

SURVEY QUESTIONNAIRE ON CURRICULUM IN MOLECULAR AND MATERIALS SCIENCES

Dear our Alumni,

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 treatment, 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:

I. Bachelor in Chemistry (4 years, 140 credit points)

- Spectroscopic methods for structural determination
- Modern analytical methods.

II. Bachelor in Medicinal Chemistry (4 years, 140 credit points)

- Quantitative molecular structure–activity relationship
- Techniques for extraction and isolation of natural compounds
- Biomedical materials
- Synthetic Medicinal Chemistry.

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

A. Personal information

- Age: < 30 30–40 40–50 > 50
- Sex: Male Female
- Job Title:
- Organization:
- Mailing address:
- Expertise:
- Education/Occupational experience:
- | | | | | | |
|---------------|------------------------------|-----------------------------------|------------------------------------|------------------------------------|-------------------------------|
| 1. Management | <input type="checkbox"/> < 5 | <input type="checkbox"/> (5 – 10] | <input type="checkbox"/> (10 – 15] | <input type="checkbox"/> (15 – 20] | <input type="checkbox"/> > 20 |
| 2. Research | <input type="checkbox"/> < 5 | <input type="checkbox"/> (5 – 10] | <input type="checkbox"/> (10 – 15] | <input type="checkbox"/> (15 – 20] | <input type="checkbox"/> > 20 |
| 3. Education | <input type="checkbox"/> < 5 | <input type="checkbox"/> (5 – 10] | <input type="checkbox"/> (10 – 15] | <input type="checkbox"/> (15 – 20] | <input type="checkbox"/> > 20 |
| 4. Consulting | <input type="checkbox"/> < 5 | <input type="checkbox"/> (5 – 10] | <input type="checkbox"/> (10 – 15] | <input type="checkbox"/> (15 – 20] | <input type="checkbox"/> > 20 |

B. Survey questions

1. How would you evaluate the necessity level described in the following questions. Scale of necessity level ranging from low to high: 1=(0–20%); 2=(21–40%); 3=(41–60%); 4=(61–80%); 5=(81–100%).

No	Question	Necessity level					Explanation (if any)
1.1	The importance of interdisciplinary knowledge (physics, chemistry, biology and technology) in the above training programmes.	1	2	3	4	5	
1.2	The importance of coordinations between university and enterprise for developing programmes in the field of molecular science and materials.	1	2	3	4	5	

2. How could you predict the society need for human resource in the fields of Molecular and Materials Science in coming years?

Answer	Explanation (if any)
<i>Increase</i> <input type="checkbox"/>
<i>Decrease</i> <input type="checkbox"/>
<i>No change</i> <input type="checkbox"/>

3. Your job status after graduation:
- Having been working
 - Worked before but not now
 - Never get job
4. If you have been working, please answer Question 4.1, otherwise please answer Question 4.2.

Question 4.1 (*If you have been working*)

- a) How long did it take you to get a job after graduation?
- < 6 months 6 – 12 months > 12 months
- b) What kind of business are you currently working for?
- State agencies Private enterprise
- Foreign organizations Self-employment
- c) How is your job in accordance with your specialization?
- Total in accordance Rather in accordance Not in accordance

- d) The job you obtained is thank to (maybe more than one option)
- Specialization trained
 - Foreign language proficiency
 - Computer skills
 - Personal relationships
 - Own experiences
 - Others (Please specify):

Question 4.2. (For whom not having a job) Why did you not get a job?

- Continue to learn to improve knowledge
- Do not intend to find a job
- Did apply for a job but failed
- Have to take care of family
- Knowledge/specialization not appropriate
- Foreign language skills not appropriate
- Computer skills not appropriate
- Others (Please specify):
- Lack of working experience
- Lack of job information
- Incompatible capacity

5. Please circle the degree of your consent, satisfaction, or understanding about the training programme you have attended. The degree scale ranging from low to high: 1=(0–20%); 2=(21–40%); 3=(41–60%); 4=(61–80%); 5=(81–100%).

N0	Question	Degree					Explanation (if any)
		1	2	3	4	5	
5.1	Objectives and outcomes of the training programme satisfy with the social requirements	1	2	3	4	5	
5.2	Links between theory, practice and career after graduation in the training programme	1	2	3	4	5	
5.3	The distribution ratio between theoretical and practical courses in the training programme	1	2	3	4	5	
5.4	The degree of update of the training programme	1	2	3	4	5	
5.5	The integrity and interdisciplinary of the training programme	1	2	3	4	5	
5.6	The training programme is typical research-based programme	1	2	3	4	5	
5.7	The university provides appropriate facilities, materials for research-based learning and teaching	1	2	3	4	5	
5.8	The university provides appropriate equipments for research-based practical teaching	1	2	3	4	5	
5.9	Lectures/exercises/experiments,... are designed in accordance with research-based learning and teaching.	1	2	3	4	5	

6. Could you please kindly circle the necessary of the existing courses as described below. The rating scale is ranked from low to high: 1=(0–20%); 2=(21–40%); 3=(41–60%); 4=(61–80%); 5=(81–100%).

No	Course	Satisfactory scale					Explanation (if any)
		1	2	3	4	5	
4.1	Quantitative molecular structure–activity relationship						
4.2	Techniques for extraction and isolation of natural compounds						
4.3	Modern analytical methods						
4.4	Spectroscopic methods for structural determination						
4.5	Biomedical materials						
4.6	Synthetic Medicinal Chemistry						

7. In your opinion, which course(s) listed below should be ADDED to the existing education programmes in Molecular and Materials Science?

No	Course	Description	Yes	No
7.1	Molecular and material modeling	This course introduces students to different modeling methods and different simulation from molecular dynamics to quantum mechanics such as continuum models, CG models (coarse grain models), AA methods (All Atoms), DFT (density functional theory) theory, as well as their applications in the field of molecular science and materials. At the end of the module, students have the ability to (i) perform simple simulations by using techniques appropriate to existing conditions; (ii) select the appropriate simulation method for each specific object (molecule, material); (iii) read and criticize scientific documents on calculations and material and molecular simulation.		
7.2	Design, discovery and synthesis of rational drugs	This course provides knowledge related to drug design / discovery / synthesis processes including understanding characteristics of targets (enzymes, cells, tissues,) related to disease, setting up drug design concepts, providing compounds called LEADs (through traditional medicine, natural products, biological macromolecules, synthetic compound library, computational chemistry, etc.), design and optimize LEAD by analyzing structural-activity relationships. The module will also help understand deeply molecular-level action mechanisms and effectively active synthesis methods.		
7.3	Bioinorganic chemistry	This course provides the learners the basic principles of Inorganic Chemistry related to bioinorganic researches. It also helps the learners understand the physical methods used in Bioinorganic Chemistry such as EPR spectroscopy, Mössbauer spectroscopy, EXAFS spectroscopy, etc. In		

		<p>addition, the learners would understand the role of metals in biochemical systems as well as the transport and storage of metal ions. For example, the function of metals in metalloproteins in transporting and storing oxygen; the electronic transport function of metals in metalloproteins. Besides, the learners can understand the structures and functions of enzymes containing iron, copper, sulfur, etc. Furthermore, the learners can learn the use of metals for drug preparation and mechanism of action of drugs such as vanadium-containing drugs for the treatment of diabetes, platinum-containing drugs for cancer treatment, etc.</p>		
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8. In your opinion, which courses listed below need to be strongly research-based orientedly upgraded?

No	Course	Yes	No	Explanation
8.1	Quantitative molecular structure–activity relationship			
8.2	Techniques for extraction and isolation of natural compounds			
8.3	Modern analytical methods			
8.4	Spectroscopic methods for structural determination			
8.5	Biomedical materials			
8.6	Synthetic Medicinal Chemistry			

9. Which of education courses have you been following since graduation in order to get your job as well as to satisfy your job requirement?

- | | |
|--|---|
| <input type="checkbox"/> Professional training | <input type="checkbox"/> English training |
| <input type="checkbox"/> Informatics training | <input type="checkbox"/> To enroll in second bachelor programme |
| <input type="checkbox"/> Graduate education | <input type="checkbox"/> To enroll in a communicate skill class |
| <input type="checkbox"/> Others: | |

10. Your other opinions (if any):

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Thank you very much for your valuable cooperating and helping.

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