



**Erasmus Mundus Master Course in
Chemical Innovation and Regulation**

Annual Report 2014

for the Programme Committee

University of Barcelona

July 9, 2014





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Summary

This report summarizes the results of the EMMC-ChIR project to be presented to the Programme Committee. The Programme Committee is the highest management structure in the organization of the EMMC-ChIR project. It includes representatives of the partner Universities, of the students, the lecturers, the research supervisors, and representatives of the chemical industry and regulatory bodies, as course external stakeholders.

The report is intended to be the basis for the discussion and approval of the list of modules and research topics for the next edition of the course. The annual report for the Programme Committee typically provides a brief description of the project, of its results in the previous editions and of the plans for following editions.

The present report provides information on the ongoing 1st edition (2014-2016), on the selected students and the planning for the next year.

Introduction

What is the EMMC-ChIR?

The EMMC ChIR - Erasmus Mundus Master in Chemical Innovation and Regulation - is a MSc run by a Consortium of European Universities. It provides professionals with all the tools and knowledge needed from the scientific, the regulatory and the economic point of view to manage the risks of chemicals responsibly and to meet responsibilities over chemical legislation worldwide. As an Erasmus Mundus project, ChIR aims to promote research and collaboration in the EHEA supporting the implementation of chemical safety regulations.

Who are the partners?

The EMMC-ChIR is managed by the consortium of universities University of Algarve (UAIG), University of Barcelona (UB), University of Bologna (UniBo) and Heriot-Watt University (HWU). The UAIG coordinates the project in its first five years.

In addition to the universities above (full partners), the project involves Associated Partners. The roles of the academic and non-academic associated partners include one or more of the following:

- (i) promoting the course among potentially interested companies and individuals;
- (ii) contributing to the self-evaluation and improvement of the course;
- (iii) hosting students for part of their research theses.

The following entities currently contribute to the EMMC-ChIR project as associated partners:

- NILU - Norsk Institutt for Luftforskning (Norway), www.nilo.no
- CQE - Centro de Química Estrutural (Portugal), <http://cqe.ist.utl.pt/>
- CIQA - Centro de Investigação em Química do Algarve (Portugal), <http://www.ciqa.ualg.pt/>
- CBME - Centro de Biomedicina Molecular e Estrutural (Portugal), <http://www.cbme.ualg.pt/>
- USP - Universidade de São Paulo (Brazil)
- CSU - Central South University (China), <http://www.csu.edu.cn>
- HNU - Holy Names University (USA), <http://www.hnu.edu/>
- Lab*S - Red Espanola de Laboratorios Sostenibles (Spain), <http://www.fundacionmaite.org/labs>
- GRISC - Governance Risk Research Center (Spain), www.grisc.cat
- SEQUI - Sociedade Espanola de Quimica Industrial e Ingenieria Quimica (Spain), www.sequi.es
- SPQ - Sociedade Portuguesa de Química (Portugal), www.spq.pt
- VALAGRO S.p.A (Italy), www.valagro.com
- CEFIC - European Chemical Industry Council - (Belgium) (awaits agreement of cooperation)
- ECHA - European Chemicals Agency (Finland) (EMMC-ChIR is included in ECHA's graduate Scheme)

New associated partners from stakeholders of EMMC-ChIR are welcome. New associated partners are proposed and approved annually in the meeting of the Programme Committee.

In the last PCm meeting, the following associated partners have been proposed:

3rd-country universities:

- Hokkaido University (Japan)
- University of Pune (India)
- Mahatma Gandhi University (India)
- Universidade do Estado do Rio de Janeiro (Brazil)
- Universidade Federal do Rio Grande (Brazil)
- Clemson University, South Carolina (USA)

Research centers:

- RAIZ - Instituto de Investigação da Floresta e do Papel (Portugal)

Companies:

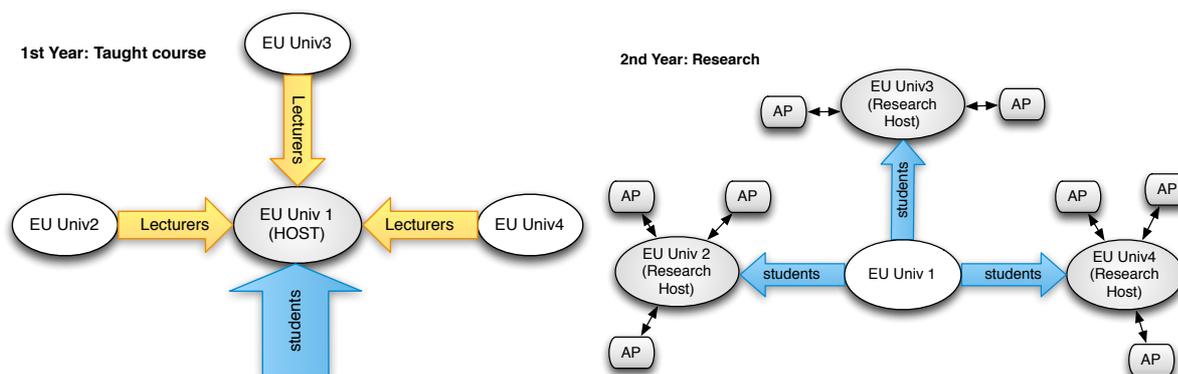
- Repsol (Spain)

Associations:

- APEQ - Associação Portuguesa de Empresas Químicas (Portugal)
- AIPQR - Associação das Indústrias da Petroquímica, Química e de Refinação (Portugal)

Structure

The Masters course has a duration of 2 years for a total of 120 ECTS credits. There are two main components: first, a fully integrated taught (Curricular) part of 60 ECTS credits (one year); second, a research project leading to a thesis dissertation of 60 ECTS credits (one year). The course is hosted in turn at the European member institutions in subsequent years.



Contents

Staff dealing with the regulation of chemicals need an integrated, interdisciplinary view of the lifecycle of chemical substances: the **Design**, including the most recent technology for the production of alternative materials; the **Industry**, including a solid understanding of the current economy of the chemical industry and the requirements for implementation of new processes; the **Market**, including understanding the social perception of the risk of chemicals; the **Assessment**, including a deep understanding of the mechanisms of environmental and human toxicity of chemicals and of the most advanced techniques to evaluate it; and the **Regulation**, including a thorough knowledge of European and non-European legislation related to the use of chemicals.

The EMMC ChIR covers these five fields essential to understand chemical regulation. As such, the course is organized into five large disciplines, within which a number of stand-alone modules is offered:

- D - Design
- I - Industry
- M - Market
- A - Assessment
- R - Regulation

Students can build a tailored study plan by choosing modules to complete each discipline. All modules are optional and each student may choose them freely, provided he/she takes a

minimum of 3 modules from each discipline and that his/her choices fulfill all the General Learning Outcomes of the course.

The same modules are not necessarily offered every year, but a sufficient number and variety is offered to allow the completion of the General Learning Outcomes.

The list of modules is proposed every year by the Programme Management Team and approved by the Programme Committee.

Project Management

Programme Coordinator: Isabel Cavaco (UAIG)

Programme Director 2013/14: Isabel Cavaco (UAIG)

Programme Director 2014/15: Daniel Sainz (UB)

Programme Management Team:

Isabel Cavaco (UAIG)
Daniel Sainz (UB)
Emilio Tagliavini (UniBo)
Teresa Fernandes (HWU)

Selection Committee:

Isabel Cavaco (UAIG)
Ana Rosa Garcia (UAIG)
Daniel Sainz (UB)
Emilio Tagliavini (UniBo)
Paola Galletti (UniBo)
Teresa Fernandes (HWU)

Examiners Board:

Isabel Cavaco (UAIG)
Daniel Sainz (UB)
Emilio Tagliavini (UniBo)

External Examiners:

Alice Newton (UAIG)
Isabel Pérez (Lab*S)

Candidates 2014-2016

Erasmus Mundus Student Applications 2014

The European Commission provides, each year, a limited number (n) of Erasmus Mundus grants. The n top ranked candidates are selected for the main list of candidates. Two restrictions were applied to get geographical and gender balance: (i) not more than 2 candidates may come from the same country, and (ii) not less than 40% must be female candidates. To comply with these restrictions some candidates may be removed from the main list and replaced by the next ranked candidates in the reserve list.

For the second edition of the course a total of 180 complete applications were received between October and December 2013. Corresponding approximately to the same number of applicants as in the first edition, which received 178 applications. From the applications to the second edition, 81% came from 3rd-country applicants (Category A), while only 19% came from European candidates, or candidates who had previously lived in Europe (Category B). Figure 1 represents the geographical distribution of candidates.

In the second edition the European Commission provided 13 Erasmus Mundus student grants: 8 for 3rd-country students (category A), 4 for European students (category B). Additional funding may be available for one studentship in the Turkey and FYROM special Window.

The top ranked candidates fulfilling geographical and gender balance received Erasmus Mundus grants. Two candidates declined the grants, which were offered to the following ranked candidates in the reserve list.

Gender distribution among candidates was skewed towards male candidates, with only 32% female candidates. This is due to the Ethiopia candidates contribution, which are almost exclusively male. Comparing with the previous edition candidates, there are 7% more female completed applications. Gender balance was monitored in the selection of candidates for EM studentships, and as a result the main list contains 41% (7) female students.



Figure 1 - Geographical Distribution of Erasmus Mundus candidates for ChIR 2014-2016



Figure 2 - Geographical Distribution of Erasmus Mundus students selected for ChIR 2014-2016 main list.

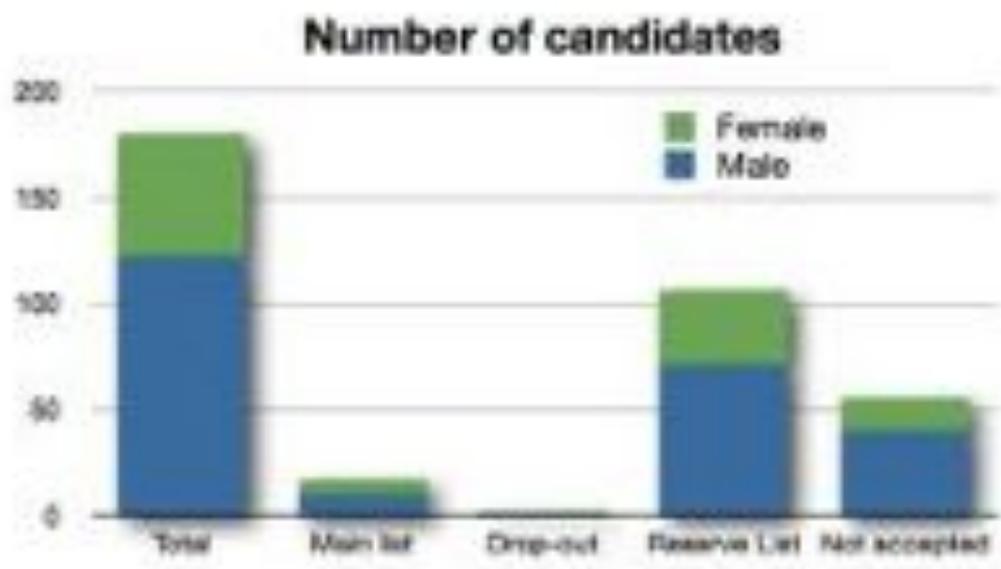


Figure 3 - Gender Distribution of Erasmus Mundus candidates for ChIR 2014-2016: **Total** number of candidates, Candidates selected for the **Main List**, Candidates declining the studentship (**drop-out**), candidates in the **reserve list** and candidates **not accepted** to the course.

List of Selected Erasmus Mundus category A Students 2014-2016:

Name	Gender	Nationality	Background (BSc/MSc)
Asnake Gudisa Ede	Male	Ethiopia	Chemistry/Environmental Sciences
Hagos Tesfay Kidanu	Male	Ethiopia	Chemistry/Chemistry
Paola Blair Vásquez	Female	Costa Rica	Chemistry
Miguel Antonio Brion	Male	Philippines	Chemistry
Angelo Kenneth Romasanta	Male	Philippines	Chemistry
Tom Kauki	Male	Kenya	Pharmacy/Pharmacy
Wei Wang	Female	China	Pharmacy/Chemistry
Yu Zhang	Male	China	Chemistry/Chemistry

List of Selected Erasmus Mundus category B Students 2014-2016:

Name	Gender	Nationality	Background (BSc/MSc)
Bazarsad Narmandakh	Male	Mongolia	Chemistry
Mireia Broch Gosser	Female	Spain	Chemistry
Shahbaz Ahmad	Male	Pakistan	Chemistry / Chemistry
Kirthiga Ramalingam	Female	India	Pharmacy / Chemistry
Nazmiye Tugce Eran	Female	Turkey	Chemistr

ChIR 2013-2015

Students

In its first edition the EMMC-ChIR received 17 students, all Erasmus Mundus grant-holders. Their names, nationalities and background are summarized below.

	Antoine Karengera (Rwanda) Pharmaceutical Sciences		Jagadish Roy (Bangladesh) Chemical Engineering & Polymer Science		Silvana Agostinho Martins (Portugal) Pharmaceutical Sciences
	Arsalan Afkhami (Iran) Chemical Engineering		Kateryna Vengel (Ukraine) Chemistry		Sohaib Mahri (Algeria) Pharmacy
	Emmanuel Neba Ambebia (Cameroon) Biochemistry		Maybel Monfero Nonato (Philippines) Biochemistry		Stavros Moschidis (Greece) Chemical Engineering
	Fabián Andrés Lara González (Chile) Chemistry&Pharmacy		Oleksii Shemchuk (Ukraine) Pharmaceutical Sciences		Tiruwork Mequanint Bezabih (Ethiopia) Analytical Chemistry
	Gokhan Gulten (Turkey) Chemistry		Pauline Angelic Roxas (Philippines) Chemistry		Victor Olusola Ajao (Nigeria) Industrial Chemistry
	Hintsa Gitet Kahsay (Ethiopia) Education in Chemistry		Payam Alikhani (Iran) Petroleum Engineering		

List of modules offered in 2013-2014

A - Assessment

code	Name of module	University	Name of lecturer
A01	<i>Environmental Assessment</i>		
A0101	Chemical Transformation and Degradation in the Environment	UniBo	Paola Galletti
A0102	Chemical Pollutants	UniBo	Paola Galletti
A0104	Environmental Analysis and Detection in the Environment	UniBo	Laura Tositti
A0105	Trace Metal Speciation	UAlg	José Paulo Pinheiro
A0106	Environmental and Health Safety of Nanotechnology	HWU	Teresa Fernandes
A0108	Chemical Pollutant Remediation	HWU	Thomas Aspray
A0109	Environmental Physical Chemistry	UniBo	Alberto Modelli
A02	<i>Toxicological Assessment</i>		
A0201	Genotoxicity Assessment	UAlg	Vera Marques
A0202	Toxicokinetics and Toxicogenetics	UAlg	Vera Marques
A0203	Trace Metal Bioavailability	UAlg	José Paulo Pinheiro
A0204	Toxicology	HWU	Teresa Fernandes
A0206	Principles of Toxicological Assessment	Ualg	Vera Marques
A0207	Human Physiology	Ualg	Vera Marques
A03	<i>General Assessment</i>		
A0303	Estimation of Uncertainty in Chemical Analysis	UAlg	Isabel Cavaco
A0304	Reference Materials and Laboratory Proficiency Testing Schemes	UB	Angels Sahuquillo
A0305	Measuring Variability and Statistical Decision	UAlg	Isabel Cavaco
A0306	Chemometrics	UB	Anna de Juan
A0307	Sampling Strategies	UB	Miquel Vidal
A0308	Experimental Design	UB	Xavier Saurina
A0309	Guidelines for the Testing of Chemicals: Toxicology Approaches	EM Scholar	Susana Etcheverry
A04	<i>Physical Hazard Assessment</i>		
A0402	Chemical Reactivity Hazards	UB	Daniel Sainz

D - Design

code	Name of module	University	Name of lecturer
D01	Alternative Green Products	UniBo	Emilio Tagliavini
D02	Properties of Materials and New Materials	UB	Merçé Segarra
D03	Patenting New Products	UAlg	Lurdes Cristiano
D04	Drug Design	UB	Axel Bidon-Chanal

D05	Structure Toxicity Relationship	UniBo	Assimo Maris
D08	Modeling and Simulation	UB	Gabriel Aullon
D09	Food and Chemistry	UB	Carne Gonzalez
D10	Soft Materials	UB	Jordi Ignes
D11	Design of Chemical formulations	UB	Santiago Esplugas
D12	Synthesis and Properties of Inorganic Nanomaterials	UniBo	Giuseppe Fallini

I - Industry

code	Name of module	University	Name of lecturer
<i>I01</i>	<i>Sustainable Chemistry:</i>		
I0101	Renewable Sources	UniBo	Emilio Tagliavini
I0103	Catalysis for a Sustainable Synthetic Chemistry	UniBo	Marco Bandini
I0104	Alternative Green Solvents	UniBo	Claudio Trombini
I0105	Green Synthetic Strategies	UniBo	Pier Giorgio Cozzi
I0106	Zeolites for Clean Chemistry	UAlg	João Paulo Lourenço
I0107	Applied Heterogeneous Catalysis	UB	Pilar Ramirez de La Piscina
<i>I02</i>	<i>Chemical and fine chemical industry:</i>		
I0203	Pharmaceutical and Fine Chemicals Industry	UniBo	Walter Cabri
I0204	Industrial Forgery Detection	UAlg	José Moreira
I0205	Chemical Process Safety	UB	Cristina Massa
I0206	Chemical Industry	UAlg	Ana Rosa Garcia / João Bordado (IST)
I0207	Nanomanufacturing and Nanoprocessing	UB	Albert Romano

M - Marketing and Social

code	Name of module	University	Name of lecturer
M01	Business Planning	UB	Guillem Crosas Cano
M02	Market Research	UB	Jaume Valls
M03	Social Perception of the Chemical Risk	UB	Ruben Huertas Garcia
M04	Health and Safety in Chemistry	UB	Daniel Sainz
M05	Life Cycle Assessment	UniBo	Fabrizio Passarini
M06	Quality Management	UAlg	Isabel Cavaco

R - Regulation

code	Name of module	University	Name of lecturer
R02	Risk Management	HNU	Paolo Ricci (EM Scholar)
R03	REACH and CLP Regulations	UB/INSHT	Ruth Jimenez (INSHT)
R04	Non-EU Regulations: Japan, Brazil and China	UB	Daniel Sainz
R06	Pharmaceuticals Regulations	UAlg	Vera Marques / João Rocha

R07	Nanomaterials and Nanotechnologies Regulations	HWU	Teresa Fernandes
R08	Chemical Waste Materials Regulations	UB	Victor Garrido / Joan Marti (Sita Spe, Suez group)
R09	Priority Substances in EU Environmental Legislation	UAlg	Alice Newton
R10	Comparative Analysis of Chemical Regulations – US and EU	HNU	Paolo Ricci (Scholar HNU)

T - Transferable Skills

Transferable skills modules provide an opportunity for students to train and improve skills that are useful in a wide range of fields. A maximum of three T modules can be included in a study plan.

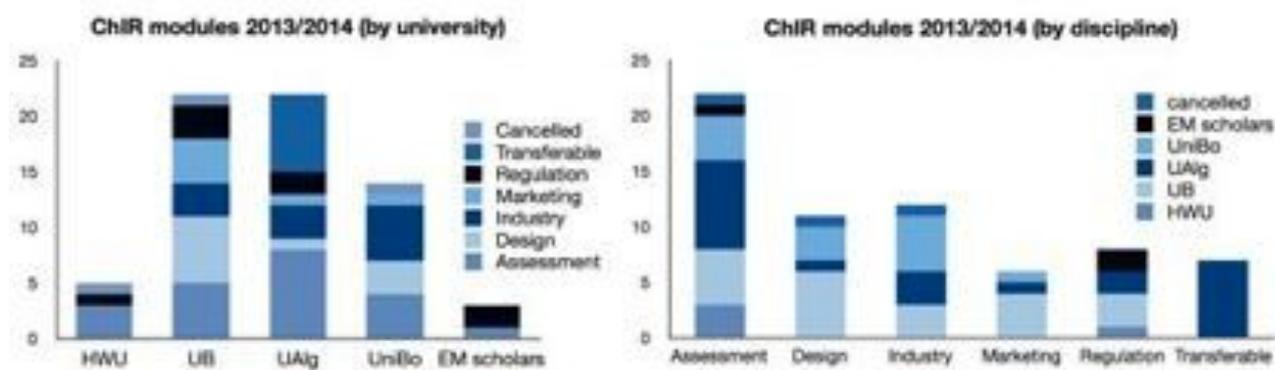
code	Name of module	University	Name of lecturer
T01	IT Tools	UAlg	José Paulo Pinheiro
T02	Communication Skills	UAlg	Isabel Cavaco
T03	Laboratory Skills	UAlg	José Paulo Pinheiro, Maria Clara Costa
T04	Research Skills	UAlg	Maria Clara Costa
T05	Fieldwork Skills	UAlg	Ana Rosa Garcia
T06	Innovation Skills	UAlg	Isabel Cavaco
T07	Intensive "Survival" Language Course - Portuguese	UAlg	Adriana Nogueira

Cancelled Modules

Three modules were cancelled this year because the small number of students choosing them was considered insufficient:

A0110	Marine Microbial Diversity and Ecology	HWU	Tony Gutierrez
D07	Chemical Databases	UB	Santiago Alvarez / Eliseo Ruiz
I0102	Green Metrics	UniBo	Marco Lombardo

Distribution of Modules by University and by Discipline



Calendar

The calendar for 2013/2014 was defined taking into account the following principles: 1) fundamental modules are taught before the ones that require knowledge acquired from others; 2) no student takes more than two modules in the same week; 3) considering the time availability of each lecturer.

The calendar is available online at:

<https://www.google.com/calendar/embed?src=e817govbncv538g5p1sn3l1ksg%40group.calendar.google.com&ctz=Europe/Lisbon>

month	week#	code	Name of module
Oct 2013	1340-42	T07	Intensive "Survival" Language Course - Portuguese
	1341	T01	IT tools
	1343	A0305	Measuring Variability and Statistical Decision
	1344	A0105	Trace Metal Speciation
Nov 2013	1345	D01	Alternative Green Products
	1346	A0304	Reference Materials and Laboratory Proficiency Testing Schemes

month	week#	code	Name of module
2013	1347	A0207	Human Physiology
Dec 2013	1349	M04	Health and Safety in Chemistry
	1350	A0204	Toxicology
		A0303	Estimation of Uncertainty in Chemical Analysis
Jan 2014	1402	A0203	Trace Metal Bioavailability
	1403	A0307	Sampling Strategies
		D10	Soft Materials
	1404	D11	Design of Chemical formulations
		I0104	Alternative Green Solvents
1405	D09	Food and Chemistry	
Feb 2014	1406	D05	Structure Toxicity Relationship
	1407	I0203	Pharmaceutical and Fine Chemicals Industry
	1408	A0101	Chemical Transformation and Degradation in the Environment
		M01	Business Planning
	1409	A0109	Environmental Physical Chemistry
		M02	Market Research
Mar 2014	1410	M06	Quality Management
		R03	REACH and CLP Regulations
	1411	A0106	Environmental and Health Safety of Nanotechnology
		A0206	Principles of Toxicological Assessment
	1412	A0108	Chemical Pollutant Remediation
		A0202	Toxicokinetics and Toxicogenetics
	1413	R09	Priority Substances in EU Environmental Legislation
	1414	A0201	Genotoxicity Assessment
R10		Comparative Analysis of Chemical Regulations – US and EU	
Apr 2014	1415	D08	Modeling and Simulation
		R02	Risk Management
	1417	T05	Fieldwork skills
	1418	D03	Patenting New Products
May 2014	1419	I0206	Chemical Industry
		R07	Nanomaterials and Nanotechnologies Regulations
	1420	A0308	Experimental Design
		I0204	Industrial Forgery Detection
	1421	A0102	Chemical Pollutants (solvents. VOC,...)
		R06	Pharmaceuticals Regulations
	1422	A0104	Environmental Analysis and Detection in the Environment
D04		Drug Design	

month	week#	code	Name of module
Jun 2014	1423	D02	Properties of Materials and New Materials
		I0106	Zeolites for Clean Chemistry
	1424	D12	Synthesis and Properties of Inorganic Nanomaterials
		R04	Non-EU Regulations: Japan, Brazil and China
	1425	I0107	Applied Heterogeneous Catalysis
		M05	Life Cycle Assessment
	1426	A0306	Chemometrics
		I0101	Renewable Sources
	1427	I0105	Green Synthetic Strategies
I0207		Nanomanufacturing and Nanoprocessing	
Jul 2014	1428	M03	Social Perception of the Chemical Risk
	1429	A0402	Chemical Reactivity Hazards
		I0103	Catalysis for a Sustainable Synthetic Chemistry
	1430	A0309	Guidelines for the Testing of Chemicals: Toxicology Approaches
		I0205	Chemical Process Safety
R08		Chemical Waste Materials Regulations	

Field trips:

Within the module I0206 - Chemical Industry and T05 - Fieldwork Skills, a study trip was organized in week 1417 to visit the following industries in the Lisbon region:

FISIPE (www.fisipe.pt)

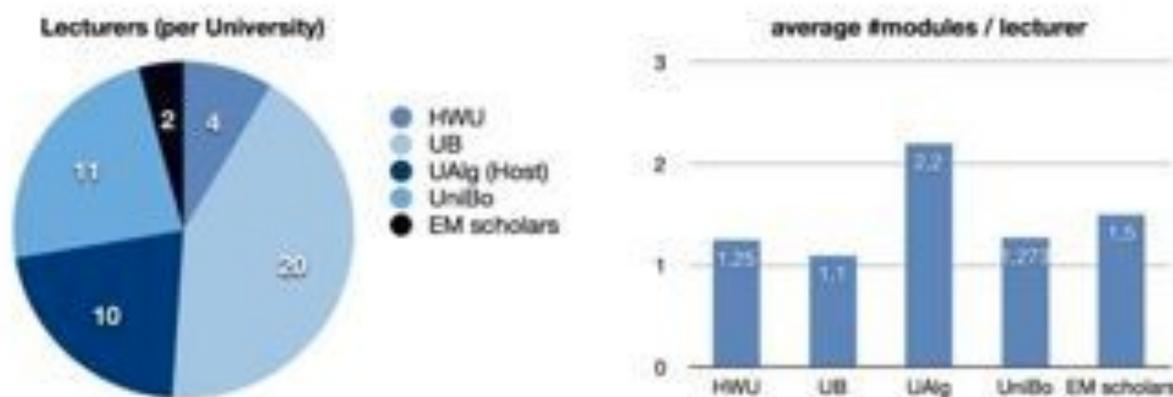
RESQUÍMICA (www.resiquimica.pt)

HOVIONE (www.hovione.pt)

DYRUP (www.dyrup.pt)

Teaching Staff Mobility

The first curricular year of ChIR involved 45 lecturers from the European partner Universities, of which 35 were teaching in the Host university under mobility agreements.



Erasmus Mundus Scholars and Invited lecturers

Two non-European Erasmus Mundus scholars were invited to teach modules in the first edition of the EMMC-ChIR:

Paolo Ricci - Professor at Holy Names University (USA); Adjunct Professor at University of MA (Amherst), School of Public Health; Visiting Professor at Xiamen University (PR China); Professor at University of Bologna (Italy).

Susana Etcheverry - Professor of biochemistry at National University of La Plata, Argentina and senior researcher in CEQUINOR (Inorganic Chemistry Center- National Research Council (CONICET) Argentina and National University of La Plata, Argentine).

The following European experts contributed to enrich the contents of the 1st academic year:

João Carlos Moura Bordado - Professor at Instituto Superior Técnico, Lisbon (Portugal)

David Carlander - Nanotechnology Industries Association, Lisbon (Portugal)

Birgit Sokull-Kluettgen - JRC (European Commission - Joint Research Center)

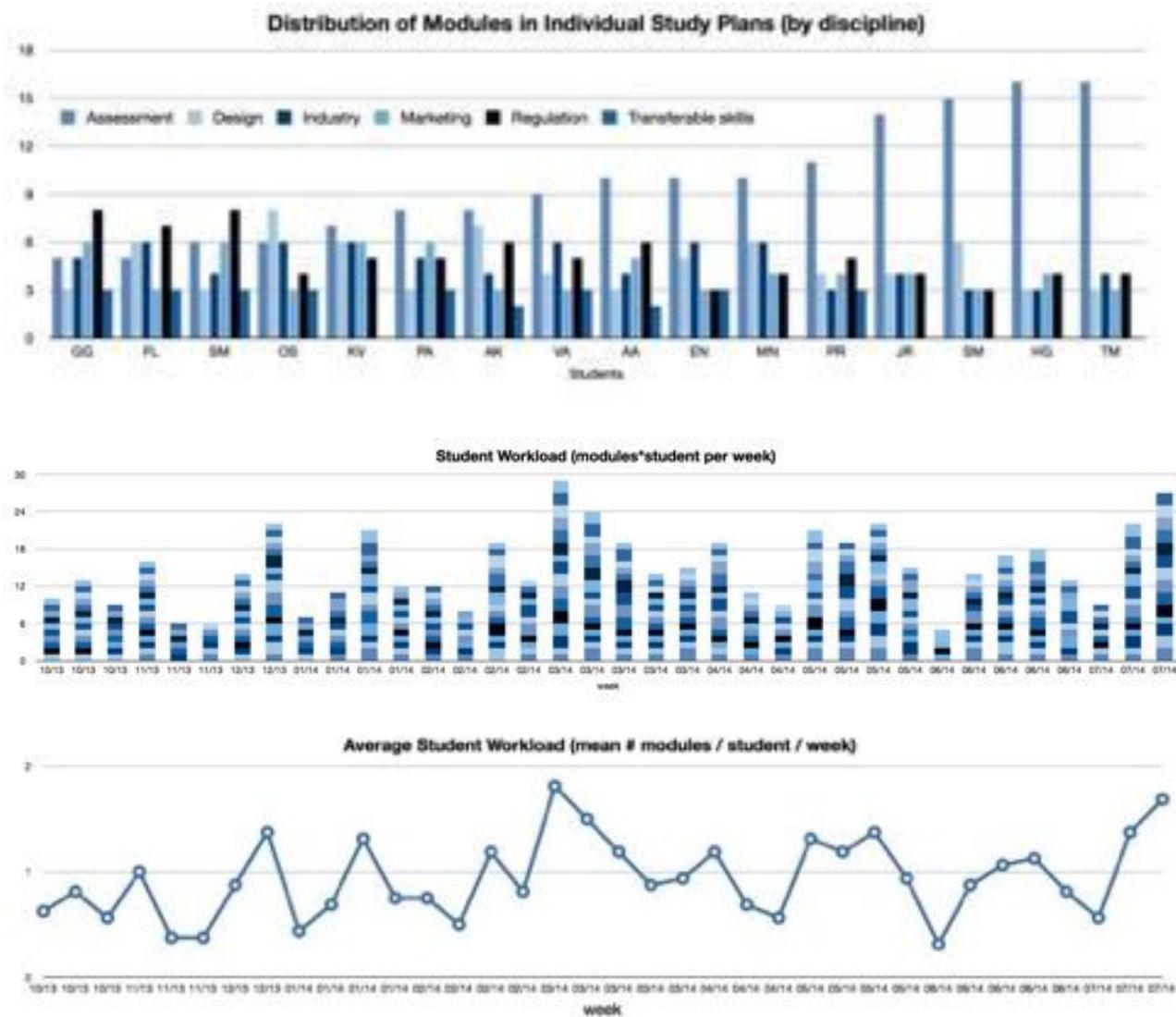
Ruth Jimenez - AEHI (Asociación Española de Higiene Industrial), Barcelona (Spain)

Water Cabri - Indena, Bologna (Italy)

Victor Garrido Mateo, Joan Marti - Sita SPE, Barcelona (Spain)

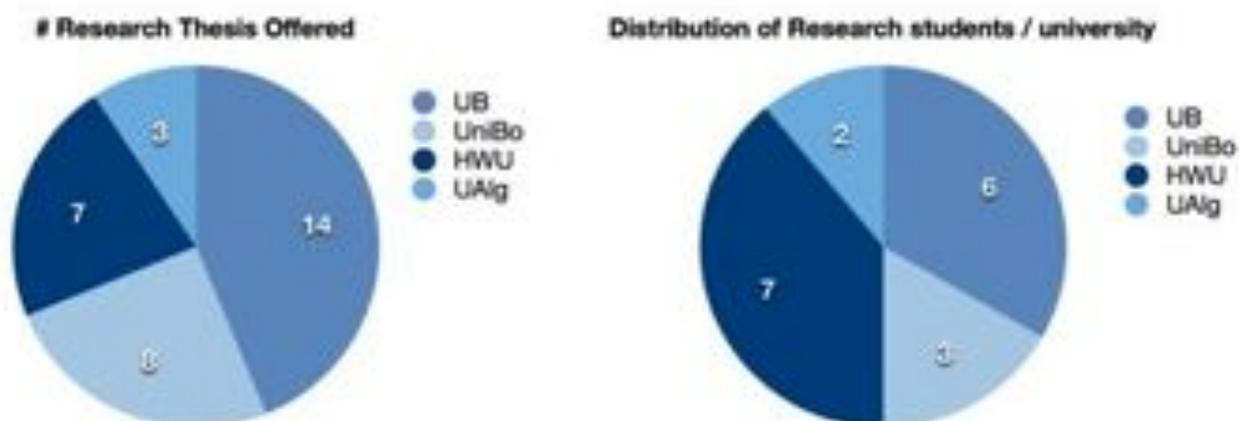
Student's Choices

Study Plans



Research Topics

Students were offered a list of 32 research topics. The selection of topics took place between October and December 2013. The final distribution of topics among the students is presented in the table below.



Student Name	Research Host	Supervisor	Topic description
FABIÁN LARA GONZÁLEZ	HWU	Teresa Fernandes	Study of trophic uptake of nanomaterials
JAGADISH ROY	HWU	Teresa Fernandes	Species and models sensitivity analysis to nanomaterials
SOHAIB MAHRI	HWU	Heli Johnston, Vicki Stone	Effects of nanomaterials on the skin
TIRUWORK BEZABIH	HWU	Thomas Aspray	Role of microbes in bioremediation
PAYAM ALIKHANI	HWU	Tony Gutierrez	Study of bacterial processes that influence the bioavailability and degradation of oil hydrocarbons
GOKHAN GULTEN	HWU / DEFRA	Teresa Fernandes, Helinor Johnston	Suitability of the current European legislation to manage the safety of products of Nanotechnologies.
STAVROS MOSCHIDIS	HWU / HNU	Teresa Fernandes, Paolo Ricci	Suitability of the current USA legislation to manage the safety of products of Nanotechnologies
EMMANUEL AMBEBILA	UB	C. Gonzales	Study of new textures in gastronomy (to be defined)
ARSALAN AFKHAMI	UB	S. Esplugas	Chemical oxidative treatments for municipal water reuse.
KATERYNA VENGEL	UB	C. González	Study of new textures in gastronomy
PAULINE ROXAS	UB	Xavier Santos	Development of analytical methods for determination of emergent pollutants in environmental matrix
ANTOINE KARENGERA	UB/UAIG	I. Cavaco / Patrick Gamez	Evaluation of the citotoxicity of transition metal complexes.

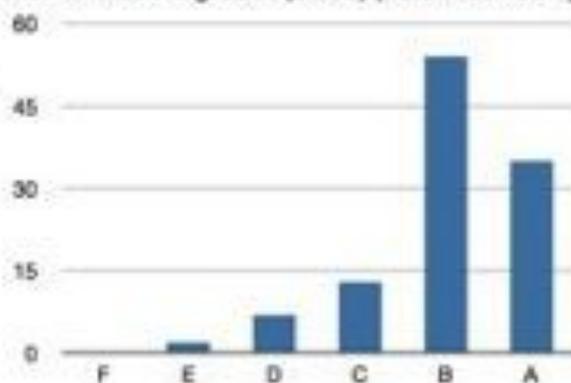
Student Name	Research Host	Supervisor	Topic description
HINTSA GITET KAHSAY	UB	D.Sainz	Development of a simplified method for risk assessment of laboratories
MAYBEL NONATO	UniBo	Maris Assimo, Melandri Sonia	Molecular modeling and spectroscopic characterization of small molecular systems of biological and environmental interest
VICTOR AJAO	UniBo	E. Tagliavini, P. Galletti	"Use of renewable sources of materials for producing valuable chemicals and transformation of substances obtained into useful products.
OLEKSII SHEMCHUK	Unibo / UAIG (CQE)	F. Grepioni, D. Braga, M- T. Duarte (CQE)	Multiple crystal forms of active pharmaceutical ingredients: patent implications

Students' Performance

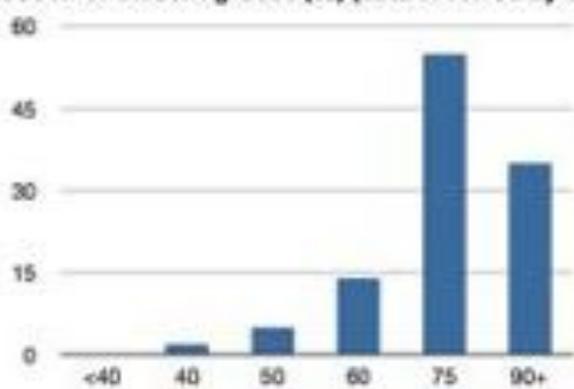
Student grades

In order to facilitate the transfer of grades between universities of the consortium, two different scales are used: an “absolute” grading scale (0-100%), and the ECTS grading scale (A-F). The average grade is 82%, considering all the data collected by June 2014. More than 30% of all grades are A and 80% of all grades are B or above. These are excellent results, reflecting the exceptional academic quality of the Erasmus Mundus students.

Distribution of student grades (ECTS) (data received by June 2014)



Distribution of student grades (%) (data received by June 2014)



Quality Assessment

Students were invited to assess the course at three levels: the individual modules, the Host institution and the project as a whole.

Questionnaires were managed using the Moodle portal and open source software Limesurvey, which allows the total anonymity of students.

Individual modules were assessed through online questionnaire available at the end of each module using the Moodle portal.

The Host institution and the project as a whole were assessed through one annual questionnaire.

A copy of the text for the annual questionnaires can be found in annex 1.

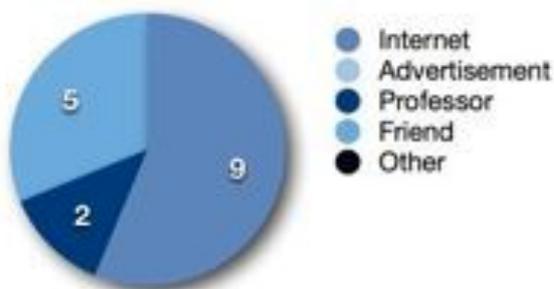
The questionnaire and results of the assessment of individual modules can be found in annex 2.

General Questionnaire

The following results come from the ChIR annual questionnaire. This survey evaluates the course as a whole, and the conditions of the host university. It was distributed and filled by the students between May 19 and May 28. All students filled the questionnaire, but were not required to answer all questions.

Information about Erasmus Mundus

How did you learn about Erasmus Mundus and ChIR?

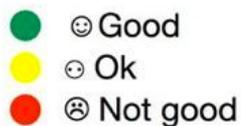
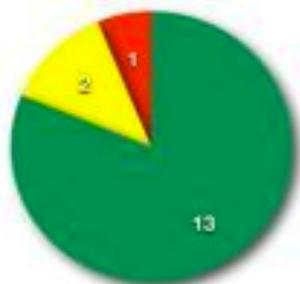


How important are the following aspects in choosing an EM master course?

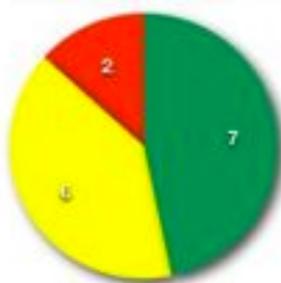


Student Assessment of the 1st curricular year

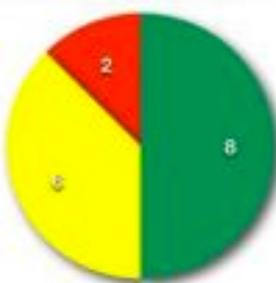
Professional Quality of the Programme Director



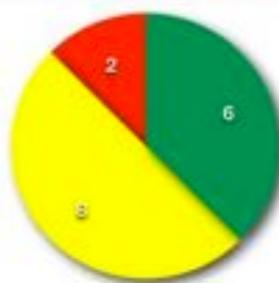
Pedagogic Quality of Lectures



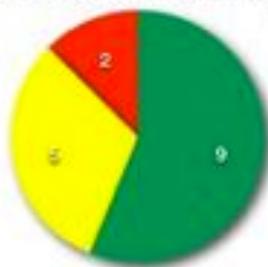
Academic Quality of Lectures



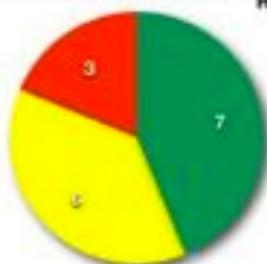
Composition and Content of the Curriculum



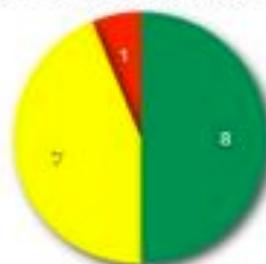
Balance between lectures and self-initiated study



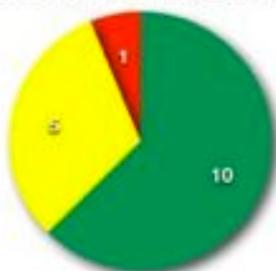
Balance between lectures, group work and other forms of study



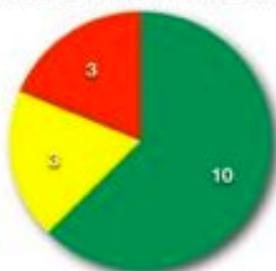
Help, access to and time devoted to you by the academic staff



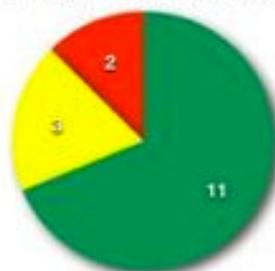
Service from the administrative staff



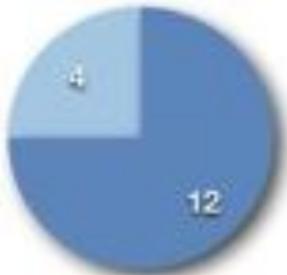
Service from the international office



Quality and access to the library



Where are you living?



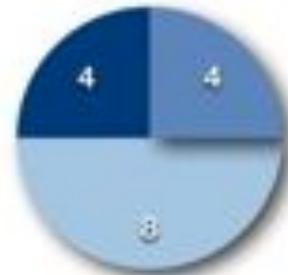
● Private accommodation
● University Accommodation

Are you satisfied?



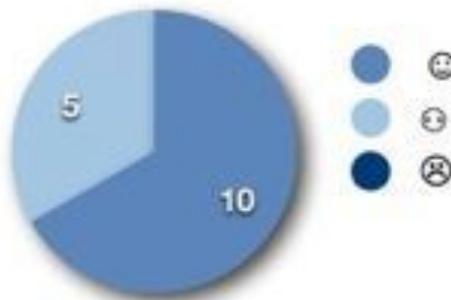
● Yes
● No

How much do you spend per month?



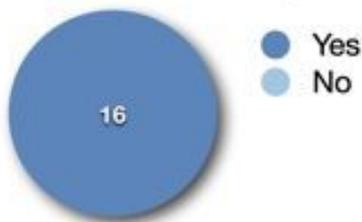
● <500 €
● 500-700 €
● 700-900 €

How do you assess life at the university with local and international students?

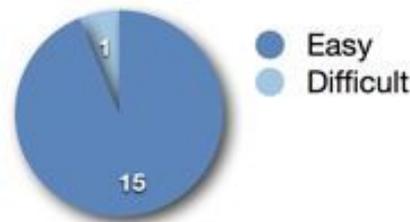


● 😊
● 🙂
● ☹️

Do you have friends at the university? Is it difficult to contact European students?

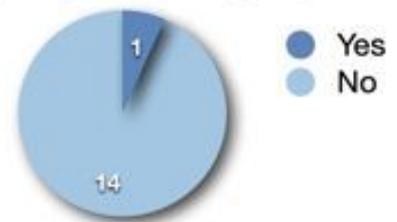


● Yes
● No



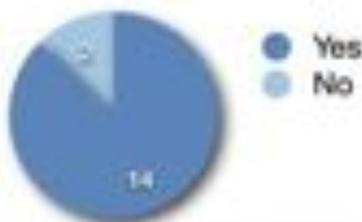
● Easy
● Difficult

Do you participate in university groups?



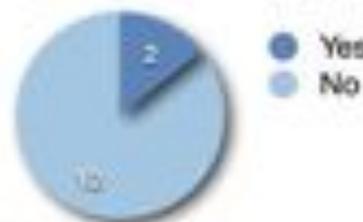
● Yes
● No

Do you have friends outside the university?



● Yes
● No

Do you participate in extra-university groups?



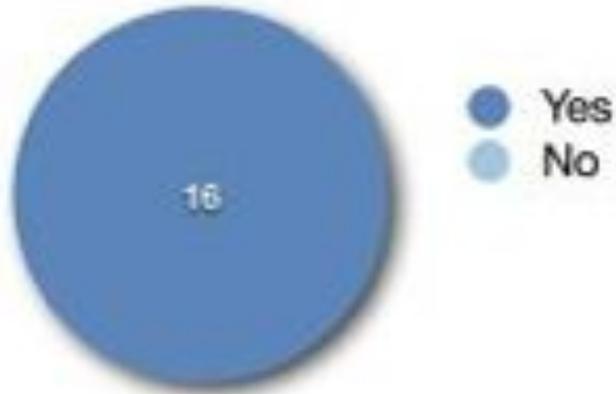
● Yes
● No

Do you feel accepted / integrated?

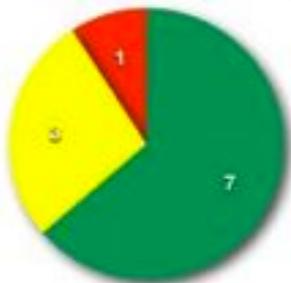


● Yes
● No

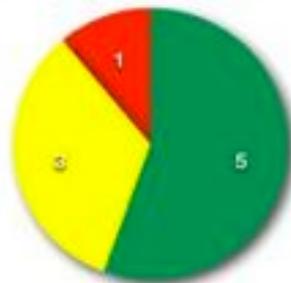
Would you recommend the ChIR?



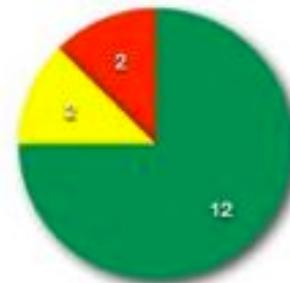
Quality and access to the laboratories



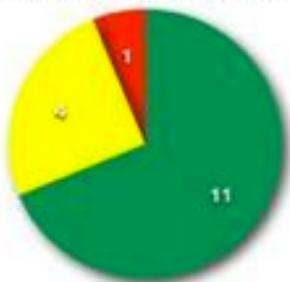
Quality and access to the computing facilities



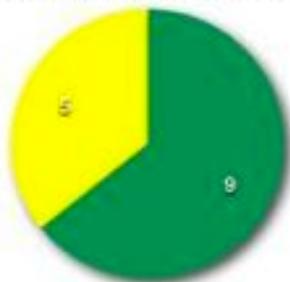
Quality and access to the internet



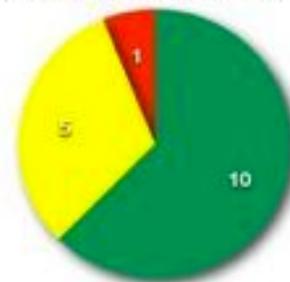
Quality and access to the canteen



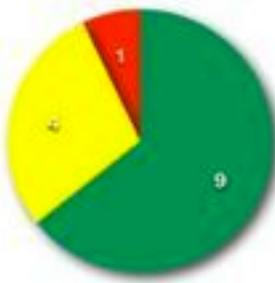
Quality and access to accomodation



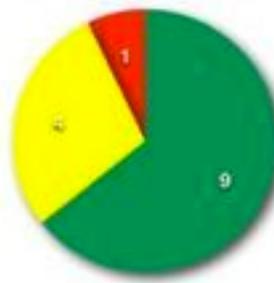
Quality and access to transport



local language training



Integration Activities (welcome programme, mentoring and guidance from staff, help from local students and alumni, etc)



The best in the EMMC-ChIR	The worst in the EMMC-ChIR
<ul style="list-style-type: none"> - good program coordinator; - free portuguese lessons; - 1 module per week (we won't get sick and tired of the module and the professor); - knowledge, experiences and contacts we gained 	<ul style="list-style-type: none"> - internship is not sure; - some modules are not good / useless / repetitive; - the class started late and will end up late; - 1 month of summer only
<ul style="list-style-type: none"> - Diversity of academic staff; - High Academic level of some teachers and modules(not all of them); - Diversity of classmates (different backgrounds and cultures) 	<ul style="list-style-type: none"> - No link between many of the courses.; - Some courses should last longer than one week.; - Despite of the high quality of the academic staff of the master, many of them did not speak fluent English which made some modules really hard to follow.; - University did not promote our integration with other students in the university.
<ul style="list-style-type: none"> - Some interesting modules and the good weather where is located the university 	<ul style="list-style-type: none"> - Really short modules and no heating!
<ul style="list-style-type: none"> - It has got a good name and a nice integration of different aspects; spanning through design, industry, assessment and regulation of chemicals 	<ul style="list-style-type: none"> - Really sad that some course content are below expectations. All lectures should be tailed up to the course title: Chemical Innovation and Regulation.
<ul style="list-style-type: none"> - The masters program ChIR was hosted at the university of Algarve for the first time. I found, it was very interesting and well organized by the university. Every facility like quality education, schedule, transport, library, canteen and other relevant services to students were well provided. It will be a nice opportunity to the next host university to use these experience for the coming batch of this masters program. - Finally, I need to mention one point about the society or people in Faro; - They are well behaved, cooperative, kind, easy to live and I had the feeling like living in my home country. 	<ul style="list-style-type: none"> - Personally, I have no any worst feature.
<ul style="list-style-type: none"> - Meeting different professionals. Learning about European regulations, 	<ul style="list-style-type: none"> - Very short courses. 3-4 days is not enough for learning seriously.
<ul style="list-style-type: none"> - Knowledge of every aspect of chemistry and chemical technology. Development of personal skills. A process for a potential student in research and professional. 	<ul style="list-style-type: none"> - Need to harmonize the evaluation of students. It should not be vary module by module. Need to include some module about global chemical market and market trends. Also need to include some modules related to analysis of act/law from the point of a lawyer.

The best in the EMMC-ChIR	The worst in the EMMC-ChIR
<p>- Best features of this master course: International lecturers, as they are coming from different university i can now measure my capability to study in these consortium countries. I also appreciate the mood in class, every student is like my own brother or sisters. we talk openly about ourselves, we share our cultures... and I always have different partners when it comes to group assignments. this is promising experience as it makes me accustomed to the ability of working in team of different people. I also appreciate this master course about the diversity of classes. we come from different backgrounds and we help each other to complete our skills. for instance student from pharmacy helps one from chemical engineering and vis versa. University of Algarve is really wonderful, especially international mobility office staff. they help efficiently every time you have a concern. The coordinator of the Program is quite efficient in the management of the program. I will not forget the help from both Coordinator and International Mobility office when I was applying visa. it was complicated procedure but their help was extremely crucial. I finally stress my feelings in Portugal. sociable and warm welcome that characterized Portuguese people are really a good thing that i learn from them.</p>	<p>- The worst thing that i can comment is about accommodation. It's not fair to mix students from first year undergraduate with a masters student. it doesn't work since they don't have the same academics tasks (studies).</p>

The best in the EMMC-ChIR	The worst in the EMMC-ChIR
<ul style="list-style-type: none"> - 1. it is heterogeneous; 2. I have the opportunity to learn from professors from four different universities; 3. It is related to human health and environment; 4. The coordinator is charismatic and I feel motivated when ever I hear her speak.; 5. The monthly allowance helps me to focus all my attention on studies 	<ul style="list-style-type: none"> 1. I almost got frozen in the classroom during winter due to the absence of a heating device in the room; 2. some of the modules are wrongly named and completely misleading. e.g research skills should be named Project writing. 3. the contents of some of the modules are either repeated in other modules or will form a complete module in combination with other modules. 4. Assignment overload. theoretically, one assignment takes one month to do but practically, it is just one week and most professors don't take in to consideration the fact that we have other assignments to do. 5. assessment method. Assignments are good because they help us get more information on about the course but exams help to push us read and understand better the slides which have been prepared by somebody experienced in the field. It will be ideal to strike a balance between exam and assignment without overloading the students. this might be difficult to achieve but what if the number of modules per student are reduced from 30 to say 20 and more time allocated to some principal modules. 6. some of the research proposals are not well explicit. at least a one-page description of the contents and expectations of the research topic will be helpful. The potential application of the project in industry or other institutions should also be highlighted. 7. The study plan for each student should be confirmed only after all the research topics have been assign to each student. 8. The fact that if a student fails in more than two modules, he fails the whole program is not good. A second chance should be given to such students the following year to to attend and or do the evaluation. 9. The program in most cases does not follow the school calender. most often, when other students are free, we are studying.
<ul style="list-style-type: none"> - Friendly people, professional lecturers from different universities. 	<ul style="list-style-type: none"> - The course is overloaded with assignments.

The best in the EMMC-ChIR	The worst in the EMMC-ChIR
<ul style="list-style-type: none"> - Schedule of modules. There are advantages and disadvantages to the current structure of the course. Generally, the four-day lectures are sufficient for a "teaser" to the course content. When well-delivered, the assessment extends the teaching time and allows the student to apply what was taught on his/her own. The effectivity of this method would of course vary per module, as well as the learning habits of the students. Despite some limitations of this technique, I think it works :) The good mix of lecturers from the four consortium universities, as well as experts from the field, are a treat. Generally, they really really know what they are talking about. Of course, some were more effective teachers than the others. As a whole, the choice of lecturers were pretty good :) 	<ul style="list-style-type: none"> - There is always room for improvement. Considering that this is the first year of the Master Course, inputs from the surveys would be very helpful indeed. So I guess this is already a step in the right direction; Re: university accommodation, I suggest that wifi internet be available at Residencia Albacor. In the rooms also. A router per floor wouldn't be so difficult to install, I think. Otherwise, it's OK living here.
<ul style="list-style-type: none"> - The courses are novel. Lots of new things to learn during the course. Not a regular Chemistry master course, indeed. 	<ul style="list-style-type: none"> - 30 modules are much. Some courses are repeating each other. The repeating courses can be united into one. Some assignments are really similar. Very bad for time management.
<ul style="list-style-type: none"> - hard working and exact coordinator, friendly atmosphere in university and especially in faro 	<ul style="list-style-type: none"> - some times delay in works!
<ul style="list-style-type: none"> - I had very interesting class especially most assessment(A)modules with smart professors. I did like the assessment type usually assignments this has helped me a lot to gain more knowledge and be familiar with scientific papers, develop writing skills. 	<ul style="list-style-type: none"> - Some modules did overlap.; - In some modules the description and the real course were different/beyond our expectations.; - Modules of some teachers were not appropriate for the course.
<ul style="list-style-type: none"> - International character, possibility to attend courses that are taught by professors from different backgrounds and universities, possibility to cover variety of modules related to chemical science and industry, learning to see the existent problem from critical point of view and developing different solutions for it 	<ul style="list-style-type: none"> - Sometimes the description of the courses differed completely from the material presented during the classes, for most modules more time for lectures could be applied in order to cover deeply all the topics.

Module Questionnaires

Both the students and lecturers are fundamental stakeholders to EMMC ChIR and can contribute substantially to the project development, therefore the opinion of both were collected in two parallel questionnaires: one designed for students and an equivalent one, designed for lecturers. The students' the lecturer's perspective of the same classes can then be compared. The questionnaires were based on the SEEQ (Students' Evaluation of Educational Quality) reference questionnaire developed by H. W. Marsh¹.

The detailed results from the module questionnaires collected by June 2014 can be found in annex 2.

The questionnaire was available online at the end of each module through the Moodle portal. Students were invited to fill the questionnaire only after submitting the module assignments, in order to have a complete view of the module, and before the grades were published in order not to be influenced by their grade. Participation was not compulsory, but students were frequently reminded of the importance of their contribution to the evaluation of the course.

The resulting students participation is summarized in the graphic below.

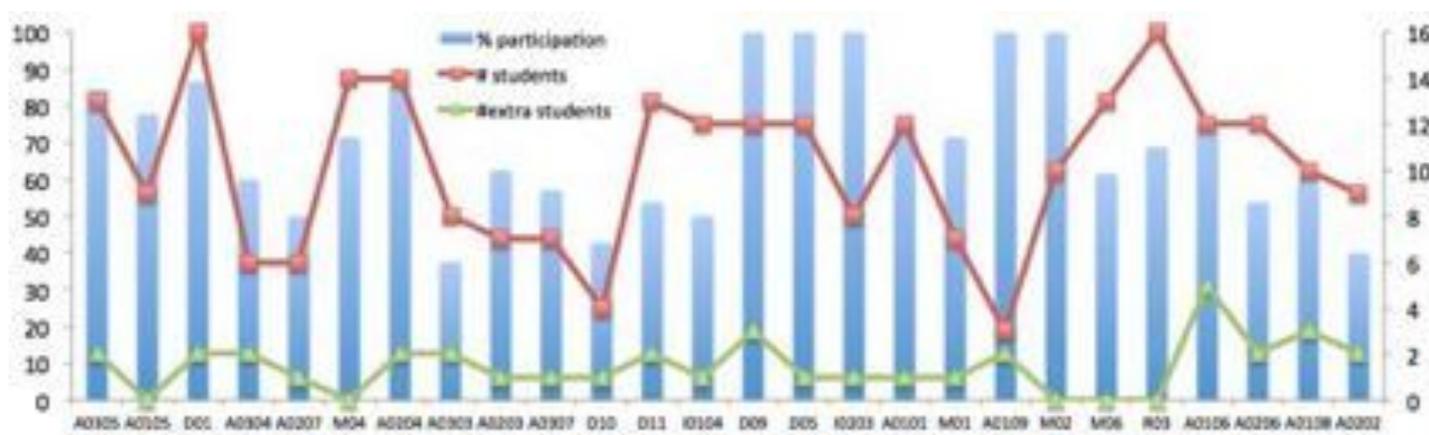


Figure 4 - Student participation in module questionnaires, collected by June 2014. Modules are ordered sequentially according to the study calendar. The total number of students taking each module and the number of students taking it as extra-curricular are also indicated.

¹ “SEEQ: a reliable, valid and useful instrument for collecting student’s evaluation of university teaching”, H. W. Marsh, British Journal of Educational Psychology, 52 (1) 77-95, 1982

Student participation in the questionnaires was high, always above 40% and in general above 60%. Taking into account that this involved on average filling a long questionnaire once (or sometimes twice) every week, this level of participation is remarkable and demonstrates a high sense of responsibility and maturity among the ChIR students.

An individual report for each module summarizes the quantitative as well as qualitative analysis of the questionnaires. Results from both students and lecturer are represented in the same page by colored pie charts and can be easily analyzed by visual inspection. An overall “green” report does not raise concerns, while the appearance of “reds” requires some attention. A complete version of the report, containing the open student comments, is given to the lecturer and can be used to improve the module in future editions.

An overall analysis of the available questionnaires points to the following conclusions:

Strengths - for most of the modules a general good (or very good) appreciation is made. In the students’ opinion the lecturers are highly skilled on the different subjects. Since almost all lecturers are exclusively dedicated to the classes during the module correspondent week, they spent as much time as the students needed to accomplish the proposed objectives. Therefore a good interaction is established between lecturer and students, in both teachers and students opinion. The modules are interesting, introducing stimulating and innovative concepts, however most of the students feel that they are prepared to follow the classes.

Weaknesses - due to the fact that it is the first year of the EMMC ChIR the structure of some modules needs some adjustments. Some communication problems may be established when lecturer and students are not native English speakers. The students’ opinion is that some modules have a heavy workload, exceeding a lot the previously established by the ECTS number attributed. This workload excess can be difficult to solve since is depending on the lecturer but mainly on the previous preparation of the students. In fact, due to the diversity of the students’ initial background some are not prepared for specific modules.

Problems – from the 27 modules analyzed, one was considered overall unsatisfactory for students. In the students’ opinion the problems are related to the class material (slides), communication between students and lecturer, and also in evaluation. The PMT will take action to minimize in future editions this problem.

Annexes

Annex 1

Copy of the Annual Questionnaire and Module questionnaire.

Annex 2

Results of the QA of individual modules.





