



## MEMORANDUM of AGREEMENT – MoA

### Double Master's Degree

between

**Faculty of Mathematics and Natural Sciences,  
Institut Teknologi Bandung ( Bandung, Indonesia )**

and

**Ecole des Mines de Nantes ( Nantes, France )**

This Memorandum of Agreement falls within the framework of the Memorandum of Understanding between Faculty of Mathematics and Natural Sciences Institut Teknologi Bandung, hereafter referred to as FMIPA ITB and Ecole nationale supérieure des Mines de Nantes hereafter referred to as Mines-Nantes, a member of the Institute Mines-Telecom.

#### **Article 1. Purpose of the MoA**

The purpose of this Memorandum of Agreement is to develop exchanges of students that will lead to the award of degrees of both institutions:

- From ITB :
  - o The Master of Science in Physics
- From Mines-Nantes :
  - o The Master of Science and Technologies in Sustainable Nuclear Engineering : Applications and Management : **SNEAM**
    - Specialization in Advanced Nuclear Waste Management – **ANWM**
    - Specialization in Nuclear Energy Production and Industrial Applications – **NEPIA**

under the conditions specified hereafter.

## Article 2. Participating Bodies

The participating bodies will be ITB and Mines-Nantes

The following liaison officers will be primary point of contact and persons responsible for the collaborative discussions:

For ITB

Prof. Edwan Kardena, Director of International Relations

For Mines-Nantes

Dr Annya Réquillé, Dean of International Graduate School

## Article 3. Fields of study

All fields of study at each institution are potentially covered by this agreement. However, the compatibility of the respective programs must be confirmed and the programs and study paths on both sides approved prior to implementation in a particular domain.

## Article 4. Program structure for students from ITB

*Double degree :*

From ITB : Master of Science in Physics

From Mines-Nantes : Master of Science and Technologies in Sustainable Nuclear Engineering : Applications and Management : **SNEAM**  
Specialization in Advanced Nuclear Waste Management – **ANWM**  
Specialization in Nuclear Energy Production and Industrial Applications – **NEPIA**

- The program structure is as follows:

Year		Master year 1		Master year 2		
Semester		1	2	1	2	
Month				August	Sept – Jan	Feb – Jul
ITB	Programme	Master programme year 1 sem 1	Master programme year 1 sem 2			
				French Summer School	Master programme year 2 sem 1	Master Thesis
Mines-Nantes	Programme					

Intensive and Extensive French Language and Culture courses are provided for students throughout their period of study in Mines-Nantes during the 2<sup>nd</sup> year of Master from August to July.

An additional intensive 4 weeks French Language and Culture courses is offered to the students in July at Mines-Nantes. The tuition fees will be clearly mentioned to the students.

- Conditions of attribution of the double degree

The double is awarded after:

- Successful completion of M1 (1<sup>st</sup> year of Master) at ITB and
- Successful completion of the intensive French Summer school program, the first academic semester of the M2 in one of the Master of Science and Technologies programs at Mines-Nantes, with a 6 month Master thesis which meets the relevant requirements for degree-conferring.

For the duration of the double degree program students will be jointly registered at ITB and Mines-Nantes.

The double degree will be delivered after the successful completion of studies in both institutions  
The general program of studies is detailed in Appendix 1.

### Article 5. Program structure for students from Mines-Nantes

*Double degree :*

From ITB : Master of Science in Physics

From Mines-Nantes : Master of Science in Engineering in nuclear engineering

- The program structure is as follows:

Year		Master year 1		Master year 2
Semester		1	2	
Month				Sept – Dec N+1 (16 months)
Mines-Nantes	Programme	Master in Engineering programme year 1 sem 1	Master in Engineering programme year 1 sem 2	
ITB	Programme			Master year 2 +Master Thesis

The tuition fees will be clearly mentioned to the students.

- Conditions of attribution of the double degree

The double is awarded after:

- Successful completion of M1 (1<sup>st</sup> year of Master) at Mines-Nantes and
- Successful completion of M2 (2<sup>nd</sup> year of Master) at ITB with a Master thesis which meets the relevant requirements for degree-conferring.

For the duration of the double degree program students will be jointly registered at ITB and Mines-Nantes.

The double degree will be delivered after the successful completion of studies in both institutions  
The general program of studies is detailed in Appendix 1.

## **Article 6. Arrangement of Academic Conditions**

Both institutions mutually recognize the credits that students acquired in the double degree program.

## **Article 7. Language of Instruction and Thesis**

All courses for this double degree program will be delivered in English in both institutions. Students enrolled in the double degree program are expected to write his/her thesis in English and the thesis must be submitted to both institutions for oral examination.

## **Article 8. Admission**

The students will be pre-selected by their home institution based on the excellence of their academic records and will be recommended to the host institution for admission to the Master program..

The selection process shall then go through an evaluation, by the host institution of the candidate's application (with regard to academic level, language ability and candidate's motivation).

The final decision for admission is decided by the host institution, subject to its rules and procedures. Details of the application procedure will be clearly mentioned to the candidates.

## **Article 9. Costs**

### **i. Tuition and fees**

Tuition fees will be paid by the students only to the home institution, where they are studying. ITB and Mines-Nantes will clearly mention the tuition fees to the students.

### **ii. Other costs**

Students must cover their own travel and subsistence expenses – housing, food, insurance etc. ITB and Mines-Nantes will clearly mention the living cost expenses and the facilities on campus.

### **iii. Financial support**

ITB and Mines-Nantes will actively seek for funding to cover partially or totally these tuition fees and/or living costs.

## **Article 10. Annual meetings**

The persons responsible for the program at both institutions shall meet at least once a year within the frame of the general agreement of cooperation between the Mines-Nantes and ITB in order to :

- Review effectiveness of the teaching programs
- Examine the academic results achieved by the students in the light of the institutions' joint efforts
- Review the domains and programs able to host students in the frame of the double-degree program
- Review the selection and admissions procedures and criteria

- Decide, each year, the number of students to be admitted to the double degree program.
- Discuss further actions

**Article 11. Effective Date and Length of MoA**

The Memorandum of Agreement will remain in force for a period of five years subject to the availability of funds. Any amendment and/or modification of the Memorandum of Agreement will require written approval by each partner institution's signing officer for Memorandums of Agreement. After the initial five-year period, this MoA will be renewed automatically unless written notice of termination is given.

Either party reserves the right to terminate this MoA upon six months' written notice to the other party. In this case, the program(s) or the activity(ies) already approved by both parties shall be allowed to be completed under the conditions of this MoA. In such event, the obligations of Mines-Nantes and ITB towards the students, currently enrolled in a Double Degree program, will be carried out under the conditions of the present agreement.

This Memorandum of Understanding will take effect when signed by each side:

On behalf of FMIPA ITB

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Prof. Dr. Edy Tri Baskoro  
Dean of Faculty of Mathematics and  
Natural Sciences

On behalf of Mines-Nantes

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Ms. Anne Beauval *p. j.*  
Director of Ecole des Mines de Nantes

Date: 30<sup>th</sup> OCT 2015

Date: 30. 10. 2015.

## ***Master year 1 Master of Science in Physics – ITB Programme of the master year 1***

### List of Courses (ITB)

- 1<sup>st</sup> year at ITB (for Student of ITB)

No	Courses	CU
1	Quantum Mechanics	3
2	Statistical Mechanics	3
3	Physical System Computation	3
4	Physical Instrumentation or Electrodynamics	3
5	Research Methodology	3
6	Elective Courses	9

- 2<sup>nd</sup> year at ITB (for Student of Mines-Nantes)

No	Courses	CU
1	Quantum Mechanics	3
2	Statistical Mechanics	3
3	Physical System Computation	3
4	Physical Instrumentation or Electrodynamics	3
5	Theses and Seminar	9
6	Independent Study	3

**Master year 2 SNEAM – Mines-Nantes**  
**Specialization in Advanced Nuclear Waste Management: ANWM**

SNEAM/ANWM MSc in Advanced Nuclear Waste Management		Year 2	
		Sem 1	Sem 2
CODE	Scientific and Technical modules	European credit - ECTS	
ST121WS	Wastes, conditioning and Storage .....	7	
	Inventories of waste and classification		
	Waste characterization and conditioning		
	Storage concepts and sites		
ST221DD	Dismantlement and Decommissioning of Nuclear Installations .....	4	
	Dismantlement strategies and projects		
	Dismantlement scenario		
	Radiological inventories		
ST321GD	Geological Disposal.....	7	
	Geology and hydraulics		
	Repository technology		
	Engineered barrier system		
ST421SA	Safety .....	5	
	Geochemical and transport modelling		
	Transfer to human beings		
	Performance and safety		
	Radioprotection		
	Environmental impact		
	<b>Social Science and Management modules</b>		
SSG21NS	Nuclear : Management, Safety and Society .....	5	
	Institutional framework, actors		
	Socioeconomic and ethical aspects		
	Sustainable nuclear development		
	Project Management		
	<b>Training for the corporate world</b>		
FEM22MT	Master Thesis .....		30
	<b>Foreign Languages</b>		
	French Summer School - 4 week in August	4	
LVI21FL	French Language and Culture [for native French speakers : Spanish course].....	2	
	<b>Individual / Society Project courses</b>		
CEP21	Competencies evaluation and professional project.....	X	

1 ECTS credit is equivalent to 25 hours of courses and personal work

*Master year 2 SNEAM – Mines-Nantes  
Specialization in Nuclear Energy Production and Industrial Applications  
- NEPIA*

SNEAM/NEPIA	MSc in Nuclear Energy Production and Industrial Applications	Year 2	
		Sem 1	Sem 2
CODE	Scientific and Technical modules	European credit - ECTS	
ST121RT	Reactors and Advanced Nuclear Technologies .....	7	
	Nuclear reactors		
	Physics of neutron transport		
	Thermohydraulics		
	Particles beam and radiation production		
	Particles beam and radiation qualification		
ST221EP	Engineering in Nuclear Power Plants .....	7	
	Thermohydraulical simulation		
	Operation		
	Safety		
	Detailed study of nuclear materials		
ST321EI	Engineering in Standard Nuclear Installations.....	5	
	Safety		
	Technical applications review		
	Security applications and waste characterisation		
ST421SW	Safety, Radioprotection and Waste Management.....	4	
	Safety of the fuel cycle installations		
	Non-proliferation		
	Radioprotection		
	Specific waste management in industrial environment		
	<b>Social Science and Management modules</b>		
SSG21NS	Nuclear : Management, Safety and Society .....	5	
	Institutional framework, stakeholders		
	Socioeconomic and ethical aspects		
	Sustainable nuclear development		
	Project Management		
	<b>Training for the corporate world</b>		
FEM22MT	Master Thesis - Research or Industrial Internship .....		30
	<b>Foreign Languages</b>		
	French Summer School - 4 week in August	4	
LVI21FL	French Language and Culture [for native French speakers : Spanish course].....	2	
	<b>Individual / Society Project courses</b>		
CEP21	Competencies evaluation and professional projects.....	X	

*1 ECTS credit is equivalent to 25 hours of courses and personal work*