UNIVERSITA' DEGLI STUDI DI MILANO
PROGRAMME DESCRIPTION - ACADEMIC YEAR 2018/19
BACHELOR
Chemical safety and Toxicological Environmental Sciences (Classe L-29)
enrolled from 2009/10 academic year

HEADING

Degree classification - Denomination and code:	L-29 Pharmacy
Degree title:	Dottore
Length of course:	3 years
Total number of credits required to complete programme:	180
Years of course currently available:	1st , 2nd , 3rd
Access procedures:	Cap on student, student selection based on entrance test
Course code:	E17

PERSONS/ROLES

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Degree Course website

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Matriculation and applications

http://www.unimi.it/studenti/matricole/77598.htm

CHARACTERISTICS OF DEGREE PROGRAMME

General and specific learning objectives

The degree in Chemical-Toxicological and Environmental Safety Sciences (SSCTA) belongs to Teaching Class "Pharmaceutical Sciences and Technology", called L-29. According to the present rules, SSCTA shares 60 credits with the degree course in Herbal Sciences and Technologies belonging to the Faculty of Pharmacy and the same teaching class.
The main objectives of the course Chemical-Toxicological and Environmental Safety Sciences (SSCTA) are: learning the traditional and novel analytical approaches in the area of chemistry, biology, microbiology and toxicology. The methods are developed, according to certified procedures or new protocols, to measure pollutants present in the environment (water, air, soil) and contaminants in foods. These activities provide suitable and innovative tools to the bodies in charge for prevention and education.

The main goals of the degree in Chemical-Toxicological and Environmental Safety Sciences (SSCTA) are: 1) the contribution to the improvement of living conditions by identifying harmful environmental situations at risk for the population; 2) to help overcoming hazards and achieving better environmental conditions including the quality and the safety of the food chain. Moreover, the qualification of the students in SSCTA can be socially useful because they could promote a better cultural and scientific aggregation in understand environmental systems and predict environmental changes. The degree in SSCTA allows a specific culture and scientific expertise, which can be applied to support appropriate initiatives in environmental protection, that have a strict correlation with the protection of animal and human health.

Expected learning outcomes

In accordance with the principles of European harmonization, the output powers in terms of learning outcomes, developed by graduates in SSCTA respond to the specific requirements of the Dublin Descriptors of the European Union. This means to prepare graduates, who will cover technical or professional roles in the various fields treated by the curriculum in SSCTA, using modern tools such as computer and statistical protocols. In particular, they could be involved in: 1) monitoring pollutants in the environment (water, air, soil) and contaminants in food; 2) planning prevention and health education of the population in relation to the toxicological aspects arising from chemical and biological pollutants; 3) coordinating laboratories of control, where analytical methods are applied to chemical, biological, microbiological and toxicological compounds, according to the international standards of quality (certification systems); transferring expertise in public or private institutions.

Professional profile and employment opportunities

The degree in Chemical-Toxicological and Environmental Safety Sciences (SSCTA) is awarded to students who have gained the knowledge described above and have acquired the expertise necessary to face and solve chemical and toxicological issues related to environment and food chain contamination. They must be ready to collaborate with national and international operators, in different scientific fields.
A doctor in Chemical-toxicological and environmental safety sciences (SSCTA), also in reference to activities classified by the Italian Institute ISTAT, is normally employed in the following fields: life sciences (in the area of biology, biochemistry, microbiology and pharmacology); laboratories associated with health sciences (technical activities in clinical laboratories, food safety, etc.); pharmaceutical, cosmetic, food industries; universities, public and private research facilities inside the National Health System and agencies responsible for regulations in health and food safety.
Compared to other degrees of the Class L-29 present at the University of Milan, the doctors in Chemical-toxicological and environmental safety sciences (SSCTA) receive a specific training allowing them to apply for a wide spectrum of employments (see ISTAT code interested).

Notes

Knowledge required for admission
The admission requires, at the moment of matriculation, the knowledge and abilities suitable for the specific degree in SSCTA. This consists of a satisfactory familiarity with computation, the major laws of mechanics physic; cell biology, general chemistry, logic; a mode of oral and written expression free from mistakes, and a good general knowledge.

Course structure
The degree in Chemical-Toxicological and Environmental Safety Sciences (SSCTA) lasts three years, as for similar curricula of other European Countries.
The initial stage of the studies includes compulsory teachings, which aim to give a general understanding of environmental science and introduce to specializing, and professional teaching and training activities.
In fact, the objective of the course is the education of students, who at the end of the training have the suitable scientific skills to enter the world of work.
The degree in Chemical-Toxicological and Environmental Safety Sciences (SSCTA) is a three-years course: two semesters supply general skills, the remaining four semesters are dedicated to specializing teachings, theoretical and practical

activities, seminars, external activities, teachings at free choice of the student, conferences and congresses in the field.
The students must complete the course with 180 credits. As established by the Didactic Rules of the University of Milan and the Faculty of Pharmacy, a credit corresponds to:
• 8 hours of lessons or similar activities (with extra hours up to 25/credit of personal learning);
• 16 hours of practical activities with academic tutor (with extra hours up to 25/credits for personal elaboration and learning);
• 25 hours of personal activity in laboratory;
• 25 hours of personal learning;
• 25 hours of stage.

Library
The library of Pharmacy is located in via Balzaretti 9.
Opening time: Monday-Friday 8:00-13:15/14:00-17:00; Saturday closed
Tel numbers: tel. +39 0250318424/3/2; fax +39 0250318421;
E-mail biblioteca.farmacia@unimi.it
Further information at: http://www.sba.unimi.it/bibliofarmacia

Teaching organisation
The curriculum in SSCTA consists of several didactical activities: basic sciences (51 credits); professional/specialized teaching activities (83 credits); integrative teachings (22 credits), activities at free choice of the student (12 credits); activities for preparing the final dissertation (3 credits); English language test (3 credits), training period (6 credits).

Language and computer science tests
During the three-years course, a teaching in English language is planned. To pass the examination, where positive results is defined as "Approvato", there are two possibilities: 1) a written examination; 2) approval of a document proving the acquisition of the First Certificate of English or similar, having level B2 or higher.
During the three-years course, a teaching in computer science is planned. No accreditation is recognized to Certificate ECDL.

Final dissertation and defence
The degree in Chemical-Toxicological and Environmental Safety Sciences (SSCTA) requires a final dissertation and defence of a thesis. The admission to the final dissertation is allowed when the students have acquired 177 credits as established by the didactical rules of the course.
The thesis, prepared under the supervision of a teacher, consists in the elaboration of data from an experimental work done at University, or other laboratories from public or private institutions.
In the final dissertation, which is considered an important step of the curriculum, the student illustrates and defends the activities done during the stage as specified at Art. 4, and discuss other possible associations with the recent knowledge in the area of Chemical-Toxicological and Environmental Safety Sciences (SSCTA).
The thesis can be in English and the student can present the dissertation in the same language.

Information and modalities for matriculation
To be enrolled at the Course in Chemical-Toxicological and Environmental Safety Sciences (SSCTA), a high school diploma, or equivalent title obtained abroad, is required according to D.M. n. 270, dated 22nd October 2004.
The access to SSCTA is regulated by a selective admission test. The number of positions for the academic year 2015/2016 is 100, plus 5 positions for foreign students resident abroad.
The admission test is compulsory for all applicants, apart from students and graduated of other curricula of the Faculty of Pharmacy at the University of Milan.
The deadline for registration to the admission test will be published on the website of the University of Milan.

Number of positions for extra-EU students, resident abroad
5

Number of positions
100

Date, Time and Venue of the test
08-09-2015 , h. 9.00 a.m. Venue will be indicated on test announcement.

Admission Test
The test is based on multiple-choice questions concerning different topics, such as biology, mathematics, chemistry, physics, and logic. The test must be completed within the established time frame.

EXPERIENCE OF STUDY ABROAD AS PART OF THE TRAINING PROGRAM

The University of Milan supports the international mobility of its students, offering them the opportunity to spend periods of

study and training abroad, a unique opportunity to enrich their curriculum in an international context.

Study and internships abroad

The course in Chemical-Toxicological and Environmental Safety Sciences (SSCTA) offers to its students the possibility to spend periods of study and training abroad using international programs of mobility and exchange; among them, the most important program is Erasmus+. The experience abroad is considered by the teachers of the course as a unique opportunity for the students to acquire personal experiences and professional skills.
The Universities hosting SSCTA students are at the moment located in Romania (Transilvania University of Brasov); Spain (Universities of Madrid and Granada), and Slovenia (University of Ljubljana).
The mobility is aimed to acquire credits (attending courses) and/or work in a training program, which can be used to prepare the final thesis
The universities involved in the exchanges offer activities in the area of biochemistry, pharmacology, and analytical methods (including both traditional and novel approaches).
Each student has a tutor, selected among the SSCTA teachers. All information about international mobility is reported at http://www.farmacia.unimi.it/CorsiDiLaurea/3125_ITA_HTML.html.

Reward for the period spent abroad:
According to the period spent abroad, each student must prepare a suitable Learning Agreement in term of credits:
- An academic year: 60 credits;
- An academic semester: 30 credits;
- A three-months period: 20 CFU

The students must obtain at least 70% of credits established in the Learning Agreement. For students spending a training period abroad, the student must obtain all credits reported in the Learning Agreement.
For the students, who finalize positively their training period, a reward is planned at the end of the academic carrier. Extra marks, ranging between 1 and 3 (according to the period spent abroad, the number of credits obtained, and the value of the whole experience), are added to the final grade taking into consideration the tutor's proposal.

How to participate in Erasmus mobility programs

To gain access to mobility programs for study purposes, lasting 3-12 months, the enrolled students of the University of Milan must attend a public selection that starts usually around the month of February each year through the presentation of specific competition announcements, which contain information on available destinations, respective duration of the mobility, requirements and deadlines for submitting the online application.

The selection, aimed at evaluating the proposed study abroad program of the candidate, knowledge of a foreign language, especially when this is a preferential requirement, and the motivations behind the request, is performed by specially constituted commissions.

Each year, before the expiry of the competition announcements, the University organises information sessions for the specific study course or groups of study courses, in order to illustrate to students the opportunities and participation rules.

To finance stays abroad under the Erasmus + program, the European Union assigns to the selected students a scholarship that - while not covering the full cost of living abroad - is a useful contribution for additional costs as travel costs or greater cost of living in the country of destination.

The monthly amount of the communitarian scholarship is established annually at national level; additional contributions may be provided to students with disabilities.

In order to enable students in economic disadvantaged conditions to participate in Erasmus+ program, the University of Milan assigns further additional contributions; amount of this contributions and criteria for assigning them are established from year to year.

The University of Milan promotes the linguistic preparation of students selected for mobility programs, organising every year intensive courses in the following languages: English, French, German and Spanish.

The University in order to facilitate the organisation of the stay abroad and to guide students in choosing their destination offers a specific support service.

More information in Italian are available on www.unimi.it > Studenti > Studiare all'estero > Erasmus+

For assistance please contact:
Ufficio Accordi e relazioni internazionali
via Festa del Perdono 7 (ground floor)
Tel. 02 503 13501-12589-13495-13502
Fax 02 503 13503

E-mail: mobility.out@unimi.it
Desk opening hour: Monday-friday 9 - 12

1st COURSE YEAR Core/compulsory courses/activities common

Learning activity		Ects	Sector
Analytical chemistry		8	CHIM/01
Calculus and Statistics		6	MAT/07
General Chemistry		8	CHIM/03
Human Anatomy and General Biology		12	(4) BIO/16, (8) BIO/13
Organic Chemistry		8	CHIM/06
Physics and Informatics		9	(4) INF/01, (5) FIS/01
Scientific English		3	L-LIN/12
	Total compulsory credits	54	

2nd COURSE YEAR Core/compulsory courses/activities common

Learning activity		Ects	Sector
Biochemistry		8	BIO/10
Chemical and Toxicological Analysis 1		11	CHIM/08
Environmental chemistry		8	(8) CHIM/12, (8) CHIM/06
General Pathology		6	MED/04
Microbiology and Hygiene		8	BIO/19
Pharmacology 1 and Pharmacology 2		8	BIO/14
Physiology		6	BIO/09
Toxicology I		8	BIO/14
	Total compulsory credits	63	

3rd COURSE YEAR Core/compulsory courses/activities common

Learning activity		Ects	Sector
Biotechnology 1 and Biotechnology 2		8	BIO/14
Chemical and Toxicological Analysis 2		11	CHIM/08
Food Chemistry		10	CHIM/10
Technology and Pharmaceutical Legislation and Toxicology II		13	(10) BIO/14, (3) CHIM/09
	Total compulsory credits	42	

Further elective courses

12 CREDITS ARE AT FREE CHOICE OF THE STUDENT AND MUST BE FOUND AMONG THE TEACHINGS ACTIVATED IN SSCTA. THESE TEACHINGS ARE USUALLY AT THE SECOND SEMESTER. POSSIBLE CHANGES DUE TO DIDACTICAL ORGANIZATION ARE PROMPTLY COMMUNICATED.

Basic information on laboratory safety (chemistry, microbiology and biology)	4	BIO/09
Biochemical and molecular technologies for environmental diagnostics	4	BIO/12
Detection of residues of toxic contaminants in food	4	CHIM/10
Environmental fate of toxicants	4	CHIM/06
Environmental impact assessment	4	ICAR/03
Environmental toxicology	4	BIO/14
Molecular mechanisms and biostrasformation	4	BIO/10
Pollution and Environmental Safety	4	BIO/14
Study of the mechanism of action of toxicants in the environment	4	BIO/14
Training for Quality, Environment, Safety, Ethics, GMP	4	BIO/14
Training job-support	4	BIO/14

End of course requirements

Final exam		3	NA
Stage		6	NA
	Total compulsory credits	9	

COURSE PROGRESSION REQUIREMENTS

The acquisition of credits related to Analytical Chemistry is a prerequisite to the practical activities (laboratory) of Chemical and Toxicological Analysis 1.

The acquisition of credits related to Organic Chemistry is a prerequisite to the practical activities (laboratory) of Chemical and Toxicological Analysis 2.

Learning activity	Prescribed foundation courses	O/S
General Pathology	Human Anatomy and General Biology	Core/compulsory

Microbiology and Hygiene	General Chemistry	Core/compulsory
	Human Anatomy and General Biology	Core/compulsory
Toxicology I	Human Anatomy and General Biology	Core/compulsory
Physiology	Physics and Informatics	Core/compulsory
	General Chemistry	Core/compulsory
	Human Anatomy and General Biology	Core/compulsory
Pharmacology 1 and Pharmacology 2	Human Anatomy and General Biology	Core/compulsory
Environmental chemistry	Organic Chemistry	Core/compulsory
	Physics and Informatics	Core/compulsory
	General Chemistry	Core/compulsory
Biochemistry	Organic Chemistry	Core/compulsory
	General Chemistry	Core/compulsory
	Human Anatomy and General Biology	Core/compulsory
Chemical and Toxicological Analysis 1	Physics and Informatics	Core/compulsory
	General Chemistry	Core/compulsory
Chemical and Toxicological Analysis 2	Chemical and Toxicological Analysis 1	Core/compulsory
	Organic Chemistry	Core/compulsory
Technology and Pharmaceutical Legislation and Toxicology II	Toxicology I	Core/compulsory
Food Chemistry	Biochemistry	Core/compulsory
	Chemical and Toxicological Analysis 1	Core/compulsory
Biotechnology 1 and Biotechnology 2	Pharmacology 1 and Pharmacology 2	Core/compulsory
	Biochemistry	Core/compulsory
Organic Chemistry	General Chemistry	Core/compulsory
Analytical chemistry	General Chemistry	Core/compulsory