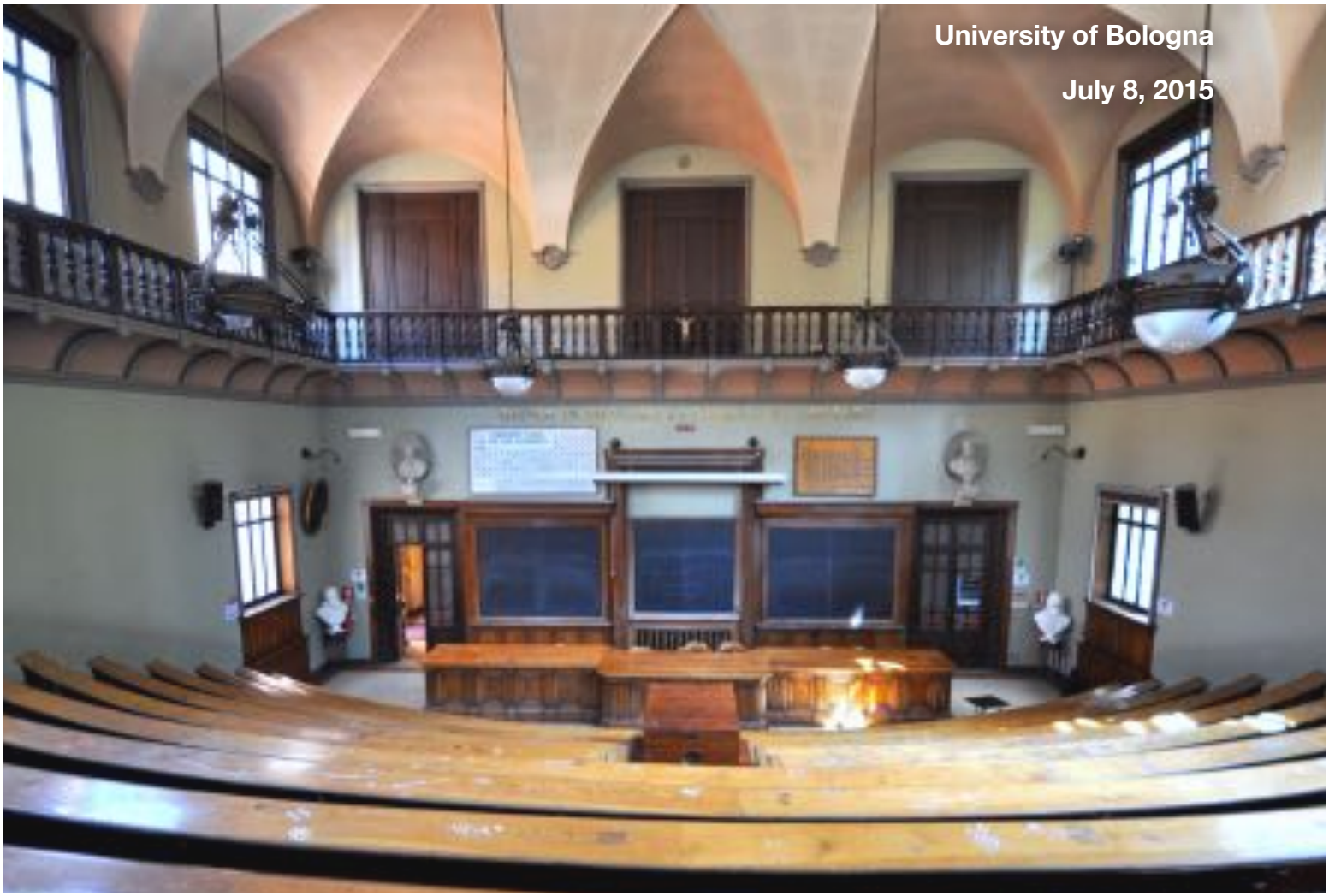
Erasmus Mundus Master Course in
Chemical Innovation and Regulation

Annual Report 2015

for the Programme Committee



UAlg UNIVERSIDADE DO ALGARVE

Universitat de Barcelona

ALMA MATER STUDIORUM UNIVERSITÀ DI BOLOGNA

HERIOT WATT UNIVERSITY

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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 ones.

The present report provides information on the ongoing 1st and 2nd editions and on the selected students for the 3rd edition hosted by the University of Bologna.

Introduction

What is the EMMC-ChIR?

The EMMC ChIR - Erasmus Mundus Master in Chemical Innovation and Regulation - is a MSc created in 2012 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 University of Algarve (UAlg), University of Barcelona (UB), University of Bologna (UniBo) and Heriot-Watt University (HWU). The UAlg coordinates the project in its first five years.

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:

- NILU - Norsk Institutt for Luftorskning (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)

In July 2013 the following institutions were proposed to join the Consortium as Associated Partners:

Universities:

- Hokkaido University (Japan)
- University of Pune (India)
- Mahatma Ghandi 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:

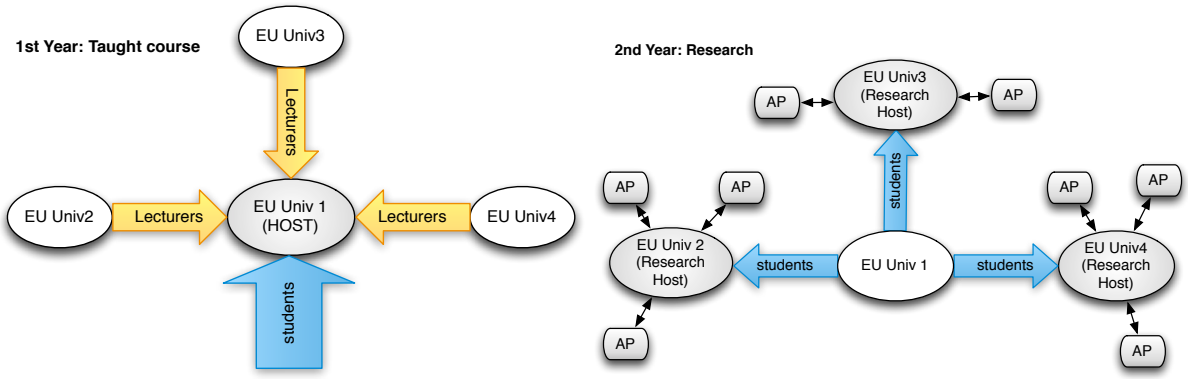
APEQ - Associação Portuguesa de Empresas Químicas (Portugal)

AIPQR - Associação das Indústrias da Petroquímica, Química e de Refinação (Portugal)

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 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 Universities in subsequent years. The research may 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: 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 students may choose them freely, provided they take a minimum of 3 modules from each discipline and that their 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 (UAlg)

Programme Director 2014/15: Daniel Sainz (UB)

Programme Director 2015/16: Emilio Tagliavini (UniBo)

Co-Directors in 2015/2016: Paola Galleti (UniBo); Assimo Maris (UniBo)

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)

Examiners Board:

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

External Examiners:

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

Secretary:

Mar Santacana (UB)

Nataliya Butenko (UAlg)

Chiara Brighi (UniBo)

Candidates 2015-2017

Erasmus Mundus Student Applications 2015

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, and it has been updated from a maximum of two 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 third edition of the course received between October 2014 and January 2015 a total of 137 complete applications from 38 countries. Comparing with previous editions, in the first edition 178 and in the second 180 applicants, this corresponds to a reduction of approximately 23 % in the number of candidates since the first edition.

In this third edition 120 (88%) candidates are non Europeans and only 17(12%) are Europeans or candidates who have previously lived in Europe, while in the second edition were 146(81%) and 34(19%) respectively. Figure 1 represents the geographical distribution of candidates.

The third edition of the EMMC-ChIR adopts the new Erasmus+ Programme rules, which replaces the Erasmus Mundus 2009-2014 Programme. In the 2015-2017 edition the European Commission provided 13 Erasmus Mundus student grants: 8 for a general main list of Partner Country candidates, 3 for special funding windows and 2 for Programme Country candidates. The three selected special funding windows for EMMC-ChIR candidates were the DCI-Asia, DCI-Middle East and DCI-Latin America LMIC.

The top ranked candidates fulfilling geographical and gender balance received Erasmus Mundus grants. One candidate declined the grant and another did not reply to the contacts within the two-weeks deadline. These grants which were offered to the following ranked

candidates in the reserve list. Figure 2 represents the geographical distribution of candidates that received the grants.

Gender distribution among candidates was skewed towards male candidates, with only 32% female candidates. Once again, this is due to the Ethiopia candidates contribution (25% of completed applications), which are almost exclusively male. Comparing with the previous editions candidates, there are 7% more female completed applications than the first edition and the same percentage as the last one. Gender balance was monitored in the selection of candidates for EM studentships, and as a result the main list contains 50 % (6) female students. Figure 3 represents the gender distribution for all the candidates.

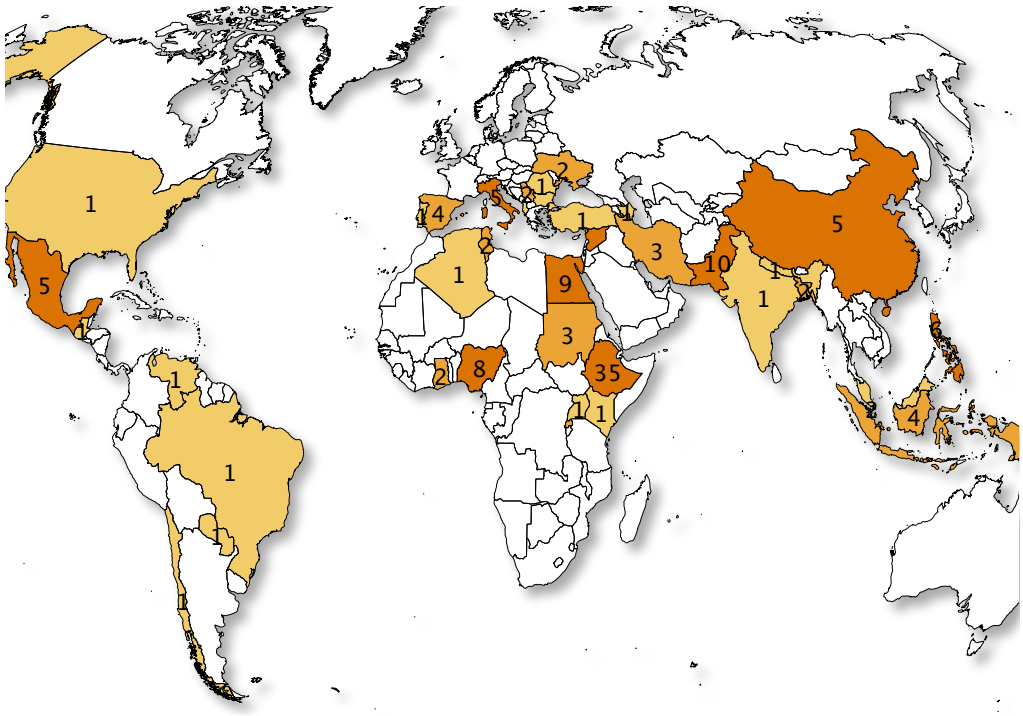


Figure 1 *- Geographical Distribution of Erasmus Mundus candidates for ChIR 2015-2017*

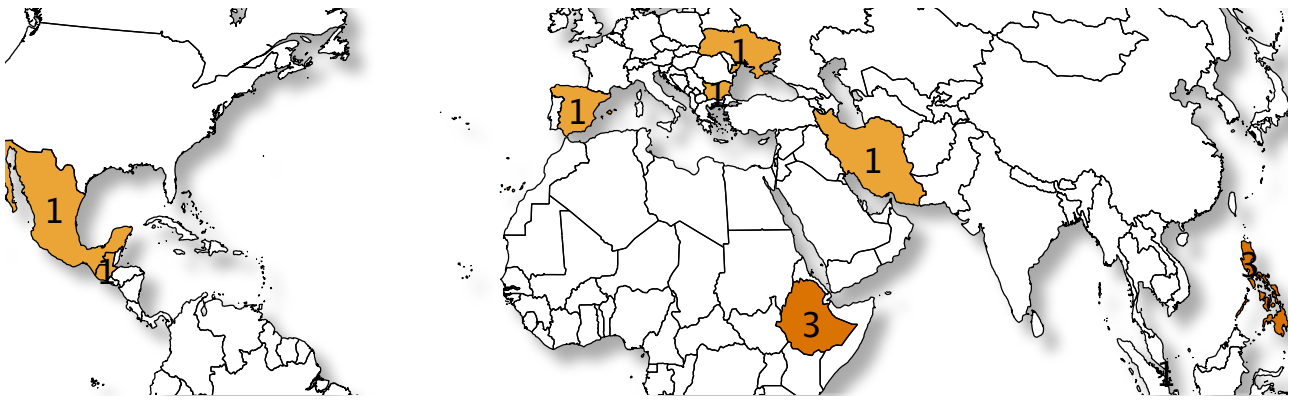


Figure 2 *- Geographical Distribution of Erasmus Mundus students selected for ChIR 2015-2017 main list.*

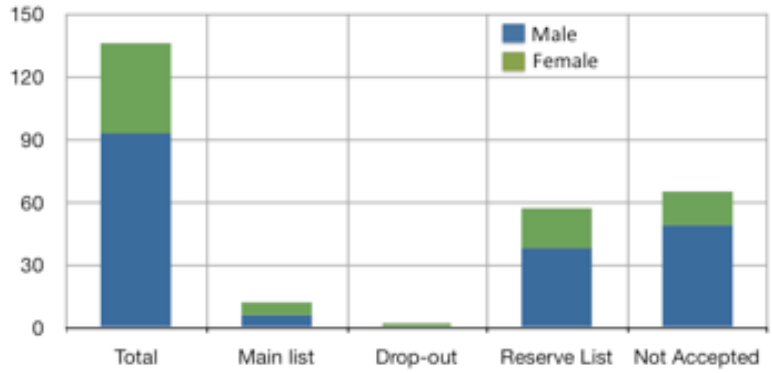


Figure 3 *- Gender Distribution of Erasmus Mundus candidates for ChIR 2015-2017:* ***Total*** *number of candidates, Candidates selected for the* ***Main List****, Candidates declining the studentship (****drop-out****), candidates in the* ***reserve list*** *and candidates* ***not accepted*** *to the course.*

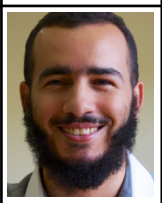
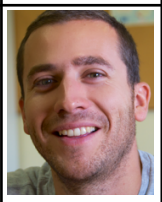
List of Selected Erasmus Mundus Students 2015-2017:

Name	Gender	Nationality	Background (BSc/MSc)
Boryana Tsenkova	Female	Bulgaria	Chemistry
Mulatu Yohannes Nanusha	Male	Ethiopia	Chemistry / Chemistry
Wubshet Belay	Male	Ethiopia	Chemistry / Environmental Sciences
Yemataw Addis Alemu	Male	Ethiopia	Chemistry / Pharmacy
Diego Milián Izeppi	Male	Guatemala	Chemical Engineering
Pegah Montazeri	Female	Iran	Chemistry / Chemistry
Ana Vallejo Cortes	Female	Mexico	Pharmacy
DJ Donn Matienzo	Male	Philippines	Chemical Engineering
Loveille Jun Gonzaga	Male	Philippines	Chemical Engineering
Shella Talampas	Female	Philippines	Chemical Engineering
Mohammad Sufian Bin Hudari	Male	Singapore	Chemistry
Ester Carregal Romero	Female	Spain	Chemistry / Business Studies
Kseniia Tuholukova	Female	Ukraine	Environmental Sciences/ Environmental Sciences

ChIR 2013-2015

Students

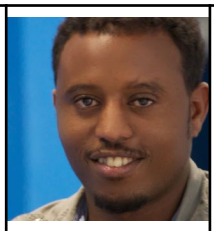
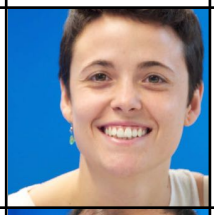
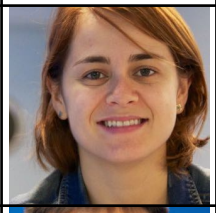
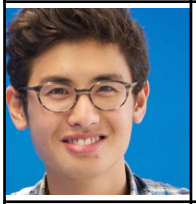
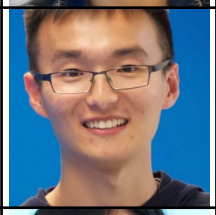
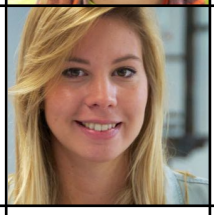
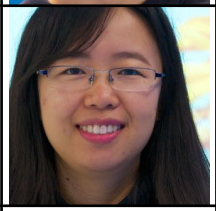
In its first edition the EMMC-ChIR received 17 students, all Erasmus Mundus grant-holders. All but one completed the first year of classes at the University of Algarve. The exception was Silvana Agostinho who dropped out in the first semestre. The others are doing their ChIR research theses to obtain their MSc degree.

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

ChIR 2014-2016

Students

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.

	Angelo Kenneth Romasanta (Philippines) BSc Chemistry		Hagos Tesfay Kidanu (Ethiopia) BSc Applied Chemistry MSc Chemistry		Nazmiye Tugce Eran (Turkey) BSc Chemistry
	Asnake Gudisa Eded (Ethiopia) BSc Applied Chemistry MSc Environmental Sciences		Isabel Navarro (Spain) BSc Chemistry		Paola Blair Vásquez (Costa Rica) BSc Chemical Engineering
	Bazarsad Narmandakh (Mongolia) BSc Applied Chemistry		Miguel Antonio Brion (Philippines) BSc Chemistry		Yu Zhang (China) BSc Chemistry MSc Chemistry
	Chukwuka Bethel Anucha (Nigeria) BSc Chemistry		Mireia Broch Gosser (Spain) BSc Chemistry		Wei Wang (China) BSc Pharmacy MSc Chemistry
	Donaldben Mbagag Neba (Cameroon) BSc Biochemistry MSc Biotechnology		Mohammad Anisur Rahman Jamil (Bangladesh) BSc Chemistry MSc Inorganic Chemistry		

List of modules offered in 2014-2015 in UB

A total of 76 modules were offered in the 2nd edition. After the students built their study plans, ten modules needed to be cancelled because they were chosen by an insufficient number of students. The 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	*Environmental Assessment*		
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
A0111	Chemical and biological treatment of wastewater	UAlg	Clara Costa
A02	*Toxicological Assessment*		
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
A0208	Determination of toxic substances Migration from packaging to food	EM Scholar	Shirley de Mello Pereira
A03	*General Assessment*		
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
A04	*Physical Hazard Assessment*		
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	Merçé Segarra
D03	Patenting New Products	UAlg	Lurdes Cristiano
D04	Drug Design	UB	Axel Bidon-Chanal
D05	Structure Toxicity Relationship	UniBo	Assimo Maris
D06	Chemical Databases	UB	Gabriel Aullón / Arnald Grabulosa
D09	Food and Chemistry	UB	Carme Gonzalez
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
I01	*Sustainable Chemistry:*		
I0101	Renewable Sources	UniBo	Emilio Tagliavini
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	UniBo	Pier Giorgio Cozzi
I0108	Chiral Technology in the Chemical & Pharmaceutical Industry	UB	Albert Moyano
I02	*Chemical and fine chemical industry:*		
I0203	Pharmaceutical and Fine Chemicals Industry	UniBo	Walter Cabri
I0204	Industrial Forgery Detection	UAlg	José Moreira
I0205	Chemical Process Safety	External	Cristina Massa
I0206	Chemical Industry	UB	Daniel Sainz
I0207	Nanomanufactoring and Nanoprocessing	UB	Albert Romano

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	External	Joaquín Rodríguez
M04	Health and Safety in Chemistry	UB	Daniel Sainz
M05	Life Cycle Assessment	UniBo	Fabrizio Passarini
M06	Quality Management	UAlg	Isabel Cavaco
M07	Innovation Management	UB	Innovation Management
M08	Biosafety	External	Cristina Massa
M09	Entrepreneurship	UB	Jaume Argerich
T11	Personal Marketing	External	Xavi Ripoll

R - Regulation

code	Name of module	University	Name of lecturer
R02	Risk Management	HNU	Paolo Ricci (EM Scholar)
R03	REACH and CLP Regulations	External	Ruth Jimenez
R04	Non-EU Regulations: Japan, Brazil and China	UB	Daniel Sainz
R06	Pharmaceuticals Regulations	UAlg	Vera Marques / João Rocha
R07	Nanomaterials and Nanotecnologies Regulations	HWU	Teresa Fernandes
R08	Chemical Waste Materials Regulations	External	Victor Garrido / Joan Marti
R09	Priority Substances in EU Environmental Legislation	UAlg	Alice Newton
R10	Comparative Analysis of Chemical Regulations – US and EU	EM Scholar	Paolo Ricci

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	UB	Fermin Huarte
T02	Communication Skills	External	
T03	Laboratory Skills	UB	Daniel Sainz
T06	Innovation Skills	UB	Daniel Sainz / Isabel Cavaco
T07	Intensive "Survival" Language Course - Spanish	UB	

Cancelled Modules

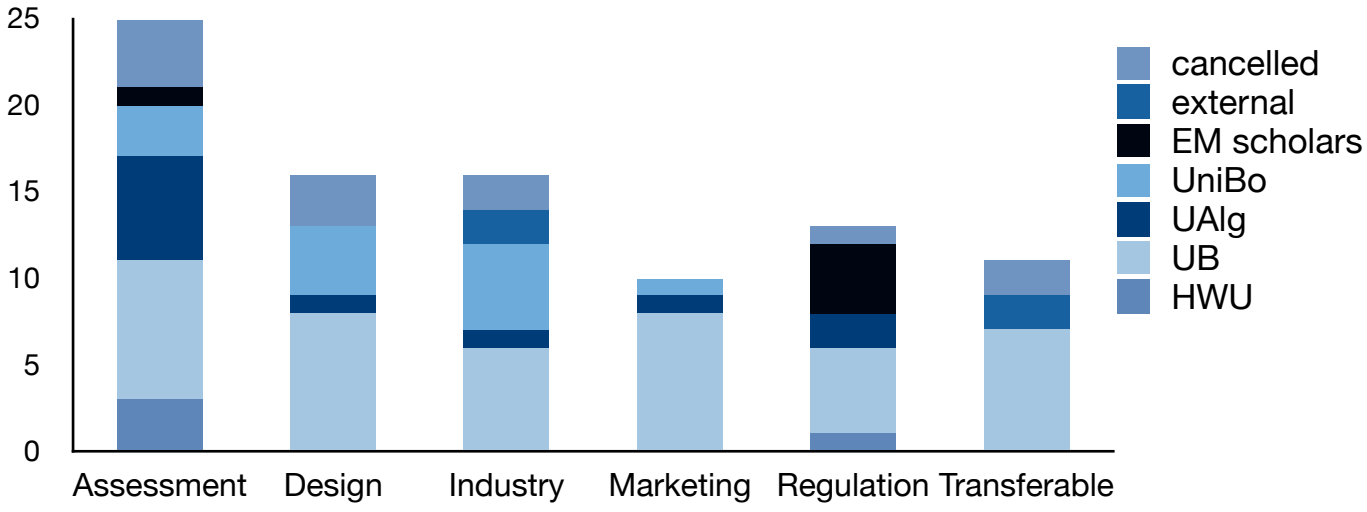
The following modules were cancelled this year because the small number of students choosing them was considered insufficient:

D08	Modelling and Simulation
D10	Soft Materials
D14	Design and Synthesis of Peptides and
I0106	Nanoporous Catalysts for Clean Chemistry
I0107	Applied Heterogeneous Catalysis
A0109	Environmental Physical-chemistry
A0110	Marine Microbial Diversity and Ecology
A0310	Bioavailability
T04	Research Skills
T05	Fieldwork Skill
A0306	Chemometrics
R07	Nanomaterials and Nanotechnologies Regulations

Distribution of Modules by University and by Discipline

Compared to the first edition, the distribution of modules offered by discipline (graphic 1) was better balanced in the second edition. The number of modules on Assessment (24, compared to 22 in the first edition) still predominate, but the increased offer of modules on

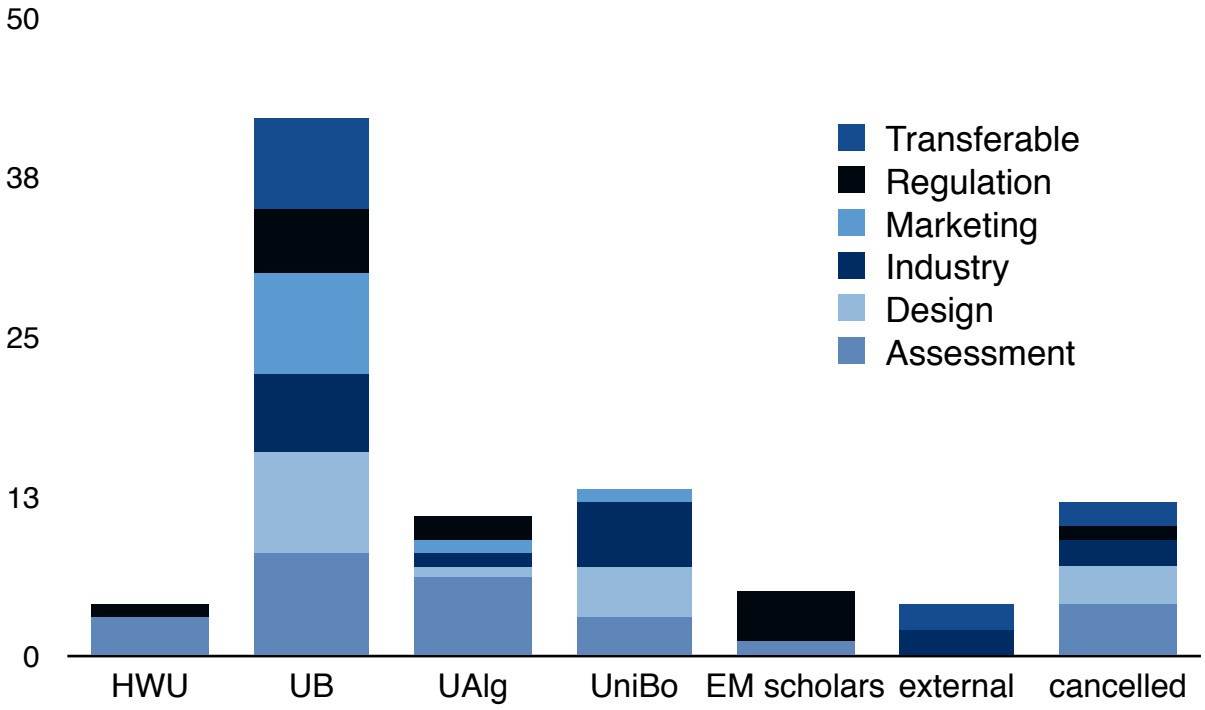
Graphic 1 - ChIR modules 2014/2015 (by discipline)



Design (11->16), Industry (12->16), Marketing (6->10) and Regulation (8->12) result in a richer and more balanced offer by the Consortium.

Graphic 2 depicts the distribution of module offer among the universities of the consortium. As Host University, UB contributed with most taught modules (49), followed by UniBo (15), UAlg (12) and HWU (6). Five modules were offered by invited specialist, from institutions external to the consortium, and 4 modules were offered by invited Erasmus Mundus Scholars.

Graphic 2 - ChIR modules 2014/2015 (by university)



Calendar

The calendar for 2014/2015 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=e8l7govbncv538g5p1sn3l1ksg%40group.calendar.google.com&ctz=Europe/Barcelona

month	week#	code	Name of module
Sep 2014	1440		Welcome
Oct 2014	1441	T07	Intensive "Survival" Language Course - Spanish (I)
		A0305	Measuring variability and statistical decision
	1442	M06	Quality Management (ISO9000, ISO 14000, EMAS, etc)
		T06	Innovation Skills
	1443	T07	Intensive "Survival" Language Course - Spanish (II)
		I0102	Green Metrics
	1444	D01	Alternative Green Products
Nov 2014	1445	A0101	Chemical Transformation and degradation in the environment
	1446	D13	Sustainable biocatalytic processes
		M09	Entrepreneurship
	1447	I0203	Pharmaceutical and fine chemicals Industry
	1448	M04	Health and Safety in Chemistry
Dec 2014	1449	R02	Risk Management
		A0204	Toxicology
	1450	R13	Advanced Risk Analysis
	1451	D07	Chemical Database
	1452	Christmas Break	
	1501		
Jan 2015	1502		
	1503	A0307	Sampling strategies
		A0111	Chemical and biological treatment of wastewater
	1504	T01	IT tools - part I
		A0304	Reference materials and laboratory proficiency testing schemes
		A0207	Human Physiology
	1505	M02	Market research
		M01	Business planning
Fev 2015	1506	D11	Design of Chemical formulations
		D09	Food and Chemistry
	1507	M05	Life Cycle Assessment
	1508	A0106	Environmental and Health Safety of Nanotechnology
		R03	REACH and CLP regulations
	1509	A0208	Determination of toxic substances Migration from packaging to food
	1510	M08	Biosafety
	1511	A0104	Environmental analysis and detection in the environment
		A0308	Experimental design

month	week#	code	Name of module
Mar 2015	1512	I0204	Industrial forgery detection
		T03	Laboratory skills
	1513	D04	Drug design
		I0103	Safe Reagents and Catalysts / Catalysis for a sustainable synthetic chemistry
	1514	Easter break	
Apr 2015	1515	A0102	Chemical Polluants (solvents. VOC,...)
		R04	Non-EU regulation: Japan, Brazil and China
	1516	A0108	Chemical Polluant Remediation
		D05	Structure Toxicity Relationship
	1517	T02	Communication skills
		I0207	Nanomanufactoring and Nanoprocessing
	1518	D02	Properties of materials and new materials
		A0202	Toxicokinetics and toxicogenetics
May 2015	1519	A0201	Genotoxocity assessment
		A0206	Principles of Toxicological Assessment
	1520	I0104	Alternative Green Solvents
		D03	Patenting new products
	1521	M03	Social Perception of the Chemical Risk
		T11	Personal Marketing
	1522	R12	EU and US legislation
		M07	Innovation Management
Jun 2015	1523	R09	Priority substances in EU environmental legislation
		R10	Comparative Analysis of Chemical Regulations – US and EU
	1524	I0108	Chiral Technology in the Chemical & Pharmaceutical Industry
		D12	Synthesis and Characterization of Nanomaterials
	1525	I0101	Renewable Sources
		R08	Chemical waste materials regulations and valorizations
	1526	I0105	Green Synthetic Strategies
		I0205	Chemical Process Safety
		R06	Pharmaceuticals regulations
	1527	A0402	Chemical Reactivity Hazards
		R14	Safety in the use of Chemicals
Jul 2015	1528		
	1529		ChIR Symposium

Field trips:

Within the module I0206 - Chemical Industry study trips were organized to the following industries in the region of Barcelona:

March 5:

Josep Carreras Leukaemia Research Institute. Cell Therapy Program UB (TCUB)

June 26:

Alba Synchrotron lLight Source : http://www.lightsources.org/facility/alba

SUEZ Environnement: http://www.suez-environnement.com/

July 3:

BASF, Tarragona (https://www.basf.com/es/es/company/about-us/Ubicaciones/Tarragona.html)

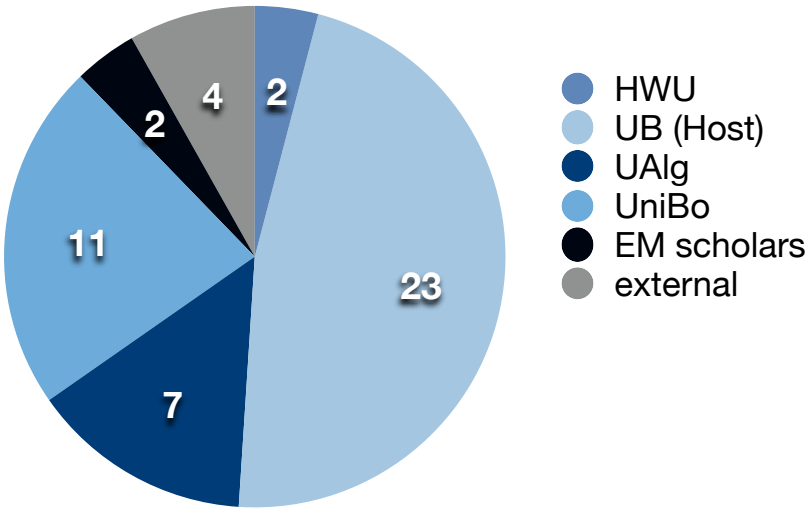
Linde Gas, Parets (http://www.linde-gas.com)

Cordorniu, Sant Sadurny D'Anoia (http://www.codorniu.com/en/)

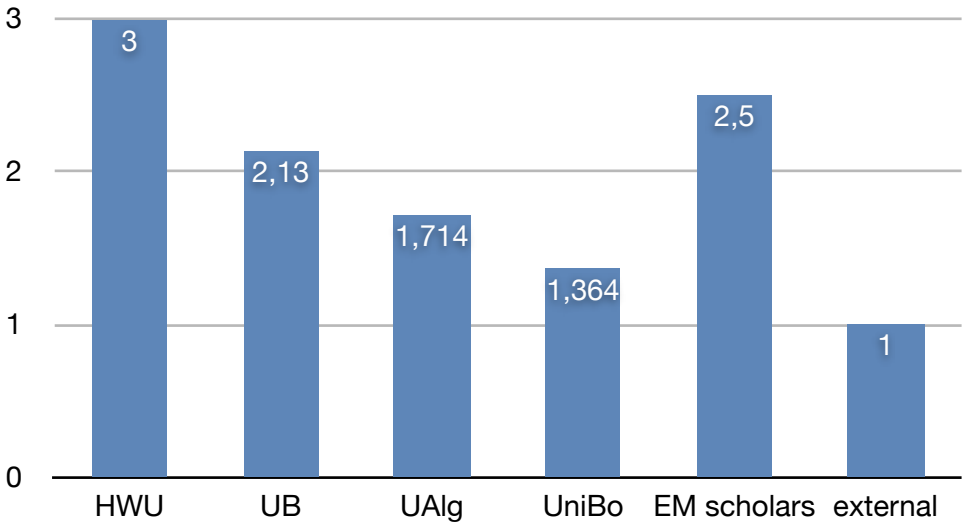
Teaching Staff Mobility

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 second edition of ChIR involved a total 43 lecturers from the European partner Universities, of which 20 were teaching in the Host university under mobility agreements. This is a decrease in the number of staff mobilities in the 1st edition (35) but is still an impressive number.

Graphic 3 - Lecturers (2014-15)



Graphic 4 - Average #modules / lecturer



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

Shirley de Mello Pereira Abrantes - Professor of Analytical Chemistry at Universidade Federal do Rio de Janeiro, Brazil. researcher at INCQS - Fundação Oswaldo Cruz.

The following European experts contributed to the second edition of ChIR:

Ruth Jimenez - AEHI (Associación Española de Higiene Industrial) and INSHT (Instituto Nacional de Seguridad e Higiene en el Trabajo), Barcelona (Spain)

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

Victor Garrido - Stahl Ibérica S.L., Barcelona (Spain)

Joan Marti - SUEZ Environnement, Barcelona (Spain)

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

Lidia Barragán - FEIQUE (Federación Empresarial de la Industria Química Española), Barcelona (Spain)

Xavi Ripoll - XRG, Barcelona (Spain)

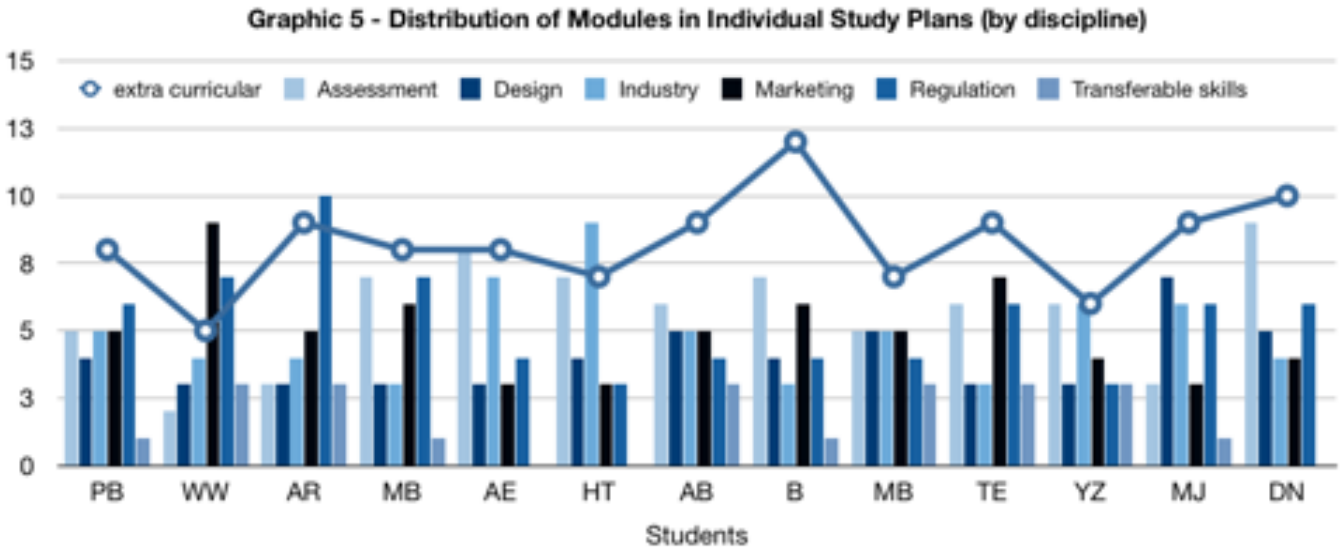
Cristina Massa - Alba Synchrotron Light Source, Barcelona (Spain)

Joaquín Rodrígues - Fundación Universidad Autónoma de Barcelona, Barcelona (Spain)

Student's Choices

Study Plans

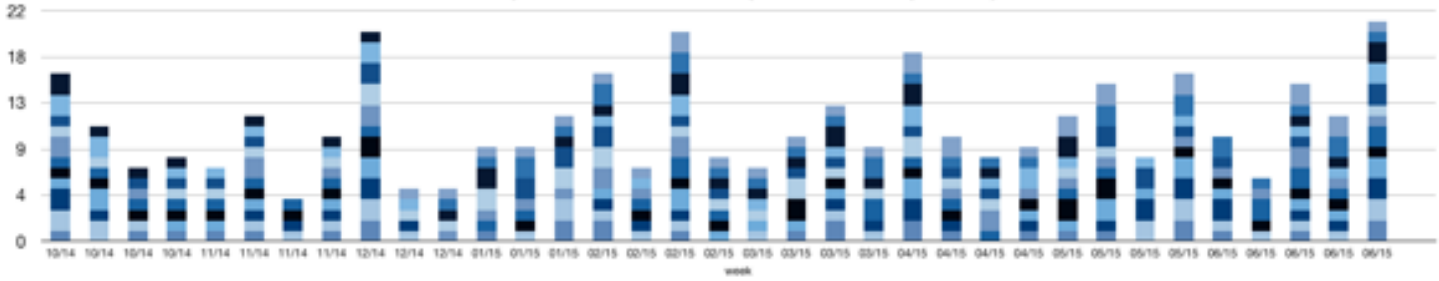
Compared to the 1st edition, where several students chose mainly modules in the discipline "Assessment" the study plans in the 2nd edition are better balanced, with most students choosing between 3 and 5 modules from each discipline (graphic 5). This may be a reflection of the increased and richer offer of modules in the other disciplines.



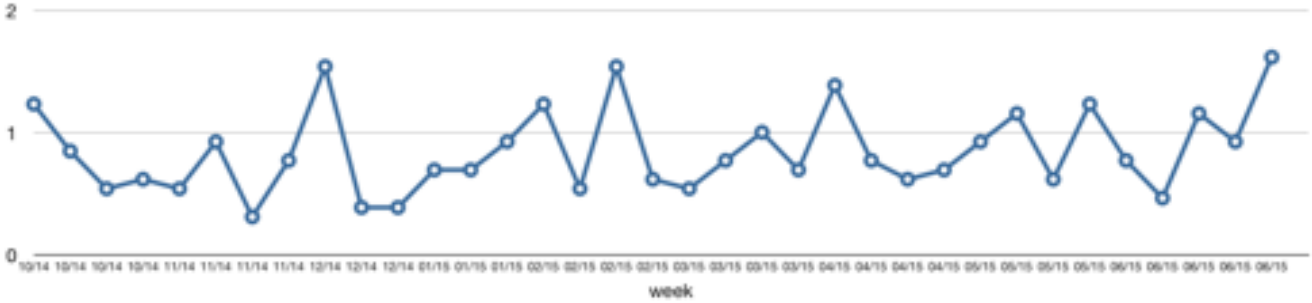
Student Workload

One difficulty detected in the 1st edition was that many modules were concentrated in the middle and end of the academic year, resulting in an excessive student workload in those periods. Ideally, each student should take one module per week, but depending on their choices they are allowed to take a maximum of two modules in one week, provided they have sufficient time in the following weeks to make up for the effort. This is feasible, provided the student is not overloaded too many weeks in a row. In the first ChiR edition many students were taking two modules per week for several weeks in a row mainly in December, March and July. This resulted not only from the distribution of modules along the year, which was hard to organize in the first edition, but also from the student's choices of modules. The situation was much improved in the second edition. Graphics 6 and 7 show that even though there is a higher concentration of modules in December, February and June, it is not as striking as in the first edition.

Graphic 6 - Student Workload (modules*student per week)



Graphic 7 - Average Student Workload (mean # modules / student / week)



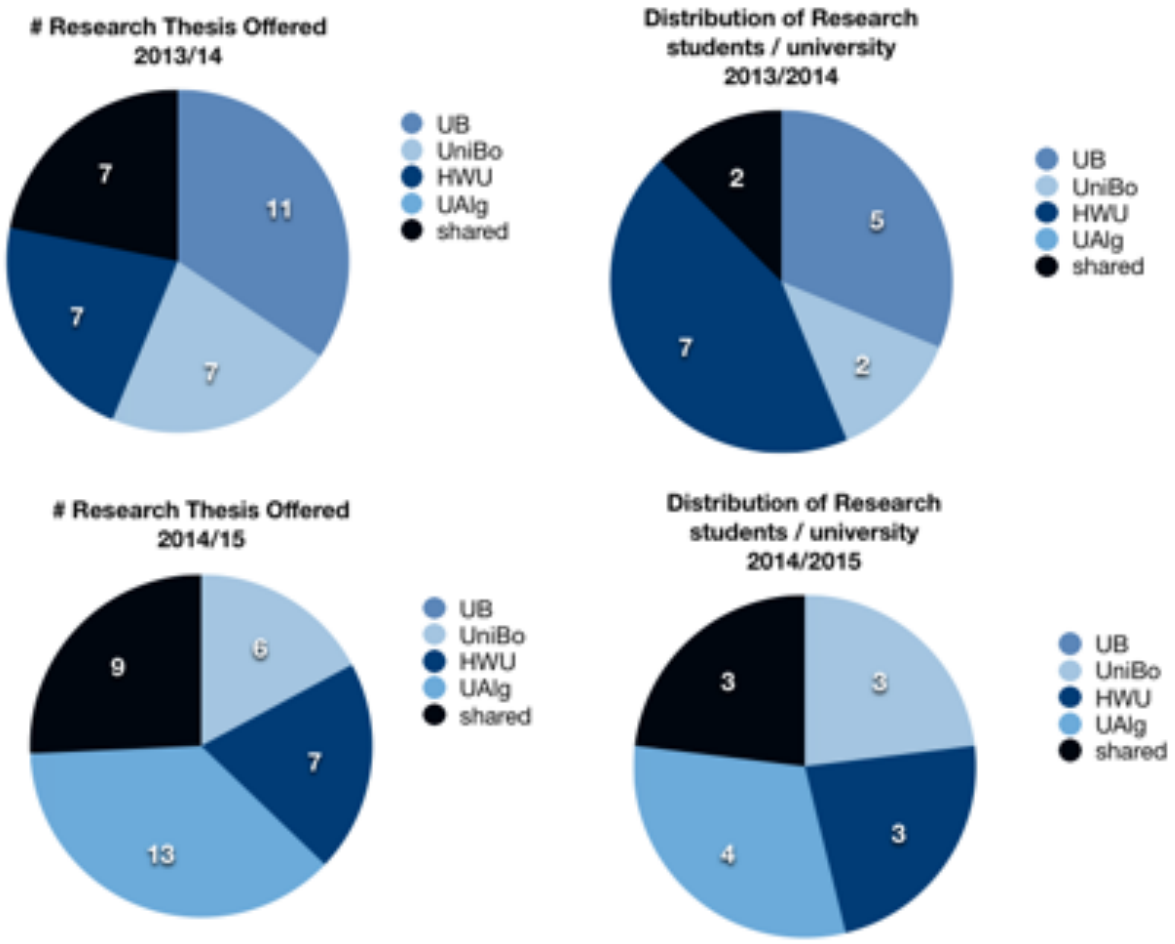
Research Topics

Students were offered a list of 35 research topics (compared to 32 topics in the 1st edition). Students are free to chose 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. In the 2nd ChIR edition, all students were assigned their 1st or 2nd research topic choice.

Some research topics are shared in collaboration between two universities of the consortium, and allow the student to spend 6 months in each university. Such topics are interesting to strengthen the collaborations in the Consortium.

Graphic 8 shows the distribution of research thesis offer and final distribution of research students. The number roof offered shared topics increased for 7 in 2013 to 9 in 2014. The number of students choosing these topics has also increased from 2 to 3.

Graphic 8 - Offer of research topics in the ChIR Consortium and distribution of Research students



The selection of topics took place between October and December 2014. The final distribution of topics among the students is presented in the next table.

Student Name	Research Host	Supervisor	Topic description
Asnake Gudisa Ede	UAlg	Luísa Barreira; João Varela; Katkam N. Gangadhar	Purification and characterization of bioactive compounds from microalgae: a value-addition to biodiesel production
Anucha Chukwuka Bethel	UAlg	M.C.Costa and J. Carlier	Development and optimization of chemical and biological processes for the treatment of metals contaminated wastewaters
Donaldben Neba	UAlg	M.C.Costa	Investigating the biodegradation of some emerging polutants by bacterial communities
Wei Wang	UB (Hospital Clinic) / UAlg	L. Alvarez / A. Gomes, I. Cavaco	Risk to patient safety from laboratory errors and delays
Mohammad Jamil	UNIBO	C.Trombini	Development of new synthetic and catalytic processes
Paola Blair Vásquez	UniBo	E. Tagliavini, P. Galletti	Use of renewable sources of materials for producing valuable chemicals
Angelo Romasanta	Unibo / UAlg (CQE)	F. Grepioni, D. Braga / Teresa Duarte	Multiple crystal forms of active pharmaceutical ingredients: patent implications
Mireia Broch Gösser	UniBO / HWU	E. Tagliavini / T. Fernandes	Green solvents and the study of its toxicity
Zhang Yu	HWU	H Johnston	Effects of Nanomaterials in the Immune System
Hagos Tesfay Kidanu	Unibo	P.G. Cozzi	Catalytic stereoselective redox reactions mediated by photocatalysis or air.
N.TUGCE ERAN	HWU	T Gutierrez	Role of Microorganisms in the Degradation of Hydrocarbon Spills in Marine Systems
Bazarsad Narmandakh	UAlg	I. Cavaco	Suitability of REACH regulations for the safety of transition metal complexes.
Miguel Antonio M. Brion	UAlg	Margarida Ribau Teixeira, Ana Costa, José Moreira	Develpment of a Fe-nano coagulant for water treatment

Students' Performance

Student grades

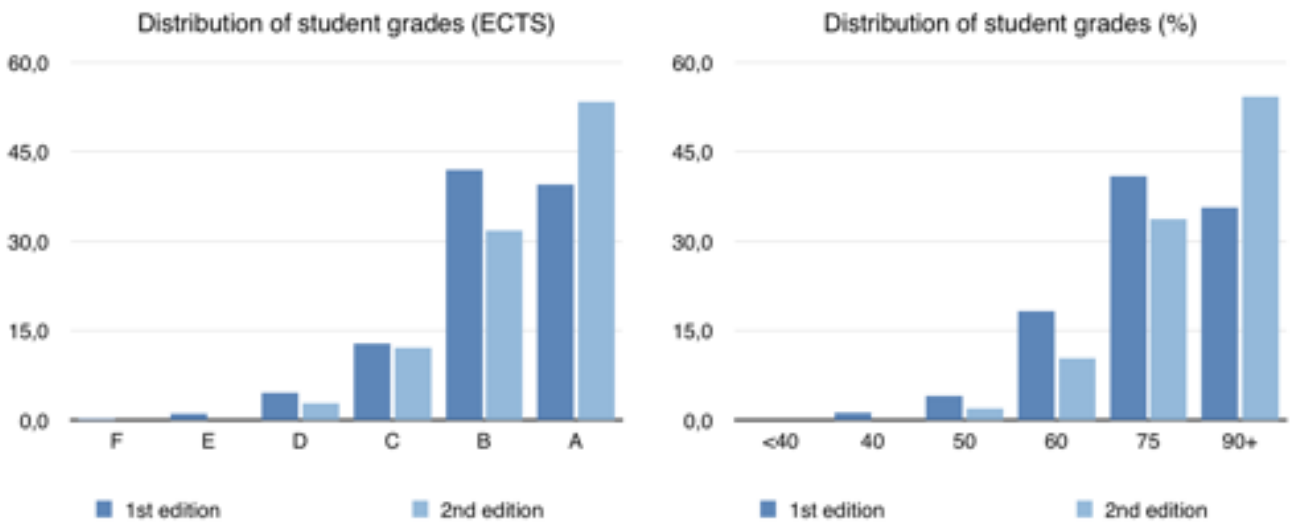
By the end of June 2015 only 13 modules were graded, out of the 33 for which students had already submitted assignments and two months had passed for the evaluation. This is a recurring problem in the structure model of this Erasmus Mundus Master. It was already observed in the first edition, when only 11 modules out of 24 were graded by June 2014.

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 in the second edition is 86%, considering all the data collected by June 2014. More than 50% of all grades are A and 91% of all grades are B or above. These are exceptional results of this group of students.

Graphic 9 compares the results of the 1st (for the whole academic year) and 2nd edition (for 1/3 of the academic year). The distribution of grades shows higher results in the 2nd compared to the 1st edition, which may be a clear consequence of the better organization of the classes and better distribution of student workload. Nevertheless this comparison must be done with care, because only partial results are known for the 2nd edition.

Graphic 9 - Distribution of student grades an the 1st (complete) and 2nd (by June 2015) editions



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.

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

The Host institution and the project as a whole were assessed through one annual questionnaire distributed in June 2015.

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

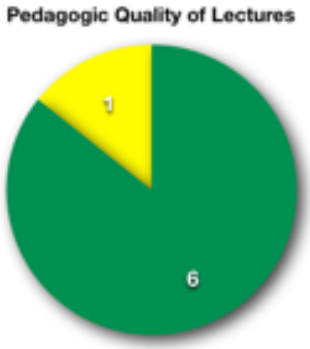
The questionnaire and results of the assessment of individual modules can be found in annex 2.

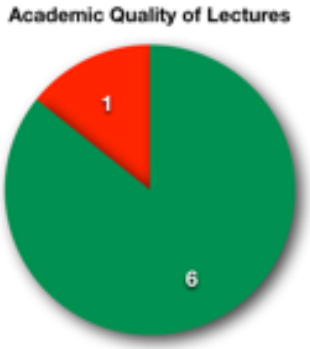
General Questionnaire

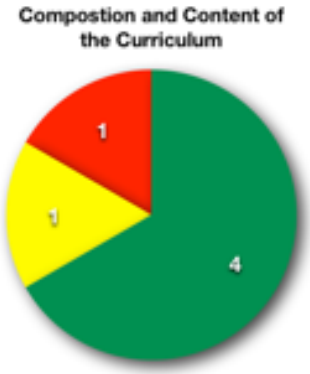
The following results come from the ChIR annual questionnaire. This survey evaluates the course as a whole, and the conditions of the host university. It was distributed and filled by the students between June 9 and 18. Seven students filled the questionnaire. Answering all questions was not mandatory, so several questions were left blank.

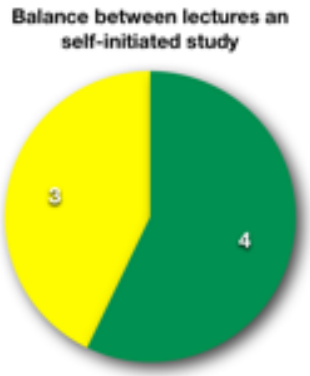
Information about Erasmus Mundus

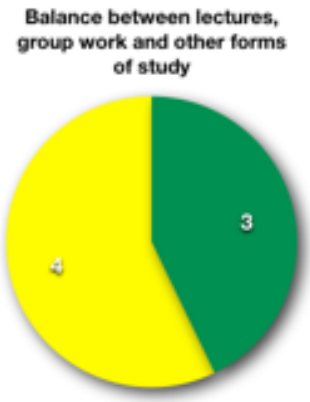
Student Assessment of the curricular year 2014/2015

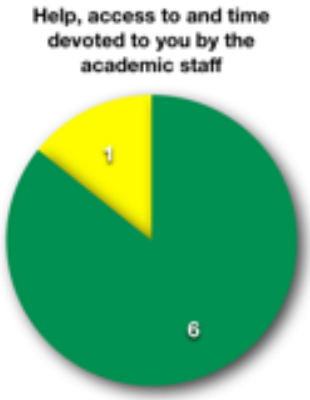


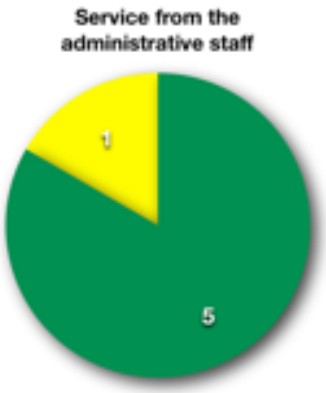


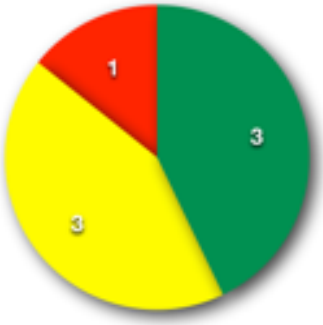






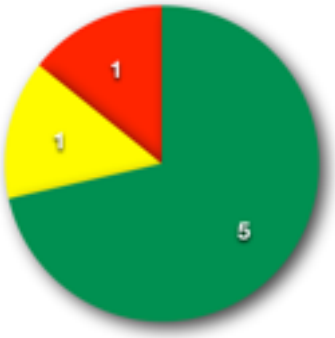






Quality and access to the laboratories

Quality and access to the computing facilities



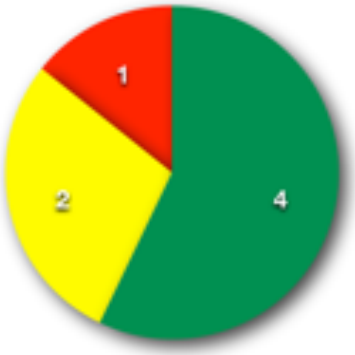
Quality and access to the internet

Quality and access to the canteen

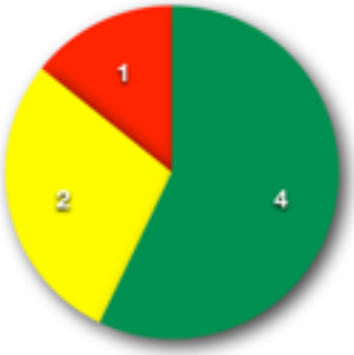
Quality and access to accomodation

Quality and access to transport

local language training



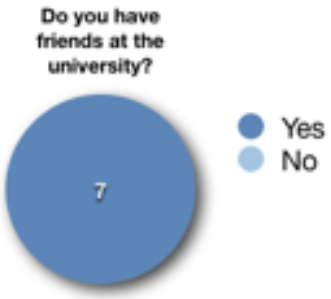
Integration Activities (welcome programme, mentoring and guidance from staff, help from local students and alumni, etc)

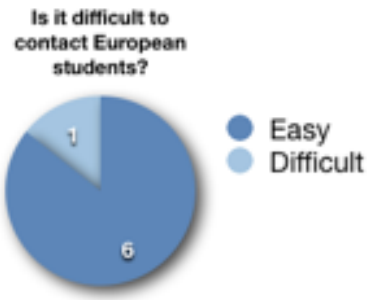



Where are you living?
7
Private accomodation
University Accomodation

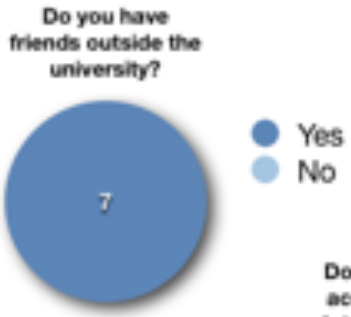

Are you satisfied?
1
6
Yes
No

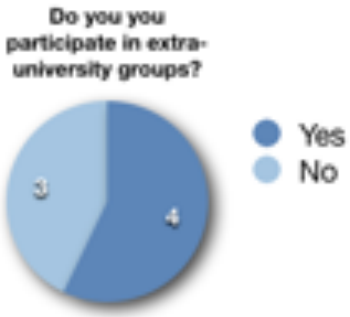

How much do you spend per month?
1
1
2
3
<500 €
500-700 €
700-900 €
900-1200 €
>1200 €

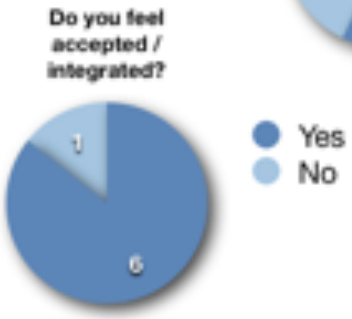

Do you have friends at the university?
7
Yes
No

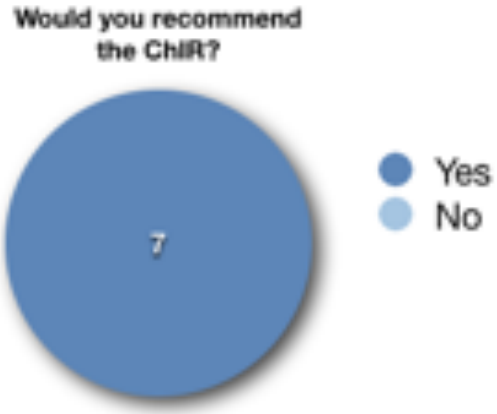

Is it difficult to contact European students?
1
6
Easy
Difficult


Do you participate in university groups?
3
3
Yes
No


Do you have friends outside the university?
7
Yes
No


Do you you participate in extra-university groups?
3
4
Yes
No


Do you feel accepted / integrated?
1
6
Yes
No


Would you recommend the ChIR?
7
Yes
No

The best in the EMMC-ChIR	The worst in the EMMC-ChIR
Daniel was very helpful. He is very concerned about the needs of the students. There were some really good lecturers. Special mention to Walter Cabri and Jaume Augurich.	The grading from some professors is not efficient. And it would be better to know the lectures BEFORE application, because it is good to know what will be the scope of study in the 2 years.
Good organisation and respect of schedule.	Insufficient group work assignments hence INADEQUATE INTEGRATION among STUDENTS
This Master Course provide us lots of moodles which cover many areas, according to our interest, we are free to choose any course we like. The host institution has good quality of basic facilities such as library, labs and classrooms.	Selection of lecturers with less English proficiency. There should be a minimum level of english proficiency (reasonable!!) to deliver lectures in english fluently or commute with the students. This should not be a platform for the lecturers to practice english!!! Few teachers are found very confusing, ambiguous in organizing the course materials and teaching.
Multidisciplinary	The school dormitory is too expensive.
Some professors are terrific in academy and also charming in personality and teaching style! The host institution UB is an open campus for international students, and the coordinator Daniel is very passionate and gave us lots of help!	The lectures feel very disjointed. It is true that there were lectures that were interesting and helpful but when we combine all these lectures together, they don't feel united. I don't feel like I'm building knowledge from this course. On the contrary, the classes were all over the place. I would take classes from many disciplines yet they do not feel connected. For example, I would learn from a class about chemical design. Then later I would learn something about regulating a chemical. Yet, the course is taught in such a way that I don't see the connection between these two. It would have been better if the professors talked together so that the classes feel more united. I would like to see the knowledge from each class complementing and supplementing my knowledge from other classes. Right now, the program feels like I'm taking various seminars. In the end, it caused me not to learn anything. Thus, I wish that our language was further built on and deepened especially on the subjects we are interested in. For example, let's say I am interested in REACH. I should be allowed to further my knowledge there. Moreover, I think it is deceptive that the program advertises many partnerships in the industry yet not allow internships to be granted. I would have wanted to go to China or Brazil to do a short work there but these options have not been presented to me.

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. Marsh[1].

The detailed results from the module questionnaires collected by June 2015 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 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.

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

Follow-up from the previous year

The following table summarizes the issues raised in the Programme Committee 2014 meeting, and how they were addressed.

Issue	Action	Status
Internships - should be an integral part of the master	In the first edition internships were planned as optional and taking place within the timeframe of the research thesis. In the first edition two students did internships in this manner, but the organization was difficult. The PMT decided that for the second and following editions, internships will be limited to periods within July-September of the 1st academic year, and to be done in the same country as the curricular year.	Under implementation
Transcripts - students would like to have tentative transcripts by the end of the 1st year	Students were provided with a list of modules and grades signed by the Programme Director. This was prepared for all students when all the grades were available. Students who need such records before all grades are available may get them upon request.	solved
Grades - long delay of most lecturers delivering grades	The PMT decided that the PD would press the lecturers further to deliver the grades on time. But this measure has had no significant effect in the second edition.	Not solved.
Theses - guidelines for writing research thesis should be available at the beginning of the research year	A detailed procedure (T0206) with common rules for Research Theses in the ChIR Consortium was developed and approved by the PMT in October 2014, and made available to the students through Moodle.	solved
Theses - more detailed information on each research group should be available	As theses proposals are collected in all the universities of the consortium and research groups do not all keep webpages updated, the PMT considers that it is better that students get information about the research topics through the Programme Directors, as originally defined. Also, it is not possible topics to be described in detail when they must be proposed almost two years in advance	solved
Visa Application - details of visa application procedures should eb communicated on time	The Consortium is aware of the difficulty of non-European students obtaining visas, and give all possible support to facilitate that. Unfortunately rules and requirements can change, and it is not always possible for the consortium to foresee that.	Solved as far as it is possible
Number of modules - the number of modules is too high resulting in intense workload	The number of modules in the study plan, 30, cannot be changed as long as each module counts as 2 ECTS. In the structure model of ChIR it is not possible to change that. Nevertheless, the distribution of modules along the year was improved from the 1st to the 2nd edition, and this has had positive results in student workload.	Under evaluation.

Issue	Action	Status
Calendar and subject overlap - the calendar can be rearranged to assure the fundamental topics are taught first and avoid overlap of subjects in different modules.	The PMT has defined four "clusters" of modules within which lecturers will be in contact with each other, a careful check will be done to avoid overlaps and define fundamental contents. These clusters are: REACH; Green Chemistry; Statistics and Toxicology.	Under implementation
Mode of Assessment - evaluation of most modules is through a literature review and report, which can be heavy for 25 modules.	Regardless of the type of evaluation, 30 evaluations in the academic year are very heavy if each lecturer does a similar evaluation to what is done in traditional courses. Lecturers are free to choose the best evaluation for their module. During the first edition they were sent the student feedback on the module, which includes feedback on the adequacy of the evaluation and student workload. Lecturers are expected to adjust their modules to these comments.	Under implementation.
Flexibility - students would be allowed to change their study plans	Students are allowed to change their study plans, provided there is a strong reason for that. Each change must be submitted to the PMT for approval. During the 1st edition, 20 requests were submitted to the PMT and only 1 was not approved.	Solved
More balanced disciplines - more modules should be offered in discipline *Marketing and Social*	In the 1st edition only 6 modules were offered in *Marketing and Social*. In the 2nd edition this was increased to 10 modules. Also in the discipline *Regulation* three new modules were introduced. Overall, the more balanced offer is clear in the study plans of the second edition.	Solved
Modules nature - Some professors do not have a clear vision of the goals of the master.	Due to the high number of participating lecturers such situations may appear with lecturers less familiar with the course. When such cases are detected, the Programme Director speaks with the lecturer.	Solved for the 1st edition.

Issue	Action	Status
New modules - new modules were proposed	The following modules were included in the 2nd edition: M09 – Entrepreneurship M10 - Personal Training M08 – Biosafety R14 – Safety in the use of Chemicals A0112 – Bioavailability A0310 – "Advanced" statistics (Anova, regression analysis,...) R12 - Introduction to EU and US law A0310 and A0112 were not chosen by a sufficient number of students in order to be implemented. The other modules were offered.	Solved

Annexes

Annex 1

Copy of the Annual Questionnaire and Module questionnaire.

Annex 2

Results of the QA of individual modules - 1st edition

Results of the QA of individual modules - 2nd edition

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