Course Syllabus

1. **Course Title**: Design Project on Supply Treatment
2. **Course Code**: PWWS415010
3. **Credit Units:** 1 credits (0/1/2) (0 units of theory/ 1 unit of practice/ 2 units of self-study)

   Duration: 10 weeks (0 hours of theory+1 hours of practice, and 2 hours of self-study per week)
4. **Course Instructors:**

   1 / Tran Thi Kim Anh

   3 / Nguyen My Linh
5. **Course Requirements:**

   Prerequisite courses: None

   Previous courses: None

   Parallel courses: None
6. **Course Description:**

   After project work, students are equipped with the knowledge and skills in the selection of technological process, doing the computational analysis and design of the units in the groundwater treatment systems, surface water treatment systems, supply water treatment systems for boiler or swimming pool, etc,. Moreover, students can draw the technical drawings for the supply water treatment plant.
7. **Course goals**

Goals	Goal description	Programme Expected learning outcome (ELOs)
G1	Recommending supply water treatment processes and technological units in accordance with national emission standards for specific supply water in Vietnam.	ELO3, ELO6
G2	Skills such as collecting documents, planning, calculating and drawing technical drawings	ELO7
G3	Designing technical drawings for the process and supply water treatment units.	ELO14, ELO15, ELO16

8. Course Learning Outcomes (CLOs)

CLOs		CLO Description	Programme ELOs
G1	CLO1	Propose the technological process of supply water treatment system in accordance with the objectives.	ELO3
	CLO2	Decide supplywater treatment units in accordance with the proposed process.	
	CLO3	Compare the environmental indicators of the supply water treatment system with the environmental standards, construction standards, in accordance with the demand of enterprise and society.	ELO6
G2	CLO4	Collect document and information to solve the problems.	ELO7
G3	CLO5	Design the supply water treatment system	ELO14
	CLO6	Deploy technological supply water treatment processes and detail the treatment units with technical drawings.	ELO15
	CLO7	Describe the operation modes of the treatment and management systems.	ELO16

9. Learning Resources

- Textbooks:

- References**:**

[1] Trịnh Xuân Lai, **Xử lý nước cấp cho sinh hoạt và công nghiệp**, NXB Xây dựng 2009

[2] Hoàng Văn Huệ, **Công nghệ môi trường, tập 1: Xử lý nước**, NXB Xây dựng, 2010

[3] Nguyễn Ngọc Dung, **Xử lý nước cấp**, NXB Xây Dựng, năm 1999

[4] Trịnh Xuân Lai, **Tính toán thiết kế các công trình trong hệ thống cấp nước sạch**, NXB Khoa Học Kỹ Thuật, năm 2000

[5] Nguyễn Thị Thu Thủy, **Xử lý nước cấp sinh hoạt và công nghiệp**, NXB Khoa học và Kỹ thuật Hà Nội, 2003.

[6] Trần Hiếu Nhuệ, **Cấp nước và vệ sinh nông thôn**, NXB khoa học và kỹ thuật – 2001.

[7] Lê Dung, **Máy bơm-công trình thu nước-trạm bơm cấp thoát nước**, NXB Xây dựng – 2008

[8] Lê Mục Đích, **Sổ tay thi công công trình cấp thoát nước**, XB Xây dựng - 2008

[9] Luận văn, đồ án chuyên ngành

[10] Tiêu chuẩn Việt Nam, Tiêu chuẩn xây dựng

[11] Tomonori Matsuo, **Advances in water and wastewater treatment technology**, Elsevier Science B.V., 2001

[12]Nicholas P. Cheremisinoff, **Handbook of Water and Wastewater Treatment Technologies**, Butterworth-Heinemann, 2002.

10. Student assessment

- Grading scale: 10

- Assessment plan:

Type	Content	Timeline	Assessment method	CLOs	Rate (%)
Skills					**20**
Exercise #1	Collect document and information to solve the problems	All process	Attendance (roll call)	CLO4	10
Exercise #2	Calculatte and design environmental problems.	Week 10	questions	CLO2 CLO4 CLO5	10
Report					**30**
Exercise #1	Report full project work and all drawings of units.	Week 15	Report	CLO1 CLO3 CLO6 CLO7	**30**
Oral presentation					**50**
Exercise #1	Present, protect the ideas and results of supplywater treatment design.		Oral test	CLO1 CLO3 CLO6 CLO7	50

11. Course Content:

Week	Contents	CLOs
1	**Part 1: PROJECT IMPLEMENTATION GUIDELINES (0/3/6)**	
	A/ Content and pedagogical methods in class **Content** 1.1 Objectives and meaning of project work in the educational propram) 1.2 Guide to collect information, document, use the information in project work 1.3 Guide to solve the requirement of project work 1.4 Work out the performance of project work **Pedagogical methods**: + Discussion + Guide to do project 1. Assignment task: Two students are in one group as well as one topic. This topic concerning the design of a specific supplywater treatment plant. 2. Requirement: Students find out the characteristic of the chosen supplywater, propose and design two suitable technological process for supplywater treatment plant.	CLO1
	B/ Self-study content + Students find out the characteristic of the chosen supplywater, propose and design two suitable technological process for supplywater treatment plant. + Analyze advantages and disadvantages of each option. Select the best option. + Refer to the project work, dissertations.	CLO1 CLO3 CLO4
2-6	**Part 2: CALCULATION OF UNITS IN SUPLLYWATER TREATMENT PLANT (0/15/30)**	
	A/ Content and pedagogical methods in class **Content** 2.1 Search all problems relate to project work 2.2 Describe the technological processes of the treatment 2.3 Computational analysis and design of supplywater treatment plant **Pedagogical methods:** + Discussion + Guide to do project 1. Guide to students how to make references, computational analysis supplywater treatment units 2. Revise the errors in the calculation, report 3. Troubleshooting	CLO2 CLO5

	B/ Self-study content + Refer to the document, computational analysis work units + Refer to another project works, theses	CLO2 CLO4 CLO5
7-9	**Part 3: TECHNICAL DRAWINGS (0/9/18)**	
	A/ Content and pedagogical methods in class **Content** 3.1 Instructions on how to present a technical drawing 3.2 Instructions on how to present a technological process drawing 3.3 Instructions on how to present a detailed technical drawing of supplywater treatment reactors **Pedagogical methods:** + Questions and responses + Discussion	CLO6 CLO7
	B/ Self-study content + Completing the drawing, the report + Refer to another project works, theses + Prepare to project work's protection	CLO4 CLO6 CLO7
10	**Part 4: PROJECT PROTECTION (0/3/6)**	
	A/ Content and pedagogical methods in class **Content** 4.1 Student presents the knowledge of supplywater treatment technologies made 4.2 Questions and responses **Pedagogical methods:** + Questions and responses + Discussion	CLO1 CLO2 CLO3 CLO5 CLO6 CLO7
	B/ Self-study content + Review the knowledge which the students have not mastered	CLO1

12. Learning Ethics:

+ The copy of All the exercises and translated information from internet are banned. If this thing are detected, the process score of students will be zero; and in serious case, these students who joined this problem, will be banned from taking their final exam.
+ In case of the detection of students who replace the others in the exam, all of them will be suspended or leaved the learning program.

13. Date of first approval: August 1st, 2012

14. Approval by:

Dean of the faculty	Head of department	Complier
A/Prof. Nguyen Van Suc	**MSc Nguyen Thi Minh Nguyet**	**Hoang Thi Tuyet Nhung**

15. Date and Up-to-date content

1st time: - Update content and structure of the programme adjusted in 2015	Instructor: Hoang Thi Tuyet Nhung Head of Department: Tran Thi Kim Anh