



CHERNE Workshop COVILHA-2017

ROUND TABLE 1

Analysis and discussion on activities proposed for CHERNE partners

Moderator: Frieder Hoyer

Topics to be discussed in RT1:

1. *CHERNE activities organised in 2016-17*
2. *CHERNE activities: New initiatives and Proposals for 2017-18*
3. *Non CHERNE activities open for CHERNE partners*
4. *Other CHERNE partners – No activities*
5. *Remarks*

Annexes

1. *Template: Project Plan for CHERNE activities and other actions proposed to the network*
2. *Report of NTUA activity in 2015-16*
3. *List of participant to the workshop*

1. CHERNE activities organised in 2016-17

- *Proposals for 2017-18*

| | |
|---------------------------------|---|
| Intensive course IC: | RADAM-3 (Radiation Detection and Measurement) |
| Date of the project: | 5-9/9/2016 |
| Place(s) of the project: | FH Aachen Campus Jülich |
| Coordinator(s): | Friedrich Hoyer |
| Other partners: | – |
| Number of participants: | 11 students from AcUAs, Bologna, and NTUA |
| ➤ Status 2017-18: | will be perhaps organized again: RADAM-, 04/09-8/9/2017 number of participants: max 12 |

| | |
|---------------------------------|--|
| Intensive course IC: | MARC (Methods of Applied Radiochemistry) |
| Date of the project: | 12/9-16/9/2016 |
| Place(s) of the project: | FH Aachen Campus Jülich |
| Coordinator(s): | Felix Schneider |
| Other partners: | Caroline Licour |
| Number of participants: | 10, from UPV, UHasselt ,AcUAs, Bologna, and NTUA |
| Remarks: | funded by SP in Erasmus + |

- **Status 2017-18:** will be perhaps organized again: proposed date: 11/9-15/9/2017
number of participants: max 16

Training Course: **GATE: GEANT4 Application for Tomographic Emission**
Date of the project: **19-23/09/16**
Place(s) of the project: FH Aachen Campus Jülich
Coordinator(s): Karl Ziemons
Other partners: –
Number of participants: 6 from AcUAS, 1 from Canada, but none from CHERNE members

- **Status 2017-18:** Probably proposed for 2017-18

Intensive course IC: **IC-IRAD: Intensive Course on Industrial Radiography**
Date of the project: not organised in 2016-17
Place of the project: Nuclear Engineering Laboratory and School of Mechanical Engineering, National Technical University of Athens NTUA (Greece)
Coordinator (s) Nick P. Petropoulos
Number of participants:
Remarks: final report of previous edition (2015-16): see annex

- **Status 2017-18:** course website: <https://sites.google.com/site/ntuaradiographycourse>
will be organized again biannually In case of demand and interest
Spring 2018
max. number of participants: 12
course can be extended to 7 working days

Intensive course IC: **MERIBel (Environmental measurements)**
Date of the project: 19-26/4/2017
Place(s) of the project: Brussels, Belgium
Coordinator(s): ISIB, UHasselt, , Belgium
Other partners: SCK•CEN, FANC, UPV
Number of participants: 16 students (UPV, ISIB, Coimbra, Unibo, CTU, AcUAs, NTUA, UHasselt)
Remarks: funded by SP in Erasmus +

- **Status 2017-18:** will not be organised in 2017-18 but in 2018-19

Intensive course IC: **TRA (Training on Risk Assessment)**
Date of the project: 13-17/02/2017
Place(s) of the project: UPV – Valencia (Spain)
Coordinator(s): Sebastián Martorell
Other partners: ISIB, UHasselt, Unibo
Number of participants: 17 students (UPV, ISIB, Unibo, CTU, AcUAs, NTUA, UHasselt)
Remarks: funded by SP in Erasmus +

- **Status 2016-17:** will be probably organised (partner: ISIB, UHasselt)

Training school Erasmus+: **MaRaWas (Waste management)**
Date of the project: 21-26/11/2016
Place(s) of the project: Diepenbeek , Belgium,
Coordinator(s): UHasselt
Other partners: ISIB, NTUA, Unibo, CTU,
Number of participants: 20 students (UPV, ISIB, Unibo, CTU, AcUAs, NTUA, UHasselt)
Remarks: funded by SP in Erasmus +

- **Status 2016-17:** will be organised with project funds by UHasselt
End of November-beginning of December 2017

Intensive course IC: **SARA (Safe Application of Radiation and radionuclides)**
Date of the project: 5-9/12/2016
Place(s) of the project: Prague
Coordinator(s): CTU-Prague
Other partners: SURO v.v.i., ISIB, UHasselt
Number of participants: 22 students (UPV, ISIB, Unibo, CTU, AcUAs, NTUA, UHasselt)
Remarks: funded by SP in Erasmus +

- **Status 2016-17:** will be probably organized again, Time period to be discussed

Intensive course IC: **MANTRA (Medical application of Radiation and Radioisotope)**
Date of the project: 13-17/03/2017
Place(s) of the project: Bertinoro
Coordinator(s): UNIBO
Other partners: CTU, ISIB, Coimbra, UHasselt
Number of participants: 15 students (UPV, ISIB, Unibo, CTU, AcUAs, NTUA, UHasselt, Coimbra)
Remarks: funded by SP in Erasmus +

- **Status 2016-17:** can be organised if cheap accommodation found

Master Course: **Monte Carlo method applications to Laboratory, Industry and Medicine**
Date of the project: 13-15/02/2017
Place(s) of the project: ISIB (Brussels)
Coordinator(s): Wouter Schroeyers (UH), Isabelle Gérardy (ISIB)
Number of participants: 20 from Belgium (UH, ISIB)

- **Status 2016-17:** will be probably organised again during the second quadrimester in ISIB, 20 or more participants

Master Course : **Soft Computing: An Introduction to Soft Computing Methods in Modern Engineering: Genetic Algorithms, Neural Networks and Fuzzy Logic**

Date of the project: 30/01-03/02/2017
Place(s) of the project: UPV – Valencia (Spain)
Coordinator(s) José Ródenas, UPV
Other partners: Enrico Zio, Politecnico de Milano (Italy)
Number of participants: 11 participants from UPV

➤ **Status 2016-17:** Probably it will be organized, but it should be confirmed by UPV (to get funds)

Master Course: **NATURAL RADIOACTIVITY: Protection against Natural Ionizing Radiation**

Date of the project: 6-10/02/2017
Place(s) of the project: UPV – Valencia (Spain)
Coordinator(s): José Ródenas, UPV
Other partners: Isabelle Gerardy, Institut Supérieur Industriel de Bruxelles (ISIB, Belgium)
Number of participants: 3 participants from UPV, 2 participants from CTU

➤ **Status 2017-18:** Probably organized within a STA structure

Workshop: **CHERNE Workshop**
Date of the projects: 22/05-25/05/2017
Place(s) of the project: Covilha, Portugal
Coordinator(s): Sandra Soares, (UBI)
Other partners: CHERNE partners
Participants: See list of participant in Annex

2. *CHERNE activities: New initiatives and proposals for 2017-18*

Training school: **Radionuclide production with Cyclotrons RPC**
Date of the project: 4-8/09/2017
Place(s) of the project: Mannheim and Heidelberg
Coordinator(s): Ulrich Scherer, Hochschule Mannheim University of Applied Sciences
Other partners: German Cancer Research Center DKFZ (Deutsches Krebsforschungszentrum)
Number of participants: 6-8

Training Course: **GATE: GEANT4 Application for Tomographic Emission**

Date of the project:
Place(s) of the project: FH Aachen Campus Jülich
Coordinator(s): Karl Ziemons
Other partners: –
Number of participants: max 12
Remark: The course was proposed last year but had no participant
Probably proposed for 2017-18

| | |
|---------------------------------|---|
| Master Course : | RADIOCHEMISTRY: Methods and applications in Radiochemistry |
| Date of the project: | March or April 2018 |
| Place(s) of the project: | UPV – Valencia (Spain) |
| Coordinator(s): | José Ródenas |
| Other partners: | Ulrich Scherer, Manheim (Germany) |
| Number of participants: | theoretical course (12 participants maximum) |

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|---------------------------------|--|
| Master Course: | Applications of Plasma |
| Date of the project: | first week of October 2017 |
| Place(s) of the project: | ISIB – Brussels (Belgium) |
| Coordinator(s): | Isabelle Gerardy |
| Other partners: | Domiziano Mostacci, UNIBO (Italy) |
| Number of participants: | theoretical course (no limit of participant) |

3. Non CHERNE activities open for CHERNE partners

| | |
|---------------------------------|---|
| Intensive course IC: | III GEANT4 International School and Parallel Computing Concepts |
| Date of the project: | will be organized again, but in Belgrade (Serbia) in 2017-18 |
| Place(s) of the project: | INFN-Laboratori Nazionali del Sud and Università degli Studi di Catania |
| Coordinator(s): | Enzo Bellini |
| Number of participants: | max. 50 |

4. Other CHERNE partners

Associate Members

- Department of Nuclear Engineering, Università degli Studi di **Palermo** (Italia)
- Department of Physics, Università degli Studi di **Messina** (Italia) (renewed membership)
- Instituto Superior Tecnico (IST), **Lisboa** (Portugal)
- Universidad de **Salamanca** (Spain)

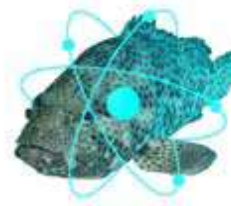
5. Remarks

- For the announcement of the next activities the CHERNE template 2017-18 should be used (see annex), to be included in the CHERNE Bulletin.
- This template should be filled in *before the beginning of September 2017* to allow the communication to the students at the beginning of the academic year (end of September) in the CHERNE Bulletin and should be send to:
 - the new Bulletin coordinator Agnes Peeters (apeeters@he2b.be)
 - the CHERNE secretary Isabelle Gerardy (igerardy@he2b.be)

- Well before the actual organisation of a course a separate second announcement should be send by the organisers to the partners.
- All further information concerning the projects will be distributed on the CHERNE Platform (platform coordinator: Marios Anagnostakis (managno@nuclear.ntua.gr))



CHERNE 2017-18



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

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|--|
| Acronym/Short title of the project: xxx xxx |
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|--|---|
| 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 CHERNE secretary Isabelle Gerardy ((igerardy@he2b.be) and to the Bulletin coordinator Agnes Peeters (apeeters@he2b.be) before September 30: received proposals are sent by means of the CHERNE Bulletin to all CHERNE partners by the CHERNE secretary and made available on the CHERNE 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.cherne.ntua.gr) |
| Definitions | IC: Intensive course, at least 1 week/2 ECTS Master Course: organised for home students but open to others |

| | |
|---|--|
| Title of the project and acronym (if applicable) | |
| Type of the project | Please fill in: IC, training school, excursion, visit, internship, workshop, research, other? |
| Main objective of the project | Describe in a few lines the main objective of the project. A more extensive description can be given in an annex |
| Short description of the project | |
| 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 | students (Ba, Ma, PhD?), staff members, external, ...? |
| Expected present studying level of participants and their specialisation (if relevant) | 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 an Erasmus program? | |
| ECTS or ECVET credits applicable? How many? | |
| Are any other academic, 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

.../...

ΕΘΝΙΚΟ ΜΕΤΣΟΒΙΟ ΠΟΛΥΤΕΧΝΕΙΟ

ΣΧΟΛΗ ΜΗΧΑΝΟΛΟΓΩΝ ΜΗΧΑΝΙΚΩΝ
ΤΟΜΕΑΣ ΠΥΡΗΝΙΚΗΣ ΤΕΧΝΟΛΟΓΙΑΣ

ΕΠΙΚ. ΚΑΘΗΓΗΤΗΣ Ν.Π. ΠΕΤΡΟΠΟΥΛΟΣ
Αρ. Μηχανολόγος Μηχανικός ΕΜΠ



NATIONAL TECHNICAL UNIVERSITY
OF ATHENS
SCHOOL OF MECHANICAL ENGINEERING
DEPARTMENT OF NUCLEAR ENGINEERING

ASSIST. PROFESSOR N.P. PETROPOULOS
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Dr. Ing. Isabelle GERARDY,

Chef de travaux
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Institut Supérieur des Ingénieurs de Bruxelles
BELGIUM

Athens, May 06, 2016

Re: Final Report for the 2nd (interim) Intensive Course on Industrial Radiography

Dear Dr. GERARDY,

Let me please provide herewith an accounting report of the 2nd Intensive Course on Industrial Radiography (IC-IRAD), which was successfully held between Sep 21 and Sep 25, 2015, at the Nuclear Engineering Department of the National Technical University of Athens (NED-NTUA). As well-known, the course is a joint initiative of NED-NTUA and the CHERNE network. Detailed data on this course have been also made available at the course web site, which has been specifically prepared for the course purposes, at the following link:

<https://sites.google.com/site/ntuaradiographycourse/>

1. Course history, aim and generic particulars

The aim of this one-week intensive course is to bring together students and teaching staff from higher education institutions involved in the nuclear engineering applications fields, for a 5 continuous full day (09.00-17.00) course regarding the principles of conventional (film) industrial radiography and associated radiation protection.

The usefulness of an intensive course on industrial radiography, either with or without ERASMUS or other funding support, were proposed by the Nuclear Engineering Department of the National Technical University of Athens (NED-NTUA) during the 8th CHERNE Workshop, which was hosted by NED-NTUA in GREECE, between 28 to 30 May 2012.

A second detailed discussion on the matter was further held during the 9th CHERNE Workshop, which was hosted by the Faculty of Sciences at the University of Salamanca, SPAIN, between 5 to 7 June 2013. Following these discussions, it was finally decided that such a course could be organized for the first time within Autumn 2014 under the name IC-IRAD and for the duration of one week only.

The 1st Course was successfully held between Sep 29 and Oct 3, 2014. Despite the fact that the organizers were planning to hold the 2nd Course, in 2016, an expressed interest coming from many students of the FH-Aachen was the initiative, which led to the organization of this course in 2015.

2. Particulars of the 2nd Course

The course was not funded by any external source and, therefore, it was run using the personnel, the facilities and the equipment available at NED-NTUA. Registered participants were not supported

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financially, in any way i.e. for transportation, accommodation, per-Diem etc. It has been decided that despite the lack of funding to charge no fees to the course participants.

The course was held for eleven (11) participants, namely: nine (9) students coming from FH Aachen (GERMANY), one (1) student coming from the National Technical University of Athens (GREECE) and one (1) faculty member of the Frederick University in CYPRUS. All participants were registered in June 2015. All lectures were given in English (the official course language). All participants received adequate course material mainly in printed form and also electronic copies of suggested studying material.

Since the level of the attending participants was sufficiently high it was decided that there was no need for an oral or written examination. Course duration and content was unofficially considered as equivalent to 2 ECTS, nevertheless there was no official provision for ECTS or ECVET credits, since the credit system has not been yet adopted in our University for such provisional seminars.

A duly signed certificate of attendance was issued for all course participants.

Rest of the characteristics of the given lectures program and course conduct specifics may be found at the link of the course web site.

3. Course equipment and facilities

Here is a basic list of the main equipment and facilities which were available for the course:

- a. X-Ray Source type ERESO MF42 (200 kV) by GE Inspection and Sensing Technologies
- b. NOVA (Agfa) Film Processor Type: 7070/100 by GE Inspection and Sensing Technologies
- c. 4X Film Viewer 205x85 mm for Welding Film by Kowolux
- d. Digit-X Densitometer by Fidgeon Ltd
- e. Scanjet G4050 by Hewlett Packard]
- f. Image quality indicators (after DIN), lead letters and numbers, densitometer calibration film, spatial resolution specimens

In addition:

The was provided an independent and adequate classroom with all necessary audio visual means.

4. Course evaluation

An evaluation of the course was held in the form of discussion during the last day. The summary conclusions and suggestions are listed below coming from both the participants and the instructor:

- The course was practically taught by a sole instructor only. It would be advisable that more instructors should be involved in future courses.
- The time available for the course seems limited; participants expressed their suggestion of more laboratory work like radiography of random specimens provided by the participants themselves, further laboratory investigation of the penumbra effects etc.
- Participants expressed their suggestion to include radiography simulation, digital radiography and tomography in the course program. The discussion on this suggestion led to the recognition of a need to extend the course duration to 7 or 8 days. Alternatively, the course could still be held within 5 days only, if the ionizing radiation theory during the first day could be skipped for MSc level participants with a radiation physics background and if weld and cast defects analysis could be skipped for participants with a mechanical engineering background.
- The logistics of the course were quite satisfactory (web site, accommodation instructions, visa and health insurance info, Wi-Fi services, registration procedure, location, transportation means, bar and restaurant facilities, availability of the instructor for non-course guidance etc.)

5. Course future and sustainability

It is intended that this course will be held biannually, i.e. the next course should be held in 2017. However, this could change according to demand or interim courses could be organized at the request of an adequate number of participants.

An effort is being put so that funding shortage could change by the 3rd course and on. There will be examined the possibility of charging a rather symbolic fee (let's say ~50 EUR) to the participants to cover just the immediate logistic needs of the course conduct especially in the case when the students are more than five.

It is intended that the next (possibly in 2017) course will focus more on digital radiography, since relevant equipment has been purchased. At the moment this equipment has not yet been set-up for educational purposes.

Both international and local Greek students would be welcome. The international students would have priority. Eligible 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. Students originating from CHERNE partner higher education institutions are particularly welcome. All students levels would be accepted (3rd or 4th year Ba, Ma, PhD).

It has been worked out that the maximum number of course participants, taking into account the facilities and equipment available and the possibility of external funding or a fee system, could be set to twelve.

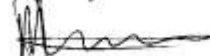
5. Overview and conclusions

The organization of the 2nd (interim) Course was rather successful. A major improvement, as compared to the 1st Course was the increased number of participants: eleven as compared to three respectively. Evaluation pointed out however, that the amount of knowledge to be transferred during this course barely fits to the course duration schedule. The course should be extended to 7 working days or so, if more radiography material is to be covered or if participants are asked to present a short project work. Furthermore, the involvement of more and rather international instructors would fulfill the explicit course aim to *"bring together students and teaching staff from higher education institutions involved in the nuclear engineering applications fields"*.

6. Acknowledgments

The signatory of this report would like to thank colleague Lecturer Panagiota ROUNI for her collaboration and assistance during the Laboratory Exercises organized for this course and colleague Associate Professor Marios ANAGNOSTAKIS, for supporting and pushing forward towards the organization of this 2nd IC-IRAD and for his continuous support and advice. Thanks are extended also to Professors Friedrich HOYLER and Ulrich SCHERER of FH-Aachen, Germany for encouraging and supporting their students to register and attend. Finally, thanks are due to all CHERNE network members for their support and advice.

Sincerely,



Nick P. Petropoulos

Assist. Professor NTUA



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