

Course Syllabus

1. Course Title: Experiments on Environmental Engineering Chemistry

2. Course Code: EECE326610

3. Credit Units: 2 credits (0/2/4) (0 units of theory/ 2 unit of practice/ 4 units of self-study)

Duration: 10 weeks (0 hours of theory+ 6 hours of practice, and 12 hours of self-study per week)

4. Course Instructors:

1 / Dr. Nguyen My Linh

2 / Dr. Trần Thị Kim Anh

5. Course Requirements:

Prerequisite courses: None

Previous courses: Experiments on Environmental Analytical Chemistry.

Parallel courses: Environmental Engineering Chemistry.

6. Course Description:

The course provides students the knowledge and analytical skills, chemical preparation, to equipment and assessment of physical and chemical properties in water: pH, COD, BOD, Iron, Nitrogen, Phosphorus Sulfate, hardness, alkalinity, acidity, color, turbidity, solids, chloride, DO,....

7. Course goals

Goals	Goal description	Programme Expect learning outcome (ELOs)
G1	Professional knowledge in sample analysis; sample preservation; equipment usage, and environmental significance, affecting factors, analysis principles of each parameter.	ELO2
G2	Practise calculation, present, plot, explain the results and the phenomenon in the experiment.	ELO5 ELO8
G3	Practise team-work skill; Communicate though written report.	ELO9,ELO10

8. Course Learning Outcomes (CLOs)

CLOs		CLO Description	Programme ELOs
G1	CLO1	Use tools, equipment and chemical in analyzing water sample.	ELO2
	CLO2	Illustrate the principles of collecting and preserving the sample.	
	CLO3	Demonstrate the environmental significance of each parameter, the principles of analysis, affecting factors on the analytical method.	
G2	CLO4	Perform accurate operation, meticulous during the experiment.	ELO5
	CLO5	Assess the experiments's result.	
	CLO6	Perform a precise, meticulous manual in experiments.	
	CLO7	Demonstrate honesty in experiments's reporting as well as in scientific research.	ELO8
G3	CLO8	Work in team	ELO9
	CLO 9	Communicate effectively though report.	ELO10

9. Learning Resources

- Textbooks:

1. Textbook of experiments on environmental engineering chemistry, Environmental technology Department, HCMC University of Technology and Education.

- References:

[1]. 2005, HCMUT, Textbook of analytic environmental engineering chemistry.

[2] Clair N. Sawyer, **Chemistry for environmental Engineering**, McGraw – Hill, 4th, 1994. Udo Wiesmann, Fundamentals of Biological Wastewater Treatment, WILEY-VCH, 2007.

10. Student assessment:

- Grading scale: **10**

- Assessment plan:

Type	Content	Timeline	Assessment method	CLOs	Rate (%)
Subtest					15
BT#1	Summarize document of experiments on environmental engineering chemistry before class.	Weeks 2-10	Small questions in class	CLO1 CLO2 CLO3	15
Essay - Report					35
BL #1	Report process of experiments, results, all exercises of experiments.	Week 10	Report	CLO4 CLO5 CLO6 CLO7 CLO8 CLO9	35
Final exam					50
	The content covers all of course outcomes.		Wtiting / practical test	CLO1 CLO2 CLO3 CLO4 CLO5 CLO6	50

11. Course Content:

Week	Contents	CLOs
1	Unit 1: The theoretical basis for sample sampling and preservation (0/6/12)	
	A/ Teaching content in classroom (6) 1.1. Definition 1.2. Collecting sample and preservation. 1.3. Chemical preparation Summary of teaching methodology:	CLO1 CLO2 CLO3 CLO4 CLO5 CLO6 CLO7

	<ul style="list-style-type: none"> + Presentation of lecture + Group discussion + Guide to how to manual experiments, do the report 	<p>CLO8 CLO9</p>
	<p>B/ Self-study content (12)</p> <p>The contents of home self-study</p> <ul style="list-style-type: none"> + Do the report + Prepare the test lesson for the next class. 	<p>CLO1 CLO2 CLO3 CLO4 CLO5 CLO6 CLO7 CLO8 CLO9</p>
	<p>Unit 2: Practice analyzing turbidity; color; pH (0/6/12)</p>	
	<p>A/ Teaching content in classroom (6)</p> <p>2.1. Theory</p> <ul style="list-style-type: none"> + Definition + Environmental significance + Analytic principles <p>2.2 Practice:</p> <ul style="list-style-type: none"> + Do the experiment <p>Summary of teaching methodology:</p> <ul style="list-style-type: none"> + Presentation of lecture + Group discussion + Guide to how to manual experiments, do the report 	<p>CLO1 CLO2 CLO3 CLO4 CLO5 CLO6 CLO7 CLO8 CLO9</p>
2	<p>B/ Self-study content (12)</p> <ul style="list-style-type: none"> + Do the report + Prepare the test lesson for the next class. 	<p>CLO1 CLO2 CLO3 CLO4 CLO5 CLO6 CLO7 CLO8 CLO9</p>
3	<p>Unit 3: Practice analyzing acidity; alkali; Chloride (0/6/12)</p>	

	<p>A/ Teaching content in classroom (6)</p> <p>3.1 Theory</p> <ul style="list-style-type: none"> + Definition + Environmental significance + Analytic principles <p>3.2 Practice:</p> <ul style="list-style-type: none"> + Do the experiment <p>Summary of teaching methodology:</p> <ul style="list-style-type: none"> + Presentation of lecture + Group discussion + Guide to how to manual experiments, do the report 	<p>CLO1 CLO2 CLO3 CLO4 CLO5 CLO6 CLO7 CLO8 CLO9</p>
	<p>B/ Self-study content (12)</p> <ul style="list-style-type: none"> + Do the report + Prepare the test lesson for the next class. 	<p>CLO1 CLO2 CLO3 CLO4 CLO5 CLO6 CLO7 CLO8 CLO9</p>
4	<p>Unit 4: Practice analyzing hardness; calcium; suspend solid (0/6/12)</p> <p>A/ Teaching content in classroom (6)</p> <p>4.1 Theory</p> <ul style="list-style-type: none"> + Definition + Environmental significance + Analytic principles <p>4.2 Practice:</p> <ul style="list-style-type: none"> + Do the experiment <p>Summary of teaching methodology:</p> <ul style="list-style-type: none"> + Presentation of lecture + Group discussion + Guide to how to manual experiments, do the report 	<p>CLO1 CLO2 CLO3 CLO4 CLO5 CLO6 CLO7 CLO8 CLO9</p>

	<p>B/ Self-study content (12)</p> <ul style="list-style-type: none"> + Do the report + Compare the effectiveness of models 	<p>CLO1 CLO2 CLO3 CLO4 CLO5 CLO6 CLO7 CLO8 CLO9</p>
	<p>Unit 5: Practice analyzing iron; sulphate; phosphorus (0/12/24)</p>	
5-6	<p>A/ Teaching content in classroom (12)</p> <p>4.2 Theory</p> <ul style="list-style-type: none"> + Definition + Environmental significance + Analytic principles <p>5.2 Practice:</p> <ul style="list-style-type: none"> + Do the experiment <p>Summary of teaching methodology:</p> <ul style="list-style-type: none"> + Presentation of lecture + Group discussion + Guide to how to manual experiments, do the report 	<p>CLO1 CLO2 CLO3 CLO4 CLO5 CLO6 CLO7 CLO8 CLO9</p>
	<p>B/ Self-study content (24)</p> <ul style="list-style-type: none"> + Do the report + Prepare the test lesson for the next class. 	<p>CLO1 CLO2 CLO3 CLO4 CLO5 CLO6 CLO7 CLO8 CLO9</p>
	<p>Unit 6: Practice analyzing nitrate; nitrite; ammonia (0/12/24)</p>	
7-8	<p>A/ Teaching content in classroom (12)</p> <p>6.1 Theory</p>	<p>CLO1 CLO2 CLO3</p>

	<ul style="list-style-type: none"> + Definition + Environmental significance + Analytic principles <p>6.2 Practice:</p> <ul style="list-style-type: none"> + Do the experiment <p>Summary of teaching methodology:</p> <ul style="list-style-type: none"> + Presentation of lecture + Group discussion + Guide to how to manual experiments, do the report 	<p>CLO4 CLO5 CLO6 CLO7 CLO8 CLO9</p>
	<p>B/ Self-study content (24)</p> <ul style="list-style-type: none"> + Do the report + Prepare the test lesson for the next class. 	<p>CLO1 CLO2 CLO3 CLO4 CLO5 CLO6 CLO7 CLO8 CLO9</p>
	<p>Unit 7: Practice analyzing DO; BOD; COD (0/12/24)</p>	
9-10	<p>A/ Teaching content in classroom (12)</p> <p>7.1 Theory</p> <ul style="list-style-type: none"> + Definition + Environmental significance + Analytic principles <p>7.2 Practice:</p> <ul style="list-style-type: none"> + Do the experiment <p>Summary of teaching methodology:</p> <ul style="list-style-type: none"> + Presentation of lecture + Group discussion + Guide to how to manual experiments, do the report 	<p>CLO1 CLO2 CLO3 CLO4 CLO5 CLO6 CLO7 CLO8 CLO9</p>
	<p>B/ Self-study content (24)</p> <ul style="list-style-type: none"> + Do the report 	<p>CLO1 CLO2 CLO3</p>

	+ Prepare the test lesson for the next class.	CLO4 CLO5 CLO6 CLO7 CLO8 CLO9
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12. Learning Ethics:

- Students study seriously and follow the instructions of experiments.
- Strictly implement the rules laboratories.
- Students who do not complete the task, banned 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. Approved by:

Dean

Head of Department

Compiler

A/Prof. Nguyen Van Suc

MSc Nguyen Thi Minh Nguyet

Dr. Nguyen My Linh

15. Date and Up-to-date content

<p>1st time: Date: 2015</p> <p>- Update content and structure of the programme adjusted in: Updated content of Experiments on environmental engineering chemistry.</p>	<p>Instructor:</p> <p>Head of Department:</p>
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