UNIVERSITÀ DI SIENA 1240

General information

Denomination Master (II Livello): DRUG DESIGN AND SYNTHESIS
Learning objectives The Master in Drug Design and Synthesis (MDDS) of the University of Siena is a European-level program that trains specialists in the field of Drug Discovery and Biotechnology for the pharmaceutical industry. The curriculum integrates medicinal chemistry, synthesis, analysis, quality control, computational techniques, and sustainable strategies. Lectures are taught by academic experts and industry professionals from across Europe, with a focus on the key issues of modern Drug Discovery. A strong industrial component guarantees practical and work-oriented training. Students complete their preparation with a research internship at a partner company, university or research institution, gaining direct experience on real projects. The program provides graduates with the skills necessary to enter the pharmaceutical and biotechnology sectors, contributing to innovation and sustainability in drug development.
Credits 60
Hours 1500
Duration in months 12
Deadline for applications 01/12/2025
Start date January 2026
End date January 2027
Absence percentage 20%

Website

https://www.mdds.unisi.it/

Expected languages

Italian, English

Department

Department of Biotechnology, Chemistry and Pharmacy (DBCF)

Teaching Contacts

Prof. Elena Petricci e-mail elena.petricci@unisi.it

Support and agreement

Support and agreement

No support or convention

Access qualifications

Class	Description	Type Degree
Class LM-6	Biology (new system pursuant to Ministerial Decree 270/04)	LM
Class LM-7	Agricultural biotechnology (new system pursuant to Ministerial Decree 270/04)	LM
Class LM-8	Industrial biotechnology (new system pursuant to Ministerial Decree 270/04)	LM
Class LM-9	Medical, veterinary and pharmaceutical biotechnology (new system pursuant to Ministerial Decree 270/04)	LM
Class LM-13	Pharmacy and industrial pharmacy (new system pursuant to Ministerial Decree 270/04)	LM
Class LM-21	Biomedical engineering (new system pursuant to Ministerial Decree 270/04)	LM
Class LM-22	Chemical engineering (new system pursuant to Ministerial Decree 270/04)	LM
Class LM-54	Chemical Sciences (new system pursuant to Ministerial Decree 270/04)	LM
Class LM-71	Science and technology of industrial chemistry (new system pursuant to Ministerial Decree 270/04)	LM
Class LS14	Pharmacy & Industrial Pharmacy	LS
LS26 Class	Biomedical Engineering	LS

LS27 Class	Chemical engineering	LS
Class LS62	Chemical Sciences	LS
Class LS81	Industrial Chemistry Science and Technology	LS
-	Biotechnology	V.O.
-	Agro-industrial biotechnology	V.O.
-	Pharmaceutical biotechnology	V.O.
-	Industrial biotechnology	V.O.
-	Chemistry	V.O.
-	Pharmaceutical Chemistry and Technology	V.O.
-	Industrial chemistry	V.O.
-	Pharmacy	V.O.
-	Biomedical Engineering	V.O.
-	Chemical engineering	V.O.
-	Materials Science	V.O.
-	Sciences	V.O.

Legend of degree classes - L: bachelor's degree - LS: specialist degree - LM: master's degree - O.V. degree under the old system - DU: university diploma

- Conditional admission for students who have not obtained the qualification required for access. Confirmation of admission remains fixed at the time of obtaining the qualification itself and, in any case, no later than the date of the admission tests or the evaluation of the curricula. (This item is mandatory for all master's degrees with admission except those that require additional requirements such as qualification, registration with professional associations and specializations)

Action on patient

No

Mannequin alternative

No

Register registration

No

Professional qualification

No

Specialization

No

Application for admission or enrolment

Admission procedures
Admission

Documentation to be attached
Curriculum vitae et studiorum
Dissertation abstract
Any publications
Any other qualifications

Selection procedure	
CV evaluation	Friday 12 December 2025

Attachment evaluation	
Title category	**Score (30th)**
Educational qualification	18
Diplomas or certificates of specialization and professional qualification	5
Additional titles	7

Minimum number of participants
5

Maximum number of subscribers
20

Application fees

Total amount in €
3500.00

First instalment amount in €

2500.00
Amount of the second instalment in € 1000.00
Second instalment deadline Tuesday 9 June 2026

Training

Teaching methods Blended (lessons are partly face-to-face and partly online under the guidance of the teacher)
Internal venue Department of Biotechnology, Chemistry and Pharmacy

Area Title: NEW SUSTAINABLE METHODOLOGIES FOR THE PRODUCTION OF BEES
Total credits area: 6
Professors in charge: Petricci Elena

Educational activity: BIOCATALYTIC PROCESS FOR API PRODUCTION
University credits: 1
SSD code: CHIM/08 (PHARMACEUTICAL CHEMISTRY)

Educational activity: LABORATORY OF GREEN METHODOLOGIES FOR THE SYNTHESIS OF BIOLOGICALLY ACTIVE MOLECULES
University credits: 1
SSD code: CHIM/06 (ORGANIC CHEMISTRY)

Educational activity: GREEN METHODOLOGIES FOR THE SYNTHESIS OF BIOLOGICALLY ACTIVE MOLECULES
University credits: 2
SSD code: CHIM/06 (ORGANIC CHEMISTRY)

Didactic activity: SUSTAINABLE PROCESSES FOR THE SYNTHESIS OF NEW ANTIBODY-DRUG CONJUGATES
University credits: 1
SSD Code: CHIM/06 (ORGANIC CHEMISTRY)

Educational activity: SELECTIVITY AND EFFICIENCY OF ORGANOMETALLIC PROCESSES AND THEIR APPLICATION TO THE SYNTHESIS OF COMPLEX MOLECULES
University credits: 1
SSD code: CHIM/06 (ORGANIC CHEMISTRY)

Title Area: NEW TRENDS IN PHARMACEUTICAL CHEMISTRY
Total credits area: 6
Professors in charge: Taddei Maurizio

Educational activity: CHEMODIVERSITY OF SECONDARY METABOLITES
University credits: 1
SSD code: CHIM/08 (PHARMACEUTICAL CHEMISTRY)

Educational activity: IMPORTANT FACTORS IN THE DISCOVERY OF NEW DRUGS FOR CNS AND PERIPHERAL
CNS University credits: 1
SSD code: CHIM/08 (MEDICINAL CHEMISTRY)

Educational activity: THE NEW FRONTIERS: METABOLOMICS AND PROTEOMICS NUTRACEUTICALS
University credits: 1
SSD Code: CHIM/08 (MEDICINAL CHEMISTRY)

Educational activity: MAJOR CLASSES OF ANTIBACTERIAL DRUGS
University credits: 1
SSD Code: MED/07 (MICROBIOLOGY AND CLINICAL MICROBIOLOGY)

Didactic training activity: O-GLYCOSYLATION SELECTIVE SETEREOSESELECTIVE REACTIONS
University credits: 1
SSD code: CHIM/06 (ORGANIC CHEMISTRY)

Didactic educational activity: DEVELOPMENT OF A VACCINE
University credits: 1
SSD code: BIO/14 (PHARMACOLOGY)

Title Area: ANALYTICAL PROBLEMS IN MEDICINAL CHEMISTRY
Total credits area: 5
Professors in charge: Petricci Elena

Educational activity: QUALITY CONTROL IN THE PHARMACEUTICAL AND BIOTECHNOLOGICAL FIELD
University credits: 2
SSD code: CHIM/08 (PHARMACEUTICAL CHEMISTRY)

Educational activity: PROCESS VALIDATION
University credits: 1
SSD code: CHIM/01 (ANALYTICAL CHEMISTRY)

Educational activity: ANALYTICAL TECHNIQUES IN PHARMACEUTICAL CHEMISTRY
University credits: 1
SSD Code: CHIM/01 (ANALYTICAL CHEMISTRY)

Educational activity: EVALUATION OF DANGEROUS SUBSTANCES AND PREPARATIONS
University credits: 1
SSD Code: CHIM/09 (PHARMACEUTICAL TECHNOLOGICAL APPLICATION)

Title Area: DRUG DESIGN AND OPTIMIZATION
Total credits area: 5
Professors in charge: Docquier Jean Denis

Didactic activity: IN SILICO APPROACHES TO VACCINE DEVELOPMENT
University credits: 1
SSD code: CHIM/09 (PHARMACEUTICAL TECHNOLOGY APPLICATION)

Educational activity: IN SILICO SCREENING
University credits: 2
SSD code: CHIM/08 (MEDICINAL CHEMISTRY)

Educational activity: LIGAND- AND STRUCTURE-BASED DESIGN
University credits: 1
SSD code: CHIM/08 (MEDICINAL CHEMISTRY)

Educational activity: PROBLEMS AND NEW APPROACHES FOR ADME PREDICTION
University credits: 1
SSD code: CHIM/09 (PHARMACEUTICAL TECHNOLOGY APPLICATION)

Area Title: MANAGEMENT AND REGULATORY AFFAIRS
Total credits area: 3
Responsible professors: Dimitri Nicola

Educational activity: NOTES ON PHARMACOECONOMICS
University credits: 1
SSD Code: SECS-P/01 (POLITICAL ECONOMY)

Educational activity: MANAGEMENT AND COMMUNICATION
University credits: 1
SSD Code: M-PSI/06 (PSYCHOLOGY OF WORK AND ORGANIZATIONS)

Educational activity: INTELLECTUAL PROPERTIES
University credits: 1
SSD code: CHIM/08 (MEDICINAL CHEMISTRY)

Choice of internship/traineeship

TRAINING

Internship/traineeship procedures

an internship of at least 625 hours is provided on a topic consistent with the training modules into which the Master is divided. The internship activity may be carried out in a different period agreed with the company, in the period between February 2022 and June 2023.

Carrying out structures

The internship can be carried out at universities, research centers and/or affiliated companies.

Credits awarded internship/traineeship

25

Internship/Internship Hours

625

Internship/traineeship end date

January 2027

Teachers in charge of internships/internships:

Docquier Jean Denis - Petricci Elena - Taddei Maurizio

Intermediate verification tests (Modalities)

The following verification tests are provided within the master's course: - multiple choice tests; - group work with presentation of the projects developed. Taking the intermediate tests does not involve the acquisition of University Educational Credits (CFU) as they constitute an element of evaluation by the Examining Committee for the final examination.

Assessment methods

Thesis or final paper, Written test aimed at verifying the knowledge acquired

Credits awarded to the final exam

10

Collegial bodies

Teaching Board

Body composed of all area managers

Board of Directors

No