



**MASTER - Chimie**

**Physical and Analytical Chemistry (UFAZ)**

Langue du parcours	Français		
ECTS	ECTS		
Volume horaire			
TP : 0h	TD : 0h	CI : 0h	CM : 0h
Formation initiale	Oui		
Formation continue	Non		
Apprentissage	Non		
Contrat de professionnalisation	Non		

# M1 Physical Chemistry and Chemical Engineering

## M1S1 Physical Chemistry and Chemical Engineering

	ECTS	CM	CI	TD	TP	TE	Stage
<b>Phys Chem 1</b>	12 ECTS		63 h		30 h	9 h	
Kinetics and Thermodynamics			21 h			3 h	
Analytical and physical chemistry, Pratical courses					30 h		
Optical spectroscopies			21 h			3 h	
Separation methods and mass spectrometry			21 h			3 h	
<b>Chem Eng 1</b>	9 ECTS		63 h			9 h	
Polymer chemistry			21 h			3 h	
Petrochemistry			21 h			3 h	
Membrane separation			21 h			3 h	
<b>Info1</b>	9 ECTS	21 h		18 h	18 h	85.5 h	
Project-mode applied programming in Python		12 h		9 h	9 h	45 h	
Introduction to Data Science		9 h		9 h	9 h	40.5 h	

## M1S2 Physical Chemistry and Chemical Engineering

	ECTS	CM	CI	TD	TP	TE	Stage
<b>Phys Chem 2</b>	9 ECTS		84 h			12 h	
Inorganic analysis and speciation			21 h			3 h	
Electrochemistry			21 h			3 h	
NMR Spectroscopy			21 h			3 h	
<b>Chem Eng 2</b>	6 ECTS		42 h			6 h	
Advanced transfers			21 h			3 h	
Polymer Reaction Engineering			21 h			3 h	
<b>Info 2</b>	6 ECTS	12 h	18 h	9 h	15 h	45 h	
Chemical databases and Chemoinformatics			21 h				
Molecular Modeling + Quantum Chemistry			18 h		6 h		
<b>5 week Internship</b>	9 ECTS						
Internship 5 weeks							

## M2 Physical and Analytical Chemistry

### M2S3 Physical and Analytical Chemistry

	ECTS	CM	CI	TD	TP	TE	Stage
Advanced mass spectrometry	3 ECTS	15.1 h		3.3 h		2 h	
Advanced mass spectrometry		18.66 h					
Advanced spectroscopic methods	3 ECTS	21 h					
Advanced spectroscopic methods		21 h					
Advanced recognition and applications	3 ECTS	17.5 h				10 h	
Advanced recognition and applications		17.5 h					
Characterization methods for solid surfaces and nanomaterials	3 ECTS	21 h				10 h	
Characterization methods for solid surfaces and nanomaterials		21 h					
Analytical sciences and health	6 ECTS	33.5 h		4.4 h		117 h	
Introduction to chemobiology		5.83 h					
Bioanalytical chemistry		21 h					
Miniaturization for biomolecules		11.66 h					
Technics for sampling and analysis of environmental samples	6 ECTS	16 h	25 h	8 h	40 h		
Technics for sampling and analysis of environmental samples		16 h		8 h	40 h		
Evaluation of environmental pollution processes	6 ECTS		40 h			8 h	
Evaluation of environmental pollution processes			40 h				

### M2S4 Physical and Analytical Chemistry

	ECTS	CM	CI	TD	TP	TE	Stage
Stage en laboratoire de recherche ou en entreprise Training period	30 ECTS						18 sem
Stage en laboratoire de recherche ou en entreprise Training period							18 sem