Title: Methodology  
Teaching coordinators: G. Marcou, JO Dalbavie, N. Giuseppone

Programme: Operating systems and networks  
Components and peripherals of a PC. The DOS/Windows7/Linux environment. Administration. Principles of operating systems. Command interfaces and automation scripts. Local networks, TCP/IP. Shell scripts: the bash
Targeted skills:  
Disassembly/reassembly of material. System installation. Networks Security Write and execute a script

Programme: Statistical methods  
Descriptive statistics, Statistical tests, One-Way ANOVA, Single and multiple regression, Stepwise regression, Principal Component Analysis, Advanced methods: Partial Least Square (PLS) and Logistic Regression.
Targeted skills:  
Implementation in specific cases for chemistry. Use of EXCEL for statistical analysis.

Programme: Organic chemistry  

Title: Molecular Modelling  
Teaching coordinator: R. Schurhammer

Programme: Molecular Modelling  
Introduce three complementary approaches to the modelling of molecular architectures: database investigations, construction and minimisation by force field methods, and quantum mechanics.
Targeted skills:  
Force field methods. Use of structural databases. Overview of quantum chemistry methods.

Programme: Modelling practical  
Modelling of structure and properties of organic molecules (quantum chemistry, mechanics and molecular dynamics, chemoinformatics). Modelling software.
**Targeted skills:**
Conformational sampling. Theoretical calculations of molecules parameters. Structural research in the CCDC database.

**Programme: Introduction to Therapeutic Chemistry**

**Targeted skills:**
Strategies and methods for identifying and optimising active substances. Pharmaceutical industry and R & D.

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**BQ1AY030 CHEMOMINFORMATICS (10 ECTS)**
Coordinator: A. VARNEK

**Title:** Chemoinformatics

**Teaching coordinator:** A. Varnek

**Programme I:**

**Targeted skills:**
Create/manage chemical data using commercial software. Processing, creation of chemical data.

**Programme II:**

**Targeted skills:**
Be able to select relevant descriptors, obtain QSAR models and use them for virtual screening.

**Programme: In silico Chemical Diversity**
Create and manage a chemical database. To qualitatively analyse the content. Suggest "new" compounds.

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**BQ1AU040 COMMUNICATION (2 ECTS)**
Coordinator:

**Title:** Communication

**Teaching coordinator:**

**Programme: Disciplinary English**
Intensive English course at the beginning of the semester supported by lectures and homework in English. Understanding, expression, pronunciation. + Guided English self-study where students use resources on the Internet or resources installed on computers.

**Targeted skills:**
Understand articles and lectures in English. Mastery of the meaning of words used. Intelligible pronunciation.

**Programme: Conferences**
Lecture cycles given by renowned researchers and industrialists. Examples: Artem Cherkasov (Vancouver, Canada), Alexander Tropsha (Chapel Hill, USA), Joao Aires de Susa (Lisbon), Markus Gastreich (Biosolvit), Philippe Vayer (Servier).
Targeted skills:
Have an objective look at the state of knowledge in Chemoinformatics and Drug Design.

Programme: Presentation of articles
Bibliographic work and article analysis

SEMESTER S2 UNIVERSITY DEGLI STUDI DI MILANO (30 ECTS)

BQ1BY010 PROGRAMMING IN C (6 ECTS)
Coordinator: C. LORENZO

Title: Programming in C
Teaching coordinator: C. Lorenzo

Programme:

Targeted skills:
To be able to write and execute simple codes in C

BQ1BY020 STRUCTURAL BIOLOGY AND ENZYMOLGY (6 ECTS)
Coordinator: MR VANONI

Title: Structural Biology and Enzymology
Teaching coordinator: Mr Vanoni

Programme:
Structural Biology and Enzymology Introduction to the identification of biological drug targets by bioinformatic, genomic, transcriptomic, and proteomic techniques. Criteria for the validation of pharmacological targets. Molecular recognition and nature of ligand binding sites. Structure-function Synthetic Techniques Applied to the Design and Synthesis of Biologically Active Principles Expanded role of chemistry in all phases spanning the initial concept idea, the rational design, the synthesis, and the structural optimisation of a pharmacologically active molecule.

Targeted skills:
Structural biology and enzymology in structural design, synthesis and structural optimisation of a pharmacologically active molecule.
**BQ1BY030 MEDICINAL CHEMISTRY (6 ECTS)**
Coordinator: L. BELVISI

**Title:** Medicinal chemistry

**Teaching coordinator:** L. Belvisi

**Programme:**

**Targeted skills:**
Knowledge on Principal phases of drug action

**BQ1BY040 SIMULATION, MODELLING AND BIOMOLECULES (6 ECTS)**
Coordinator: S. PIERACCINI

**Title:** Simulation, Modelling and Biomolecules

**Teaching coordinator:** S. Pieraccini

**Programme:**

**Targeted skills:**
Molecular modelling for Biomolecules, molecular dynamics, and sampling simulation

**BQ1BU050 BIOACTIVE MOLECULES (6 ECTS)**
Coordinator: L. BELVISI

- BQ1BY050 Synthetic methods in Biotechnology or CHIM06 courses (6 ECTS) (Or)
- BQ1BE060 Bioinformatics & language (6 ECTS) (if Erasmus semester French degree)

Coordinator: L. BELVISI