Co-funded by the
Erasmus+ Programme
of the European Union

SURVEY QUESTIONNAIRE ON CURICULUM IN MOLECULAR AND MATERIALS SICENCES

Dear Madam/Sir

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:

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 group*: □ < 30 □ 30–40 □ 40–50 □ > 50
- *Gender*: □ *Male* □ *Female*
- *Highest qualification*: □ Bachelor □ Master □ Doctor

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- *Organisation*: ……

- *Expertise*: ……

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- *Teaching courses*: ……

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- *Occupational experience (year)*:

□ < 5 □ (5 – 10] □ (10 – 15] □ (15 – 20] □ > 20

B. Survey questions

1. How would you evaluate the necessity level within 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 necessity level of the integrated knowledge in Physics, Chemistry, Biology and Technology in the above education programs.	1	2	3	4	5	
1.2	The necessity level of collaboration between university and industry in education program in MMS.	1	2	3	4	5	

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

Answer		Explanation (if any)
Increase	□	…… ……
Decrease	□	…… ……
Not change	□	…… ……

3. Could you please circle your level of agreement, satisfactory or understanding about the curricula of the above education programs? The scale ranging from low to high: 1=(0–20%); 2=(21–40%); 3=(41–60%); 4=(61–80%); 5=(81–100%).

No	Question	Satisfactory scale					Explanation (if any)
3.1	The objectives and outcomes of the programs meet the society demand/labour market requirement.	1	2	3	4	5	
3.2	The connection of theory and practice in curricula and jobs after graduation.	1	2	3	4	5	
3.3	The proportion of theory and practice allocated in courses of the above programs is	1	2	3	4	5	

	appropriate.						
3.4	The level of update on courses of the above programs	1	2	3	4	5	
3.5	The integrated and multidisciplinary level of curricula	1	2	3	4	5	
3.6	The curricula are research-based developed.	1	2	3	4	5	
3.7	The availability of learning and teaching sources, materials, and equipment for research-based learning and teaching	1	2	3	4	5	
3.8	The availability of instruments for practical trainings to satisfy research-based education	1	2	3	4	5	
3.9	The design and implementation of lectures, assignments, and practical classes satisfy research-based education.	1	2	3	4	5	

4. In your opinion, how would the curricula of the above education programs satisfy students' knowledge, skills, and attitude? Satisfactory scale ranging from low to high: 1=(0–20%); 2=(21–40%); 3=(41–60%); 4=(61–80%); 5=(81–100%).

No	Question	Satisfactory scale					Explanation (if any)
Knowledge							
4.1	Basic knowledge	1	2	3	4	5	
4.2	Professional knowledge	1	2	3	4	5	
4.3	General knowledge	1	2	3	4	5	
Skills							
4.4	Skills to complete assigned work	1	2	3	4	5	
4.5	Planning and organizing skills	1	2	3	4	5	
4.6	Evaluating and problem solving skills	1	2	3	4	5	
4.7	Creativity, technical improvement idea, process to improve working productivity	1	2	3	4	5	
4.8	Communication skills	1	2	3	4	5	
4.9	Using foreign language skills	1	2	3	4	5	
4.10	Applying technology skills at work	1	2	3	4	5	
4.11	Team working skills	1	2	3	4	5	

4.12	Adapting, integrating and developing skills	1	2	3	4	5	
4.13	Self-studying and self-preparing skills	1	2	3	4	5	
Attitudes							
4.14	Awareness of organization and discipline	1	2	3	4	5	
4.15	Responsibility	1	2	3	4	5	
4.16	Studious attitude to improve working productivity	1	2	3	4	5	
4.17	Contribute ideas, build and develop organization	1	2	3	4	5	
4.18	Listen, internalize and overcome personal weakness	1	2	3	4	5	
4.19	**General satisfaction**	1	2	3	4	5	

5. Could you please kindly circle on satisfactory scale to describe the necessity 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					Explaination (if any)
5.1	Quantitative molecular structure–activity relationship	1	2	3	4	5	
5.2	Techniques for extraction and isolation of natural compounds						
5.3	Modern analytical methods						
5.4	Spectroscopic methods for structural determination						
5.5	Biomedical materials						
5.6	Synthetic Medicinal Chemistry						

6. In your opinion, which course(s) listed below strongly need to be upgraded to meet research-based education?

No	*Course*	*Yes*	*No*	*Explanation (if any)*
6.1	Quantitative molecular structure–activity relationship			
6.2	Techniques for extraction and isolation of natural compounds			
6.3	Modern analytical methods			
6.4	Spectroscopic methods for structural determination			
6.5	Biomedical materials			
6.6	Synthetic Medicinal Chemistry			

7. In your opinion, which course(s) listed below should be ADDED to the existing education programs 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 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.		

8. In your opinion, how should the teaching and assessment of courses be designed and implemented in order to develop research-based education and students' skills and competence?

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9. Other ideas (If any):

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Thank you very much for your valuable cooperating and helping.