



ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
Α Δ Ι Π
ΑΡΧΗ ΔΙΑΣΦΑΛΙΣΗΣ ΚΑΙ ΠΙΣΤΟΠΟΙΗΣΗΣ
ΤΗΣ ΠΟΙΟΤΗΤΑΣ ΣΤΗΝ ΑΝΩΤΑΤΗ
ΕΚΠΑΙΔΕΥΣΗ

HELLENIC REPUBLIC
HQA
HELLENIC QUALITY ASSURANCE
AND ACCREDITATION AGENCY

Accreditation Report for the Undergraduate Study Programme of:

Chemistry
Institution: University of Crete
Date: 26 – 10 – 2019

ΑΡΙΣΤΕΙΔΟΥ 1 & ΕΥΡΙΠΙΔΟΥ, 105 59 ΑΘΗΝΑ
Τηλ.: +30 210 9220944, FAX: +30 210 9220143
Ηλ. Ταχ.: adipsecretariat@hqa.gr Ιστότοπος: <http://www.hqa.gr>

1, ARISTIDOU ST., 105 59 ATHENS, GREECE
Tel.: +30 210 9220944, Fax: +30 210 9220143
Email: adipsecretariat@hqa.gr Website: www.hqa.gr



Επιχειρησιακό Πρόγραμμα
Ανάπτυξη Ανθρώπινου Δυναμικού,
Εκπαίδευση και Διά Βίου Μάθηση
Με τη συγχρηματοδότηση της Ελλάδας και της Ευρωπαϊκής Ένωσης



Report of the Panel appointed by the HQA to undertake the review of the
Undergraduate Study Programme of
Chemistry of the University of Crete
for the purposes of granting accreditation

TABLE OF CONTENTS

Part A: Background and Context of the Review	4
I. The Accreditation Panel	4
II. Review Procedure and Documentation	5
III. Study Programme Profile	7
Part B: Compliance with the Principles	8
Principle 1: Academic Unit Policy for Quality Assurance	8
Principle 2: Design and Approval of Programmes	10
Principle 3: Student- centred Learning, Teaching and Assessment.....	12
Principle 4: Student Admission, Progression, Recognition and Certification	15
Principle 5: Teaching Staff	17
Principle 6: Learning Resources and Student Support	19
Principle 7: Information Management	21
Principle 8: Public Information	23
Principle 9: On-going Monitoring and Periodic Internal Review of Programmes	24
Principle 10: Regular External Evaluation of Undergraduate Programmes.....	26
Part C: Conclusions.....	28
I. Features of Good Practice	28
II. Areas of Weakness	28
III. Recommendations for Follow-up Actions.....	29
IV. Summary & Overall Assessment	31

PART A: BACKGROUND AND CONTEXT OF THE REVIEW

I. The Accreditation Panel

The Panel responsible for the Accreditation Review of the Undergraduate Study Programme of **Chemistry** of the **University of Crete (UoC)** comprised the following five (5) members, drawn from the HQA Register, in accordance with the Law 4009/2011:

- 1. Dimitri Coucouvanis, PhD (Chair)**
Professor Emeritus of Chemistry
Department of Chemistry,
University of Michigan, USA
- 2. Georgia Kyriakakou, PhD**
Association of Greek Chemists
- 3. Themis Lazaridis, PhD**
Professor of Chemistry
City College of New York
New York, USA
- 4. Christos Takoudis, PhD**
Professor of Chemical Engineering and Bioengineering
University of Illinois, Chicago, USA
- 5. Emmanuel Theodorakis, PhD**
Professor of Chemistry
University of California San Diego, USA

II. Review Procedure and Documentation

• General information and review material

All relevant review material was received by all members of the Accreditation Panel (AP) about 3 weeks prior to the accreditation process. Additional material with extensive detailed information concerning research and educational aspects/activities was received during the site visit.

• Dates of the site visit

The visit at UoC was carried out from Tuesday October 22, 2019 until Wednesday October 23, 2019.

• Committee meetings

On Monday October 21, 2019, a briefing took place at the HQA* offices from 9.30 to 12:00. Prof. P. Kyprianos (President of HQA) and Dr. C. Besta (General Director of HQA) informed the AP about the overall goals of the visit. The AP members were then transported to Heraklion, Crete. On Tuesday October 22, 2019, the AP members were transported to the Department of Chemistry at UoC where, at 9:30, they met with Prof. I. Karakassis (Vice Rector, President of QAU) and Prof. G. Froudakis (Head of the Chemistry Department, UoC). At 10:15 the AP members also met with the CHEM OMEA group members: Prof. I. Smonou (Coordinator of OMEA), Prof. D. Anglos, Prof. A. Spyros, Prof. K. Demadis and Prof. G. Tsiolis, as well as with the QAU members: Prof. I. Karakassis (Vice Rector, President of QAU), Prof. E. Anagnostopoulou (Dept Philology), Prof. E. Tsouvelekas (Dept Economics, teleconference), A. Konstanteli (support staff), E. Karkanaki (support staff) and K. Varoucha (support staff). At 12:30 the AP members met with representative teaching faculty members: Profs. C. Katerinopoulos, I. Pavlidis, K. Milios, S. Pergantis, G. Vassilikogiannakis, M. Kanakidou, as well as with Lab Teaching Staff: E. Vardalachaki, A. Kouvarakis, V. Papadimitriou and K. Kavelaki, and visiting professors: C. Chatzicharalambous and N. Kavilitis. At 13:30, the AP members met with a representative group of current undergraduate students to discuss study experience and student welfare. At 15:30 the Panel met with representative graduate alumni of the Chemistry Department who are currently employed in the private, academic and public sectors to discuss the impact of the educational programme to their professional careers. At 16:30 the AP members also met with various employers and stakeholders of the department to discuss networking between the Department and the private/public sector. The meetings ended at 17:30 and the AP members were transported back to the hotel.

On Wednesday October 23, 2019, the AP members were transported to the Department of Chemistry at UoC to meet with various teaching personnel and visit various resources of the Department such as undergraduate/graduate laboratories, lecture rooms, the cafeteria, computer rooms, instrumentation and research infrastructure. At 11:15, the Panel members met again with OMEA and QAU representatives to discuss updates and clarifications and at 11:45 they made closing remarks to both QAU/OMEA members. Following another meeting with selected undergraduates at 12:30, the AP members left the Department of Chemistry at UoC and later in the evening they were transported back to Athens.

* Abbreviations:

HQA: Hellenic Quality Assurance and Accreditation Agency (ΑΔΙΠ, Αρχή Διασφάλισης και Πιστοποίησης της Ποιότητας στην Ανώτατη Εκπαίδευση)

QAU: Quality Assurance Unit (ΜΟΔΙΠ, Μονάδα Διασφάλισης Ποιότητας)

OMEA: Ομάδα Εσωτερικής Αξιολόγησης (Internal Evaluation Group)

UoC: University of Crete

Summary: The Department of Chemistry at UoC organized an extensive schedule that allowed meetings and discussions with the QAU and OMEA groups as well as with various faculty members, instructors, administrative personnel and support staff. The Accreditation Panel had the opportunity to visit most undergraduate/graduate laboratories as well as various departmental facilities and resources. The Panel also met formally and informally with a group of students, selected alumni and stakeholders of the Department.

III. Study Programme Profile

The Department of Chemistry at the University of Crete (UoC) was founded in 1985, when it initiated its educational activities with an advanced graduate research programme. In 1987, the Department admitted its first undergraduate students and since then, it has offered more than 1200 B.Sc. degrees, 350 M.Sc. degrees and 149 Ph.D. degrees. At present, the Department has a human capital of 750 undergraduate students, 20 international students, 155 graduate students (88 M.Sc. and 67 Ph.D.), 22 faculty members, 12 lab staff, 2 technical staff and 4 administrators. Several of its faculty members have received prizes, awards and distinctions as a reward for their exemplary activities in research and teaching.

The Department of Chemistry at UoC offers a rigorous undergraduate study programme that provides the necessary skills and scientific knowledge for employment at a national and international level, thus addressing the needs of the local and broader economy. As an example, several graduates of the Department currently hold leadership positions in the private/public sector as well as professorship positions at various Universities. As such, the programme is of comparable structural depth and quality to its international peers. In one recent ranking (i.e., Nature Index publications 2018-2019) where the research output was taken into consideration, the Department ranked higher than all similar Greek departments. Other rankings further support the argument that the teaching and research activities of this Department are among the best in Greece.

The overall duration of the undergraduate studies requires a minimum of 4 years (8 semesters total). The undergraduate degree requires a total of 240 ECTS that can be assembled by a combination of: (a) obligatory lecture courses (20) and lab courses (10) that offer fundamental education/training in chemical sciences; (b) elective classes with chemical content (>6) and non-chemical content (<4); and (c) optional participation in a 3-month internship (1) and undergraduate student thesis (1). There are also mandatory but non-credit classes in English (2) and computer programming (2). In total, the undergraduate curriculum and organization is inspired by similar curricula of leading universities worldwide and provides a good balance between core areas of chemistry (e.g., organic, inorganic, analytical, physical and biochemistry) and applications (e.g., food, polymers, advanced materials, pedagogy, oenology etc).

The Department of Chemistry at UoC is hosted in a new (constructed in 2006) bioclimatic building that has state-of-the-art facilities and fully equipped laboratories and lecture rooms. Specifically, the departmental facilities include 1 large state-of-the-art amphitheater, 2 medium-size rooms, 3 smaller lecture rooms, 1 seminar room and various laboratories. All lecture rooms and labs are equipped with internet and audiovisual facilities. In the past 3 years, approximately 45% of the incoming students graduated within 4 years and about 95% within 6 years.

PART B: COMPLIANCE WITH THE PRINCIPLES

Principle 1: Academic Unit Policy for Quality Assurance

INSTITUTIONS SHOULD APPLY A QUALITY ASSURANCE POLICY AS PART OF THEIR STRATEGIC MANAGEMENT. THIS POLICY SHOULD EXPAND AND BE AIMED (WITH THE COLLABORATION OF EXTERNAL STAKEHOLDERS) AT ALL INSTITUTION'S AREAS OF ACTIVITY, AND PARTICULARLY AT THE FULFILMENT OF QUALITY REQUIREMENTS OF UNDERGRADUATE PROGRAMMES. THIS POLICY SHOULD BE PUBLISHED AND IMPLEMENTED BY ALL STAKEHOLDERS.

The quality assurance policy of the academic unit is in line with the Institutional policy on quality, and is included in a published statement that is implemented by all stakeholders. It focuses on the achievement of special objectives related to the quality assurance of study programmes offered by the academic unit.

The quality policy statement of the academic unit includes its commitment to implement a quality policy that will promote the academic profile and orientation of the programme, its purpose and field of study; it will realise the programme's strategic goals and it will determine the means and ways for attaining them; it will implement the appropriate quality procedures, aiming at the programme's continuous improvement.

In particular, in order to carry out this policy, the academic unit commits itself to put into practice quality procedures that will demonstrate:

- a) the suitability of the structure and organization of the curriculum;*
- b) the pursuit of learning outcomes and qualifications in accordance with the European and the National Qualifications Framework for Higher Education;*
- c) the promotion of the quality and effectiveness of teaching;*
- d) the appropriateness of the qualifications of the teaching staff;*
- e) the enhancement of the quality and quantity of the research output among faculty members of the academic unit;*
- f) ways for linking teaching and research;*
- g) the level of demand for qualifications acquired by graduates, in the labour market;*
- h) the quality of support services such as the administrative services, the Library, and the student welfare office;*
- i) the conduct of an annual review and an internal audit of the quality assurance system of the undergraduate programme(s) offered, as well as the collaboration of the Internal Evaluation Group (IEG) with the Institution's Quality Assurance Unit (QAU);*

Study Programme compliance

- The chemistry curriculum at UoC covers “core” areas, namely organic, inorganic, analytical, physical chemistry and biochemistry. It also covers various elective topics such as food chemistry, polymers, environmental and computational chemistry, catalysis, spectroscopy and materials. As such, it provides the students with a solid foundation in chemistry that can be further diversified during their fourth year of studies by choosing the desired elective classes. Overall, the programme is compliant with the EU Framework for Higher Education.
- The Department has highly qualified teaching staff. Effective efforts are made to ensure and promote the quality and value of teaching. Evaluation of the quality and effectiveness of teaching is

accomplished with a standardized questionnaire that the students are asked to complete for each class/instructor.

- In accordance with the ongoing process of evaluation and accreditation, the Department has instituted an internal evaluation mechanism (Ομάδα Εσωτερικής Αξιολόγησης, OMEA). On an annual basis, OMEA receives the student questionnaires, correlates the input/output of teaching performance and makes recommendations to the faculty.
- The study programme undergoes annual reviews by the Undergraduate Committee that oversees the curriculum and the textbook selection. Overall, there is continuous effort by the Department to improve its educational activities and maintain a fresh academic programme that reflects the current research trends.
- In general, there is good synchronization between classroom teachings and laboratory work. Exposure of students to a particular subject via classroom teaching usually precedes laboratory training on that subject.
- The majority of the teaching faculty members are also involved in frontier research and maintain sizeable research groups and state-of-the-art research facilities. In turn, this allows undergraduate students of the Department to be exposed to cutting-edge research activities. For instance, all undergraduate research theses are research oriented and are performed in well-equipped laboratories. In addition, undergraduate students are encouraged to participate in paid 3-month internships that take place at the public/private sector. Moreover, senior undergraduate students attend colloquia and seminars and participate in special events (e.g., Career Days).

Panel judgement

Principle 1: Institution policy for Quality Assurance	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

1. The synchronization between classes and laboratories could be improved in certain courses such as Physical Chemistry 1 for which both lectures and labs are offered in the same semester.

Principle 2: Design and Approval of Programmes

INSTITUTIONS SHOULD DEVELOP THEIR UNDERGRADUATE PROGRAMMES FOLLOWING A DEFINED WRITTEN PROCESS WHICH WILL INVOLVE THE PARTICIPANTS, INFORMATION SOURCES AND THE APPROVAL COMMITTEES FOR THE PROGRAMME. THE OBJECTIVES, THE EXPECTED LEARNING OUTCOMES, THE INTENDED PROFESSIONAL QUALIFICATIONS AND THE WAYS TO ACHIEVE THEM ARE SET OUT IN THE PROGRAMME DESIGN. THE ABOVE DETAILS AS WELL AS INFORMATION ON THE PROGRAMME'S STRUCTURE ARE PUBLISHED IN THE STUDENT GUIDE.

Academic units develop their programmes following a well-defined procedure. The academic profile and orientation of the programme, the objectives, the subject areas, the structure and organisation, the expected learning outcomes and the intended professional qualifications according to the National Qualifications Framework for Higher Education are described at this stage. The approval or revision process for programmes includes a check of compliance with the basic requirements described in the Standards, on behalf of the Institution's Quality Assurance Unit (QAU).

Furthermore, the programme design should take into consideration the following:

- the Institutional strategy*
- the active participation of students*
- the experience of external stakeholders from the labour market*
- the smooth progression of students throughout the stages of the programme*
- the anticipated student workload according to the European Credit Transfer and Accumulation System*
- the option to provide work experience to the students*
- the linking of teaching and research*
- the relevant regulatory framework and the official procedure for the approval of the programme by the Institution.*

Study Programme compliance

- In general, the Department strives to provide its students a balanced blend of education and training that covers the foundations of chemistry and also includes modern trends in chemical sciences. Several committees, such as the undergraduate committee and OMEA, are involved in the process of course design, selection, assignment and evaluation. The Department has responded favorably and diligently toward implementing an educational programme at the undergraduate level that took into account earlier recommendations.
- The programme is well structured and is clearly and early communicated to the students. In several cases, the instructors have chosen internationally renowned textbooks for their classes that are available to the students in advance. The study guide is extensive and is accessible online by all students.
- The Department has implemented several ways to link teaching with research including an optional diploma thesis (πτυχιακή εργασία), a 3-month paid internship in local companies (πρακτική εξάσκηση) and a student "Career Day". In addition, students are encouraged to attend seminars organized by the department and scientific meetings inside and outside the University. The diploma thesis focuses on research and introduces students to research methodology and current scientific

literature. The 3-month paid internship (πρακτική εξάσκηση) links students with scientists and potential future employers from the local industry and is funded by various programmes/sponsors.

- Students participate in the curriculum development by providing feedback via the class questionnaires and participating in the Department Assembly.
- The external stakeholders of the Department are clearly interested in the quality of the undergraduates. They offer several opportunities for collaborations on R&D as well as paid internships that often lead to full-time hires. In certain cases, they also influence the curriculum design.

Panel judgement

Principle 2: Design and Approval of Programmes	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

2. It is not evident whether there are sufficient paid internships for all students who are interested in participating. The Department should intensify its efforts to secure additional funds and sponsors from both the campus and the public/private sectors.
3. There is a clear need for a better and wider integration of the external stakeholders and alumni of the Department to the departmental educational/training activities. Such integration will benefit not only the students but also the local industry. To this end, the Department could establish an “Industry-Academia Day” where members of the public/private sector can easily interact with students. In addition, the Department should create an “External Advisory Board” to further improve the relationship and networking with the public/private sectors.
4. An increased emphasis should be placed in promoting scientific presentation and writing skills of the students. The ideal forum for this would be the Chemistry Day, Career Day and/or similar events as proposed above.

Principle 3: Student-centered Learning, Teaching and Assessment

INSTITUTIONS SHOULD ENSURE THAT THE UNDERGRADUATE PROGRAMMES ARE DELIVERED IN A WAY THAT ENCOURAGES STUDENTS TO TAKE AN ACTIVE ROLE IN CREATING THE LEARNING PROCESS. THE ASSESSMENT METHODS SHOULD REFLECT THIS APPROACH.

Student-centered learning and teaching plays an important role in stimulating students' motivation, self-reflection and engagement in the learning process. The above entail continuous consideration of the programme's delivery and the assessment of the related outcomes.

The student-centered learning and teaching process

- *respects and attends to the diversity of students and their needs, enabling flexible learning paths;*
- *considers and uses different modes of delivery, where appropriate;*
- *flexibly uses a variety of pedagogical methods;*
- *regularly evaluates and adjusts the modes of delivery and pedagogical methods aiming at improvement*
- *regularly evaluates the quality and effectiveness of teaching, as documented especially through student surveys;*
- *reinforces the student's sense of autonomy, while ensuring adequate guidance and support from the teaching staff;*
- *promotes mutual respect in the student - teacher relationship;*
- *applies appropriate procedures for dealing with students' complaints.*

In addition :

- *the academic staff are familiar with the existing examination system and methods and are supported in developing their own skills in this field;*
- *the assessment criteria and methods are published in advance;*
- *the assessment allows students to demonstrate the extent to which the intended learning outcomes have been achieved. Students are given feedback, which, if necessary is linked to advice on the learning process;*
- *student assessment is conducted by more than one examiner, where possible;*
- *the regulations for assessment take into account mitigating circumstances*
- *assessment is consistent, fairly applied to all students and carried out in accordance with the stated procedures;*
- *a formal procedure for student appeals is in place.*

Study Programme compliance

- In the current curriculum the core, mandatory courses are collected in the first three years of study whereas the fourth year is left for electives, including the optional Diploma Thesis and Internship.

Thus, the students have some freedom to shape their study path, but only in the last year. This is typical in chemistry studies, and in tune with international practice.

- The majority of the course content is delivered via the traditional lectures, which do not allow substantial active learning, especially in large auditoriums. Some instructors have started to experiment with the use of modern technology, such as live streaming of the lectures and uploading them on YouTube, or the use of cell phone-based clickers to engage students during the lectures. The recitation sessions allow much higher participation by the students. Of course, the laboratory courses involve a type of learning that is completely active. Although students, due to their large number, have to work in groups of 2 or 3, their assignments and reports are individual.
- Student satisfaction surveys are performed regularly using the electronic system established by the Quality Assurance Unit (QAU) of the University. The results for each course are communicated to the instructor and to the Chair and the OMEA of the Department who can take steps to correct any issues pointed out in these surveys. One problem is that a small percentage of students actually fill out these surveys (10-25%). Students find the survey too long. To increase the participation, the Department has started to allow students to fill out the surveys in class using cell phones.
- The Department has established a formal system for student appeals that is in accord with international practice. The student first talks to the instructor, and, if not satisfied, they can talk to their advisor, the Department Secretary, the undergraduate studies committee, a School-level committee, and finally the University Student Advocate. However, appeals are rare.
- All classrooms and laboratories are accessible to students with impaired mobility. Moreover, students with disabilities are accommodated according to Institutional policy. For example, following a written exam, such students can explain orally their responses to the instructor.
- All students are assigned a faculty advisor. As a result, each faculty member has about 20 advisees (a rather large number). However, few students visit their advisor, especially in the beginning of their studies. Students indicated that they do not feel comfortable initiating contact, especially with a faculty member they have not yet met. The Department has started to require from students to meet with their Advisor before they register for the labs.

Panel judgement

Principle 3: Student- centered Learning, Teaching and Assessment	
Fully compliant	
Substantially compliant	X
Partially compliant	
Non-compliant	

Panel Recommendations

5. The Department as a whole needs to more systematically explore new pedagogical methods that go beyond the traditional lecture-based format. There is substantial discussion internationally on ways to use available technology to better engage students. For example, the “flipped classroom”, short instructional videos, web-based problem solving, or cell phone-based classroom interaction could, if used wisely, improve learning outcomes and student satisfaction.

6. The low participation of students in course surveys is troubling. The Department should consider shortening the questionnaire from 35 to 20-25 questions by eliminating some questions and combining others. Also, they should pursue their idea of allowing filling out of questionnaires during class time. The exit survey of graduating seniors is also very long and cumbersome. Informal interviews of some of them with the Chair may also be very useful.
7. Although the institution of Student Advisor exists, in practice it is underutilized. The Department should find ways to initiate and enforce contact of incoming students with their advisor as a requirement for advancing with their studies. This should happen as soon as the students arrive and even be added as a requirement for class enrollment.

Principle 4: Student Admission, Progression, Recognition and Certification

INSTITUTIONS SHOULD DEVELOP AND APPLY PUBLISHED REGULATIONS COVERING ALL ASPECTS AND PHASES OF STUDIES (ADMISSION, PROGRESSION, RECOGNITION AND CERTIFICATION).

Institutions and academic units need to put in place both processes and tools to collect, manage and act on information regarding student progression.

Procedures concerning the award and recognition of higher education degrees, the duration of studies, rules ensuring students progression, terms and conditions for student mobility should be based on the institutional study regulations. Appropriate recognition procedures rely on institutional practice for recognition of credits among various European academic departments and Institutions, in line with the principles of the Lisbon Recognition Convention.

Graduation represents the culmination of the students' study period. Students need to receive documentation explaining the qualification gained, including achieved learning outcomes and the context, level, content and status of the studies that were pursued and successfully completed (Diploma Supplement).

Study Programme compliance

- The programme currently admits about 140 students per year. This number, which is determined by the Ministry of Education without regard to the Department's suggestion, is very large compared to the available personnel. This leads to excessive workload and reduction in the quality of training, especially in the labs. The number of students is large also compared to other Chemistry Departments in Greece. For example, Athens, with twice as many faculty members admits about 100 students per year.
- The Department makes available to the students a comprehensive Student Handbook that explains in detail the content of their studies and the requirements for a Degree. The programme uses the ECTS system and each graduating student is given a Diploma Supplement. There is also a Thesis Handbook for those who choose to do a Diploma Thesis.
- The Department offers orientation to incoming students, which is very useful. However, some students find it insufficient for a smooth transition from high school to higher education.
- Since Academic Advising is not functioning optimally (see above), monitoring of student progress is insufficient. An instructor has knowledge of who did or did not do well in his/her course, but no one has a complete picture of the standing of each individual student.
- Student mobility, primarily through the Erasmus programme, is encouraged by providing all relevant information on the departmental website. The number of outgoing Erasmus students is substantial, but incoming students are virtually nonexistent presumably due to the language barrier.
- The programme offers Practical Training (Internships) to local industry, research labs, and public organizations. This component is supported by several local and national employers. Both students and employers value this arrangement, but some employers feel that the 3-month duration is very short.
- The Department also offers two Special Programmes, one on Oenology and one on Pedagogy. The former is aimed at students who are interested in careers in local wine makers and the latter at students who are interested in becoming teachers in Secondary Education. Both programmes appear to be well designed and appreciated.

Panel judgement

Principle 4: Student Admission, Progression, Recognition and Certification	
Fully compliant	
Substantially compliant	X
Partially compliant	
Non-compliant	

Panel Recommendations

8. The Department should make a greater effort to smoothen the transition from high school to higher education. This could be accomplished perhaps by improving the initial orientation and certainly by bridging the gap between 1st year students and advisors. The advisor should take the extra step to approach the students who are often intimidated. The Department could also implement mentorship award(s) to promote interactions and reward success. Improvement in advising will allow better monitoring of the progress of each student.

9. It is highly recommended that the Department adopt a policy of promoting and rewarding academic excellence. For instance, students with excellent academic records could be rewarded by inclusions in tools such as a "Chair's List of Excellence". If possible, names and pictures should also be uploaded to the departmental website.

Principle 5: Teaching Staff

INSTITUTIONS SHOULD ASSURE THEMSELVES OF THE QUALIFICATIONS AND COMPETENCE OF THE TEACHING STAFF. THEY SHOULD APPLY FAIR AND TRANSPARENT PROCESSES FOR THE RECRUITMENT AND DEVELOPMENT OF THE TEACHING STAFF.

The Institutions and their academic units have a major responsibility as to the standard of their teaching staff providing them with a supportive environment that promotes the advancement of their scientific work. In particular, the academic unit should:

- *set up and follow clear, transparent and fair processes for the recruitment of properly qualified staff and offer them conditions of employment that recognize the importance of teaching and research;*
- *offer opportunities and promote the professional development of the teaching staff;*
- *encourage scholarly activity to strengthen the link between education and research;*
- *encourage innovation in teaching methods and the use of new technologies;*
- *promote the increase of the volume and quality of the research output within the academic unit*
- *follow quality assurance processes for all staff members (with respect to attendance requirements, performance, self-assessment, training etc.);*
- *develop policies to attract highly qualified academic staff;*

Study Programme compliance

- The Department has a merit-based and extrovert attitude in recruitment of new faculty with virtually no inbreeding.
- The Department offers opportunities for professional development to its staff and faculty members. Administrative staff and support personnel also have opportunities to further develop their knowledge and skills by attending training events and seminars that are organized by the UoC or external parties.
- The Department offers limited administrative and teaching duties to new assistant professors so they can focus on research. In general, the workload is reasonable although the number of students is very high. To cover specific teaching needs, the Department is forced to rely heavily on emeriti/retired professors.
- Teaching is linked to research in various ways. As an example, undergraduate students are exposed to modern advanced instrumentation or other relevant activities. In addition, the diploma thesis offers an opportunity to educate students in modern research.
- The research output of the Department is certainly aided by the fact that research active faculty has access to highly motivated and qualified final year chemistry students many of whom are working on their graduation theses for two semesters. This is an asset that offers additional tangible benefits with continuing efforts to further promote its vital nature.
- The role of the students in promoting quality assurance for all staff is seen as very important in determining its effectiveness. Consequently, the students should be encouraged and empowered so as to be able to display an active interest in the affairs of the Department within the realm of quality indicators of its staff.
- The newly formed campus-wide “Training of the Trainers” programme is a welcomed addition to the Department. This programme takes place two hours every month and is in addition to other development activities like EU exchange programmes, sabbatical leaves, and student evaluations.

Panel judgement

Principle 5: Teaching Staff	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

10. The faculty members should make additional efforts to recruit interested undergraduate students in their labs as a way to successfully link teaching and research. In addition, faculty members should incorporate recent exciting examples from their research activities into teaching as a way to link teaching and research even further.

11. Without compromising adherence to meritocracy, the Department must be more sensitive to issues like gender diversity when looking at new hires. The Department should also encourage their best female undergraduate/graduate students to pursue academic careers.

12. The Department should establish formal mechanisms to reward excellence for both teaching and service. It is recommended that a process of peer evaluation system is adopted that allows for a frank and collegial input on an annual basis. Alternatively, or in addition, senior students could be asked each year to recommend a professor based on his/her teaching and with no involvement of the faculty. These nominations can help select the "Teacher of the Year". Similarly, administrative personnel and related professionals who perform an outstanding service could be rewarded with an "Exemplary Service Award".

Principle 6: Learning Resources and Student Support

INSTITUTIONS SHOULD HAVE ADEQUATE FUNDING TO COVER TEACHING AND LEARNING NEEDS. THEY SHOULD –ON THE ONE HAND- PROVIDE SATISFACTORY INFRASTRUCTURE AND SERVICES FOR LEARNING AND STUDENT SUPPORT AND–ON THE OTHER HAND- FACILITATE DIRECT ACCESS TO THEM BY ESTABLISHING INTERNAL RULES TO THIS END (E.G. LECTURE ROOMS, LABORATORIES, LIBRARIES, NETWORKS, BOARDING, CAREER AND SOCIAL POLICY SERVICES ETC.).

Institutions and their academic units must have sufficient funding and means to support learning and academic activity in general, so that they can offer to students the best possible level of studies. The above means could include facilities such as libraries, study rooms, educational and scientific equipment, information and communications services, support or counselling services.

When allocating the available resources, the needs of all students must be taken into consideration (e.g. whether they are full-time or part-time students, employed or international students, students with disabilities) and the shift towards student-centred learning and the adoption of flexible modes of learning and teaching. Support activities and facilities may be organised in various ways, depending on the institutional context. However, the internal quality assurance ensures that all resources are appropriate, adequate, and accessible, and that students are informed about the services available to them.

In delivering support services the role of support and administrative staff is crucial and therefore they need to be qualified and have opportunities to develop their competences.

Study Programme compliance

- The Department has a dedicated building for education and research that includes 1 large state-of-the-art amphitheater, 2 medium-size rooms, 3 smaller lecture rooms, 1 seminar room and various laboratories. All lecture rooms and labs are equipped with free wi-fi and audiovisual facilities. In addition, there is a computer room with access to 30 computers. All rooms, facilities and labs are in excellent condition.
- The Panel was impressed by the clean and odor-free state of both the labs and lecture rooms and congratulates the teaching staff, the students and the cleaning crew for maintaining such a pleasant environment!
- All class and lab material (notes, reports, exercises, powerpoint presentations etc) are uploaded onto the web and are readily available to all enrolled students. The chosen textbooks are of high quality and are available to all students. The e-class and related software are available to all students and provide comprehensive syllabi and updates for all classes.
- The service and facilities at the gym, restaurant and cafeteria are very good and in close proximity to the Department; these facilities are greatly appreciated by the students.
- In several classes and labs the education is interactive and actively engages the students in the learning process. In several advanced classes, teaching is based on scientific analysis of recently published research papers. In other classes, students are encouraged to visit local companies in order to learn more about real-world problems and potential future job opportunities. These efforts are coordinated by the professors/TAs and require active participation of all students.
- Despite the insufficient funding from the Ministry of Education, the Department makes honest efforts to update laboratory instruments and provide needed consumables for all undergraduate students thus ensuring and enhancing the quality of education.

- The Department offers opportunities for student exchange programmes (e.g., ERASMUS) that encourage mobility, networking and the acquiring of potentially new skills.
- During their practical training (offered as an elective class), students have the opportunity to perform research in local companies and research laboratories thus strengthening their technical and communication skills. In addition, they are asked to present their research in a poster session format.

Panel judgement

Principle 6: Learning Resources and Student Support	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

13. It is clear that the Department has severely limited funding for the education and training of the undergraduate students. The budget for these efforts should increase, particularly in view of the increasing costs of labs and consumables per undergraduate student.

14. The Department should further increase the interaction between students and local/national/international industry by inviting its alumni and other professionals to participate in various related activities. Efforts should be made to generate and maintain an alumni list. This list should be used to search for fundraising and employment opportunities

15. There are no dormitories in close proximity to the Chemistry Department. This is a challenge for the entire UoC campus but it is more important to students who, due to research/experimental/teaching activities, need to stay in the Department afterhours. These students should have priority to reside in the planned dormitories. A university-operated shuttle service could address this problem.

Principle 7: Information Management

INSTITUTIONS BEAR FULL RESPONSIBILITY FOR COLLECTING, ANALYSING AND USING INFORMATION, AIMED AT THE EFFICIENT MANAGEMENT OF UNDERGRADUATE PROGRAMMES OF STUDY AND RELATED ACTIVITIES, IN AN INTEGRATED, EFFECTIVE AND EASILY ACCESSIBLE WAY.

Institutions are expected to establish and operate an information system for the management and monitoring of data concerning students, teaching staff, course structure and organisation, teaching and provision of services to students as well as to the academic community. Reliable data is essential for accurate information and for decision making, as well as for identifying areas of smooth operation and areas for improvement. Effective procedures for collecting and analysing information on study programmes and other activities feed data into the internal system of quality assurance.

The information gathered depends, to some extent, on the type and mission of the Institution. The following are of interest:

- *key performance indicators*
- *student population profile*
- *student progression, success and drop-out rates*
- *student satisfaction with their programme(s)*
- *availability of learning resources and student support*
- *career paths of graduates*

A number of methods may be used for collecting information. It is important that students and staff are involved in providing and analyzing information and planning follow-up activities.

Study Programme compliance

- The Department of Chemistry has established procedures for collection of data regarding student body, teaching methods, student progression, employability and career paths. Statistics from entrance exams, class questionnaires, feedbacks from collaborators as well as exit surveys from graduating students are collected and stored at the Secretariat office.
- The Department and, in particular, the Committee of Undergraduate Affairs analyzes student data and makes recommendations to the Department. In the recent past, such feedback has led to several corrective actions that have shown to be highly beneficial to the students. Specifically, to address the common “slow start” issue of incoming undergraduate students, the Department plans to force the students to meet with their academic advisors during their first week of their studies. Also, the Department implemented a 1-day symposium on job opportunities for chemistry graduates in the private sector that includes job finding strategies, interview tips and career planning.
- OMEA, the internal evaluation group, analyzes the student data and uses this information to improve performance of both students and all teaching personnel.
- Data from entrance exams show that less than 10% of the incoming students declared chemistry as their first choice. Despite this low number, it appears that student progression through the programme is satisfactory since more than 95% of the incoming students graduate with a chemistry degree within 6 years of studies.

Panel judgement

Principle 7: Information Management	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

NONE

Principle 8: Public Information

INSTITUTIONS SHOULD PUBLISH INFORMATION ABOUT THEIR TEACHING AND ACADEMIC ACTIVITIES WHICH IS CLEAR, ACCURATE, OBJECTIVE, UP-TO-DATE AND READILY ACCESSIBLE.

Information on Institution's activities is useful for prospective and current students, graduates, other stakeholders and the public.

Therefore, institutions and their academic units provide information about their activities, including the programmes they offer, the intended learning outcomes, the qualifications awarded, the teaching, learning and assessment procedures used, the pass rates and the learning opportunities available to their students, as well as graduate employment information.

Study Programme compliance

- The Department maintains a comprehensive and regularly updated website that contains a wide variety of information about classes, research activities, news, programmes and events. The information is well categorized and easily accessed.
- The Department maintains Facebook and LinkedIn pages that have about 700 followers.
- The Department participates in various educational and outreach activities including high school visits, public talks by staff etc. All these activities are advertised in the departmental social media sites.

Panel judgement

Principle 8: Public Information	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

16. The Department should create a flyer or short brochure with information on departmental activities, events, student/instructor awards/recognitions. The flyer/brochure could be electronically sent or mailed to the alumni and may be accompanied by a request for support.

17. The Department should further intensify its efforts to advertise its activities in its website. Educational activities, research accomplishments and societal contributions of the entire body and the individual members (students, professors, employees) should be recognized and broadcasted. Short videos of current students/employees that talk about the department should be added. These activities could target high school students who are on their way to enter the university.

Principle 9: On-going Monitoring and Periodic Internal Review of Programmes

INSTITUTIONS SHOULD HAVE IN PLACE AN INTERNAL QUALITY ASSURANCE SYSTEM FOR THE AUDIT AND ANNUAL INTERNAL REVIEW OF THEIR PROGRAMMES, SO AS TO ACHIEVE THE OBJECTIVES SET FOR THEM, THROUGH MONITORING AND AMENDMENTS, WITH A VIEW TO CONTINUOUS IMPROVEMENT. ANY ACTIONS TAKEN IN THE ABOVE CONTEXT SHOULD BE COMMUNICATED TO ALL PARTIES CONCERNED.

Regular monitoring, review and revision of study programmes aim to maintain the level of educational provision and to create a supportive and effective learning environment for students.

The above comprise the evaluation of:

- the content of the programme in the light of the latest research in the given discipline, thus ensuring that the programme is up to date;*
- the changing needs of society*
- the students' workload, progression and completion;*
- the effectiveness of the procedures for the assessment of students*
- the students' expectations, needs and satisfaction in relation to the programme;*
- the learning environment, support services and their fitness for purpose for the programme*

Programmes are reviewed and revised regularly involving students and other stakeholders. The information collected is analysed and the programme is adapted to ensure that it is up-to-date. Revised programme specifications are published.

Study Programme compliance

- The Department has established an Internal Evaluation Committee, named OMEA, that is composed of 5 faculty members. Its function is to collect and analyze all data from the undergraduate programme and present the data on an annual basis at the faculty meeting.
- The Department has also created an Undergraduate Curriculum Committee that oversees the undergraduate programme, ensures its smooth operation and makes recommendations for improvements. Recommendations include updates/revisions of the curriculum and take into account revisions of relevant European universities and latest developments in chemical sciences and technologies. Revisions also address issues related to student needs, student expectations and social changes.
- The undergraduate programme is evaluated on an annual basis both by OMEA and the Undergraduate Curriculum Committee in order to improve its overall operation and achieve the stated goals.

Panel judgement

Principle 9: On-going Monitoring and Periodic Internal Review of Programmes	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

None

Principle 10: Regular External Evaluation of Undergraduate Programmes

PROGRAMMES SHOULD REGULARLY UNDERGO EVALUATION BY COMMITTEES OF EXTERNAL EXPERTS SET BY HQA, AIMING AT ACCREDITATION. THE TERM OF VALIDITY OF THE ACCREDITATION IS DETERMINED BY HQA.

HQA is responsible for administrating the programme accreditation process which is realised as an external evaluation procedure, and implemented by a committee of independent experts. HQA grants accreditation of programmes, with a specific term of validity, following to which revision is required. The accreditation of the quality of the programmes acts as a means of verification of the compliance of the programme with the template's requirements, and as a catalyst for improvement, while opening new perspectives towards the international standing of the awarded degrees.

Both academic units and institutions participate in the regular external quality assurance process, while respecting the requirements of the legislative framework in which they operate.

The quality assurance, in this case the accreditation, is an on-going process that does not end with the external feedback, or report or its follow-up process within the Institution. Therefore, Institutions and their academic units ensure that the progress made since the last external quality assurance activity is taken into consideration when preparing for the next one.

Study Programme compliance

- The current accreditation is in compliance with the Greek law (3374/2005) and has benefited from the excellent function and effective interaction between various agencies and committees including OMEA, QAU and HQA. The Department's internal evaluation committee (OMEA) has a continuous and productive collaboration with MODIP. All members of staff contributed to the review processes and evidence was provided that they appreciate the importance of both professional body accreditation and HQA peer review.
- The Panel drew evidence from representatives of all stakeholders (students, faculty, alumni and employers). The follow-up actions recommended by the previous external evaluation committee have been implemented within the constraints of the Department. The stakeholders have expressed their willingness to contribute to the programme in various ways thus enhancing student education and career orientation.
- The previous external recommendations in 2011 were taken into consideration and the Department made a serious effort to implement them. For example, the computer lab is in a much improved state now as compared to the previous evaluation period.
- One of the international rankings (Nature Index) shows that the Dept of Chemistry of UoC is the best in Greece. Other rankings place the Department among the best in Greece. The standing of the Department could be even higher if we consider the scientific output per faculty member rather than the total output per department.

Panel judgement

Principle 10: Regular External Evaluation of Undergraduate Programmes	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

- 18.** The processes of evaluation and accreditation should be fair and be performed on a regular basis and according to the international guidelines.
- 19.** A 5-year strategic plan at the time of the accreditation could contribute to innovative thinking for the optimization of the quality of the Department in the future. Therefore, a strategic planning committee that would look into where the Department wants to be in the future is recommended and should be included with the material sent by the Department for review.

PART C: CONCLUSIONS

I. Features of Good Practice

Overall, the undergraduate programme of chemistry at UoC is in full compliance with the principles of the European Framework for Higher Education. The goals and functions of the Department are well documented and its strategic plan is updated. The infrastructure of the campus and the Department (building, facilities, library, etc.) is appropriate for its educational and research goals. The personnel is well trained but is overwhelmed due to the small number of faculty compared to the large number of undergraduate students that are admitted every year. All class/lab-related material (e.g., class goals, notes, syllabi, grading requirements etc.) is readily available to all students. The Department has been making serious efforts to encourage student-centered learning and promote student-instructor interactions. Good efforts have been made to accommodate students with special needs. The Department has established an internal evaluation committee (OMEA) that deals with all undergraduate affairs including modernization of the undergraduate curriculum.

The Chemistry Department of the University of Crete has established a high quality research and teaching programme that is commensurate with international standards. It is worth noting that:

- All faculty members have active research programmes.
- The group of young faculty members lead vibrant research initiatives.
- Many faculty members pursue creative and modern teaching initiatives.
- The best Ph.D. graduates are sought after for postdoctoral positions nationally and abroad, and some of them follow academic careers at domestic and foreign universities.
- The existing building facilities, experimental laboratories space for teaching and research, the classrooms, the office space, the library, the reading facility, the internet, and communications infrastructure are comparable or exceed corresponding facilities at internationally recognized departments.
- To maintain excellence in research and pursue scientific questions of high impact there is an urgent need for recruit faculty and staff to maintain and upgrade the experimental infrastructure.

II. Areas of Weakness

Certain weaknesses have been identified that once addressed will further elevate the current undergraduate programme. These are:

- (a) The student participation in the online class evaluation is limited and insufficient to draw conclusions. The Department should increase its efforts to inform the students not only of the use of this questionnaire but of the benefit of such data for the modernization and revision of the education. Efforts should be made to streamline the evaluation process and advertise the benefits of the student participation (see recommendation 6 below).
- (b) The role of academic advising for the education of a student should be further strengthened and advertised by the Department. Although the Department has assigned academic advisors to all students, it is apparent that many students do not take advantage of this service and do not benefit from it. It may be necessary to require the students to approach their advisers prior to class enrolment (see recommendations 7 and 8 below).

- (c) Student academic excellence, teaching excellence as well as exemplary professional service should be better recognized by the Department (see recommendations 9 and 12 below).

As indicated above, the listed weaknesses are found in most international undergraduate programmes. As such, they do not affect accreditation nor compliance with the International standards.

III. Recommendations for Follow-up Actions

Note: *The recommendations below are a repetition of the ones suggested in each principle. Thus, their numbering does not reflect relative importance.*

1. The synchronization between classes and laboratories could be improved in certain courses such as physical chemistry for which both lectures and labs are offered in the same semester.
2. It is not evident whether there are sufficient paid internships for all students who are interested to participate. The Department should intensify its efforts to secure additional funds and sponsors from both the campus and the public/private sectors.
3. There is a clear need for a better and wider integration of the external stakeholders and alumni of the Department to the departmental educational/training activities. Such integration will benefit not only the students but also the local industry. To this end, the Department could establish an “Industry-Academia Day” where members of the public/private sector can easily interact with students. In addition, the Department should create an “External Advisory Board” to further improve the relationship and networking with the public/private sectors.
4. An increased emphasis should be placed in promoting scientific presentation and writing skills of the students. The ideal forum for this would be the Chemistry Day, Career Day and/or similar events as proposed above.
5. The Department as a whole needs to more systematically explore new pedagogical methods that go beyond the traditional lecture-based format. There is substantial discussion internationally on ways to use available technology to better engage students. For example, the “flipped classroom”, short instructional videos, web-based problem solving, or cell phone-based classroom interaction could, if used wisely, improve learning outcomes and student satisfaction.
6. The low participation of students in course surveys is troubling. The Department should consider shortening the questionnaire from 35 to 20-25 questions by eliminating some questions and combining others. Also, they should pursue their idea of allowing filling out of questionnaires during class time. The exit survey of graduating seniors is also very long and cumbersome. Informal interviews of some of them with the Chair may also be very useful.
7. Although the institution of Student Advisor exists, in practice it is underutilized. The Department should find ways to initiate and enforce contact of incoming students with their advisor as a requirement for advancing with their studies. This should happen as soon as the students arrive and even be added as a requirement for class enrollment.
8. The Department should make a greater effort to smoothen the transition from high school to higher education. This could be accomplished perhaps by improving the initial orientation and certainly by bridging the gap between 1st year students and advisors. The advisor should take the extra step to approach the students who are often intimidated. The Department could also implement mentorship award(s) to promote interactions and reward success. Improvement in advising will allow better monitoring of the progress of each student.

9. It is highly recommended that the Department adopt a policy of promoting and rewarding academic excellence. For instance, students with excellent academic records could be rewarded by inclusions in tools such as a "Chair's List of Excellence". If possible, names and pictures should also be uploaded to the departmental website.
10. The faculty members should make additional efforts to recruit interested undergraduate students in their labs as a way to successfully link teaching and research. In addition, faculty members should incorporate recent exciting examples from their research activities into teaching as a way to link teaching and research even further.
11. Without compromising adherence to meritocracy, the Department must be more sensitive to issues like gender diversity when looking at new hires. The Department should also encourage their best female undergraduate/graduate students to pursue academic careers.
12. The Department should establish formal mechanisms to reward excellence for both teaching and service. It is recommended that a process of peer evaluation system is adopted that allows for a frank and collegial input on an annual basis. Alternatively, or in addition, senior students could be asked each year to recommend a professor based on his/her teaching and with no involvement of the faculty. These nominations can help select the "Teacher of the Year". Similarly, administrative personnel and related professionals who perform an outstanding service could be rewarded with an "Exemplary Service Award".
13. It is clear that the Department has severely limited funding for the education and training of the undergraduate students. The budget for these efforts should increase, particularly in view of the increasing costs of labs and consumables per undergraduate student.
14. The Department should further increase the interaction between students and local/national/international industry by inviting its alumni and other professionals to participate in various related activities. Efforts should be made to generate and maintain an alumni list. This list should be used to search for fundraising and employment opportunities
15. There are no dormitories in close proximity to the Chemistry Department. This is a challenge for the entire UoC campus but it is more important to students who, due to research/experimental/teaching activities, need to stay in the Department afterhours. These students should have priority to reside in the planned dormitories. A university-operated shuttle service could address this problem.
16. The department should create a flyer or short brochure with information on departmental activities, events, student/instructor awards/recognitions. The flyer/brochure could be electronically sent or mailed to the alumni and may be accompanied by a request for support.
17. The Department should further intensify its efforts to advertise its activities in its website. Educational activities, research accomplishments and societal contributions of the entire body and the individual members (students, professors, employees) should be recognized and broadcasted. Short videos of current students/employees that talk about the department should be added. These activities could target high school students who are on their way to enter the university.
18. The processes of evaluation and accreditation should be fair and be performed on a regular basis and according to the international guidelines.
19. A 5-year strategic plan at the time of the accreditation could contribute to innovative thinking for the optimization of the quality of the Department in the future. Therefore, a strategic planning committee that would look into where the Department wants to be in the future is recommended and should be included with the material sent by the Department for review.

Recommendations to the State and the Greek Ministry of Education

It is clear that the Chemistry Department at the University of Crete has built a highly successful undergraduate programme that is in full compliance with the principles of the European Framework for Higher Education. This programme can be further improved if the Ministry offers increases academic autonomy in the Department in terms of: (a) maintaining a reasonable ratio of faculty to students in order to safeguard the quality of education; (b) allow new faculty members to be chosen sequentially based on a short list of selected candidates rather than reopening the search when the first choice declines; (c) allow inter-departmental mobility of undergraduates students if they meet certain admission criteria; and (d) reduce the excessive bureaucratic burden related to the traveling and purchasing of supplies and consumables.

IV. Summary & Overall Assessment

The Principles where full compliance has been achieved are:

1, 2, 5, 6, 7, 8, 9, 10

The Principles where substantial compliance has been achieved are:

3, 4

The Principles where partial compliance has been achieved are:

NONE

The Principles where failure of compliance was identified are:

NONE

Overall Judgement	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

The members of the Accreditation Panel

Name and Surname

Signature

1. **Dimitri Coucovanis, PhD**
Professor Emeritus of Chemistry
Department of Chemistry,
University of Michigan, USA
2. **Georgia Kyriakakou, PhD**
Association of Greek Chemists
3. **Themis Lazaridis, PhD**
Professor of Chemistry
City College of New York
New York, USA
4. **Christos Takoudis, PhD**
Professor of Chemical Engineering and Bioengineering
University of Illinois, Chicago, USA
5. **Emmanuel Theodorakis, PhD**
Professor of Chemistry
University of California San Diego, USA