| NONG LAM UNIVERSITY  FACULTY OF ENVIRONMENT AND NATURAL RESOURCES | SOCIALIST REPUBLIC OF VIETNAM  Independence - Freedom - Happiness |
| --- | --- |

**COURSE DETAILED OUTLINES**

**UNDERGRADUATE EDUCATION PROGRAM**

**Major: Environmental Engineering Level: Undergraduate**

1. **General information of the course**

* Name in Vietnamese: **Đồ án Công nghệ xử lý nước cấp**
* Name in English: **Project on Supply Water Treatment**
* Module: 212341
* Number of credits: 1
* Conditions for participating in the course

*+ Prerequisite: none*

*+ Prior study:*

Department: Environmental Technology

* Duration: 15 weeks
* Semester: 1 (3rd year)

The course belongs to the knowledge block:

| Fundamental □ | | Fundamental specialized □ | | Specialized 🗹 | |
| --- | --- | --- | --- | --- | --- |
| Mandatory □ | Optional □ | Mandatory □ | Optional □ | Mandatory 🗹 | Optional |

* **Teaching language**: English Vietnamese 🗹

1. **Information of lecturer**

* Name: Le Thi Lan Thao
* Position, title, degree: Lecturer, MSc.
* Phone, email: 0909795551, thao.lethilan@hcmuaf.edu.vn
* Time and place of work: Office hours, Department: Environmental Technology
* Address: Nong Lam University, quarter 6, Linh Trung ward, Thu Duc district, Ho Chi Minh city, Vietnam
* The main research orientations: Environmental Engineering
* Information about tutors/lecturers who teach together (if any) (full name, phone number, email):

1. **Course description:**

The module Project on Supply Water Treatment Technology includes the following contents: Selecting a source of water supply which is suitable to the location of plant or to the characteristics of each region; Propose technological processes in water treatment in accordance with water demand: domestic supply water, bottled drinking water, boiler feed water, swimming pool water, hospital water... Calculation and design works in the water treatment plant and draw technical drawings of the water treatment plant.

1. **Course goals and Expected Learning Outcomes**

* Course goals

After completing the course, students are able to:

- Proposing water treatment technology suitable for each specific water user.

- Design of treatment works in specific water treatment systems.

The module contributes to the following Output Standards of the curriculum according to the following levels:

| Module | Subject | Learning outcomes (PLO) dedication degree | | | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 212341 | Project on Supply Water Treatment Technology | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| S | H | S | H | S | S | S | S | H | H | S | H | S | S | H | S |

Note:

*N: none supporting*

*S: small supporting*

*H: high supporting*

* Course learning outcomes (*according to Bloom measurement scale*) :

| **Symbol** | **Course learning outcomes**  **Completing this module, students can implement** | **PLOs** |
| --- | --- | --- |
| **Knowledge** | | |
| CLO1 | Evaluation of the properties of the water used in the treatment process. | PLO1, PLO2 |
| CLO2 | Proposing water treatment technology suitable for each specific water user. | PLO3, PLO4, PLO5, PLO6 |
| CLO 3 | Apply knowledge of calculating water treatment works. | PLO4 |
| **Skills** | | |
| CLO 4 | Calculation and drawing of treatment tanks in specific water treatment works | PLO7, PLO8, PLO9, PLO10 |
| CLO 5 | Apply knowledge of applying necessary regulations and standards when designing water treatment systems | PLO11, PLO12 |
| **Attitude and moral qualities** | | |
| CLO 6 | Have a high sense of responsibility and autonomy at work | PLO13, PLO14, PLO15, PLO16 |

**V. Teaching and learning methods**

1. Teaching methods

* *Combine lectures, slides and videos presentation*
* *Q & A (questions and answers)*
* *Give teaching materials, homework and assignment*

1. Learning methods

* *E-learning and self-learning (students read the materials and watch video tutorials)*
* *Students present assigned topics in class and do the discussion*
* *Students refer to documents, calculate and design specific water supply and drainage systemsPhương pháp học tập*

1. **Tasks of students**

* *Attendance: Students must attend at least 80% of the class period, ask for permission before being absence*
* *Prepare for the lesson: Students do homework and the assignment at home, prepare the presentation slides and questions to participate the discussions in class*
* *Attitude: Students actively participate in the discussion, ask questions and answer the questions*

1. **Evaluation and grade scale**
2. Grade scale: 10
3. Evaluation plan and weight

**Table 1. Matrix assesses the course learning outcomes of the module** *(percentage points according to the academic regulations of NLU)*

| **Course learning outcomes** | **Diligence** | **Presentation** |
| --- | --- | --- |
| **(10%)** | **(90%)** |
| CLO1 |  | x |
| CLO2 |  | x |
| CLO3 |  | x |
| CLO 4 |  | x |
| CLO 5 |  | x |
| CLO 6 | x | x |

**Table 2. Framework of evaluation criteria *(Rubric)***

1. Class attendance **(10 %)**

| Criteria | Percent (%) |  | **Level** | |  |
| --- | --- | --- | --- | --- | --- |
| Excellent | Good | Average | Poor |
| *7-10* | *7-5* | *5-4* | *Dưới 4* |
| Class attendance | 100 | Attend <80% of the class period | Attend 70-80% of the class period | Attend 40-70% of the class period | Class attendance |

1. **Topic presentation - Seminar (90%)**

*During the learning process, there will be topics reported, each subject has about 5-8 students to perform. Students who report on the topic will receive a maximum of 9 points*

| Criteria | Percent (%) |  | **Mức chất lượng** | |  |
| --- | --- | --- | --- | --- | --- |
| **Excellent** | **Good** | **Below required level** | **Does not accepted** |
| *3* | *2* | *1* | *0đ* |
| Content | 50 | Full presentation of required content: (1) overview of input water sources, (2) overview of supply water treatment technologies suitable with input water characteristics, (3) proposed treatment technology, (4) full calculation of treatment works, (5) drawings of supply water treatment technology. | Present the contents (1), (2) lack of necessary information; (3), (4) and (5) fully with necessary information. | Presentation of content (1), (2), (3), (4) and (5) are wrong. | Present all irrelevant content or the content is too sketchy, does not provide the necessary information. |
| Report form | 10 | The presentation is clear, easy to understand, and creative. Get comments/questions of interest | The presentation is clear and easy to understand. | Presented in a reading form, not generating interest from the audience | The presentation is too sketchy, the audience cannot understand the content |
| Answer the question | 20 | Questions are answered fully, clearly, and satisfactorily | Answered 70% of questions. | Answered 25%-50% of questions | No answer |
| Group working | 20 | Show collaboration among team members clearly. There is division of answers and reports among members | There is cooperation among team members but it is not obvious | There is no combination of members, one or more members prepare and report | The report is incomplete and has incorrect content. |

1. **Overall rating**

| Score | **10** | **9** | **8** | **7** | **6** | **5** | **4** | **3** | **2** | **1** | **0** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **General assessment** | Completed the course with excellence | Completing the course well | Completing the course quite well | Completing the course with good grades | Completing the course with average grade | Completing the course with fair grade | Completing the course | Not achieved | | | |

VIII. **Textbooks and references**

* + *Textbook:*

1. TS. Nguyễn Ngọc Dung, Xử lý nước cấp, Đại học kiến trúc Hà Nội, NXB xây dựng Hà Nội

2. Nguyễn Thị Thu Thủy, xử lý nước cấp sinh hoạt và công nghiệp – NXB Khoa học và kỹ thuật Hà Nội 2000

3. TS. Trịnh Xuân Lai, cấp nước (tập 2) – Xử lý nước thiên nhiên cấp cho sinh hoạt và công nghiệp – NXB KHKT Hà Nội 2002

4. Trịnh Xuân Lai – Tính toán thiết kế các công trình trong hệ thống cấp nước sạch – NXB Khoa học và Kỹ thuật, 2003

* *References*

5. TCVN 33 – 85 Tiêu chuẩn ngành: Cấp nước mạng lưới bên ngòai, Bộ xây dựng

6. TCXDVN 33: 2006, Cấp nước - Mạng lưới đường ống và công trình, Tiêu chuẩn thiết kế

7. AWWA, Water Quality and Treatment, Mc Graw Hill, 1990

8. Xử lý nước, Raymod Desjardins, NXB Xây Dựng, 2009

9. Water Treatment: Principles and Design**,** 3th ed.*,* MWH, John Wiley & Sons, 2012

**IX. Detail content of module:**

| Week | Content | **LLOs** | **Teaching and learning** **activities** | **Evaluation activities** | **CLOs** |
| --- | --- | --- | --- | --- | --- |
| 1  INSTRUCTIONS FOR PROJECT IMPLEMENTATION | * 1. Purpose and meaning of the project in the training program   2. Instructions for collecting information, documents, and using information in the project   3. Instructions on the required content to be implemented in the project   4. Make a project implementation plan | Understand what needs to be done and plan to do what is required | Lectures combined with video presentations  Discuss | Diligence  Discus  Final report | CLO1, CLO5, CLO6 |
| 2+3+4+5  CALCULATION OF WORKS IN SUPPLY WATER TREATMENT | * 1. Find out about the project's product-related issues   2. Building process technology   3. Calculating the design of works in the system | Know how to calculate and design the treatment technology to meet the required standards | CLO1, CLO3, CLO4, CLO5, CLO6 |
| 6+7+8+9+10  TECHNICAL DRAWINGS | * 1. Instructions for presenting technological process drawings * Instructions for presenting detailed drawings of water treatment tanks | Know how to represent calculations into technical drawings  Arrange processing works on reasonable technical drawings | CLO2, CLO5, CLO6 |
| 11-15  PROTECTION OF COURSE PROJECTS | 1.1. Students present their knowledge of the water treatment technology they have done  1.2. The teacher asks some questions for the students to answer | Understand the work done, absorb other comments | CLO1, CLO2, CLO3, CLO4, CLO5, CLO6 |

X. **Organizational form of teaching**:

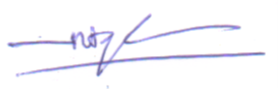
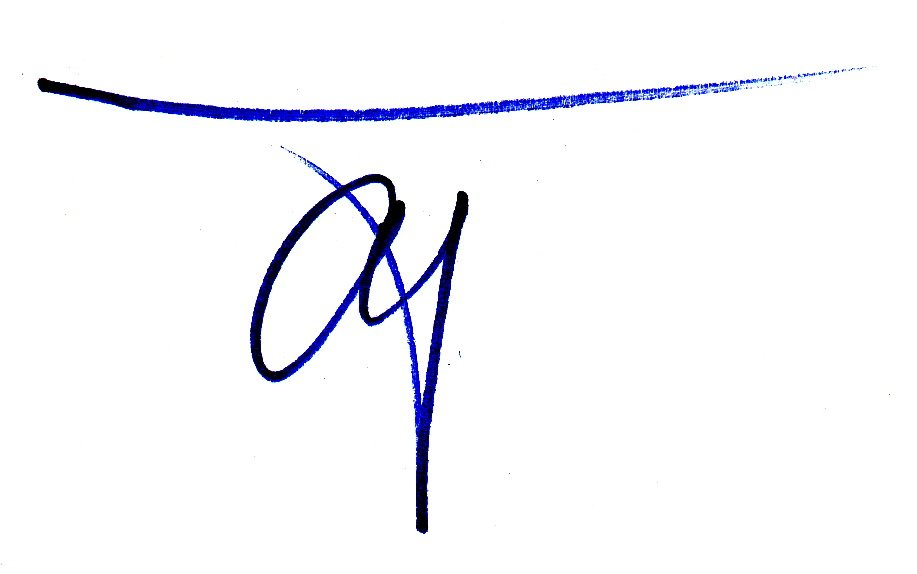
| Content | Course management (hours) | | | | | Sum |
| --- | --- | --- | --- | --- | --- | --- |
| Theory | Exercise | Discussion | Practice | Self-learning |
| 1/ INSTRUCTIONS FOR PROJECT IMPLEMENTATION | 2 |  | 1 |  | 3 | 6 |
| 2/ CALCULATION OF WORKS IN SUPPLY WATER TREATMENT | 8 |  | 4 |  | 12 | 24 |
| 3/ TECHNICAL DRAWINGS | 8 |  | 4 |  | 12 | 24 |
| 4/ PROJECT DEFENSE | 10 |  | 5 |  |  | 15 |
| SUM | 28 | 0 | 14 | 0 | 27 | 69 |

XI. **The** **requirements of lecturer for the module**

* Classroom, workshop: rooms full of light and ventilation
* Teaching facilities: classrooms have projectors, micro

*HCMC, October 1st, 2018*

**Dean Head of Dept Lecturer**

Assoc. Prof. LE QUOC TUAN Assoc. Prof. NGUYEN TRI QUANG HUNG MSc. LE THI LAN THAO