**COURSE SYLLABUS**

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| **Subject: Protein Engineering** | **Academic field: Biotechnology** |
| **Lecturer: Sophie Bozonnet, PhD, Ing.** |  |
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| **Academic year: 2016-2017** |  |

**COURSE DESCRIPTION**

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| **Credit points** |  | |
| **Level** | Undergraduate | |
| **Teaching time**  **Location** | University of Science and Technology of Hanoi | |
| **Time Commitment** | Lecture | 18 hrs |
| Exercises | 14 hrs |
| Practicals | 24 hrs |
| Total | 56 hrs |
| **Prerequisites** | - | |
| **Recommended background knowledge** | Molecular Biology, Biochemistry | |
| **Subject description:** | Principles, methods and examples of protein engineering | |
| **Objectives & Out-come** | *In the course of this lecture students will be provided with a comprehensive overview of the basic principles of protein engineering and the diverse approaches that are available to design proteins for different purposes.*  *In the end, students will*  *- understand the theory and practice of a variety of protein engineering methods.*  *- have learned about specific applications of protein engineering,*  *- have gained the skills to design an engineered protein.* | |
| **Assessment/ Evaluation** | Attendance/Attitude | - |
| Exercise(s) | - |
| Article analyses | 30 % |
| Practicals | 30 % |
| Mid-term test | - |
| Final exam | 40 % |
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**COURSE CONTENTS & SCHEDULE**

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| **Class** | **Contents** | **Hours** | | | **Ref./Resources** | **Assignment(s)** |
| **Lect.** | **Exr.** | **Prc.** |
| 1 | Protein engineering : aims, examples and basis of protein chemistry. | 3 |  |  |  |  |
| 2 | Molecular biology for protein engineering. Production of proteins.  Protein implementation. | 3 |  |  |  |  |
| 3 | Protein engineering : structure prediction & rational design. | 3 |  |  |  |  |
| 4 | Protein engineering : rational engineering, directed evolution. | 3 |  |  |  |  |
| 5 | Screening methods for discovery of original proteins in large mutant libraries. | 3 |  |  |  |  |
| 6 | Protein engineering : towards metabolic engineering and synthetic biology. | 3 |  |  |  |  |
| 7 | Cloning exercises |  | 4 |  |  |  |
| 8 | Bioinformatics exercise: PyMol software |  | 4 |  |  |  |
| 9 | Article analyses |  | 6 |  |  | Student’s presentation |
| 10 | *Practical work: Enzyme immobilization* |  |  | 8 (x3 groups =24) |  | Lab report. |

*Notes:*

* *Abbreviation: Lect. (lecture), Exr. (Exercise), Prc. (Practise).*
* *Exercises may include assignment, reports, student’s presentation, homework, class exercises ...for each class sessions*
* *Practicals mostly refer to Lab- work or outside practice such as field trip.*