

## **GUIDELINES FOR RESEARCH MASTER THESIS**

### **1 Objective**

This document provides guidelines for the EMQAL consortium to propose subjects for research thesis, and for students and supervisors on the Master Research Thesis period. It was developed by the PMT of EMQAL in order to agree on a common set of rules that obeys the specific regulations on each partner institution.

### **2 Scope**

This procedure describes the minimum rules regarding Master Research Thesis within the EMQAL. In addition to these guidelines, each host university will follow its local rules and legislation.

### **3 List of Abbreviations and Definitions**

EMQAL – Erasmus Mundus Master in Quality in Analytical Laboratories

EM – Erasmus Mundus

PMT- Program Management Team

PD – Programme Director

PC – Programme Coordinator

Host Institution – the University of the EMQAL Consortium which academic staff includes the Thesis Promoter and/or is directly responsible for the research thesis,

Thesis Promoter – Doctorate member of the academic staff (Professor or Researcher) of the Host Institution who proposes a research thesis. The Promoter is responsible for giving the student all the conditions needed for the successful completion of his/her research thesis. The Promoter may or may not be the same person as the Supervisor.

Thesis Supervisor – person who is responsible for closely accompanying the research work of the student. This may or may not be the same person as the Promoter.

RMT – Research Master Thesis

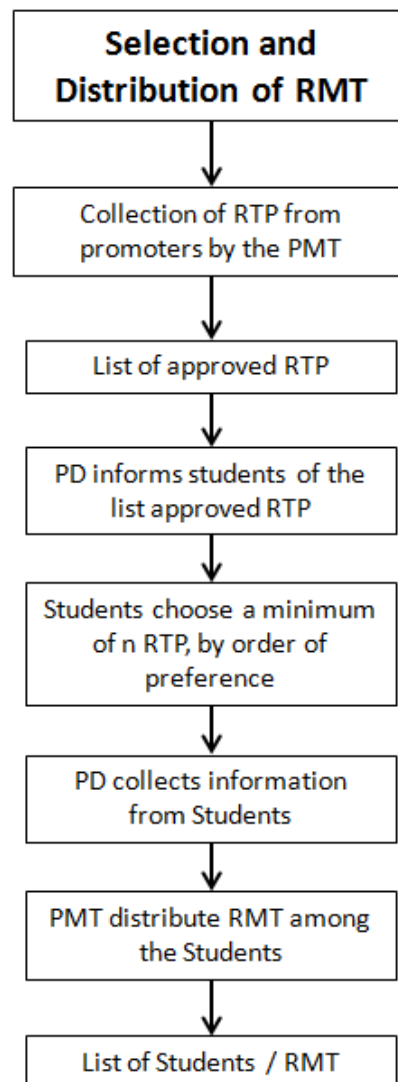
RTP – Research thesis proposals

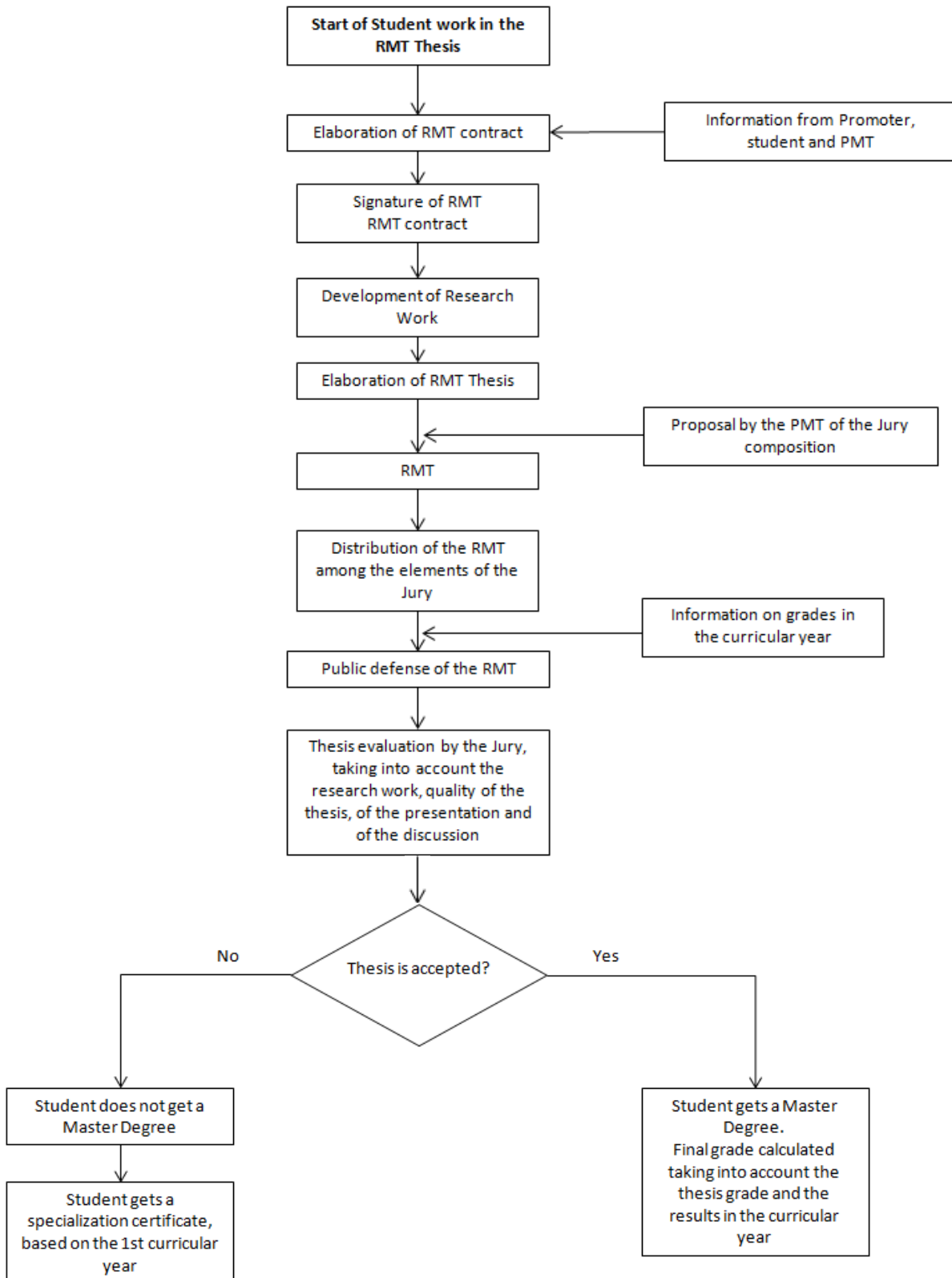
### **4 Responsibilities**

PMT	To collect, select and propose yearly a list of research thesis proposals for EMQAL students
PD	To communicate with the students and the PMT during the phase of collection and distribution of the Research Thesis Proposals.

Student	To choose a Research Thesis according to the rules defined in this procedure. To discuss and agree with the Promoter the conditions for pursuing the research work. To complete his/her research work, to write and defend a Research Thesis according to the Supervision Agreement.
Thesis Promoter	To propose research thesis for EMQAL students. To provide his/her research students with all the necessary conditions for the successful completion of the Thesis.
Supervisor	To accompany and help the student during the work and writing phase of the research thesis.

## 5 Flowcharts





## 6 Description

### 6.1 Selection of Research Proposals

Each partner may contribute with a reasonable number of RMTs proposals, to give the students a wide choice and diversity of subjects. The number of students assigned to each partner may be restricted by the PMT each year.

The Consortium should propose some RMT in collaboration with the non-EU partners or non-EU Associated Partners. These theses should be planned so that the student may complete 15 ECTS in the non-EU partner and 45 ECTS in one of the European universities of the consortium.

Theses may be proposed in collaboration with other institutions inside the consortium, including the Associated Partners. In this case, a local supervisor will be defined, but there will always be a promoter, who is a member of a full partner university of the EMQAL consortium and who is responsible for the academic quality of the work.

The members of the PMT will collect information from research supervisors/promoters in their institutions and send a title and a short description of each project to the PC together with the recommended background of the student for succeeding in the RMT project. This information is collected using the template *M0205 - Template for thesis proposals*. The PC will prepare a list of all the proposed RMT projects and submit it for approval by the PMT. The members of the PMT should approve a final version of this list. Deadlines for each of these actions should follow the established calendar.

Any EMQAL student may propose a RMT he/she may wish to pursue. The PD will ask this from the students, and it should be submitted together with the selection of RMT by all students. Such proposals will be evaluated by the PMT using similar criteria as for the other proposals.

To be accepted by the PMT, RMT projects must comply with the following criteria:

- a) be within a subject related to EMQAL. This can be on Quality Management, Data Analysis, Analytical Chemistry or within any research project having a strong component of analysis, where students can apply the knowledge they acquired in the curricular part of EMQAL;
- b) be feasible within one year, including the time for writing and public defence. Research projects must be an original contribution to knowledge for the student.
- c) the promoter holds a doctorate degree and is member of the academic staff of one of the partner universities.
- d) each institution must provide two contact persons (names and email) for each RMT project.

## **6.2 Distribution of Research Proposals**

The PD gives the list of approved RMT projects to the students. This list contains the title, a short description of the project, the supervisor(s) and the institution(s) offering the project.

Students are asked to rank at least five projects by order of their preference. The students are advised that, in case none of their choices is available, the PMT may assign them to any research project. They should deliver their preferences to the PD by the established deadline.

The PD assigns the RMT projects to the students based on their preferences and on their original ranking during the selection procedure. In case more than one student chooses the same project, the higher ranked student is selected. The project promoters are also consulted and may decide to accept a different student than the first one ranked by the PMT, based on their backgrounds and specific skills for the RMT. However, administrative problems (for instance, students arriving late by visa problems or whatever), the request of fulfilling the EM mobility rules and other extraordinary personal reasons will allow the PMT to change the distribution order by ranking. Specific demands by students regarding the RMT projects will be analysed by PMT case by case.

In order to guarantee an equal distribution of the students among EU-partners (including EU-Associated partners), the maximum number of assigned RMT projects by institution should be as close as possible to the result obtained by dividing the total number of students by 4 (or 3 when UB or UCA are the host institution), in order to accommodate possible extraordinary cases as those above mentioned.

The PD submits the list of RMT projects and students to the PMT for approval, by the established deadline.

## **6.3 Contents**

### **6.3.1 Duration**

The thesis has a value of 60 credits, which corresponds to a workload of maximum 1800 hours, including study, experimental, writing, preparation of presentations, etc. The defences of the RMTs will take place during the last month of the second academic year. Exceptionally, if some additional time would be required by particular circumstances (family problems, equipment failures, ....), the student, with the agreement of the supervisor/s will communicate to the local PMT representative in order to be approved by PMT. A detailed calendar for RMT defences will be approved, at due time and according to the internal rules of the institutions, by PMT.

### 6.3.2 Purposes

The purpose of the RMT is to give the student experience of independent work on a problem. In order to pass the evaluation, the thesis must meet the following requirements: *i)* the thesis should address a clearly stated problem; and *ii)* the thesis should contain an independent contribution to knowledge.

### 6.3.3 Format

The thesis must have the format specified by the PMT. The thesis must have a professional form, and the text must be of acceptable clarity and correctness. A professional form means a form like a scientific article or research report. All references in the text should be listed in the bibliography. On the other hand, the bibliography should only list works that are referred to.

## **6.4 Thesis Agreement and Contract**

No later than two weeks after work on the thesis commences, the student and thesis promoter must draw up a Supervision Agreement containing the following information:

- Plan for supervision during thesis preparation, including the minimum contact time a supervisor should spend with the student.
- Regime of intellectual property and confidentiality statements.
- Title of RMT the project.
- Weight of thesis in ECTS credits (60).
- Tentative work plan.
- Period for submitting the thesis in accordance with the rules on scope and time

The Supervision Agreement must be signed by the student and supervisor and a copy sent to the PMT. In case of shared thesis among different institutions (partners or associated partners), individual copies of this agreement must be completed by at least one supervisor of each institution, upon arrival of the student to the partner. In order to guarantee the coherency of the joint project, both supervisors should be aware of the development of the project, including regular communication among supervisors already from the beginning of the project.

The purpose of having a plan for supervision during thesis preparation is to ensure that the student and thesis supervisor/s agree on the expectations and playing rules regarding supervision during thesis preparation. Student and supervisor/s may jointly decide whether to make the plan very general or very detailed. The plan may be based on the general guidelines for supervision during thesis preparation. A template for the Supervision Agreement is provided by the PMT (*M0210 - Template for Supervisor Agreement*). .

The student must sign a renewed Supervision Agreement in which the project description is revised so that the student will be able to complete the thesis within three months<sup>1</sup> in the following cases:

- 1 - failure to meet the deadline of submitting the thesis;
- 2 - non-acceptance of the thesis by supervisor;
- 3 - non-acceptance of the thesis by the jury,

The revised project description must be in the same topic area. An extended deadline does not mean an increase in the ECTS weight of the thesis. If the new deadline is not met, and only under exceptional circumstances, the student may be offered a third examination attempt and a renewed Supervision Agreement.

## **6.5 Supervision**

### **6.5.1 Scope and nature of supervision**

Students of EMQAL are entitled to receive a minimum of 10 h per trimester of supervision individually or in groups during the RMT period.

**Supervisor(s)** shall give advice on formulation and demarcation of subjects and problem approaches for the thesis, literature, subject contents, tasks and progress plan. Supervisor(s) are under obligation to receive and discuss drafts with the student. This shall normally take place on demand and shall be scheduled evenly throughout the agreed period. Supervisor(s) shall record an overview of the supervision in order to monitor the progress in the candidate's work and assess this in relation to the plan of work.

**The student** is obliged to keep the supervisor(s) informed about the work, at least monthly, if necessary by written notification. This applies also to practical aspects that are essential for the progress of the RMT. The student is obliged to abide by the principles of research applicable to the subject area.

**The PMT representative** of the institution where the RMT is in progress **must be informed** by both the student and the supervisor about the progress of the RMT at least one at trimester, if necessary by written notification. If not informed or if any problem arises, the representative of the PMT must inform about it in the next PMT meeting.

### **6.5.2 Changes in supervision conditions**

Both supervisor and student may request that the supervision agreement be cancelled. The student or the supervisor, and PMT, are mutually obliged to inform the other party of any problem in fulfilling the agreement.

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<sup>1</sup> Obtaining visas, residence permits, finding housing, financing, etc. for the period of the new contract will be the sole responsibility of the student.

If the student finds and justifies the supervision to be unsatisfactory, he/she shall notify the PMT about it. The PMT must collect information about the situation and will assess whether the supervision conditions shall be changed or cancelled.

If the supervisor finds and justifies that the student is not fulfilling duties satisfactorily, the PMT shall be notified accordingly. The PMT must collect information about the situation and will assess whether the supervision conditions shall be changed or cancelled.

The student may not hold the supervisor, institute, PMT or university responsible for the result of his/her education.

## **6.6 Reporting**

### **6.6.1 The reporting consists of 2 parts:**

Thesis

Thesis defence

### **6.6.2 The thesis must contain the following parts:**

Objectives.

State of the art of the subject with proper references.

Description of experiments, work done, findings, discussion, etc... (Articulated in chapters).

Conclusions and suggestions for future work.

The thesis is handed over to the jury members at least 2 weeks before the final defence, unless decided otherwise by the host university.

### **6.6.3 Guidelines for writing the thesis**

The final report is 40 to 80 DIN A4 pages with a margin at least 3 cm wide both left and right sides. Character Times 12 (or equivalent) should be used and line spacing 1,5. The cover page should contain the logos of EMQAL and Erasmus Mundus Programme, as well as those required according to the local rules.

The following items must be included:

*Title:* The title should be as short as possible and contain the most essential words describing the work.

*Index:* This serves as an outline of the thesis with the headlines of text sections as key words.

*Abstract:* A short summary of what has been investigated and the findings.

*Introduction:* This provides background for the subject being treated. Critically review the essential literature for the area by discussing the results of several authors. Refer to the selected literature in context. End with a short



conclusion that sums up current knowledge in the area and points out any deficiencies in this knowledge in a way that leads up to the purpose of the investigations made in the experimental part of the thesis. Indicate whether the investigations are simply an evaluation of whether former assumptions remain valid.

*Experimental:* The details of your research should be described so precisely that other people can replicate the experiments on the basis of the instructions in your thesis.

*Instruments:* As a rule, mention all of the equipment used unless it is standard equipment that cannot be assumed to affect research results, such as scales, for example. Commercially available equipment is not usually described, but the model and name of manufacturer should be clearly indicated.

*Results and Discussion:* Not all the results from experiments should be included uncritically in the thesis. All results should be subjected to relevant statistical treatment, and these results should be included and as far as possible presented graphically (tables, bar charts, graphs or similar). The same results should not ordinarily be presented in more than one form. Only average values and results essential to the discussion/conclusion of the thesis should be included in the thesis.

Individual results and measurements, including all analysis schedules, work sheets, various printouts, etc. may be enclosed with the thesis as appendices. Figures and tables should be numbered and captioned.

Captions should be formulated so that the reader can understand the main content of the figure or table without reading the actual thesis. Research results should not have more decimal places than there is a basis for in the uncertainty of the investigation. Research results should be discussed as well as described. It is important to interpret without over interpreting. During the discussion of the results, significant effects should be pointed out and the possible causes of them should be discussed properly. Obtained results must be compared to results from similar investigations described in the literature.

*Conclusions:* They must be obtained on the basis of the results reached and experience gained. Conclusions can be either positive or negative, but they must be logical and adequately substantiated. Undocumented claims have no place in scientific writing.

*Literature cited:* There are several ways to list references and the different scientific journals have their own rules. For this case, the Analytical Chemistry (ACS) literature cited style is strongly recommended.

#### **6.6.4 Thesis Defence**

Students can only submit the final thesis evaluations after they have completed and have been approved for the 60 ECTS of the curricular part of the EMQAL.

For the final evaluation of the thesis the student will submit it to a public defence in front of a jury.

The jury will be proposed by the PMT and approved by the competent body of the host university. It includes a

minimum of three and maximum of five doctorates or specialists of recognized merit, and will include:

- a) the Chair, an element from the Host institution
- b) one element from the PMT
- c) a discussant, of recognized merit in the field of the thesis

The students must be evaluated taking into consideration the value of their work during the twelve months of the RMT project, and this must be evaluated by the supervisor. Depending on the national legislation and local rules of the host institution for the RMT project, the supervisor may not be allowed to be part of the jury. In this case, the contribution from the supervisor will be indirect. When the research thesis takes place in Portugal or Poland, the supervisor is part of the jury and contributes directly. If the research thesis takes place in Spain or Norway, then the PMT member participating in the jury has the responsibility of contacting the supervisor and taking his/her evaluation of the student into the decisions of the jury. The PMT member will assure that this opinion will be taken into account in the evaluation of the thesis.

The Host University will distribute a copy of the thesis to the elements of the jury.

A date is defined by the host institution for the public defence.

The public defence takes place according to the rules of the Host Institution.

The evaluation of the RMT involves four components:

- A. the quality of the submitted thesis;
- B. the performance of the student during the one year (60 ECTS) duration of his/her project;
- C. the public presentation of the work by the student;
- D. student's performance in his/her public defence of the work against the jury.



In case the project supervisor is not part of the jury, the PMT will have asked for his/her opinion and consider it for evaluating criterion B.

The final score of the research thesis will be calculated as the average of criteria A – D.

All meetings of the jury are recorded in minutes/protocols, stating clearly the grade of the RMT. The final grade has to be submitted to the PD of the EMQAL edition.

## 7 Input / Output

Input	Output
NA	NA

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## 8 Additional information

Calendar: (these deadlines are merely guidelines, and may be redefined by the PMT each year)

Action	Responsibility	Deadline
Collect research thesis proposals and submit them to the PD	Each element of the PMT	Mid May
Prepare list of all research proposals and submit it to the PMT	PD	June
Approve final list of research thesis	PMT + PCm	July
Disseminate list of approved thesis among the EMQAL students	PD	July - September
Collect student choices for research thesis	PD	September - October
Select students for research thesis and approve final list	PMT	October
Inform students of final list students/research thesis	PD	October - November
Start of Research Thesis work	Student and Supervisor	September
Submission of Thesis Agreement and contract	Students, Supervisor and element of the PMT	September - October
Definition of the jury composition	PMT	July - September
Submission of thesis	Student	July - September
Thesis defence	Each element of the PMT	September

\*Except when defined otherwise by the host university

## 9 Annexes

M0210 - Template for Supervisor Agreement

M0205 - Template for thesis proposals

## 10 Distribution

- 1 – Representative of EMQAL in University of Algarve
- 2– Representative of EMQAL in University of Barcelona
- 3 – Representative of EMQAL in University of Bergen
- 4 – Representative of EMQAL in University of Cadiz
- 5 – Representative of EMQAL in Gdansk University of Technology