



POSTGRADUATE RULES OF PHYSICS AND CHEMISTRY DEPARTMENTS

MS PROGRAMS IN THE PHYSICS AND CHEMISTRY DEPARTMENTS

1. INTRODUCTION

Under the By-Laws of Institute of Graduate Studies and Research of Eastern Mediterranean University, Physics and Chemistry Departments offer two Master Degrees

- A. MS Degree in Physics
- B. MS Degree in Chemistry

2. ADMISSION

(In accordance with Eastern Mediterranean University (EMU) Graduate Programs, Registration and Admission By-Law)

Admission of an applicant is decided by the Graduate Studies Committee of Physics and Chemistry Departments (GSCPCD). Prospective applicants are required to have a Bachelor of Science (BS) Degree for the Master programs with a *CPGA* ≥ 2.50 out of 4.00 or its equivalent:

Grading system	Matchings
Four numeral	$\geq 2.5 / 4.00$
Hundred numeral	$\geq 62.5 / 100$
Twenty numeral	$\geq 12.5 / 20$
Fifteen numeral	$\geq 9.38 / 15$
Five numeral	$\geq 3.13 / 5.0$

Applicants that provide extra evidence of academic achievement with a BS *CGPA* grade between 2.00–2.49 may also be accepted by the GSCPCD, subject to the decision of Arts and Sciences Faculty Board.

3. METHOD

(EMU By-Law for Postgraduate Studies and Examinations)

- i. The duration of Master Degree (with Thesis) studies in EMU is as stated in Article 4(1-7) by of “EMU By-Law for Postgraduate Studies and Examinations”. The general practice is not less than 4 semesters.
- ii. According to Article 5(1) of “EMU By-Law for Postgraduate Studies and Examinations”, a thesis Supervisor/Co-supervisor amongst the academic personnel holding a Ph.D. degree is appointed to a MS student. An accepted applicant is encouraged to arrange an academic personnel (with Ph.D. degree) who expresses her/his willingness to supervise the applicant. However, in the case of a thesis supervisor not being specified, GSCPCD appoints an academic advisor to the MS

student. The student must find a supervisor for herself/himself until the beginning of the registration period of the second semester. Otherwise, GSCPCD assigns a supervisor (selecting among the appropriate academic staff) to the student, and presents it to the DC for approval.

- iii. An advisor can only register a student to the compulsory courses. In order to register for the non-compulsory courses, the student needs the approval of her/his thesis supervisor.
- iv. Providing a justified decision (stated by either from the student or the supervisor) to the chairs of GSCPC and DC, thesis supervisor or the thesis topic of a MS student may be changed subject to the approval of the GSCPC and the DC. The relevant form (*Supervisor/Co-supervisor Change Form or Thesis/Dissertation Subject/Title Change Form*) is filled and submitted to the IGSR for approval.
- v. The student must take courses from at least three different faculty members to complete the MS program. The advisor, supervisor, and students are responsible to make sure to fulfill this rule.
- vi. Students failing a credited MS course with the same code twice or failing 3 courses in total taken at any time during the MS program (even if a certain course was passed during the second time) are dismissed from the program automatically according to the rules of the IGSR.
- vii. Based on the student's English level specified at the beginning of the program, the student is required to register for the specified courses as of the first academic semester. Depending on her/his English level, each student is obliged to follow the English Support Program for at least one semester and become successful. Courses offered at the English Support Program are non-credit courses and students are evaluated as Successful (S) or Unsuccessful (U). If a student receives two consecutive (U) grades from the English course with the same course code, regardless of the fact that she/he took a leave of absence during this period, she/he will be dismissed from the MS program.
- viii. The student must propose a thesis topic (in consultation with her/his thesis supervisors(s)) and fills in the relevant form until the add drop date of the 3rd semester of the student by Article 5(1) of "EMU By-Law for Postgraduate Studies and Examinations".

4. CURRICULA OF PHYSICS AND CHEMISTRY MS PROGRAMS

(In accordance with EMU By-Law for Postgraduate Studies and Examinations)

Each MS program of the Departments of Physics and Chemistry requires a minimum of 21 credit-hours of at least 7 courses to be completed, Seminar Course and the preparation of a Master's thesis. Students in each field will take the following courses:

A. MS in Physics

- a. Compulsory Courses
 1. PHYS500 Thesis

2. PHYS511 Mathematical Methods for Engineers and Scientists-I
 3. PHYS521 Classical Mechanics-I
 4. PHYS522 Electromagnetic Theory-I
 5. PHYS551 Quantum Mechanics-I
 6. PHYS598 Seminar
- b. At least two or more postgraduate courses must be selected by the student under the guidance of her/his thesis supervisor(s) and upon approval of the DC from the following postgraduate courses:
1. PHYS5XX Any Physics Postgraduate Course (either from the existed ones or from the ones to be opened in the future)
 2. MATHXXX Any Relevant Mathematics Postgraduate Course
 3. COMPXXX Any Relevant Computer Postgraduate Course
 4. CHEMXXX Any Relevant Chemistry Postgraduate Course
 5. Any Relevant Engineering Postgraduate Course
 6. GRAD501 Graduate Research Skills in Science and Engineering
- c. An elective “undergraduate course” can be selected by the student under the guidance of her/his thesis supervisor(s) and upon approval of the DC. This course can be selected from the undergraduate programs offered by the Departments of Mathematics and Biology and by the Faculty of Engineering.

B. MS in Chemistry

- a. Compulsory Courses
1. CHEM500 Thesis
 2. CHEM507 Special Topics in Physical Chemistry
 3. CHEM508 Special Topics in Organic Chemistry
 4. CHEM545 Fundamentals of Analytical Chemistry
 5. CHEM598 Seminar
- b. Selective Compulsory Courses from
1. CHEM541 Special Topics in Electrochemistry (Compulsory for a MS student who will write her/his dissertation in organic field)
 2. CHEM511 Principles of Polymer Science (Compulsory for a MS student who will write her/his dissertation in polymer field)
- c. At least two or more postgraduate courses must be selected by the student under the guidance of her/his thesis supervisor(s) and upon approval of the DC from the following postgraduate courses:
1. CHEMXXX Any Chemistry Postgraduate Course (either from the existed ones or from the ones to be opened in the future)
 2. MATHXXX Any Relevant Mathematics Postgraduate Course
 3. COMPXXX Any Relevant Computer Postgraduate Course
 4. PHYSXXX Any Relevant Physics Postgraduate Course
 5. GRAD501 Graduate Research Skills for Science & Engineering

6. Any Relevant Engineering Postgraduate Course

7. Any Relevant Pharmacy Postgraduate Course

- d. An elective “undergraduate course” can be selected by the student under the guidance of her/his thesis supervisor(s) and upon approval of the DC. This course can be selected from the undergraduate programs offered by the departments of Mathematics, Biology, or the Faculties of Engineering, or Pharmacy.

5. MS THESIS, THESIS JURY, AND EVALUATION

- i. The thesis consists of an abstract and an introduction, a survey of known knowledge in the area concerned, the candidate’s own work/contribution and a list of cited references.
- ii. The thesis must be written in accordance with the general “Postgraduate Thesis Writing” guidelines set by the IGSR. The number of copies to be submitted to the Institute through the Department must be the same as the number of Jury members (including the substitute member).
- iii. The content of the thesis should reflect the student’s own understanding of the research topic. It should contain a piece of work which, although not necessarily original, is not readily available in the literature.
- iv. *For the “Thesis Jury and Evaluation” please read the Article 8 (1-7) of EMU By-Law for Postgraduate Studies and Examinations*

Ph.D. PROGRAMS IN THE PHYSICS AND CHEMISTRY DEPARTMENTS

1. INTRODUCTION

Under the by-laws of Institute of Graduate Studies and Research of Eastern Mediterranean University, Physics and Chemistry Departments offer two Ph.D. Degrees

- C. Ph.D. Degree in Physics
- D. Ph.D. Degree in Chemistry

2. ADMISSION

(EMU Graduate Programs, Registration and Admission By-Law)

First of all, the candidates applying for Ph.D. studies must have completed a relevant MS degree. Admission of an applicant is decided by the GSCPCD. Prospective applicants are required to have a Bachelor of Science (BS) Degree for Physics/Chemistry's PhD Programs with a $CGPA \geq 3.00$ out of 4.00 or its equivalent:

Grading system	Matchings
Four numeral	$\geq 3.00 / 4.00$
Hundred numeral	$\geq 75 / 100$
Twenty numeral	$\geq 15 / 20$
Fifteen numeral	$\geq 11.25 / 15$
Five numeral	$\geq 3.75 / 5.0$

Applicants having extra evidence of academic achievement with $2.5 \leq CGPA < 3$ of BS Degree and with $CGPA \geq 3.5$ of MS Degree may also be accepted. Acceptance of such an application is conditional on the approvals of the GSCPCD and the DC.

3. DURATION, ACADEMIC ADVISOR, and THESIS SUPERVISOR

- i. The duration of Doctoral Degree studies in EMU is stated in Article 11 (1-8) of "EMU By-Law for Postgraduate Studies and Examinations". The general practice is not less than 6 semesters.
- ii. According to Article 12(1) of "EMU By-Law for Postgraduate Studies and Examinations", a thesis Supervisor of a student admitted to the Ph.D. program must be a faculty member (Assist.Prof.Dr./Assoc.Prof.Dr./Prof.Dr.). An accepted applicant is encouraged to arrange a faculty member who expresses her/his willingness to supervise herself/himself. However, in the case of a thesis supervisor not being specified, GSCPCD assigns an academic advisor to the Ph.D. student. A relevant form (Graduate Student Advisor Appointment Form) is filled in and the Director of IGSR is informed accordingly. If a need arises, a co-supervisor (with degree of Assist.Prof.Dr./Assoc.Prof.Dr./Prof.Dr.) from within or outside the university can be appointed to contribute towards the supervision of the thesis. Reasons for the

appointment of a co-supervisor and the areas of contribution of each supervisor are indicated in the relevant appointment form.

- iii. An advisor can only register a student to the compulsory courses. In order to register for the non-compulsory courses, the student needs the approval of her/his thesis supervisor.
- iv. A thesis supervisor should be appointed for each Ph.D. student, if the supervisor has not been appointed before, taking into consideration the preference of the student and subject to the consent of the concerned academic staff, no later than the add-drop date of the third semester of the student in accordance with Article 12(1). The student registers to the Ph.D. thesis course and starts doing preliminary work on the thesis topic. A relevant form (Ph.D. Thesis Preliminary Proposal Form) is filled in and submitted to the IGSR accordingly.
- v. Ph.D. student registers for the thesis study (PHYS600/CHEM600) every semester and completes the Ph.D. thesis until the Ph.D. thesis defense date. At the end of every semester, thesis supervisor assigns “Satisfactory (TP)” or “Unsatisfactory (TU)” grades according to the student’s performance. After the Ph.D. Qualifying exam and the acceptance of the student’s Ph.D. Thesis Proposal, the grade of the Ph.D. thesis is given upon the decision of the Thesis Monitoring Committee
- vi. In the case of the thesis supervisor leaving the University temporarily or permanently, duties of the thesis supervisor continue subject to the consent of the thesis supervisor and the student, and the approvals of the GSCPCD and DC. However, an academic advisor among the University staff is appointed for the student. Relevant forms are filled in and the Director of IGSR is informed accordingly. If the thesis supervisor declares that she/he does not want to continue supervising the student, the GSCPCD will suggest an appropriate supervisor to the student asap.

3. Ph.D. COURSES

- i. The Doctoral program requires on a minimum of 21 credit-hours of at least 7 courses to be completed, the “Qualifying Examination” and the preparation of a doctoral thesis.
- ii. The student determines and registers for the Ph.D. courses (which have not been previously taken) to be taken in consultation with the academic advisor or the thesis supervisor. Registration must be approved by the academic advisor or the thesis supervisor, the GSCPCD, and the DC.
- iii. The student must take courses from at least three different faculty members to complete the Ph.D. program. The advisor, supervisor(s), and students are responsible to make sure to fulfill this rule.
- iv. Upon the suggestion of the thesis supervisor (with the consent of the GSCPCD and the DC, and approval of the Director of IGSR), a maximum of 2 Postgraduate courses

may be taken from another university. The equivalence of the grades obtained from such courses is determined by the GSCPCD and approved by the DC and the Director of IGSR.

- v. The minimum passing grade is “B” for the courses taken in the Ph.D. program.
- vi. Regardless of their status, students who fail to successfully complete the credit courses required by the program within 4 semesters will be dismissed from the Ph.D. program.
- vii. Any compulsory Ph.D. course that has already been taken by a Ph.D. student (seen in her/his MS transcript), at least **B** grade is required. Otherwise, the associated Ph.D. course must be re-taken as a “deficiency course” through her/his Ph.D. study.
- viii. A student obtaining a grade below “B” in a compulsory course will have to repeat the same course in the first semester the course becomes available. (The Department makes sure that this course will be offered before the end of the student’s course taking period.) For Postgraduate elective courses from which the student fails, the same course or a new course subject to the approvals of the GSCPCD and academic advisor/thesis supervisor may be taken.
- ix. Students who fail a credit Postgraduate course with the same code twice or who fail a total of 2 courses taken any time during the Postgraduate studies (even if a certain course was passed during the second time) are dismissed from the IGSR.
- x. Based on the student’s English level specified at the beginning of the program, the student is required to register for the specified courses as of the first academic semester. Depending on her/his English level, each student is obliged to follow the English Support Program for at least one semester and become successful. Courses offered at the English Support Program are non-credit courses and students are evaluated as Successful (S) or Unsuccessful (U). If a student receives two consecutive (U) grades from the English course with the same course code, regardless of the fact that s/he took a leave of absence during this period, she/he will be dismissed from the Ph.D. program.

4. CURRICULA OF PHYSICS AND CHEMISTRY PH.D. PROGRAMS

Each Ph.D. program offered by the Departments of Physics and Chemistry requires a minimum of 21 credit-hours of at least 7 courses to be completed, the Ph.D. Qualifying Examination and the preparation of a doctoral thesis.

A. Ph.D. in Physics

a. Compulsory Courses

1. PHYS600 Ph.D. Thesis
2. PHYS611 Mathematical Methods for Engineers and Scientists-II
3. PHYS621 Classical Mechanics-II
4. PHYS622 Electromagnetic Theory-II
5. PHYS652 Quantum Mechanics-II
6. PHYS699 Ph.D. Qualifying Exam

b. At least three Physics Postgraduate courses must be selected by the student under the guidance of her/his supervisor and upon approval of the DC from the following postgraduate courses:

1. PHYSXXX Any Other Physics Postgraduate Course (either from the existed ones or from the ones to be opened in the future)
2. MATHXXX Any Relevant Mathematics Postgraduate Course
3. COMPXXX Any Relevant Computer Postgraduate Course
4. CHEMXXX Any Relevant Chemistry Postgraduate Course
5. GRAD501 Graduate Research Skills for Science & Engineering
6. Any Relevant Engineering Postgraduate Course

B. Ph.D. in Chemistry

a. Compulsory Courses

1. CHEM600 Ph.D. Thesis
2. CHEM699 Ph.D. Qualifying Exam
3. CHEM507 Special Topics in Physical Chemistry (*If not already taken in the MS program with $\geq B$ grade*)
4. CHEM508 Special Topics in Organic Chemistry (*If not already taken in the MS program with $\geq B$ grade*)
5. CHEM545 Fundamentals of Analytical Chemistry (*If not already taken in the MS program with $\geq B$ grade*)

b. Selective Compulsory Courses from

6. CHEM541 Special Topics in Electrochemistry (Compulsory for a Ph.D. student who will write her/his dissertation in organic field) (*If not already taken in the MS program with $\geq B$ grade*)
7. CHEM511 Principles of Polymer Science (Compulsory for a Ph.D. student who will write her/his dissertation in polymer field) (*If not already taken in the MS program with $\geq B$ grade*)

b. In accordance with the obligation to complete the 7 postgraduate courses in Chemistry Ph.D. program, Chemistry Postgraduate courses must be selected by the student under the guidance of her/his supervisor and upon approval of the GSCPCD from the following postgraduate courses:

2. CHEMXXX Any Chemistry Postgraduate Course (either from the existed ones or from the ones to be opened in the future)
3. MATHXXX Any Relevant Mathematics Postgraduate Course
4. COMPXXX Any Relevant Computer Postgraduate Course
5. PHYSXXX Any Relevant Physics Postgraduate Course
6. PHARXXX Any Relevant Pharmacy Postgraduate Course
7. Any Relevant Engineering Postgraduate Course
8. GRAD501 Graduate Research Skills for Science & Engineering

6. Ph.D. QUALIFYING EXAMINATION

- i. Ph.D. students who have completed the minimum course requirements specified in "Article 11(1) of EMU By-Law for Postgraduate Studies and Examinations" will register for the qualifying exam during the registration period of the following semester. The aim of the Ph.D. qualifying exam is

to determine the student's sufficiency in research, knowledge and skills on basic and relevant subjects in their Ph.D. studies.

- ii. Student who is going to enter the Ph.D. Qualifying Examination must have a PhD Thesis Preliminary Proposal Form, which was already submitted to the IGSR.
- iii. Ph.D. Qualifying Examination consists of written and oral exams.
- iv. Those examinations should be conducted within the Ph.D. Qualifying Examination period, which is shown in the *Academic Year Important Dates* of the IGSR of EMU.
- v. The Ph.D. Qualifying exams are conducted within the last 15 days before the end of the classes on a date and place determined by the DC (see *Article 14(4) of EMU By-Law for Postgraduate Studies and Examinations*).
- vi. In the Departments of Physics and Chemistry, Ph.D. Qualifying Examination is administered centrally. In the Physics Ph.D. Qualifying Examination, thesis supervisor and the Physics members of the GSCPCD are appointed as the Ph.D. Qualifying Committee. Similarly, in the Chemistry Ph.D. Qualifying Examination, thesis supervisor and Chemistry members of the GSCPCD are appointed as the Ph.D. Qualifying Committee (see "*Article 14(2) of EMU By-Law for Postgraduate Studies and Examinations*").
- vii. Chair of the Ph.D. Qualifying Committee is the Chair of the GSCPCD for both departments. In case of a setback or if the Chair of the GSCPCD is the supervisor of the examinee, the Chair of the GSCPCD assigns an appropriate Chair to the Ph.D. Qualifying Committee, by taking the approval of the DC.
- viii. Ph.D. Qualifying Examination Guide must be prepared by Ph.D. Qualifying Committee. This guide is a detailed written document which shows from which subjects of the courses and research fields a Ph.D. Qualifying examinee is responsible in the written and oral Ph.D. Qualifying exams. Ph.D. Qualifying Examination Guide should be distributed to every student when she/he registers to PHYS699/CHEM699.
- ix. The Chair of the Ph.D. Qualifying Committee or one of the oral jury members, excluding the supervisor/co-supervisor, appointed by the Chair is the moderator of the Ph.D. Qualifying oral exam.
- x. With the approval of the Director of IGSR, the Ph.D. Qualifying Committee assigns the Ph.D. Qualifying written and oral exam juries with the purpose of designing, preparing, and administering exams in different subject areas. To this end, "Authorization Request to Schedule a Ph.D. Qualifying Examination Form" must be filled in and submitted for the approvals of the DC and the Director of IGSR.
- xi. All the exams must start and end during the official working hours of the university. The invigilators of the Ph.D. Qualifying written exams must be

selected from the full-time academic staff having a doctoral degree. The DC prepares the invigilation list. Supervisor/Co-supervisor cannot be an invigilator in the Ph.D. Qualifying written exams. In the case of an extraordinary situation, the Ph.D. Qualifying Committee has a right to postpone (no later than the last day of the Ph.D. Qualifying Examination period) the examination(s) with the consents of the GSCPCD, the DC, and the Director of IGSR.

- xii. Students who register to PHYS699/CHEM699 are considered to be Unsuccessful if they do not enter the Ph.D. Qualifying examination without showing any valid excuse and asking for a delay.

A-PH.D. QUALIFYING WRITTEN EXAM

- i) The members of the Ph.D. qualifying written exam juries are responsible for submitting [either by hand (closed envelope method) or as encrypted document in electronic form] their Ph.D. Exam Problems to the DC before the Ph.D. qualifying written examination.
- ii) The duration of each part of the Ph.D. qualifying written exam should be maximum 3 hours. The number of questions to be asked in the exam must be determined by the Ph.D. qualifying written exam juries in such a way that the relevant period should be respected.
- iii) The written part of the Ph.D. qualifying exam is split into 2, namely Paper-I and Paper-II. All students attending to the Ph.D. qualifying exam in one exam period take the same Paper-I exam, comprising problems/questions are asked from the MS compulsory courses. Paper-II should include problems/questions from two-course subjects of undergraduate Physics/Chemistry and from the subjects selected from the postgraduate courses (at least two courses) within the student's research field, including her/his minor interests.
- iv) At least three Ph.D. qualifying written exam jury members must give contribution to Paper-I and Paper-II, separately.
- v) Ph.D. qualifying examination starts with Paper-I exam on the 1st day of the Fall/Spring semester of the Ph.D. Qualifying examination period shown in the "*Academic Year Important Dates* of the IGSR of EMU". Paper-II exam is conducted within three working days after the Paper-I exam. Each Paper-exam is prepared with a total mark of 100.
- vi) Each Ph.D. qualifying written exam jury member's question for Paper-I will have a weight, which is formulated as follows

$$\frac{100}{\text{Jury member number}}\%$$

vii) Each Ph.D. qualifying written exam jury member's problems/questions for Paper-II within the student's research field, including her/his minor interests; will have a weight, which is formulated as follows

$$\frac{70}{\text{Jury member number}}\%$$

and undergraduate Physics/Chemistry problems/questions will have a weight of 30%. If more than one jury member is going to contribute for this part, the contribution of each jury member will be

$$\frac{30}{\text{Jury member number}}\%$$

viii) In the topics of Undergraduate Physics/Chemistry each student will be responsible from two-course subjects selected by her/his supervisor. The associated courses are listed below:

PHYSICS	
1	Quantum Physics
2	Optics and Modern Physics
3	Classical Mechanics
4	Physics of Atoms, Molecules and Solids
5	Physics of Fluids
6	Nuclear Physics and Particles
7	Electromagnetic Theory
8	Condensed Matter Physics
9	Statistical Mechanics and Thermodynamics
10	Health Physics

Please see the appendix for the contents of the undergraduate Physics courses.

CHEMISTRY	
1	Organic Chemistry
2	Analytical Chemistry
3	Quantum Chemistry
4	Physical Chemistry
5	Inorganic Chemistry
6	Biochemistry
7	Polymer Chemistry
8	Environmental Chemistry
9	Electrochemistry
10	Chemical Kinetics and Thermodynamics

Please see the appendix for the contents of the undergraduate Chemistry courses.

ix) The number of problems/questions prepared by each jury member should be more than the number of problems/questions to be answered. The student should

only answer the number of problems/questions stated by each jury member (by selecting from the problems/questions being asked).

x) DC is responsible to conduct the exam at the relevant time and place (see *Article 14(4) of EMU By-Law for Postgraduate Studies and Examinations*) with the assigned invigilators. When the Ph.D. qualifying written examinations are over, DC and Chair of the Ph.D. Qualifying Committee are responsible for distributing the exam papers which are answered by the Ph.D. student(s) back to the Ph.D. qualifying written exam jury members, who must complete marking the exam papers within 3 days after the start time of the relevant written exam (Paper I/II). In sequel, Ph.D. qualifying written exam juries' members must inform the Chairs of Ph.D. Qualifying Committee and Department from the results of each Paper in written - either by hand or by email - before the date of the oral examination.

xi) The written Ph.D. qualifying exam' papers submitted back by the student and marked by the Ph.D. qualifying exam juries must be delivered by the Chair of the Ph.D. Qualifying Committee to the DC in order to be filed in the student's personal folder. This should be done before the submission of the "Ph.D. Qualifying Examination Report form".

xii) The minimum passing mark for each Paper (Paper-I and Paper-II, separately) is 50/100. However, the overall **Passing Grade** of the Ph.D. Qualifying written examination is **70**, which is to be calculated by arithmetic mean of the Paper-I and Paper-II. On the other hand, the status of a student, who got 60-69 overall in the Ph.D. Qualifying written examination will be clarified in the Ph.D. Qualifying oral exam.

B-PH.D. QUALIFYING ORAL EXAM

i) Ph.D. Qualifying Oral exam should be organized within three working days after the Paper-II exam.

ii) The jury of the Ph.D. Qualifying Oral exam preferably consists of faculty members who are researchers in the field of student's thesis subject. Besides, for a student scored 60-69 overall in the Ph.D. Qualifying written examination, the written exam jury member, whose from her/his part the student got the worst grade in the written exam, can attend (if she/he wishes) to the student's Ph.D. Qualifying oral exam jury. However, although the aforementioned jury member has a right to ask questions to the student and to give remarks about the student's performance in the Ph.D. qualifying oral exam, she/he has no right to vote the final decision about the student's successfulness/unsuccessfulness in the Ph.D. qualifying oral exam.

ii) Ph.D. Qualifying oral exam (not exceeding one hour) tests the applicant's comprehensive understanding of the course materials closely related to the student's chosen research field. Ph.D. Qualifying oral exam may include questions from the subjects that student showed low performance in the written exam.

iii) Ph.D. Qualifying oral exam is a presentation of a short research paper, a book chapter, short literature reviews from selected papers related to the preliminary

thesis proposal, etc., provided by the oral exam jury at least one week before the Ph.D. Qualifying oral exam.

C-EVALUATION OF PH.D. QUALIFYING EXAM

- i. The result of the Ph.D. Qualifying oral exam is based on the opinion of the Ph.D. Qualifying Committee. The evaluation should be made as Successful or Unsuccessful.
- ii. If the Ph.D. Qualifying Committee includes an exam jury/juries consisting of academic staff as well as the committee members, evaluation is done by an extended committee including the jury/juries.
- iii. The Ph.D. Qualifying Committee evaluates the student as Successful (QS) or Unsuccessful (QU) and informs the DC, Chair of the GSCPCD, and Director of IGSR, accordingly.
- iv. Students who are evaluated as Unsuccessful in any of the Ph.D. Qualifying Exams (Written/Oral) will register for the Ph.D. Qualifying Examination in the following semester. The jury as defined in the Article 14(2) will consist of the same members, if possible.
- v. A student who fails the Ph.D. Qualifying Examination twice will be dismissed from the Ph.D. program.

7. THESIS MONITORING COMMITTEE

- i. A Thesis Monitoring Committee is formed for every student who becomes successful from the Ph.D. Qualifying Examination until the add-drop period of the semester following the Ph.D. Qualifying Examination, based on the opinion of the thesis supervisor, the recommendations of the GSCPCD and the DC, and the approval of the Director of IGSR.
- ii. The Thesis Monitoring Committee consists of three members including the thesis supervisor, one member of the department and, if possible, one member from another department. The co-supervisor, if available, can attend the committee meetings without the right to vote.
- iii. Upon the recommendation of the GSCPCD and the DC, and the approval of the Director of IGSR, members of the Thesis Monitoring Committee can be changed after the semester of its formation.

8) APPROVAL OF THESIS TOPIC AND THESIS MONITORING COMMITTEE REPORTS

(Article 16(1-4) EMU By-Law for Postgraduate Studies and Examinations)

- i. The Thesis Monitoring Committee decides to accept or reject the student's Ph.D. Thesis/Doctoral Dissertation Proposal Form with simple majority vote. The IGSR is informed about the decision of the committee which is put on a form and which includes the approvals of the Chair of the Thesis Monitoring Committee and the DC. Based on the Committee's decision, the thesis supervisor will assign either a

“Satisfactory (TP)” or an “Unsatisfactory (TU)” grade as the student’s end of semester thesis grade.

- ii. A student whose Ph.D. thesis topic proposal is rejected has the right to choose a different topic and a new thesis supervisor. Under such circumstances, a new Thesis Monitoring Committee may be appointed. Students who get reject second time from her/his Ph.D. Thesis/Doctoral Dissertation Proposal will be dismissed from the Ph.D. program.
- iii. The Thesis Monitoring Committee will meet once every semester for a student whose thesis topic proposal was accepted. The student will submit a written report to the committee at least 15 days before the meeting date, explaining the progress of the thesis work, a list of national and international publications and work planned for the following semester. The student will give an oral presentation on her/his ongoing thesis study. This presentation is open to interested people, but only the Thesis Monitoring Committee members can ask questions to the student. After the presentation, the committee convenes to give its decision. The committee evaluates the work of the student as “Successful” or “Unsuccessful”. The thesis supervisor gives the semester grade of the student’s Ph.D. course (PHYS600/CHEM600) parallel to the decision of the committee as “Sufficient (TP)” or “Insufficient (TU)”.
- iv. At the end of each semester, work regarding thesis study is evaluated as Satisfactory (TP) or Unsatisfactory (TU) by the Thesis Supervisor as explained under article 16(4). Students whose thesis study is evaluated as (TU) in 2 consecutive semesters without regard to any semester of leave of absence between the 2 semesters, or who fail thesis study 3 times at certain intervals are dismissed from the program.
- v. According to Turkey’s High Council of Higher Education (see, 20 April 2016 Wednesday, Turkish Official Journal Number: 29690), and also strongly recommended by the IGSR, any Ph.D. student must have minimum 3 Thesis Monitoring Committee Reports in her/his personal folder.

9) PH.D. THESIS, THESIS JURY, AND EVALUATION

- i. For the rules for Ph.D. thesis, please follow the *Article 17 (1-3) EMU By-Law for Postgraduate Studies and Examinations*.
- ii. The thesis must be written in accordance with the general “Postgraduate Thesis Writing” guidelines set by the Institute Directorate. The number of copies to be submitted to the Institute through the Department office must be the same as the number of Jury members (including the substitute member) set out in the *Article 18(2) EMU By-Law for Postgraduate Studies and Examinations*.

- iii. For the thesis jury to be appointed, the candidate should fulfill scientific activities and meet special conditions (at least one publication related to the thesis topic must be published or be accepted for publication in SCI/SCI-Expanded specified in the Academic Evaluation Criteria.
- iv. The candidate defends the thesis in front of the thesis jury. The thesis jury, having evaluated the written thesis and the defense of the candidate can reach one of the following decisions by a simple majority. Possible decisions are “Approved (TS)”, “Approval Upon Alteration (TI)”, “Repetition of Defense (TR)”, or “Rejected (TJ)”. Decision of the jury is verbally given to the candidate and in writing together with relevant justifications to the IGSR. Students who receive “Rejected” are dismissed from the program.
- v. Time periods associated with jury decisions “Approval Upon Alteration” or “Repetition of Defense” are in addition to all study periods indicated for the Postgraduate program in the *Article 18 EMU By-Law for Postgraduate Studies and Examinations*. Such students will be required to register to the program for the indicated period.
- vi. The other rules of the IGSR related to the Ph.D. Thesis jury and evaluation are as stated in the *Article 18 (1-9) EMU By-Law for Postgraduate Studies and Examinations*.

LIST OF SOME ABBREVIATIONS

- 1) EMU: Eastern Mediterranean University
- 2) IGSR: Institute of Graduate Studies and Research
- 2) DC: Department Chair
- 3) GSCPCD: Graduate Studies Committee of Physics and Chemistry Departments
- 4) MS: Master of Science
- 5) Ph.D.: Philosophiae Doctor or Doctorate of Philosophy

APPENDIX

List of contents of the Undergraduate Courses

Chemistry

1. Organic Chemistry

A new mechanistic approach to the study of chemical reactions and survey of hydrocarbons, alcohol, esters, aldehydes, ketones, carboxylic acids (and their derivatives), amines, amino acids and proteins. Fundamental properties of organic compounds. Survey of alkanes, alkenes, alkynes, alcohols and ethers.

Detailed study of aromatic compounds, aldehydes, ketones, carboxylic acids (and their derivatives), and amines. Spectroscopic identification of organic compounds and mechanistic approach.

Detailed information on the chemistry of Carbohydrates, Lipids, Amino Acids, Proteins and Nucleic Acids.

Analysis of Organic Molecular Structures by the use of modern spectroscopic and spectrometric methods of UV, IR, mass and NMR.

2. Analytical Chemistry

Fundamental principles and theories of analytical chemistry. Quantitative analysis by gravimetry. aqueous solution chemistry. Theory of titrimetric methods of analysis. Quantitative analysis by volumetry.

Data evaluation, errors. Theory and applications of volumetry. Molecular spectroscopy, electroanalytical chemistry, potentiometry and chromatography.

Several instruments and instrumental techniques that are currently used in industry and in research laboratories. Electro-analytical, spectroscopic and chromatographic techniques.

A brief review of physical separation principles, solvent extraction, distillation. Theory and applications of GLC, HPLC and Ion Chromatography. Contemporary development in chromatographic techniques

3. Quantum Chemistry

Particles and waves; stationary state, the elements of wave mechanics, classical mechanics, quantum mechanics. The hydrogen like atom and the diatomic molecule, electronic structure of atoms, approximate methods, molecules and chemical bond, spectroscopy.

4. Physical Chemistry

Thermodynamics. Material equilibrium, standard thermodynamics of reaction and reaction equilibrium. Real gases and kinetic theory of gases.

Extensive applications of specific physicochemical topics such as kinetics of elementary and complex reactions, molecular reaction dynamics, and electrochemical systems.

5. Inorganic Chemistry

Atomic structure, Periodic table, inorganic nomenclature, chemical bonds, molecular structure and symmetry chemical bond, covalent bond, molecular orbital theory, solid state, acids and bases.

Coordination compounds, oxidation and reduction, systematic chemistry of the metals, hydrogen and its compounds, main group organometallic compounds, systematic chemistry of the nonmetals.

6. Biochemistry

A chemical approach to biochemistry. A study of the structures and functions of biomolecules, metabolism and bioenergetics, replication, transcription and translation processes with an emphasis on the chemical structures, transformations.

7. Polymer Chemistry

Macromolecular science, some basic concepts of polymer science, polymers in nature, synthetic polymers, resins, blends and plastics, polymer composites, ceramics. Homo and block copolymers, branched and network polymers.

Polymer chains and characterization. Statistics and kinetics of polymerization reaction. Structure and properties of bulk polymers. Properties of commercial polymers.

Introductory information about the importance and application of polymers and polymer science. Materials and synthetic polymers. Plastics, ceramics, glass and rubber elasticity and entropy. Polymers as working substances to produce energy and their thermodynamic applications. Some novel applications and trends in polymer science. Properties of polymers. Introduction to polymeric materials selection and characterization.

8. Environmental Chemistry

Chemical problems related to environment. Energy balance of the earth, ozone in the stratosphere, micro meteorology, acid deposition, cycles, water treatment technologies, Greenhouse effect, photochemical smog and particles in the environment.

9. Electrochemistry

Cells, types of reversible electrodes, thermodynamics of galvanic cells, standard electrode potentials, classification of galvanic cells liquid junction potentials, emf measurements, membrane equilibrium, electrode kinetics and electrical double layer.

Electro-reduction and oxidation mechanisms of various compounds, principles and applications of polarography, cyclic voltammetry, chrono voltammetry and similar techniques along with metal coating and corrosion.

10. Chemical Kinetics and Thermodynamics

Chemical reactions, the theories of reaction rates, differential and integrated forms of rate laws and experimental determinations, and the mechanisms of elementary and complex reactions.

Basic concepts of statistical mechanics and thermodynamics. Ensembles and ensemble averages, partition functions, Boltzmann distribution. Introduction to computer simulation methods for extracting thermodynamical properties.

Physics

1. Quantum Physics

Introduction to quantum ideas; postulates of quantum mechanics; one dimensional problems; harmonic oscillator; angular momentum.

Matrix formulation; perturbation theory; interaction of electromagnetic radiation with atomic systems; identical particles; quantum statistics; selected applications to lasers, semiconductors; electron conduction; superconductivity.

Postulates of quantum mechanics; Dirac delta function and Dirac notation; the Schrödinger equation in three-dimensions; angular momentum; the radial equation; the hydrogen atom; interaction of electrons with electro-magnetic field; operators, matrices, and spin; the addition of angular momenta; time-independent perturbation theory.

The real hydrogen atom; atomic and molecular structure; time dependent perturbation theory; radiation; radiation; collision theory.

2. Optics and Modern Physics

Optics: ray model of light; reflection and refraction; mirrors; thin lenses, simple optical instruments, waves, interference, diffraction, polarization. Modern Physics: special theory of relativity, particle properties of waves, wave properties of particles, Bohr model of atoms; introduction to quantum mechanics, nucleus and radioactivity.

3. Classical Mechanics

Lagrangian mechanics; Hamiltonian mechanics; the two-body central force problem; dynamics of a system of particles; motion in a non-inertial reference frame; rigid body motion; small oscillations; nonlinear oscillations and Chaos.

4. Physics of Atoms, Molecules and Solids

The exclusion principle; ground states of multielectron atoms and periodic table; LS coupling, Zeeman effect, quantum statistics, classical and quantum description of the state of a system; electronic, vibrational and rotational energies of molecules; band theory of solids; the quantum free-electron model; the motion of electrons in a periodic lattice

5. Physics of Fluids

Properties of fluids; molecular structure and the continuum hypothesis; the fundamental law of viscosity; pressure variation in static compressible and incompressible fluids; description of fluid motion using Lagrangian and Eulerian methods; principle of mass conservation and Bernoulli's equation; analysis of

rotational and potential flows; stream function, velocity potential and Cauchy-Riemann conditions.

6. Nuclear Physics and Particles

Nuclear properties and nuclear models; alpha, beta and gamma decays; the Mössbauer effect; excited states of nuclei; fission and fusion; elementary particles; nucleon forces; fundamental interactions and conservation laws; hyper charge and quarks; isospin; pions and muons. Nuclear astrophysics.

7. Electromagnetic Theory

Maxwell's equations; electromagnetic waves; propagation of electromagnetic waves in bounded region; Lienard-Wiechert potential; field of accelerated charge; electromagnetic radiation; Thomson cross-section; Lorentz transformation of electromagnetic fields.

8. Condensed Matter Physics

Energy bands, p-n junctions, Fermi surfaces, electron dynamics in external fields, optical properties, dielectric properties, magnetic properties.

Superconductivity, review of magnetic properties, magnetic resonance, Masers and Lasers, devices, defect and alloys.

9. Statistical Mechanics and Thermodynamics

The macroscopic and microscopic states; statistical basis of thermodynamics; probability concept; quantum and statistical nature of probability; elements of ensemble theory; macrocanonical, canonical and grand canonical ensembles quantum and classical statistics; Fermi-Dirac and Bose-Einstein systems, and some other applications.

10. Health Physics

Atomic and nuclear structure, radioactivity, interaction of radiation with matter, radiation detection and measurement, radiation dosimetry, biological effects of ionizing radiation, radiation protection and non-ionizing radiation