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SURVEY QUESTIONNAIRE ON CURICULUM IN MOLECULAR AND MATERIALS SICENCES

Dear Bachelor students and Master students,

Molecular and Material Science (MMS) is a comparatively recent field of research encompassing physics, biology, chemistry and technology. It is aiming to find out novel properties and activities of molecules so far unexplored, and to create innovative materials with new and valuable functionalities which can be applied in medicine, pharmacy, electrical engineering, environmental treament, new energy,... In Viet Nam, although integration of courses in MMS into education programmes in chemistry and physics has been recently conducted in universities but still in low scale and the results obtained have still not been met with the demand of the society.

Within the framework of the Project "*Research-based curriculum development in molecular and materials sciences Vietnam"* (MOMA), Project Reference 597795-EPP-1-2018-1-BE-EPPKA2-CBHE-JP, Co-funded by the Erasmus+ Programme of the European Union, we aim to upgrade the quality of education programmes in MMS to match the need of the society. To that end, we will organize a workshop focusing on evaluating the effectiveness thereby orienting the upgrade of the current education programmes. We would like to get feedback from you related to our education programmes in MMS listed below:

Bachelor in Engineering Physics (4 years, 140 credit points)

- Introduction to materials science (3 credicts)
- Nano structured materials (3 credicts)
- Luminescent materials (3 credicts)
- Physics of thin films (3 credicts)

Your feedback will be valuable foundation for upgrading the above education programmes.

A. Personal information

- Sex: □ Male □ Female
- You are: □ Bachelor student □ Master student
- Year: □ 1st □ 2nd □ 3rd □ 4th
- Your training program: …….

B. Survey questionnaire

1. Please circle the level of necessity in the questions below. The scale of necessity is arranged from low to high level: 1=(0–20%); 2=(21–40%); 3=(41–60%); 4=(61–80%); 5=(81–100%).

No.	Question	Level of necessity					Explanation (if any)
1.1	The level of necessity of interdisciplinary knowledge (Physics, Chemistry, Biology and Technology) in the above training programs	1	2	3	4	5	

1.2	The level of necessity of a collaboration between universities and companies in training programs related to the field of Molecular and Materials Sciences	1	2	3	4	5	

2. How could you predict the labour market trend for the above education programmes in MMS in the coming years?

Answer		Explanation (if any)
Increase	□	…… ……
Decrease	□	…… ……
Unchanged	□	…… ……

3. Could you please tell us why you chose the training program you are following?

□ Due to the interest in this training program
□ Easy to apply for a job after graduation
□ Easy to pass the entrance university exam
□ Failure to meet the first expectation into the desired university
□ Impact from family and relatives
□ Impact from teachers and friends
□ Other reasons
……

4. Do you intend to advise your relatives/acquaintances to follow the above training programmes in Molecular and Materials Sciences?

Answer		Explanation (if any)
Yes	□	…… ……
No	□	…… ……
Not sure	□	…… ……

5. Which of the following soft skills have you sucessfully trained yourself upon attending your current training program:

□ Group working
□ Performance of professional reports
□ Adaptation to a diverse working environment
□ English for common communication; English for reading, understanding professional documents
□ Using basic office softwares such as Word, Excel, Power-point, exploitation and using the Internet.

6. Which of the following knowledge do you wish to develop during your study at the university:

- □ Scientific thinking
- □ Rules/scientific principles
- □ Analyzing the problems
- □ Solving the problems
- □ Operating the laboratory equipment
- □ Planning and designing the experiments
- □ Calculating and processing the data
- □ Writing a report
- □ Presentation
- □ Searching and retrieving the information
- □ Group working
- □ Self-learning and self-study

7. Please circle the level of importance of the following knowledge/skills for Bachelor students / Master students in the field related to Molecular and Materials Sciences mentioned above. Evaluation scale is arranged from low to high level: 1=(0–20%); 2=(21–40%); 3=(41–60%); 4=(61–80%); 5=(81–100%).

No.	Question	Level of importance					Explanation (if any)
Scientific knowledge							
7.1	Concept, scientific terms	1	2	3	4	5	
7.2	Rules/scientific principles	1	2	3	4	5	
7.3	Analytical techniques	1	2	3	4	5	
7.4	Safety in handling chemicals and materials	1	2	3	4	5	
7.5	Practical skills	1	2	3	4	5	
Exchange skills							
7.6	Planning and designing experiments	1	2	3	4	5	
7.7	Calculating and processing data	1	2	3	4	5	
7.8	Write a report	1	2	3	4	5	
7.9	Presentation	1	2	3	4	5	
7.10	Searching, retrievinge information	1	2	3	4	5	
7.11	Problem solving	1	2	3	4	5	
7.12	Group working	1	2	3	4	5	
7.13	Time management	1	2	3	4	5	

No.	Question	Level of importance					Explanation (if any)
7.14	Self-learning, self-study	1	2	3	4	5	

8. Apart from the knowledge/skills mentioned above, according to you, which knowledge/skills (if any) do we need to complement into your current training program? Explain if any.

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9. Please circle the level of necessity of the existing courses in the above training programs. The scale of necessity is arranged from low to high level.: 1=(0–20%); 2=(21–40%); 3=(41–60%); 4=(61–80%); 5=(81–100%).

No	Course	Satisfactory scale					Explaination (if any)
9.1	Introduction to materials science	1	2	3	4	5	
9.2	Nanostructured materials						
9.3	Luminescent materials						
9.4	Physics of Thin Films						

10. According to you, which courses in the field of Molecular and Materials Sciences should be added into the existing training programs?

No.	Course	Description	Yes	No
10.1	Methods of material characterizations	This course presents methods for measuring mechanical, thermal, electrical, optical (absorption, photoluminescence, photoluminescence excitation), magnetic, dielectric, superconducting properties, and specific surface areas of nanomaterials.		
10.2	Methods of structural analysis	This course introduces the methods and techniques for determining the structural and morphological properties of nanostructured materials such as X-ray diffraction (XRD), Transmission electron microscope (TEM), scanning electron microscope (SEM), probe scanning microscope (SPM), atomic force microscope (AFM) methods.		
10.3	Multiscaling Modelling	The course introduces and discuss multi-scale models to reasonably handle material systems including reactions in material systems and interaction between biological molecular and		

		nanomaterials, resulting in simulation real processes in a more efficient way. Based on the results of the simulation, new phenomena can be found, which help to minimize the time and cost of experiments.		
10.4	Solid State Chemistry	The course will discuss relationship between the structure and properties of solid crystal materials such as electronic, optical, magnetic and semiconductor properties. Especially, the main groups of inorganic materials such as metal, metal oxide and silicate and main crystal structures like perovskite, spinel,… will emphasis in this subject.		

11. In your opinion, which courses listed below need to be strongly research-based orientedly upgraded?

No.	Course	Yes	No	Explanation
11.1	Introduction to materials science			
11.2	Nanostructured materials			
11.3	Luminescent materials			
11.4	Physics of Thin Films			

12. Please provide the solutions (if any) to improve the quality of the training program that you are following:

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13. Your other comments (if any):

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Thank you for your valuable cooperation and support.