



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

Annual Report 2017

for the Programme Committee

University of Barcelona

July 12, 2017





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Summary

This report summarises the results of the EMMC-ChIR programme to be presented to the Programme Committee. The Programme Committee is the highest management structure in the organisation 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 provides a brief description of the project and of its results in the previous editions. It 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 present report provides information on the ongoing 3rd and 4th editions and on the selected students for the 5th edition to be hosted by the University of Barcelona.



1. Introduction

What is the EMMC-ChIR?

The EMMC ChIR - Erasmus Mundus Master in Chemical Innovation and Regulation - is a MSc providing professionals with the key tools and knowledge needed from the scientific, the regulatory and the economic point of view to manage the risks of chemicals responsibly and to address chemical legislation requirements worldwide.

The EMMC-ChIR was created in 2012 as a Joint Degree by the ChIR Consortium of European Universities. As a Joint Degree offered by the ChIR Consortium, it benefits from a much larger offer of contents and facilities than would be possible in a single university. As an Erasmus Mundus project, ChIR also aims to promote research and collaboration in the EHEA supporting the implementation of chemical safety regulations.

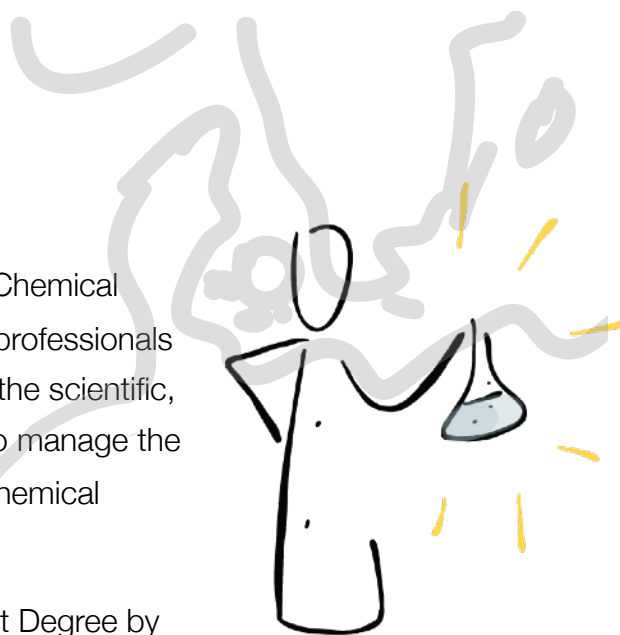
Detailed information is available at www.emmcchir.org.

Who are the partners?

The EMMC-ChIR is managed by the consortium of 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 editions, 2013-2019.

In addition to the Full Partner universities above, 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:

Universities:

USP - Universidade de São Paulo (Brazil)

CSU - Central South University (China)

HU - Hokkaido University (Japan)

UPune - University of Pune (India)

Research Centers:

NILU - Norsk Institutt for Luftforskning (Norway), www.nilo.no

CQE - Centro de Química Estrutural (Portugal), <http://cqe.ist.utl.pt/>

CQFM - Centro de Química Física Molecular (Portugal), <http://cqfm.ist.utl.pt>

CIQA - Centro de Investigação em Química do Algarve (Portugal)

CBME - Centro de Biomedicina Molecular e Estrutural (now Center for Biomedical Research, CBMR), Portugal

GRISC - Governance Risk Research Center (Spain), www.grisc.cat

Associations:

FEIQE - Federación Española de Industrias Químicas

SEQUI - Sociedade Espanola de Quimica Industrial e Ingenieria Quimica (Spain), www.sequi.es

SPQ - Sociedade Portuguesa de Química (Portugal), www.spq.pt

APEQ - Associação Portuguesa de Empresas Químicas (Portugal)

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.

Structure

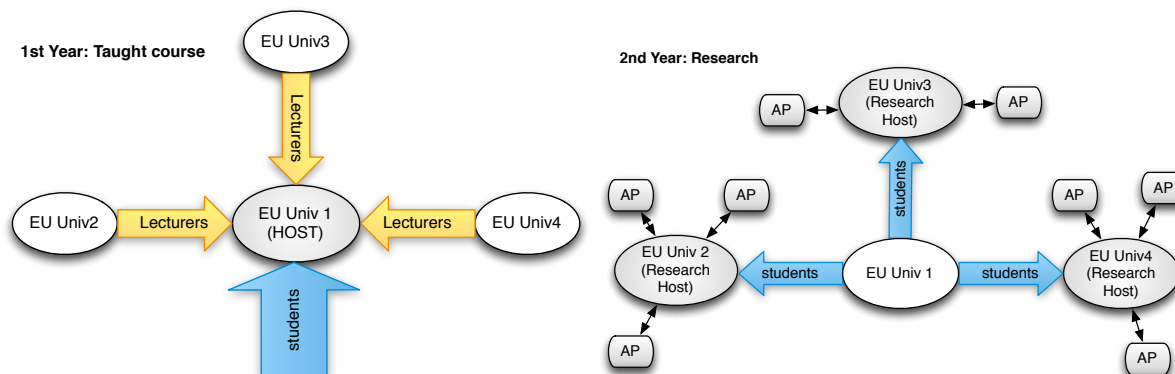
The Masters course has a duration of 2 years and comprise a total of 120 ECTS credits.

There are two main components: first, a fully integrated taught (curricular) part of 60 ECTS credits (one year). Second, a period when the research theses take place (60 ECTS credits, another year). The course is hosted in turn at the European Universities, as such:

Edition	Academic Year	Host University
1st	2013 / 2014	UAlg
2nd	2014 / 2015	UB
3rd	2015 / 2016	UniBo
4th	2016 / 2017	UAlg

The Host university for the next edition will be the UB.

The research theses take place in any of the other European Universities of the Consortium, and may be shared with associated partners (AP).



Contents

Staff dealing with the regulation of chemicals need an integrated, interdisciplinary view of the lifecycle of chemical substances, to include: 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 **Marketing**, 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 ChIR covers these five fields essential to understand chemical innovation and regulation. The course is organised into five large disciplines, within which a number of stand-alone modules is offered:

D - Design

A - Assessment

I - Industry

R - Regulation

M - Marketing and Social

All modules are optional and students may choose them freely, provided they take a minimum of 3 modules from each discipline and that their choices fulfil all the General Learning Outcomes of the course. The same modules are not necessarily offered every year, but a sufficient number and variety are 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 (UAlg)

Programme Director 2013/14: Isabel Cavaco (UAlg)

Programme Director 2014/15: Daniel Sainz (UB)

Programme Director 2015/16: Emilio Tagliavini (UniBo)

Programme Director 2016/17: Ana Rosa Garcia (UAlg)

Co-Directors in 2016/2017: Isabel Cavaco (UAlg), Vera Marques (UAlg)

Programme Director 2017/18: Daniel Sainz (UB)

Programme Management Team:

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

Selection Committee:

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

Examiners Board:

Daniel Sainz (UB)
Emilio Tagliavini (UniBo)
Ana Rosa Garcia (UAlg)
Teresa Fernandes (HWU)

External Examiners:

Alice Newton
Isabel Pérez

Administrative Assistants:

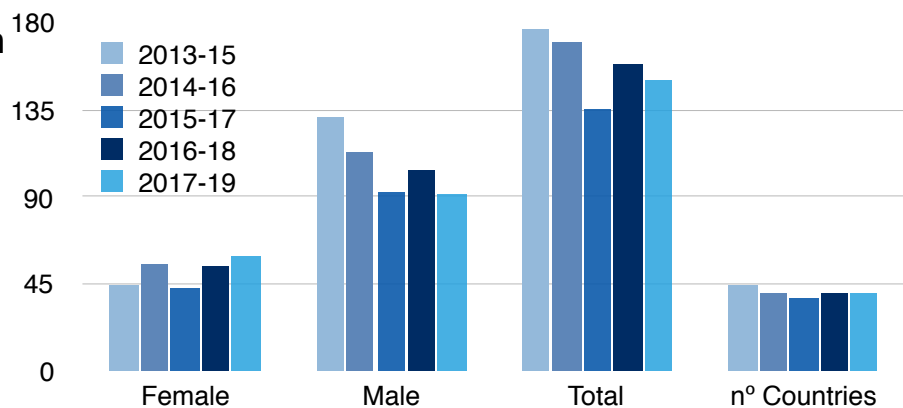
Nataliya Butenko (UAlg)

2. Candidates 2017-19

Student Applications

The EMMC-ChIR has received every year 200-400 online applications, of which 130-180 are complete applications. Candidates apply from 40-45 countries distributed all over the world (Graphic 1).

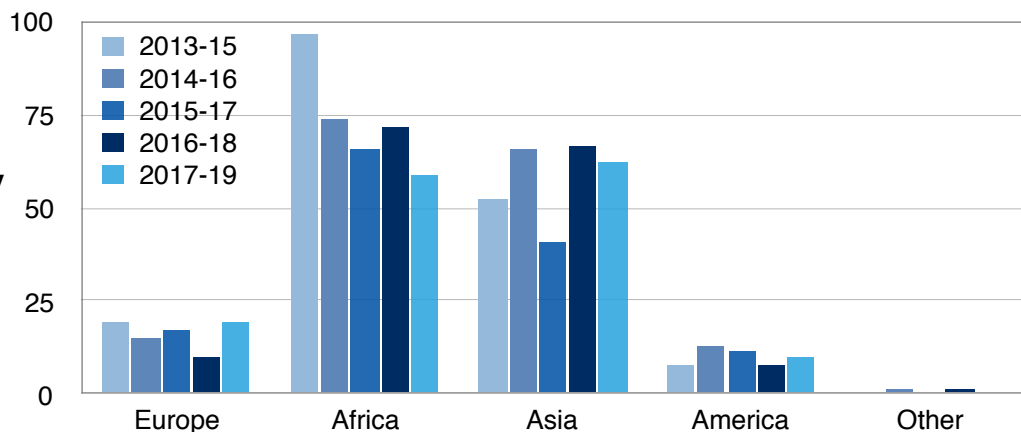
Graphic 1 - Evolution of the number of candidates



Gender distribution among candidates was skewed towards male candidates. Female candidates, although increasing from the previous editions, are only 40% of the evaluated applicants in 2017. This is due to the contribution of the candidates from Africa (22% of completed applications), which are almost exclusively male (~80%). Comparing with the previous editions, there are 14% more female applications than the first edition and almost 8% more than the second and third editions.

The majority of candidates apply from Africa and Asia, followed by Europe and the Americas (Graphic 2). There was a high amount of candidates from Africa in the first edition, and an equivalent number from Asia in the more recent applications. In 2017/19 the number of candidates from Asia is slightly higher than those from Africa.

Graphic 2 - Evolution of the number of candidates, by world region



Erasmus Mundus Student Applications 2017

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. Restrictions on geographical and gender balance are applied. Geographical balance is imposed by the European Commission to a maximum of three candidates from the same country in the main list of Erasmus Mundus studentship holders. Gender balance demands not less than 40% female candidates as studentship holders. 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.

The 5th edition of the course received between November 2016 and January 2017 a total of 315 applications, from which 150 were complete. Most candidates (135, 90%) are from Partner countries and only 15 (10%) are Europeans or candidates who have previously lived in Europe. The number of European candidates has decreased consistently since the start of the project in 2013 until the 4th edition. Nevertheless, the number of candidates to Programme country scholarships this year was the highest of all editions. Figure 1 represents the geographical distribution of candidates.

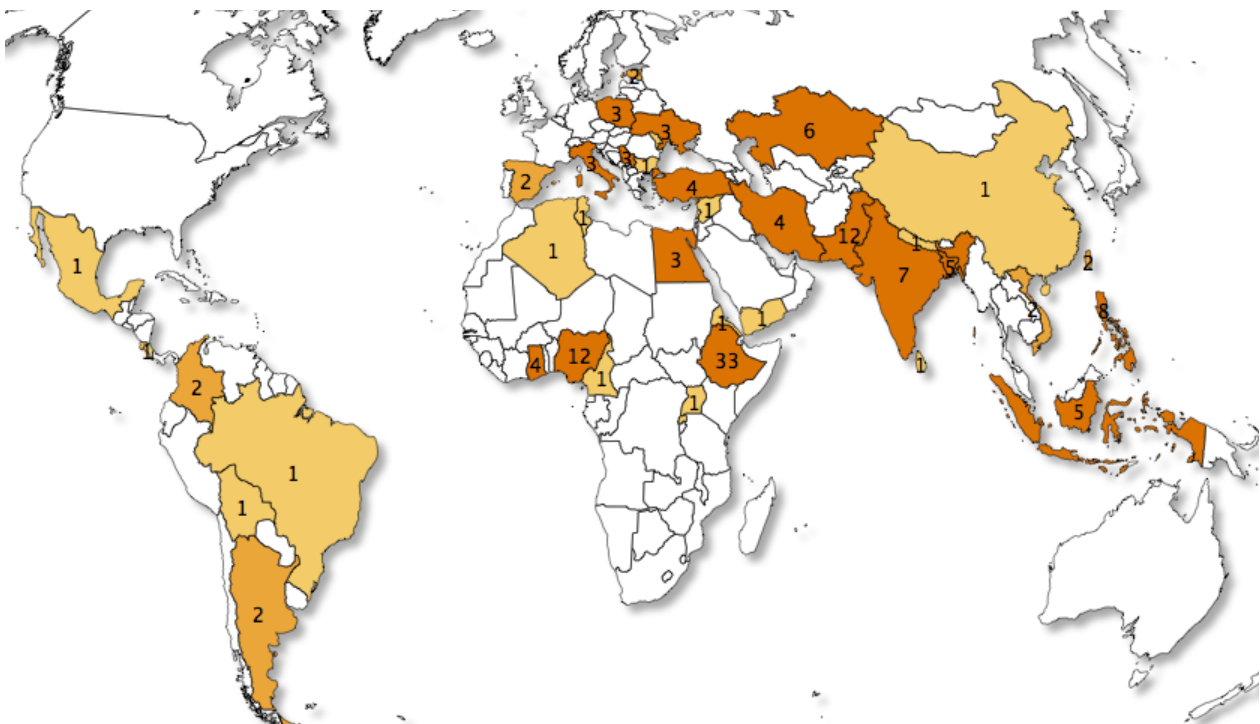
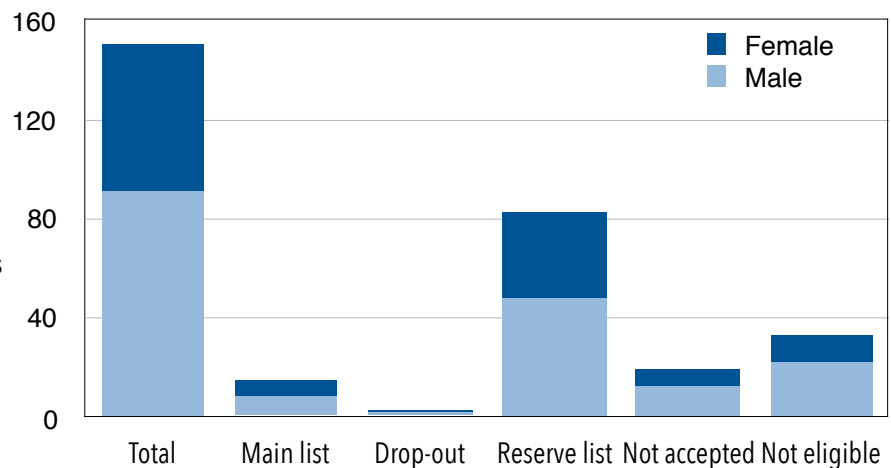


Figure 1 - Geographical Distribution of Erasmus Mundus candidates for ChIR 2017-2019

Graphic 3 represents the gender distribution for all the candidates.

Graphic 3 - Gender Distribution of Erasmus Mundus candidates for 2017-2019



The 8 top ranked candidates from Partner countries and 2 top ranked from Programme countries fulfilling geographical and gender

balance received Erasmus Mundus grants. Two candidates declined the grant and were replaced by the next ones on the reserve list. In addition six windows of funding were provided by the European Commission to fund candidates coming from specific regions of the world: ENI-East, ENI-South; Central Asia, Middle East, Iran and ACP. The selected candidate to Iran window declined the grant and no replacement was possible. Figure 2 represents the geographical distribution of grant-holder candidates.

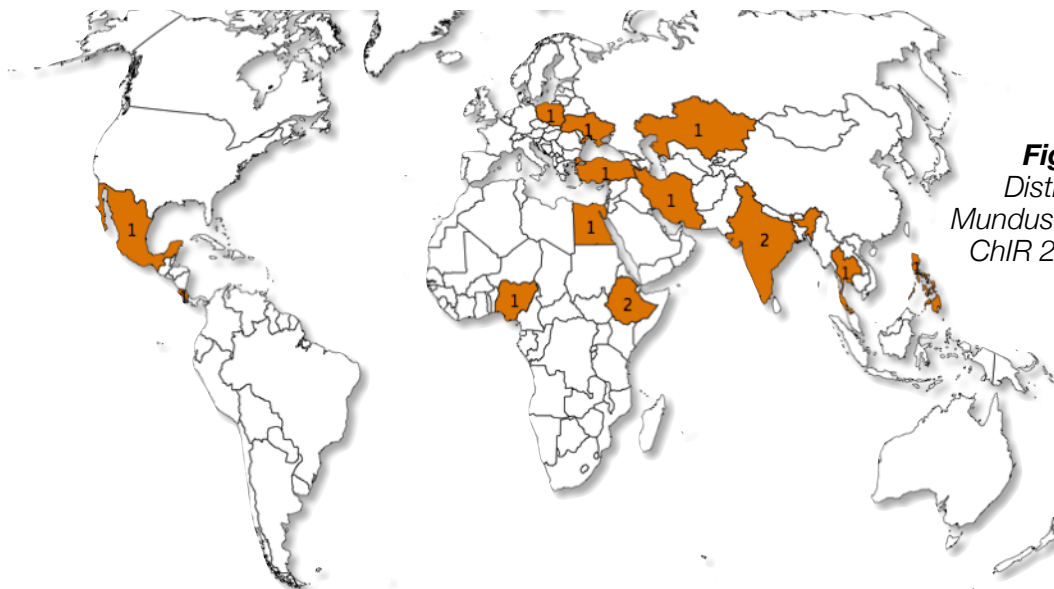


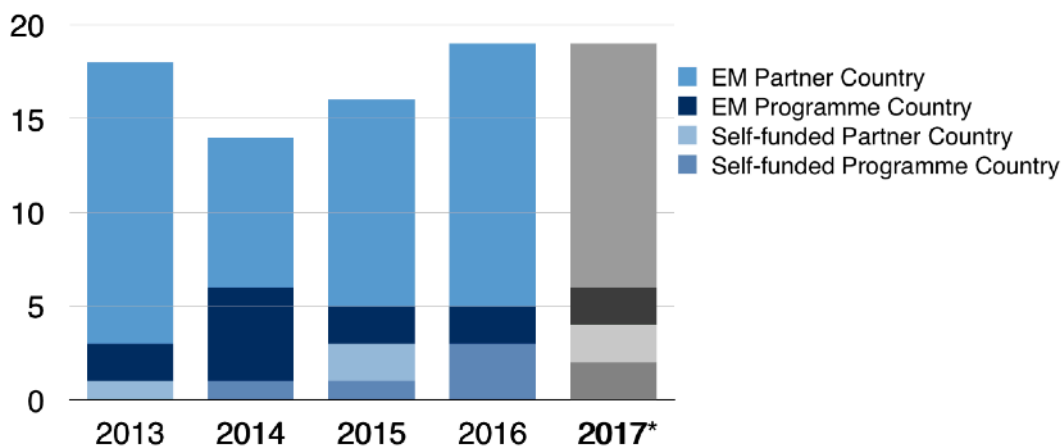
Figure 2 - Geographical Distribution of Erasmus Mundus students selected for ChIR 2017-2019 main list.

3. Students

Evolution of ChIR students

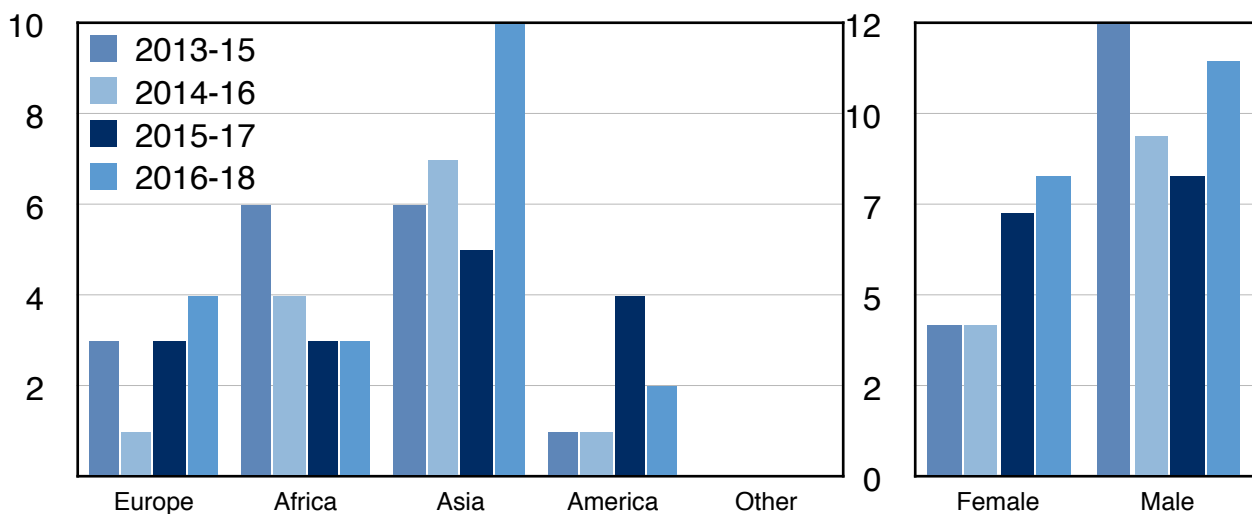
As ChIR is a project funded by the European Commission, a number of students is supported through Erasmus Mundus studentships for Partner Country and for Programme Country nationals. The number of self-funded students, initially very low, has increased gradually in the 3rd and 4th edition, and is expected to keep this tendency in the 5th edition.

Graphic 4 - Evolution of Student Funding (2017 shows expected values)



















Studentships are awarded assuring geographical and gender balance. As a result, the richness in cultural diversity in ChIR cohorts has been impressive.

Graphic 5 - Number of ChIR students, by world region and by gender








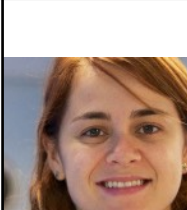
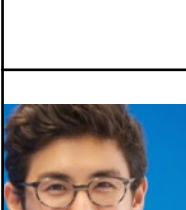


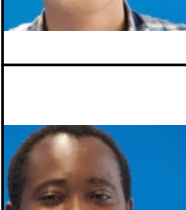
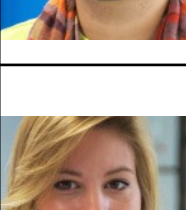

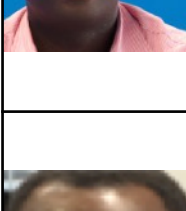
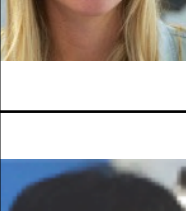
Students 2013-2015

In its first edition the EMMC-ChIR received 17 students, all Erasmus Mundus grant-holders. All but one completed the first year of classes at UAlg. Antoine Karengera, who arrived late in the academic year, was allowed to complete a few modules in the next edition in the UB.

	Antoine Karengera (Rwanda) Pharmaceutical Sciences Research: UB and UAlg Current position: PhD student, Wageningen University (Netherlands)		Jagadish Roy (Bangladesh) Chemical Engineering Research: HWU Current position: PhD student, GEMTEX (France)		Silvana Agostinho Martins (Portugal) Pharmaceutical Sciences dropped out
	Arsalan Afkhami (Iran) Chemical Engineering Research: UB Current position: Wastewater treatment engineer, Peyvand Ab Sepahan (Iran)		Kateryna Vengel (Ukraine) Chemistry Research: UB Current position: Quality Assurance/R&D, Galenicum Health Company. (Spain)		Sohaib Mahri (Algeria) Pharmacy Research: HWU Current position: PhD student, Université catholique de Louvain (France)
	Emmanuel Neba Ambebia (Cameroon) Research: UB Current position: Searching employment (USA)		Maybel Monfero Nonato (Philippines) Research: UniBo Current position: Science Research Specialist, Department of Energy, Philippines)		Stavros Moschidis (Greece) Chemical Engineering Research: HWU Current position: Business Analyst at Credit Suisse (UK)
	Fabián Andrés Lara González (Chile) Chemistry&Pharmacy Research: HWU Current position: Consultancy in Chemical and Pharmaceutical Regulations (Chile)		Oleksii Shemchuk (Ukraine) Pharmaceutical Sciences Research: UniBo and UAlg Current position: PhD student (UniBo, Italy)		Tiruwork Mequanint Bezabih (Ethiopia) Analytical Chemistry Research: HWU Current position: Searching employment (USA)
	Gokhan Gulden (Turkey) Chemistry Research: HWU Current position: Searching employment		Pauline Angelic Roxas (Philippines) Chemistry Research: UB Current position: Environmental Program Manager, Land Bank of the Philippines (Philippines)		Victor Olusola Ajao (Nigeria) Industrial Chemistry Research: UniBo Current position: PhD student, Marie Curie, Wetsus, European centre of excellence for sustainable water technology (Netherlands)
	Hintsat Gitet Kaysay (Ethiopia) Education in Chemistry Research: UB Current position: Mekelle University, Lecturer (Ethiopia)		Payam Alikhani (Iran) Petroleum Engineering Research: HWU Current position: PhD student, Politecnico di Milano (Italy)		




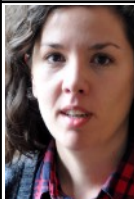








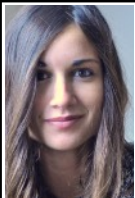
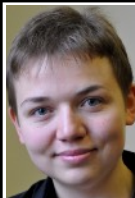
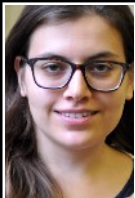


Students 2014-2016

In its second edition the EMMC-ChIR received 14 students. Thirteen Erasmus Mundus grant-holders and one self-funded students, Bethel Anucha. Isabel Navarro abandoned the course in the first semestre.

	<p>Angelo Kenneth Romasanta (Philippines) BSc Chemistry Research: Unibo / UAlg Current position: PhD student, VU Amsterdam (Netherlands)</p>		<p>Hagos Tesfay Kidanu (Ethiopia) BSc Applied Chemistry MSc Chemistry Research: UniBo Current position: PhD student, Taiwan (Academia Sinica research center)</p>		<p>Nazmiye Tugce Eran (Turkey) BSc Chemistry Research: HWU Current position: Searching for PhD position (Turkey)</p>
	<p>Asnake Gudisa Eded (Ethiopia) BSc Applied Chemistry MSc Environmental Sciences Research: UAlg Current position: Arba Minch University, Lecturer (Ethiopia)</p>		<p>Isabel Navarro (Spain) BSc Chemistry dropped out</p>		<p>Paola Blair Vásquez (Costa Rica) BSc Chemical Engineering Research: UniBo Current position:</p>
	<p>Bazarsad Narmandakh (Mongolia) BSc Applied Chemistry Research: UAlg Current position: Chemical Plant (Mongolia)</p>		<p>Miguel Antonio Brion (Philippines) BSc Chemistry Research: UAlg Current position:</p>		<p>Yu Zhang (China) BSc Chemistry MSc Chemistry Research: HWU Current position: PhD student, University of Barcelona (Spain)</p>
	<p>Chukwuka Bethel Anucha (Nigeria) BSc Chemistry Research: UAlg Current position: Searching for employment</p>		<p>Mireia Broch Gosser (Spain) BSc Chemistry Research: Unibo / HWU Current position: Regulatory Affairs Technician, Laboratories Maverick (Spain)</p>		<p>Wei Wang (China) BSc Pharmacy MSc Chemistry Research: UB / UAlg Current position: Access Campaign Advisor - Médecins Sans Frontières (China)</p>
	<p>Donaldben Mbagag Neba (Cameroon) BSc Biochemistry MSc Biotechnology Research: UAlg Current position:</p>		<p>Mohammad Anisur Rahman Jamil (Bangladesh) BSc Chemistry MSc Inorganic Chemistry Research: UniBo Current position: PhD student, Hokkaido University (Japan)</p>		










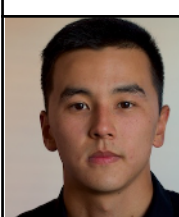





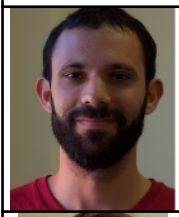



Students 2015-2017

In its third edition the EMMC-ChIR received 16 students, of which 13 were Erasmus Mundus grant-holders and 3 self-funded students: Erica Quagliarini, Diana Guillen Ferrari and Jose Miguel Albahaca Oliva. Erica Quagliarini abandoned the course in the second semestre. Peggy Montazeri joined the course but, for personal reasons, left in the beginning. She was replaced by Zohre Alughare Eskandari, who joined in January 2016.

	DJ Donn Matienz (Philippines) BSc Chemical Engineering Research: UB		Wubshet Belay (Ethiopia) BSc Chemistry MSc Environmental Sciences Research: UAlg		Mulatu Yohannes Nanusha (Ethiopia) BSc Chemistry MSc Chemistry Research: UAlg
	Ester Carregal Romero (Spain) BSc Chemistry MSc Business Studies Research: HWU		Mohammad Sufian Bin Hudari (Singapore) BSc Chemistry Research: HWU		Diana Guillen Ferrari (Uruguay) BSc Chemical Engineering Research: HWU / UAlg
	Shella Talampas (Philippines) BSc Chemical Engineering Research: UAlg / UB		Yemataw Addis Alemu (Ethiopia) BSc Chemistry MSc Pharmacy Research: UAlg		Ana Vallejo Cortes (Mexico) BSc Pharmacy Research: HWU
	Loveille Jun Gonzaga (Philippines) BSc Chemical Engineering Research: UAlg		Jose Miguel Albahaca Oliva (Venezuela) BSc Chemistry Research: UB		Diego Josué Milián Izeppi (Guatemala) BSc Chemical Engineering Research: UB
	Erica Quagliarini (Italy) Dropped out.		Kseniia Tuholukova (Ukraine) BSc Environmental Sciences MSc Environmental Sciences Research: UB		Boryana Tsenkova (Bulgaria) BSc Chemistry Research: UniBo / UAlg
	Zohre Alughare Eskandari (Iran) BSc MSc Research: UAlg		Pegah Montazeri (Iran) BSc Chemistry MSc Chemistry Dropped out.		

Students 2016-2017

In its fourth edition the EMMC-ChIR received 19 students. Sixteen Erasmus Mundus grant-holders and three Italian self-funded students: Anna Ciurlini, Diego Gerini and Giulia Mengotti,

	<p>Ahmed Mashaly (Egypt) BSc Pharmacy MSc Chemistry</p> <p>Research: UB</p>		<p>Fadi Al-Shnani (Jordan) BSc Chemistry MSc Chemistry</p> <p>Research: UB</p>		<p>Napatr Kunachitpimol (Thailand) BSc Env. Sciences MSc Env. Sciences</p> <p>Research: HWU</p>
	<p>Ana Ligia Sandoval Pérez (Guatemala)</p> <p>MSc Pharmacy</p> <p>Research: UB</p>		<p>Gidey Gebremeskel Kidane (Ethiopia) BSc Chemistry MSc Medical Biochemistry</p> <p>Research: UB</p>		<p>Nazan Altun (Turkey) BSc Chemical Engineering</p> <p>Research: UniBo</p>
	<p>Anna Ciurlini (Italy) BSc Chemistry</p> <p>Research: UniBo</p>		<p>Giulia Mengotti (Italy) BSc industrial Chemistry</p> <p>Research: UniBo / HWU</p>		<p>Seyed Mohammadreza Hesami (Iran) BSc Chemical Engineering MSc Chemical engineering</p> <p>Research: HWU</p>
	<p>Askar Nurassilov (Kazakhstan) BSc Chemistry</p> <p>Research: UAIG / UB</p>		<p>Jose Albert Cruz (Philippines) BSc Chemical Engineering MSc Chemistry</p> <p>Research: UB</p>		<p>Sharmaine Atencio (Philippines) BSc Food Science and Technology</p> <p>Research: UB</p>
	<p>Basma Raad Shakir (Iraq) BSc Chemistry</p> <p>Research: UB</p>		<p>Jye Ming Ong (Malaysia) BSc Chemistry</p> <p>Research: UniBo</p>		<p>Dawit Gebremichael Gidey (Ethiopia) BSc Chemistry MSc Chemistry</p> <p>Research: UniBo</p>
	<p>Danilo Bertagna Silva (Brazil) BSc Chemical Engineering</p> <p>Research: UB</p>		<p>Mart Benson Castillo (Philippines) BSc Chemical Engineering MSc Chemistry</p> <p>Research: HWU</p>		
	<p>Diego Gerini (Italy) BSc Chemistry</p> <p>Research: UniBo / UB</p>		<p>Mi Nguyen Thi Diem (Vietnam) BSc Chemistry MSc Chemistry</p> <p>Research: UB</p>		

Students 2017-2019

List of Selected Erasmus Mundus Students for the 5th edition:

Family Name	First Name	Gender	Nationality	Background (BSc/MSc)
VARGAS	Esteban	Male	Costa Rica	Chemistry
SHABAN	Ahmed	Male	Egypt	Pharmacy
BEJIGA MELKA	Alemu	Male	Ethiopia	Chemistry / Environmental Sciences
WODAJE ADDIS	Tegege	Male	Ethiopia	Chemistry / Chemistry
SINHA	Sukanya	Female	India	Chemical Engineering
PASUPULETI	Goutham	Male	India	Chemistry / Microbiology
ESMAEILI	Majid	Male	Iran	Chemistry / Chemistry
KAIBALDIYEVA	Ulmeken	Female	Kazakhstan	Chemical Engineering
VEGA PIEDRAS	Francisco Javier	Male	Mexico	Chemical Engineering
ASHAOLU	Christine	Female	Nigeria	Chemistry / Chemistry
VASQUEZ	Maria Katrina	Female	Philippines	Chemistry
DORUCH	Maciej	Male	Poland	Engineering
SATHITYATIWAT	Suthapat	Female	Thailand	Chemistry
ANGI	Gulsah	Female	Turkey	Chemical Engineering
BABYCH	Kateryna	Female	Ukraine	Chemistry

4. Study Contents

List of modules offered in 2016-2017 in UAlg

A total of 73 modules were offered in the 4th edition. In comparison to the 3rd edition, additional modules were offered taking advantage of the fact that the Erasmus Mundus MSc in Quality in Analytical Laboratories (EMQAL) took place at UAlg during the same academic year, and a few modules could be offered to both courses. The ChIR benefitted from the addition of modules on General Assessment A0301 - "Good Laboratory Practice" and A0303 - "Estimating Uncertainty in Chemical Analysis". Modules A0306 - "Chemometrics" and A0308 - "Experimental Design and Optimization", previously offered by UB, were during this year offered by the EMQAL course. In a similar way, EMQAL benefitted from ChIR modules, namely R02, R13 and R06.

Three modules were cancelled because they were chosen by an insufficient number of students. These were I0106 - "Nanoporous Catalysts for Clean Chemistry", I0207 - "Nanomanufacturing and Nanoprocessing" and A0112 - "Bioavailability". In addition, module

T11 - Personal Branding could not be offered due to the unavailability of the lecturer. The definitive list of modules and lecturers, as well as the origin university of each lecturer, is presented in the tables below.

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
A0106	Environmental and Health Safety of Nanotechnology	HWU	Teresa Fernandes
A0108	Chemical Pollutant Remediation	HWU	Thomas Aspray
A0109	Transport processes and dispersion of pollutants in the atmosphere	UniBo	Alberto Modelli
A0111	Chemical and biological treatment of wastewater	UAlg	Clara Costa
A02	<i>Toxicological Assessment</i>		
A0201	Genotoxicity Assessment	UAlg	Vera Marques
A0202	Toxicokinetics and Toxicogenetics	UAlg	Vera Marques
A0204	Toxicology	HWU	Teresa Fernandes
A0206	Principles of Toxicological Assessment	UAlg	Vera Marques
A03	<i>General Assessment</i>		
A0301	Good laboratory practice	EMQAL	Carmen Navarro
A0303	Estimating Uncertainty in Chemical Analysis	EMQAL	Ricardo Bettencourt
A0304	Reference Materials and Laboratory Proficiency Testing Schemes	UB	Angels Sahuquillo
A0305	Measuring Variability and Statistical Decision	UAlg	Isabel Cavaco
A0306	Chemometrics / Fundamentals Of Multivariate Analysis	EMQAL	Bjorn Grung
A0308	Experimental Design and Optimization	EMQAL	Bjorn Grung
A04	<i>Physical Hazard Assessment</i>		
A0402	Chemical Reactivity Hazards	External	Victor Garrido

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	Mercè Segarra
D03	Patenting new products	Ualg	Lurdes Cristiano
D04	Drug design	UB	Axel Bidon-Chanal
D05	Structure Toxicity Relationship	UniBo	Sonia Melandri

D07	Chemical Database	UB	Arnald Grabulosa
D08	Modelling and Simulation	UB	Gabriel Aullón
D09	Food and Chemistry	UB	Carne González
D10	Soft Materials	UB	Francesc Sagués
D11	Design of Chemical formulations	UB	Santiago Esplugas
D12	Synthesis and Characterization of Nanomaterials	UniBo	Giuseppe Falini
D13	Sustainable Biocatalytic Processes	UniBo	Alessandra Tolomelli
D14	Peptides and peptidomimetics as green chemistry tools	UniBo	Claudia Tomasini

I - Industry

code	Name of module	University	Name of lecturer
<i>I01</i>	<i>Sustainable Chemistry:</i>		
I0101	Renewable Sources	UniBo	Chiara Samorì
I0102	Green Metrics	UniBo	Marco Lombardo
I0103	Catalysis for a sustainable synthetic chemistry	UniBo	Marco Bandini
I0104	Alternative Green Solvents	UniBo	Claudio Trombini
I0105	Green Synthetic Strategies and and Pathways	UniBo	Pier Giorgio Cozzi
I0107	Environmental Catalysis	UB	Pilar Ramirez de la Piscina
I0108	Chiral Technology in the Chemical & Pharmaceutical Industry	UB	Albert Moyano
<i>I02</i>	<i>Chemical and fine chemical industry:</i>		
I0203	Pharmaceutical and Fine Chemicals Industry	External	Walter Cabri
I0204	Industrial Forgery Detection	UAlg	José Moreira
I0205	Chemical Process Safety	External	Matteo Pori
I0206	Chemical Industry	UAlg	Ana Rosa Garcia

M - Marketing and Social

code	Name of module	University	Name of lecturer
M01	Business planning	UB	Jaume Argerich
M02	Market research	UB	Rubén Huertas
M03	Social Perception of the Chemical Risk	UniBo	Luca Pietrantoni
M04	Health and Safety in Chemistry	UB	Xavier Guardino
M05	Life Cycle Assessment	UniBo	Fabrizio Passarini
M06	Quality Management	UAlg	Isabel Cavaco
M07	Innovation Management	UB	Jaume Valls
M08	Biosafety	UB	Cristina Massa

M09	Entrepreneurship	UB	Jaume Argerich
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R - Regulation

code	Name of module	University	Name of lecturer
R02	Risk Management	EM Scholar	Paolo Ricci
R03	REACH and CLP Regulations	UB	Daniel Sainz
R04	Non-EU Regulations: Japan, Brazil and China	UB	Daniel Sainz
R06	Pharmaceuticals Regulations	UAlg	João Rocha / Hélder Mota-Filipe
R07	Nanomaterials and Nanotechnologies Regulations	HWU	Teresa Fernandes
R08	Chemical Waste Materials Regulations	External	Victor Garrido
R09	Priority Substances in EU Environmental Legislation	UAlg	Alice Newton
R10	Comparative Analysis of Chemical Regulations – US and EU	EM Scholar	Paolo Ricci
R12	introduction to EU and US law	EM Scholar	Paolo Ricci
R13	Advanced Risk Analysis	EM Scholar	Paolo Ricci
R14	Safety in the Use of Chemicals	External	Eugenia Anta

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	Luisa Barreira
T02	Communication Skills	UAlg	Isabel Cavaco / Ana Rosa Garcia
T03	Laboratory Skills	UAlg	Luisa Barreira
T04	Research Skills	UAlg	Isabel Cavaco / Ana Rosa Garcia
T06	Innovation Skills	UAlg	Isabel Cavaco / Ana Rosa Garcia
T07	Intensive "Survival" Language Course - Italian	UAlg	FCHS
T12	Team Building	External	Martin Fussi

Cancelled Modules

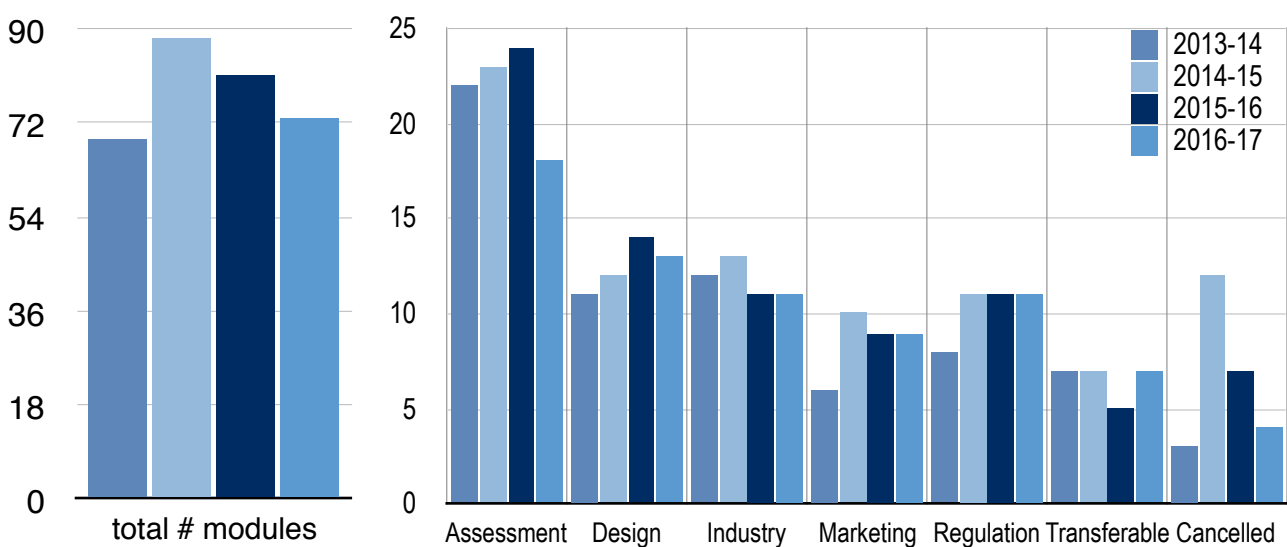
The following modules were cancelled this year:

A0112	Bioavailability
I0106	Nanoporous Catalysts for Clean Chemistry
I0207	Nanomanufacturing and Nanoprocessing
T11	Personal Branding

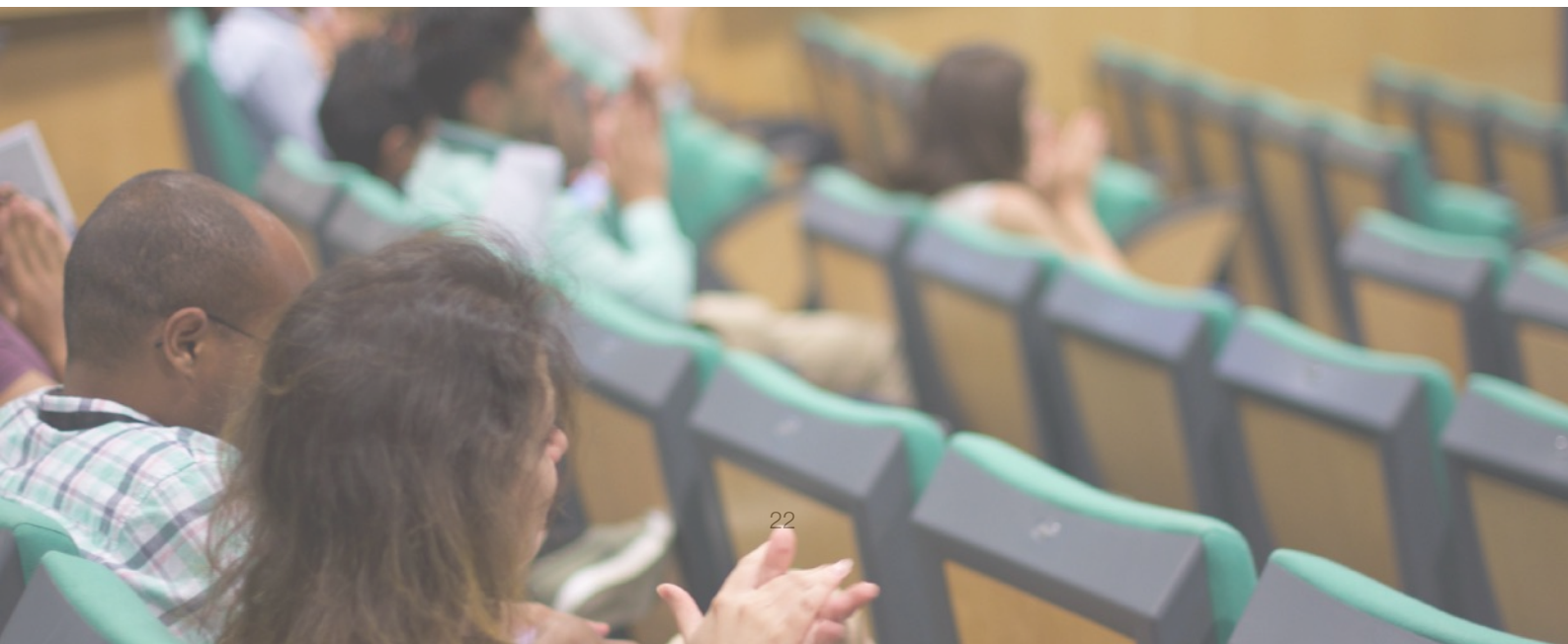
Distribution of Modules by Discipline and by University

In comparison with the previous editions, the fourth edition witnessed a decrease in the offer of modules in the discipline “Assessment”, unlike the tendency of the previous years and providing a more balanced distribution of subjects (Graphic 6). The remaining disciplines maintain approximately the same offer, in terms of number of modules. The number of cancelled modules reflects the large number of modules on offer compared to the number of students on the course. The consortium offers ca. 70 modules per year, from which 62-66 are effectively chosen by students.

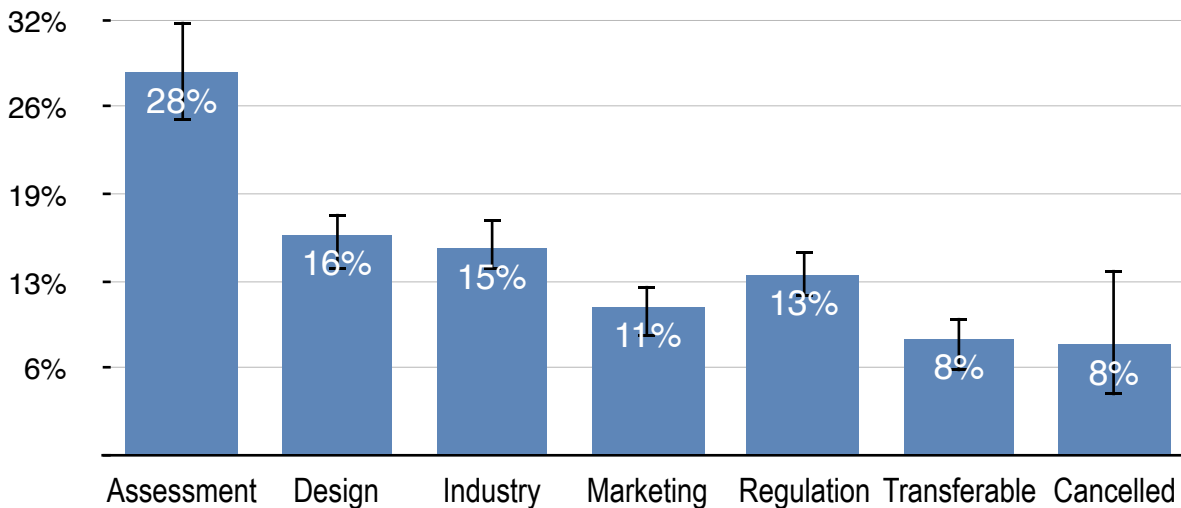
Graphic 6 - Evolution of the number of modules



Along the four editions of the course, its composition in terms of number of modules offered in each discipline has stabilised with a large offer of Assessment modules, contributing to 28% of the academic offer of the Consortium, followed by a balanced offer of modules on Design, Industry, Management and Regulation modules, each containing about 11-16% of the academic offer.

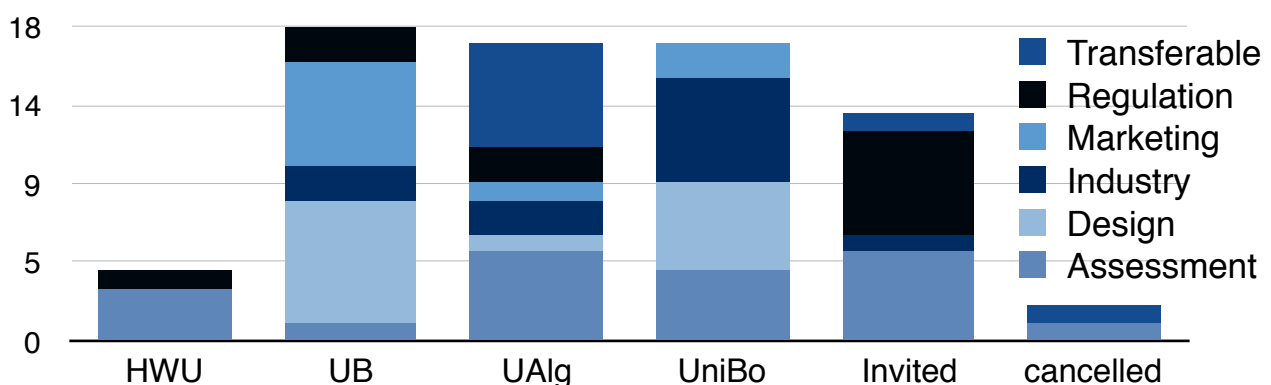


Graphic 7 - Average academic offer, expressed as % of modules offered within each discipline (error bars indicate ranges).



Graphic 8 depicts the distribution of module offer among the universities of the consortium. UAlg, Unibo and HWU offer a similar number of modules. The increase in modules offered by UAlg, 18, in comparison to the previous year, 14, is due to the transferable skills modules, typically offered by the host institution. HWU contributed with four modules, one of which was cancelled. Thirteen modules were offered by invited specialists, of which four were offered by an Erasmus Mundus Scholar, Prof. Paolo Ricci, and five were offered by European specialists, including a new transferable skills module “Team Building”, offered by Martin Fussi, Four invited modules were offered by the Erasmus Mundus MSc in Quality in Analytical Laboratories, EMQAL.

Graphic 8 - ChIR modules 2016/2017 (by university)



Calendar



The calendar for 2016/2017 was defined, like in previous years, 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 for all editions can be found in Annex A. It is also available online at:

<https://calendar.google.com/calendar/embed?src=e8l7govbncv538g5p1sn3l1ksg@group.calendar.google.com&ctz=Europe/Lisbon>

Field trips

Within the module I0206 - Chemical Industry, study trips were organised:

March 1:

Cortes de Cima Winery, Vidigueira (<https://cortesdecima.com>)

Cultural trip: Barragem do Alqueva

March 2:

Hovione, Loures (<http://www.hovione.pt>)

Cultural trip: Sintra historic center



March 3:

Resiquimica, Mem Martins (<http://www.resiquimica.pt>)



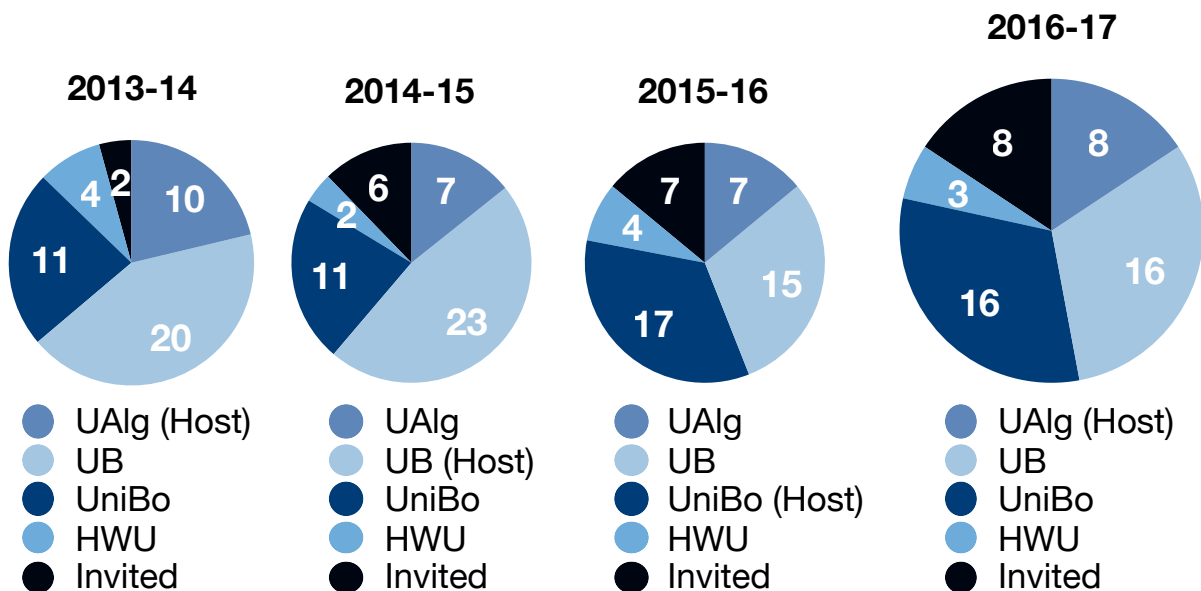
A cultural trip to *Ruínas do Milreu* was organised on October 2016



Teaching Staff Mobility

The high number of staff mobilities is a strong point of the EMMC-ChIR project. Staff mobility opens minds, fosters innovation and creativity in teaching and facilitates research contacts and involvement in transnational projects. The fourth edition of ChIR involved a total 43 lecturers from the European partner Universities, of which 35 were teaching in the Host university under mobility agreements.

Graphic 9 - Number of lecturers involved



Erasmus Mundus Scholars and Invited lecturers

For the fourth edition of the EMMC-ChIR, one non-European Erasmus Mundus scholar was invited:

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

The following European experts also contributed to the fourth edition of ChIR:

Birgit Sokull-Klüttgen- European Commission Joint Research Center (JRC), Ispra (Italy)



Cristina Massa - Alba Synchrotron Light Source, Barcelona (Spain)

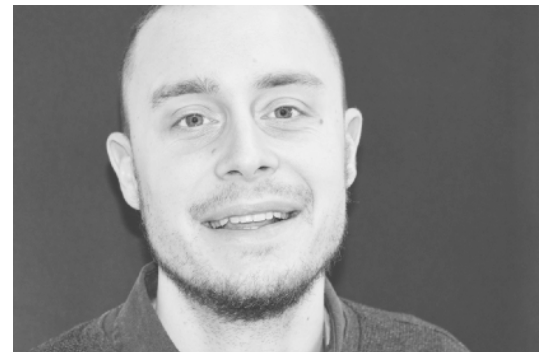
David Carlander - Nanotechnology Industries Association (NIA), Lisbon (Portugal)

Eugenia Anta - FEIQUE (Federación Empresarial de la Industria Química Española), Barcelona (Spain)



Martin Fussi - Team building consultant (Argentina)

Matteo Pori -
BASF
Pontecchio
Marconi (Italy)



Victor Garrido - Alba Synchrotron Light Source, Barcelona (Spain)



Walter Cabri - Fresenius Kabi Anti-Infectives, Bologna (Italy)

Cycle of Seminars

Taking advantage of the unique opportunity for exchange given by the high number of staff mobilities, visiting staff contributing to the 4th edition were invited to offer a seminar to the UAlg academic community as part of a ChIR cycle of seminars. In total, 27 seminars most of which (12) were offered by UniBo lecturers, 7 by external or Erasmus Mundus Scholars, 6 by UB, and the remaining by UAlg and HWU.

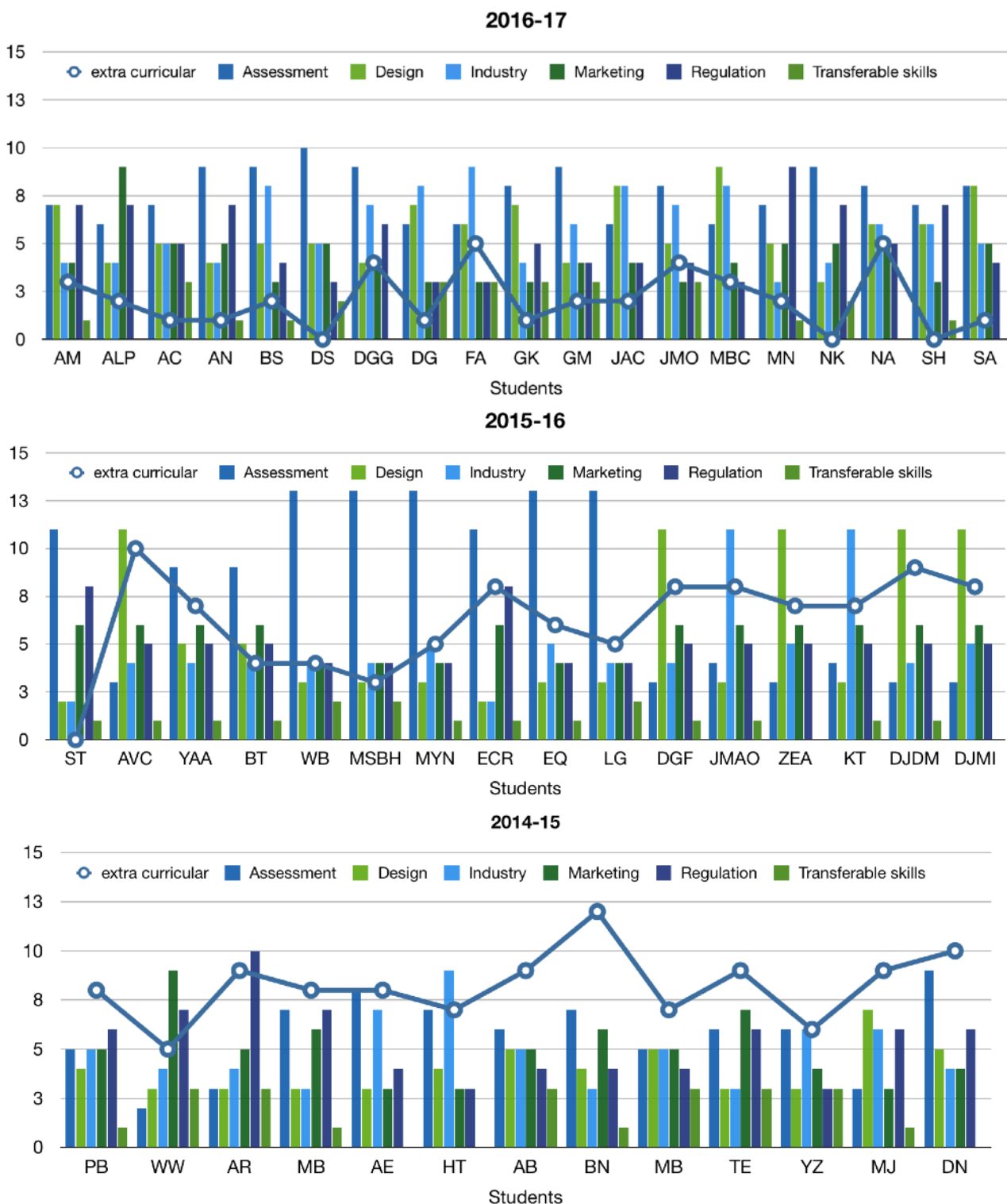


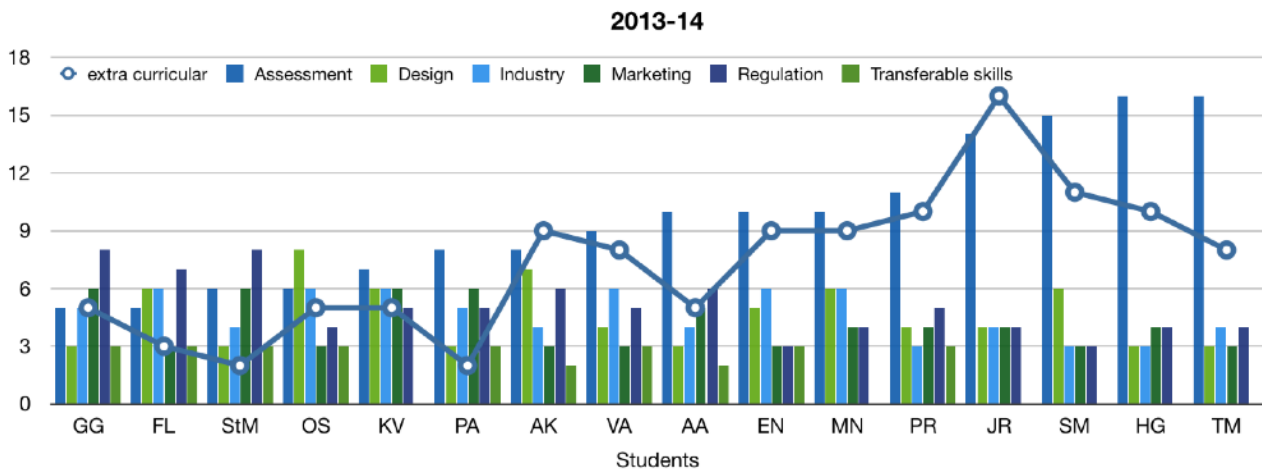
Students' Choices

Study Plans

Compared to the previous editions, in 2016-17 students chose very few extra-curricular modules. This may be a consequence of the advice towards good management of the workload given by the Programme Directors. In addition, the students' choices are reasonably balanced, with no predominance of one discipline over the other. All students chose less than 10 modules in each discipline.

Graphic 10 - Students' choice of modules

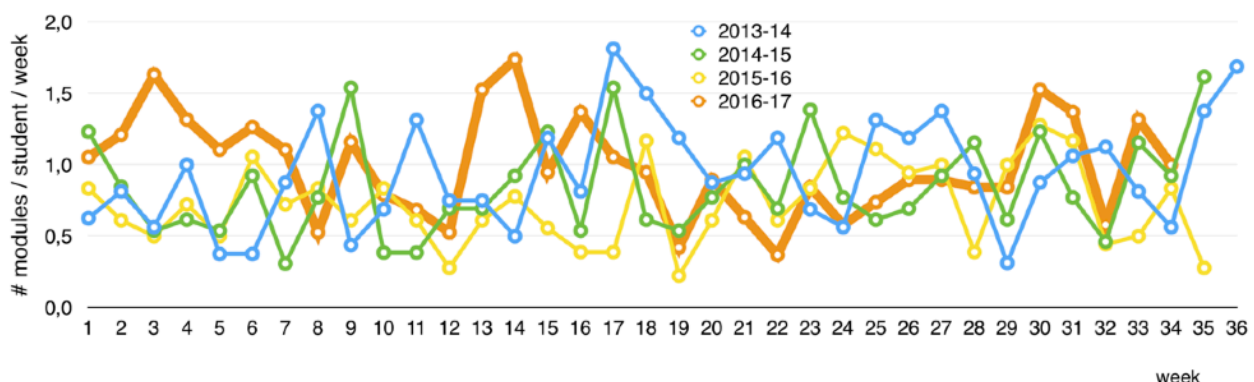




Student Workload

One consequence of the modular and flexible organisation of the course is that there is a risk that students choose modules which result in work overload at some times during the academic year, with other periods of relative low amount of work. Ideally, each student should take one module per week, but a maximum of two modules in one week are allowed, provided there is sufficient time in the following weeks to make up for the added effort. Graphic 11 shows the mean number of modules taken by students per week. In 2016-17 two peaks of work were observed: one at the beginning of the academic year, in week 3, late October, and another on week 13, late January. These peaks occurred much earlier than in previous editions, which reflects an effort to concentrate modules at the beginning of the academic year.

Graphic 11 - Student workload: average # modules / student / week



5. Research

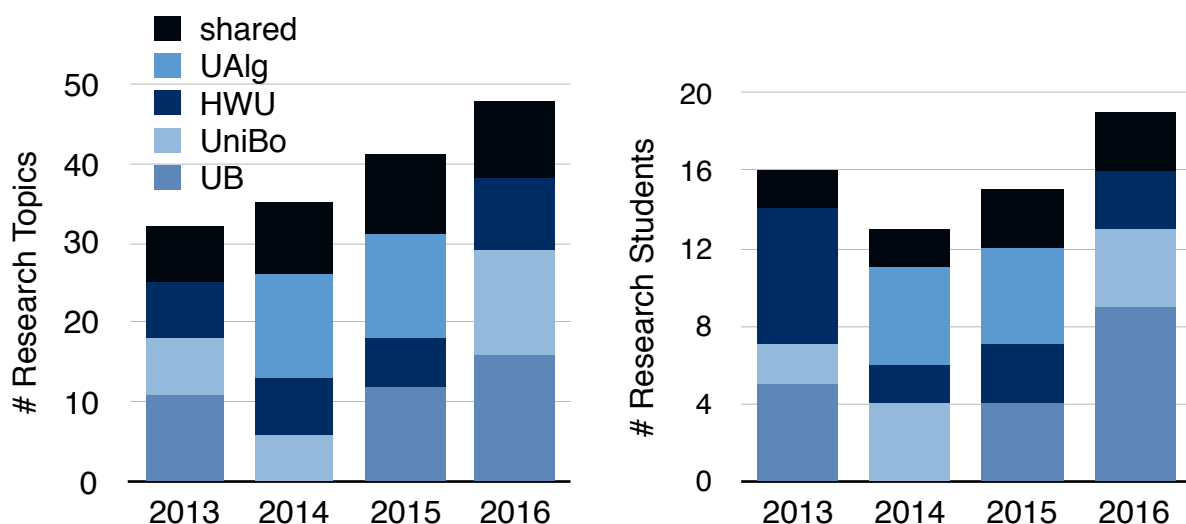
Research Topics

Every year students are offered a large choice of research topics to pursue during the second year of the course. Students are free to choose the research topic of their preference. In case there is more than one student choosing the same topic, they are advised to select a minimum of 5 topics by order of preference. If necessary, students applying for the same topic are selected according to their background and suitability for the topic.

Some research topics are shared in collaboration between two universities of the consortium, and allow the student to spend 6 months in each university. These projects are particularly interesting for further promoting international research collaboration within the topics of the EMMC-ChIR.

Graphic 12 shows the distribution of research theses offered and final distribution of research students in each course edition. The total offer of research topics has consistently increased each year, from 32 in the 1st edition to 48 in the fourth. The number of offered shared topics increased from 7 in 2013 to 10 in 2015 and 2016.

Graphic 12 - Offer of research topics and distribution of research students



The selection of topics by students from the 3rd edition took place between October and December 2016. The final distribution of topics among the students is presented in the next table.

Student Name	Research Host	Supervisor	Topic description
Ahmed Abdelmoneim Abdelfattah Mashaly	UB	Axel Bidon- Chanal	Computational Drug Design of inhibitors of Hemagglutinin A to tackle the influenza virus.
Ana Ligia Sandoval Pérez	UB	Rubén Huertas	Marketing research on new products associated with the respondent's sensory perceptions (e.g., food, drinks, perfumes, hair and cosmetics products, etc.).
Anna Ciurlini	UniBo	P.G. Cozzi - R. Dorta (University of Erlangen, Germany)	New catalytic methodologies for stereoselective Michael reactions
Askar Nurassilov	UAlg/UB	Isabel Cavaco / Daniel Sainz	Study on the different strategies and approaches followed by companies in Portugal and Spain to comply with REACH regulations.
Basma Raad Shakir	UB	Joan Albert	Anticancer palladium(II) compounds.
Cruz, Jose Albert Villareal	UB	Pilar Ramirez de la Piscina	Catalytic CO ₂ conversion for its recycling and use as C ₁ source: study of new catalysts.
Danilo Bertagna Silva	UB	Santiago Esplugas	Chemical oxidative treatments for municipal water reuse.
Dawit Gebremichael Gidey	UniBo	E. Tagliavini, P. Galletti, C. Samorì	Use of renewable sources of materials for producing valuable chemicals
Diego Gerini	Unibo/UB	Emilio Tagliavini / Daniel Sainz	Catalysis in green alternative solvents
Fadi AL-Shnani	UB/UJI	Daniel Sainz / Eduardo Peris (UJI)	Preparation of three-dimensional organometallic molecules with cavities, for the recognition of small molecules and selective catalysis.
Gidey Gebremeskel Kidane	UB/ENS Lyon	Montserrat Corbella Cordomí (UB) Belen Albela Castrillo. (ENS Lyon)	Manganese compounds as models of antioxidant enzymes. Insertion in mesoporous supports.
Giulia Mengotti	UniBo / HWU	E. Tagliavini / T. Fernandes	Green chemicals and the study of their toxicity and degradability
Jye Ming Ong	UniBo	D. Fabbri, C. Torri	Analytical methods for the determination of key compounds for advanced biofuel development
Mart Benson M. Castillo	HWU	Dr Karl Stephen	Oil recovery efficiencies.
Mi Nguyen Thi Diem	UB	Merce Segarra	Environmental impact of materials used for packaging.
Napatr Kunachitpimol	HWU	Prof Teresa F Fernandes; Dr Ted Henry	The effects of micro/nano plastics in the aquatic environment.

Student Name	Research Host	Supervisor	Topic description
Nazan Altun	UniBo	Dora Melucci	Application of chemometrics and Design of Experiments (DOE) to pharmaceutical processes
Seyyed Mohamedreza Hesami	HWU	Prof Teresa F Fernandes	Environmental safety assessment of nanomaterials.
Sharmaine Atencio	UB	Carmen González	Study of new textures in gastronomy

ChIR Symposia

2nd ChIR Symposium, 2016

The 2nd ChIR Symposium was organized in Bologna on July 6, 2017 at the end of teaching activities of the 3rd Edition of the Erasmus Mundus master in Chemical Innovation and Regulation.

About 50 people attended the Symposium coming from the Universities of Algarve, University of Barcelona, University of Bologna and from Italian Companies.

After introduction from the Director of the Department of Chemistry “Ciamician” of the University of Bologna, Prof. Luca Prodi, and from the Coordinator of the ChIR Master, Prof. Isabel Cavaco, presentations were organized in four successive sessions chaired by Dr. Walter Cabri, Prof. Claudio Trombini, Prof. Daniel Sainz, Prof. Marco Lombardo, Prof. Paola Galletti.

The following invited speakers, from chemical industries, provided Key Lectures:

Elena Badaloni – Sigma Tau
 Cosimo Franco – Endura
 Gabriele Fontana – Indena
 Katerina Vengel – Galenicum
 Matteo Pori – BASF

From the 2nd ChIR edition students provided short 10 oral communications and posters where their research was presented, each followed by a thorough discussion.

As social activities, a lunch buffet, offered by the ChIR Management Team and a dinner with all the students and the ChIR staff, completed the Symposium.

3rd ChIR Symposium, 2017

Following the tradition started in the UB in 2015, UAlg organised the 3rd annual ChIR Symposium, under the topic “Safety, Innovation and Regulation”. The symposium brings

together the students, researchers and industry stakeholders, is an excellent mean for students to share their research work and train scientific communication skills, and also gives to students from consecutive editions the opportunity to meet and share experiences. This year's Symposium took place in July 3-4, following the last week of classes. The programme and details are available online at <http://emmcchir.org/symposium2017/>. Research students from UAlg, UB and HWU presented their work orally and in the form of posters. Students of the 4th edition presented posters from the modules Communication Skills and Innovation Skills. Invited speakers included David Carlander (Nanotechnology Industries Association, Lisbon), Susana Gomes (APEQ, Lisbon), Paulo Baião (Hovione, Portugal), Dominic Byrne (Blue Frog Scientific Limited, UK), Mark Irvine (ERM, UK), Ricardo Mendonça (Hovione, Portugal), Cristina Gonzalez (FEIQUE, Spain), Matilde Mazzotti (Micoperi Blue Growth, Italy) and Andrew Bell (Shell, UK).

6. Quality Assessment

Student Performance

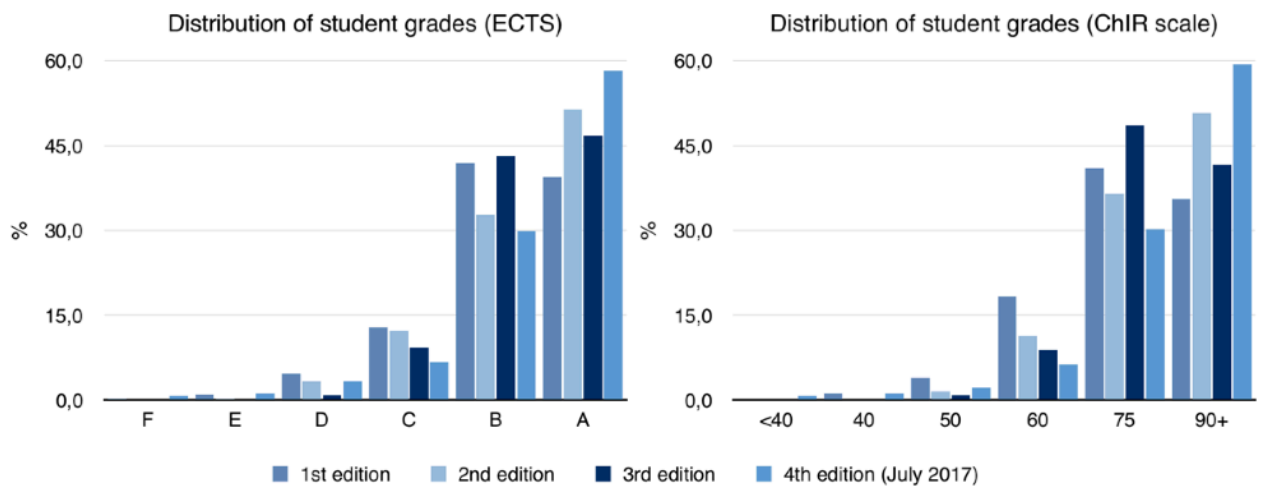
In order to facilitate the transfer of grades between universities of the consortium, two different scales are used: the ChIR “absolute” grading scale (0-100), and the ECTS grading scale (A-F).

By the end of June 2017, 28 modules were graded, 80% of the 35 for which students had already submitted assignments and two months had passed for the evaluation. This is not as good as the edition in UniBo, where this ratio was 95%, but it is still a good result compared to the two first editions, when it was about 30%.

The average grade in the third edition is 87%, considering all the data collected by July 2017. More than 58% of all grades are A. As in previous years, these are exceptional results reflecting the high quality of Erasmus Mundus students.

Graphic 13 compares the student grades in individual modules during the four editions. Results for the first edition are not complete, as not all grades are yet available. Results show high grades (A) are predominant, and their proportion has increased significantly in the last edition compared to the previous ones. On the other hand, a few D, E and F were observed, grades which usually did not appear in previous editions.

Graphic 13 - Distribution of student grades



Student initiatives

For each edition of ChIR, two representatives are elected among ChIR students to participate in the Programme Committee. A student representative for the EMA (Erasmus Mundus Alumni Association) is selected in a separate election. No EMA election took place during the 2nd edition of ChIR.

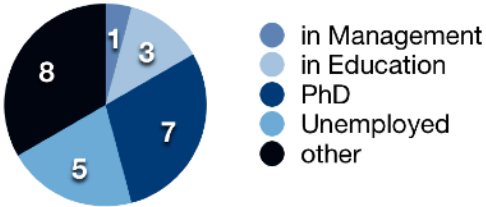
Elected student representatives:

	PCm	EMA
1st edition	Victor Ajao (Nigeria) Sohaib Mahri (Algeria)	Victor Ajao (Nigeria)
2nd edition	Paola Blair Velazquez (Costa Rica) Chukwuka Bethel Anucha (Nigeria)	-
3rd edition	DJ Donn Matienzo (Philippines) Diana Guillen Ferrari (Paraguay)	Pauline Roxas (Philippines)
4th edition	Jose Albert Cruz (Philippines) Danilo Bertagna Silva (Brazil)	Maybel Nonato (Philippines)

Alumni Information

ChIR graduates typically defend their MSc theses in September. A survey is sent to alumni on June of the year following their graduation, roughly 9 months after graduation. Fourteen (88%) of the sixteen students of the 1st edition and ten (77%) of the thirteen graduates of the second edition filled the survey. Of these, only 5 (21%) were unemployed within 9 months of graduation. The remaining are either pursuing a doctorate degree (7, 30%) or working in fields related to the ChIR: management, regulatory and risk assessment areas (3, 13%), in education (3, 13%) or in other areas (4, 17%).

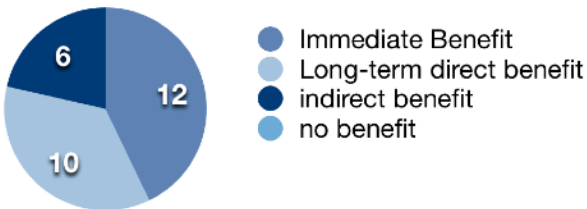
Current Employment Status



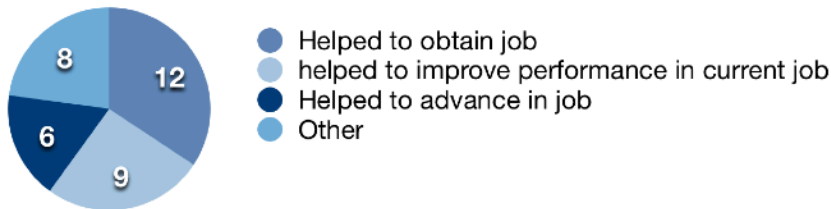
Responsibility Level



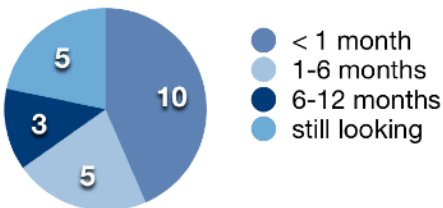
How did ChIR influence your career



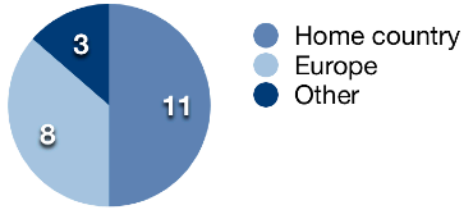
How did ChIR help in your employment



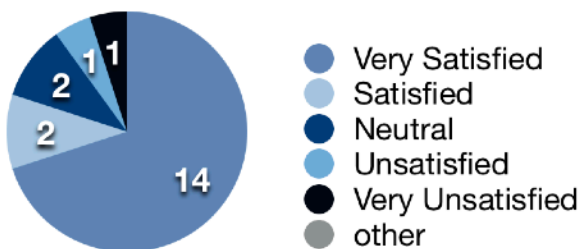
How long to obtain employment



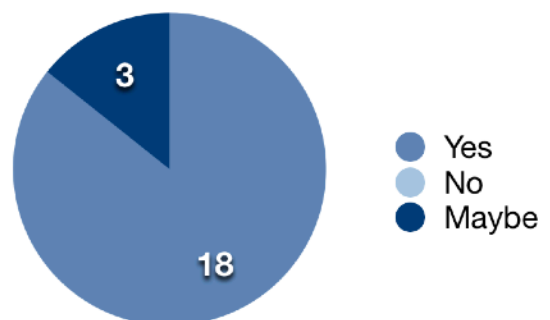
Where are you working presently



Current Job Satisfaction



Would you recommend ChIR?



Comments from EMMC-ChIR alumni 2013-2015

Definitely an extraordinary experience, recommend to all young hearts to take this adventure

Indeed this is an effective program and highly recommended.

The programme is quite interesting, but I suggest that it becomes more direct. In this sense, I mean if it can be splitted into division of innovations and regulations separately, it will make more sense than one jumping into the programme and then picking some many courses in both innovation and regulation and then ending up doing all together a project thesis out of the curriculum courses you had earlier obtained. Let it be streamlined with courses done during the one year that will always be in line with any prospective thesis project topic one could choose at the end of the curriculum.

I wish the course would be backed up with some real industrial intenship in order to facilitate and expand job opportunities.

It is important that a solid internship program is embedded within the program because it is very difficult to find a job with regard to the regulation aspect because most companies are searching for EUROPEANS and those with experience. Through the internship, it can serve as a work experience

Long live EMMC-ChIR; Wish you to get promoted to PhD program

It needs to be perfected in modules and second year projects or in general. It was a great programme and I recommend to the next person but we have had issues about the classes, the projects, the visas and places to stay. I wish other people do not go through these difficulties we experienced.

Internal Quality Assessment

As part of the ChIR internal quality assessment, students were invited to assess the course at three levels: the individual modules, the Host institution and the project as a whole.

The **Host institution and the project as a whole** were assessed through one annual questionnaire distributed in June 2017. A copy of the text for the annual questionnaires can be found in annex 1. The results are summarised below in this text.

Individual modules were assessed through online questionnaire available at the end of each module in the Moodle portal. The questionnaire and results of the assessment of individual modules can be found in annex 2.

Questionnaires were managed using the Moodle portal as well as Google forms.

QA data is analysed in the PCm meeting. The follow-up from issues raised in 2016 may be found in Annex A.

General Questionnaire

The following results come from the ChIR annual questionnaire, distributed to students of the 4th edition completing the curricular year in UAlg. The first part of the survey was distributed in November and covers the motivations of students coming to ChIR. It was filled by 20 students, including one student from the 3rd edition, Zhore Eskandari, who participated in some modules in UAlg.

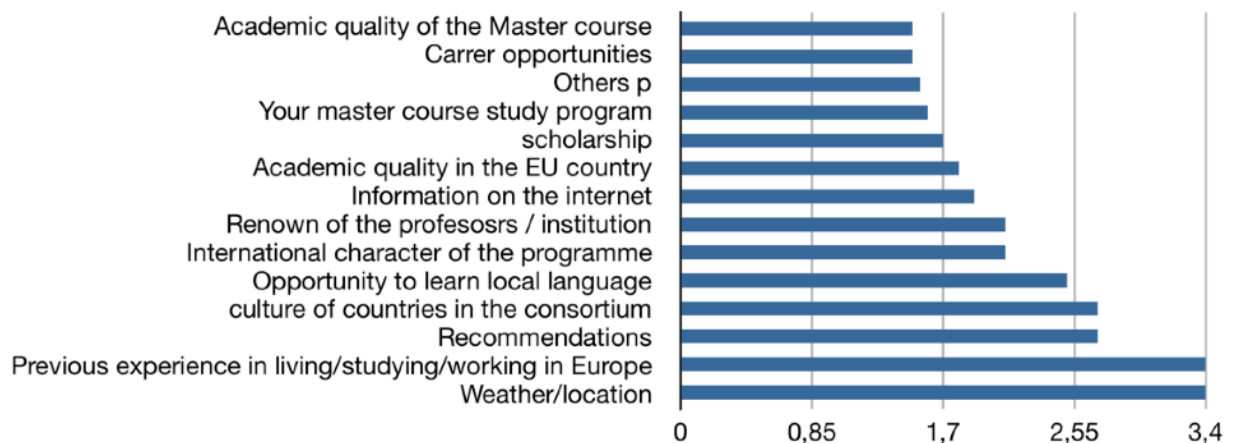
The second part of the survey was distributed during May and June 2017 and evaluates the course as a whole, and the conditions of the host university. Sixteen (84%) students participated.

Answering all questions was not mandatory, so several questions were left blank. The results are summarised below.

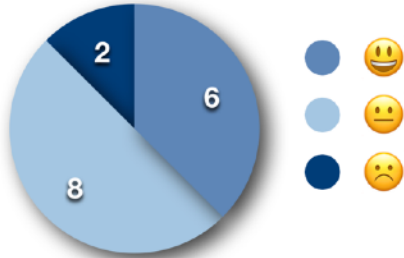
How did you learn about Erasmus Mundus and ChIR?



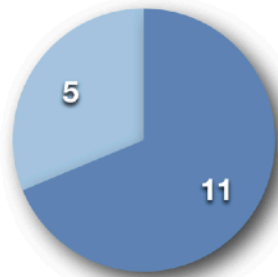
How important are the following aspects in choosing an EM master course?



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

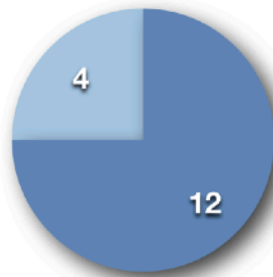


Where are you living?



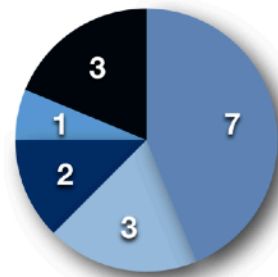
- Private accomodation
- University Accomodation

Are you satisfied?



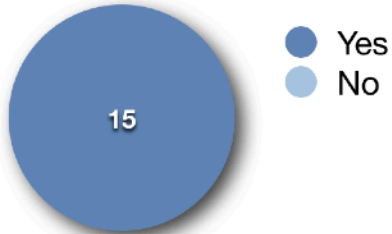
- Yes
- No

How much do you spend per month?

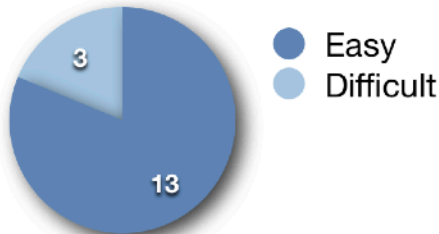


- <300 €
- 300-500 €
- 500-700 €
- 700-900 €
- 900-1200 €

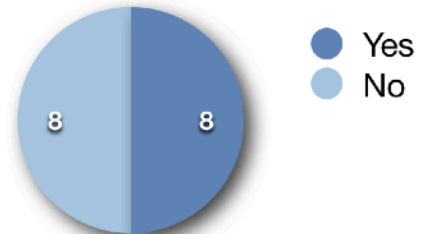
Do you have friends at the university?



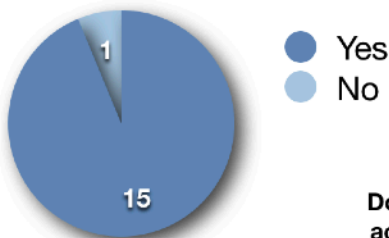
Is it difficult to contact European students?



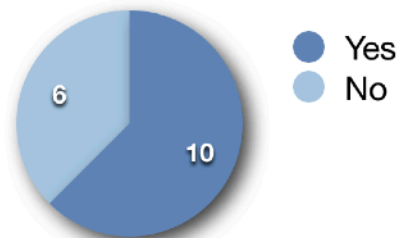
Do you participate in university groups?



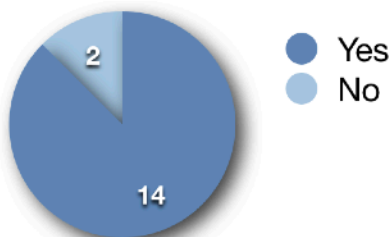
Do you have friends outside the university?



Do you participate in extra-university groups?

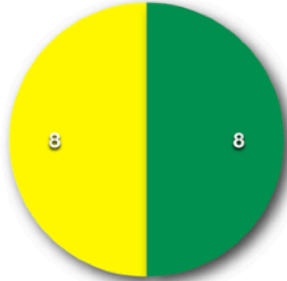


Do you feel accepted / integrated?

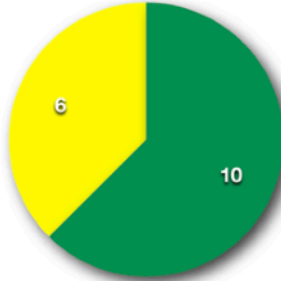




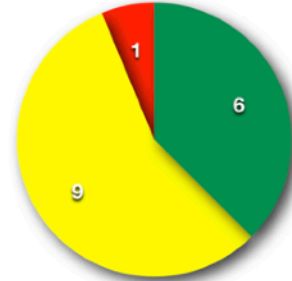
Pedagogic Quality of Lectures



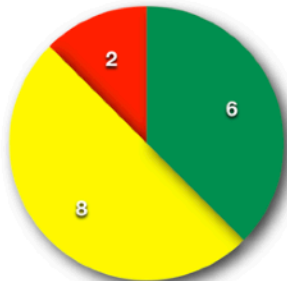
Academic Quality of Lectures



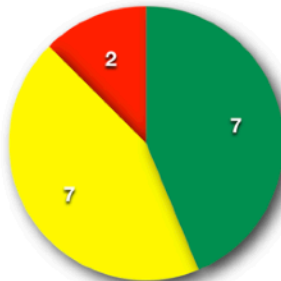
Composition and Content of the Curriculum



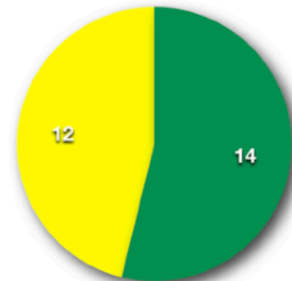
Balance between lectures and self-initiated study



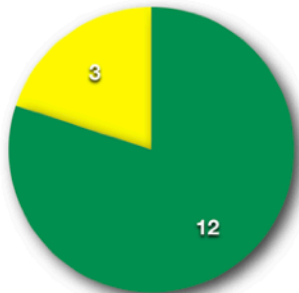
Balance between lectures, group work and other forms of study



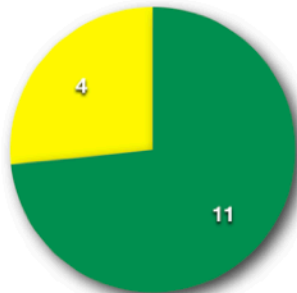
Help, access to and time devoted to you by the academic staff



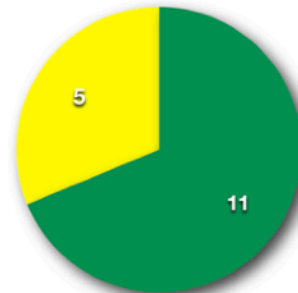
Service from the administrative staff



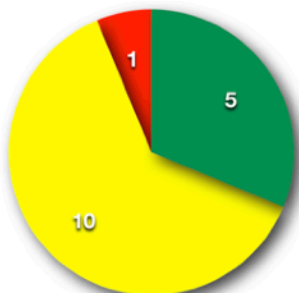
Service from the international office



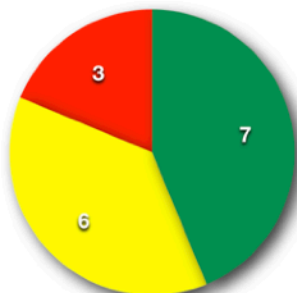
Quality and access to the library



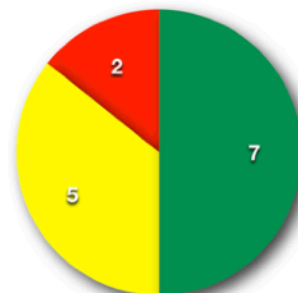
Quality and access to the laboratories



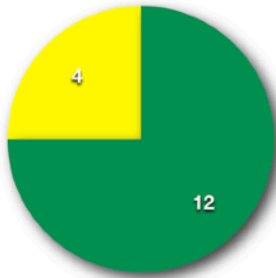
Quality and access to the computing facilities



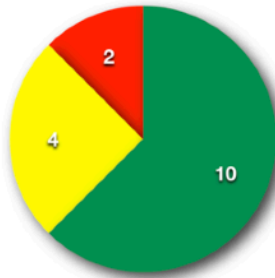
Quality and access to the internet



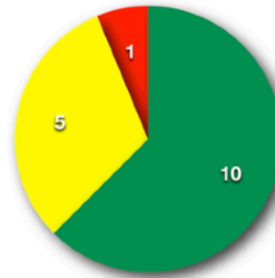
Quality and access to the canteen



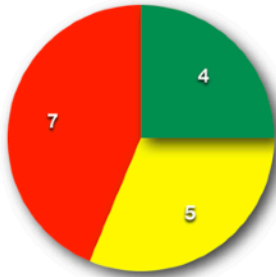
Quality and access to accomodation



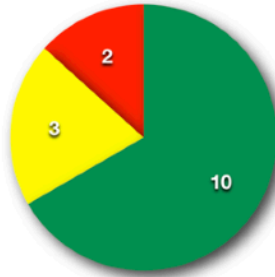
Quality and access to transport



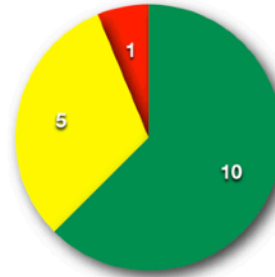
local language training



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



Professional Quality of the Programme Coordinator



The best in the EMMC-ChIR	The worst in the EMMC-ChIR
<p>This master programme is very diverse. It has different modules that can fit whatever path you want to pursue whether you want to focus on design, industry, marketing, assessment, or regulation. In addition, we composed of professionals from different background where exchanges of personal and professional experiences happened. Moreover, we have professors or lecturers from different universities in Europe which makes the programme very intercultural and very interesting. Furthermore, the master programme is very dynamic because each module is taken within the week and it changes each week. Additionally, it has weekly seminars where latest innovations and studies of scholars are presented. The 4th edition is also lucky because we are given different opportunities such as summer class offer in Hokkaido and internship offer in Hovione. The University of Algarve has given me the opportunity to experience the life of Portuguese people. The international office, together with its staff, is assisting and accommodating. The library is also accessible and internet is available within the university. Portuguese are very polite and kind.</p>	<p>Some modules are very brief and have no in-depth learning. Some professors should improve their lectures and communication to convey with the students. In addition, during the initial stage of classes, our room is an Electrical Engineering laboratory which is not quite convenient in doing lectures and discussions.</p>
<p>Host institution staff is nice and helpful. Environment in Faro is good and local people are friendly.</p>	<p>-</p>
<p>It is about green chemistry and sustainable chemistry. Different professors and a different way in teaching and presenting knowledge.</p>	<p>Too many modules. One module each week. Lots of work on professors to deliver different information in short time. Yes, it is nice to have a diversity in courses but that can effect the quality.</p>
<p>The highlight of this program is the possibility to choose between a really huge number of courses, and to be able to learn about concepts, cultures and professors from different parts of Europe. Many professors are extremely prepared and explain their subjects with enthusiasm, although they have a very limited time to do it. The university where this 4th edition has been conducted is beautiful, well cared in all the aspects and has all the attractions and amenities necessary for the students. Excellent the idea to visit important industries and cultural poles in Portugal (or in the country where the ChIR takes place).</p>	<p>Often the information about the courses are given with not enough advice. At the beginning of the year we were asked to decide the research thesis project: it might be better to give students time to decide what they want to study for a whole year after following at least the courses (e.g.: until December). Changes in the schedules, cancellations or, worse, shifts of lessons from a date to weeks (if not months!!) later, do not allow students to organize their study plan - outside the classes.</p>

The best in the EMMC-ChIR	The worst in the EMMC-ChIR
<p>The arrangement of the courses are really good. It gives us space to choose freely whatever we are interested to develop ourselves. It is possible to choose them in a way that some of the topics complete each other in more deep or just to choose some in order to gain some introductory knowledge and broaden our viewpoint. The professors are in general very professional at their area and very understanding and nice towards the students. It was really nice to be able to stay in the university residence at the first days of our arrival and to learn Portuguese at the very basic level. The monthly allowance is for sure very useful for our living costs and to focus on our duties.</p>	<p>Master Course: It was very difficult to choose and be sure about the research topic just at the beginning of the studies. In the provided research topics, the majority of options were focusing on Chemical and Environmental Sciences while the topic and supervisor options for engineers and pharmacists were somehow restricted. Host Institution: Social services of the university are in general so much incompetent. The staff of Service of Social Action is treating the students in very bad manners in personal. Sometimes they don't talk or answer in English even though they know, related to university residences and behave very improper especially because of their misgivings on monthly fee issues. The rule of "no permission to move out after the first month" was very restricting for us.</p> <p>The worst part was Portuguese Language Course administration's approach on the semester course due to the coordinator's and secretary's treatment. In specific, they were very careless at operating the data they gathered at their side in contrast with their strictness and were missing empathy to students at an extreme level. For me, it was not possible to keep learning the local language at the university because of these things even though I wished.</p>
<p>It is science and interest of today world</p>	<p>It is too much to manage</p>
<p>Well, let me see, we have nice classmates, impressive professors, sweet mobility office, beautiful country, welcoming people, cannot complain. Cheap country for non-Europeans.</p>	<p>Uni accommodation is horrible, shouldn't place master students with undergraduates.</p> <p>Too many courses in a very short time, and I think most of our professors complained about time somehow feel disconnected.</p> <p>Some professors don't answer assignment related question.</p> <p>Little bit unorganised, probably due to its structure of many courses.</p> <p>No practical courses.</p>
<p>You can choose from a vast group of modules and really expand your knowledge. The professors are extremely open to dialogue and discussion of any subject or deadline.</p>	<p>No integration at all between CHIR students and regular students from the university of algarve.</p> <p>We could have made a better use of the university facilities, such as labs. Never once we were on a lab.</p>
<p>Very flexible and dynamic Host institution is very hospitable We get to learn a lot of new things and new ideas, different perspectives ChIR staff (Prof. Isabel, Prof. Vera, Prof. Ana Rosa, Nataliya, Dina Jesus, etc.) are very nice</p>	<p>Too many assignments</p>

The best in the EMMC-ChIR	The worst in the EMMC-ChIR
<p>Hollistic, innovative and integrated approach covering different aspects from design, industry, marketing, assessment, and regulation of chemical substances</p> <p>Allows you to create your own study plan based on your preferred modules.</p> <p>Develop technical, social, innovative, and research skills.</p>	<p>The objectives of some modules are not fully satisfied</p> <p>Scope of some modules are too broad</p> <p>Learning and discussion are sometimes difficult due to delivery of the subject and/or language barrier</p>
<p>Admin Nataliya is very supportive.</p> <p>The diversity of the modules: new aspects of knowledge.</p> <p>A few professors are very impressive in term of mindset.</p> <p>The freedom of students to choose modules and plan the studying schedule.</p> <p>The model 4 days studying/3 days off for assignments and leisure is reasonable.</p> <p>The Multinational feature of the program</p> <p>The canteen has good food.</p>	<p>Quality of the class room is not good: the room does not have enough light; blurred projector; not good air ventilation; connection from professor's laptops to projector always have problems that it takes 15 - 30 mins to fix.</p> <p>The timetable of class and seminars should be more convenient for students. Most of students come from countries that have lunch at 12.00.</p> <p>English capability of numerous lecturers must be better.</p> <p>There are many modules that the content of slides looks interesting but due to the English capability we can not understand what is being taught at all. In my opinion, this issue is the most important.</p>
<p>Host Institution: The University have very accessible facilities. Everything you may need is available in the University, usually is not necessary to go out of campus.</p> <p>Master Course: The international environment, not only of students but from professors. It was a great experience to interact with the professors during the week and understand the similarities within cultural backgrounds. Most of the professors were very successful on their areas and it was a great opportunity their experiences on the field.</p>	<p>Host Institution: The staff of Service of the Social Action (residence payment and reservation) was not helpful and was rude. Apart from that, I don't believe that the University have any "worst feature", staff was always helpful and kind.</p> <p>Master Course: Little flexibility in changes of research topic and study plan. Interest may change during the learning process and by the time of choosing, some topics are still unknown for the students. Also, some courses do not disclose at the beginning specific requirements in background knowledge, making it difficult to be able to follow the information.</p>

Module Questionnaires

The questionnaires designed to collect the opinion of students on the quality of the modules 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 July 2017 can be found in annex 2.

The questionnaire was available online at the end of each module in 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 reminded of the importance of their contribution to the evaluation of the course.

An individual report for each module summarises the quantitative as well as qualitative analysis of the questionnaires. Results from both students and lecturer are represented in the same page by coloured pie charts and can be easily analysed. 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.

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

Follow-up from the PCm meeting 2016

The following table summarises the issues raised in the Programme Committee 2016 meeting, and how they were addressed.

	Issue	Action	Status
1	Study Plan 4th edition	Include a new transferable skills module on Team Building	Solved.
2	Research Topics: insufficient information is given to students about some research topics.	To provide more detailed information to help students decide, additional information is given for each research topic including a link to the research group website, etc.	Solved.
3	Lecturers: improving student-lecturer interaction	Weekly seminars given by the lecturers were created to bring them closer to the students, as one of their purposes. Unfortunately, not many students participated. It is suggested to include as part of the Research Skills module the participation in a minimum number of seminars.	Ongoing.
4	Supervisors: lack of skills presenting and discussing results	The module Communication Skills was expanded to cover also written skills and visual poster presentation.	Ongoing.
5	Students: difficulty finding accommodation	The Consortium helps finding accommodation as best as possible, but the unrealistic expectations from the students arriving to Europe cannot always be met. The most important aspect is that no ChIR student never arrived to Europe without a place to stay. UAlg reserves residence rooms specially for ChIR students. Students have one month to decide whether they will keep the room, or find another place. UB, UniBo, and HWU offer information on how to book a place to stay before arrival.	Solved as far as it is possible.
6	Software in local language	Software used class in computers of the Host university 2016-17 was installed in English.	Solved
7	Visa and residence permit difficulties	It was suggested to prepare a text including past experiences of the students, thus contributing to the personalised support that ChIR offers to the incoming students. This issue is recurrent, but solving it transcends the Consortium. European legislation is being put in place to facilitate visa issuing for students. Meanwhile, the suggested improvements are under implementation.	Improvements under implementation.

	Issue	Action	Status
8	Language survival course insufficient	The survival language course is necessarily very short. It may not be sufficient for many students, but it should be better than no course at all. Alternative regular local language courses are available, but schedule is often incompatible with the ChIR intense schedule.	Not solved.
9	Slow delivery of grades	Monitoring the process after a module is taught, i.e., within the following month, which is the time given for the students to complete the corresponding assignment, make available the questionnaire of this module, ask the students to fill it. After they do, send an email to the lecturer reminding that he/she has 1 or maximum 2 months to deliver the grades. After receiving the grades from the lecturer, the PD must check whether they are consistent with the ChIR rules. If so, they will be communicated to students by publication in the Moodle portal, but only after all students have completed the module questionnaires. NB controlled this process during the 4th edition in UAIG.	Under implementation. This issue has been dramatically improved in the 3rd and 4th edition through the active reminding of lecturers by the PD or the ChIR secretary. Nevertheless, the grades for about 20% of modules take too long to be available.
10	Decrease the amount of written reports.	The PMT took it into consideration and agreed that presently no changes can be done, since the evaluation must be decided by the lecturers, and the structure of the ChIR evaluation is based mainly on written assignments.	Solved.
11	Lack of assistance with the Erasmus Mundus health insurance	Providing more clear information to students at the beginning of the academic year.	Solved.
12	Lack of internships	Internships are not mandatory, but are possible. The students initiative on searching for internships is welcome. Additionally, short internships were offered at the Portuguese company Hovione, through contacts of UAIG, at the end of the academic year.	Ongoing. Four students are doing short internships at BASF (Germany), SGS (Madrid, Spain) and Hovione (Lisbon, Portugal)

	Issue	Action	Status
13	Quality of classes taught by videoconference	In the 3rd edition, two modules were taught by videoconference as a resource solution. This was not planned in advance and the quality was not satisfactory. It was decided that a lecturer can deliver a module by VC only if there is no other option and as long as there are conditions with adequate videoconference infrastructures.	Solved.
14	Decision on the choice of Research topics is requested too early from students.	It was decided that for the 5th edition research topics will be presented at the beginning of the academic year, as before, but the decision from students is expected in December, before the Christmas break.	Ongoing.
15	Need to improve students team working skills.	Including Team Building and Personal Branding modules. Team building was offered successfully in the 4th edition. Personal Branding was offered but later cancelled, due to unavailability of the lecturer.	Ongoing.
16	Not all module descriptors are up to date.	Making the module descriptors available in the Moodle section of each module.	Implemented.
17	Keeping track of alumni career achievements	Students were encouraged to create LinkedIn® accounts and keep them updated. A page within the ChIR website describes alumni profiles and links to LinkedIn® accounts: http://emmcchir.org/Info/Alumni/	Implemented.
18	Insufficient Quality Assessment data regarding the research year.	A survey for research year students was developed and will be implemented in the theses defences of the 3rd edition.	Ongoing.
19	Improving the visibility of ChIR	New promotion strategies were implemented: advertisement in ChemWatch providers guide. Campaigns on Facebook. Expanding the dissemination of the ChIR Symposium.	Under implementation.

Annexes

Annex 1

Modules Calendar 2016 - 2017

Follow-up on issues raised in the 4th PCm meeting

Annex 2

2a - Results of the QA of individual modules - 3rd edition

2b - Results of the QA of individual modules - 4th edition





Annual report to the PCm
Revised version: July 10, 2017

