

MASTER BIOINFORMATICS (2022-2023)
ISDD Research Course - Bioactive Molecules :
Design of Bioactive Molecules

(French diploma or Franco-Italian double diploma for students who have completed the M1 in the Universities of Strasbourg and degli studi di Milano)

Master 1: Universities of Strasbourg and Degli studi di Milano
SEMESTER 1 - University of Strasbourg (30 ECTS)

BQ1AY010 Methodology (10 ECTS) Operating systems and networks Statistical methods Organic chemistry	G. Marcou, J.O. Dalbavie, N. Giuseppone
BQ1AY020 Molecular Modeling (8 ECTS) Basics of electronic structure calculations Molecular modelling Drug discovery	Rachel Schurhammer
BQ1AY030 Chemoinformatics (10 ECTS) Chemoinformatics 1 Chemoinformatics 2 Chemoinformatics 3	A.Varnek
BQ1AU040 Communication (2 ECTS)	Faculty of Languages

SEMESTER 2 - University Degli studi di Milano (30 ECTS)

BQ1BY010 Programming in C (6 ECTS)	C. Lorenzo
BQ1BY020 Structural Biology and enzymology (6 ECTS)	Mr. Vanoni
BQ1BY030 Medicinal chemistry (6 ECTS)	L. Belvisi
BQ1BY040 Simulation, Modelling and Biomolecules (6 ECTS)	S. Pieraccini
BQ1BU050 Bioactive molecules or equivalent module (6 ECTS)	L. Belvisi
BQ1BY050 Synthetic Methods in Biotechnology or CHIM06 races Or BQ1BE060 Bioinformatics & language (if Erasmus semester - French degree)	

Master 1: University Degli studi di Milano

First year at UNIMI		
CHIM/02	Physical chemistry A	9
CHIM/02 or CHIM/06	Physical Chemistry B or Organic Chemistry A	9
CHIM/01 or CHIM/12 (6ECTS from the courses listed below)	- Environmental Analytical Chemistry (CHIM/01) - Advanced Electroanalytical Chemistry (CHIM/01) - Application of photoluminescence and magnetic resonance in inorganic and metal-organic chemistry (CHIM/01) - Environmental Chemistry (CHIM/12)	6
	Free choice (the student must obtain 6 ECTS by choosing courses proposed by the university and consistent with the educational project)	6
INF/01	Programming in C	6
BIO/10	Structural Biology and Enzymology	6
CHIM/08	Medicinal Chemistry	6
CHIM/02	Simulation, Modeling and Biomolecules	6
	English	3
	Final Master's thesis (prova)	3

Master 2 (60 credits)

ISDD Research Course - Bioactive Molecules :

SEMESTER 3 - University Paris Cité (30 ECTS)

Block UE0. Refresher course (A-C. Camproux)

BQAAY010 Unix and R Basics (Upgrade) (L. Regad)

BQ2CY021 Toxicology -Methodology upgrade (A-C Camproux)

Block UE1. Data analysis in drug design (8 ECTS) (A-C. Camproux)

BQAAY070 (Python1 programming (Fuchs & P. Poulain) (3 ECTS)

Or **BQAAY080** Python programming 2 or **BQAAY030** Python project (S. Murail) (3 ECTS)

BQ2CY050 Data analysis in Drug Design (A-C Camproux & L. Regad) (3 ECTS)

BQ2CY060 Application in Drug Design & QSAR (O. Taboureau & L. Regad) (1 ECTS)

BQ2CY070 Seminars and R&D (A-C Camproux) (1 ECTS)

Block UE2. Molecular analysis and dynamics & drug design (7 ECTS) (D. Flatters)

BQ2CY090 Structural exploration of proteins (L. Regad) (3 ECTS)

BQ2CY100 Dynamic Target Analysis I (D. Flatters) (2 ECTS) or According to level or path

BQ2CY110 Dynamic analysis of targets II (G. Moroy) (2 ECTS)

BQ2CY080 Structural and dynamic modeling (G. Moroy & D. Flatters) (2 ECTS)

Block UE3. High-throughput screening: structure & ligand-based (5 ECTS) (G. Moroy)

BQ2CY120 Structure-based (G. Moroy) (3 ECTS)

BQ2CY130 Ligand-based (O. Taboureau) (1 ECTS)

BQ2CY140 Hits to lead (O. Taboureau) (1 ECTS)

Block UE4. Space analysis of macromolecules (4 ECTS) (A. Badel)

BQ1CY150 Data Analysis I (A. Badel & A-C Camproux)

BQ1CY160 Understanding macromolecules (D. Flatters)

Block UE5. Preparation for research in Drug Design (6 ECTS) (L. Regad)

BQ2CY170 3-projects in Drug Design (L. Regad & O. Taboureau) (2 ECTS)

BQ2CY180 Tutored research project design (A-C Camproux) (2 ECTS)

BQ2CY190 Application of high throughput screening (G. Moroy) (2 ECTS)

SEMESTER 4 - University Paris Cité (30 ECTS)

INTERNSHIP (30 ECTS) (A-C. Camproux)

UE6- BQ2DY010 Preparation of a tutored research project (A-C Camproux & S. Murail) (3 ECTS)

UE7- BQ2DT020 International research internship (A-C Camproux) (27 ECTS)

The M2 is mainly conducted in English. The French-Italian double degree concerns students who have completed the M1 in the Universities of Strasbourg and/or degli studi di Milano