CHERNEws

Internal information bulletin of the CHERNE network

#2 - October 2013
Editors: J. Ródenas, F. Tondeur

CONTENTS

- ***Calendar of CHERNE intensive programmes and intensive courses for 2013-2014***
- ***CHERNE databases***
- ***CHERNEws is your bulletin***
  Travel grant for staying at ISIB, Brussels

1. Calendar of CHERNE intensive programmes and intensive courses for 2013-2014

The calendar of CHERNE activities in 2013-2014 is given in page 2. The details about these activities are annexed to the bulletin, because the CHERNE information platform is not yet operational.

2. CHERNE databases

The database of **CHERNE electronic addresses** is operational but will not be disseminated through the bulletin. It is indeed expected that the bulletin can be forwarded to other colleagues and to students, without any restriction. The database includes presently 63 names of colleagues involved in the activities of the network.

The database for **Erasmus placement**, developed for the SARA intensive programme, was extended and now includes nuclear engineering. It is given in pp 5-8. Please disseminate it among your students. More data can be included, especially from CHERNE members not yet present in this list. Please send the information to J. Ródenas and F. Tondeur.

3. CHERNEws is your bulletin

All CHERNE members are invited to send short communications, related to the CHERNE objectives, which they believe interesting for the other members. CHERNE objectives are described in the CHERNE declaration on www.upv.es/cherne .

Here you can announce conferences, job offers, call for partners for your projects …

Send your text to both editors jrodenas@iqn.upv.es, tondeur@isib.be .

Travel grant for staying at ISIB, Brussels

IRISIB, the research institute of ISIB, HESpaak, Brussels, offers a grant for a research stay of 3 to 6 months for a CHERNE PhD student. Students at the master level may be accepted too. The proposed R&D work includes MC simulations and measurements in X-ray spectrometry. The grant will cover the local expenses during up to 6 months, and the travel costs from and to home. Details, amount, procedure can be asked to Isabelle Gerardy gerardy@isib.be. Deadline: October 31, 2013.

CALENDAR OF CHERNE ACTIVITIES 2013-2014

How to submit a CHERNE activity proposal? See the template in pp3-4.

DATE	*PLACE*	*TITLE*	*DESCRIPTION*	*ECTS*	*COMMENT*
Nov 4-8	UP Valencia	Soft Computing	Introduction to Soft Computing Methods in Modern Engineering: Genetic Algorithms, Neural Networks and Fuzzy Logic	3	Registration before **October 15**
Nov. 25-29	UP Valencia	Natural radioactivity	Protection against natural radiation	3	Registration before **Oct. 15**
Jan. 27-31	UP Valencia	Probabilistic Risk Assessment	Introduction to fundamentals, procedures and tools to perform a PRA of a NPP.	2	Registration before **Oct. 30**
Feb 16 – Mar 1	Mol / Hasselt	Safe Application of Radiation and Radionuclides	Practical study the safety constraints and organisation of the applications of ionising radiation and radionuclides, including environmental protection	4	Registration before **October 10** – partnership closed
Mar 10-14	UP Valencia	Radiochemistry	Basic information to students of chemical and nuclear engineering on the principles of Nuclear Chemistry and how they are applied in many disciplines	3	Registration before Jan. 30
Mar. 17-28	Hasselt / Brussels	Measurement of environmental radioactivity	Radioactivity measurements in the environment. Both artificial and natural contaminations will be examined.	4	Registration before Jan. 8
Apr. 7-18	Catania / Bologna	Medical Applications of Nuclear Techniques and Radiations	study with a practical, hands-on approach the most advanced nuclear and radiological techniques in medicine	4	Deadline Dec.1 Partnership closed
May 5-9	UP Valencia	Imaging	Formation, Acquisition and Processing of Images in Nuclear Medicine Techniques	3	Registration before March 30.
May 26-28 ?	Thessaloniki	CHERNE workshop	Annual workshop and meeting of the CHERNE network	-	Open to non members
Aug. 25-29	Jülich	Radiation detection and measurement	Familiarize students with the practical aspects of radiation measurements.	2	Partnership open till Nov.30, pre registration Apr30
Sep. 1-5	Jülich	Methods of Applied Radiochemistry	Lab Course with introductory lectures	2	Pre-registration April 30
Sep. 1-5	Athens	Industrial Radiography	basic knowledge on industrial radiography theory and practice and its associated radiation protection issues	-	Partnership open till Nov. 30
Sep.8-12	Athens	Nuclear Analytical techniques and applications	basic knowledge on nuclear analytical techniques: gamma spectrometry, alpha-spectrometry, X-Ray Fluorescence, PIXE etc, and their applications	-	Partnership open till Nov. 30

CHERNE 2013-14

Project Plan for CHERNE activities and other actions proposed to the network

Acronym/Short title of the project: xxx xxx

Time schedule for the proposal of educational activities for students (proposals not addressed to students may be introduced at any time)	**before September 15**: the organiser fills the present form and sends it to the secretary of CHERNE,José Ródenas (jrodenas@iqn.upv.es) before September 30: received proposals are sent to all CHERNE partners by the CHERNE secretary and made available on the information platform
Context	This project plan is meant to inform CHERNE partners and their students about an activity organised in the framework of the CHERNE network, taking into account the objectives of CHERNE as described in the CHERNE declaration www.upv.es/cherne
Definitions	IC: Intensive course, at least 1 week/2 ECTS SP: strategic partnership (may include intensive programmes and other actions) IP: intensive programme, part of the actions of a SP

Title of the project and acronym (if applicable)	
Type of the project	Please fill in: SP, IP, IC, excursion, visit, internship, workshop, research, other?
Main objective of the project	Describe in a few lines the main objective of the project.
Short description of the project	Eventually an extensive description can be given in an annex
Expected learning outcomes (if applicable)	
Date of the project	
Place(s) of the project	
Coordinator(s)	Name, Institution, email
Contact person (if different)	Name, Institution, email
Other partners	Name, Institution
Is the partnership still open to more partners?	open / closed
Intended participants Expected present studying level of participants and their specialisation (if relevant)	students(Ba, Ma, PhD?), staff members, external, …? the activity is organised for the own students, free places are open for students of CHERNE partners / or: the activity is organised for students of all CHERNE partners / or: the activity is organised for …/…
Prerequisites Expected initial knowledge	
Intended or maximal	

number of participants	
Task force (if applicable)	Name, Institution
Working method, time schedule and deadlines for the organisation and for the task force	Make clear here which kind of answer is expected from CHERNE members to this proposal and when.
Evaluation (of participants, by participants, by organisers, …)	
Reporting and dissemination (if applicable)	
Is the project part of anErasmus program?	
ECTS or ECVET credits applicable? How many?	
Are any other industrial or research non CHERNE partners involved?	Name, Institution
Terminology	CHERNE: Cooperation for Higher Education on Radiological and Nuclear Engineering other: …/…
Practical organisation	Accommodation : organised / not organised
Costs for the students (if applicable)	Travel : covered / not covered Accommodation Social events Tuition fee **TOTAL FEE**
Extra information or conditions	…/…
Anything else	…/…

Annex 1

Annex 2

…/…

DATABASE OF POSSIBLE PLACES FOR ERASMUS PLACEMENT IN THE FIELD OF RADIOLOGICAL AND NUCLEAR ENGINEERING

Students interested in Erasmus placement can obtain more information about the fields in which an internship is possible, and receive the names and coordinates of the contacts in the company/institute, by sending an email to the CHERNE contact person.

Please first check the website of the institute or company for more information on their activities.

The CHERNE contact person cannot guarantee that an internship will be possible at the time when it will be asked.
His/her only role is to establish the link between the company/institute and the student.
The Erasmus placement will be organised by a direct contact between the company/institute and the Erasmus department of the university of origin of the student.

The database is divided in two sheets.
Some companies/institutes with a wide range of activities may appear in both sheets.

RAR: Radiation and Radionuclides	includes	radiological physics radiation measurements radiological safety application of radiation production of radionuclides application of radionuclides medical applications accelerators and applications
NEM: Nuclear Energy and Materials	includes	Nuclear research reactors Nuclear energy research and engineering Nuclear power plants Nuclear fuel industry Radioactive waste management Nuclear fusion

RAR Country	City	Company/Institute	activity	web site	CHERNE contact	email
BE	Brusssel	UZ-Brussel	hospital	www.uzbrussel.be	Prof. Janssens, XIOS	herwig.janssens@uhasselt.be
BE	Bruxelles	Clinique St Jean	hospital	www.clstjean.be	Dr. Gerardy, ISIB	gerardy@isib.be
BE	Bruxelles	Institut Bordet	hospital	www.bordet.be	Dr. Gerardy, ISIB	gerardy@isib.be
BE	Bruxelles	AFCN-FANC	radiation safety agency	www.fanc.be	Dr. Gerardy, ISIB	gerardy@isib.be
BE	Fleurus	IRE / IRE-Elit	production of radionuclides	www.ire.eu , www.ire-elit.eu	Dr. Gerardy, ISIB	gerardy@isib.be
BE	Hasselt	CMK	research intitute (environment)	www.uhasselt.be/CMK	Prof. Janssens, XIOS	herwig.janssens@uhasselt.be
BE	Louvain la Neuve	IBA	accelerator manufacturer	www.iba.be	Dr. Gerardy, ISIB	gerardy@isib.be
BE	Mol	SCK-CEN	Research Center	www.sckcen.be	Prof. Hoyler, Prof. Scherer, FHA	hoyler@fh-aachen.de, scherer@fh-aachen.de
BE	Mol	SCK-CEN	research centre	www.sckcen.be	Prof. Janssens, XIOS	herwig.janssens@uhasselt.be
BE	Mol	SCK-CEN	research centre	www.sckcen.be	Dr. Gerardy, ISIB	gerardy@isib.be
BE	Geel	CEC-JRC-IRMM	research centre	www.irmm.jrc.be	Prof. Janssens, XIOS	herwig.janssens@uhasselt.be
BE	Vilvoorde	AV Controlatom	radiation protection control	www.controlatom.be	Dr. Gerardy, ISIB	gerardy@isib.be
CR	Prague	Hospital "Na Bulovce"	Hospital	http://bulovka.cz/	Prof. Tomas Cechak, CVUT	tomas.cechak@fjfi.cvut.cz
CR	Prague	NRPI	Research Center	www.suro.cz	Prof. Tomas Cechak, CVUT	tomas.cechak@fjfi.cvut.cz
CR	Prague	Nuclear Physics Institute	Research Center	www.ujf.cas.cz/	Prof. Tomas Cechak, CVUT	tomas.cechak@fjfi.cvut.cz
CR	Prague	Nuclear Research Institute	Research Center	www.nri.cz/web/ujv	Prof. Tomas Cechak, CVUT	tomas.cechak@fjfi.cvut.cz
CR	Prague	FNSPE CTU in Prague	University	www.cvut.cz	Prof. Tomas Cechak, CVUT	tomas.cechak@fjfi.cvut.cz
DE	Aachen	University Hospital	Hospital	www.ukaachen.de	Prof. Hoyler, Prof. Scherer, FHA	hoyler@fh-aachen.de, scherer@fh-aachen.de
DE	Cologne	University Hospital	Hospital	www.uk-koeln.de	Prof. Hoyler, Prof. Scherer, FHA	hoyler@fh-aachen.de, scherer@fh-aachen.de
DE	Erlangen	AREVA	Manufacturer	www.areva.com	Prof. Hoyler, Prof. Scherer, FHA	hoyler@fh-aachen.de, scherer@fh-aachen.de
DE	Essen	GNS	Waste Management	www.gns.de	Prof. Hoyler, Prof. Scherer, FHA	hoyler@fh-aachen.de, scherer@fh-aachen.de

DE	Jülich	FZJ	Reserach Center	www.fz-juelich.de	Prof. Hoyler, Prof. Scherer, FHA	hoyler@fh-aachen.de, scherer@fh-aachen.de
DE	Mannheim	Westinghouse Electric Germany	Manufacturer	www.westinghouse.com	Prof. Scherer, FHA	scherer@fh-aachen.de
ES	Castellón	H. General	Hospital		Prof. Verdú, UPV	gverdu@iqn.upv.es
ES	Madrid	CIEMAT	Research Center	www.ciemat.es	Prof. Ródenas, UPV	jrodenas@iqn.upv.es
ES	Valencia	H. Clínico	Hospital		Prof. Ródenas, UPV	jrodenas@iqn.upv.es
ES	Valencia	H. Peset Aleixandre	Hospital		Prof. Ródenas, UPV	jrodenas@iqn.upv.es
ES	Valencia	LAINSA	Radiatiion Protection	http://www.lainsa.com	Prof. Ródenas, UPV	jrodenas@iqn.upv.es
ES	Valencia	TITANIA	spin-off UPV	http://www.titaniast.com	Prof. Verdú, UPV	gverdu@iqn.upv.es
IT	Bologna	Policlinico S. Orsola - Malpighi	Hospital	www.aosp.bo.it	Prof. Mostacci, UniBo	domiziano.mostacci@unibo.it
IT	Bologna	Ospedale Maggiore	Hospital	http://www.ausl.bologna.it	Prof. Mostacci, UniBo	domiziano.mostacci@unibo.it
IT	Castel Bolognese	COMECER	Manufacturer	http://www.comecer.com/	Prof. Mostacci, UniBo	domiziano.mostacci@unibo.it
IT	Cesena	Ospedale Bufalini	Hospital	http://www.ausl-cesena.emr.it/Azienda/Ospedali/OspedaleMBufalini/tabid/118/Default.aspx	Prof. Mostacci, UniBo	domiziano.mostacci@unibo.it
IT	Faenza	TEMA Sinergie	Manufacturer	www.temasinergie.it	Prof. Mostacci, UniBo	domiziano.mostacci@unibo.it
IT	Catania	INFN-LNS	Research Center	www.lns.infn.it	Dr. Paolo Finocchiaro	finocchiaro@lns.infn.it
NL	Maastricht	Maastro Clinic	hospital	www.maastro.nl	Prof. Janssens, XIOS	herwig.janssens@uhasselt.be
NL	Petten	NRG	Research Center	www.nrg.eu	Prof. Scherer, FHA	scherer@fh-aachen.de
PT	Coimbra	IBILI	Research Center	www.uc.pt/en/fmuc/ibili	Prof. Isabel Lopes, U.Coimbra	isabel@coimbra.lip.pt
PT	Lisboa	ITN	Research Center	www.itn.pt	Prof. Isabel Lopes, U.Coimbra	isabel@coimbra.lip.pt

NEM Country	City	Company/Institute	activity	web site	CHERNE contact	email
BE	Bruxelles	Tractebel engineering (GdF-Suez)	nuclear engineering	www.tractebel-engineering-gdfsuez.com	Dr. Gerardy, ISIB	gerardy@isib.be
BE	Bruxelles	Electrabel (GdF-Suez)	nuclear engineering	https://www.electrabel.com	Dr. Gerardy, ISIB	gerardy@isib.be
BE	Bruxelles	ONDRAF	Waste Management	www.nirond.be	Dr. Gerardy, ISIB	gerardy@isib.be
BE	Hasselt	IMO	research institute (materials)	www.uhasselt.be/IMO	Prof. Janssens, XIOS	herwig.janssens@uhasselt.be
BE	Mol	SCK-CEN	Research Center	www.sckcen.be	Prof. Hoyler, Prof. Scherer, FHA	hoyler@fh-aachen.de, scherer@fh-aachen.de
BE	Mol	SCK-CEN	research centre	www.sckcen.be	Prof. Janssens, XIOS	herwig.janssens@uhasselt.be
BE	Mol	SCK-CEN	research centre	www.sckcen.be	Dr. Gerardy, ISIB	gerardy@isib.be
BE	Tihange	Electrabel (GdF-Suez)	NPP	https://www.electrabel.com	Dr. Gerardy, ISIB	gerardy@isib.be
CR	Prague	Nuclear Research Institute	Research Center	www.nri.cz/web/ujv	Prof. Tomas Cechak, CVUT	tomas.cechak@fjfi.cvut.cz
CR	Prague	Nuclear Physics Institute	Research Center	www.ujf.cas.cz/	Prof. Tomas Cechak, CVUT	tomas.cechak@fjfi.cvut.cz
DE	Erlangen	AREVA	Manufacturer	www.areva.com	Prof. Hoyler, Prof. Scherer, FHA	hoyler@fh-aachen.de, scherer@fh-aachen.de
DE	Essen	GNS	Waste Management	www.gns.de	Prof. Hoyler, Prof. Scherer, FHA	hoyler@fh-aachen.de, scherer@fh-aachen.de
DE	Mannheim	Westinghouse Electric Germany	Manufacturer	www.westinghouse.com	Prof. Scherer, FHA	scherer@fh-aachen.de
ES	Cofrentes	Cofrentes NPP	NPP	www.cncofrentes.es	Prof. Ródenas, UPV	jrodenas@iqn.upv.es
ES	Juzbado	ENUSA	Nuclear Fuel	http://www.enusa.es	Prof. Ródenas, CUPV	jrodenas@iqn.upv.es
IT	Catania	INFN-LNS	Research Center	www.lns.infn.it	Dr. Paolo Finocchiaro	finocchiaro@lns.infn.it
IT	Genova	Ansaldo Nucleare	Manufacturer	www.ansaldonucleare.it	Dr. Paolo Finocchiaro	finocchiaro@lns.infn.it
IT	Roma	Sogin	Decommissioning	www.sogin.it	Dr. Paolo Finocchiaro	finocchiaro@lns.infn.it
NL	Borssele	EZP	NPP	www.epz.nl	Prof. Scherer, FHA	scherer@fh-aachen.de
NL	Petten	NRG	Research Center	www.nrg.eu	Prof. Scherer, FHA	scherer@fh-aachen.de
PT	Lisboa	ITN	Research Center	www.itn.pt	Prof. Isabel Lopes, U. Coimbra	isabel@coimbra.lip.pt

CHERNE 2013-14

Project Plan for CHERNE activities and other actions proposed to the network

Seminars of the UPV Master on Industrial Safety and Environment

1) SOFT COMPUTING

Title of the project and acronym (if applicable)	**Soft Computing** An Introduction to Soft Computing Methods in Modern Engineering: Genetic Algorithms, Neural Networks and Fuzzy Logic
Type of the project	Intensive course
Main objective of the project	This course aims at introducing basic concepts and techniques of soft computing for engineering applications. Particular emphasis to the problems of reliability, safety, risk, fault detection and diagnosis.
Short description of the project	The course is structured in a series of daily 4-hours lectures, some of them devoted to the hands-on computer practice of the theory. INTRODUCTION • Introduction to fault diagnosis and soft computing techniques GENETIC ALGORITHMS • Introduction to genetic algorithms for optimisation • Applications to system reliability analysis and preventive maintenance optimization NEURAL NETWORKS • Introduction to neural computing and to the supervised feedforward neural network trained by the error back-propagation FUZZY LOGIC SYSTEMS • Fuzzy logic systems for fault detection • Fuzzy logic systems for fault classification
Expected learning outcomes (if applicable)	At the end of the course, the participants will have acquired a level of familiarity with concepts and techniques of soft computing, necessary to further develop them in the specific applications of interest.
Date of the project	4 – 8 November 2013
Place(s) of the project	UPV – Valencia (Spain)
Coordinator(s)	Prof. José Ródenas, UPV, jrodenas@iqn.upv.es
Contact person (if different)	
Other partners	Prof. Enrico Zio, Politecnico de Milano (Italy)
Is the partnership still open to more partners?	closed
Intended participants Expected present studying level of participants and	The course is a Seminar of the UPV **Master** on Industrial Safety and Environment, offered to CHERNE institutions as far as places are free.

their specialisation (if relevant)	
Prerequisites Expected initial knowledge	The students should have a basic knowledge of MatLab or similar codes, as well as Statistics.
Intended or maximal number of participants	Number of admitted students depending on official registration at the Master.
Task force (if applicable)	NA
Working method, time schedule and deadlines for the organisation and for the task force	20 hours / 1 week The course is structured in a series of daily 4-hours lectures, some of them devoted to the hands-on computer practice of the theory illustrated.
Evaluation (of participants, by participants, by organisers, …)	Assessment of the student by the report of a project.
Reporting and dissemination (if applicable)	NA
Is the project part of an Erasmus program?	No
ECTS or ECVET credits applicable? How many?	This course is representing **3 ECTS** credits.
Are any other industrial or research non CHERNE partners involved?	No
Terminology	CHERNE: Cooperation for Higher Education on Radiological and Nuclear Engineering UPV: Universidad Politécnica de Valencia
Practical organisation	Accommodation : not organised
Costs for the students (if applicable)	Travel : not covered Accommodation : not covered Registration as UPV visiting student **TOTAL FEE: 46,20€/credit**
Extra information or conditions	• **Deadline for registration: 15 October 2013** • Communication of admittance: 22 October 2013 • Fees will include assurance for students under 26 (about 2 €).
Anything else	Students can participate in 1, 2, 3 or all of 4 seminars, provided there are places available. Registration can be done at any moment, but it would be convenient to do at once for more than one Seminar to shorten administrative task. Selection at home institutions.

Annex 1: Application form (see last pages of the bulletin)

Annex 2: Instructions for registration (see last pages of the bulletin)

Annex 3: Translation of the application form (see last pages of the bulletin)

CHERNE 2013-14

Project Plan for CHERNE activities and other actions proposed to the network

Seminars of the UPV Master on Industrial Safety and Environment

2) NATURAL RADIOACTIVITY

Title of the project and acronym (if applicable)	**NATURAL RADIOACTIVITY** Protection against Natural Ionising Radiation
Type of the project	Intensive course
Main objective of the project	This course plan to give an overview of human exposure to natural sources of ionizing radiation.
Short description of the project	The course combines lectures, computer exercises, and measurement of indoor radon. CONTENTS A. NATURAL RADIATION • A1 Introduction • A2 Cosmic rays • A3 Natural radioactivity B. EXPOSITION TO COSMIC RAYS • B1 factors affecting the dose • B2 Exposition of air crews: regulation C. EXTERNAL EXPOSITION TO NATURAL RADIONUCLIDES • C1 Radioactivity of the soil and of building materials • C2 Areas with high γ activity • C3 Building materials with high radioactivity • C4 Enhanced external exposition on workplaces D. INTERNAL EXPOSITION TO NATURAL RADIONUCLIDES • D1 Our unavoidable radioactivity • D2 Enhanced internal exposition of workers • D3 Radon E ENHANCED EXPOSITION TO NATURAL RADIOACTIVITY DUE TO HUMAN ACTIVITIES • E1 Regulation • E2 Industries using naturally radioactive materials • E3 Waste problems F. INDOOR RADON • F1 Introduction • F2 Origin of radon • F3 Radon production

	• F4 Radon migration • F5 Factors affecting the indoor pollution by radon • F6 Radon progeny in air • F7 Evaluation of the cancer risk • F8 What is a dangerous radon concentration? • F9 Indoor radon measurements • F10 Measurement of radon progeny and PAEC • F11 Prevention and mitigation • F12 Justification of mitigation in an existing building • F13 Justification of prevention in a new building • F14 Exposition to radon in workplaces.
Expected learning outcomes (if applicable)	Different aspects are developed e.g. identification of natural source, effects on human health, measurement techniques and mitigation techniques. During the course, 8 hours of laboratory are scheduled. During this practical part, the participants realize physical measurements and use numerical codes to evaluate the dose of ionizing radiations received in practical cases.
Date of the project	25 – 29 November 2013
Place(s) of the project	UPV – Valencia (Spain)
Coordinator(s)	Prof. José Ródenas, UPV, jrodenas@iqn.upv.es
Contact person (if different)	
Other partners	Dr. Isabelle Gerardy, Institut Supérieur Industriel de Bruxelles (ISIB), Haute Ecole Paul-Henri Spaak, Brussels (Belgium)
Is the partnership still open to more partners?	closed
Intended participants Expected present studying level of participants and their specialisation (if relevant)	The course is a Seminar of the UPV **Master** on Industrial Safety and Environment, offered to CHERNE institutions as far as places are free.
Prerequisites Expected initial knowledge	The participants must have a basic knowledge in chemistry and in nuclear physics (type of radioactive disintegration, period of a nuclear emitter,…)
Intended or maximal number of participants	Number of admitted students depending on official registration at the Master.
Task force (if applicable)	NA
Working method, time schedule and deadlines for the organisation and for the task force	20 hours / 1 week The course combines lectures, computer exercises, and measurement of indoor radon.
Evaluation (of participants, by participants, by organisers, …)	Assessment of the student by oral presentation of a personal work.
Reporting and dissemination (if applicable)	NA
Is the project part of an Erasmus program?	No
ECTS or ECVET credits	This course is representing 3 ECTS credits.

applicable? How many?	
Are any other industrial or research non CHERNE partners involved?	No
Terminology	CHERNE: Cooperation for Higher Education on Radiological and Nuclear Engineering UPV: Universidad Politécnica de Valencia
Practical organisation	Accommodation : not organised
Costs for the students (if applicable)	Travel : not covered Accommodation : not covered Registration as UPV visiting student **TOTAL FEE: 46,20€/credit**
Extra information or conditions	• **Deadline for registration: 15 October 2013** • Communication of admittance: 25 October 2013 • Fees will include assurance for students under 26 (about 2 €).
Anything else	Students can participate in 1, 2, 3 or all of 4 seminars, provided there are places available. Registration can be done at any moment, but it would be convenient to do at once for more than one Seminar to shorten administrative task. Selection at home institutions.

Annex 1: Application form (see last pages of the bulletin)

Annex 2: Instructions for registration (see last pages of the bulletin)

Annex 3: Translation of the application form (see last pages of the bulletin)

CHERNE 2013-14

Project Plan for CHERNE activities and other actions proposed to the network

PRA - Probability Risk Assessment

Title of the project and acronym (if applicable)	PRA Probability Risk Assessment
Type of the project	Intensive course
Main objective of the project	The main objective of the course is to provide an introduction to the fundamentals, procedures and tools to perform a PRA of a NPP.
Short description of the project	The course will be developed on the basis of a well established methodology introduced in reference "Procedures for conducting PSA of Nuclear Power Plants (Level 1). Safety Series Nº 50-P-4. IAEA. Vienna. 1992". It will cover the following major contents: 1. Introduction to fundamentals and procedures to develop a PRA ▪ Introduction to LWR technology (Elements, PWR, BWR) ▪ Overview of the PRA ▪ Accident identification ▪ Accident sequence modeling ▪ Data assessment ▪ Accident sequence quantification 2. Practical application to a PWR Nuclear Power Plant ▪ Large Break Loss of Coolant Accident (LBLOCA) – Level 1 PRA ▪ Use of Software tools: Reliability Workbench (FaultTree+) IAEA databank @RISK
Expected learning outcomes (if applicable)	To be able to apply fundamental tolls for the Basic Safety Analysis of a LWR
Date of the project	27-31 January 2014
Place(s) of the project	Department of Nuclear Engineering, UPV – Valencia (Spain)
Coordinator(s)	Prof. Sebastián Martorell, smartore@iqn.upv.es
Contact person (if different)	Prof. Sebastián Martorell, UPV, smartore@iqn.upv.es Prof. José Ródenas, UPV, jrodenas@iqn.upv.es
Other partners	
Is the partnership still open to more partners?	closed
Intended participants Expected present studying level of participants and their specialisation	Activity organised for Master students of CHERNE partner institutions

(if relevant)	
Prerequisites Expected initial knowledge	Basic knowledge of components and operation of a NPP with LWR (PWR or BWR).
Intended or maximal number of participants	The total number of participants is limited to 20 due to constraints in the organisation of practical exercises. Minimum number of students to organise the course is 10.
Task force (if applicable)	NA
Working method, time schedule and deadlines for the organisation and for the task force	**Pre-registration deadline: 30 October 2013** See Annex 1
Evaluation (of participants, by participants, by organisers, …)	Participants will be evaluated by application of the methodology to a practical Case Study (portfolio).
Reporting and dissemination (if applicable)	NA
Is the project part of an Erasmus program?	No
ECTS or ECVET credits applicable? How many?	This course is representing 2 ECTS credits (after positive evaluation).
Are any other industrial or research non CHERNE partners involved?	No
Terminology	CHERNE: Cooperation for Higher Education on Radiological and Nuclear Engineering PRA: Probability Risk Assessment NPP: Nuclear Power Plant UPV: Universidad Politécnica de Valencia CFP: Centro de Formación Permanente
Practical organisation	
Costs for the students (if applicable)	Travel & Accommodation: not covered Tuition fee: 100 € **TOTAL FEE (100 Eur)**
Extra information or conditions	Registration at CFP of UPV is necessary. Information for this will be given after acceptation of participants.
Anything else	…/…

Annex 1

SCHEDULE (Tentative)

	Monday 27	Tuesday 28	Wednesday 29	Thursday 30	Friday 31
10-11	Introduction	Accident Sequence Modeling	Data Assessment	Accident Sequence Quantification	Evaluation
11-12	PRA Overview				
12-13					
13-15	Lunch break				
15-16	Accident Sequence Identification	Accident Sequence Modeling	Data Assessment	Accident Sequence Quantification	Free
16-17					
17-18					

CHERNE 2013-14

Project Plan for CHERNE activities and other actions proposed to the network

SARA 2014

Title of the project and acronym (if applicable)	SARA 2014 Safe application of radiation and radionuclides
Type of the project	IP
Short description of the project	The SARA 2-week course includes lectures (10), practical exercises (9), technical visits (3), an ALARA roundtable prepared by the students before the course, and a conference-debate on the ethical aspects of radiation safety. Three social events and a cultural visit will also be organised. The first week is organised in two research centres: SCK•CEN and JRC-IRMM. Full program in annex.
Main objective of the project	The main objective of this practical course is to give students the opportunity to practically study the safety constraints and organisation of the applications of ionising radiation and radionuclides, including environmental protection. This will be done in real working situations, including an access to large facilities (nuclear reactor and particle accelerator) which is not available in most of the partner institutions. The context of radiological safety, from the medical and ethical point of views, will be included
Expected learning outcomes (if applicable)	The expected learning outcome is the experience of the practical constraints of radiation safety and the consciousness of the rigorous approach which is necessary in this field, bearing in mind the associated ethical aspects
Date of the project	February 16 – March 1, 2014
Place(s) of the project	Mol – Diepenbeek (Belgium)
Contact name and e-mail	Week 1: Isabelle Gerardy gerardy@isib.be Week 2: Wouter Schroeyers wouter.schroeyers@uhasselt.be
Coordinator(s)	Tomas Cechak , CVUT
Other partners	HE Spaak Brussels, UHasselt, FH Aachen, U. Coimbra, UP Valencia, U. Bologna, U. Catania, U.Palermo, U. Salamanca
Is the partnership still open to more partners?	closed
Intended participants	Students at Master level, PhD students admitted; professors from partners
Prerequisites Expected initial knowledge	Elementary nuclear and radiation physics Elementary nuclear measurement techniques
Intended or maximal number of participants	20 students
Task force (if applicable)	CVUT Prague, HE Spaak Brussels, U. Hasselt, FH Aachen, U. Coimbra

Working method, time schedule and deadlines for the organisation and for the task force	Programme announced: September 15 Confirmation of participation, student coordinates sent (including waiting list) : **October 10** Security documents collected : **deadline given by SCK•CEN** Instructions for the ALARA workshop sent: November 8 Groups and tasks for the ALARA workshop defined: November 15 Second round of applications closed: **NO SECOND ROUND**
Evaluation (of participants, by participants, by organisers, …)	Assessment of students by a jury based on ALARA workshop, MCQ exam and presentation of exercises by the students Quality evaluation of the IP by the students
Reporting and dissemination (if applicable)	Documents and reports will be available on the IP Website
Is the project part of an Erasmus program?	Yes
ECTS or ECVET credits applicable? How many?	Yes, 4 ECTS credits
Are any other industrial or research non CHERNE partners involved?	SCK•CEN, Mol JRC-IRMM, Geel
Terminology	ALARA : As Low As Reasonably Achievable, more or less equivalent to radiological optimisation
Practical organisation	Accommodation, breakfast and lunch : organised
Costs for the students (if applicable)	Travel : refunded Accommodation : covered Social events : covered Tuition fee : no **TOTAL FEE 200.00 €**
Anything else	…/…

Annex : detailed program

…/…

Erasmus Intensive Programm (IP)

SARA

Safe Application of Radiation and Radionuclides

An activity of the CHERNE network

16/02/2014-01/03/2014

Mol/Geel - Hasselt/Diepenbeek , Belgium

Alma Mater Studiorum Università di Bologna
Czech Technical University CVUT, Prague (coordinator)
Fachhochschule Aachen, Jülich
Haute Ecole Paul Henri Spaak ISIB, Brussels (organiser)
Universidad de Salamanca, Salamanca
Universidade de Coimbra, Coimbra
Universita degli Studi di Palermo, Palermo
Università degli Studi di Catania
Universitad Politecnica de Valencia, Valencia
Universiteit Hasselt, Diepenbeek (organiser)

Programme

Preliminary – Sep.19

SARA 2014

Date	hour	Event	Place
Sunday 16/02	19:00	Welcome Party – Short presentation of the intensive programme (Isabelle Gerardy, ISIB, Brussels) – Self-presentation of the participants	
Monday 17/02	8:30- 9:45 9:45-10:30 10:30-10:45 10:45- 11:30 11:30- 12:15	Access formalities at SCK•CEN – Presentation of SCK•CEN – Presentation of the first week (Isabelle Gerardy, ISIB, Brussels). Lecture L1 Activation analysis: applications and safety aspects (Domiziano Mostacci, U. Bologna) Break Lecture L2 Dosimetry in radiation protection (Petr Prusa, CVUT Prague) Lecture L3 Health risks of external and internal exposition to radiation	SCK•CEN

		(Frieder Hoyler, FHAachen)	
	12:30 – 13:45	lunch	SCK•CEN cafeteria
	14:00-17:00	3 exercises in parallel: E1-Activation measurements at the reactor BR1 E2-Radiological emergency exercise E3-Anthropogammametry	SCK•CEN•
Tuesday 18/02	8:30-9:15 9:30-12:30	Lecture L4: Neutron spectrometry and dosimetry (Elio Tomarchio, U. Palermo) visits at SCK-CEN geological waste disposal, hot cells and/or BR2 reactor	SCK•CEN
	12:40 – 13:45	lunch	SCK•CEN cafeteria
	14:00-17:00	3 exercises in parallel: E1-Activation measurements at the reactor BR1 E2-Radiological emergency exercise E3-Anthropogammametry	SCK•CEN
Wednesday 19/02	8:30-9h15 9:30-13:00	Lecture L5: Radiological emergencies (Sergio Gallardo, UPV) W1 - Conference-debate- The Ethics of Radiological Risk Governance (Gaston Meskens, SCK•CEN, Herwig Janssens, UHasselt)	SCK•CEN
	13:15 – 14:00	lunch	SCK•CEN cafeteria
	14:15-17:15	3 exercises in parallel E1-E2-E3	SCK•CEN
	19:30	social event : course dinner 1	
Thursday 20/02	8:30-9:15 9:30-12:30	presentation of JRC-IRMM 3 exercises in parallel E4- Neutron dosimetry with Bonner spheres? **OR** Introduction in the specific safety aspects in a mixed neutron/gamma field (GELINA); Safety training and introduction to GELINA? E5- Dose mapping at the GELINA north part E6- Cross section measurement and analysis	JRC-IRMM
	12:30 – 13:45	lunch	JRC-IRMM cafeteria
	14:00-17:00	3 exercises in parallel E4-E5-E6	JRC-IRMM
Friday 21/02	9:00-12:00	visit of Belgoprocess : radioactive waste management	Belgoprocess facilities
	12:30 – 13:45	lunch	JRC-IRMM cafeteria
	14:00-17:00	3 exercises in parallel E4-E5-E6	JRC-IRMM
Saturday 22/02	10:00 PM	Transfer to Hasselt by bus. Visit of the renovated industrial site 'C-Mine', Genk (old coal mine)	

Sunday 23/02		Free – suggested excursions (direct connections): Brussels, Antwerp, Liège.	
Monday 24/02	8:45-9:00 9:00-9:45 9:45-10:30 10:30-10:45 10:45-11:30 11:30-12:15	presentation of the second week – Wouter Schroeyers (UHasselt) lecture L6: Control of environmental radioactivity (Begoña Quintana, U. Salamanca) lecture L7: Medical diagnostic and therapeutic techniques and their safety aspects (Isabel Lopes, U. Coimbra) Break lecture L8: X-ray techniques and their safety aspects (Tomas Cechak, Czech technical University) lecture L9: EMR and film dosimetry, relevance for audits in radiotherapy centres (Brigitte Reniers, NuTec, UHasselt)	UHasselt - NuTeC
	12:30-13:30	Lunch	UHasselt Cafeteria Gebouw D
	13:45 14:15-17:15	Transfer to Jessa Hospital visit of Jessa hospital (radiotherapy, radiology, nuclear medicine), with practical demonstrations of irradiation of dosimeters to be used in further exercise	Jessa Hospital, Hasselt
Tuesday 25/02	8:45-12.15	W2: ALARA Workshop – coordination: Herwig Janssens (UHasselt)	UHasselt - NuTeC
	12:30-13:30	Lunch	Cafeteria Gebouw D
	14:00-17.00 PM 17:15	3 exercises in parallel (in subgroups of 3 or 4 students): E7: dosimetry : part I alanine-EMR , part II film E8: environmental monitoring : part I detection portals, part II gamma spectrometry E9: X-ray fluorescence analysis : part I in situ analysis, part II laboratory analysis. ALARA workshop: meeting of the jury ALARA workshop: communication of the evaluation to the students	UHasselt - NuTeC
Wednesday 26/02	8:45-9.30 9:30-12:30	Lecture L10: Radioactive waste monitoring (Paolo Finocchiaro, Catania) 3 exercises in parallel (in subgroups of 3 or 4 students): E7: dosimetry : part I alanine-EMR , part II film E8: environmental monitoring : part I detection portals, part II gamma spectrometry E9: X-ray fluorescence analysis : part I in situ analysis, part II laboratory analysis.	UHasselt - NuTeC

	12:45-13:45	Lunch	Cafeteria Gebouw D
	14:00-17:15	Transfer to APERAM Genk – visit of APERAM	
	19:30	Social event : course dinner II	
Thursday 27/02	9:00-12:15	Supervised synthesis of results, preparation of exam and presentations	UHasselt - NuTeC
	12:30-13:45	Lunch	Cafeteria Gebouw D
	14:00-17:00	Supervised synthesis of results, preparation of exam and presentations	UHasselt - NuTeC
Friday 28/02	9:00-10:00 10:00-10:30 10:30-12:30	MCQ exam Break Oral presentation of the synthesis of the results by the students	UHasselt - NuTeC
	12:45-13:45	Lunch	Cafeteria Gebouw D
	14:00-15:00 15:00-15:15 15:15-15:30 15:30-16:45 17:00	Students: filling evaluation forms / professors: meeting of the jury Communication of the final assessment of the students by the jury Break Round table: discussion and evaluation of the intensive programme by the students Farewell drink	UHasselt - NuTeC
Saturday 01/03		Travel to home	

CHERNE 2013-14

Project Plan for CHERNE activities and other actions proposed to the network

Seminars of the UPV Master on Industrial Safety and Environment

3) RADIOCHEMISTRY

Title of the project and acronym (if applicable)	**RADIOCHEMISTRY** Methods and applications in Radiochemistry
Type of the project	Intensive course
Main objective of the project	This course attempts to provide some basic information to students of chemical and nuclear engineering on the principles of Nuclear Chemistry and how they are applied in many disciplines.
Short description of the project	CONTENTS • Carrier and Tracers • Sources of Radionuclides • Decontamination • Protective Techniques • Radiolabelling • Radiotracer Applications • Radioanalytical Methods • Radiochemical Separation Techniques • X-Ray Fluorescence Analysis • Transuranium Elements
Expected learning outcomes (if applicable)	Radioactive materials play an important role in many areas of science and technology. Some of our most pressing problems in nuclear energy production are connected to the chemical properties of radionuclides, e.g. the waste management problems. On the other hand, the multitude of applications of the tracer technique has provided us until now with important insight e.g. in biochemistry and physiology and is being applied every day in medicine to diagnose and treat diseases.
Date of the project	10 – 14 March 2014
Place(s) of the project	UPV – Valencia (Spain)
Coordinator(s)	Prof. José Ródenas, UPV, jrodenas@iqn.upv.es
Contact person (if different)	
Other partners	Prof. Ulrich W. Scherer, Aachen University of Applied Sciences, Jülich campus (Germany).
Is the partnership still open to more partners?	closed
Intended participants Expected present studying	The course is a Seminar of the UPV Master on Industrial Safety and Environment, offered to CHERNE institutions as far as places are free.

level of participants and their specialisation (if relevant)	
Prerequisites Expected initial knowledge	The participants must have a basic knowledge in chemistry and in nuclear physics (type of radioactive disintegration, period of a nuclear emitter,…)
Intended or maximal number of participants	Number of admitted students depending on official registration at the Master.
Task force (if applicable)	NA
Working method, time schedule and deadlines for the organisation and for the task force	20 hours / 1 week The course combines lectures, and lab exercises.
Evaluation (of participants, by participants, by organisers, …)	Assessment of the student by an MCQ exam and oral presentation of a personal work.
Reporting and dissemination (if applicable)	NA
Is the project part of an Erasmus program?	No
ECTS or ECVET credits applicable? How many?	This course is representing 3 ECTS credits.
Are any other industrial or research non CHERNE partners involved?	No
Terminology	CHERNE: Cooperation for Higher Education on Radiological and Nuclear Engineering UPV: Universidad Politécnica de Valencia
Practical organisation	Accommodation : not organised
Costs for the students (if applicable)	Travel : not covered Accommodation : not covered Registration as UPV visiting student **TOTAL FEE: 46,20€/credit**
Extra information or conditions	• **Deadline for registration: 30 January 2014** • Communication of admittance: 10 February 2014 • Fees will include assurance for students under 26 (about 2 €).
Anything else	This course might be completed by the IC MARC provided in the framework of the CHERNE network. Students can participate in 1, 2, 3 or all of 4 seminars, provided there are places available. Registration can be done at any moment, but it would be convenient to do at once for more than one Seminar to shorten administrative task. Selection at home institutions.

Annex 1: Application form (see last pages of the bulletin)

Annex 2: Instructions for registration (see last pages of the bulletin)

Annex 3: Translation of the application form (see last pages of the bulletin)

CHERNE 2013-14

Project Plan for CHERNE activities and other actions proposed to the network

XIMER - Measurement of Environmental Radioactivity

Title of the project and acronym (if applicable)	XI-MER Measurements of Environmental Radioactivity
Type of the project	Intensive course
Main objective of the project	The goal of the XI-MER course is to involve the students in radioactivity measurements in the environment. Both artificial and natural contaminations will be examined. While the activity itself will focus on the measurement techniques, the output will also be a better understanding of our radioactive environment and a better evaluation on what can be harmful and what has to be accepted.
Short description of the project	ISIB (Brussels) and UHasselt-NuTeC (Diepenbeek) are proposing a 10-day course to confront the participants with possible problems regarding radioactivity in our environment. The course will mix, approximately in 40/60 proportion, lectures and practical exercises (laboratory work and in situ measurements). It will include an evaluation part.
Expected learning outcomes (if applicable)	
Date of the project	March 17th to March 28th, 2014
Place(s) of the project	Diepenbeek (UHasselt-NuTeC)and Brussels (ISIB), Belgium
Coordinator(s)	Caroline Licour, ISIB, licour@isib.be Luc Lievens, UHasselt, luc.lievens@uhasselt.be
Contact person (if different)	Caroline Licour, ISIB, licour@isib.be
Other partners	UHasselt
Is the partnership still open to more partners?	closed
Intended participants Expected present studying level of participants and their specialisation (if relevant)	The course is intended for ISIB and UHasselt students studying in the field of nuclear technology. Individual students from CHERNE institutions are welcome.
Prerequisites Expected initial knowledge	Elementary knowledge about nuclear and radiation physics and radiation measurements is expected. Students in the last year of the Bachelor level, or at the Master level, are the target audience, but other students may be accepted.
Intended or maximal number of participants	The total number of participants is limited to 12 due to constraints in the organisation of practical exercises.
Task force (if applicable)	Name, Institution

Working method, time schedule and deadlines for the organisation and for the task force	The students from the institutions of the CHERNE network should apply to **Caroline Licour** (licour@isib.be) before **January 08**, **2014.** If less than 12 students have applied at that date, the recruitment will be open to other institutions.
Evaluation (of participants, by participants, by organisers, …)	The basis of the evaluation of the participants will be: - laboratory reports - short oral presentation of a defined aspect of the measurement campaign.
Reporting and dissemination (if applicable)	
Is the project part of anErasmus program?	No
ECTS or ECVET credits applicable? How many?	This course is representing 4 ECTS credits.
Are any other industrial or research non CHERNE partners involved?	No
Terminology	CHERNE: Cooperation for Higher Education on Radiological and Nuclear Engineering
Practical organisation	Accommodation of non-local students is organised in Hasselt during the first week and in Brussels during the second week and the intermediate week-end.
Costs for the students (if applicable)	The fee is fixed at 200€ and covers: -The accommodation for the non-local students -The welcome party, farewell drink, and other social activities. -The travel from Hasselt/Diepenbeek to Brussels between week 1 and week 2. Foreign students are expected to organise their travel to Brussels airport and to Hasselt/Diepenbeek (first week) themselves at their own cost, as well as their return trip from Brussels at the end of the course.
Extra information or conditions	…/…
Anything else	…/…

Annex 1: Preliminary program

First week in UHasselt Diepenbeek

Day	Sun 16/03	Mon 17/03	Tue 18/03	Wed 19/03	Thu 20/03	Fri 21/03	Sat 22/03
AM		Introduction to program Lectures: -NORM project -Field trip introduction -Canisters	Lecture: soil sampling introduction lecture Practical	Field trip SCK-Mol	Field trip Demerbroeken	Preparation and finishing reports	Free in Brussels
		Lunch in XIOS	Lunch in XIOS	Lunch in SCK centre	Picnic in the field	Lunch in XIOS	
PM	Arrival of foreign students at airport. Students by train to station Hasselt.	Intervention exercise with detection portal Introduction Fieldspec. Testing on lab samples. Introduction soil sampling equipment	Presentation: On site monitoring technology	Fieldtrip SCK-Mol	Field trip Demerbroeken	Transfer to Brussels by train	Free in Brussels
Eve-ning	20.00 : Welcome drink in Hollywood studio						

Second week in ISIB Brussels

Day	Sun 23/03	Mon 24/03	Tue 25/03	Wed 26/03	Thu 27/03	Fri 28/03
AM	Free in Brussels	Lecture: Environmental radioactivity, sampling and measurement methods	Field trip in Ardennes	Laboratory work	Laboratory work Discussion of results	Preparation of reports and of oral presentations
		Lunch in ISIB	Picnic in the field	Social activity	Lunch in ISIB	Lunch in ISIB
PM	Free in Brussels	Lecture: radon, sampling and measurement methods	Field trip in Ardenne	Laboratory work	Discussion of results Preparation of reports	Oral Presentations Farewell drink
Eve-ning						

CHERNE 2013-14

Project Plan for CHERNE activities and other actions proposed to the network

MANTRA

Title of the project and acronym (if applicable)	Medical Applications of Nuclear Technologies and Radiations, MANTRA
Type of the project	IP
Main objective of the project	Familiarize students with application of nuclear techniques to medical physics
Short description of the project	See approved application as sent to every member involved
Expected learning outcomes (if applicable)	Likewise
Date of the project	7th – 18th April 2014
Place(s) of the project	Catania (1st week) and Bologna (2nd week)
Coordinator(s)	Domiziano Mostacci (UNIBO) and Enzo Bellini (UNICT)
Contact person (if different)	
Other partners	D AACHEN02, P COIMBRA01, CZ PRAHA10, B BRUXEL89, I PALERMO01, G ATHINE02, E VALENCI02, SALAMAN02, B DIEPENB01
Is the partnership still open to more partners?	closed
Intended participants Expected present studying level of participants and their specialisation (if relevant)	Students (MS; PhD possible), staff members The activity is organised for students of participating CHERNE partners (see list above)
Prerequisites Expected initial knowledge	Radiation protection fundamentals
Intended or maximal number of participants	22 students + needed teachers
Task force (if applicable)	None
Working method, time schedule and deadlines for the organisation and for the task force	Students should be selected and names forwarded by e-mail to both coordinators: domiziano.mostacci@unibo.it and Vincenzo.Bellini@ct.infn.it **The deadline is December 1st 2013** Selection is done by sending institution.
Evaluation (of participants, by participants, by organisers, …)	Final evaluation by professors involved in the IP.
Reporting and	See approved application as sent to every member involved

dissemination (if applicable)	
Is the project part of an Erasmus program?	Yes, it is an Erasmus IP
ECTS or ECVET credits applicable? How many?	Yes: 4 ECTS
Are any other industrial or research non CHERNE partners involved?	INFN (Laboratori Nazionali Sud), Policlinico S. Orsola-Malpighi, TEMA Srl, Comecer SpA
Terminology	CHERNE: Cooperation for Higher Education on Radiological and Nuclear Engineering INFN: National Institute of Nuclear Physics
Practical organisation	Accommodation : organised
Costs for the students (if applicable)	Travel : covered Accommodation: covered Social events: covered Tuition fee: 200 € **TOTAL FEE 200 €**
Extra information or conditions	…/…
Anything else	…/…

CHERNE 2013-14

Project Plan for CHERNE activities and other actions proposed to the network

Seminars of the UPV Master on Industrial Safety and Environment

4) IMAGING

Title of the project and acronym (if applicable)	**IMAGING** Formation, Acquisition and Processing of Images in Nuclear Medicine Techniques
Type of the project	Intensive course
Main objective of the project	The course aims primarily: 1) to introduce the basics of nuclear medical imaging techniques in three main aspects: formation, acquisition and processing. 2) to develop skills that enable them to apply this knowledge.
Short description of the project	CONTENTS • Introduction: basics of imaging formation in Nuclear Medicine Techniques • Parameters to assess image quality • Image acquisition in planar nuclear imaging and SPECT • Image acquisition in Positron Emission Tomography (PET) • Image reconstruction in tomographic techniques • Digital imaging processing: introduction • Digital processing techniques in the spatial and frequency domain
Expected learning outcomes (if applicable)	At the end of the course, students are expected to have acquired a level of familiarity with concepts and techniques of nuclear medical imaging.
Date of the project	5 – 9 May 2014
Place(s) of the project	UPV – Valencia (Spain)
Coordinator(s)	Prof. José Ródenas, jrodenas@iqn.upv.es
Contact person (if different)	Prof. José Ródenas, UPV
Other partners	Prof. Isabel Lopes, Universidade de Coimbra (Portugal).
Is the partnership still open to more partners?	closed
Intended participants Expected present studying level of participants and their specialisation (if relevant)	The course is a Seminar of the UPV Master on Industrial Safety and Environment, offered to CHERNE institutions as far as places are free.
Prerequisites	The students should have a basic knowledge of nuclear physics, including

Expected initial knowledge	interaction of radiation with matter and radiation detectors.
Intended or maximal number of participants	Number of admitted students depending on official registration at the Master.
Task force (if applicable)	NA
Working method, time schedule and deadlines for the organisation and for the task force	This course aims to provide basic information on the principles of formation, acquisition and processing of images in Nuclear Medicine Imaging Techniques (Scintigraphy, SPECT and PET). The course combines lectures and hands-on sessions (i.e. computer exercises). 20 hours / 1 week
Evaluation (of participants, by participants, by organisers, …)	Assessment of the student by an MCQ exam and oral presentation of a personal work.
Reporting and dissemination (if applicable)	NA
Is the project part of an Erasmus program?	No
ECTS or ECVET credits applicable? How many?	This course is representing 3 ECTS credits.
Are any other industrial or research non CHERNE partners involved?	No
Terminology	CHERNE: Cooperation for Higher Education on Radiological and Nuclear Engineering UPV: Universidad Politécnica de Valencia
Practical organisation	Accommodation : not organised
Costs for the students (if applicable)	Travel : not covered Accommodation : not covered Registration as UPV visiting student **TOTAL FEE: 46,20€/credit**
Extra information or conditions	• **Deadline for registration: 30 March 2014** • Communication of admittance: 5 April 2014 • Fees will include assurance for students under 26 (about 2 €).
Anything else	Students can participate in 1, 2, 3 or all of 4 seminars, provided there are places available. Registration can be done at any moment, but it would be convenient to do at once for more than one Seminar to shorten administrative task. Selection at home institutions.

Annex 1: Application form (see last pages of the bulletin)

Annex 2: Instructions for registration (see last pages of the bulletin)

Annex 3: Translation of the application form (see last pages of the bulletin)

CHERNE 2013-14

Project Plan for CHERNE activities and other actions proposed to the network

RADAM/ Radiation Detection and Measurement

Title of the project and acronym (if applicable)	Radiation Detection and Measurement) RADAM
Type of the project	IC
Main objective of the project	Familiarize students with the practical aspects of radiation measurements.
Short description of the project	Eventually an extensive description can be given in an annex
Expected learning outcomes (if applicable)	The student is able to set up and/or to analyse 1. nuclear counting measurements (GM-counting, proportional counters etc.) 2. measurements using NaI- (and LaBr-)Scintillators and HPGe-Detectors for gamma-spectrometry 3. basic LSC measurements (he gets to know quench effects) 4. measurements (without sample preparation) using alpha-detectors He is aware of the importance of a correct treatment of the uncertainties in the data and knows how to apply the recipes given in the GUM-publications for some typical cases He knows how to determine the counting efficiency for simple geometries and gets first information on simulation tools to determine efficiencies for more complex situations The student can apply the methods of this laboratory in other disciplines e.g. **nuclear chemistry** (see offer by Ulrich Scherer)
Date of the project	Week 35 (**Aug. 25-29 , 2014**)
Place(s) of the project	FH Aachen Campus Jülich
Coordinator(s)	F. Hoyler, FH Aachen Campus Jülich, hoyler@fh-aachen.de
Contact person (if different)	"
Other partners	None yet – but highly welcome
Is the partnership still open to more partners?	Open!!
Intended participants Expected present studying level of participants and their specialisation (if relevant)	Students , mainly at **Master level**, Bachelor students only if initial knowledge appropriate This IC is highly recommended for students who want to participate in the nuclear chemistry course, proposed by Prof. Scherer at the Campus Jülich in the following week, which have little or no experience in nuclear measurements.

	The activity is organised for our own students, free places are open for students of CHERNE partners
Prerequisites **Expected initial knowledge**	Basic knowledge of nuclear physics and of interaction of radiation with matter Basic knowledge of EXCEL. Students which are familiar with tools like MATLAB, GNUPLOT etc. are highly welcome.
Intended or maximal number of participants	Max. 20 (including our students from EMINA course)
Task force (if applicable)	
Working method, time schedule and deadlines for the organisation and for the task force	The IC is mainly focused on experimental activities. If more than 12 participants, 2 subgroups will be formed, since anyhow there will be ½ day experiments and approx. ½ day data analysis and write-up of experimental reports. Short presentations at the end of the IC will be part of the evaluation **Potential partners** should show their interest **before Nov 30th, 2013**. They will receive a list of possible experiments and will be asked for further suggestions and comments **Students** should express their interest by the **end of April 2014** and **register not later than 31st May 2014**. Accepted students will obtain a hand-outs of the intended experiments and some literature to be prepared
Evaluation (of participants, by participants, by organisers, …)	Evaluation of participants by organizer Evaluation of course by participants
Reporting and dissemination (if applicable)	Not yet figured out
Is the project part of an Erasmus program?	No
ECTS or ECVET credits applicable? How many?	2 ECTs
Are any other industrial or research non CHERNE partners involved?	No – not at the present stage
Terminology	CHERNE: Cooperation for Higher Education on Radiological and Nuclear Engineering EMINA: European Master In Nuclear Applications
Practical organisation	Accommodation : can be organised
Costs for the students (if applicable)	Travel not covered Accommodation approx. 50€/night in local hotels possible Apartments for approx. 20€/night (no breakfast) also possible There is a possibility of installing tents on the Campus at no cost! One social dinner sponsored by Kursstätte No Tuition fee **TOTAL FEE Depends on accommodation and travel**
Extra information or conditions	We will try hard to obtain cheap accommodation
Anything else	For students from certain countries (e.g. Portugal, Spain, Italy, Greece,…) we can try to ask for DAAD money. So please colleagues from these countries should get in touch ASAP to check out the possibilities

CHERNE 2013-14

Project Plan for CHERNE activities and other actions proposed to the network

MARC / Methods of Applied RadioChemistry

Title of the project and acronym (if applicable)	Methods of Applied Radiochemistry MARC
Type of the project	IC
Main objective of the project	Familiarize students with basic radiochemical methods
Short description of the project	Lab Course with introductory lectures
Expected learning outcomes (if applicable)	The student is able to perform basic operations with open sources of radionuclides: 1. decontamination 2. preparation of radioactive sources and radiochemicals 3. determination of radiochemical yields 4. radiochemical separations 5. radioanalytical techniques Students can imply basic rules of radiation safety when handling open radioactive sources. They can apply methods of radiation detection and determination of uncertainties to real-life situations of radiochemical procedures.
Date of the project	Week 36 2014
Place(s) of the project	FH Aachen Campus Jülich
Coordinator(s)	U.W.Scherer, FH Aachen Campus Jülich, scherer@fh-aachen.de
Contact person (if different)	dto.
Other partners	C. Licour, ISIB
Is the partnership still open to more partners?	Open!!
Intended participants Expected present studying level of participants and their specialisation (if relevant)	Students at Master level The activity is organised for students of all CHERNE partners
Prerequisites Expected initial knowledge	Thorough knowledge radiation detection and measurement. Basic knowledge of Chemistry. Basic knowledge of EXCEL.
Intended or maximal number of participants	Max. 14

Task force (if applicable)	
Working method, time schedule and deadlines for the organisation and for the task force	The IC is mainly focused on experimental activities. Students should express their interest by the end of April 2014 and register not later than 31st May 2014. Registered students will obtain a hand-outs of the intended experiments and some literature to prepare
Evaluation (of participants, by participants, by organisers, …)	Evaluation of participants by organizer Evaluation of course by participants
Reporting and dissemination (if applicable)	
Is the project part of an Erasmus program?	No
ECTS or ECVET credits applicable? How many?	2 ECTs
Are any other industrial or research non CHERNE partners involved?	No – not at the present stage
Terminology	CHERNE: Cooperation for Higher Education on Radiological and Nuclear Engineering
Practical organisation	Accommodation : can be organised
Costs for the students (if applicable)	Travel expenses not covered Accommodation approx. 25€/night guest house FZJ possible There is a possibility of installing tents on the Campus at no cost One social dinner sponsored Tuition covered **TOTAL FEE Depends on accommodation**
Extra information or conditions	
Anything else	For students from certain countries (e.g. Portugal, Spain, Italy, Greece,…) we can try to ask for DAAD money. So please colleagues from these countries should get in touch ASAP to check out the possibilities

CHERNE 2013-14

Project Plan for CHERNE activities and other actions proposed to the network

IC-IRAD / Intensive Course on Industrial Radiography

Title of the project and acronym (if applicable)	Intensive Course on Industrial Radiography IC-IRAD
Type of the project	IC
Main objective of the project	To provide basic knowledge on industrial radiography theory and practice and its associated radiation protection issues along with hands-on experience using available equipment at the Nuclear Engineering Laboratory of NTUA
Short description of the project	Please see Annex 1 below
Expected learning outcomes (if applicable)	As per the objective
Date of the project	1 – 5 September 2014
Place(s) of the project	National Technical University of Athens (NTUA), Athens, GREECE
Coordinator(s)	Nick P. Petropoulos, (NTUA), npetr@mail.ntua.gr
Contact person (if different)	
Other partners	CHERNE partners can join the project during October and November 2013 with deadline on **30 November 2013**
Is the partnership still open to more partners?	Open
Intended participants Expected present studying level of participants and their specialisation (if relevant)	The activity is organised for students of all CHERNE partners and free places are open to own local and other international students. All students levels are accepted (3rd or 4th year Ba, Ma, PhD)
Prerequisites Expected initial knowledge	Basic knowledge of radioactivity theory and radiation protection
Intended or maximal number of participants	Minimum 6 participants Maximum 12 participants
Task force (if applicable)	Not applicable
Working method, time schedule and deadlines for the organisation and for the task force	Please see Annex 2 below
Evaluation (of participants, by participants, by organisers, …)	Activity would provide participants with a certificate of attendance and learning material. Participants not present in all courses and laboratory work would not be entitled to a certificate. Activity will be open for an

	internal evaluation from participants and lecturers coming from institutions other than NTUA.
Reporting and dissemination (if applicable)	Through the specific web site
Is the project part of an Erasmus program?	Not currently
ECTS or ECVET credits applicable? How many?	There is no such provision available for such a short course
Are any other industrial or research non CHERNE partners involved?	Not currently
Terminology	CHERNE: Cooperation for Higher Education on Radiological and Nuclear Engineering
Practical organisation	Accommodation: organised (organisers would suggest affordable accommodation starting from the youth hostel level and upwards)
Costs for the students (if applicable)	Travel : not covered Accommodation: Starting from approx. 120-150 EUR for six nights Social events: Activity dinner or short excursion or live concert for approx. 15 EUR Lunch and dinner: 3 EUR per working day at NTUA's facilities Minimum transportation: 3 EUR per working day Tuition fee: FREE **TOTAL MINIMUM COST: 200 EUR**
Extra information or conditions	If any, these will be published at the activity's web site
Anything else	As above

ANNEX 1

Activity summary

Aim and characteristics

The aim of this activity is to bring together students and teaching staff from higher education institutions participating in CHERNE, for a 5 continuous full day (09.00-17.00) course regarding principles of industrial radiography and associated radiation protection. Students' original discipline may be of Nuclear Engineering, Mechanical Engineering, Naval Engineering, Materials Engineering, Chemical Engineering, Physics and/or Medical Imaging. Other disciplines may be considered according to applications. Continuous education students may be accepted as well. All lectures will be given in English. All students will receive adequate course material in electronic form.

Curriculum

a. Classroom

Orientation – Summary review of common acquired and existing knowledge from home institutions - Introduction to Radiography – Photons produced by excited nuclei – Photons produced by X-RAY sources – Radiography optics – Focal spot and penumbra – Imaging on film – Intensifying screens – Exposure – Optical density - Exposure diagram – Contrast – Signal-to-noise ratio – Film characteristic curve – Reciprocity laws – Filters – Photon scattering and consequences – Steel & aluminium equivalent exposure – Image quality control – Identification of flaws – Common welding flaws - Review of radiation protection principles – List of applied standards -

b. Laboratory

Radiography vault details and visit and principles of radiation protection – Dark room details and visit - Film basics description, Hands-on manual film development, Hands-on automated film development - Development of a fully exposed film in ambient light conditions, development of a non-exposed film in darkness, Actual step wedge specimen radiography - Industrial radiography simulation using the XRSIM software platform.

Available equipment

(1) GE Inspection and Sensing Technologies X-Ray Source ERESCO MF42 (200 kV), (2) GE Inspection and Sensing Technologies NOVA (Agfa) Film Processor Type: 7070/100, (3) Kowolux 4X Film Viewer 205x85 mm for Welding Film, (4) Densitometer Digit-X by Fidgeon, Ltd (5) NTB GmbH Linear X-RAY Scanners, (6) NEC Ultra High Resolution Digital (Medical) Radiography Monitors, (7) Image quality indicators (after DIN), lead letters and numbers, densitometer calibration film, spatial resolution specimens etc.

ANNEX 2

Working method, time schedule and deadlines for the organisation

30 November 2013:	Final formation of the activity partners and pool of lecturers coming from CHERNE Partners, NTUA and local Institutions
10 January 2014:	IC-IRA activity web site publication (bilingual English & Greek), start of e-mail campaign.
05 May 2014:	Deadline for applications
20 May 2014:	Activity status and viability evaluation with regard to received applications
09 June 2014:	Final notification to the applicants regarding the acceptance of the application and the course final schedule
01 September 2014:	Course starting date (if previous steps positive)
05 September 2014:	Course closing date including final written exam, project evaluation by the participants and external lecturers and fair well hour
30 September 2014:	Course final report submitted to CHERNE secretariat and partners

CHERNE 2013-14

Project Plan for CHERNE activities and other actions proposed to the network

NATA / Nuclear Analytical Techniques and Applications

Title of the project and acronym (if applicable)	Intensive Course on Nuclear Analytical Techniques and Applications NATA
Type of the project	IC
Main objective of the project	To provide basic knowledge on nuclear analytical techniques such as: gamma spectrometry, alpha-spectrometry, X-Ray Fluorescence, PIXE etc, and their applications, along with hands-on experience, using available equipment at the Nuclear Engineering Laboratory of NTUA (NEL-NTUA) and the NCSR Demokritos
Short description of the project	Please see Annex 1 below
Expected learning outcomes (if applicable)	As per the objective
Date of the project	8 – 12 September 2014
Place(s) of the project	National Technical University of Athens (NTUA), Athens, GREECE
Coordinator(s)	Marios J. Anagnostakis, (NTUA), managno@mail.ntua.gr
Contact person (if different)	
Other partners	CHERNE partners can join the project during October and November 2013 with deadline on **30 November 2013**
Is the partnership still open to more partners?	Open
Intended participants Expected present studying level of participants and their specialisation (if relevant)	The activity is organised for students of all CHERNE partners and free places are open to own local and other international students. All students levels are accepted (3rd or 4th year Ba, Ma, PhD)
Prerequisites Expected initial knowledge	Basic knowledge of radioactivity theory and interactions of radiation with matter
Intended or maximal number of participants	Minimum 6 participants Maximum 12 participants
Task force (if applicable)	Not applicable
Working method, time schedule and deadlines for the organisation and for the task force	Please see Annex 2 below
Evaluation (of participants, by participants, by organisers, …)	Activity would provide participants with a certificate of attendance and learning material. Participants not present in all courses and laboratory work would not be entitled to a certificate. Activity will be open for an

	internal evaluation from participants and lecturers coming from institutions other than NTUA.
Reporting and dissemination (if applicable)	Through the specific web site
Is the project part of an Erasmus program?	Not currently
ECTS or ECVET credits applicable? How many?	There is no such provision available for such a short course
Are any other industrial or research non CHERNE partners involved?	Not currently
Terminology	CHERNE: Cooperation for Higher Education on Radiological and Nuclear Engineering
Practical organisation	Accommodation: organised (organisers would suggest affordable accommodation starting from the youth hostel level and upwards)
Costs for the students (if applicable)	Travel : not covered Accommodation: Starting from approx. 120-150 EUR for six nights Social events: Activity dinner or short excursion or live concert for approx. 15 EUR Lunch and dinner: 3 EUR per working day at NTUA's facilities Minimum transportation: 3 EUR per working day Tuition fee: FREE **TOTAL MINIMUM COST: 200 EUR**
Extra information or conditions	If any, these will be published at the activity's web site
Anything else	As above

ANNEX 1

Activity summary

Aim and characteristics

The aim of this activity is to bring together students and teaching staff from higher education institutions participating in CHERNE, for a 5 continuous full day (09.00-17.00) course regarding the principles of nuclear analytical techniques and their applications. Aim of this activity is to cover basic aspects of nuclear analytical techniques, focusing on their common ground. Students attending will have:

- an overview of a wide variety of analytical techniques and their applications,
- a hands-on experience on the use of various types of nuclear and atomic radiations that will help them better understand and deepen into their nature and characteristics.

Students' original discipline may be: Nuclear Engineering, Nuclear Physics, Mechanical Engineering, Material Science etc. Continuous education students may be accepted as well. All lectures will be given in English. Students will receive adequate course material in electronic form.

Curriculum

a. Classroom

Principles of radiation detection, radiation detector systems and nuclear electronics. Sources of radiation. Gamma spectrometry (principles, calibrations, analysis, corrections, detection limits, in-situ spectrometry). Alpha spectrometry. X-ray Fluorescence. Instrumental Neutron Activation Analysis (INAA). Liquid Scintillation Analysis. Particle induced X-Ray & Gamma Emission (PIXE & PIGE). Sampling and sample preparation. Applications and Case Studies.

b. Laboratory

Gamma-ray spectrometry. In-situ gamma-ray spectrometry, Alpha-spectrometry. X-Ray Fluorescence. Instrumental Neutron Activation Analysis. Liquid Scintillation. PIXE, PIGE, RBS (to be confirmed).

Available equipment

At NEL-NTUA the following equipment is available for laboratory training (1) Various types of detector systems (HPGe, LEGe, XtRa, Compton Suppression System). (2) In situ BEGe detector, (3) XRF facility with a 50kV X-ray tube and a Super SiLi detector, (4) NAA facility with Am-Be neutron source (10Ci), (5) A Triathler Liquid Scintillation System.

The TANDEM accelerator at NCSR Demokritos will be used for PIXE, PIGE, RBS experiments (to be confirmed).

ANNEX 2

Working method, time schedule and deadlines for the organisation

30 November 2013:	Final formation of the activity partners and pool of lecturers coming from CHERNE Partners, NTUA and local Institutions
10 January 2014:	IC-NATA activity web site publication (bilingual English & Greek), start of e-mail campaign.
05 May 2014:	Deadline for applications
20 May 2014:	Activity status and viability evaluation with regard to received applications
09 June 2014:	Final notification to the applicants regarding the acceptance of the application and the course final schedule
08 September 2014:	Course starting date (if previous steps positive)
12 September 2014:	Course closing date including final written exam, project evaluation by the participants and external lecturers and fair well hour
10 October 2014:	Course final report submitted to CHERNE secretariat and partners

ANNEXES FOR APPLICATIONS TO THE SEMINARS PROPOSED BY UP VALENCIA

Annex 1: Application form.

UNIVERSIDAD POLITECNICA DE VALENCIA

Nº. Registro: *Núm. Registre:*	
Fecha: *Data:*	

SOLICITUD DE ADMISIÓN A ALUMNO VISITANTE / SOL·LICITUD D'ADMISSIÓ A ALUMNE VISITANT

DATOS PERSONALES/DADES PERSONALS

APELLIDOS / COGNOMS: _____ NOMBRE/NOM: _____

D.N.I.: _____

Domicilio en / Adreça en: _____, Nº: _____, Pta.: _____

Municipio/Municipi: _____ Provincia/Provincia _____ CP: _____

Teléfono/Telèfon: _____

DATOS ACADÉMICOS/DADES ACADÈMIQUES

→ CURSO ACADÉMICO PARA EL QUE SOLICITA LA MATRÍCULA
/CURS ACADÈMIC PER AL QUE SOL·LICITA LA MATRÍCULA: _____

→ TITULACIÓN PARA LA QUE SOLICITA LA MATRÍCULA
/ TITULACIÓ PER A LA QUE SOL·LICITA LA MATRÍCULA: _____

→ ASIGNATURAS A MATRICULAR
/ASSIGNATURES A MATRICULAR:

1.- .....
2.- .....
3.- .....
4.- .....
5.- .....

JUSTIFICACIÓN DE LA SOLICITUD/ JUSTIFICACIÓ DE LA SOL·LICITUD:

_____
_____
_____

DOCUMENTACIÓN A PRESENTAR/DOCUMENTACIÓ A PRESENTAR

1	Fotocopia de D.N.I./*Fotocòpia del D.N.I.*	☐
2	Foto carnet/*Foto carnet*	☐
3	Fotocopia datos bancarios/*Fotocòpia dades bancàries*	☐

Valencia, a _____ de _____ de _____
València, a _____ *de* _____ *de* _____

Firma del alumno
Signatura de l'alumne

Annex 2: Instructions for registration.

PRE-REGISTRATION: until 30 September 2013 via CHERNE Institution representatives for one or several of these Seminars.

Selection, if necessary, at home institutions.
After acceptation by the Master, accepted students should follow the following **procedure to be admitted as visiting students at UPV**:

1. Send to DIQN the application form (deadlines proposed for each Seminar). If several Seminars are requested, it is better to send only one application form at due time (earliest deadline).
2. DIQN signs the authorisation letter.
3. Registration attaching the documents required:
    - Personal information,
    - account number, where fees will be charged
    - photo
    - ID or passport photocopy
    - DIQN authorization letter, stating subjects to be registered and motivation.

After being admitted, (and received the approval by the UPV Rector), steps are the following:

1. Participation in the Seminar including evaluation process.
2. An official certificate is signed.
3. Recognition will be done by home Institution.

Annex 3: Translation of the application form.

Application to be admitted as visiting student at UPV
PERSONAL INFORMATION
Family name ……First Name
ID / Passport
Address [Street, Nº, city, province, country, ZIP, Phone]
ACADEMIC INFORMATION
Academic year: 2013/2014
Title: MÁSTER UNIVERSITARIO EN SEGURIDAD INDUSTRIAL Y MEDIO AMBIENTE
Matters to be registered: (include only those desired)

- ANÁLISIS AVANZADO DE LA SEÑAL
- INTRODUCCIÓN A LOS MÉTODOS DE SOFT COMPUTING EN INGENIERÍA: ALGORITMOS GENÉTICOS, REDES NEURONALES Y LÓGICA FUZZY
- MÉTODOS Y APLICACIONES EN RADIOQUÍMICA
- RADIACTIVIDAD NATURAL

Justification: (**Attached DIQN letter**)
Documentation to be presented:

1. Photocopy of ID / Passport
2. Photo carnet
3. Photocopy of bank data

Date Signature of the student