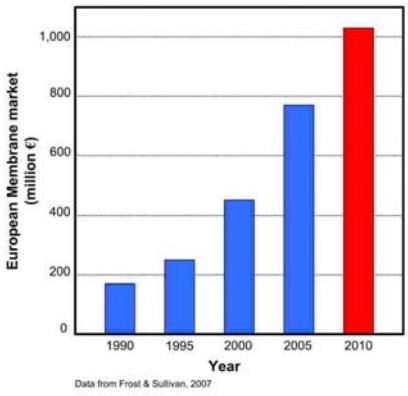
B.1.1 The promotion of sustainable industrial growth patterns is today considered as a key objective in the European Union Sustainable Development Strategy (EU SDS)[1]. In this respect, Membrane Engineering is significantly contributing to innovation in new technologies and strategies – like Process Intensification - and it is offering effective and successful answers in many strategic areas as today well documented at international level. NEED ANALYSIS in the field of membrane science and technology clearly proves that :

1) no PhD program dedicated to membrane engineering is currently available, whereas the need of well-educated R&D membrane engineers is growing very fast, in relation with the important membrane market growth in Europe and over the world. The European membrane separation systems market is currently passing through a high growth phase, catalyzed by steadily increasing demand from both municipal and industrial sectors, reaching $1 billion[2]. Reverse Osmosis worldwide market is estimated at close to $10 Billion dollars, growing at double digit rates (in Europe ~ 10%/year); in general, chances in the membrane market are highly valued and the competition is intensifying*: the new competitors from Korea, China, and other Asian countries, with their cost advantage, represents a big threat for today´s European industrial leaders*[3].



2) There is a urgent need for Europe to increase efforts for advancing and strengthening research and higher education in this strategic area in order to rise competitiveness at international level.
In front of the limited activity of European HEIs, *several aggressive actions have been undertaken worldwide*: the KAUST University (Saudi Arabia) is enrolling since 2009 the most prominent and expert membranologists –in large part from EU and USA - as senior researchers or directors in research centres on "Membranes" and "Water Desalination and Reuse". Similar actions are in progress in Middle East countries, Korea, India, Australia etc.; in this strongly competitive environment, with enormous impact on various industrial sectors, the necessity to improve the attractiveness of European HEI in this field is becoming real and extremely urgent.

3) In front of the strategic role played by membrane engineering, the so far limited and fragmented efforts aiming to update University curricula and Doctorate Schools appears insufficient. Consequences are worrying: as an example, from analyses of worldwide distribution of patents related to the development of advanced membrane devices in the last decade, EU holds an average of only 10% of the applications compared to Japan, China, USA, and Korea that hold more than 80%[4].

Within the depicted framework, the prominent OBJECTIVES of the EMJD "EUDIME" are:

1. to reinforce multidisciplinary skills and expertise in membrane technology, reduce the fragmentation in education/training/research programmes trough the implementation of a joint doctorate programme, limit dispersion in research efforts making them closer to needs of the European membrane industry in a fast growing and extremely competitive field. An **EUROPEAN NETWORK OF EXCELLENCE "**NANOMEMPRO**"** ("Expanding membrane macroscale applications by exploring nanoscale material properties") was funded for 4.5 years (2004-2009) in the scope of FP6 with the objective to promote long-term synergies between European teachers, researchers, engineers, manufacturers, suppliers and end-users in order to solve problems related to the multidisciplinary nature of the membrane science and engineering. The creation of an Higher Education Programme is the answer to the pressing request from EU, also supported by a significant number of small and medium-size enterprises or larger industrial companies. EUDIME will strengthen the interdisciplinary research and development activities by merging the contributions of experts with strong reputations from 9 Universities located in 8 different EU Countries (Italy, France, Netherlands, Belgium, Czech Rep., Spain, Portugal, Germany). The 4.5 years spent under the umbrella of FP6-NanoMemPro Network of Excellence[5] already permitted to create a well integrated virtual laboratory with strong interlink among the consortium;
2. to strongly contribute to INNOVATION AND ADVANCEMENT in SCIENTIFIC and TECHNOLOGICAL terms with consequent huge impact in SOCIO-ECONOMIC terms:

[1] European Commission communication on the sustainable consumption and production and sustainable industrial policy action plan. COM, 2008; 397/3
[2] Editorial, Membrane Technology 4 (2007) 3
[3] Global Membrane Market for Water and Wastewater Treatment Forecasts and Analysis to 2015, Global Markets Direct, Nov.2009
[4] Data provided by European Membrane Society
[5] www.nanomempro.com

- *innovation* in membrane materials, in emerging membrane processes (membrane distillation/crystallization, forward osmosis etc.) and strategies (hybrid membrane processes) for desalination will drastically increase the WATER AVAILABILITY, reduce the cost of water and decrease the environmental impact of discharged wastes. The emerging role of membrane engineering in wastewater treatment is also well recognized: the European Directive on Integrated Pollution Prevention and Control EC96/61 and Urban Waste Water Treatment Directive 91/271/EECencourages the use of MBR as "*Best Available Technology*";
- *advances* in new or emerging membrane systems for energy production (H_2 production by steam reforming via catalytic membrane reactors, fuel cells technology, electrodialysis reversal, biodiesel production via Catalytic Membrane Bioreactors etc.), in nanotechnology and membrane separation processes at molecular level (N_2/O_2 purification, CO_2 sequestration and storage etc.), will support a sustainable social and economic growth and will consolidate the *leading role* of Europe in these areas of strategic relevance;
- medical applications are among the most important in membrane market, with hemodialysis, blood oxygenators, plasma separation and fractionation being the traditional areas of applications, while membrane-based bioartificial organs for human implants or as extracorporeal life-support devices, tissue engineering and regenerative medicine represent very promising areas in the field, advanced formulation of active pharmaceutical ingredients (enantioselective purification, polymorphs selection...) .

3. to address the PROFESSIONAL CAREER DEVELOPMENT AND EMPLOYABILITY of candidates by creating a direct interface between EUDIME Programme and European Membrane Industry. The great attention paid to this aspect is demonstrated by the fact that 5 Industrial Companies are Associate Partners of EUDIME. In addition, EUDIME project includes a CLUB OF INTEREST (CoI) formed by 12 supporting industrial companies that will play a key role in orienting research projects, in co-supervision and financial support to the program, in transfer of knowledge from academic institutions to industrial practice. Highly-motivated doctoral candidates with advanced knowledge of membrane technology will be available for industrial R&D; EUDIME will contribute to form a new generation of creative and independent researchers, will stimulate original contributions, will offer great opportunities to fulfil their aspirations and pursue their ambitions for career in industry or in academies;
4. to promote, at international level, excellence, innovation, mobility and diversity in scientific investigation approaches related to membrane engineering, at the interface with material science and chemical and biochemical engineering;
5. to offer the opportunity to develop innovative management schemes for integrate doctoral programmes in order to realize a common platform for advanced and high-competitive training and research activities with worldwide recognized excellence, in order to support the development of the future generation of Membrane Engineers:
6. to ensure favourable conditions for candidates from developing countries to return home and exploit their professional competences acquired for the benefit of their country, thanks to the strong partnership between EUDIME and third-countries Institutions and Associations, as demonstrated by 15 letters of support (Annex 6).

B.1.2 A systematic survey revealed that, AT PRESENT, NO MULTIDISCIPLINARY DOCTORAL DIPLOMA ENTIRELY DEVOTED TO MEMBRANE ENGINEERING, SCIENCE AND TECHNOLOGY EXISTS OVER THE WORLD. Research and training activities on membranes are usually carried out within more general programmes in Chemical Engineering, Chemistry or Material Science. The creation of a network of leading European Universities devoted to the implementation of a Joint Doctorate in Membrane Engineering represents an appropriate answer to the necessity of upgrading and expanding PhD curricula, to advancement in R&D activities, to impellent requests coming from industrial world and society , to the consolidation of this multisectorial field of strategic relevance for EU citizens.

The ADDED VALUE of the EUDIME Programme with respect to the existing generic R&D activities in the field will consist in a coordinated multidisciplinary approach, needed to overcome the variety of technical challenges in membrane engineering, and able to develop more efficient and integrated schemes in research and training activities. EUDIME will have a major long-term impact in promoting EU as a Centre of Excellence in Membrane Engineering by implementing structured and integrated cooperation among 9 European HEI, on the increase of international visibility of the EU Institutions of the Consortium as a result of the mobility stream between EU and Third Countries, on the development of new models for doctoral studies, focusing on institutional cooperation and implementation of joint governance models.

EUDIME will promote the development of multiple/joint PhD awards among 6 Universities from 5 different EU countries, according to objectives of the "BOLOGNA PROCESS"[6]: to strengthen the European dimension in research and

[6] www.bologna-berger2005.no/Docs/00-Main_doc/990719BOLOGNA_DECLARATION.PDF

education, encourage mobility, promote academic excellence, cooperation and joint-working among European HEI, improve the ability to attract the best researchers from Third Countries.
Moreover, research advances will stimulate new business opportunities for EU being favourably exploited by SMEs, whose flexible business models facilitate commercialising high risk and innovative research[7].

B.1.3 INNOVATIVE COUNTERMEASURES AS REGARDS TO EMPLOYABILITY

- Direct interface between EUDIME Programme and European industry through activities of co-supervision, quality assessment, short-term traineeship (1ECTS) provided by industrial world (5 industrial companies are Associate Partners of EUDIME);
- Creation of a Club of Interest (CoI) open to SME and large enterprises with interest in the Membrane Market; so far the following companies joined CoI:

VEOLIA	ALM LAVAL	SAPIO	SASOL	CZEMP	TOTAL
GVS	MIKROPUR	VLADIPOR	MemBrain	mega	EDF

- Organization of 2 BUSINESS DEVELOPMENT SEMINARS held by representatives of supporting SME and large companies members of CoI (Annex 5), given during Summer Schools (and vehicled to all PhD students through e-learning and video-conference facilities), focussing on business cases, commercial exploitation and technology transfer of the real opportunities of research activity;
- in cooperation with the European Membrane House (EMH, Associate Partner), a non-profit association aimed at enhancing industrial implementation of membrane-based technologies, EUDIME will create a permanent interface with European SMEs and large enterprises, that will include a PERMANENT CURRICULA DATABASE of Doctoral candidates who have successfully completed their studies within EUDIME.

EMH European Membrane House

ORIGINALITY AND INNOVATIVE ASPECTS IN RESEARCH METHODOLOGIES AND APPROACHES

- A Virtual MemL@b will be developed on the e-learning platform "*emedu*", with the purpose to ***reinforce interlink between all laboratories of the Consortium*** and to enhance the efficiency of the research activities, by providing: i) list of equipments/analytical tools available; ii) common records of procedures and protocols; iii) common database of publications/patents produced within EUDIME programme.

Training/research activities are organized in 4 RESEARCH THEMES, all of great impact on societal and economical needs (*ENERGY, WATER & ENVIRONMENT, HEALTH & BIOTECHNOLOGY, NEW MEMBRANES AND INNOVATIVE PROCESSES*) and 6 CLUSTERS. In order to make evident the harmonisation and complementarity of the EUDIME Consortium, *each partner HEI serves as HOME UNIVERSITY in one of the 6 clusters and as HOSTING UNIVERSITY in two clusters*. This subdivision reflects the main research collaborations among partner and associate Institutions, integrated in the inter-disciplinary field of membrane science and technology. Selection of a thematic area, including the cross-organization placement, are detailed in (B.3.2).

THEME 1. ENERGY (Industrial Co-supervisor: SAPIO)

Cluster 1.1: Electrolyte membranes for fuel cells (*HOME: KULEUVEN, HOSTING: UTWENTE, UM2*)
(Fluorinated) proton conductive functionalised membranes, anion conductive membranes and membranes for PEM fuel cells. Fast ionic and mixed ionic-electronic transport in condensed phases and associated interfacial/electrode reactions. Dense ceramic membranes and solid oxide fuel cell (SOFC): micro-machined solid acid fuel cell, surface exchange kinetics of mixed conducting perovskite electrode and membrane materials [I.F.J. Vankelecom, Chem. Rev. 102/10 (2002) 3779].

[7] Communication COM/2007/182/ FINAL: Improving knowledge transfer between research institutions and industry across Europe…"

Cluster 1.2: Membranes for gas separation, catalytic reactors & biofuel production (*HOME: UTWENTE, HOSTING: KULEUVEN, UM2*)

Advanced membrane processes for gas separation (syngas, ammonia purge gas, hydrogen recovery from refinery, gas dehydration, CO_2 caption etc.). Optimization of catalytic membrane reactors for Water Gas Shift, Hydrocarbons Steam Reforming, Partial Oxidation etc.; membrane bioreactors for biofuel production: effect of catalysts, membrane properties, operative parameters. O_2-permeable membranes for selective oxygenation of alkanes, miniaturized oxygen sensor [H.J.M. Bouwmeester, A.J. Burggraaf, Dense Ceramic Membranes for Oxygen Separation, in: CRC Handbook of solid state electrochemistry, eds. P.J. Gellings and H.J.M. Bouwmeester, CRC Press, Boca Rato, USA, 1997, 481-553]

THEME 2. WATER & ENVIRONMENT (Industrial Co-supervisors: VEOLIA, ALFA LAVAL)

Cluster 2.1: Membrane systems for desalination and water purification (*HOME: UNICAL, HOSTING: ICTP, UPS*)

Design of MF/UF processes as pre-treatment methods with better performances with respect to conventional ones, study of nanofiltration as softening method and for separation or organic pollutants, eletrodeionization and electrodialysis for pure water production, membrane distillation/crystallization for higher water recovery factors and low brine-disposal impact. Design and development of innovative integrated membrane desalination systems for energy and cost reduction [E. Drioli, E. Curcio, A. Criscuoli, G. Di Profio, J. Membrane Sci. 239 (2004) 376].

Cluster 2.2: (Bio-Catalytic) Membrane Reactors for wastewater treatment (*HOME UPS, HOSTING: UNICAL, ICTP*)

Studies on the immobilisation/heterogenization of catalyst in membrane allowing easy recycling/regeneration of the catalyst and making it better performing due to the selective adsorption induced by the polymer environment. Supported liquid membranes and photo-catalytic membrane reactors for separation and degradation of organic pollutants. Design and optimization of submerged Membrane Bioreactors (MBR) for cost-effective treatment of wastewater[P. Bacchin, P. Aimar, J. Colloid and Interface Sci. 320 2 (2008) 483].

THEME 3. HEALTH & BIOTECHNOLOGY (Industrial Co-supervisor: GVS)

Cluster 3.1: Biomedical membrane processes/ Active Pharmaceutical Ingredients/Food formulation (*HOME: UM2, HOSTING: UNICAL, UTWENTE*)

Synthesis of new hemodialytic membranes for the removal of endogenous/exogenous toxins from blood; blood oxygenation. Development of membrane bioreactors acting as extra-corporeal artificial organs for cell culturing. Innovative membrane techniques for: i) protein crystalization (function-structure correlations) and polymorphs selection (drug formulation); ii) controlling the protein adsorption on membranes by γ radioactivity and fluorescent labelling; iii) recognition of enantiomers by membranes functionalized with molecular selectors. Deacidification, lactic acid extraction, enzymatic hydrolysis for low lactose milk content [*T.* Gumí, D. Paolucci-Jeanjean, M.P. Belleville. G. M. Rios, J. Membrane Sci. 297 (2007) 98].

THEME 4. NEW NANOSTRACTURED MEMBRANE MATERIALS (Industrial Co-supervisors: MIKROPUR)

Cluster 4.1: Nanofabrication / inorganic-hybrid membranes/molecular-scale monitoring
HOME: ICTP, HOSTING: UPS, KULEUVEN

Design and fabrication of microstructurized membrane systems; microsystems with arrays of microelectrodes consisting of semipermeable media as membranes for studies of electrokinetic phenomena in a microchannel with applications in: polymer composite structures, bacteria sensoring, electrically tunable superhydrophobic surfaces, porous ceramic membrane microreactors, fluid dynamics in membrane microreactors. Membrane properties determination on the base of its microscopic structure: pore structure studies by X-ray micro-tomography, electron microscopy, AFM etc; spatially 3D representation of porous/multi-phase media by methods of statistical reconstruction, serving as computational domain for calculation of transport properties [K. Bouzek, P. Holzhauser, R. Kodým, S. Moravcová, M. Paidar, J. Applied Electrochemistry 37 (2007) 137].

ORIGINALITY AND INNOVATIVE ASPECTS IN EDUCATION/TRAINING ACTIVITIES:

- Development of a **e-Learning platform** (details in B.3.1), located on http://www.emedu.eu (trial version evaluation: username *reviewer* and password *revem3e*), with the aim to give to candidates a full access to computer-based teaching/training activities, to promote exchange and feedback between teachers and students (*forum, evaluation questionnaires*…), to manage learning and collaborative activities, self-assessment and evaluation. The platform will allow: i) the creation of a ***common electronic library including all the PhD manuscripts and defence records***, and the diffusion of all the PhD defences over all the partner network by using *videoconferencing tools*.

- Management of talents by specific awards and other incentives to attend international conferences will be taken by the European Membrane Society EMS (Associate Member);
- Teaching/training activities involving the participation of industry/public sector through:- ANNUAL SUMMER SCHOOL organized by the European Membrane Society (EMS, Associate Partner), a learned society that has been existing since 1982 (the XXVII edition will be held in Bucharest (Romania) on June 2010). The summer school aims at providing in-dept knowledge about membrane technology, giving to candidates the opportunity to exchange experience, and at stimulating a highly interactive contact between participants and lecturers (industrial and academic experts of international reputation in the field).

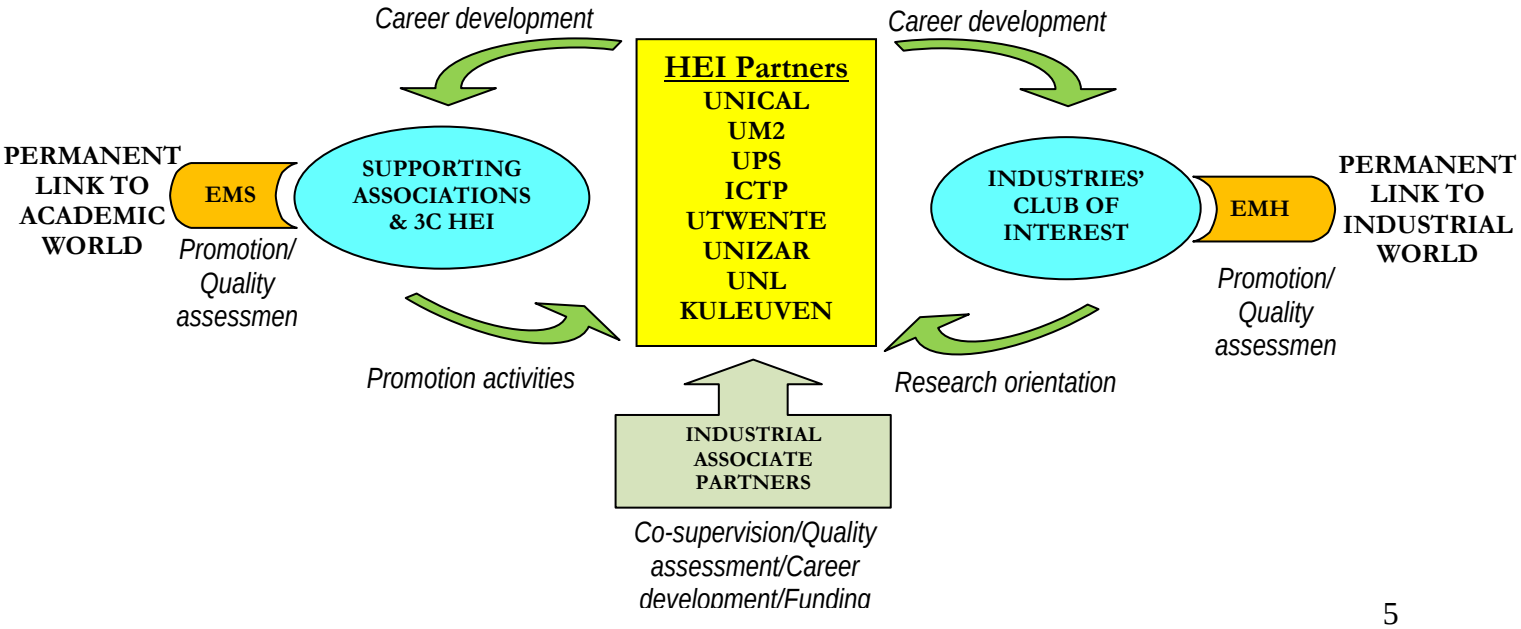
EUROPEAN MEMBRANE SOCIETY

- Two (2) training/research periods (6 months each) in two Hosting Universities located in two different European countries represented in the EUDIME consortium (B.3.2).
- Teaching/training activities modules as detailed below:

SCIENTIFIC MODULES (provide a general knowledge on membrane science and technology) 5 ECTS				
NAME	UNIVERSITY	TERM	ECTS	NOTE
Membrane science & technology	all 6 HEI	M1-M3	1	Homologation
Advanced membrane processes	all 6 HEI	M3-M6	2	Homologation
N°2 Summer Schools	EMS	M21; M31	Tot. 2	Homologation
TECHNICAL MODULES (provide a technical knowledge necessary to the conduction of the research in a given thematic field). Candidates are requested to attend the technical module corresponding to their specific thematic cluster. 3 ECTS				
Electrolyte Membranes	K.U.Leuven	M6-M9	3	Cluster 1.1
Catalytic membrane reactors & Gas separation	UTWENTE	M6-M9	3	Cluster 1.2
Membrane processes for water treatment	UNICAL	M6-M9	3	Cluster 2.1
Membranes in downstream processing	UPS	M6-M9	3	Cluster 2.2
Membranes in biomedicine and ingredient formulation	UM2	M6-M9	3	Cluster 3.1
Nanostructured membranes	ICTP	M6-M9	3	Cluster 4.1
MANAGEMENT MODULES (transferrable skills training related to research and industry) 4 ECTS				
Intellectual capital management	UNICAL/e-learning platf.	M18-M21	2	Common
Valorisation, commercialisation and entrepreneurship	ICTP/e-learning platf.	M18-M21	2	Common(held in cooperation with industrial partners)

Courses are mandatory, provided in English language and also available on e-learning platform; the proficiency will be assessed by the Supervisory Committee (B.3.5); minimum grade requested: E (Annex 10).

B.1.4 Inter-sectorial and inter-organization collaboration among the EUDIME Consortium is an essential feature of the programme with the aim to exploit the interdisciplinary nature of the partner/associate/supporting Institutions and Industries. The following scheme summarizes these aspects:



All the research themes and clusters strictly address relevant SOCIETAL AND ECONOMICAL NEEDS (B.1.1):

- innovative membrane materials/systems for **energy** production (fuel cells, electrodyalisis reversal, H_2 conversion/purification, Biodiesel production via Catalytic Membrane Bioreactors...);
- innovative membrane processes for large/small-scale potable **water production** (new-generation hybrid RO desalination systems) and **wastewater treatment** (MBR) with enhanced eco-compatibility (Zero Liquid Discharge/Process Intensification strategies);
- innovative biomedical and biotechnological systems for **health** and **food**: tissue engineering, bioartificial organs, regenerative medicine, advanced formulation of active pharmaceutical ingredients.

The choice made for the content and the structure of the program towards the 4 selected research themes are based on a detailed analysis of the European Membrane Strategic and Business Research Agenda (SBRA)[8] established by NanoMemPro Centre of Excellence in strong links with European Industry. The participation of 12 industrial companies in the EUDIME **Industries Club of Interest** confirms the existing WIDE EMPLOYMENT MARKET and the attention of EUDIME Consortium towards the requested skills or profiles associated with current job offers in the scientific and technological field of membrane engineering, with the goal to enhance the opportunities for GRADUATE EMPLOYABILITY. In addition, the **co-supervision and quality assessment activities of Industrial Associate Partners** will provide a unique and direct exposure of Doctoral Candidates to concrete needs of the industrial practice, thus offering **highly valuable competencies and professional outcomes for their future beyond academic career**.
The wide interlink between EUDIME and 3C HE Institutions and Associations will support the mobility stream from Third Countries to EUDIME (15 letters of support) and will strengthen the opportunities of candidates for **academic or professional career** in their own countries. Details on MOBILITY SCHEMES are provided in B.3.2. Not counting the "**Home University**", the candidates will visit (at least) **2 different "Hosting Universities"** with **a minimal mobility of 12 months** (6 months for each visit).

B.1.5 In terms of EDUCATIONAL, SCIENTIFIC AND TECHNOLOGICAL OUTCOMES (level 8), as identified by the European Qualification Framework[9], EUDIME will provide: 1) PhD with systematic and advanced understanding in membrane engineering, and mastery of harmonized terminology, research protocols, analytical methods and measures; 2) PhD with ability to conceive, design, implement and adapt a research program in **membrane engineering** with scholarly integrity; 3) PhD with capability of critical analysis, independent management of complex ideas and problems, ability to properly communicate within the scientific community, to promote, within academic and professional contexts, technological, social and cultural advancements in a knowledge-based society; 4) PhD that will contribute through **original research** to the advance of knowledge with expected impact in various socio-economical areas in which *membrane engineering can play a prominent role in improving the quality of life and insuring a sustainable development: health, food, energy, clean processes*.

B.2.1 The EUDIME Consortium includes 9 **leading European Universities** in the area of chemical and biochemical engineering, chemistry, material science, membrane engineering, **all with relevant experience in joint European projects**; partnership has been **carefully selected** so as to bring a **critical mass of European expertise** to the area of membrane engineering, and to provide a **unique infrastructure** and all necessary facilities to form a new generation of researchers in a vital, positive and multi-disciplinary environment. All partners have a large experience in **international mobility management**. In each University, the **Office for International Affairs** (10-15 staffs per University) will be in charge of the assistance of incoming students. It will facilitate the administrative procedures and the welcome of incoming candidates. All partner Universities involved in the project have a proved capacity to manage the mobility flows: all of them have signed the **Erasmus Charter** and have implemented the **Bologna Process**. Capacity, expertise and experience of these Institutions, detailed in the **part B** of the **Application Form**, are briefly summarized below.

UNIVERSITÀ DELLA CALABRIA (UNICAL): R&D activities on Membrane Science and Technology are carried out at the Department of Chemical Engineering and Materials, also in cooperation with the Institute on Membrane Technology of National Research Council of Italy (ITM-CNR). The *key academic & research staff* comprises: 2 Professors (Prof. **Enrico Drioli**, **EUDIME coordinator**; Prof. R. Molinari, coordinator of the Doctorate in Chemical Engineering at UNICAL), 3 Assistant Professors (Dr. E. Curcio, Dr. P. Argurio and Dr. G. Golemme), additional 21 researchers (staff ITM-CNR: www.itm.cnr.it), 15 PhD students (also from China, India, MENA countries etc.) and several Post-Doc. Prof. **Enrico Drioli**, past-Dean of the Engineering Faculty at UNICAL and past-director of ITM-CNR, has a long and distinguished experience of coordination/coordination of EU research & educational projects **in the specific field of Membrane Engineering** (i.e. MEDINA, IMETI, NEMOPUR, NANOMEMCOURSE, PROMEMBRANE).

[8] NanoMemPro. Deleverable Report D03.3_WP03_CNRS_ed1 "Mobility Plan"
[9] A Framework for Qualifications of the European Higher Education Area (document from: www.vtu.dk).

Dr. Raffaele Arena, head of the *administrative staff,* is director of the Office for Scientific Research Area and International Affairs at UNICAL (20 staffs). The Office has extensive experience in managing international cooperation for Higher Education and Research and mobility schemes: Erasmus (LLP/Erasmus, LLP/ERASMUS PLACEMENT), Leonardo, Marie Curie actions. The excellence in the administration of Mobility projects is confirmed by the Prize in the contest "Erasmus Success Stories 2009" that will be awarded to UNICAL (LLP Conference, Prague, 6-7 may, 2009) for the best management of the Erasmus Placement-Lifelong Learning Programme.

UNIVERSITÉ MONTPELLIER 2 (UM2): The R&D in membrane field within the UM2 is mainly performed at the laboratories of the European Membrane Institute (IEM), a 'Joint Research Unit' of CNRS also attached to the National Graduate Chemistry School of Montpellier and the University Montpellier 2. The *key academic & research staff* includes 2 Professors (André Ayral, responsible for the proposal of EMMC in "Membrane Engineering"; G. Pourcelly), the Assistant Professors S. Roualdes and various researchers. UM2 has a strong experience and expertise in international cooperation with HEI and mobility scheme management within Erasmus (CREPUQ program in Quebec), Leonardo actions, Marie Curie & other multilateral programmes (AVERROES). The leader of *administrative staff* is Dr. Sandrine Canadas, project manager with expertise in promotion of European & international programmes, European projects set-up in the area of Education with international partner universities (EMECW, Erasmus Mundus, , Tempus, LLLP..).

INSTITUTE OF CHEMICAL TECHNOLOGY PRAGUE (ICTP): Membrane related R&D activities are carried out at the Department of Inorganic Technology, also in cooperation with the Institute of Macromolecular Chemistry and the Heyrovsky Institute of the Physical Chemistry. The *academic & research staff* includes 9 regular members with long experience with education and supervisory of students in the frame of Erasmus-Socrates programs: Prof. Karel Bouzek (Head of Department of Inorganic Technology, vice-dean of the Faculty of Chemical Technology for International Relations and Contacts with the Industry), Dr. V. Fila, Prof. B. Bernauer, Dr. M. Paidar, Dr. J. Kosek, Dr. D. Snita, Dr. J. Krysa, Dr. R. Kodym, Dr. M. Lhotka). The leader of the *administrative staff* is Dr. Hana Optatova, Head of the International department at ICT Prague and Institutional Erasmus Coordinator.

KATHOLIEKE UNIVERSITEIT LEUVEN (KULEUVEN): The K.U.Leuven research group involved in membrane technology is supervised by Prof. Ivo Vankelecom at the Faculty of Bio-science Engineering. The membrane research was initiated in this Faculty in the beginning of the nineties as a part of the Centre of Surface Chemistry and Catalysis (COK). Currently, the COK membrane research group consists of 25 members and 14 PhD students. The key *academic & research staff* also includes Prof. De Vos, Dr. Cano-Odena, dr. P. Declerck. K.U.Leuven is an extremely active HEI within the joint programmes and mobility actions, that include several Erasmus Mundus Masters, Erasmus Mundus External Windows, a number of Leonardo Da Vinci actions, LLP/Erasmus Intensive Programmes, 2 Jean Monnet Centre of Excellence. The leader of the *administrative staff* is Dr. Piet Henderikx, Chief Executive Officer of the European Open University Network (EOUN) and special advisor of the Rector for European policy and international relations.

UNIVERSITY OF TWENTE (UTWENTE): R&D activities in membrane engineering are carried out in three research groups integrated in a single capacity group at the Department of Science and Technology: 1) Institute for Biomedical Technology (BMTI); 2) MESA+ Institute for Nanotechnology; 3) Institute of Mechanics, Processes and Control-Twente (IMPACT). The key *academic and research staff* includes Prof. H.J.M. Bouwmeester, Dr. R.G.H. Lammertink, Dr. A.J.B. Kemperman, and Dr. D. C. Nijimeijer. Training and Research activities at UTWENTE are embedded in large networks at both national (Microned, Dutch Separation Technology Institute DSTI, TTI Water Wetsus, EOS-LT, Process-on-a-chip NWO-ACTS, Research School for Process Technology OSPT etc.) and international level (FP-6 & FP-7 networks, NSF, MAST-Center Boulder CO, NSF Clips Center University of Texas, MEM-BRAIN, KNAW - Collaboration with China, etc). The *administrative staff* is coordinated by Harriet B.M. Kamphuis-ten Wolde, Director for Personnel & Organization at the Department of Science and Technology.

UNIVERSITÉ PAUL SABATIER (UPS): Research activities in membrane engineering are developed in the Chemical Engineering Laboratory (LGC) part of the CNRS and linked to the Institut National Polytechnique de Toulouse (INPT) and the Paul Sabatier University. The *key academic and research staff* involved in EUDIME comprises: 2 professors (Dr. P. Bacchin and Dr. C. Causserand), 3 researchers (Dr. Pierre Aimar, Dr. H. Roux and Dr. M. Meireles) and 3 associate professors (Dr. S. Galier, Dr. J. C. Remigy and Dr. J.F. Lahitte). The management staff, leaded by Dr. M. Perier-Camby, European project manager, has wide experience of Erasmus Mundus actions.

ASSOCIATE PARTNERS

UNIVERSIDAD DE ZARAGOZA (UNIZAR): The activities in membrane engineering are carried out at the Nanoscience Institute of Aragon (INA) by two research groups: "Catalysis and reaction engineering group" CREG and the "Nanoporous Films and Particles" NFP. The responsible is Prof. Reyes Mallada. UNIVERSIDADE NOVA DE LISBOA (UNL): The research on membranes is carried out at the Chemistry Department by the Biochemical and Process Engineering Group. The team leader is Prof. J. Crespo is Academic Dean of Faculdade de Ciencia e Tecnologia (UNL). RWTH Aachen: Research activity is carried out at the Institute of Chemical Process

Engineering, under the direction of Prof. M. Wessling, the Alexander von Humboldt Professorship – Award Winner 2009. Associate Industrial Partners are: SAPIO, leader in production of hydrogen for Italian merchant market, with experimental centre of 348 m^2 in Monza to develop Cryogenic applications, WWT units and oxy-combustion systems for industrial employment, and 280 m^2 of laboratories working about special gases and their mixture (resp: L. Grimolizzi, Responsible R&D sector). Anjou Recherche, the water research centre of VEOLIA Environment, develops innovative technologies for treating drinking water, municipal and industrial waste water (resp: J.C. Schrotter, Membrane R&D Manager). With 12,000 employees and a turn-over of approx. 2.7 billion Euro in 2008, Alfa Laval Nakskov A/S has long-term experience of membrane production and membrane applications in various industries (resp: F. Lipnizki, Manager, Market Development & Strategy and Process Industry). GVS Group employing about 1050 people in facilities located in Italy, Europe, South America, USA, and China, produces filters for biomedical, pharmaceutical, laboratory and air treatment (resp: S. Gaeta, R&D New Products Manager). MIKROPUR is a SME firm founded in 1994 as an engineering and consultancy company for membrane processes (resp: J. Pridal, general manager).

B.2.2 The EUDIME Consortium includes 9 Public partner Universities from 8 different European Countries: Italy, France, Belgium, The Netherlands, Czech Republic, Portugal, Spain, Germany. The MUTUAL COMPLEMENTARITY developed through the Network of Excellence NanoMemPro (2004-2009) facilitates strong synergies in terms of fundamental and applied research in membrane science and technology, and communication in a common language with shared concepts and terminologies. In addition, the support of several Institutions and Industrial companies offers the opportunity to create a strong learning environment. The involved Universities are characterized by similar selection/enrolment procedures, articulation between education and research activities, in-progress and final evaluation procedures. The only critical issue concerns the dissimilar duration of the doctoral programmes in the various Countries. As a consequence, the EUDIME Programme will definitely last 3 years at UNICAL, UM2 and UPS, and will definitely last 4 years at UTWENTE (that will fund the doctoral candidates for the entire 4th year). At KULEUVEN and ICTP the EUDIME programme will be extended from 3 to 4 year only if necessary to the fulfilment of the R&D activities and under the constrain that extra-funds to financially support the doctoral candidates for the entire 4th year will be available. *The duration of the PhD programme at a given Home University will be clearly indicated for each edition in the Application form*. However, the degree awarded by Erasmus Mundus Doctorate in Membrane Engineering will be fully recognized in all countries of the Consortium regardless to the different duration of the programme (B.3.6).

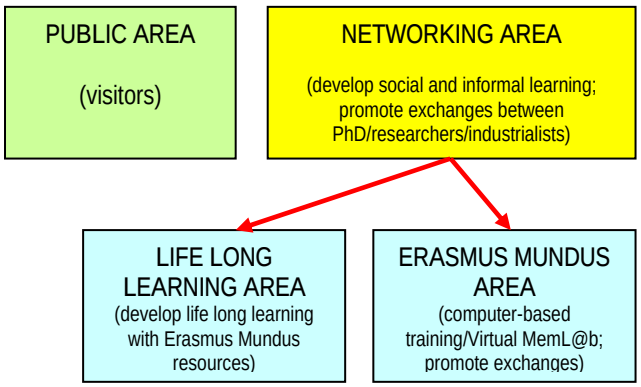
B.2.3 The Partners of the EUDIME Consortium share 4.5 years of common experience and high-level international NETWORKING AND COOPERATION in the framework of the European Network of Excellence NanoMemPro NMP3-CT-2004-500623 «Expanding membrane macroscale applications by exploring nanoscale material properties», funded by European Union (2004-2009) in FP6. NanoMemPro was born as a joint initiative of 13 European partners, all leaders in the field of membrane technologies, coming from 13 member states. Main objectives were: to set up a "European Membrane Technology Platform", to share research facilities, to establish of long-term synergies between European teachers, researchers, engineers, manufacturers, suppliers, end-users, in order to exploit advantages related to the multidisciplinary nature of the membrane science and engineering. A specific work package (WP12) of NanoMemPro was dedicated to Education, with the aim to develop a curriculum in Membrane Engineering at both Master and PhD level: In this respect, the preparation and submission of both EM3E (Erasmus Mundus Master in Membrane Engineering) and EUDIME (Erasmus Mundus Doctorate in Membrane Engineering) proposals are recognized as coherent and key actions. Supporting Institutions from Third Countries will play a decisive role in the implementation of the EUDIME Programme:

- they will encourage the flow of the best researchers towards European HEI of the Consortium;
- they will be able to address EUDIME training/research activities towards topics of specific interest (i.e: water desalination for Middle-East Countries, environmental protection for China/India, etc…), so increasing the probability for career success of doctoral candidates in their own countries;
- from a financial standpoint, Third Countries Organizations (i.e: MEDRC) are expected to promote specific actions for supporting doctoral candidates.

B.2.5 The PROFESSIONAL SECTOR is directly involved in EUDIME programme as support of promotion, co-supervision and orientation towards specific goals, quality assurance activities. Industrial Representatives of the Club of Interest CoI (B.1.3) are part of the External Evaluation Committee (B.5.4) and in the Quality Committee (B.5.1). The Industrial Associate Partners of EUDIME will play co-supervision activities for their pertinent *research themes* as specified in B.1.3. The participation of several internationally recognized Associations and 3C HEI, formalized by official letters of support (Annexes 4-6), will assure an adequate promotion activity; in some cases the possibility of financial support in terms of scholarship awards (MEDRC), mobility co-funding (EMS), opening positions to EUDIME graduates in industry on a fair basis with other candidates will be explored. Supporting Associations and Institutions will also play a crucial role in the dissemination of EUDIME results through presentations at national and international conferences, papers published in scientific journals (Prof. P. Aimar, local responsible of UPS, is co-editor of Journal of Membrane Science, the leading journal in the field, IF:3.247). The management of related knowledge, exploitation and dissemination of results, and intellectual property (IP) generated by EUDIME programme will be under the supervision of the Executive Board under the advice of CoI. The detailed IP rules will be set in the Consortium Agreement that will define property right to protect findings, especially those with identifiable commercial value. All researchers will be urged to follow basic rules of confidentiality.

B.3.1 The creation of EUDIME programme represents a coherent action in the frame of the work-package dedicated to Education in the European Network of Excellence NanoMemPro "*Expanding membrane macroscale applications by exploring nanoscale material properties*". EUDIME Partners operate within the WELL STRUCTURED AND INTEGRATED ENVIRONMENT resulting from 4.5 years of strong collaborations, with the objective of long-term synergies between European academics, researchers, engineers, manufacturers, suppliers and end-users in order to overcome problems related to the multidisciplinary nature of membrane engineering. Sources for current GOOD-PRACTICES, that will be exploited with the aim to create an administrative integrated plan, are:

- JOIMAN Project: "*Good Practice Report for the Administration and Management of Joint Programmes*", www.joiman.eu
- Code of Good Practice in the Provision of Joint Degrees, adopted by the Lisbon Recognition Convention Committee in 2001 and revised by the Committee in 2007 (http://www.coe.int/t/dg4/highereducation/Recognition/code%20of%20_good%20practice_EN.asp#TopOfPage, and UNESCO/OECD Guidelines for Quality Provision in Cross-Border Higher Education adopted in autumn 2005 in the framework of both Organizations (http://www.oecd.org/dataoecd /27/51/35779480.pdf);



- EUROPASS: http://europass.cedefop.europa.eu/europass/home/
- Recommendation on the Recognition of Joint degrees, adopted by the Lisbon Recognition Convention Committee in 2004:http://wcd.coe.int/viewDoc.jsp?id=836481&BackColorInternet=9999CC&BackColorIntranet=FFBB55&BackColorLogged=FFAC75
- EACEA:http://eacea.ec.europa.eu/erasmus_mundus/ tools/good_practices_en.php

The Management Board of the EUDIME, formed by senior administrative personnel from the Office for International Affairs of each partner University, *is perfectly skilled and experienced to explore and to take advantages from these good-practices opportunities*.

Training and research activities are focussed on specific application fields of strategic relevance for Europe, such as energy, water, environment, health, biomedical applications, food, in accordance with the INTERNATIONALLY RECOGNIZED EXPERTISE of the HEI Partners, Industrial Companies part of the Club of Interest, and Supporting Institutions involved in the Consortium. This STRONG RESEARCH ENVIRONMENT, operating coherently with the European Strategic and Business Research Agenda (SBRA) established with European Industry, will promote excellence and innovation in scientific investigation approaches related to membrane engineering, and will REINFORCE INTERNATIONAL COLLABORATIONS. Scheme in Section B.1.4, the 12 letters of support from SMEs and large companies active in the membrane industry,

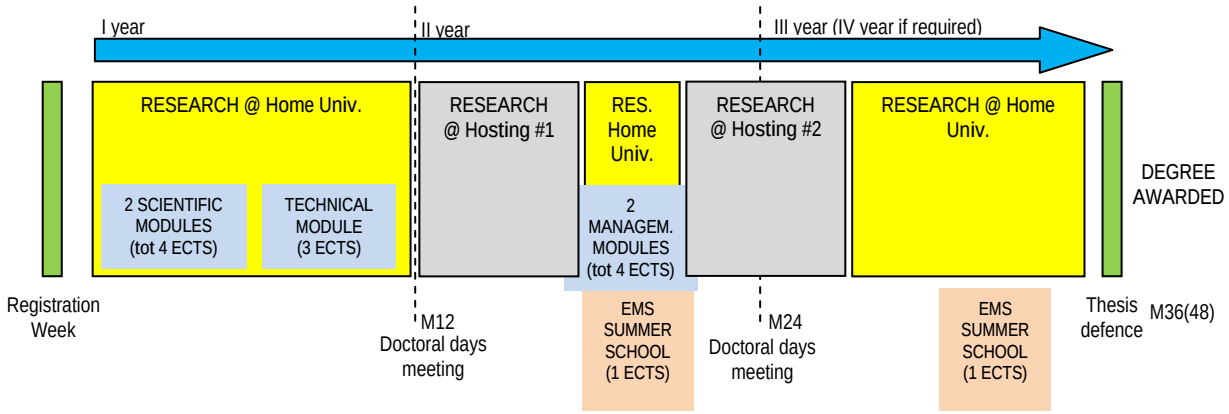
and 15 letters from supporting Institutions, clearly emphasise the great expectations around the EUDIME project. The efficiency of the organisational and management structure within the Consortium (B.5.1) has been largely proved in a number of FP projects, Erasmus, Leonardo, Marie Curie actions that are specific in the field of membranes.
In order to facilitate and promote the NETWORKING among all the actors of the EUDIME program (Doctoral Candidates, Teachers, Researchers, Industrialists, Institutions...), a platform for e-learning is currently developed by the partners of both Erasmus Mundus Master and Doctorate projects (trial version on: www.emedu.eu; username: *reviewer;* password: *revem3e*). The core of the platform, "The Erasmus Mundus Area" will be dedicated to students, teachers and supervisors. This space aims: 1) to give to Erasmus Mundus students access to a computer-based teaching or training; 2) to promote the exchange between Doctoral Candidates/Teachers/Researchers/Supervisors in the formation with possibility to perform collaborative activities and to promote contacts between external doctoral candidates (link to Erasmus Mundus Alumni Association) and supervisors (especially during mobility periods); 3) to manage learning and collaborative activities; 4) to manage evaluation and auto-assessment. The different resources will be also used in the context of LONG LIFE LEARNING; objectives of this dedicated area are: 1) to develop social and informal learning in the "membrane engineering" community; 2) to promote exchanges between students/industrialists/researchers. In parallel to these spaces with a restricted access to members, a "Public area" will be open for visitors and citizens. This space will present some generalities and some attractive and accessible multimedia resources. The objectives of this space are: 1) to attract external people toward the master and the PhD program; 2) to improve citizen awareness on membrane applications in the European industry. Training and research activities performed by doctoral candidates, both at "home" and "hosting" Institutions, will be FULLY RECOGNIZED THROUGH ECTS[10], and specifically:

- Teaching/Training: 12 ECTS
- Research activities @ Home University: 108 ECTS (3 years programme) or 168 ECTS (4 years programme)
- Placement @ Hosting Universities (2x6 months): 60 ECTS

B.3.2 At the end of the selection procedures, successful candidates are assigned to a given Research Cluster (B.1.3) by the Admission and Examination Committee (B.5.1). Assignments are made by matching:

- the candidate preference, as expressed in the application form (B.3.3);
- coherence with the scientific and technical background of the candidate;
- necessity to equally distribute PhD candidates among all HEI of the Consortium.

Assignments need final ratification from the Executive Board (B.5.1). Candidates will spend two MANDATORY MOBILITY PERIODS (6 months each) in two Hosting Universities, thus accomplishing training/research periods in 3 different European countries. All doctoral candidates pay the registration fees only at the consortium secretariat located at the University of Calabria (Coordinating Institution). PhD students are requested to register also at the Home University and at the 2 hosting Universities. Each student will be assured access to services and to receive the certification of his studies (certification of mobility, transcript of records, diploma supplement and diploma) from all the Institutions involved. SPECIFIC ACTIONS AND SERVICES TO SUPPORT STUDENTS AND TO LIMIT THEIR EXPOSURE TO BUROCRATIC COMMITMENTS ARE OUTLINED IN SECT. B.4.2. The mobility program is exemplified below:



The following table illustrates how mobility is defined according to individual research themes and how they are integrated across the network. In order to emphasise the harmonisation and complementarity of the EUDIME Consortium, *each HEI serves as HOME UNIVERSITY in one of the 6 clusters and as HOSTING UNIVERSITY in two clusters*. This subdivision is made in *coherence with the overall content of the programme that* reflects the main

[10] ECTS Users' Guide, Directorate-General for Education and Culture, Brussel 17 August 2004

research collaborations among partner and associate Institutions integrated in the **inter-disciplinary field of membrane science and technology**.

Research themes	Cluster	UNICAL	KU LEUVEN	ICTP	UTWENTE	UM2	UPS
1.ENERGY	1.1		HOME		HOST	HOST	
	1.2		HOST		HOME	HOST	
2. WATER & ENVIRONMENT	2.1	HOME		HOST			HOST
	2.2	HOST		HOST			HOME
3. HEALTH & BIOTECHNOLOGY	3.1	HOST			HOST	HOME	
4. NEW MATERIALS & PROCESSES	4.1		HOST	HOME			HOST

HOME: Home University; HOST: Hosting University

UNL, UNIZAR and RWTH will joint the Consortium as **full Partners** in the second edition of EUDIME, after recognition of the degree awarded. Each Doctoral candidate will carry out his training/research activity under control of a **Supervisor Committee SC** (B.3.5). *The SC is in charge to define the sequence and to supervise the mobility periods according to the status of the research activity, and to re-define them in case of specific/urgent situations.* Activities are preceded by a **registration week**: a welcome ceremony will be organised, and practical information will be given to students in order to: 1) make easy the administrative steps; 2) organize their stay at Home University; 3) introducing the language policy in place and the possibility of networking, social, informal and formal learning (e-learning platform); 4) have cultural activities aiming at their social integration.

B.3.3 COMMON STANDARDS for recruitment process will respect principles and requirements applicable to researchers as laid out in the European Charter for Researchers, Code of Good Conduct for the Recruitment of Researchers[11], **Delivering lifelong learning for knowledge, creativity and innovation**[12] in order to **implement lifelong learning** to achieve **efficiency** and **equity**.

The APPLICATION to EUDIME programme is submitted on-line, with form available on ***EUDIME website*** (www.em3e.eu). In the website, applicants will find a **list of research projects** (theme/mobility pathway/supervisor committee) provided by the Consortium for each edition. The application must be filled with:

- digital copy (the original has to be provided, before enrolment, to the Co-ordinating Institution) with all academic certificates of the candidates and the respective official transcription in *English* (for Third-Countries students, transcription must be validated by the Embassy/Consulate of a country of the consortium);
- if applicable, the candidate should send by mail an official document – issued by the HEI that awarded the Master diploma - stating the candidate relative position in the corresponding graduation course, i.e. top 5%, 10% or 20% of his/her *Bologna second cycle* (Master) studies;
- a detailed CV and a motivation letter (in English);
- n.2 letters of recommendation to be sent by registered mail to the EMJD coordinator;
- current and correct addresses to enable communication via e-mail and mail;
- preference for attending a 3 or 4 years PhD program;
- short description of the intended doctoral research and eventual preference for research themes suggested by the Consortium.

For ADMISSION to EUDIME Programme, **candidates must hold**:

1) a **Master degree** (2nd Level degree, 120 ECTS) in Chemical Engineering, Process Engineering, Bio-Engineering, Materials Science, Chemistry or a equivalent degree in a pertinent field, awarded by a College, University or Technical School with recognized standing;
2) **additional information** supporting the applicant's ability to apply and complete a doctoral programme: academic record, professional experience and qualification (previous experience of practical laboratory, publications), motivation letter and letters of recommendation;
3) candidates are required to demonstrate their **proficiency in English**, either by proving that some of their previous studies were successfully completed in English, or by submitting the results of a recognized language proficiency test (TOEFL iBT with minimum required score of 80, TRINITY ISE ESOL II, IELTS with minimum score of 5.5, or equivalent tests to level B2 or higher). In some cases (PET, certificates from Schools of English equivalent to level B1, or absence of certification) the applicant is asked to confirm their good command of English by phone interview or teleconference.

[11] www.europa.eu.int/eracareers/pdf/am509774CEE_EN_E4.pdf
[12] 15292/07 EDUC 211 SOC 460 + ADD 1, Brussels, Jan 2008

SELECTION procedure is done by the Admission&Examination Committee A&EC (B.5.1) during 2 meetings taking place in person or via video-conference/Skype organized by the Coordinator. In the first meeting (beginning of January) A&EC verifies the coherence of applications with admission criteria and provide a ranked selection list (to be published on the website) made on the basis of pre-defined, fair transparent and objective evaluation criteria where CV, educational background, scientific/professional experience, letters of motivation and recommendation. *Each file is examined independently by 2 members from 2 different countries*.

Final grade of the Master degree	From 1 to 5, proportionally to final score If final grade of the Bologna Master degree is applicable: - in the top 5%: 5 - in the top 10%: 4 - in the top 20%: 3		
	Very good	*Good*	*Fair*
Professional/Scientific experience	2.0	1.0	0.5
Motivation/Recommendation letters	1.0	0.5	0.25
Interview (second step)	2.0	1.0	0.5

- Recognition and evaluation of qualifications will focus on judging the achievements of the person rather than his/her circumstances or the reputation of the institution where the qualifications were gained;
- Mobility experiences will be recognized as a valuable contribution to the professional development of a researcher;
- for female applicants, career breaks in CVs due to maternity will not be penalised.

In a second meeting (end of January), A&EC finalises the selection list by interview via phone or videoconference to candidates and assigns each PhD student to the appropriate research cluster (B.1.3). Final selection results will be available on EUDIME web-site and communicated by e-mail (and regular e-mail) to successful applicants. A good balance in terms of country of origin (max. 2 selected candidates from a Country) will be ensured.

Recruitment procedures will be also finalized in seeking an equitable balance between men and women, being recognized that gender-mixed research teams are more successful. Actions aiming to attract female candidates to EUDIME project:

- invitations to join EMJD Programme will explicitly express the need for participation of women researchers;
- need for mixed (male/female) structure of existing hosting teams will be expressly mentioned;
- in event of equality of the final score, A&EC will give priority to female candidates;
- for female applicants, career breaks in CVs due to maternity will not be penalised;
- allowing flexible working hours whenever possible;
- availability/support in finding appropriate accommodation and, if possible, temporary employment opportunities to partners/husbands;
- for families with children, help will be offered to place them in nursery schools or schools with international programmes (already present in the Campus of Universities of the Consortium).
- monitoring gender impact on professional careers.

Moreover, all partner HEI have adopted accessibility measures for candidates with special needs in order to encourage their application to EUDIME Programme.

B.3.4 The overall financial management of the programme will strictly follow the rules imposed by the Commission, and will be defined and agreed during negotiation phase. The contribution from the commission, in terms of Erasmus Mundus fellowships awarded and of financial contribution to internal costs management, will be handled by the Management Board. The REGISTRATION FEES (sum of tuition fees and other participation costs) are of 7,200 Euro/year for both 3C and EU candidates (*laboratory-based EMJD: 600Euro/month x 12 months*); decision was taken considering: i) the average value of the registration fees of doctoral programmes in the Universities of the Consortium; ii) the maximum grant awarded by individual Erasmus Mundus fellowships.

Breakthrough of tuition fees and other participation costs	
TUITION FEES	1,000 Euro/year
LABORATORY AND EQUIPMENT UTILIZATION & MAINTENANCE COST	3,000 Euro/year
INSURANCE	500 Euro/year
PHONE/FAX/PC/LIBRARIES	200 Euro/year
ATTENDANCE AT SUMMER SCHOOLS, MEETINGS, CONFERENCES	2,000 Euro/year
COSTS RELATED TO TRAINING ACTIVITIES	500 Euro/year
TOTAL	**7,200 Euro/year**

In order to improve the attractiveness and the long-term sustainability of the EUDIME Programme, doctoral candidates non-granted by an Erasmus Mundus fellowship are ONLY requested to pay tuition fees (1,000 Euro/year); the "other participation costs" will be in charge of the Consortium. These fees will include insurance covering accidents that might occurring during training/research activities. Additional/complementary forms of insurance will be in charge of the doctoral candidates.

Students will pay registration fees in one only place (Coordinating Institution: UNICAL) that will provide to distribute through Institutions of the Consortium according to criteria in (B.4.4). For supports to mobility (including attendance to summer school, meetings, conferences) see B.5.2.

B.3.5 JOINT SUPERVISION and MONITORING of doctoral candidates are implemented in order to ensure a daily progression of the doctorate programme towards the established objectives. A **personal supervisor** is appointed to each doctoral candidate. Full-time ordinary, associate and assistant professors are eligible for supervision activity. The supervisor carriers the responsibility for the scientific training of the PhD candidate and serves as a link with: 1) the Executive Board (B.5.1); 2) the Admission & Examination Committee A&EC (B.5.1); 3) the **Supervisory Committee SC**, composed by 5 members: 2 academic representatives of the **Home University**, 1 academic representatives for each of the 2 **Hosting Universities**, 1 **co-supervisor** from **Industrial Associate Partners** with the aim to orient the research to specific industrial applications. SC will be in charge to: *i) assess the proficiency of candidates on the **taught part** (scientific/technical/management modules) of the Programme; ii) approve the written & oral reports provided by candidates at the end of each year of activity; iii) monitor mobility periods; approve the PhD Thesis manuscript.*

At the **end of each year of activity**, examination procedures also include the following deliverables:

- a **written report** on research/training activities, preventively approved by the supervisor and positively considered by the Supervisory Committee, that the doctoral candidate must provide to the Admission & Examination Committee. The A&EC reports to Executive Board about the doctoral candidate activity. The **enrolment to the successive year of activity, or to the final defence**, depends on: 1) the positive judgement of A&EC; 2) the definitive approval of the Executive Board;
- an **oral report** (in the form of a seminar) on research/training activities in front of the Supervisory Committee, members of the University Department(s) where activities have been carried out, and Video Conference during **Doctoral Meeting Days**.

COMPULSORY ELEMENTS for a successful **completion of the doctorate programme** are:

i) the candidate must have produced **at least 2 scientific publications** (in the form of journal article, contribution to a book, conference proceedings, patent) at international level;
ii) the candidate must have successfully attended teaching/**training activities** for a total of 12 ECTS;
iii) the candidate must have fulfilled the scheduled **mobility periods**.

By July 1st, the doctoral candidate is requested to submit own **PhD Thesis manuscript** to A&EC upon approval of the supervisor and SC.

By July 20-25th, a preliminary oral defence is organized at the Home University in front of the SC and of the academic staff of the Department where research activities have been carried out.

By the July 31th, the A&EC assesses the content (with special look to the originality and innovative contributions of the work) and the form of the **PhD Thesis manuscript** and decides if the manuscript is approved (eventually subject to minor/major revisions) or rejected. The doctoral candidate is thus requested

i) if approved with revision: to amend the manuscript according with comments;
ii) if rejected: a chance to prepare a new manuscript is offered;

and send back to the A&EC by September 15th for the **definitive approval or rejection**. The final decision on the approval or rejection of the PhD Thesis must be certified by the Executive Board.

The Executive Board nominates an **External Evaluation Committee (EVC)**, composed up to 7 members:

- 3 professors from Academic Institutions supporting EUDIME programme;
- 2 Industrial Representatives from the Industrial Club of Interest;
- members of the Ministry of Education for countries whenever this is expressly requested.

A copy of the PhD thesis is send to each EVC member.

The FINAL PUBLIC DEFENSE will take place by October 31th in one of the Universities of the consortium. Within 45 minutes, the doctoral candidates will present key findings and conclusion of their research activities in front of the the **External Evaluation Committee** and 3 academic staffs of HEI Partners. The audience will give opportunity to make comments or questions. The result will be announced immediately after the deliberation in public section.

B.3.6 EUDIME partners will provide a **multiple doctoral degree** to successful doctoral candidates, released from the Home University and the 2 Hosting Universities visited by the candidate, regardless to the different duration of the programme. In addition, a **Diploma Supplement** (Annex 10) will be delivered by the University of Calabria on behalf of the Consortium (jointly written and signed by the Executive Board) that will give details about the structure of the programme, mobility periods and skills acquired. The final objective is to deliver a fully accredited and recognized joint degree: this is already possible at UNICAL (**Italian Decrees 509/99 and 270/2003**) and KEULEUVEN (**Flemish Act of 4 April 2003**), in UTWENTE starting from June 2010 (Annex 2), and actions are in progress in all the HEI Countries driven by the success of Erasmus Mundus Programmes (**part E**).

B.4.1 The strategy for INFORMATION AND PROMOTION includes the following tools:

- the website on Erasmus Mundus Program in Membrane Engineering for both Master and Doctoral programmes (http://www.em3e.eu/). Expected to be an important mechanism for recruitment, the website is designed with the aim to provide all necessary information on EUDIME mission, description of the Universities of the Consortium, terms and conditions for applicants, details on training/research activities and facilities offered, e-learning platform, promoted by links from/to EU commission, European Membrane Society, European Membrane House, EMS, etc. The web page will be updated and maintained periodically; the members of the Consortium have intensive expertise in the construction and maintenance of web sites directly related to EU-funded projects;
- the Erasmus Mundus Websites of National Structures;
- The Education, Audiovisual and Culture Agency Executive Agency (EACEA) website (http://eacea.ec.europa.eu/index.htm); the European Job Mobility Portal –EURES (http://ec.europa.eu/eures/); the European Services Network –EURAXES (http://ec.europa.eu/euraxes)
- the websites of Universities forming the EUDIME Consortium;
- in order to assure a balanced number of women in the EUDIME Programme, available positions will be publicized on European Association for Women in Science Engineering& Technology WiTEC website (http://www.witec-eu.net/).
- Supporting Institutions will offer their support with the aim to inform and to promote the participation of candidates, both from European Third Countries, to EUDIME Programme.
- Personal Contacts of EUDIME members by e-mail and/or conventional mail communications;
- advertisements of vacancies in national and international scientific and trade journals, newspapers, newsletters (ie: *Membrane News*, edited by European Membrane Society, *Watermark* edited by MEDRC …).

B.4.2 The welcoming and the services offered doctoral candidates is a crucial point for the success of EUDIME mission. The Erasmus International Offices of each partner universities will give a specific support to this programme. In addition, DEDICATED SERVICES FOR EMJD CANDIDATES will be implemented. In order to simplify and reduce the exposure to burocracy, candidates will be supported by:

- a Local Management Office (LMO), working in close relation with the Management Board (B.5.1), will be appointed in each HEI of the Consortium (3 staffs) with the aim to manage admission services, candidates consulting, programme promotion, e-learning. Payment of registration fees and signature of the Doctoral Candidate Agreement occurs only at the Coordinating Institution (UNICAL); most part of burocratic steps are managed by LMOs.
- the Erasmus life counsellor, a contact person from LMO for the student services (assistance in application procedure, burocratic commitments, VISA and residence permit obtaining, planning trips, housing, insurance, bank account opening, sport and cultural activities) specifically appointed in each university (staff of Erasmus Office).

Additional actions are:

- pre-arranged short-term (one month) accommodation starting as soon student is recruited and at the beginning of mobility periods;
- priority in obtaining housing facilities, especially for students with special needs or having family, facilitated by clear mobility scheme as detailed in B.3.2;
- special assistance in obtaining a "long-stay permit": the 6 HEI Partners of the EUDIME Consortium are EU members, so that the permit of stay requested and obtained at Home University is valid when moving to Hosting Universities;
- preparation of an ERASMUS MUNDUS WELCOME GUIDE, containing practical information and useful addresses in all HEI of the consortium, and concerning: *Registration as Erasmus Mundus Students, Residence permit & VISA, Health & Insurance, Canteen, Students with special needs, Access to University Libraries, language course, Erasmus Students Association, Banking, Post offices, Transports, University Sports Association, Internet Points etc.*
- creation of an Association and social network community of Alumni, a rich source of support for current students and applicant candidates.

A short description of student services offered by each university is provided below:

UNICAL 	The Residence Center at the Arcavacata Campus of the University of Calabria provides housing facilities (single/double/multiple rooms) to more than 3500 rooms as assistance with social insurance. Meals for (PhD) students are served in 3 Restaurants located in the Campus (~2 €/meal). The Campus is served by 1 Bank, 1 Post Office, 1 Health Center (Cosenza Hospital is 10 min far), theatre, Immigration Office providing assistance with visas; sport activities are coordinated by Universitary Sport Center CUS (www.cuscosenza.it); special needs: "Servizio di Accoglienza Studenti con Disabilità" Center (ufficio.disabili@unical.it)
K.U.Leuven 	K.U.Leuven has a long-standing tradition of hospitality towards students and scholars from abroad. Once in Leuven and settled in a temporary guestroom, international students/guests are welcome to come to the Housing Service where they will be given information and guided through the procedure to find housing. (housingservice@dsv.kuleuven.be). Meals for (PhD) students are available from ~3 €/meal). An impressive sports accomodation is available at K.U.Leuven (http://www.kuleuven.ac.be/sports/index.htm). The Medical Centre for students is staffed by a team of doctors with extensive experience. Dedicated facilities to students with special needs: Annick.Ulburghs@dsv.kuleuven.be
ICTP 	ICT Prague offers accommodation services in its halls of residence (http://www.vscht-suz.cz/suz/eng/recreationfacilities/default.asp). Meals for students are served at ~2 €. The ICT Prague Halls of Residence offer facilities for a wide range of students' leisure time activity, including student clubs, fitness centres, tennis courts, darkroom, etc. Voluntary sport-courses organised by the Department of Physical Training focusing on the broad range of sports; participation of students is for free. Training and recreation facilities in Jachymov and Pec pod Snezkou (http://www.vscht-suz.cz/suz/eng/recreationfacilities). On-site assistance for special needs.
UTWENTE 	International Office/Housing helps international students in finding accommodation by coordinating supply and demand (housing@so.utwente.nl). PhD students and employees should contact the Personnel Department of Foreign Affairs (http://www.utwente.nl/pao/en/) in order to arrange the visa and residence permit. Meals for students are served at ~5 €. The campus of the UTwente offers a variety of services: psychologists, a medical centre, counsellors, religious services, a hotel, restaurants, bars, etc. For special needs: http://www.utwente.nl/studentenbalie/en/
UM2 	Information about the accommodation proposed by the University: www.espace-etudiant.com. Meals are served at the university restaurant (~3 € per lunch). Sport activities are organized by Service Universitaire des Activités Physiques et Sportives SUAPS(suapsum2@univ-montp2.fr). More than 30 student associations are active in the Campus. For information: Service Commun Universitaire d'Information et d'Orientation (SCUIO) (scuio@univ-montp2.fr). ADUM : Directory of the current and former students of the Doctoral Schools of the Academy of Montpellier (http://adum.contact.asso.fr). Cellule Handicap de l' UM2 : handicap@univ-montp2.fr
UPS 	The student house is the Crous (http://www.crous-toulouse.com/). This organism manages an important number of universitary rooms, helping also students in finding others accomodations (guest rooms, shared accomodations ...). Two universitary restaurants for students are in the scientific campus, belonging to the Crous (http://www.crous-toulouse.com/); meals at ~ 3 €. Sport practice (volley, tennus, rugby, soccer…): http://www.ufrstaps.ups-tlse.fr/ . "Cellule Handicap de l' UPS": riggio@adm.ups-tlse.fr

- All services below listed are available for candidates with family or with special needs.
- Associations of Students present in all the Universities of the Consortium aim to facilitate a greater integration of its members in the university community, and to favour the development of cultural, sport, artistic and recreational activities.
- The Consortium is conceived as an international environment, which presents its staff and students with the challenge of being fluent in more than one language. All Universities involved, through their Language centres, offers gratuity English/National Language courses and facilities for language study.
- The Student Counselling Services, present in all Universities of the Consortium, provides support and information to doctoral candidates on regulations and financial aspects related to the university life.

B.4.3 The official language of EUDIME Programme is English. It will be the language for the training/research activities, courses, discussion and examination. The Consortium is conceived as an international environment and promotes specific actions with the aim that candidates acquire at least basic language and hermitage knowledge of the Countries visited. All Universities involved, through their Language Centres, will gratuity offer English/Hosting National Language, culture and civilization courses taught by professional language trainers, and facilities for language study. Although optional, each course will be recognized with 1 ECTS up to a maximum of 2 ECTS (to be deducted from research activity ECTS) and certified in the Diploma Supplement. In order to incentivise the use of at least two

different EU languages, it will be mandatory to *provide an additional abstract of written reports and the abstract of PhD thesis in a EU language different from English*; candidates will be encouraged to use the hosting country language during periodic oral presentations or discussions within their research team.

B.4.4 HEALTH AND ACCIDENT INSURANCE coverage is provided according to EACEA directives[13]. Home Universities will guarantee high-quality (call-centre accessible 24h/24h with multilanguage operators, local assistance back up available 24h/24h, specific insurance cards available within 1 week) insurance against health and accident risks related to the EUDIME activitiessuch as illness, accident, death, permanent disability, third-party liability etc. (costs included in the tuition fees), including all worldwide travel required for the participation in the Programme. In addition, the co-ordinating institution will deliver to doctoral candidates (costs included in the other participation costs for Erasmus Mundus fellowship recipients as in B.3.4) an additional insurance: Sickness/pregnancy and childbirth/accident, death, permanent invalidating injuries, Third-party liability, hospital stay, Theft and loss of documents, other supplementary assistance services. Pension right will be addressed according to rules established in each Home University. SINGLE EMPLOYMENT CONTRACTS will be used to appoint candidates in all partner Universities.
FELLOWSHIP SCHEME: grantees will be equally distributed over 5 editions among the 6 partner HEI. A provisional scheme is in Annex 7. The Executive Board will be in charge to guarantee the equal distribution of fellowships between partners.
FINANCIAL MANAGEMENT OF FELLOWSHIPS (see also B.3.4): All doctoral candidates will pay the tuition fees (1,000 Euro/year) at the Co-ordinating Institution (UNICAL) that will provide to transfer the entire sum to the Home University assigned to doctoral candidate after selection procedure. For a recipient of an Erasmus Mundus fellowship, the remaining sum (6,200 Euro/year, or 516,7 Euro/month) will be allocated among involved Institutions on a pro-rata time based: the annual amount is assigned to each visited Institution (Home + 2 Hosting University) proportionally to the time spent by the doctoral candidate for training/research activities (516,7 Euro/month).
CONSORTIUM LUMP SUM: as Coordinating Institution, UNICAL will receive an additional financial contribution of 5,000 Euro/edition for internal management costs; the remaining sum (45,000 Euro/edition) will be equally divided among the 6 partner Universities (7,500 Euro/edition to each Institution).

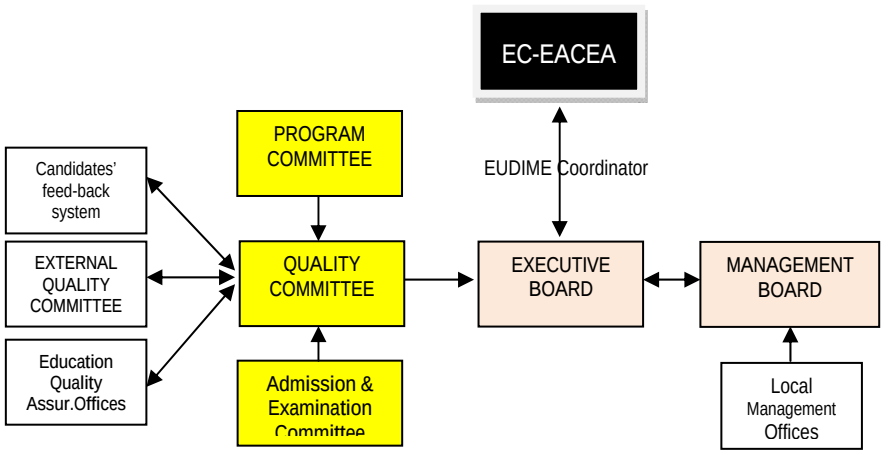
B.4.6 SPECIFIC INNOVATIVE COUNTERMEASURES AS REGARDS TO EMPLOYABILITY AND CAREER PROSPECTS have been outlined in section B.1.3. In addition, each doctoral candidate, in cooperation with the supervisors, will draw up a Personal Career Development Plan, describing their scientific goals (recognized as Specific, Measurable, Action-Oriented, Resonate and Timely), identifying: 1) short-term training/transfer of knowledge needs for improving current performance, competences and skills (emphasise the appropriateness of mobility networking, necessity of additional courses/seminars, etc.); 2) middle-term items relevant items for professional growth within present or future position; 3) long-term career goals, and progressively reporting on whether or not these objectives were successfully met. At the end of the EUDIME programme, for each doctoral candidate, a Professional Skill Form (PSF) will be prepared by the Supervisor and approved by the Executive Committee, in order to facilitate the identification of tailored career paths for each doctoral candidate. The PSF will be located into a PERMANENT CURRICULA DATABASE of the European Membrane House, associate member of EUDIME offering a single reference point of expertise and know-how to European membrane industry, to the group of supporting Institutions and to the Industrial Club of Interest. The career progression of doctoral candidates, once graduated, will be monitored - though periodical questionnaires that graduate doctors are requested to fill in relation to their career status - by the Program Committee (B.5.1) during the upcoming three years; the Program Committee will be also in charge to maintain easily accessible profile information using e-learning platform.

B.4.7 During the registration week, a joint DOCTORAL CANDIDATE AGREEMENT will be signed by the Consortium and the doctoral candidates (preliminary version in Annex 9). According to the principles and requirements applicable to researchers as laid out in the European Charter for Researchers and a Code of Good Conduct for the Recruitment of Researchers, in order to create a more transparent, open, equal and internationally accepted system of recruitment and career development as a prerequisite for a genuine European labour market for researchers, HEIs and candidates will be subjected to specific rights and duties.

B.5.1 At institutional level, all Universities of the EUDIME Consortium clearly recognize the strategic value of this program: all letters of endorsement signed by Rectors, expressly assuring "***all possible efforts to ensure the proper***

[13] http://eacea.ec.europa.eu/erasmus_mundus/funding/2010/documents/minimuminsurance_en.pdf

implementation of the programme and its sustainability and continuity beyond Community funding", confirm the FULL INSTITUTIONAL COMMITMENT, strong institutional support at the highest levels and appropriate financial resources to be allocated to EUDIME on a fair basis with respect to existing conventional Doctorate programmes (i.e. partitioning grants received from Ministry of Education or from Local Governments). Moreover, the Academic Boards of the participating Universities demonstrated high level of flexibility, and have decided do not interfere with the programme in terms of timetable, composition and structure of management and supervision boards, etc. STRONG ACADEMIC AND INTELLECTUAL LEADERSHIP is confirmed by the involvement of senior staff in all the Institutions of the EUDIME Consortium and proves that the programme is FULLY EMBEDDED INTO UNIVERSITY STRUCTURES. In particular: Prof. Enrico Drioli, EUDIME Coordinator, is the past-Dean of the faculty of Engineering at University of Calabria and recipient of two Doctorate Honoris-Causa in Chemistry; Prof. A. Ayral is Deputy director of the Department of Chemistry at the Faculty of Sciences of the University Montpellier 2; Prof. Karel Bouzek is Vice-dean of the Faculty of Chemical Technology at ICT Prague; Prof. M. Wessling is past-Dean Faculty of Science and Technology at UTWENTE; Prof. J. Crespo is Dean of the faculty of Science and Technology at UNL. Moreover, within the EUDIME management board, Dr. Raffaele Arena is Director of the Office for Scientific Research Area and International Affairs at UNICAL; Dr. Harriet B.M. Kamphuis-ten Wolde is Director for Personnel & Organization at the Department of Science and Technology at UTWENTE; Dr. Piet Henderikx is Chief Executive Officer of the European Open University Network (EOUN) at K.U. Leuven, Dr. Hana Optatova is Head of the International Department at ICT Prague; Dr. E. Pastor is Head of the International Relations Office at Universidad de Zaragoza etc. Moreover, the robust and well-qualified academic and management key-staffs has been carefully selected in order to ensure a sustainable leadership SUCCESSION over time.
Research and teaching activities, carried out in prestigious Departments of Chemistry, Chemical Technology, Chemical Engineering, Materials Science etc. will be surrounded with world-class resources, such as libraries and information technology services.



In order to assure an high qualitative level of ORGANISATIONAL ARRANGEMENTS and EFFICIENT COOPERATION MECHANISMS throughout the Institutions of the EUDIME Consortium, an Executive Board, a Management Board, and three committees will be established. All minutes of the boards and committees meetings will be published on EUDIME website. In the forum page, a space will be reserved for exchanging ideas, remarks and suggestions about the boards/committees decisions. *Boards gather 4 times a year by teleconference or in one of the partner Universities. Committees gather 3 times a year by teleconference or in one of the partner University.*

EXECUTIVE BOARD: has a highest advisory, strategic and decisional role. The Executive Board is responsible for training/research activities carried out in each Institution and for cross-organization placements, it will make efforts to overcome eventual legal and administrative obstacles to the implementation of the joint programme and to ensure full recognition of joint doctoral diploma, will handle any conflict resolution within the project, will ensure dissemination of knowledge. It is composed by llocal co-ordinator of each partner University; in the FIRST EDITION: E. Drioli (UNICAL), A. Ayral (UM2), I. Vankelecom (K.U.LEUVEN), H. Bouwmeester (UTWENTE), P. Aimar (UPS), K. Bouzek (ICTP). The EUDIME Coordinator ensures the interface with EC-EACEA. The head of the Board is elected by members for a period of 3 years.

MANAGEMENT BOARD: has in charge the management of administrative and financial aspects of the EUDIME Program. It will: 1) monitor the financial activities within the programme, ensure funding is distributed appropriately, prepare financial reports regularly; 2) manage contract issues; 3) provide access to University's administrative services through the 6 Local Management Offices (one per partner University, B.4.2); 4) transfer "good-practice" concepts between Partners. It is composed of one Senior Administrative Staff member per partner University; in the FIRST EDITION: R. Arena (UNICAL), S. Canadas (UM2), P. Henderikx (K.U.LEUVEN), H. Kamphuis-ten Wolde (UTWENTE), M. Perier-Camby (UPS), H. Opatova (ICTP). The head of the Board is elected by its members for a period of 3 years.

PROGRAM COMMITTEE: is monitoring and supporting the *proper and efficient implementation* of EUDIME Program. It is composed of 1 staff member per partner University, 1 representative per Associate Institution, and 2 doctoral

candidates' representatives (elected among their colleagues for a period of 2 years); in the FIRST EDITION: Dr. E. Curcio (UNICAL):organisational arrangements and cooperation mechanisms within the Consortium; Prof. S. Roualdes (UM2): link with Erasmus Mundus Master in Membrane Engineering (EM3E) and other Bachelor programmes; Prof. D. De Vos (K.U.LEUVEN): services provided by the Consortium to host doctoral candidates; Dr. F. Vlastmil (ICTP): relationships with industries/monitoring career prospect of doctored; Prof. A. Nijmeijer(UTWENTE): quality assurance aspects of the Doctorate Programme; P. Bacchin (UPS): implementation and management of E-learning platform; Dr. J. Coronas (UNIZAR): information and promotion activities; M.A. Reis (UNL): exploring extra-Erasmus Mundus funding opportunities for assuring the sustainability to the programme; Prof. M. Wessling (RWTH Aachen): supports to dissemination activities; Dr. L. Giorno (President of European Membrane Society EMS): reinforce links with 3C Associations, Institutions, Universitites; Prof. G. Rios (President of European Membrane House EMH and coordinator of the NoE NanoMemPro): reinforce links with Industrial World operating in the frame of membrane technology; Dr. L. Grimolizzi (Director of Innovation, R&D Center of SAPIO SrL), Dr. J.C. Schrotter (Membrane R&D Director of Water Research Center VEOLIA Environment), Dr. J. Pridal (General Manager MIKROPUR), Dr. N. Gaeta (R&D New Products Manager GVS): monitor the coherent evolution of the EUDIME with respect to expectations from Industry; reinforce professional outcomes of candidates; explore possibility of financial support. The head of the Committee is elected by its members for a period of 3 years.

ADMISSION AND EXAMINATION COMMITTEE (A&EC): is responsible for enrolment procedures and annual evaluation of the activities of doctoral candidates. It is composed of 1 staff member per partner University and 1 member per Associate Industrial Partner. The head of the Committee is elected by its members for a period of 3 years.

QUALITY COMMITTEE: is in charge of *evaluation and monitoring of the quality* of the EUDIME Program. It organises and analyses the internal evaluation procedures carried out by the *local Education-Quality Assurance Offices* present in each partner University, implement *candidates feed-back evaluation systems*, interfaces with the External Evaluation Committee (B.5.4), assesses the partnership efficiency and evaluates the attractiveness of the programme. It communicates back to the Executive Board in order to improve administrative and scientific quality of the programme and to define strategic developments in terms of future research trends and employment opportunities. It is constituted by 1 staff member for each partner University, 2 elected doctoral candidates' representatives, the President of the European Membrane Society (EMS), the Executive Director of the European Membrane House (EMH), and 1 member per Associate Industrial Partner. The head of the Committee is elected by its members for a period of 3 years.

Draft of a detailed cooperation agreement covering the academic, scientific and administrative aspects is provided in Annex 11.

B.5.2 At institutional level, Universities of the EUDIME Consortium clearly recognize the strategic value of this program: all letters of endorsement, signed by Rectors, expressly assure "*all possible efforts to ensure the proper implementation of the programme and its SUSTAINABILITY and continuity beyond Community funding*". In concrete, EUDIME will benefit for partitioning of grants received from Ministry of Education or from Local Governments on a fair basis with respect to existing Doctorate programmes.
The Consortium development plan will include the possibility, in the next future, to:

- enlarge the number of full partner Universities (at present: 6) to associate partners UNL, UNIZAR and RWTH Aachen after they will complete the recognition process of the doctoral degree awarded, thus exploiting their well recognized competences and excellence in biomedical and biotechnological applications of membranes in the development of innovative nanostructured membrane materials;
- extend the number of members of the EUDIME Industrial Club of Interest, with benefits in terms of financial support to the programme and improvement of the carrier perspectives and professional outcomes of doctoral candidates.

The EUDIME Proposal has been implemented not only for interest of partners Universities (to modify their existing doctoral courses through the development of a joint and prestigious curriculum), but also for the interest of several Industrial Companies active in the expanding market of membrane technology, and of a number of HEIs and Society, especially from Third Countries, that will benefit of a new generation of researchers with excellent qualification in membrane engineering and able to face some of the most critical challenges of this millennium: energy, water, environment, food, health. *15 Letters of Support from Associations and HEI, and confirm the high expectations for EUDIME Programme*. Coherently, all these organizations are expected to play an active role in sustaining – also financially - the EUDIME Program, so making it long-lasting and operative on similar bases beyond the initial EC funding; in particular:

- 12 Industrial Companies have declared their strong support to EUDIME, some of them confirming concrete possibilities of financial contribution to the initiative;
- the European Membrane Society will partially support the mobility of doctoral candidates, and in particular for what concerns their participation to Summer Schools;

- among supporting Institutions, the Middle East Research Desalination Centre (MEDRC) explicitly mention the possibility to provide scholarships to students from MENA countries; many other Associations offered their support to sustain mobility of candidates.

The enrolment projections (analytically depicted in Annex 7) reflect this concrete position. Throughout the first 5 editions of the EUDIME program, each of the 6 Universities involved are expected to receive 5 doctoral candidates supported by individual Erasmus Mundus fellowships and, at minimum, 7 doctoral candidates self-financing or supported by extra-grants. The sustainability of the Doctorate will be also improved by connecting it to the Erasmus Mundus Master in Membrane Engineering EM3E (submitted in the same 2010 call), so creating an unique opportunity to develop a very attractive joint curriculum in the field of membrane engineering.

B.5.3 All the partners of EUDIME Consortium have traditionally developed a considerable attitude in attracting EU funds; only referring to the most recent EU granted projects RESTRICTED to the *educational field of membrane engineering*, we mention:

- IMeTI - Implementation of Membrane Technology to Industry (FP7 - Marie Curie Actions –IAPP)
- NEMOPUR -New Molecular Purification Technologies For Pharmaceutical Production (FP7 - Marie Curie Actions – ITN)
- NANO-HOST: Homogeneous Supported Catalyst Technologies (FP7- Marie Curie Initial Training Networks ITN)
- NANOMEMCOURSE:Training courses on Nanostructured Materials for Advanced Membrane Processes (FP6 - Marie Curie Actions –Intra-European Fellowships)

EUDIME Consortium will explore, with concrete probability of success, all opportunities offered by Marie Curie actions or similar. Moreover, European students attending the Erasmus Mundus programme are entitled to an Erasmus mobility grant according to standard Erasmus rules; candidates will be encouraged and assisted to apply for financial support to International Organizations such as ESF, Eurodesk database, Unesco, Fors Foundation, Gates Foundation, Nature, etc. In addition, partners will collaboratively develop joint R&D projects in order to drive additional financial sources towards the programme.
With the aim to make affordable and attractive the EUDIME Program, all Universities of the Consortium will provide a partial support to participation costs to doctoral candidates non-granted by Erasmus Mundus fellowships, that will be decreased from 7,200 Euros/year (the actual cost for the Consortium as detailed in B.3.4) down to 1,000 Euros/year. This cost will include insurance coverage for accidents occurred during training/research activities.

B.5.4 INTERNAL EVALUATION[14, 15] will be assessed in a number of inter-dependent actions.
All Partner Universities have signed the Erasmus Charter, assure the existence of learning Agreements and of Transcript of Records documents, regular and formal monitor the quality of all their internal Doctoral programmes through their local Education-Quality Assurance Offices, that commend evaluation procedures (including *financial Audit*) to national and international quality assurance bodies. In particular:

- ITALY: CNSU (Comitato Nazionale per la Valutazione del Sistema Universitario) www.cnvsu.it
- FRANCE: AERES (Agence d'Evalutation de la Recherce et de l'Einsegnement Superior) www.aeres-evaluation.fr
- NETHERLANDS AND BELGIUM: NVAO (Netherlands-Flemish Accreditation Organization; Nederlands-Vlaamse Accreditatieorganisatie) www.nvao.net
- CZECH REPUBLIC: CAI (Cesky Institut pro Akreditaci) www.cai.cz

Sharing across the Consortium the experience of formal review processes at Institution level is expected to contribute to good practice.
In addition, with the aim to define A SPECIFIC, INTEGRATED AND AGREED APPROACH for quality insurance, the EUDIME Consortium specifically set a Quality Committee (B.5.1), in charge to monitor the quality of training/research activities, to assesses the partnership efficiency and progress towards the goals of the program, to evaluates the attractiveness of the programme. The Quality Committee (QC) interfaces with local Education-Quality Assurance Offices (scheme in B.5.1). Internal evaluation aims to emphasise the role of doctoral candidates as main beneficiaries of the Programme: in order to encourage PhD students to participate to review process, 2 elected representatives of doctoral candidates will be members of the QC and of the Program Committee. Representatives of Associated Industries and Institutions are QC members (B.5.1). The level of satisfaction of CANDIDATES AND STAFF will be assessed through the implementation of regular feed-back evaluation systems (questionnaires to be filled: 1) at the beginning of the Doctoral Programme; 2) at the end of each teaching/training module; 3) at the end of each mobility period; 4) at the end

[14] Standards and Guidelines for Quality Assurance in the European Higher Education Area, European Association for Quality Assurance in Higher Education, 2005, Helsinki
[15] RECOMMENDATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL, 15 February 2006 (2006/143/EC)

of each year of activity) concerning the perceived quality of mentoring and coaching, training & supervision actions, appropriateness of research and other facilities, and of the services offered by the universities. Questionnaires will be discussed by the Quality Committee, in charge to provide appropriate and rapid feedback to students.
Some relevant quantitative indicators, milestones and targets used to monitor the successful implementation of a EUDIME Edition are listed below:

MILESTONE	INDICATOR	TARGET	CORRECTIVE ACTIONS
Short-term assessment (month 6)	Application received/places offered	>1.5	Improve promotion activities
	Ratio of Male/Female candidates	=1±0.1	Strengthen gender balance measures
	Ratio of total granted places/Erasmus Mundus fellowships	>2.4	Improve funds catch strategies
Mid-term assessment (month 30)	Overall external conference presentations	>30	Improve mentoring/coaching activities, organize specific courses on bibliographic research, writing scientific papers, preparing oral presentations...
	Overall journal publications submitted with joint (across partners) inventors/edition	>20	
	Overall patents submitted with joint (across partners) inventors	>5	Strengthen collaboration with partner research groups; move audaciously research activities towards originality.
Long-term assessment (2 years after end of edition)	Successful candidates employed by Industries of the EUDIME Club of Interest	>30%	Identify causes: i) low visibility of the program: improve promotion and dissemination actions; ii) unsatisfactory competences of PhD: strengthen appropriateness of training activities.

An *annual* Progress Report will provide a clear establishment of the current situation of the EUDIME Consortium (the final output at the end of each edition will be a public deliverable put on the EUDIME website). The report, jointly elaborated by the Executive Board by the Management Board, will include:

- an extensive assessment of the activities implemented, results obtained, any delayed work, status of the mobility, financial situation, progresses towards the full recognition of a joint degree, and future actions;
- a consolidated overview of the budgetary situation of the programme.

EXTERNAL EVALUATION will be assessed by the "External Evaluation Committee", composed by 3 academics with well recognized reputation and 2 industrial representatives; for the FIRST EDITION: Prof. Kang Li (Imperial College – UK), Prof. Andre Nagy (Director of Veszprem University – Hungary), Prof. K-H. Lee (Director of Strategy and Cooperation Division of the Korea Research Institute of Chemical Technology), Dr. T. D. Phillips (SASOL Technology – South Africa), Dr. Didier Noel (Research Division Electricité de France- France).
External Evaluation Committee gathers 2 times per year in videoconference; a *quality report* will be provided to QC at the end of each year of activity.

ANNEXES

ANNEX 1: Letters of endorsement (full Partners)
ANNEX 2: Prof of recognition (full Partners)
ANNEX 3: CVs of local coordinators (full Partners)
ANNEX 4: Letters of intent from Associate Partners
ANNEX 5: Letters of support from other Industrial Companies
ANNEX 6: Letter of support from other Institutions
ANNEX 7: Enrolment projection
ANNEX 8: Scientific/Technical/Management Modules
ANNEX 9: Doctoral Candidate Agreement
ANNEX 10: Diploma Supplement
ANNEX 11: Cooperation Agreement

ANNEX 1: Letters of Endorsement (full Partners)

Unical	1.1
UM2	1.2
UPS	1.3
K.U.LEUVEN	1.4
ICTP	1.5
UTWENTE	1.6

UNIVERSITÀ DELLA CALABRIA

Il Rettore

LETTER OF ENDORSEMENT

Project title: ***Erasmus Mundus Doctorate in Membrane Engineering / EUDIME***

Our organisation:

Full Name:	**UNIVERSITY OF CALABRIA**
Address:	Rettorato, via P. Bucci
Postcode:	87036
Town/city:	Arcavacata di Rende (CS)
Country:	Italy
Tel.:	+39 0984 493894/493932
Fax:	+39 0984 493896

I, the undersigned Professor **Giovanni Latorre, Rector of the University of Calabria (Italy)**, confirm that I have read and approved the proposal, the annexes and the breakdown of work among partners, as submitted in the application form addressed to the Education, Audiovisual and Culture Executive Agency. The project is coordinated by **Enrico Drioli**, full professor at University of Calabria.
We confirm our intention to carry out the tasks described, and that the key staff involved in the project, as presented in the application form, will be available to fulfil the role outlined. We undertake to comply with the principles of good partnership practice. *Our Institution will make all possible efforts to ensure the proper implementation of the programme and its sustainability and continuity beyond Community funding.*

I declare agreement to:

(a) operating as **Applicant/Coordinating Organisation** to carry out the project identified above;

(b) undertaking the roles stipulated in the application form.

Signature and stamp:

UNIVERSITÀ DELLA CALABRIA

IL RETTORE
(Prof. Giovanni LATORRE)

Name: **Giovanni Latorre**
Position: **Rector**
Place and Date: **February 10th, 2010**

CAMPUS DI ARCAVACATA

UNIVERSITÉ MONTPELLIER 2
SCIENCES ET TECHNIQUES

LETTER OF ENDORSEMENT

Project title: ***Erasmus Mundus Doctorate in Membrane Engineering / EUDIME***

Our organisation:

Full Name:	**Université Montpellier 2 Sciences et Technique**
Address:	Place Eugène Bataillon
Postcode:	34 095
Town/city:	Montpellier
Country:	FRANCE
Tel:	0033/ 4 67 14 30 15
Fax:	0033/ 4 67 14 48 06

I, the undersigned Professor **Danièle HERIN, President of Montpellier 2 University Sciences and Technology**, confirm that I have read and approved the proposal, the annexes and the breakdown of work among partners, as submitted in the application form addressed to the Education, Audiovisual and Culture Executive Agency.
The project is coordinated by Enrico Drioli, full professor at University of Calabria.
We confirm our intention to carry out the tasks described, and that the key staff involved in the project, as presented in the application form, will be available to fulfil the role outlined. We undertake to comply with the principles of good partnership practice. *Our institution will make all possible efforts to ensure the proper implementation of the programme and its sustainability and continuity beyond Community funding.*

I declare agreement to:

(a) operating as a Partner Organization with University of Calabria (Italy) to carry out the project identified above;

(b) undertaking the roles stipulated in the application form.

Name: Danièle HERIN

Position: President

Place and date: Montpellier, 03/03/2010

Signature and stamp

Université Paul Sabatier
TOULOUSE III

LETTER OF ENDORSEMENT

Project title: ***Erasmus Mundus Doctorate in Membrane Engineering / EUDIME***

Our organisation:

Full Name:	Université Paul Sabatier
Address:	118 Route de Narbonne
Postcode:	31062
Town/city:	Toulouse Cedex 9
Country:	France
Tel.:	+33 (0)5 61 55 66 11
Fax:	+33 (0)5 61 55 64 70

I, the undersigned **Professor Gilles FOURTANIER, President of Paul Sabatier University**, confirm that I have read and approved the proposal, the annexes and the breakdown of work among partners, as submitted in the application form addressed to the Education, Audiovisual and Culture Executive Agency. The project is coordinated by Enrico Drioli, full professor at University of Calabria.
We confirm our intention to carry out the tasks described, and that the key staff involved in the project, as presented in the application form, will be available to fulfil the role outlined. We undertake to comply with the principles of good partnership practice. *Our Institution will make all possible efforts to ensure the proper implementation of the programme and its sustainability and continuity beyond Community funding.*

I declare agreement to:

(a) operating as a Partner Organization with University of Calabria (Italy) to carry out the project identified above;

(b) undertaking the roles stipulated in the application form.

Name: Professor Gilles Fourtanier
Position: President

Place and date: Toulouse,
Le 01/03/2010

Signature and stamp

UNIVERSITE PAUL SABATIER

Le Président

Gilles FOURTANIER

118 route de Narbonne - F-31062 TOULOUSE cedex 9 Tel. +33 (0)5 61 55 66 11 Fax. +33 (0)5 61 55 64 70

RECTOR'S OFFICES
NAAMSESTRAAT 22 BUS 5000
BE-3000 LEUVEN

KATHOLIEKE UNIVERSITEIT LEUVEN

LETTER OF ENDORSEMENT

Project title: ***Erasmus Mundus Doctorate in Membrane Engineering / EUDIME***

Our organisation:

Full Name:	**Katholieke Universiteit Leuven**
Address:	Naamsestraat 22
Postcode:	3000
Town/city:	Leuven
Country:	Belgium
Tel:	+32 16 32 40 68
Fax:	+32 16 32 41 96

I the undersigned Professor **Mark Waer**, **Rector of K.U.Leuven**, confirm that I have read and approved the proposal, the annexes and the breakdown of work among partners, **as** submitted in the application form addressed to the Education, Audiovisual and Culture Executive Agency.
The project is coordinated by Enrico Drioli, full professor at University of Calabria.
We confirm our intention to carry out the tasks described, and that the key staff involved in the project, as presented in the application form, will be available to fulfil the role outlined. We undertake to comply with the principles of good partnership practice. *Our Institution will make all possible efforts to ensure the proper implementation of the programme and its sustainability and continuity beyond Community funding.*

I declare agreement to:

(a) operating as a Partner Organization with University of Calabria (Italy) to carry out the project identified above;

(b) undertaking the roles stipulated in the application form

Name: Prof. Mark Waer
Position: Rector
Place and date: Leuven, 11/04/2006

PROF. MARK WAER
TEL. +32 16 32 40 68 FAX +32 16 32 41 96
Mark.Waer@rec.kuleuven.be
www.kuleuven.be

ASSOCIATIE K.U.LEUVEN

INSTITUTE OF CHEMICAL TECHNOLOGY, PRAGUE

Ref. Nr. 10/961/0081

LETTER OF ENDORSEMENT

Project title: ***Erasmus Mundus Doctorate in Membrane Engineering / EUDIME***

Our organisation:

Full Name:	**Institute of Chemical Technology, Prague**
Address:	Technická 5
Postcode:	16628
Town/city:	Prague 6
Country:	Czech Republic
Tel.:	+420220443896
Fax:	+420224311082

I, the undersigned Associate Professor Josef Koubek, **Rector of Institute of Chemical Technology, Prague,** confirm that I have read and approved the proposal, the annexes and the breakdown of work among partners, as submitted in the application form addressed to the Education, Audiovisual and Culture Executive Agency.
The project is coordinated by Enrico Drioli, full professor at University of Calabria.
We confirm our intention to carry out the tasks described, and that the key staff involved in the project, as presented in the application form, will be available to fulfil the role outlined. We undertake to comply with the principles of good partnership practice. *Our institution will make all possible efforts to ensure the proper implementation of the programme and its sustainability and continuity beyond Community funding.*

I declare agreement to:

(a) operating as a Partner Organization with University of Calabria (Italy) to carry out the project identified above;

(b) undertaking the roles stipulated in the application form.

Name: Assoc. Prof. Josef Koubek, MSc. PhD. Position: Rector	Signature and stamp
Place and date: Prague, March, 1st 2010	VYSOKÁ ŠKOLA CHEMICKO-TECHNOLOGICKÁ V PRAZE Technická 5, 166 28 Praha 6

Phone: +420 220 444 144, fax: +420 220 445 018, e-mail: josef.koubek@vscht.cz, www.vscht.cz

Institute of Chemical Technology, Prague, public university established by Act No. [illegible], in the wording of subsequent regulations, based at Technická 5, 166 28 Prague 6 - Dejvice, Czech Republic, IČ: [illegible], DIČ: [illegible], bank account: ČSOB, [illegible]

UNIVERSITY OF TWENTE.

P.O. Box 217
7500 AE Ensc
The Netherlan

www.utwente.

Institute on Membrane Technology ITM-CNR
University of Calabria
Contact person's name: Prof. Enrico Drioli
Address: via P. Bucci CUBO 17/C
Postcode: 87036
Town/city: Arcavacata di Rende (CS)
Country: ITALY

your reference
our reference: S&C/389.012/rv
date: March 3, 2010

phone: +31 53 489 2202
fax: +31 53 489 4611
e-mail: H.J.M.Bouwmeester@tnw.utwente.nl

LETTER OF ENDORSEMENT

Project title: ***Erasmus Mundus Doctorate in Membrane Engineering / EUDIME***

Our organisation:
Full Name: University of Twente
Address: Postbus 217
Postcode: 7500 AE
Town/city: Enschede
Country: The Netherlands
Tel: + 31 53 489 5687
Fax: + 31 53 4894898
President/Rector: Dr. A.H. Flierman
Contact person's name: Dr. H.J.M. Bouwmeester

I, the undersigned, dr. A.H. Flierman, President of the Executive Board of the University of Twente confirm that I have read and approved the proposal, the annexes and the breakdown of work among partners, as submitted in the application form addressed to the Education, Audiovisual and Culture Executive Agency.
The project is coordinated by Enrico Drioli, full professor at University of Calabria.
We confirm our intention to carry out the tasks described, and that the key staff involved in the project, as presented in the application form, will be available to fulfil the role outlined. We undertake to comply with the principles of good partnership practice. *Our institution will make all possible efforts to ensure the proper implementation of the programme and its sustainability and continuity beyond Community funding.*

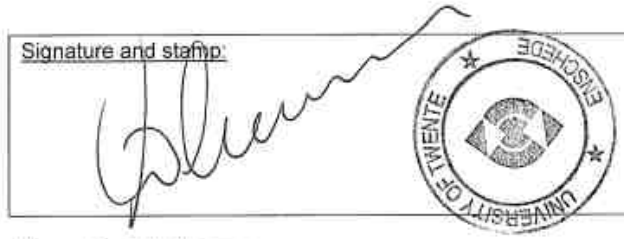
UNIVERSITY OF TWENTE.

I declare agreement to:

(a) operating as a Partner Organization with University of Calabria (Italy) to carry out the project identified above;

(b) undertaking the roles stipulated in the application form.

Signature and stamp:



Name: Dr. A.H. Flierman
Position: President of the Executive Board
Place and Date: Enschede, March 3, 2010

ANNEX 2: Proof of recognition (full Partners)

Unical	2.1
UM2	2.4
UPS	2.5
K.U.LEUVEN	2.6
ICTP	2.7
UTWENTE	2.8

UNIVERSITÀ
DELLA CALABRIA

Verbale n. 5

SENATO ACCADEMICO
Adunanza Ordinaria
del 17 Febbraio 2010

L'anno 2010, il giorno 17 del mese di febbraio alle ore 9,30 nei locali del Rettorato, si riunisce il Senato Accademico in seduta ordinaria.
Sono presenti:
il Prof. Giovanni **LATORRE,** Rettore; il Prof. Pietro **BRANDMAYR,** Prorettore Delegato al Centro Residenziale; il Prof. Franco **RUBINO,** Preside della Facoltà di Economia; il Prof. Raffaele **PERRELLI**, Preside della Facoltà di Lettere e Filosofia; il Prof. Gino Mirocle **CRISCI,** Preside della Facoltà di Scienze Matematiche Fisiche e Naturali; il Prof. Sebastiano **ANDÒ**, Preside della Facoltà di Farmacia; il Prof. Guerino **D'IGNAZIO**, Preside della Facoltà di Scienze Politiche; il Prof. Paolo **VELTRI,** Preside della Facoltà di Ingegneria; il Prof. Giuseppe **FREGA,** Direttore del Dipartimento di Difesa del Suolo; il Prof. Marcello **MAGGIOLINI,** Direttore del Dipartimento Farmaco-Biologico; il Prof. Agostino **TARSITANO,** Direttore Dipartimento di Economia e Statistica; il Prof. Giuseppe **ROMA**, Direttore Dipartimento di Archeologia e Storia delle Arti; il Prof. Pierluigi **VELTRI**, Direttore Dipartimento di Fisica; la Prof.ssa Beatrice **BITONTI,** Direttore Dipartimento di Ecologia; il Sig. Salvatore **RICCHIO**, Rappresentante del Personale tecnico-amministrativo; la Sig.ra Laura **PANTUSA,** Rappresentante del Personale tecnico-amministrativo; il Sig. Eugeniomaria **GAGLIARDI**, Rappresentante degli Studenti; il Sig. Vincenzo **SCARPELLI,** Rappresentante degli Studenti; il Sig. Francesco **GAUDIO,** Rappresentante degli Studenti; la Dott.ssa Bruna **ADAMO,** Direttore Amministrativo, Segretario.

Sono assenti giustificati:
Il Prof. Lucio **GRANDINETTI,** Pro-Rettore.

Il PRESIDENTE, constatata la presenza in numero legale dei componenti, a norma di quanto stabilito dall'art. 12 comma 4 del Regolamento Generale d'Ateneo, aggiornato con D.R. 728 del 17.03.2008, dichiara aperta la seduta.

Gli argomenti all'ordine del giorno sono i seguenti:

1	Comunicazioni
2	Approvazione verbali sedute del 23 Novembre – del 27 Novembre

Segue verbale n. 5 del 17 febbraio 2010

	- del 3 Dicembre 2009 Distribuzione verbale 21 dicembre 2009
3.	Ripartizione risorse destinate alla didattica e alla ricerca e.f. 2010
4.	Proposte Co.Co.P. – Criteri di ripartizione risorse destinate alla didattica e alla ricerca e.f. 2010
5.	Proposta modifica art. 4 Regolamento Scuole di Dottorato Unical
6.	Richiesta di attivazione del Centro Interdipartimentale di ricerca "Food Science and Engineering"
7.	Regolamento per il conferimento di incarichi retribuiti
8.	Regolamenti didattici dei corsi di studio – Facoltà di Scienze Matematiche Fisiche e Naturali
9.	Proposta di istituzione del Corso di Dottorato Internazionale in "Membrane Engineering"
10.	Dottorati di ricerca: proposte di convenzioni
11.	Questioni didattiche: - Integrazione borsa di studio (Premio di Laurea) A.A. 2008/2009 Facoltà di Farmacia e Scienze della Nutrizione e della Salute
12.	Formulazione rosa di nominativi per la composizione della "Commissione per la valorizzazione dei risultati della Ricerca e per il trasferimento tecnologico"
13.	Ratifica decreti
14.	Varie ed eventuali

OMISSIS

9.	**Proposta di istituzione del Corso di Dottorato Internazionale in "Membrane Engineering"**

Il Rettore riferisce al Senato Accademico, che il Prof. Enrico Drioli ha fatto pervenire la nuova proposta di istituzione, nell'ambito dell'Erasmus Mundus Joint Doctorate, di un corso di Dottorato in "Membrane Engineering". La precedente proposta, inoltrata all'Ufficio EACEA dell'UE, pur non essendo stata selezionata per il finanziamento per l'anno 2009, si era collocata nella categoria C (con punteggio superiore a 75/100, che includeva il 20.9% del totale dei progetti presentati), pertanto tutti i partner proponenti hanno deciso di re-inoltrare la proposta suddetta. Rispetto alla versione precedentemente discussa e approvata dal Senato Accademico, nell'adunanza del 28.04.2009, è stato inserito nel consorzio un ulteriore partner (confermando così l'interesse nell'azione intrapresa): l'Università di Aachen (Germania).
Il Rettore rammenta che, sulla istituzione del corso di Dottorato in "Membrane Engineering" si erano espressi favorevolmente il Collegio dei Docenti del Dottorato di Ricerca in Ingegneria Chimica e dei Materiali, in data 24.3.2009 e il Consiglio di Dipartimento di Ingegneria Chimica e dei Materiali, in data 25.03.2009.

Il Corso di Dottorato multinazionale, continua il Rettore, è coordinato dal Prof. Enrico Drioli e vede come partecipanti 9 Università europee:

2.2

Il Senato Accademico dopo ampia ed approfondita discussione, all'unanimità approva la proposta di istituzione del Corso di Dottorato Internazionale in "Membrane Engineering".

10. Dottorati di ricerca: proposte di convenzioni

10.1) Convenzione di dottorato di ricerca in "Statistica ed applicazioni" XXV ciclo - sede amministrativa Università degli Studi di Milano - Bicocca.

Il Rettore sottopone all'esame del Senato Accademico, per l'approvazione, la convenzione da stipulare tra l'Università della Calabria e l'Università degli Studi di Milano - Bicocca, per l'attivazione del corso di dottorato consortile in "Statistica ed applicazioni" XXV ciclo - sede amministrativa Università degli Studi di Milano - Bicocca (la cui documentazione è conservata dagli uffici).
Il Corso ha la durata di tre anni accademici. Nella predetta convenzione per il XXV ciclo non è previsto alcun finanziamento di borsa di studio da parte dell'Unical. Il referente responsabile è il Prof. Domma Filippo.
Il Rettore, inoltre, informa il Senato che il Consiglio di Dipartimento del Dipartimento di Economia e Statistica, nella seduta del 12.05.2009, ha espresso parere favorevole in merito all'adesione al corso di dottorato suddetto.
Il Rettore, infine, informa il Senato che il Nucleo di Valutazione, nella seduta del 28.09.2009, ha espresso parere positivo alla domanda di adesione al corso di dottorato di ricerca in "Statistica ed Applicazioni" per il XXV ciclo.

Il Senato Accademico, dopo ampio ed approfondito dibattito all'unanimità, esprime parere favorevole in merito alla richiesta di stipula di Convenzione tra l'Università della Calabria e l'Università degli Studi di Milano – Bicocca, per l'attivazione del corso di dottorato consortile in "Statistica ed applicazioni" XXV ciclo – sede amministrativa Università degli Studi di Milano – Bicocca.

10.2) Convenzione di dottorato di ricerca in "Marketing e gestione delle imprese" XXV ciclo - sede amministrativa Università degli Studi di Milano - Bicocca.

Il Rettore sottopone all'esame del Senato Accademico, per l'approvazione, la convenzione da stipulare tra l'Università della Calabria e l'Università degli Studi di Milano - Bicocca, per l'attivazione del corso di dottorato consortile in "Marketing e gestione delle imprese" XXV ciclo - sede amministrativa Università degli Studi di Milano - Bicocca (la cui documentazione è conservata dagli uffici)

2.3

PROOF OF DIPLOMA ACCREDITATION

Project title : *Erasmus Mundus Doctorate in Membrane Engineering / EUDIME*

I, the undersigned Daniele HERIN President of the following institution l'Université Montpellier 2 Sciences et Technique certify that the final degree awarded to the Erasmus Mundus students by my institution at the end of their Erasmus Mundus Doctorate program, which title is

« Erasmus Mundus Doctorate in Membrane Engineering »

will be a multiple degree (degrees issued by institutions of more than 2 different countries)

Its eligibility in my country derives from our Doctorate degree (or degree giving rank of Doctorate) which title is

"Doctorate in chemical sciences" (Doctorat en sciences chimiques)

Duration: 3 years

Date end of accreditation: September 2014

Signed at Montpellier on 13th April 2010

Name, Function: Daniele HERIN, President
(Signature and Seal of the Institution)

Université Paul Sabatier
TOULOUSE III

I, the undersigned **Gilles Fourtanier**, President of the following institution **Université Paul Sabatier** certify that the final degree awarded to the Erasmus Mundus students by my institution at the end of their Erasmus Mundus Master Doctorate program, which title is:

« **Erasmus Mundus Doctorate in Membrane Engineering** »

will be a multiple degree (degrees issued by institutions of more than 2 different countries).

Its eligibility in my country derives from our Master degree (or degree giving rank of Master) which title is:

"Doctorate in Processes and Environmental engineering"
(Doctorat en genie des procédés et de l'environnement)

Duration 3 years

Date end of accreditation: September 2014

Signed at Toulouse on, the 20th of April 2010 *(date)*

Name, Function: Gilles FOURTANIER, President
(Signature and Seal of the institution)

P.S. President

Gilles [illegible] ER

UNIVERSITE PAUL SABATIER

118 route de Narbonne F-31062 TOULOUSE cedex 9 - Tél. +33 (0) 5 61 55 66 11 - Fax +33 (0) 5 61 55 66 10

RECTOR'S OFFICE
[illegible]
[illegible] LEUVEN

KATHOLIEKE
UNIVERSITEIT
LEUVEN

OUR REF.
YOUR REF.
LEUVEN 22 April 2010

PROOF OF DIPLOMA ACCREDITATION

Project title : Erasmus Mundus Doctorate in Membrane Engineering / EUDIME

I, the undersigned, Prof. Mark Waer, Rector of the Katholieke Universiteit Leuven, certify that the final degree awarded to the Erasmus Mundus doctoral students by my institution at the end of their Erasmus Mundus Doctorate program, which title is :

"Erasmus Mundus Doctorate in Membrane Engineering"

will be a joint degree as defined in the proposal of the consortium.

Its eligibility in my country derives from our accredited Doctorate degree which title is :

"Doctorate in Applied Biological Sciences"

Prof. Mark Waer
Rector Katholieke Universiteit Leuven

PROF. MARK WAER
TEL. +32 16 32 [illegible] FAX +32 16 32 [illegible]
[illegible]
www.kuleuven.be

2.6

2.6

INSTITUTE OF CHEMICAL TECHNOLOGY, PRAGUE

Ref. Nr. 10/963/0106

I, the undersigned Josef Koubek, Rector of the Institute of Chemical Technology, Prague, certify that the final degree awarded to the Erasmus Mundus students by my institution at the end of their Erasmus Mundus Doctorate study program, which title is:

« Erasmus Mundus Doctorate in Membrane Engineering »

will be a multiple degree (degrees issued by institutions of more than 2 different countries).

Its eligibility in my country derives from our Doctorate degree (or degree giving rank of Doctorate) which title is:

Doktor filozofie – Ph.D. Philosophiae Doctor – Ph.D.

Domain: Chemistry and Chemical Technologies
Mention: Inorganic Technology

Date and reference of formal and legal approval of the degree:

17. 2. 2009, MŠMT č.j. 3088/2009 - 30/1

Duration: 4 years

Signed at Prague, 25. 3. 2010

Assoc. Prof. Josef Koubek, MSc. PhD.
Rector

VYSOKÁ ŠKOLA
CHEMICKO-TECHNOLOGICKÁ V PRAZE
Technická 5, 166 28 Praha 6
IČO

Phone: +420 220 444 144, fax: +420 220 445 018, e-mail: josef.koubek@vscht.cz, www.vscht.cz

2.7

13-04-2010: Ondersteunende informatie voor actie 1-aanvragen

http://www.nuffic.nl/nederlandse-organisaties/services/beursprogrammas/erasmus-mundus/nieuwsberichten/13-4-2010-ondersteunende-informatie-voor-actie-1-aanvragen

13 Apr 2010

De deadline van actie 1-aanvragen voor Erasmus Mundus programma's is 30 april 2010. De aanvragen dienen via een elektronisch formulier te worden ingediend. In een bijbehorend, apart formulier met de titel 'Consortium responses on award criteria' wordt verzocht een toelichting te geven op de master- of doctoraatsprogramma's. Het gaat daarbij onder andere om de erkenning van diploma's in de landen die betrokken zijn bij het master- of doctoraatsprogramma. Om u te helpen dit formulier in te vullen, zijn hieronder voor twee specifieke vragen, A 2.2 (formulier voor de masterprogramma's) en B 3.6 (formulier voor de doctoraatsprogramma's), Engelstalige antwoorden geformuleerd voor de Nederlandse situatie.

Een beschrijving van de aanvraagprocedure, het elektronische formulier en de benodigde aanvullende documenten is beschikbaar op de Erasmus Mundus-website.

Erasmus Mundus masters-formulier

Het is heel belangrijk dat de correcte naam van het diploma dat is uitgegeven door de Nederlandse instelling wordt vermeld. Het gaat om de naam van het programma zoals die is opgenomen in het CROHO-register, met daarbij de datum van de accreditatie.

Onderstaande Engelstalige informatie kunt u invullen bij het antwoord op vraag A 2.2 van het formulier Consortium responses on award criteria. Dit formulier staat op de Erasmus Mundus Call for proposals-website onder eForm application > Step 3 > Consortium responses on award criteria > Erasmus Mundus Masters Courses.

Accreditation
An institution in the Netherlands can award a degree to anyone who successfully completes an accredited study programme. The Accreditation Organization of the Netherlands and Flanders (NVAO) is responsible for the accreditation of academic higher education (wo) and higher professional education (hbo) study programmes. The organization's tasks arise from the Higher Education and Research Act (WHW).

Accreditation takes place at the request of the institutions, based on assessment reports produced by review and assessment boards. Accredited programmes are registered in the Central Register of Higher Education Study Programmes (CROHO), which contains an overview of all accredited study programmes in the Netherlands.

Joint degrees
On 2 February 2010, the Dutch Upper House accepted a major proposal to amend the WHW. The change in legislation is expected to be introduced during the course of 2010, and means that Dutch institutions will be able to offer joint degree programmes at both master's and doctorate level. Under the new law, it will also be possible to include English names of study programmes in the CROHO.

The programmes for joint master's degrees are accredited based on the joint study programme; in other words, the part of the programme offered by the foreign partner is also assessed. The Dutch institution is responsible for the accreditation process.

Programme length and credits
The new legislation will also introduce the option of a different programme length. A joint degree programme that is partly spent abroad often takes longer than a standard master's degree programme in the Netherlands. Moreover, a master's degree programme abroad often lasts for more than one year.

In the current situation, students can only obtain financial assistance for a 60-credit or 120-credit master's degree programme. Under the new law, they will also be able to access student grants and loans for 90-credit international joint degree programmes (joint programmes with one or more foreign institutions).

Erasmus Mundus master's programmes
Up until now, it has not been possible to award joint degrees in the Netherlands. A double degree was therefore often awarded within the context of the Erasmus Mundus programme: one degree by the Dutch institution, and one degree by the other institution where the student attended the programme. While this will still be an option, it will also be possible to award joint degrees as of 2010.

The NVAO is working to develop an accreditation protocol that will also apply to existing master's programmes within Erasmus Mundus. For existing study programmes, it will be examined on a case by case basis to what extent the joint programme has already been assessed during a previous accreditation process. The definitive version of this protocol is expected to be adopted during the course of 2010.

Erasmus Mundus doctorates-formulier

De Nederlandse instelling/onderzoeksinstituut moet bevoegd zijn een promotiegraad af te geven. Het College voor Promoties moet zijn akkoord hebben gegeven voor het Erasmus Mundus doctoraatsprogramma. Dit moet blijken uit een letter of intent of gelijksoortig document ondertekend door het college van bestuur van de Nederlandse instelling.

Onderstaande Engelstalige informatie kunt u invullen bij het antwoord op vraag B 3.6 van het formulier Consortium responses on award criteria. Dit formulier staat op de Erasmus Mundus Call for proposals-website onder eForm application > Step 3 > Consortium responses on award criteria.

Joint degrees
On 2 February 2010, the Dutch Upper House accepted a major proposal to amend the WHW. The change in legislation is expected to be introduced during the course of 2010, and means that Dutch institutions will be able to offer joint degree programmes at both master's and doctorate level.

Doctorate programmes
Dutch institutions that want to award a joint doctorate degree are bound by the applicable regulations, which are drawn up by the Doctorate Board of the relevant Dutch university. Unlike many English-speaking countries, the Netherlands does not have a more or less fixed doctorate programme that qualifies for accreditation. The Doctorate Board of a university has the power to confer doctorates.

ANNEX 3: CVs of local coordinators (full Partners)

CV of the EUDIME Co-ordinator and team leader at UNICAL

Enrico DRIOLI
Professor

Department of Chemical Engineering and Materials, University of Calabria

Via P. Bucci CUBO 45A
87030 Rende (CS) Italy

Tel: +39 0984 492039
Fax1: +39 0984 402103
Fax2: +39 0984 496655

e.drioli@unical.it
e.drioli@itm.cnr.it

- Professor of Chemistry and Electrochemistry at the School of Engineering of the University of Naples (since 1968).
- Full Professor at the School of Engineering of the University of Calabria (since 1981).
- Dean of the School of Engineering of the University of Calabria (1982-1985).
- Director of the Institute on Membranes and Chemical Reactors IRMERC-CNR of the National Research Council (since 1993).
- Director of the Institute on Membrane Technology (ITM) of CNR (2002-2008).

Doctorate Honoris Causa in Chemical Technology At University Paul sabatier of Toulouse (2009). Doctorate Honoris Causa in Chemistry and Chemical Technology from Russian Academy of Science (1992). Honorary Professor at the China Northwest University in Xi'an, Shaanxi, People's Republic of China (Sept. 1991). Honorary Member of the A. V. Topchiev Institute of Petrochemical Synthesis at the Russian Academy of Sciences, Moscow (since 1999). Guest Professor in the Environment and Safety Engineering Department at the Jiangsu Polytechnic University, China (since June 2005). International Cooperation Honor Award on September 2005 given by the Membrane Industry Association of China (MIAC) for his special dedication to the International Cooperation between China and Europe in the field of membrane and science technology.

- President of the European Society of Membrane Science and Technology (today European Membrane Society) (1982 - 1998).
- Honorary President of the European Membrane Society (since 1999).

Member of Executive Council of the European Federation of Chem. Engineering (1996 - 2004). Chairman of the Working Party on Membranes of the European Federation of Chemical Engineering (since 1985). Patron Member of the Indian Membrane Society Member of the Interim Board of Governors of the Middle East Desalination Research Center, Oman, Muscat (1994 - 1996). Member of the Advisor Board of the UNESCO Center on Membrane Science and Technology at the New South Wales University, Australia.
Member of the International Scientific Advisory Committee of the Grand Water Research Institute at Technion - Israel Institute of Technology, Israel (since 2004). Member and Moderator of the Research Advisory Council of the Middle East Desalination Research Center , Oman, Muscat (since May 1997). Member of the NATO/CCMS Pilot Study on "Clean Products and Processes" (Phase II) (2002-2007) […]
Author of more than 520 scientific papers and 18 patents in the field of Membrane Science and Technology.

CV of the team leader at UM2

André AYRAL
Professor

Institut Européen des Membranes (IEM/UMII)

Place Eugène Bataillon, CC047, 34095 – Montpellier, Cedex 5 - FRANCE

Tel: +33 (0)4 67149143
Fax.: +33 (0)4 67149119

andre.ayral@iemm.univ-montp2.fr

EDUCATION and POSITIONS

- Engineer in Materials Science and Technology from the Institute of the Engineer Sciencesof Montpellier (1983).
- Ph. D. in "dense media and materials" at the University Montpellier 2 (1988).
- Research engineer and assistant lecturer at the University Montpellier 2 (1988 - 1989) ;
- Research engineer at the French Nuclear Agency (1990-1991) ;
- Assistant professor at the High School of Chemistry of Montpellier (1992-2001);
- Professor at the University Montpellier 2 (since 2002).
- Deputy director of the Department of Chemistry, University Montpellier 2 (since 2006).
- Leader of a research team on ceramic and hybrid membranes in IEM (2004-2007).
- Deputy director of the research center: European Institute on Membranes of Montpellier(IEM) (since 2007).

RESEARCH TOPICS

Inorganic materials chemistry; Colloidal chemistry; Synthesis and characterization of oxide ceramics by the sol-gel route; Development of new inorganic and hybrid thin layers and membranes; Synthesis and characterization of nanostructured thin layers and membranes; Characterization of nanoporous thin layers using innovative techniques; Multifunctional membranes (separation and photocatalysis, separation and adsorption)

TEACHING

- Teaching of Material chemistry and Analytical Chemistry at the University Montpellier 2 (Bachelor and Master levels) and at the Graduate National Higher School of Chemistry of Montpellier (ENSCM).
- Head of the professional master « PROMAT -Physicochimie appliquée des Matériaux » at the University Montpellier 2 (A. Ayral, S. Roualdès).
- Head of the research master UM2 - ENSCM / CEA « Chimie Séparative, Matériaux et Procédés : application au cycle du combustible nucléaire » (CSMP) » and of the international program of inter-universities exchange and e-learning PROMATINTER (A. Ayral).

ORGANISATION OF RECENT OR FUTURE CONFERENCES

- "Synthesis, Characterization and Applications of Mesostructured Thin Layers" 2005 E-MRS Spring Meeting (May 2005, Strasbourg, France)
- Workshop SFC Grand Sud-Ouest –Catalogne (November 2005, Montpellier, France)
- Summer School "La liaison entre sous-réseaux organiques et inorganiques : quelle liaison pour quelle fonction ?" GDR CNRS MHOM (May 2006, La Grande Motte, France).
- 9th International Conference on Inorganic Membranes (June 2006, Lillehammer, Norway).
- XIV Internat. Workshop on Sol-Gel Science and Technology (August 2007, Montpellier, France).
- Symposium Constantin Luca, 15th RICCE (October 2007, Sinaia, Roumania).
- Euromembrane 2009 (September 2009, Monpellier, France).

CV of the team leader at UPS

Pierre AIMAR
Directeur de Recherche CNRS

Laboratoire de Génie Chimique – Universitié Paul Sabatier

31062 TOULOUSE CEDEX 9 - FRANCE

Tel: +(33) 5 61 55 83 04
Fax: +(33) 5 61 55 61 39

aimar@chimie.ups-tlse.fr

SUMMARY OF CAREER

1980: Graduate Engineer in Electrochemical Engineering ; National Polytechnic Institute, Grenoble (France)

1982: Doctorate (Docteur Ingénieur) in Chemical Engineering from National Polytechnic Institute, Toulouse (France)

1983: Appointed “Junior researcher” CNRS

1987: Doctorate (Docteur ès-Sciences) in Chemical Engineering from Paul Sabatier University, Toulouse

1988: Post Doctorate: University of Bath (Pr. J.A. Howell) U.K.

1991: On leave at the Elf-Aquitaine Research Center (Lacq, France)

1996: Promoted “Senior Researcher – 2nd Class” CNRS

2008 Promoted “Senior Researcher – 1st Class” CNRS

SCIENTIFIC ACTIVITY

Research topics: Membrane filtration / Membrane Characterisation / Membrane Fouling / Water treatment

Supervision or co-supervision of 21 thesis

Co-author of 84 refereed papers , 3 patents and 18 invited lectures at International conferences

Supervised or co-supervised 31 PhD thesis

Secretary of the European Membrane Society (1992-2008)

Editor for the “Journal of Membrane Science” (2002-)

Director of the French Research Network on Reactors and Transfer (FERMaT) (2002-2006)

Deputy Director – Laboratoire de Génie Chimique – University of Toulouse-CNRS (2002-)

CV of the team leader at K.U.LEUVEN

Ivo VANKELECOM
Professor

Department of Microbial and Molecular Systems; Centre for Surface Chemistry and Catalysis. Faculty of Applied Bioscience and Engineering

Kasteelpark Arenberg 23
B-3001 Leuven, Belgium

Tel: +32 16 321594
Fax.: +32 16 321998

ivo.vankelecom@biw.kuleuven.be

Education
1985-1990: Engeneer for food and chemical industries, K.U.Leuven
1990-1994: PhD, Doctor in the Applied Biological Sciences, K.U.Leuven
1994-2001: Postdoc at Centre for Surface Chemistry and Catalysis
*Jan 1999 – Aug 1999: P*ostdoctoral stay at Ben-Gurion University of the Negev, Beersheva, Israel
Jan 2001 – Aug 2001: Postdoctoral stay at Imperial College, London, U.K.
Since September 2001: Professor

Teaching
Research projects in chemistry
Coordinator Research Projects Interphase Chemistry
Membrane technology
Adsorption
Capita Selecta Catalytic Technology
Analytical Organic Chemistry: Chromatography

Experience
Membrane separation, preparation and characterization. High-throughput and combinatorial membrane techniques.

Awards
Co-winner of the Donald W. Breck-award 1998 for the most significant contribution to molecular sieve science and technology, presented by the International Zeolite Association at the IZA '98 in Baltimore, USA.
Price for the best paper 1998 in Clean Products and Processing for 'Clean catalytic technology for liquid phase hydrocarbon oxidation'
G. Langhendries, D.E. De Vos, B. Sels, I.F.J. Vankelecom, P.A. Jacobs, G.V. Baron
Clean Products and Processing, 1998, 1, 21-29.
Winner of the 2002 price of the 'Koninklijke Vlaamse Academie van België voor Wetenschappen en Kunst, Klasse van de Natuurwetenschappen'.

Publications
Editor of 1 book; 5 chapters in books; 90 scientific papers; 10 patents

CV of the team leader at ICTP

Karel BOUZEK
Professor

Institute of Chemical Technology Prague
Technicka 5
166 28 Prague 6
CZ

Tel: +420-22044-4019
Fax: +420-22044-4410

Karel.Bouzek@vscht.cz

1991 MSc. thesis in the field of Inorganic Technology at Institute of Chemical Technology Prague (ICTP)
1997 PhD. thesis at ICTP (Electrochemical Synthesis of Ferrates)
2001 habilitation at ICTP
2005 appointed as a full professor in the field of Inorganic Technology at ICTP

Current position: head of the Department of Inorganic Technology, vice dean of the Faculty of Chemical Technology

Fields of interest: technical electrochemistry and electrochemical engineering with a focus on the waste and drinking water treatment, fuel cells and water electrolysis.

Membership in the scientific organizations' and other related activities: Czech Chemical Society (member), Czech Society of Chemical Engineering (member of the board), Czech Society of Industrial Chemistry (vice chairman of the board), Electrochemical Society (member), International Society of Electrochemistry (member), Working party on Electrochemical Engineering at EFCE (representative of the Czech Republic), Council of the Institute of Physical Chemistry of J. Heyrovsky of the Academy of Sciences of the Czech Republic (member), Council of the Institute of Inorganic chemistry of the Academy of Sciences of the Czech Republic (member), Grant Agency of the Academy of Sciences of the Czech Republic (member of the committee).

Publication activity: 53 papers in reviewed journals, 5 chapters in monographies, 1 textbook, 2 patent applications, more than 240 contributions to the scientific meetings.

CV of the team leader at UTwente

Name: Henny J.M. Bouwmeester
Address: University of Twente
Faculty of Science and Technology
7500 AE Enschede, The Netherlands
Phone: x-31-53-4892950 (work)
E-Mail: h.j.m.bouwmeester@tnw.utwente.nl

Date of Birth: September 3, 1954
Place of Birth: Voorst, The Netherlands
Legal status: Single
Nationality: Dutch

1983-1985	Ph.D. in Inorganic Chemistry/Solid State Chemistry, University of Groningen, Groningen, The Netherlands
1975-1982	M.Sc. in Inorganic Chemistry/Solid State Chemistry (Drs), University of Groningen, Groningen, The Netherlands

Professional Experience

Since 2006	*Associate Professor, Membrane Technology group/Inorganic Membranes, University of Twente*
2003-2006	*Associate Professor, Inorganic Materials Science group, University of Twente*
1988-2002	Assistant Professor, Inorganic Materials Science group, University of Twente
1985-1987	*Research Scientist, Sentron v.o.f., Roden, The Netherlands.*

- Assistant promoter of 20 Ph.D. students
- Ca. 120 scientific papers published, h-index: 30 (based on ISI)
- Most cited author 2003-2007 and 2004-2008 awards, Elsevier Journals
- Co-Editor of the CRC Handbook of Solid State Electrochemistry
- Memberships of international advisory boards and committees of European research projects, conferences and journals.

- *A novel pulse isotopic exchange technique for rapid determination of the oxygen surface exchange rate of oxide ion conductors*, H.J. M. Bouwmeester, C. Song, J.J. Zhu, J. Yi, M. van Sint Annaland, B.A. Boukamp, Phys. Chem. Chem. Phys., 11 (2009) 9640 – 9643.
- *Oxygen stoichiometry and chemical expansion of $Ba_{0.5}Sr_{0.5}Co_{0.8}Fe_{0.2}O_{3-\delta}$ measured by in-situ neutron diffraction',* S. McIntosh, J.F. Vente, W.G. Haije, D.H.A. Blank, H.J.M. Bouwmeester*,* Chem. Mater. 18 (2006) 2187-2193.
- *A linear free energy relation for gas-solid interactions: the correlation between surface rate constant and diffusion coefficient of oxygen tracer exchange for electron-rich perovskites,* R. Merkle, J. Maier and H. J. M. Bouwmeester, Angew. Chem. Int. Edit., 43 (2004) 5069-73.

ANNEX 4: Letters of intent (Associate Partners)

UNIZAR	4.1
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ALFA LAVAL	4.8
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EMS	4.11
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Universidad de Zaragoza

LETTER OF ENDORSEMENT

Project title: ***Erasmus Mundus Doctorate in Membrane Engineering / EUDIME***

Our organisation:

Full Name:	Universidad de Zaragoza
Address:	c/ Pedro Cerbuna, 12
Postcode:	50009
Town/city:	Zaragoza
Country:	Spain
Tel:	+34 976 762052
Fax:	+34 976 762320
Email:	relint@unizar.es

I, the undersigned, Professor Manuel José López Pérez, Rector of the "Universidad de Zaragoza" (Spain), confirm that I have read and approved the proposal, the annexes and the breakdown of work among partners, as submitted in the application form addressed to the Education, Audiovisual and Culture Executive Agency.
The project is coordinated by Enrico Drioli, full professor at the University of Calabria.
We confirm our intention to carry out the tasks described, and that the key staff involved in the project, as presented in the application form, will be available to fulfil the role outlined. We undertake to comply with the principles of good partnership practice. *Our Institution will make all possible efforts to ensure the proper implementation of the programme and its sustainability and continuity beyond Community funding.*

I declare agreement to:

(a) operating as a Partner Organization with University of Calabria (Italy) to carry out the project identified above;

(b) undertaking the roles stipulated in the application form.

Name: Prof. Dr. Manuel José López Pérez
Position: Rector de la Universidad de Zaragoza

Signature and stamp

Place and date: Zaragoza, Spain – 22 March, 2010

El Rector de la
Universidad de Zaragoza

D. MANUEL JOSÉ LÓPEZ PÉREZ, RECTOR DE LA UNIVERSIDAD DE ZARAGOZA,

HACE CONSTAR:

Que el título "Doctorate in Membrana Engineering", contenido en la propuesta de Doctorado Erasmus Mundus en la que participa esta Universidad, es un título de las siguientes características:

☒ Otra situación (explicar detalladamente estado de la titulación):

Título Oficial de Doctorado que la Universidad de Zaragoza se compromete a tener aprobado y verificado con anterioridad a su puesta en funcionamiento en el curso 2011-12, tras la aprobación de la propuesta Erasmus Mundus. El periodo formativo de este Doctorado reside en el "Master in Membrana Engineering" (objeto también de propuesta en el marco Erasmus Mundus).

Zaragoza, 22 de marzo de 2010.

Manuel José López Pérez

PL. BASILIO PARAÍSO 4 • ED. PARANINFO 50004 - ZARAGOZA • TELF.: +34 (9) 76 / 761013 • FAX: 761009 • E-MAIL: vrpola@.unizar.es

FACULDADE DE CIÊNCIAS E TECNOLOGIA
UNIVERSIDADE NOVA DE LISBOA

TO WHOM IT MAY CONCERN

I, undersigned, Professor Fernando Santana, Director of the Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa (FCT-UNL), and legal representative of this Institution, confirm the support to the joint multinational programme "Erasmus Mundus Doctorate in Membrane Engineering" and the agreement with the submitted application, coordinated by Professor Enrico Drioli, from the University of Calabria, Italy.

The scientific responsible for this Doctoral Programme at FCT-UNL is Professor João G. Crespo.

FCT, *Campus* da Caparica, 27th of March, 2009

Fernando Santana
Professor
Director of FCT-UNL

FACULDADE DE CIÊNCIAS E TECNOLOGIA
UNIVERSIDADE NOVA DE LISBOA
Direcção

Re: Erasmus Mundus Doctorate in Membrane Engineering / EUDIME

I, the undersigned Fernando Santana, Dean of the Faculty of Sciences and Technology / UNL, certify that the degree "Doctorate in Membrane Engineering", included in the proposal of the *Erasmus Mundus* Doctorate in which my Faculty is participating is an official Degree of Doctorate. Our institution assumes the compromise of having it approved before its beginning, in 2011 – 12, after the approval of the *Erasmus Mundus* proposal.

Signed at Caparica, 30th April 2010.

Professor Fernando Santana
Dean

Prof. Doutor Fernando Santana
Director
Faculdade de Ciências e Tecnologia / UNL

Dezernat für Internationale Hochschulbeziehungen (2.0)
International Office

DER REKTOR

RWTH AACHEN UNIVERSITY

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RECTOR RWTH Aachen 52056 Aachen Germany

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PERSON OF CONTACT
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britta.piel@zhv.rwth-aachen.de

DATE
April 15, 2010

OUR REF
2.0-sn

Endorsement of the ERASMUS Mundus Joint Doctorate
"Membrane Engineering" (EUDIME)

I, Univ.-Prof. Dr.-Ing. Ernst M. Schmachtenberg, Rector of RWTH Aachen University, declare that the intention for cooperation in the framework of the ERASMUS Mundus Joint Doctorate "Membrane Engineering" has the consent and full support of RWTH Aachen University.

RWTH Aachen University has the intention of participating in above mentioned joint doctorate, coordinated by the University of Calabria (Prof. Enrico Drioli). Our organisational role in the project will be the one of participating partner. The responsible department and contact person at RWTH Aachen University will be the Institute of Chemical Process Engineering, Prof. Dr. Matthias Wessling.

RWTH Aachen University agrees with the contents and intentions outlined in the current proposal (April 13, 2010). The information about RWTH Aachen University in this proposal is correct to my best of knowledge.

Potential doctoral candidates of the EUDIME programme will have full access to all the services available to regular RWTH Aachen students and doctoral candidates.

Univ.-Prof. Dr.-Ing. Ernst M. Schmachtenberg
Rector

SAPIO

Spett.le
UNIVERSITÀ DELLA CALABRIA
Dipartimento di Ingegneria
Chimica e dei Materiali
Via Pietro Bucci, cubo 44a
Campus di Arcavacata
87036 Arcavacata di Rende

C.A. Prof. Enrico Drioli

Monza, 22nd April 2009

Object: Joint European Doctorate in "Membrane Engineering"

Dear Prof. Drioli,
with the present letter I would like to express the support of the Company I am representing to your initiative of proposing the creation of a Joint European Doctorate in "Membrane Engineering" in the frame of Erasmus Mundus.
At present a professional figure of "Membrane Engineer" is not available in Europe and we think that such a figure could help in proposing innovative solutions in different fields of the industrial production (food industry, chemical industry, water treatment) promoting research and development projects to achieve competitiveness.
The consortium of Universities involved in the project is an example of excellence for professionalism and education skills, so Sapio Produzione Idrogeno Ossigeno is interested in your initiative.
Best regards.

Ing. Stefano Tolloi

SAPIO Produzione Idrogeno Ossigeno S.r.l.
General Sales Manager

SAPIO

VEOLIA
ENVIRONNEMENT

Recherche et Développement

CENTRE DE RECHERCHE SUR L'EAU

Maisons-Laffitte, March 19th, 2009

Letter of support

During the last years, membrane technology has emerged, as one of the main contributor to solve water problems. The stringent regulation in the industrialized countries and the increase in scarcity of water in several places promote the use of membrane for water treatment. Based on two decades of experience, water companies, municipalities and industries operate nowadays several thousands of membrane plants delivering everyday more than 50 millions m^3 of treated water. This number is however still quite small (less than 1% of overall water treatment plants) and it is expected that this number will grow quite rapidly in the near future. An annual growth of 10% is anticipated in the next 10 years with both desalination and water reclamation expected to grow at a faster rate than other applications.
I, therefore strongly support the proposal for the creation of a Joint European Doctorate in "Membrane Engineering" in the frame of Erasmus Mundus actions as it will significantly contribute to the educational growth of young membrane engineers.

Best regards

Jean-Christophe Schrotter
Membrane R&D Director
Water research Center
Veolia
France

Date: 31.03.2009
Our Ref: FLI
Your Ref:

Prof. Enrico Drioli
Department of Chemical Engineering
and Materials
via P. Bucci CUBO 45A
University of Calabria
87030 Rende (CS)
Italy

Alfa Laval Copenhagen A/S
Massinvej 5
DK – 2860 Soborg
Denmark

Tel: +45 39 53 60 00
Fax: +45 39 53 65 59
www.alfalaval.com

To whom it may concern.

Alfa Laval is one of the leading European producers of membranes and membrane systems for the food, life science, environmental and process industry. Therefore, we would like to support the proposal for the creation of a Joint European Doctorate in "Membrane Engineering" in the frame of the Erasmus Mundus actions.

The creation of such a Joint European Doctorate would not only contribute to the educational growth of the young engineers, but it would also increase the European competitiveness in this field by ensuring that researchers with advanced knowledge of membrane technology are available for industrial R&D. This program will further ensure that the European excellence in innovation in membrane technology will be sustainable, and the European position compared to worldwide competition in this fast growing and developing technology is secured. Hence, such Doctoral programme would provide the foundation for maintaining and strengthening the position of European membrane and membrane systems producers and as such Alfa Laval.

Yours sincerely,

Nick Corner-Walker
Director Business Centre Membranes

Alfa Laval is a leading global provider of specialized products and engineering solutions based on its key technologies of heat transfer, separation and fluid handling. The solutions help them to heat, cool, separate and transport products in industries that produce food and beverages, chemicals and petrochemicals, pharmaceuticals, starch, sugar and ethanol. Alfa Laval is listed on Nasdaq OMX Nordic and, in 2008, posted annual sales of about EUR 2.9 billion. The company has some 12,000 employees.

Full Name:	Dr.-Ing. Jaroslav Přidal
Address:	Wonkova 799
Postcode:	500 02
Town/city:	Hradec Králové
Country:	Czech Republic
Tel.:	+420495499072
Fax:	+420495499072
President/Director:	Dr.-Ing. Jaroslav Přidal
Contact person's name:	Dr.-Ing. Jaroslav Přidal

LETTER OF SUPPORT

To:	University of Calabria
Contact person's name:	Prof. Enrico Drioli
Address:	via P. BUCCI
Postcode:	87036
Town/city:	Arcavacata di Rende (CS)
Country:	ITALY

Project title: *Erasmus Mundus Doctorate In Membrane Engineering /EUDIME*

I, the undersigned, Dr.-Ing. Jaroslav Přidal confirm that Mikropur, s.r.o. expresses its strong support to the application of Erasmus Mundus Doctorate programme in Membrane Engineering (EUDIME). The cooperation in the field of membrane separation between our institution and Institute of Chemical Technology, Prague has been very fruitful during last several decades. I can confirm, that not only in exchange of ideas, but also in mutual development of several scientific instruments, e.g. series of RO/UF/MF units ARNO and various pervaporation cells as well as of simulated moving bed chromatograph. All these units serve successfully in academia as well as in industry. I believe that proposed program will enhance our mutual research capacity.

Signature and stamp:

MIKROPUR s.r.o.
Wonkova 799
500 02 Hradec Králové 2

Name:	Jaroslav Přidal
Position:	Director of Mikropur, s.r.o.
Place and Date:	Hradec Králové, 17.3.2010

GVS
FILTER TECHNOLOGY

Date: March 19, 2009

Subject: Letter of Intent

To Whom It May Concern

We are glad to learn about the Erasmus Mundus Project "Membranes Engineering" having as objective the creation of a Joint European Doctorate in "Membrane Engineering".

We enthusiastically welcome such initiative and confirm our interest for this project. In fact, we believe that nowadays in Europe graduated students specialised in membrane technology and science are much needed to support the continuing industrial growth of this technology and its applications.

Membrane manufacturing companies and end-users could benefit a lot from such specialised people; they could save the time and the resources that normally are needed for their in-house technical formation.

We wish you success with the project and we confirm that, when related job position open in GVS, we would be very much interested to evaluate the students graduated in the framework of the Joint Doctorate programme on a fair basis with other candidates.

Sincerely yours

S. Seeta
International Cooperation

GVS S.p.A.
Via Roma, 50 - 40069 Zola Predosa (Bologna) - Italy
Tel. +39 051 6176211 - Fax +39 051 6176200 - e-mail: gvs@gvs.it - www.gvs.com
Cap. Soc. € 1.431.875,00 int. vers. - C.F. 03839630372 - P. Iva 00644681208
R.E.A. 0385186/BO - Reg. Imprese 45238/BO - Merc. BO 012048

EMS - European Membrane Society

24 April 2009

TO WHOM IT MAY CONCERN

This is to certify that the European Membrane Society (www.emsoc.eu) is willing to strongly support the Joint European Doctorate in Membrane Engineering (EUDIME). The involvement of the EMS in sponsoring this action has been formally approved at unanimity in the Council Meeting of 6 April 2009.
EUDIME is considered a key strategic instrument that will create a new, intercultural, advanced and legally recognized knowledge-based generation in the field of membrane science and technology, i.e. a multi- and interdisciplinary sector transversal to strategic fields, such as energy, environment, water, health, food, biotechnology. Industry is seeking these expertises. The modern multicultural socio-economical system urgently needs this human capital.
Based on these forefront perspectives, EMS contribution to the EUDIME will include:

- Sponsoring of travel bursaries for Ph.D students participation at conferences, workshops, schools.
- Sponsoring of a three year EMS membership to the Ph.D students at the beginning of their course
- Organization of Summer Schools on topics of interest for the Doctorate course
- Sponsoring of the EMS honorary members, who are among the outmost scientist in the field at international level, to give lectures for the Ph.D students, at the summer schools, in intensive courses and through virtual instruments, such as E-learning platform, to participate at tutorial activities and evaluation panels.
- Create a new section in the Membrane News for the dissemination of the Doctorate activities
- Create on the home page of the EMS website a direct link to the EUDIME website
- Sponsoring of boots/stands at major meetings, such as Euromembrane, ICOM, ACHEMA where Ph.D students can show their inventions
- Organization of guided visits at running industrial plants in Europe and abroad.

President, European Membrane Society

Lidietta Giorno

Institute on Membrane Technology, Consiglio Nazionale delle Ricerche
ITM-CNR
Via P. Bucci, 17/C, at UNICAL
87030 Rende (CS), Italy
Tel.: +39 0984 492050; Fax: +39 0984 402103
E-mail: l.giorno@itm.cnr.it; Lidietta.Giorno@tin.it
Web site: www.emsoc.eu; www.itm.cnr.it

The Statutes of the European Membrane Society are officially registered at the Prefecture de la Haute-Garonne, Toulouse, France under # 11681, 26 February 1982.

European Membrane House

Montpellier, April 22 2009

The idea to create a new European Master and PhD in "Membrane Engineering" have grown during the project of Network of Excellence NanoMempro conducted between October 2004 and February 2009 by a consortium of 13 European partners (EC project - NMP3-CT-2004-500623-"Expanding membrane macroscale applications by exploring nanoscale material properties").

Today, the Erasmus Mundus program provides the opportunity to support the implementation of this important project.

The new Durable Integrated Structure (DIS), the so-called "European Membrane House" (EMH), set up specifically to coordinate all future R&D operations in this area after the end of NanoMemPro, can only turn to the project whose primary objective is the preparation of a new kind of specialist able to embrace all facets of this new discipline, from materials to processes aspects through modelling, simulation...Who better than these specialists can feed the new operations to drive?

On its turn, the EMH will support through its daily work and as far as needed the new cursus (search for new training periods in industry, lobbying for new funding, presentation of the Master/PhD through international contacts ...).

Prof. Gilbert M. Rios

Prof. Gilbert M. Rios – Executive Director EMH
CC 047 – UMII – Place E.Bataillon -F 34095 Montpellier
Tel. +33 467 149 140 Mob : +33 612 779 709
Email : Gilbert.Rios@europeanmembranehouse.com

4.12

ANNEX 5: Letters of support from other Industrial Companies

sasol
reaching new frontiers

20 April 2009

To whom it may concern

RE: Letter of interest for the creation of a "Membrane Engineering Joint European Doctorate"

Water is a large and essential feedstock to Sasol's coal and gas to liquids processes, and the sustainable use of water, which is becoming increasingly scarce, is critical to the continued exploitation of these technologies. As such, considerable focus is placed on the clean up and reuse of water. Of the water purification processes available, membranes constitute the core technology of the majority, and are therefore most widely applied. Apart from water treatment and desalination, the use of membranes for gas separation is also an emerging technology of particular relevance to Sasol's processes. It is therefore imperative that research in these areas is strengthened worldwide and the existence of a membrane engineering Joint European Doctorate would certainly aid in the development of an expert group of individuals.

The creation of a Joint European Doctorate in Membrane Engineering in the frame of Erasmus Mundus is therefore well supported and it is believed that this Project will accelerate the development of a specialised group of membrane researchers who could ultimately contribute significantly to the development and/or improvements of membrane processes.

Yours sincerely

M Baratta

Dr Lynette M. Baratta
Principal Scientist
Environmental Science and Technology
Sasol Technology, Research and Development

Dr Trevor D. Phillips
Manager: Environmental Science and Technology
Sasol Technology, Research and Development

Sasol Technology (Pty) Limited [illegible]
1 Klasie Havenga Road Sasolburg PO Box 1 Sasolburg 1947 South Africa
Telephone +27 (0)16 960 [illegible] Facsimile +27 (0)16 960 [illegible] www.sasol.com

5.1

ВЛАДИПОР

77 B.Nizhegorodskaya Str.,
Vladimir 600016
Russian Federation

JOINT STOCK COMPANY
SCIENTIFIC TECHNICAL CENTER
« V L A D I P O R »

Phones (4922) 47-54-87
(4922) 47-53-21
Phone/Faxe (4922) 23-56-74
E-mail vladipor@vlsnet.ru
Internet www.vladipor.ru

April 6, 2009

Professor Bouzek

Institute of Chemical Technology, Prague
Faculty of Chemical Technology
Department of Inorganic Technology
Technicka 5
166 28 Prague 6
Czech Republic

Dear Professor Bouzek

We have studied the proposed Erasmus Mundus Program and find it extremely interesting both for active players in the field of membranes production and application, and for those who are studying this matter now and need practice. Our company as a manufacturer of various types of membranes will be glad to assist in further exploration of the membrane technologies' full potential

We fully support this initiative and are sure that this program will have a great future.

Truly yours,

Vladimir P.Dubyaga

General Director
JSC STC "Vladipor"

MemBrain

MemBrain

Full Name:	MemBrain, s.r.o.
Address:	Pod Vinicí 87
Postcode:	471 27
Town/city:	Stráž pod Ralskem
Country:	Czech Republic
Tel:	+420 467 866 304
Fax:	+420 467 866 102
President/Director:	Ing. Aleš Cernín, Ph.D
Contact person's name:	Ing. Aleš Cernín, Ph.D

LETTER OF SUPPORT

To: University of Calabria
Contact person's name: Prof. Enrico Drioli

Address:	via P. BUCCI
Postcode:	87036
Town/city:	Arcavacata di Rende (CS)
Country:	ITALY

Project title: *Erasmus Mundus Doctorate in Membrane Engineering (EUDIME*

*I, the undersigned, **Aleš Černín** - managing director and corporate agent, confirm that RD engineering company **MemBrain** expresses its strong support to the application of Erasmus Mundus Doctorate programme in Membrane Engineering (EUDIME). Although the field of membrane processes represents the most up-to-date technical and technological branch worldwide, penetrating all strategic application areas, as well as one of the branches of the Czech industry that are successful nationally and internationally, the research capacities within the Czech Republic have been very fragmented so far. Moreover, there is neither systematic education program in this field at all educational levels, nor sufficient administrative support of this field from the point of view of standards, certifications etc. Another problem is marked with the fact that the subjects of research activity, primarily at academic centers, are usually remote from the market requirements and the subsequent know-how transfer into industrial implementation is little efficient. This fact not only decreases substantially the efficiency of conducted research and invested financial resources, but also hinders the transfer of its results into practice.*

In this respect, we strongly support the proposal for the creation of Joint European Doctorate in "Membrane Engineering" in the frame of ERASMUS MUNDUS Program as it will significantly contribute to the educational growth of young membrane engineering.

Company MemBrain can offer the cooperation in this project based on our experience with implementations and training of practice courses for applicants and young membrane engineers. MemBrain Innovation Centre in Stráž pod Ralskem, under modern coordination and management of MemBrain offer a very flexible and efficient workplace for the set activities in the field of membrane processes.

Signature and stamp:

MemBrain
Pod Vinicí 87
471 27 Stráž pod Ralskem
IČ: 28676992

Name:	ALEŠ CERNÍN
Position	Managing director and Corporate Agent
Place and Date	Stráž pod Ralskem, Czech Republic, 17th March 2010

5.3

CZEMP

Full Name: Czech Membrane Platform
Address:
Postcode: CZ 470 71
Town/city: Česká Lípa
Country: Czech Republic
Tel: +420 487823854
Fax:
President/Director: Luboš Novák, President
Contact person's name: Miroslav Bleha, Executive Director

LETTER OF SUPPORT

To: University of Calabria
Contact person's name: Prof. Enrico Drioli
Address: via P. BUCCI
Postcode: 87036
Town/city: Arcavacata di Rende (CS)
Country: ITALY

Project title: *Erasmus Mundus Doctorate in Membrane Engineering (EUDIME*

I, the undersigned, Miroslav Bleha confirm that Czech Membrane Platform expresses its strong support to the application of Erasmus Mundus Doctorate programme in Membrane Engineering (EUDIME).

The field of membrane processes represents one of the most up-to-date technical and technological branch worldwide. It has a potential to penetrate all strategic application areas not only in the Czech industry, but also on the international level. Therefore absence of systematic highly qualified education programme in this field at all educational levels represents an important drawback. Additional aspect of the current situation represents inefficient transfer of knowledge generated within the academic institutions to the industrial practice. Profit obtained is thus not adequate to the resources invested into the research activities. With gladness I have seen, that your proposal of Joint European Doctorate addresses also this issue.

In this respect, Czech Membrane Platform representing beside its academic members also participating industry strongly supports the proposal for the creation of Joint European Doctorate in "Membrane Engineering" in the frame of ERASMUS MUNDUS Program as it will significantly contribute to the educational growth of young membrane engineering generation.

Czech Membrane Platform can offer the cooperation in this project based on experience of its members in the field.

Signature and stamp:

Česká membránová platforma o.s.
Mysliveckova 2447
470 01 Česká Lípa
IČ: 228 83 218

Name: Miroslav Bleha
Position: Executive Director
Place and Date: Česká Lípa, March 18, 2010

MEGA a.s.
Branch office: Pod Vrbou 67
471 27 Stráž pod Ralskem
Czech Republic

Full Name:	MEGA a.s.
Address:	Pod Vrbou 67
Postcode:	471 27
Town/city:	Stráž pod Ralskem
Country:	Czech Republic
Tel:	+420 487 888 304
Fax:	+420 487 883 102
President/Director:	Ing. Lubos Novak, CSc.
Contact person's name:	Ing. Ales Cernik, Ph.D.

LETTER OF SUPPORT

To: University of Calabria
Contact person's name: Prof. Enrico Drioli
Address: via P. BUCCI
Postcode: 87036
Town/city: Arcavacata di Rende (CS)
Country: ITALY

Project title: *Erasmus Mundus Doctorate in Membrane Engineering (EUDIME)*

I, the undersigned, **Lubos Novak**, managing director and the sole member of the Board of Directors of/firm that **MEGA** expresses its strong support to the application of Erasmus Mundus Doctorate programme in Membrane Engineering (EUDIME). In the field of membrane processes, there are many companies worldwide, but only few of them have been able to maintain comprehensive membrane programme consisting of research, development and production of membranes – their components or membrane process – as well as production and delivering of entire technological units including launching, guarantee and servicing. MEGA a.s. (no.1 belongs to this group and it is certainly the only company with this demanding specialisation in the Czech Republic. The company achieved this position thanks to lasting and consistent orientation to applied research in the field of membrane materials and processes with immediate industrial implementation of its results. To sustain or strengthen the position of the company and of the Czech industry in the worldwide market, it is necessary to keep up this trend.
In this respect, we strongly support the proposal for the creation of Joint European Doctorate in "Membrane Engineering" in the frame of ERASMUS MUNDUS Program as it will significantly contribute to the educational growth of young membrane engineering.

Signature and stamp:

mega a.s.
IČ: 44567140
Drahobejlova 1452/54
190 00 Praha 9 - Vysočany

Name:	LUBOS NOVAK
Position:	Managing director and the sole member of the Board of Directors
Place and Date:	Stráž pod Ralskem, Czech Republic 17th March 2010.

Bank: UniCredit Bank Czech republic a.s.
Account No.: 31888104043/2700
VAT: CZ44567140
IN: 44567140

Tel.: +420 487 888 410
Fax: +420 487 883 102
Mobile: +420 724 070 272
e-mail: lubos.novak@mega.cz
http://www.mega.cz

Registered Office: Drahobejlova 1452/54, 190 00 Prague 9 - Vysočany
The company is registered at the Commercial Register maintained by the Municipal Court in Prague, Section B, Insert No. 9113.

Dr. Efrem CURCIO
Dept. of Chemical Engineering and Materials
UNIVERSITY OF CALABRIA
via P. Bucci CUBO 44a
87036 Arcavacata di Rende
ITALY

Vos références
Nos références HT20-C2010- 058 /DNL
Interlocuteur D. Noël
Téléphone 33 (0) 1 60 73 63 19
Objet **Letter of interest for supporting the Erasmus Mundus doctorate in Membrane Engineering**

Les Renardières, april 19th, 2010

Dear Doctor,

You have transmitted us the Erasmus Mundus project for an European doctorate in Membrane Engineering (EUDIME).

I am pleased to confirm the interest and the support from EDF R&D to this project. Our interest for the progress in membrane engineering is specially focused on energy topics, and also environmental control and sustainable development issues: liquid waste control from power plants, gas separation, water purification or desalination.

This program is very useful and will contribute to assure a high quality of the formation level; we are ready to open some possibilities (training periods, fellowship) in our laboratories.

Sincerely yours

Didier Noël

Senior Scientist, Chemistry and Nanotechnology

Copie : Ellen-Mary Pavageau, Martin Bachet, Philipe Ollar

Page 1/1

EDF R&D
Département Matériaux et
Mécanique des Composants

Site des Renardières
Avenue des renardières
Ecuelles
77818 MORET SUR LOING

Téléphone +33 (0)1 60 73 60 73
Télécopie +33 (0)1 60 73 66 89

Dr. Francis Luck
Research Manager
Corporate Science&Technology/Catalysis and Process Engineering
TOTAL S.A – 2 place Jean Millier
F-92078 Paris la Défense Cedex
Tel: +33 1 47 44 63 21
Fax: +33 1 47 44 44 94

LETTER OF SUPPORT

To: University of Calabria, Department of Chemical Engineering and Materials
Contact person's name: Prof. Enrico Drioli
Address: via P. Bucci CUBO 45a 44a
Postcode: 87030
Town/city: Rende (CS)
Country: Italy

Project title: *Erasmus Mundus Doctorate in Membrane Engineering (EUDIME)*

I, the undersigned, Dr. Francis Luck, confirm that Total expresses its strong support to the application of Erasmus Mundus Doctorate Programme in Membrane Engineering (EUDIME); after having reviewed the objectives of this high quality project. This high level doctoral programme with mobility between 3 European universities will attract talented young European and international candidates to advanced studies in this area, strengthening herewith the leadership of the European Union in the applications of membrane technologies.

Since all our Branches have developed either R&D projects or practical applications of membranes for various separations, we are willing to:

- host PhD students for short-term traineeships,
- open positions at Total to PhD students graduated within the Erasmus Mundus Doctorate in Membrane Engineering, on a fair basis with other candidates,
- become an Associated Partner of the EUDIME consortium.

I look foward to the success of your ambitious project.

Signature and stamp:

TOTAL S.A.
Direction Scientifique
2 place Jean Millier
92078 PARIS LA DEFENSE CEDEX
Tel.: 01 47 44 45 46

Name: Dr. Francis Luck
Position: Research Manager
Place and Date: Paris la Défense, April 9, 2010

5.7

ANNEX 6: Letters of support from other Institutions

EUROPEAN DESALINATION SOCIETY

Science Park of Abruzzo, Via Antica Arischia 1, L'Aquila 67100, Italy
Tel. +39 346-884 8406 Fax +39 0862-314359, E-mail: mirembalaban@yahoo.com

Miriam Balaban,
Secretary General
Editor, Desalination
Desalination and Water Treatment

April 5, 2009

To: Enrico, Drioli
Universita Della Calabria

Re: Joint European Doctorate in Membrane Engineering

Dear Enrico,

Congratulations on your initiative to establish the joint European doctorate in membrane engineering. There is certainly a need for highly qualified personnel for this swiftly expanding field. The European Desalination Society has held short courses over the past six years where participants from Europe and other countries are seeking opportunities to intensify their knowledge and expertise. The doctorate would certainly be of interest.

The European Desalination Society will be prepared to promote this course through its wide involvement and contacts in this field and will be happy to take part in this important project through promotion and publication.

Best regards,

Miriam Balaban

MEDRC

April 3, 2009

Prof. Enrico Drioli
Department of Chemical Engineering and Materials
University of Calabria
P. Bucci CUBO 17/C, 87030 Rende (CS)
Italy

Re: Participation in the Joint European Doctorate in "Membrane Engineering"

Dear Prof. Drioli,

The Middle East Desalination Research Center (MEDRC) is pleased to inform you that we are interested to participate in the proposed Joint European Doctorate in "Membrane Engineering" project.

MEDRC is an autonomous non-profit international institute with the objectives of reducing the cost of desalination through development of new desalination technologies and to build the desalination expertise in the Middle East and North Africa (MENA) region. To achieve theses objectives, MEDRC involves researchers from the MENA region in the MEDRC desalination research projects and provides scholarship to the MENA region students for pursuing their MSc and PhD studies in foreign universities. MEDRC is actively involved in membrane technology research related to desalination and involves MENA region students in its programs, we have awarded a number of scholarships in this regard and accordingly will be able to help in promoting the participation of MENA region students in the proposed European Doctorate project.

We look forward to participating with you in this important project.

Sincerely,

Shannon McCarthy
Deputy Center Director

Venkat Reddy
Assoc. Director for Research

The Institution of Engineers (India)

(ESTABLISHED 1920, INCORPORATED BY ROYAL CHARTER 1935)

West Bengal State Centre

8, GOKHALE ROAD, KOLKATA – 700 020

Prof. (Dr.) Samir Kumar Bandyopadhyay, FIE
Chairman

Shri Sujit Kumar Banerjee, MIE
Honorary Secretary

Telephone : +91-33-2223 [illegible]
Fax : +91-33-2223 [illegible]
Telegram : ENJOINT
E-mail : [illegible]@gmail.com

Prof.(Dr)Sarajit Basu, FIE,FIIChE
Chairman, Chemical Engineering Division
West Bengal State Centre, Kolkata

Date : 07.04.2009

Dear Professor Drioli,

Many thanks for your letter dt.26th March,2009 regarding Joint European Doctorate in "Membrane Engineering" in the frame of Erasmus Mundus actions .

It would be a pleasure to accept the proposal from my side , and accordingly I am sending my willingness intimation.

The research student to be recommended for the proposed Ph.D program under Joint European Doctorate in "Membrane Engineering" in the frame of Erasmus Mundus actions will be intimated to you in due course after finalization.

With greetings and best wishes,

Yours Sincerely,

(Dr.Sarajit Basu,

Chairman, Chemical Engineering Division,

WBSC, The Institution of Engineers, Kolkata)

Prof. Dr. S. Basu, Ph.D, FIChE, FIE
(Ex-Professor [illegible] IIT-[illegible])
Visiting Prof. [illegible]
[illegible]
[illegible]
E-mail : [illegible]@yahoo.co.in

6.3

CHEMCHINA

Dear Dr Drioli

I am very glad to hear that the Joint European Doctorate in "Membrane Engineering" is on process. I believe that this program is very significant for their becoming the excellent entrepreneurs and scientists.

ChemChina has been working on member separation and technology for over 30 years. We are delighted to see that more and more fresh men join us. I wish we can pay more attention to the training of fresh men in the following time. I also wish the program can be carried on term by term, and train more excellent specialists.

Therefore, ChemChina is very pleased to see the program on process as soon as possible. We also hope that this program can train more and more young experts for our membrane cause.

Best wishes,

China National Chemical Corporation

Signature: _____

April 9, 2009

联系单位:中国国际化工商材对话组委会 网址:www.chemchina.com.cn
邮寄地址:北京市西城区北四环西路82号邮政编码100080
电话:0086-01-82676476; 传真:0086-01-82677279
E-mail:gyz@chemchina.com.cn

哈爾濱工業大學

HARBIN INSTITUTE OF TECHNOLOGY

地址：中国 哈尔滨西大直街92号 邮编 P.C.:150001 电话 Tel:0451-86412114
Addr:92 West Da Zhi St.Harbin China 传真 Fax:0451-86221048 电传 Telex:87217 HITCN

April 2nd, 2009

Dear Prof. Enrico Drioli

I am so sorry to answer you so late.

I am so happy to know that proposal for the creation of a Joint European Doctorate in "Membrane Engineering" in the frame of Erasmus Mundus actions is in progress. And the proposal seems very interesting for me. As you mentioned in the brief summary, one of the goal of this proposals to attract excellent students and young researchers from Third countries to participate to this initiative. I think that is very important for us to know the information. I believe that if the proposal is approved, many students and researchers from Harbin Institute of Technology would be happy to apply for it. Now many students in our school study in European countries in different actions every year. If they know that, they will be glad that they can choose more interesting applications for continue their study in membrane technology.

I and my assitant Dr. Hong Liang will inform our collegues and other universities for the proposal. I also hope to get more update information during the next days, then we can promote its proceeding in China. We will give the lectures on how to apply that if the proposal is started in one day. And membrane engineering is so important that we are eager to study more for applying membrane. If possible, we would like to go to EU to feel the Joint European Doctorate in the future.

Please do not hesitate to inform that when the proposal will start. We hope Chinese young researchers will benefit from that.

Sincerely

Guibai Li
Hong Liang

Guibai Li

Hong Liang

UNEP-TONGJI INSTITUTE OF ENVIRONMENT FOR SUSTAINABLE DEVELOPMENT
联合国环境规划署－同济大学环境与可持续发展学院

Fengting Li , Professor, Associate Dean
College of Environmental Science and Engineering
UNEP TONGJI Institute of Environment for Sustainable Development
State Key Laboratory of Pollution Control and Resource Reuse Study
Tongji University Siping Rd 1239, Shanghai, 200092, China
Phone: +86 21 65983302 Fax: +86 21 65985059
Mobile Phone: +86 13501636820
email: fengting@tongji.edu.cn fengting@hotmail.com
3 April 2008

Christel CAUSSERAND
Professeur
Université Paul SABATIER
Laboratoire de Génie Chimique UMR 5503
31062 TOULOUSE Cedex 9
tel 33 (0)5 61 55 86 90
Fax 33 (0)5 61 55 61 39
E-Mail causseran@chimie.ups-tlse.fr

Dear Prof. Christel Causserand,

We are pleased to be invited to join the program of ***European Master and PhD in Membrane Engineering***. In our university we have the State Key Laboratory of Pollution Control and Resource Reuse Study, we have several gourps work on the preparation and application of membrane for the treatment of drinking water, waste water and industry water. There are lots of engineering projects designed by our professors. It is our honor to join the program. Up to now we have memorandom with University of Montpellier, University of Toulouse, the Danish Technical University for research and education coopeation. With the new colaboration frame, we hope to promote our coopeation in the field of membran, we will offer help for the exchanging of staff and students for their research in Tongji or our partner univesities.

Yours sincerely

Fengting Li

KRICT

Korea Research Institute of Chemical Technology

April 6th, 2009

Prof. Enrico DRIOLI
National Research Council
- Institute on Membrane Technology (ITM-CNR)
c/o The University of Calabria - Cubo 17C
87030 Rende CS - Italy

Dear Prof. Enrico DRIOLI,

On behalf of the Korea Research Institute of Chemical Technology, I am pleased to have received your invitation letter dated April 6th, 2009 regarding the proposal for the creation of a Joint European Doctorate in "Membrane Engineering" in the frame of Erasmus Mundus actions. Fully agreeing upon the goal of the proposal, I am glad to inform you that KRICT is willing to participate in the project. I thank you for the offer and hope to hear from you again when it is approved. Please do not hesitate to contact me if you need any further cooperation.

Best regards

Kew-Ho Lee, Ph. D.
Research Fellow /
Director of Strategy and Cooperation Division
Korea Research Institute of Chemical Technology

Cooperation & Strategy Division, KRICT
P.O. Box 107, Sinseongno 19 Yuseong-Gu, Daejon, 305-600, Korea
TEL: +82 42-860-7750 / FAX: +82 42-860-7761

서울대학교 공과대학 화학생물공학부
School of Chemical and Biological Engineering
Seoul National University

Dear Prof. Enrico Drioli,

March 27, 2009

Seoul National University is greatly interested in the proposal for the creation of a Joint European Doctorate in "Membrane Engineering" in the frame of Erasmus Mundus actions.

I, as a professor at Seoul National University, am willing to inform and to promote the participation of candidates from my country when the proposal will be approved.

Sincerely Yours,

Chung-Hak LEE
Prof., School of Chemical and Biological Engineering,
Seoul National University, Seoul 151-744, KOREA
Tel) +82-2-8807075, Fax) +82-2-8740896
CP) +82-10-87700672, URL) http://wemt.snu.ac.kr
E-mail) leech@snu.ac.kr

Membrane Applied Science and Technology Center
NSF Multi-University Site Industry-University
Cooperative Research Center

March 31, 2009

RE: Letter of Support for European Masters and PhD degree program in Membrane Engineering

I am pleased to provide a letter supporting a European Masters and PhD degree program in Membrane Engineering within the framework of the **Erasmus Mundus** 2009-2013 program. Membrane technology is still an evolving separation methodology with enormous potential. The consortium of European universities listed for this program is an excellent assemblage with expertise that spans the wide range of materials and applications for membrane technology. This program can provide the technical leadership for generations of highly trained personnel. The benefits are economic as well as educational. As the research advances evolve from the program, they can generate new business opportunities for the European community.

I have personally interacted with researchers at most of the universities listed. I have the highest respect for their technical capabilities. The synergism that has developed from the European Network of Excellence NanoMemPro provides the structure for this program and insures that this program will provide the excellent student training and research opportunities for which it is designed.

We look forward to the implementation of this program and the opportunity to interact and collaborate.

Yours truly,

Richard D. Noble
Alfred T. & Betty E. Look Professor of Chemical Engineering
MAST Center Co-Director

MAST Center, University of Colorado at Boulder, 432 UCB, Boulder, CO 80309. Phone: 303-492-7517.

6.9

Budapest University of Technology and Economics
Department of Physical Chemistry and Materials Science
H-1111 Budapest, Budafoki út 6-8., HUNGARY

Dr. Zoltán Hórvölgyi
Associate Professor,
Deputy Head of Department
Telephone: 36-1-4632911
Telefax: 36-1-463-3767
E-mail: zhorvolgyi@mail.bme.hu

Prof. André Ayral
IEM/UMII
Place E. Bataillon cc047
34095 Montpellier
FRANCE

Tel: + 33 04 67 14 91 43
Fax: + 33 04 67 14 91 19

Subject: supporting the initiative for *a joint master course and PhD program in the field of Membrane Engineering*

Budapest, March 30, 2009

Dear Professor André Ayral,

Thank you for your invitation to take part in the initiative for *a joint master course and PhD program in the field of Membrane Engineering*.

The suggested topic is very important for us. The controlled porous structure of sol-gel derived inorganic coatings is in the focus of our recent interest. Hence, I kindly inform you that I support this initiative and I am ready to participate in the program.

With my best regards,

/Zoltán Hórvölgyi/

KAUNAS UNIVERSITY OF TECHNOLOGY

K. Donelaičio g. 73, LT-44029 Kaunas, LITHUANIA. Tel. +370 37 32 41 40 / 30 00 00
Fax +370 37 32 41 44 http://www.ktu.lt E-mail: rastine@ktu.lt

Prof . André Ayral
Institute Européen des Membranes
Université Montpellier 2
Montpellier

April 14, 2009

Subject: *letter of intent for supporting the project of the European Master in Membrane Engineering*

Dear Professor Ayral,

I am writing on behalf of my colleagues of the Faculty of Chemical Technology at Kaunas University of Technology to express my deep appreciation and support of the Erasmus Mundus Project "*Membranes Engineering*" proposed by the European Consortium shown in your document of information.

It is envisaged that a High Quality Master and PhD study program in Membrane Engineering will be made available to European students. This will surely contribute to the advancement of science and technology in a field of the membranes which has an increasing importance and it will reveal as a precious tool for young scientists. These aims are particularly important in the moment then the environment friendly and less energy consuming processes are needed.

Our Institutions will surely be very active in spreading the information of the project in the case of success among our university students and will cooperate in selecting the best candidates for this program.

Sincerely yours,

Rector

Raimundas Šlaučiūnas

Kuban State University

Федеральное агентство по образованию

Государственное образовательное учреждение
высшего профессионального образования

« КУБАНСКИЙ ГОСУДАРСТВЕННЫЙ УНИВЕРСИТЕТ »

ИНН 2312038420

350040, г. Краснодар, ул. Ставропольская, 149

(861) 219-95-02, факс: 219-95-17, 219-95-40 http://www.kubsu.ru E-mail: rector@kubsu.ru

1.04.09 № 379/01 на №

April 1 2009

Professor Bouzek
Institute of Chemical Technology, Prague
Faculty of Chemical Technology
Department of Inorganic Technology
Technicka 5
166 28 Prague 6
Czech Republic

Dear Professor Bouzek

We support completely the proposal for the creation of Joint European Doctorate in "Membrane Engineering" in the frame of ERASMUS MUNDUS Program. Membrane technologies and, in particular, electromembrane ones, where we are specializing, become more and more demanded in industry, being cost efficient and environment friendly. Development and implementation of these technologies need multidisciplinary knowledge. The initiative of the European Network of Excellence NanoMemPro to carry out actions aimed at formation European doctors in the field of membrane engineering is quite actual and useful. The Membrane Institute and the Physical Chemistry Department at the Kuban State University are preparing doctors in membrane science and technology since 1975.

We cooperate with the European Network of Excellence NanoMemPro and the European Membrane House within the frame of a FP7 project MemBridge aimed at the rapprochement of the European and Russian membrane networks. We consider the initiative Erasmus Mundus project as well-timed and valuable, and are ready to contribute in its realization.

Rector of Kuban State University M.N. Astapov

Director of Membrane Institute at KubSU, head of the Physical Chemistry Department, professor V.L. Zabolotsky

Responsible for the FP7 MemBridge project at KubSU, professor V.V. Nikonenko

RUSSIAN ACADEMY OF SCIENCES
A.V.TOPCHIEV INSTITUTE OF PETROCHEMICAL SYNTHESIS RAS
(TIPS RAS)

Leninsky prospect 29,
119991 Moscow, GSP-1, Russia
Phone: +7 (495) 952-59-27,
+7 (495) 955-42-91
Fax: +7 (495) 633-85-20
e-mail: tips@ips.ac.ru

Institute of Chemical Technology
Faculty of Chemical Technology
Prof. K. Bouzek
Technika 5
166 28 Praque 6
Czech Republic

Dear Prof Karel Bouzek,

With this letter our Institute, as a world-known research organization in the membrane area, would like to strongly support the proposed Erasmus Mundus Program of Master and Ph.D degree in Membrane Engineering. We believe that such Program is urgently required today because it focuses on the education of high-skilled young scientists in the very important and potential areas such as energy, environment, nanotechnologies, biodevices, biotechnologies, food and health. We hope that this Program will be supported and looking forward for long-term and fruitful collaboration.

With kind regards,
Alexey Volkov

A.V.Topchiev Institute of Petrochemical Synthesis
Russian Academy of Science
Leninsky pr., 29
Moscow Russia
119991
T: +7 495 955 41 62
F: +7 495 633 85 20
E: avolkov@ips.ac.ru

ANNEX 7. Enrolment projection

Edition	1			2			3			4			5			Total Erasmus Mundus fellowships	Total other fellowships
Category	A	B	Other	A	B	Other	A	B	Other	A	B	Other	A	B	Other		
UNICAL	1	1	0	1	0	1	1	0	2	0	0	2	1	0	2	5	7
K.U.LEUVEN	1	1	0	1	0	1	1	0	2	0	0	2	1	0	2	5	7
ICTP	1	0	1	1	1	1	1	0	1	1	0	2	0	0	2	5	7
UTWENTE	1	0	1	1	0	1	0	1	1	1	0	2	1	0	2	5	7
UM2	1	0	1	1	0	1	0	1	1	1	0	2	1	0	2	5	7
UPS	1	0	1	1	0	1	1	0	1	1	1	2	0	0	2	5	7
Total Erasmus Mundus Fellowships	8			7			6			5			4				

ANNEX 8

Course name: MEMBRANE SCIENCE & TECHNOLOGY	
ECTS credits: 1 / SCIENTIFIC MODULE/	
Used sources	1. L. Strathmann, L. Giorno, E. Drioli, An Introduction to Membrane Science and Technology, CNR, 2006 2. S.P.Nunes, K.-V. Peinemann,Membrane Technology in the Chemical Industry, Wiley-VCH Verlag GmbH, 2001
Short description of course contents	a. Basic membrane types and their preparation b. Characteristic properties of membranes, methods of testing c. Membrane separation processes based on the concentration gradient - osmosis, dialysis d. Pressure membrane processes e. Ion exchange membranes f. Micro- and mesoporous membranes for gas and liquid separation g. Mechanism of mass transfer in membranes h. Catalytic Membrane Reactors
Competencies acquired by the student	**Specific Competencies** 1. To understand general concepts of membrane technology 2. To be able to apply previous knowledge acquired in separation processes and transport phenomena in the separation processes with membranes 3. To understand transport mechanisms in membranes 4. To know basic of membrane preparation and characterization method **Generic Competences** 5. Communication skills. 6. To perform bibliographic searches and to process the acquired information 7. Ability to perform team-work

Activity	**Credits ECTS**	**Methodology**	**Relationship with competences**
Lectures	0,5	Lectures by teaching staff	1, 2, 3, 4
Seminars	0,1	Exercises by teaching staff	1, 2, 3, 4
Tutorials	0,1	Solving questions presented by the students. Direction of the student self-learning. Orientation in the personal assignments.	1, 2, 3, 4
Self-study, working individually	0,2	Preparation of assignments Personal study	1, 2, 3, 4, 5, 6, 7
Evaluation	0,1	Examinations	1, 2, 3, 4, 5, 6

System for assessment and evaluation	1. Assistance and participation in class and laboratory 2. Personal assignments 3. Oral Presentation 4. Examination

8.1

Course name: ADVANCED MEMBRANE PROCESSES	
ECTS credits: 2 / SCIENTIFIC MODULE/	
Used sources	1. Richard W. Baker Membrane Technology and Applications, 2nd Edition, John Wiley & Sons, Ltd., 2004 2. J.G. Sanchéz Marcano and T.T. Tsotsis, Catalytic Membranes and Membrane Reactors
Short description of course contents	a. Membranes in water treatment: reverse osmosis, ultrafiltration, microfiltration, nanofiltration b. Electrodialysis, electrodeionization, PEM fuel cells c. Membrane barriers in gas separation d. Catalytic membrane reactors for energy production & conversion e. Membrane technologies in chemical industry, directions of development
Competencies acquired by the student	**Specific Competencies** 1. To know the main applications of membranes in separation processes, reactor/separation processes and new applications of technological interest 2. To know basic of design of membrane processes, optimization and cost evaluation **Generic Competences** 3. Communication skills. Preparation and display of 'posters' reporting project work 4. To perform bibliographic searches and to process the acquired information 5. Ability to perform team-work

Activity	**Credits ECTS**	**Methodology**	**Relationship with competences**
Lectures	1	Lectures by teaching staff	1, 2, 3, 4
Seminars	0.3	Exercises by teaching staff	1, 2, 3, 4
Tutorials	0,2	Solving questions presented by the students. Direction of the student self-learning. Orientation in the personal assignments.	1, 2, 3, 4
Collaborative project	0,1	Discussion and analysis of the results obtained within the project.	1, 2, 3, 4, 5
Self-study, working individually	0,3	Preparation of assignments Personal study	1, 2, 3, 4, 5
Evaluation	0,1	Examinations	1, 2, 3, 4

System for assessment and evaluation	1. Assistance and participation in class and laboratory 2. Personal assignments 3. Oral Presentation 4. Examination

Course name: ELECTROLYTE MEMBRANES			
ECTS credits: 3/ TECHNICAL MODULE/ CLUSTER 1.1			
Used sources	1. Lecture notes, slides 2. Fuel cell Handbook: U.S. Department of Energy, 2004.		
Short description of course contents	a. Introduction, basic principles and theory b. Thermodynamics of electrochemical cells, losses and efficiency c. Electrolyte membranes, membrane electrode assemblies d. Electrode kinetics e. Different types of batteries and fuel Cells; SOFC, SAFC, PEMFC, f. DMFC, BioFC, AFC, primary and secondary batteries, etc. g. Miniaturization and other recent trends		
Competencies acquired by the student	**Specific Competencies** 1. To know basic concepts and design principles of state-of-art fuel cells and batteries. 2. To understand main transport mechanisms, electrode reactions and interfacial kinetics. 3. The ability to describe the different types of fuel cells and batteries, and to mention differences, application areas, operation conditions, and limitations. 4. To know major developments in the field of fuel cells and batteries, and future trends. **Competences Generic Competences** 5.Communication skills; Oral presentation and group discussions. 6. The ability to conduct a bibliographic search, and how to process the acquired information 7. The ability to perform team-work.		
Activity	**Credits ECTS**	**Methodology**	**Relationship with competences**
Lectures	2	Lectures by teaching staff	1, 2, 3, 4
Tutorials	0,3	Solving exercises, Solving questions raised by the students. Offering support and orientation in assignments.	1, 2, 3, 4
Self-study, working individually	0,5	Individual preparations and study time. Preparation of assignments.	1, 2, 3, 4, 5, 6,7
Evaluation	0,2	Examinations	1, 2, 3, 4, 5
System for assessment and evaluation	1. Assistance and participation in class and laboratory 2. Personal assignments 3. Oral Presentation 4. Examination		

Course name: CATALYTIC MEMBRANE REACTORS & GAS SEPARATION	
ECTS credits: 3 /TECHNICAL MODULE/ CLUSTER 1.2	
Used sources	1. Y. Yampolskii, I. Pinnau, B.D. Freeman, Materials Science of Membranes, John Wiley & Sons, Ltd. 2006. 2. R.W. Baker, Membrane Technology and Applications, John Wiley and Sons Ltd., 2004.
Short description of course contents	a. Introduction, basic principles and theory b. Metallic membranes c. Carbon, zeolite and micro-porous (sol-gel derived) ceramic membranes d. Mixed conducting oxide membranes e. High-temperature catalytic membrane reactors f. Competitive technologies for gas separation and treatment (cryogenic g. distillation, pressure swing adsorption, absorption methods etc.)
Competencies acquired by the student	**Specific Competencies** 1. To know general concepts, state-of-the-art membranes and technology used for gas separation and gas treatment. 2. To understand main transport mechanisms in different types of gas separation membranes. 3. To know main applications of membranes in separation processes, (catalytic) membrane reactors, and new applications of technological interest. 4. To know competitive technologies for gas separation membranes and gas treatment. 5. To prepare and characterize selected membranes. 6. The ability to interpret experimental data and to draw conclusions. **Generic Competences** 7. Communication skills; Oral presentation and group discussions. 8. The ability to conduct a bibliographic search, and how to process the acquired information. 9. The ability to perform team-work. 10. Based on a general problem description the ability to design an experimental Plan 11. Based on a general problem description and experimental plan the ability to conduct practical lab work in an independent way.

Activity	**Credits ECTS**	**Methodology**	**Relationship with competences**
Lectures	2	Lectures by teaching staff	1, 2, 3, 4, 5
Tutorials	0,3	Solving exercises, Solving questions raised by the students. Offering support and orientation in assignments.	1, 2, 3, 4, 5, 6
Self-study, working individually	0,5	Individual preparations and study time. Preparation of assignments.	1, 2, 3, 4, 5, 6
Evaluation	0,2	Examinations	1, 2, 3, 4

System for assessment and evaluation	1. Assistance and participation in class and laboratory 2. Personal assignments 3. Oral Presentation 4. Examination

Course name: MEMBRANE PROCESSES FOR WATER TREATMENT			
ECTS credits: 3 / TECHNICAL MODULE/ CLUSTER 2.1			
Used sources	1. P. Hillis, R. E. Hester, R. M. Harrison Membrane Technology in Water and Wastewater Treatment, Royal Society of Chemistry (2000) 2. Specialized scientific journals		
Short description of course contents	a. Introduction to Maxwell-Stefan description of mass transport b. Application to membrane separation processes c. Reverse Osmosis, Pervaporation d. Ion exchange e. Ultrafiltration f. Membrane contactors for heavy metal removal g. Membrane reactors for advanced oxidation		
Competencies acquired by the student	**Specific Competencies** 1. To understand main transport mechanisms of multi-component transport through liquid separation membranes. 2. To know general concepts, state-of-the-art membranes and technology used for water treatment. 3. To know main applications of membranes in separation processes, and new applications of technological interest. 4. To characterize and describe mass transport properties of selected membranes. **Competences Generic Competences** 5. Communication skills; Oral presentation and group discussions. 6. The ability to conduct a bibliographic search, and how to process the acquired information. 7. The ability to perform team-work.		
Activity	**Credits ECTS**	**Methodology**	**Relationship with competences**
Lectures	2	Lectures by teaching staff	1, 2, 3, 4
Tutorials	0,3	Case-studies and problems discussion. Direction of the self-learning of the student. Orientation of individual assignments. Students recitation of individual assignments. Support of students for preparation of their individual seminar	1, 2, 3, 4
Self-study, working individually	0,5	Preparation of assignments Personal study	1, 2, 3, 4, 5, 6
Evaluation	0,2	Examinations	1, 2, 3, 4, 5
System for assessment and evaluation	1. Assistance and participation in class and laboratory 2. Personal assignments 3. Oral Presentation 4. Examination		

Course name: MEMBRANES IN DOWNSTREAM PROCESSING			
ECTS credits: 3 /TECHNICAL MODULE / CLUSTER 2.2			
Used sources	1. Specialized scientific journals		
Short description of course contents	a. Introduction and general concepts b. Specificity of biological complex media and media /membrane interactions c. Product recovery and fractionation d. Product purification and polishing e. Hybrid processes and process integration f. Process monitoring and control		
Competencies acquired by the student	**Specific Competencies** 1. To acquire general concepts about downstream processing 2. To be able to apply previous knowledge, acquired in separation processes and transport phenomena, in the processing of biological media 3. To be able to design process integration schemes 4. To acquire knowledge about emerging process monitoring tools and their use for process control **Competences Generic Competences** 5. Development of communication skills. 6. Development of problem-solving competences 7. Ability to perform autonomous work 8. Ability to perform data mining		
Activity	**Credits ECTS**	**Methodology**	**Relationship with competences**
Lectures	2	Lectures by teaching staff	1, 2, 3, 4
Tutorials	0.5	Case-studies and problems discussion. Direction of the self-learning of the student. Orientation of individual assignments. Students recitation of individual assignments. Support of students for preparation of their individual seminar	1, 2, 3, 4, 5, 6, 7, 8
Self-study, working individually	0,3	Preparation of assignments Personal study	1, 2, 3, 4, 5, 6, 7, 8
Evaluation	0,2	Examinations	1, 2, 3, 4, 5, 6, 7, 8
System for assessment and evaluation	1. Assistance and participation in class and laboratory 2. Personal assignments 3. Oral Presentation 4. Examination		

Course name: MEMBRANES IN BIOMEDICINE AND INGREDIENT FORMULATION	
ECTS credits: 3 / TECHNICAL MODULE/ CLUSTER 3.1	
Used sources	1. Meyer, U.; Meyer, Th.; Handschel, J.; Wiesmann, H.P. (Eds.), Fundamentals of Tissue Engineering and Regenerative Medicine, Springer (2009) 2. Specialized scientific journals
Short description of course contents	a. Preparation and characterization of membranes for Tissue Culture and Artificial Organs b. Transport phenomena in Tissue Culture and Artificial Organs c. New challenges in Tissue Culture and Artificial Organs d. Biosensors for biomedical applications e. Advanced membrane separation methods for chiral resolution and polymorph control
Competencies acquired by the student	**Specific Competencies** 1. To acquire knowledge about development and characterization of membranes for Tissue Culture and Artificial Organs 2. To be able to model transport in complex Tissue Culture and Artificial Organs systems 3. To acquire knowledge about emerging membrane materials and methods for biomedical applications 4. To acquire knowledge about emerging applications of membranes in regenerative medicine and active ingredients formulation. **Generic Competences** 5. Development of communication skills 6. Development of problem-solving competences 7. Ability to perform autonomous work

Activity	**Credits ECTS**	**Methodology**	**Relationship with competences**
Lectures	1,5	Lectures by teaching staff	1, 2, 3, 4
Tutorials	0,6	Exercises by teaching staff	1, 2, 3, 4
Collaborative project	0,5	Case-studies and problems discussion. Direction of the self-learning of the student. Orientation of individual assignments. Students recitation of individual assignments. Support of students for preparation of their individual seminar	1, 2, 3, 4, 5, 6, 7
Self-study, working individually	0,3	Preparation of assignments Personal study	1, 2, 3, 4, 5, 6
Evaluation	0,1	Examinations	1, 2, 3, 4, 5, 6

System for assessment and evaluation	1. Assistance and participation in class and laboratory 2. Personal assignments 3. Oral Presentation 4. Examination

Course name: NANOSTRUCTURED MEMBRANES	
ECTS credits: 3 / TECHNICAL MODULE/ CLUSTER 4.1	
Used sources	1. Springer handbook of nanotechnology / Bharat Bhushan (ed.) Ed. Springer. 2. Nanotechnology: basic science and emerging technologies / Michael Wilson. et al. Ed. Chapman & Hall/CRC. Boca Raton, Florida. 3. The Chemistry Of Nanomaterials (Vols. 1 Y 2). C.N..R. Rao, A. Müller & A.K. Cheetham. Wiley-VCH
Short description of course contents	a. Introduction to Nanoscience and Nanotechnology. b. Nanomaterials vs. macroscopic materials. c. Optical, electric, magnetic, and mechanical properties of nanomaterials. d. Physical Chemistry of Surfaces: thermodynamic and electrical aspects of surface chemistry and interfaces. e. Colloids, tensoactives, monolayers, micelles, vesicles, capsules. f. Meso and microporous materials, zeolites. g. Nanobiomaterials. Biomacromolecules.
Competencies acquired by the student	**Specific Competencies** 1. To know the "state of the art" in Nanoscience and Nanotechnology, giving value to its multidisciplinary nature as well as its social, economic and legal implications. 2. To understand the conceptual differences between macro and nano systems, acquiring the needed knowledge to approach to nanoscale. 3. To identify materials and compounds of special relevance in the nanoscale, evaluating the achievements and the problems to solve. 4. To understand the importance of surface effects and the forces that appear at the nanoscale as well as their influence in the properties of the nanosystems. 5. To acquire basic knowledge to evaluate properties of special interest in nanostructured materials. 6. To know the legislation about nanostructured materials, analyzing its potential influence on health issues, environment and sustainability. **Generic Competences Generic Competences** 7. To relate previous knowledge acquired, in the field of science, to a new field such as nanoscience and nanotechnology. 8. Self-study and ability to gather information and summarize.

Activity	**Credits ECTS**	**Methodology**	**Relationship with competences**
Lectures	2	Lectures, open discussions, by teaching staff	1, 2, 3, 4, 5, 6
Self-study, working individually	0,8	Preparation of assignments Personal study	1, 2, 3, 4, 5, 6, 7, 8
Evaluation	0,2	Examinations	1, 2, 3, 4, 5, 6

System for assessment and evaluation	1. Assistance and participation in class and laboratory 2. Personal assignments 3. Oral Presentation 4. Examination

Course name: INTELLECTUAL CAPITAL MANAGEMENT	
ECTS credits: 2 /MANAGEMENT MODULE	
Used sources	1. D. A. Klein, The strategic management of intellectual capital, Butterworth-Heinemann (1998) 2. R. Cross, S. Israelit, Strategic learning in knowledge economy, Butterworth-Heinemann (2000)
Short description of course contents	a. Examining the main dynamics affecting competition in the knowledge economy; b. Organizational competencies: knowledge, innovation and intellectual property management; c. Classifications and models that emerged to define, recognize, and measure intellectual capital.
Competencies acquired by the student	**Specific Competencies** 1. Knowledge Management Strategies and Technologies 2. Basic concepts of Business Intelligence, Human Capital Management, Intellectual Capital 3. Internet Technologies & Applications 4. Role of critical thinking, evaluation and research in information and knowledge work; steps in carrying out a research project: problem identification, theoretical framework, methodological design, data collection and analysis; developing a research proposal; communicating research results; assessment and use of results of research studies; critique and review of research studies; ethical concerns and issues associated with research. Generic Competences 5. Communication skills. Knowledge Management Applications and Practices 6. Ability to perform team-work

Activity	**Credits ECTS**	**Methodology**	**Relationship with competences**
Lectures	1	Lectures by teaching staff	1, 2, 3, 4
Seminars	0.6	Presentations by external professionals of industrial applications of membranes	5, 6
Collaborative project	0,3	Critical inquiry in Knowledge management as related to the current research activity.	1, 2, 3, 4, 5, 6
Evaluation	0,1	Examinations	1, 2, 3, 4, 5

System for assessment and evaluation	1. Assistance and participation in class and laboratory 2. Personal assignments 3. Oral Presentation

Course name: VALORISATION, COMMERCIALIZATION AND ENTREPRENEURSHIP	
ECTS credits: 2 /MANAGEMENT MODULE/	
Used sources	1.Commercialiizing Micro-nanotechnology Products. Tolfree, D., Jackson, M. J., Ed.CRC Press 2. World Wide Web to look for companies and products 3. Patent Database:, European Patent Office (esp@cenet)
Short description of course contents	The course consists of a series of seminars taught by industrialists, in different fields, where membranes have been applied as a solution to solve a problem or for the development of a new product. Several case studies of industrial applications will be analyzed. A detailed description of the market before the introduction of a certain nanotechnology product will be performed, followed by the identification of the opportunity, the design of the product or process together with its technological implementation and commercialization. The students in a team-work will prepare a project for the development of a new product based on their acquired knowledge on nanotechnology/membranes.
Competencies acquired by the student	**Specific Competencies** 1. To evaluate the importance of the membrane technology products in the market. 2. To understand the high potential of nanotechnology as an horizontal discipline which is able to integrate in the fabrication process. 3. To identify the distinctive characteristics that the application at the nano-scale give to certain commercial products. 4. To identify the difficulties for the implementation of the advances in the laboratory to the commercial practice. 5. To know directly from the companies and the "main actors" their industrial experience. 6. To recognize the main factors in product design in high technology and their main features that makes them successful commercial products. **Generic Competences** 7. Communication skills. How to present and idea. 8. Ability to perform team-work

Activity	**Credits ECTS**	**Methodology**	**Relationship with competences**
Lectures	1	Lectures by teaching staff	1, 2, 3, 4
Seminars	0.6	Presentations by external professionals of industrial applications of membranes	5, 6
Collaborative project	0,3	Discussion and analysis of the results obtained within the current research activity and perspective for commercialisation.	1, 2, 3, 4, 5, 6, 7, 8
Evaluation	0,1	Examinations	1, 2, 3, 4, 5, 6, 7

System for assessment and evaluation	1. Assistance and participation in class and laboratory 2. Personal assignments 3. Oral Presentation

ANNEX 9

DOCTORAL CANDIDATE AGREEMENT

EUDIME: Erasmus Mundus Doctorate in Membrane Engineering

The present agreement stipulates the essential obligations of the parties directly involved in the programme, here undersigned:

1. **University of Calabria** (UNICAL), as Co-ordinating Institution of the Consortium EUDIME, represented by the Erasmus Mundus coordinator Prof. Enrico Drioli

AND

2. (__*name and surname of the doctoral candidate*__), born (___*date/place/nationality*__), passport/ID number _____

that ensure the successful completion of the EUDIME program.

(___ *Name of the Institution*___) is appointed as "Home University" to the doctoral candidate; **the EUDIME Program will last**:

☐ 36 month, starting on (__*day/month/year*__) and ending on (___*day/month/year*__);

☐ 48 months, starting on (__*day/month/year*__) and ending on (___*day/month/year*__).

During his stay at the Home University, the doctoral candidate is invited to contact (___*Title/ Name and Surname*___) who will serve as Erasmus Life Counsellor.

The doctoral candidate:

- agrees on performing training/research activities related to the following theme/cluster: _____ and detailed in attachment (__*** *a detailed plan of activities will be attached****__), under the supervision of (___*Title/ Name and Surname*___);

- commits himself to carry out the two planned mobility periods (12 months in total, 6 for each stay) in the following Hosting Institutions:

    1. (___ *Name of the Hosting Institution #1*___)
    2. (___ *Name of the Hosting Institution #2*___)

  that have been identified by the Executive Board of the EUDIME Program;

- takes responsibility to attend diligently at the training/research activities and on a regular basis, including courses, seminars, workshops, EMS Summer School etc. (for a total of 12 ECTS), as are deemed necessary by the Supervisory Committee;

- takes responsibility for academic misconduct (plagiarism, falsifying data, inventing citations etc.), and will strictly adhere to basic rules of confidentiality for what concerns the results obtained while carrying out the research activity;

- takes responsibility to strictly respect the programmed deadlines concerning the delivery of annual reports and final thesis manuscript.

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*For doctoral candidate **financially** supported by an Individual EMJD Fellowship*

As a beneficiary of Individual EMJD Fellowship, the doctoral candidate will receive from the EUDIME Consortium:

☐ **Category A**: a sum of 7,500 Euro, as **fixed contribution to the travel**, installation and any other types of costs. It will be paid in three instalments of 2,500 Euro each, corresponding to the installations at the Home University and at the two Hosting Universities, unless different and duly documented needs of the candidate.

☐ **Category B**: no support to the travel and installation costs and any other types of costs.

and:

- a **fixed living allowance (for 36 months)** in the form of **employment contract**: a gross sum of 2,800 Euro/month, from which is deducted the (__ *percentage according to national legislation of the Home University*__)% as compulsory charges and taxes, so resulting in a net salary of _____ Euros/month.

For a EUDIME Program lasting 4 years, the doctoral candidate will receive from the Home University, during the additional fourth year of activities (for 12 months), the same fixed living allowance of 2,800 Euro/month in the form of an **employment contract**, from which is deducted the (__ *percentage according to national legislation of the Home University*__)% as compulsory charges and taxes, so resulting in a net salary of _____ Euros/month.

In all cases, money will be transferred to the following bank Account Coordinates:

Name/Surname _____
Local address of residence _____
Name of the bank _____
Address of the bank _____
IBAN code _____
BIC code _____

The doctoral candidate is responsible for submitting the correct data refer to the bank account. In case of wrong communication, the relative bank charges will be deducted from the salary.
The Consortium may suspend or stop the monthly payment in case of missing or not regularly attending planned training/research activities, or insufficient proficiency in annual examination, or not compliance with the EUDIME rules.

As a EMJD recipient, the doctoral candidate will receive a fixed contribution of 600 Euro/month (7,200 Euro/year or 21,600 Euro for 36 months) as **fixed contribution to the doctoral candidate participation costs.** The doctoral candidate agrees that the EUDIME Consortium will deduct directly from the overall Individual EMJD Fellowship this sum for mandatory costs – established regardless of actual place of study and research, as detailed in the following table:

Breakthrough of tuition fees and other participation costs	
TUITION FEES	1,000 Euro/year
LABORATORY AND EQUIPMENT UTILIZATION & MAINTENANCE COST	3,000 Euro/year
INSURANCE	500 Euro/year
PHONE/FAX/PC/LIBRARIES	200 Euro/year
ATTENDANCE AT SUMMER SCHOOLS, MEETINGS, CONFERENCES	2,000 Euro/year
COSTS RELATED TO TRAINING ACTIVITIES	500 Euro/year
TOTAL	7,200 Euro/year

For a EUDIME program lasting 4 years, the Home University will fund, during the additional fourth year of activities (12 months), costs related to: tuition fees, laboratory and equipment utilization and maintenance costs, insurance coverage against accidents *occurred during the training/research activities only*, use of libraries/phone/fax/PC, costs related to training activities.

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*For doctoral candidate **not financially** supported by an Individual EMJD Fellowship*

The doctoral will pay the tuition fees, in the amount of **1,000** Euro/year, at the beginning of each year of activity (by the end of September), on the following account:

IBAN: IT 40 I 01030 80880 000000011319

The Consortium guarantees insurance coverage against accidents *occurred during the training/research activities only.*

After fulfilment of the EUDIME Programme, the Consortium will award to the doctoral candidate a Multiple Doctoral Degree (released by the Home University and the two Hosting universities) together with a Diploma Supplement (released by the co-ordinating institution on behalf of the EUDIME Consortium).

Tick appropriate box

☐ **Dottorato di Ricerca Erasmus Mundus in Ingegneria delle Membrane**, Università della Calabria (Italy)
☐ **Doctorat en Sciences Chimiques**, Université Montpellier 2 (France)

☐ **Doctor in de Bio-ingenieurswetenschappen**, Katholieke Universiteit Leuven (Belgium)

☐ **Doctorat en Génie des procédés et de l'environnement**, Université Paul Sabatier (France)

☐ **Doctorsky Studijni Program Chemie a Chemické Technologie**, Institute of Chemical Technology Prague (Czech Republic)
☐ **Doctor aan de Universiteit Twente**, University of Twente (The Netherlands)

The local coordinator at the Home University is responsible for the formalization of this agreement upon the candidate's arrival; the signed agreement is forwarded to the Doctoral Office at UNICAL. Any dispute among the Parties will be handled by the EUDIME co-ordinator; insurmountable conflicts will be solve according to Italian legislation.

The Consortium Coordinator
(Prof. Enrico Drioli)

The Local Coordinator
at (__ *Name of the Home University*__)
(____*Name/Surname of the Local Coordinator*____)

Date:

Date:

The Doctoral Candidate
(___*Name/Surname of the Doctoral Candidate*____)

Date:

ANNEX 10

Erasmus Mundus Doctorate in Membrane Engineering - EUDIME

DIPLOMA SUPPLEMENT

This Diploma Supplement follows the model developed by the European Commission, Council of Europe and UNESCO/CEPES. The purpose of the supplement is to provide sufficient independent data to improve the international 'transparency' and fair academic and professional recognition of qualifications (diplomas, degrees, certificates etc.). It is designed to provide a description of the nature, level, context, content and status of the studies that were pursued and successfully completed by the individual named on the original qualification to which this supplement is appended. It should be free from any value judgments, equivalence statements or suggestions about recognition. Information in all eight sections should be provided. Where information is not provided, an explanation should give the reason why.

1. Information identifying the holder of the qualification

1.1 *Family name (s)* _____

1.2 *First name (s)* _____

1.3 *Date and Place of Birth* _____

1.4 *PhD Student Identification Number* _____

2. Information identifying the qualification

2.1 *Name of qualification and title conferred with official abbreviation*
Doctor/PhD

2.2 *Main fields of study for the qualification*
Engineering and processes, industrial and chemical processes, material science, physics & chemistry, nanoscience and nanotechnology, energy, environmental control, food industry, pharmaceutical industry, biomedical applications, biotechnology.

2.3 *Multiple degree awarded, name and status of the awarding institution (original language)*

Tick appropriate box

☐ **Dottorato di Ricerca Erasmus Mundus in Ingegneria delle Membrane**, Università della Calabria (Italy)

☐ **Doctorat en Sciences Chimiques**, Université Montpellier 2 (France)

☐ **Doctor in de Bio-ingenieurswetenschappen**, Katholieke Universiteit Leuven (Belgium)

☐ **Doctorat en Génie des procédés et de l'environnement**, Université Paul Sabatier (France)

☐ **Doctorsky Studijni Program Chemie a Chemické Technologie**, Vysoká Škola Chemicko-Technologická v Praze, (Czech Republic)

☐ **Doctor aan de Universiteit Twente**, Universiteit Twente (The Netherlands)

2.4 *Name and status of institution administering studies*
Università della Calabria (Italy)

2.5 *Language(s) of instruction/examination*
English

3. Information on the level of the qualification

3.1 *Level of the qualification*
Third cycle doctoral studies

3.2 *Official length and workload of studies*
Tick appropriate box
☐ **3-years** doctoral programme – 180 ECTS
☐ **4-years** doctoral programme – 240 ECTS

3.3 *Access requirements*

- Candidate must hold a Bologna 2nd Cycle Degree or a Master degree (120 ECTS) in Chemical Engineering, Process Engineering, Bio-Engineering, Materials Science, Chemistry or a equivalent degree in a pertinent field, awarded by a College, University or Technical School with recognized standing. Recognized proficiency in English.
- Candidates are evaluated according to fair, transparent and objective evaluation criteria on the basis of their academic record, professional experience and qualification, recommendation and motivation letters. Selection is done by the Admission&Examination Committee (A&EC).

Candidate enrolled at _____(Home University)_____
Date and place: _____

4. Information on the contents of the programme and results gained

4.1 *Mode of study*
Tick appropriate box
☐ 3-years full time (180 ECTS)
☐ 4-years full time (240 ECTS)
including:

- teaching/training activities (12 ECTS)
- research activities at _____ (Home University) _____
- first mobility period (start: *dd/mm/yyyy*; end: *dd/mm/yyyy*) at _____(*Hosting University#1*)_____
- second mobility period (start: *dd/mm/yyyy*; end: *dd/mm/yyyy*) at ____(*Hosting University#2*)____
- final doctoral thesis

4.2 Programme requirements

- Validation of all compulsory **scientific, technical and management modules** (see section 4.4) by the Admission & Examination Committee. Each module requires to get a grade superior or equal to E (see section 4.4);
- Annual validation of the **research activity** (written report and oral communication) by the Executive Board;

- Fulfillment of the scheduled **mobility periods**;
- Successful Final Defense.

4.3 Programme details and individual grades/marks obtained

Research activities

Theme of the research

Tick appropriate boxes

☐ **ENERGY**

- ☐ Cluster 1.1: Electrolyte membranes for fuel cells
- ☐ Cluster 1.2: Membranes for gas separation, catalytic reactors & biofuel production

☐ **WATER AND ENVIRONMENT**

- ☐ Cluster 2.1: Membrane systems for desalination and water purification
- ☐ Cluster 2.2: (Bio-Catalytic) Membrane Reactors for wastewater treatment

☐ **HEALTH & BIOTECHNOLOGY**

- ☐ Cluster 3.1: Biomedical membrane processes/Active Pharmaceutical Ingredients/Food formulation

☐ **NEW MEMBRANE MATERIALS & PROCESSES**

- ☐ Cluster 4.1: Nanofabrication/inorganic-hybrid membranes/molecular-scale monitoring

Provide a short statement of the specific research activity

Research project title:
Objective(s):

Methods:

Results:

The research activity has been prevalently carried out at the:

Tick box corresponding to the Home University

- ☐ Department of Chemical Engineering and Materials – University of Calabria (ITALY)
- ☐ European Membrane Institute – University of Montpellier 2 (FRANCE)
- ☐ Centre of Surface Chemistry and Catalysis – Katholieke Universiteit Leuven (BELGIUM)
- ☐ Department of Science and Technology – University of Twente (THE NETHERLANDS)
- ☐ Chemical Engineering Laboratory – University of Toulouse "Paul Sabatier" (FRANCE)
- ☐ Department of Inorganic Technology – Institute of Chemical Technology of Prague (CZECH REPUBLIC)

under the supervision of :

(Dr/Prof.) _____ from _____ *(Home University)* _____
(Dr/Prof.) _____ from _____ *(Host. University#1)*_____
(Dr/Prof.) _____ from _____ *(Host. University#2)*_____
Dr. _____ _____ from _____ *(Industrial partner)*_____

First mobility period
Name of the visited Institution/Department: _____
Supervisor *(@ Hosting University)*: Dr/Prof _____

Provide a short statement of the specific research activity during the mobility period

Objective(s):

Methods:

Results:

Second mobility period
Name of the visited Institution/Department: _____
Supervisor *(@ Hosting University)*: Dr/Prof _____

Provide a short statement of the specific research activity during the mobility period

Objective(s):

Methods:

Results:

Teaching/Training activities

SCIENTIFIC MODULES (provide a general knowledge on membrane science and technology) 5 ECTS				
COURSE TITLE	LOCATION	DATE	GRADE	ECTS
Membrane science & technology		*dd/mm/yyyy*	*from A to F*	1
Advanced membrane processes		*dd/mm/yyyy*	*from A to F*	2
EMS Summer School		*dd/mm/yyyy*	==	1
EMS Summer School		*dd/mm/yyyy*	==	1
TECHNICAL MODULES (provide a technical knowledge necessary to the conduction of the research in a given thematic field). Candidates are requested to attend the technical module corresponding to their specific thematic cluster. 3 ECTS Tick appropriate box				
☐ Electrolyte Membranes	Katholieke Universiteit Leuven	*dd/mm/yyyy*	*from A to F*	3
☐ Catalytic membrane reactors & Gas separation	Universiteit Twente	*dd/mm/yyyy*	*from A to F*	3
☐ Membrane processes for water treatment	Università della Calabria	*dd/mm/yyyy*	*from A to F*	3
☐ Membranes in downstream processing	Université Paul Sabatier	*dd/mm/yyyy*	*from A to F*	3
☐ Membranes in biomedicine and ingredient formulation	Université Montpellier 2	*dd/mm/yyyy*	*from A to F*	3
☐ Nanostructured membranes	Institute of Chemical Technology Prague	*dd/mm/yyyy*	*from A to F*	3
MANAGEMENT MODULES (transferrable skills training related to research and industry) 4 ECTS				
Intellectual capital management	Università della Calabria & e-learning platform	*dd/mm/yyyy*	*from A to F*	2
Valorisation, commercialisation and entrepreneurship	Institute of Chemical Technology Prague & e-learning platform	*dd/mm/yyyy*	*from A to F*	2

Optional Language Courses

COURSE TITLE	LOCATION	DATE	GRADE	ECTS
		dd/mm/yyyy	*from A to F*	1
		dd/mm/yyyy	*from A to F*	1

Short-term traineeship (*if any*)
Name of the visited Industrial company: _____
from *dd/mm/yyyy to dd/mm/yyyy*
Supervisor *(@ Hosting University)*: Dr./Eng./ _____

Provide a short statement of the specific research activity during the traineeship period

Objective(s): *Methods & Results:*

Doctoral thesis
Title:
_____
Language: English
The two thesis'abstracts are provided in English and _____(*2nd EU language*)_____.

The Final oral Thesis Defense took place on dd/mm/yyyy at the _____
in front of the Doctoral Thesis Committee, composed by:

(Dr/Prof) _____ from _____*Institution*_____
(Dr/Prof) _____ from _____*Institution*_____
(Dr/Prof) _____ from _____*Institution*_____
(Dr/Prof) _____ from _____*Institution*_____
(Dr/Prof) _____ from _____*Institution*_____
(Dr/Prof) _____ from _____*Institution*_____
(Dr/Prof) _____ from _____*Institution*_____

4.4 Grading scheme and grading distribution guidance for ***teaching/training activities***
The used grading scale is ECTS grading system defined in ECTS framework by European Commission:

Grade	Best	National grade equivalents				
		Italy	France	The Netherlands	Spain/Belgium	Czech Republic
A	10%	30-30L	20->18	10->9	20->18	A
B	25%	27-29	18->16	9->8	18->16	B
C	30%	24-26	16->14	8->7	16->14	C
D	25%	19-23	14->12	7->6	14->12	D
E	10%	18	12->10	6->5	12->10	E
FX	Fail – some more work required	14-17	10->8	Fail	10->8	FX
F	Fail – considerable further work required	0-13	<8	Fail	<8	F

4.5 Overall classification of the qualification
The doctoral degree is awarded without distinction.

5. Information on the function of the qualification

5.1 Access to further studies
Post-doctoral studies.

5.2 Professional status
This Doctoral Degree enables to access to a position of engineer or researcher in industry or in academy.
EDUCATIONAL, SCIENTIFIC AND TECHNOLOGICAL OUTCOMES (level 8), as identified by the European Qualification Framework:

1) systematic and advanced understanding in membrane engineering, and mastery of harmonized terminology, research protocols, analytical methods and measures;
2) ability to conceive, design, implement and adapt a research program in membrane engineering with scholarly integrity;
3)capability of critical analysis, independent management of complex ideas and problems, ability to properly communicate within the scientific community, to promote, within academic and professional contexts, technological, social and cultural advancements in a knowledge-based society;
4) solid contribution, through original research, to the advance of knowledge with expected impact in various socio-economical areas in which membrane engineering can play a prominent role in improving the quality of life and insuring a sustainable development: health, food, energy, clean processes.

6. Additional information

6.1 Additional Information

Details about the Higher Education Institutions where the qualification was taken:

Università della Calabria (Italy): http://www.unical.it
Université Montpellier 2 (France): www.univ-montp2.fr
Katholieke Universiteit Leuven (Belgium): www.kuleuven.be/kuleuven/
Université Paul Sabatier (France): www.ups-tlse.fr/
Vysoká Škola Chemicko-Technologická v Praze (Czech Republic): www.vscht.cz/homepage/english
University of Twente (The Netherlands): www.universiteittwente.nl/en

6.2 Further information resources
EUDIME Website: www.em3e.eu

7. Certification of the supplement

7.1 Date

Issued on _____

7.2 Signatures
The diploma supplement is delivered by the University off Calabria, Coordinating Institution of the EUDIME programme.

_____ _____
(Prof. Enrico Drioli) (Prof. Giovanni Latorre)

7.3 Capacity
Enrico Drioli: Full professor, coordinator of the EUDIME Programme.
Giovanni Latorre: Rector of the University of Calabria, Italy

7.4 Seal
Official stamp of the University of Calabria (ITALY)

8. Information on the National Higher Education Systems

ITALY: http://www.miur.it
FRANCE: http://www.enseignementsup-recherche.gouv.fr
BELGIUM: http://www.highereducation.be/home
SPAIN: http://www.educacion.es
CZECH REPUBLIC: http://www.msmt.cz
THE NETHERLANDS: http://www.minocw.nl
PORTUGAL: http://mctes.pt

ANNEX 11

Erasmus Mundus Doctorate in Membrane Engineering - EUDIME

Cooperation Agreement

Between

- Università della Calabria (Italy), hereby represented by Prof. Giovanni Latorre in his capacity of Rector;
- Université Montpellier 2 Sciences et Techniques (France), hereby represented by Prof. Daniele Herin in his capacity of President;
- Université Paul Sabatier (France), hereby represented by Prof. Gilles Fourtanier in his capacity of President;
- Vysoká Škola Chemicko-Technologická v Praze (Czech Republic), hereby represented by Prof. Josef Koubek in his capacity of Rector;
- Katholieke Universiteit Leuven (Belgium), hereby represented by Prof. Mark Waer in his capacity of Rector;
- Universiteit Twente (The Netherlands), hereby represented by Dr. Anne Flierman in his capacity of Chairman of the Executive Board

as *full partners* of the EUDIME Consortium,

and :

- Universidad de Zaragoza (Spain), hereby represented by Prof. Manuel J. Lopez Perez in his capacity of Rector;
- Universidade Nova de Lisboa (Portugal), hereby represented by Prof. Fernando Santana in his capacity of Director of FCT-UNL;
- RWTH Aachen University (Germany), hereby represented by Prof. Ernst M. Schmachtenberg in his capacity of Rector;
- SAPIO Produzione Idrogeno Ossigeno SrL (Itay), hereby represented by Ing. Stefano Tonini in his capacity of General Sales Manager;
- Anjou Recherche- VEOLIA ENVIRONMENT, hereby represented by Dr. Jean-Christophe Schrotter in his capacity of Membrane R&D Director;
- ALFA LAVAL A/S (Denmark), hereby represented by Dr. Nick Corner-Walker in his capacity of Director Business Centre Membranes;
- GVS (Italy), hereby represented by Dr. Soccorso Gaeta in his capacity of Responsible for International Cooperation;
- MIKROPUR (Czech Republic), hereby represented by Dr. Jaroslav Pridal in his capacity of General Manager;
- European Membrane House, hereby represented by Prof. Gilbert Rios in his capacity of Director;
- European Membrane Society, hereby represented by Dr. Lidietta Giorno in his capacity of President

as *Associate Partners* of the EUDIME Consortium:

WHEREAS

- all Partners join their efforts to create an Erasmus Mundus Doctorate in Membrane Engineering (EUDIME) in order to promote excellence, innovation and mobility related to membrane science and technology;
- all Partners recognize the strategic value of the Programme and will make every effort to ensure the proper implementation, sustainability and continuity beyond Community funding;

- the six *full partner* Universities assure a full Institutional Commitment, will make available the facilities and equipment necessary to achieve the educational and scientific goals of the Programme, will provide all necessary assistance to welcome and accommodate the PhD students using all means available, including housing facilities, meal services, coaching, sport and social activities, assistance with social insurance and visas and support to doctoral candidates with family or with special needs;
- the six *full partner* Universities will release to successful doctoral candidates a multiple degree (from the three universities visited by the Candidate during the Programme), accredited and recognized in all the Countries of the Consortium and, specifically:

Dottorato di Ricerca Erasmus Mundus in Ingegneria delle Membrane, Università della Calabria (Italy)
Doctorat en Sciences Chimiques, Université Montpellier 2 (France)
Doctor in de Bio-ingenieurswetenschappen, Katholieke Universiteit Leuven (Belgium)
Doctorat en Génie des procédés et de l'environnement, Université Paul Sabatier (France)
Doctorsky Studijni Program Chemie a Chemické Technologie, Vysoká Škola Chemicko-Technologická v Praze, (Czech Republic)
Doctor aan de Universiteit Twente, Universiteit Twente (The Netherlands)

having as a final objective to offer a joint degree throughout all the universities participating from the consortium.

Article 1. Student administration

Article 1.1 Admission requirements

- Candidate must hold a Bologna 2nd Cycle Degree or a Master degree (120 ECTS) in Chemical Engineering, Process Engineering, Bio-Engineering, Materials Science, Chemistry or a equivalent degree in a pertinent field, awarded by a College, University or Technical School with recognized standing. Recognized proficiency in English.
- Candidates are evaluated according to fair, transparent and objective evaluation criteria on the basis of their academic record, professional experience and qualification, recommendation and motivation letters. Selection is done by the Admission&Examination Committee (A&EC).

Article 1.2 Selection

Selection procedure is done by the Admission&Examination Committee (A&EC) during 2 meetings taking place in person or via video-conference/Skype organized by the Coordinator. In the first meeting, A&EC verifies the coherence of applications with admission criteria and provide a ranked selection list (to be published on the website) made on the basis of pre-defined, fair transparent and objective evaluation criteria where CV, educational background, scientific/professional experience, letters of motivation and recommendation, according to the following scheme:

Final grade of the Master degree	From 1 to 5, proportionally to final score If final grade of the Bologna Master degree is applicable: - in the top 5%: 5 - in the top 10%: 4 - in the top 20%: 3		
	Very good	*Good*	*Fair*
Professional/Scientific experience	2.0	1.0	0.5
Motivation/Recommendation letters	1.0	0.5	0.25
Interview (second step)	2.0	1.0	0.5

Recognition and evaluation of qualifications will focus on judging the achievements of the person rather than his/her circumstances or the reputation of the institution where the qualifications were gained.
Mobility experiences will be recognized as a valuable contribution to the professional development of a researcher.
For female applicants, career breaks in CVs due to maternity will not be penalised.

11.2

In a second step, A&EC finalises the selection list by interview via phone or videoconference to candidates. Final selection results will be available on EUDIME web-site and communicated by e-mail (and regular e-mail) to successful applicants. A good balance in terms of country of origin and gender will be ensured. Partners adopt accessibility measures for candidates with special needs in order to encourage their application to the Programme.

Article 1.3 Enrolment of students

All doctoral candidates are registered at the consortium secretariat located at the University of Calabria (Coordinating Institution). PhD students must enrol at their starting (Home) University, while they will be registered at the hosting Universities for their 2 mobility periods. Each student will be assured access to services and to receive the certification of his studies (certification of mobility, transcript of records, diploma supplement and diploma) from all the Institutions involved.

Article 2. Programme structure

Article 1.1 Length and workload of studies

The Programme includes:

- teaching/training activities (12 ECTS)

SCIENTIFIC MODULES (provide a general knowledge on membrane science and technology) 5 ECTS				
NAME	UNIVERSITY	TERM	ECTS	NOTE
Membrane science & technology	all 6 HEI	M1-M3	1	Homologation
Advanced membrane processes	all 6 HEI	M3-M6	2	Homologation
N°2 Summer Schools	EMS	M21; M31	Tot. 2	Homologation
TECHNICAL MODULES (provide a technical knowledge necessary to the conduction of the research in a given thematic field). Candidates are requested to attend the technical module corresponding to their specific thematic cluster. 3 ECTS				
Electrolyte Membranes	K.U.Leuven	M6-M9	3	Cluster 1.1
Catalytic membrane reactors & Gas separation	UTWENTE	M6-M9	3	Cluster 1.2
Membrane processes for water treatment	UNICAL	M6-M9	3	Cluster 2.1
Membranes in downstream processing	UPS	M6-M9	3	Cluster 2.2
Membranes in biomedicine and ingredient formulation	UM2	M6-M9	3	Cluster 3.1
Nanostructured membranes	ICTP	M6-M9	3	Cluster 4.1
MANAGEMENT MODULES (transferrable skills training related to research and industry) 4 ECTS				
Intellectual capital management	UNICAL/e-learning platf.	M18-M21	2	Common
Valorisation, commercialisation and entrepreneurship	ICTP/e-learning platf.	M18-M21	2	Common(held in cooperation with industrial partners)

Courses are mandatory, provided in English language and also available on e-learning platform; the proficiency will be assessed by the Supervisory Committee.

- research activity of:
  - 3-years full time (180 ECTS) at: Università della Calabria, Université Montpellier 2 Sciences et Techniques, Université Paul Sabatier;
  - up to 4-years full time (240 ECTS) at: Vysoká Škola Chemicko-Technologická v Praze, Katholieke Universiteit Leuven;
  - 4-years full time (240 ECTS) at: Universiteit Twente
- two mandatory mobility periods (6 months each);

Themes of research:

- ENERGY
  - Cluster 1.1: Electrolyte membranes for fuel cells
  - Cluster 1.2: Membranes for gas separation, catalytic reactors & biofuel production

 WATER AND ENVIRONMENT

- Cluster 2.1: Membrane systems for desalination and water purification
- Cluster 2.2: (Bio-Catalytic) Membrane Reactors for wastewater treatment

 HEALTH & BIOTECHNOLOGY

- Cluster 3.1: Biomedical membrane processes/Active Pharmaceutical Ingredients/Food formulation

 NEW MEMBRANE MATERIALS & PROCESSES

- Cluster 4.1: Nanofabrication/inorganic-hybrid membranes/molecular-scale monitoring

- final doctoral thesis.

Article 2.2 Academic progress, examination and transfer of credits

For training/teaching activities, the used grading scale is ECTS grading system defined in ECTS framework by European Commission:

Grade	Best	National grade equivalents				
		Italy	France	The Netherlands	Spain/Belgium	Czech Republic
A	10%	30-30L	20->18	10->9	20->18	A
B	25%	27-29	18->16	9->8	18->16	B
C	30%	24-26	16->14	8->7	16->14	C
D	25%	19-23	14->12	7->6	14->12	D
E	10%	18	12->10	6->5	12->10	E
FX	Fail – some more work required	14-17	10->8	Fail	10->8	FX
F	Fail – considerable further work required	0-13	<8	Fail	<8	F

Joint supervision and monitoring of doctoral candidates are implemented in order to ensure a daily progression of the doctorate programme towards the established objectives. A personal supervisor is appointed to each doctoral candidate. Full-time ordinary, associate and assistant professors are eligible for supervision activity. The supervisor carriers the responsibility for the scientific training of the PhD candidate and serves as a link with: 1) the Executive Board; 2) the Admission & Examination Committee A&EC; 3) the Supervisory Committee SC, composed by 5 members: 2 academic representatives of the Home University, 1 academic representatives for each of the 2 Hosting Universities, 1 co-supervisor from Industrial Associate Partners with the aim to orient the research to specific industrial applications. SC will be in charge to: i) assess the proficiency of candidates on the taught part (scientific/technical/management modules) of the Programme; ii) approve the written & oral reports provided by candidates at the end of each year of activity; iii) monitor mobility periods; approve the PhD Thesis manuscript.

At the end of each year of activity, examination procedures also include the following deliverables:

- a written report on research/training activities, preventively approved by the supervisor and positively considered by the Supervisory Committee, that the doctoral candidate must provide to the Admission & Examination Committee. The A&EC reports to Executive Board about the doctoral candidate activity. The enrolment to the successive year of activity, or to the final defence, depends on: 1) the positive judgement of A&EC; 2) the definitive approval of the Executive Board;
- an oral report (in the form of a seminar) on research/training activities in front of the Supervisory Committee, members of the University Department(s) where activities have been carried out, and Video Conference during Doctoral Meeting Days.

COMPULSORY ELEMENTS for a successful completion of the doctorate programme are:

iv) the candidate must have produced at least 2 scientific publications (in the form of journal article, contribution to a book, conference proceedings, patent) at international level;
v) the candidate must have successfully attended teaching/training activities for a total of 12 ECTS;
vi) the candidate must have fulfilled the scheduled mobility periods.

By July 1st, the doctoral candidate is requested to submit own PhD Thesis manuscript to A&EC upon approval of the supervisor and SC.

By July 20-25th, a preliminary oral defence is organized at the Home University in front of the SC and of the academic staff of the Department where research activities have been carried out.

By the July 31th, the A&EC assesses the content (with special look to the originality and innovative contributions of the work) and the form of the PhD Thesis manuscript and decides if the manuscript is approved (eventually subject to minor/major revisions) or rejected. The doctoral candidate is thus requested

iii) if approved with revision: to amend the manuscript according with comments;
iv) if rejected: a chance to prepare a new manuscript is offered;

and send back to the A&EC by September 15th for the definitive approval or rejection. The final decision on the approval or rejection of the PhD Thesis must be certified by the Executive Board.

The Executive Board nominates an External Evaluation Committee (EVC), composed up to 7 members:

- 3 professors from Academic Institutions supporting EUDIME programme;
- 2 Industrial Representatives from the Industrial Club of Interest;
- members of the Ministry of Education for countries whenever this is expressly requested.

A copy of the PhD thesis is send to each EVC member.

Article 3. Diploma delivery

The FINAL PUBLIC DEFENSE will take place by October 31th in one of the Universities of the consortium. The doctoral candidates will present key findings and conclusion of their research activities in front of the External Evaluation Committee and 3 academic staffs of HEI Partners. The result will be announced immediately after the deliberation in public section.

Article 3. Cooperation aspects of the Programme

Article 3.1 Coordinating Institution

The Programme is coordinated by the University of Calabria (ITALY)

Article 3.2 The governing boards and committees

In order to assure full co-operation among all the Institutions of the Consortium, the Parties agree to establish the following organisms:

EXECUTIVE BOARD has a highest advisory, strategic and decisional role. It is composed by the local co-ordinators of each full partner institutions (one representative per university). The head of the Executive Board is elected by its members for a period of 2 years. The Programme Coordinator will provide the interface with the Executive Agency (EC-EACEA)

MANAGEMENT BOARD: has in charge the management of administrative and financial aspects. It will: 1) monitor the financial activities within the programme, ensure funding is distributed appropriately, prepare financial reports regularly; 2) manage contract issues; 3) provide access to University's administrative services through Local Management Offices (one per full partner University); 4) transfer "best-practice" concepts between all the Partners. The head of the Executive Board is elected by its members for a period of 3 years.

PROGRAM COMMITTEE: in charge to monitor and support the proper and efficient implementation of the Programme. It is composed of 1 representative per full partner and associate partner institution, and 2 doctoral candidates' representatives (elected among their colleagues for a period of 3 years). The head of the Executive Board is elected by its members for a period of 3 years. Within the Programme Committee, each partner institution assumes the specific role:

UNICAL: organisational arrangements and cooperation mechanisms within the Consortium;
UM2: link with Erasmus Mundus Master in Membrane Engineering (EM3E) and other Bachelor programmes;
K.U.LEUVEN: services provided by the Consortium to host doctoral candidates;

ICTP: relationships with industries/monitoring career prospect of doctored;
UTWENTE: quality assurance aspects of the Doctorate Programme;
UPS: implementation and management of e-learning platform;
UNIZAR: information and promotion activities;
UNL: exploring extra-Erasmus Mundus funding opportunities for assuring the financial sustainability of the Programme;
RTWH: support to dissemination activities;
EMS: reinforce links with 3C Associations, Institutions, Universitites;
EMH: reinforce links with Industrial World operating in the frame of membrane technology;
SAPIO SrL, VEOLIA Environment, MIKROPUR, GVS, ALFA LAVAL: monitor the coherent evolution of the EUDIME with respect to expectations from Industry; reinforce professional outcomes of candidates through co-supervision and orienting research activities; explore possibility of financial support to the program; technology transfer.

ADMISSION AND EXAMINATION COMMITTEE (A&EC): is responsible for enrolment procedures, PhD student's achievement, progression and annual evaluation of their activities. It is composed of 1 representative per full partner University and 1 representative per Associate Industrial Partner. The head of the Committee is elected by its members for a period of 3 years.

QUALITY COMMITTEE: is in charge of the quality assurance of the programme of the EUDIME Programme, including student feedback. It organises and analyses the internal evaluation procedures carried out by the local Education-Quality Assurance Offices present in each partner University, implement candidates feed-back evaluation systems, interfaces with an External Evaluation Committee, assesses the partnership efficiency and evaluates the attractiveness of the programme. It communicates back to the Executive Board in order to improve administrative and scientific quality of the programme and to define strategic developments in terms of future research trends and employment opportunities. It is constituted by 1 representative per each (full/associate) Partner and 2 elected doctoral candidates' representatives. The head of the Committee is elected by its members for a period of 3 years.

Article 4. Quality assurance

Article 4.1 Internal assessment procedures
All Partner Universities monitor the quality of the Doctoral programme through their local Education-Quality Assurance Offices, that commend evaluation procedures to national and international quality assurance bodies. In particular:

- ITALY: CNSU (Comitato Nazionale per la Valutazione del Sistema Universitario) www.cnvsu.it
- FRANCE: AERES (Agence d'Evalutation de la Recherce et de l'Einsegnement Superior) www.aeres-evaluation.fr
- NETHERLANDS AND BELGIUM: NVAO (Netherlands-Flemish Accreditation Organization; Nederlands-Vlaamse Accreditatieorganisatie) www.nvao.net
- CZECH REPUBLIC: CAI (Cesky Institut pro Akreditaci) www.cai.cz

In addition, the internal EUDIME Quality Committee is in charge to monitor the quality of training/research activities, to assesses the partnership efficiency and progress towards the goals of the program, to evaluates the attractiveness of the programme.

Article 4.2 External evaluation
EXTERNAL EVALUATION will be assessed by the "External Evaluation Committee", composed by 3 academics with well recognized reputation and 2 industrial representatives; for the FIRST EDITION: Prof. Kang Li (Imperial College – UK), Prof. Andre Nagy (Director of Veszprem University – Hungary), Prof. K-H. Lee (Director of Strategy and Cooperation Division of the Korea Research Institute of Chemical Technology), Dr. T. D. Phillips (SASOL Technology – South Africa), Dr. Didier Noel (Research Division Electricité de France- France).

Article 5. Financial management

CONSORTIUM LUMP SUM: as Coordinating Institution, UNICAL will receive an additional financial contribution of 5,000 Euro/edition for internal management costs; the remaining sum (45,000 Euro/edition) will be equally divided among the 6 partner Universities (7,500 Euro/edition to each Institution).

11.6

TUITION FEES: all doctoral candidates will pay the tuition fees (1,000 Euro/year) at the Co-ordinating Institution (University of Calabria) that will provide to transfer the entire sum to the Home University assigned to doctoral candidate after selection procedure.

ERASMUS MUNDUS FELLOWSHIPS: For a recipient of Erasmus Mundus fellowship (participation costs: 7,200 Euro/year), the remaining sum (6,200 Euro/year or 516,7 Euro/month) will be allocated among involved Institutions on a pro-rata time based: the annual amount is assigned to each visited Institution (Home + 2 Hosting University) proportionally to the time spent by the doctoral candidate for training/research activities.

SINGLE EMPLOYMENT CONTRACTS will be used to appoint candidates in all partner Universities.

Article 6. Agreement duration

This agreement is valid for 3 academic years, with tacit renewal fro another equivalent period of time except notice of termination by at least one of the partner Universities, by registered by post-mail sent 6 months before the end of the current period of agreement.