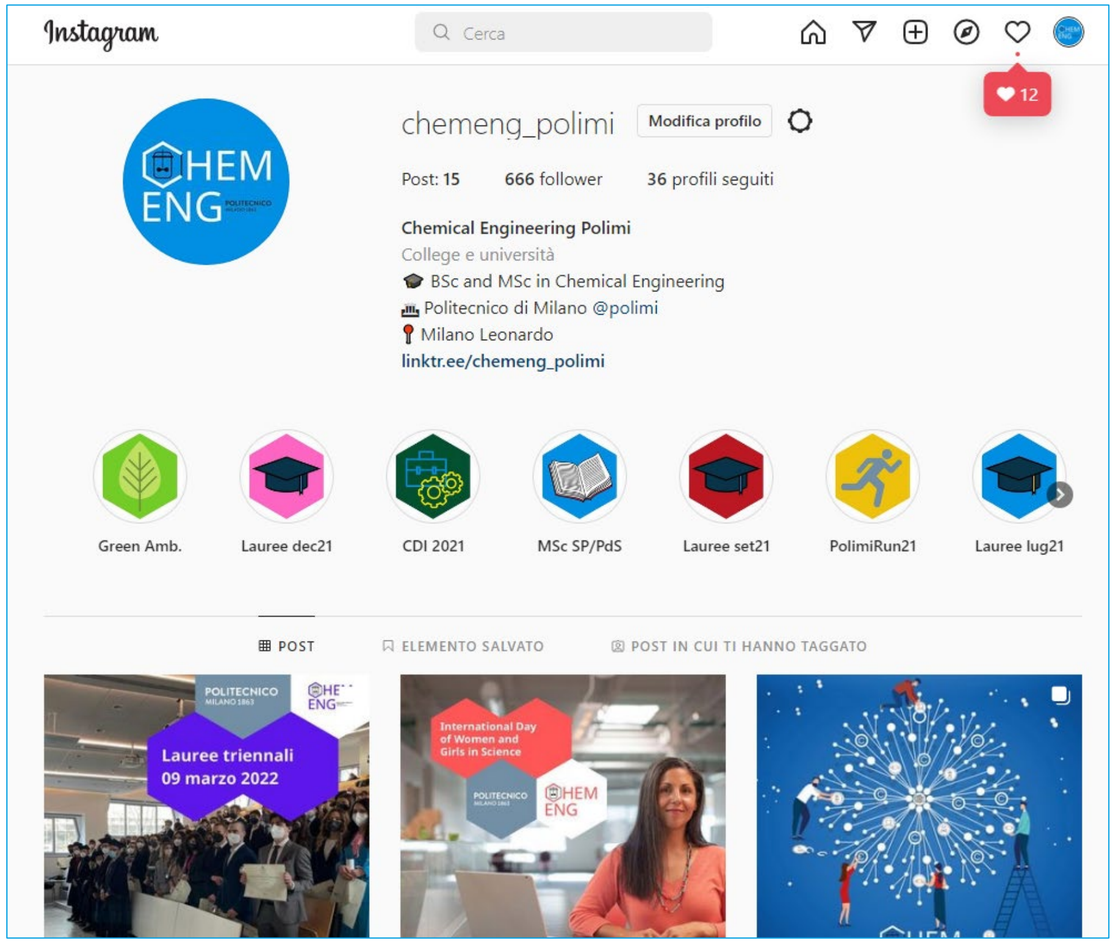
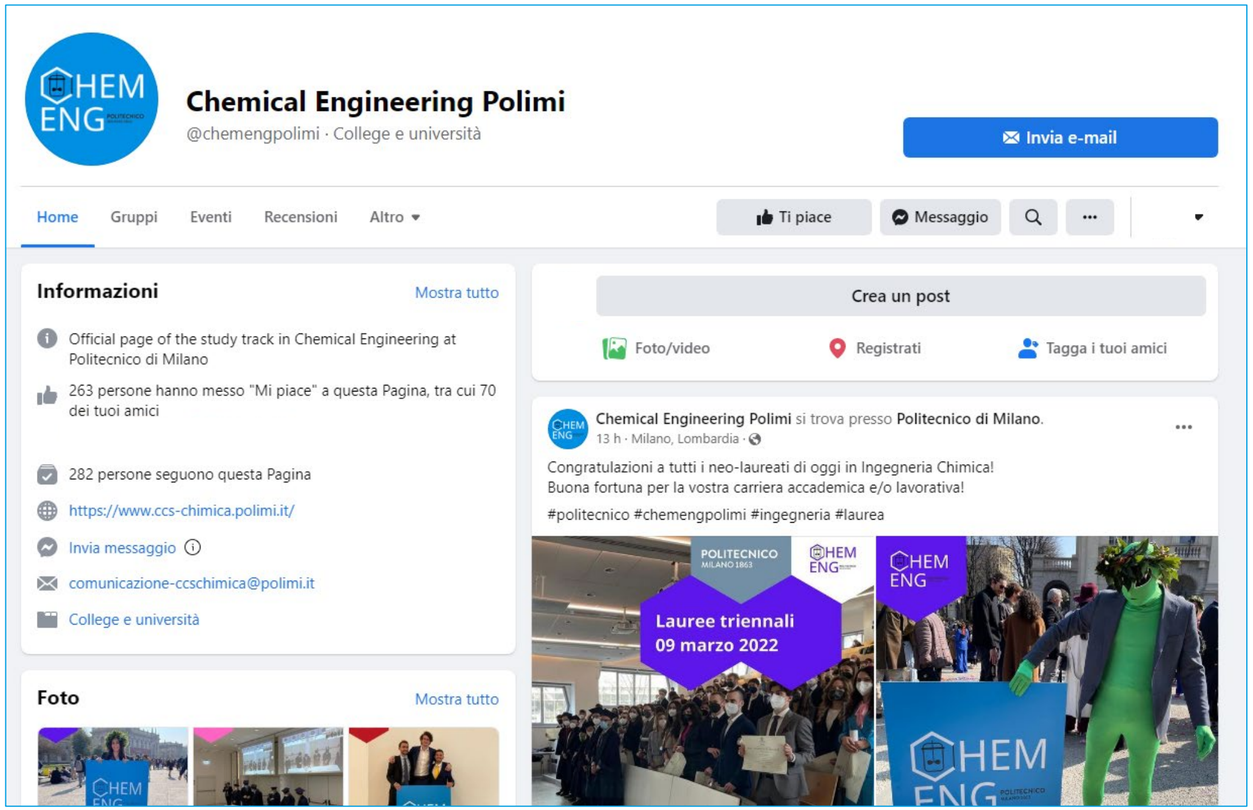
CHEM ENG

chemeng_polimi



chemengpolimi



YouTube https://www.youtube.com/channel/UCuBfCIT-sWVWX_z8n-kMgXA

«Pillole di Ing. Chimica» webinars

POLITECNICO MILANO 1863

CHEM ENG

YouTube

In diretta streaming sul nostro canale YouTube e Facebook

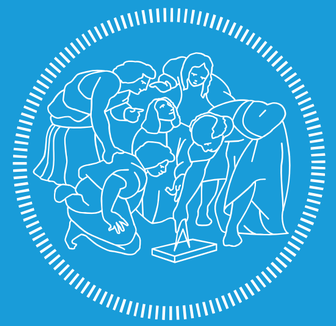
Edizioni precedenti (registrazioni disponibili sul nostro canale YouTube)

Summarizing

POLITECNICO MILANO 1863

- **A deep, polyvalent, flexible and highly appreciated technical and scientific education**
- **Creative and innovative attitude** highly appreciated by the process industry
- **Great short and long term employment opportunities**
- **Excellence in Research**
- **A multicultural and stimulating environment in a vibrant and cosmopolitan city: Milan**
- Your chance to be a first line player in **Italy**, **Europe** and around the **World**

Come join us!



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