Present and Perspective of the Faculty of Chemistry

The Faculty of Chemistry – A New Beginning

The Department of Chemistry at the University of Bucharest dates back to 1864. Over the years, a number of illustrious personalities have been associated with the Faculty's development: Constantin C. Istrati, Gheorghe G. Longinescu, Gheorghe Spacu, Eugen Angelescu, Ilie G. Murgulescu, Petre Sapcu, Maria Brezeanu, Constanța Gheorghiu, Ioan V. Nicolescu, Alecu Popescu, George Vasiliu, Grigore Popa.

The Faculty of Chemistry is now an institution of higher education where both educational and research activities contribute to its indisputable academic prestige and impact.

The university staff contributes to the crystallization of Chemistry as a major science that is also pivotal to the advancement of human knowledge, to the investigation of the physical world as well as to a true understanding of living systems. Both theoretical and practical aspects of chemistry at its fundamental and applicative levels constitute the Faculty research topics. The Faculty cooperates with other European Universities and Institutes in order to improve both educational and research aspects of academic life.

The teaching programmes of the Faculty have been constantly updated and are now comparable with reputable curricula worldwide. The latest adjustment of the curriculum was completed in 2005 in accordance with the stipulations of the Bologna Declaration. The Bologna Process aims to create a European Higher Education Area by 2010, in which students can choose from a wide and transparent range of high-quality courses and benefit from smooth recognition procedures. Based on the Bologna process, the Faculty of Chemistry introduces the three-cycle system, defined in terms of qualifications and European Credit Transfer and Accumulation System (ECTS) credits as follows:

- the 1st cycle: on average 180–240 ECTS credits, regularly awarding a Bachelor's degree.
- the 2nd cycle: on average 90–120 ECTS credits (a minimum of 60 per the 2nd-cycle level). It regularly awards a Master's degree.
- the 3rd cycle: the Doctoral degree. No ECTS range given.

The implementation of the Bologna process began with the 2005 - 2006 generation of students and consists in a short-term higher education (180 ECTS). The first stage of the higher education may be followed by an advanced studies program, Master studies (120 ECTS), giving to student a diploma for advanced studies.
Curricula at the Faculty of Chemistry cover two major domains: Chemistry and Environmental Sciences. All undergraduate students that have obtained 90 ECTS are afterwards offered four major specialisations (90 ECTS): Chemistry, Biochemistry, Radiochemistry and Environmental Chemistry.

Students who complete the 1st cycle of study have basic knowledge of Chemistry needed for both the first professional employment and studies continuation at the graduate level. Students who complete this program receive a Bachelor's degree in chemistry from Bucharest University.

The Department also offers students the opportunity to earn both the bachelor's degree (B.S.) and the master's degree (M.S.) in chemistry over a period of five years, with a 100 percent tuition scholarship towards 5 of the 7 master programs (MA) that are accredited at the Faculty of Chemistry. The Master studies are organized on a two-year basis and cover up-to-date subject matters of Chemistry.

**The Master programs with a 100% tuition scholarship:**

*The chemistry of drugs and cosmetic products* MA (Director: Professor Ph.D. Andrei Medvedovici) represents an adequate response to the requirements issued by the occupational work market. Its major aim is the fundamental knowledge transfer and formation of practical expertise (behavioural and experimental) contributing to the formation of competitive specialists acting in thoroughly regulated domains. The MA cycle is developed according to the principle of interdisciplinarity, bringing comparative inputs from all domains of chemical knowledge, and not only (pharmacy, physics and biology should also be included). Main inputs are provided by organic chemistry (synthesis and isolation of active ingredients, pharmacologic action) and analytical chemistry (separation and assay of target compounds, their structural characterization and overall quality control). Basic know-how about physical chemistry of drugs (pharmacokinetics, membrane transfer processes, correlations structure/activity/efficacy, and transport through colloidal systems) is also included. A general perspective is assumed through insights on catalytic synthesis principles and fundamentals in the pharmaceutical technology.

The master's programme *Biomolecules* (Director: Ass. Professor Ph.D. Ileana Farcasanu) is multidisciplinary, being organized at the crossroads of chemical, biological, physical, and computational sciences. The programme is research-oriented with an interest in both fundamental and application-driven research. Students are trained in state-of-the-art techniques ranging from advanced methodologies in biochemistry, protein and nucleic acids engineering, proteomics, genomics, microscopy, bioanorganic and bioorganic chemistry, high-throughput screening techniques, biosensors, modelling of biochemical processes, biocompatible polymers, advanced techniques of spectral characterization.

*The chemistry of advanced materials* (Director: Professor Ph.D. Viorica Meltzer) is a MA program which asserts by topicality and the perspective of a continuous development the interest in the domain of synthesis and complete physical and chemical characterization of some materials with special properties, employed in important fields of science and
technology. The subject matter of courses and practical activities refer to complex aspects concerning the synthesis and characterization of some materials such as: polymeric materials, materials with liquid crystal properties, polynuclear complexes, catalytic materials, nanomaterials etc.

The MA program entitled Supramolecular Chemistry (Director: Professor Ph.D. Marius Andruh corresponding member of Romanian Academy) offers courses on “hot topics” in supramolecular chemistry, as well as on modern experimental techniques. Students will gain abilities not only in chemical synthesis and in investigating the chemical reactivity, but also in applying various spectroscopic and electrochemical techniques to solve structural problems at molecular and supramolecular level. Supramolecular chemistry is a highly interdisciplinary filed, with a strong impact on the development of chemistry, which also attracts biochemists, biologists, environmental scientists, physicists, engineers, theoreticians.

The master program Chemical Pollution of the Environment (Director: Professor Ph.D. Vasile Parvulescu) aims to provide the graduated students of the Faculty of Chemistry fundamental and practical knowledge in this subject area. Chemical Pollution is a vast field of knowledge, highly advertised due to the direct impact on the population and climate. The selected courses are intended to make students aware of the most important issues and predicaments for which Romania should find solutions without delay. Each course is covered by laboratories where the students have the opportunity to operate modern devices and apparatus. Moreover, the themes that are proposed to the students for research purposes and as dissertation topics cover current subjects and open new opportunities for the completion of the educational process by means of the doctoral school.

The Master programs without tuition scholarship

The Measurement Techniques in Chemistry MA (Director: Professor Ph.D. Victor David) is included in an Euromaster program with several other university partners, such as: University of Tartu (Estonia); Adam Mickiewicz University (Poland); M.Curie Sklodowska University (Poland); Warsaw University (Poland); University of Lyon (France); South-West University Neofit Rilski (Bulgaria); Maribor University (Slovenia); University of Lisbon (Portugal). Students graduating this master become conversant with the following main aspects of measurement science chemistry: major aspects of analytical chemical and metrology terminology, nomenclature, conventions and units; the principles and procedures used in chemical analysis and characterization of chemical compounds; the principal instrumental techniques, including atomic and molecular spectroscopy, chromatography, analytical electrochemistry; mathematical methods in measurement data evaluation.

The Management of Quality in Chemistry MA (Directors: Professor Ph.D. Camelia Bala, Ass. Professor Ph.D. Valentin Munteanu) is designed for university graduates focused on acquiring knowledge about chemical laboratory quality management in fields like consumption products (food and non-food products) or environment. The Master is addressed to the graduates of chemistry and chemical engineering, physics, biology, science of the environment, agriculture, pharmacy, and management that aspire to improve their
knowledge in the field of quality management, with a special emphasis on the practical and vocational aspects of the field. The Management of Quality in Chemistry ensures competence in fields like food chemistry, environmental chemistry or waste management.

The 3rd cycle, the Doctoral Program of Chemistry, is organised from 2005 for 3 years period, under the name of the Doctoral School of Chemistry and trains chemical scientists through academic research. The academic staff includes here 27 prominent doctoral coordinators from the 5 specialised Faculty of Chemistry departments. The topics covered by the Ph. D. studies include modern aspects of chemistry and Ph.D. students are encouraged to contribute to the department's academic research program through participation in workshops, conferences and the preparation of joint papers with their supervisor(s), a process that is meant to consolidate the prestige of the Chemistry Faculty on a national and international scale.

Editorial Board