TLI 557 Teknik Analisis Pencemar Lingkungan
(Technique Analysis of Environmental Pollutants)

Lecturers:
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MASTER STUDY PROGRAM OF ENVIRONMENTAL ENGINEERING
FACULTYOF ENGINEERING
UNIVERSITAS ANDALAS
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	SYLLABUS **SEMESTER**	No.Dok : ..... Revisi : .....
	(TLI 557 Technique Analysis of Environmental Pollutants)	Tanggal : June 2020 Halaman:
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SYLLABUS

1. Lecture Information

Study Program Name : Environmental Sanitation Infrastructure
Lecture Name : Technique Analysis of Environmental Pollutants
Lecture Code : TLI 557
Category : Required Study Program
Unit : 3 units

Year	: Year 1
Semester	: 1 (one)
Prasyarat	: -
Status (required/elective)	: Required
Lecturers	: Dr. Eng. Shinta Indah Dr. Eng. Zulkarnaini

2. Description of Lecture

This lecture aims to study about technique analysis of environmental pollutants for determination of the environmental quality and also to review the differences in characteristics in different sanitation flows (e.g. faecal sludge and wastewater) and evaluate legislation, human and environmental health risk in relation to these streams.

3. Learning Achievement of Study Program

- Mastering the theory of engineering science, design engineering, methods and the latest techniques needed for the analysis and design of environmental management efforts;
- Mastering the contextual and current interdisciplinary approach related to the design of integrated environmental management systems.
- Able to solve engineering and technological problems and design systems, processes and components in environmental management efforts including management of drinking water, wastewater, solid waste, settlement drainage, liquid, solid and gas waste control systems, air pollution control and occupational health and safety (OHS) by utilizing other fields of science (if needed) and taking into account economic, health and public safety, cultural, social and environmental factors;

4. Learning Achievement of Lecture

After completion of the lecture, students will be able to:

a. Explain the concept of analytical chemistry
b. Explain the concept of environmental monitoring
c. Demonstrate the ability to conduct the sampling and analysis of environmental pollutants
d. Compare the characteristics of different sanitation streams and assess their potential pollution and health impacts
e. Evaluate the legislation in relation to these sanitation streams
f. Evaluate the results gained from laboratory test of to identify samples taken from various sanitation streams
g. Assess the results gained for compliance to legislation

5. Description of Lesson Plan

Week	Indicator of Learning Achievements of Subjects	Topics	Method of Learning	Course Time	Assignment and Evaluation	Reference
1	Be able to explain the concept of analytical chemistry	the concept of analytical chemistry	Lecture and discussion	3x50 minutes	Work individual and/ in groups	
2	Be able to explain the concept of environmental monitoring	the concept of environmental monitoring	Lecture and discussion	3x50 minutes	Work individual and/ in groups	
3	Be able to demonstrate the ability to conduct the sampling of environmental pollutants (water)	The sampling of water	Lecture and discussion	3x50 minutes	Work individual and/ in groups	
4	Be able to demonstrate the ability to conduct the sampling of environmental pollutants (air and soil)	The sampling of air and soil	Lecture and discussion	3x50 minutes	Work individual and/ in groups	
5	Be able to demonstrate the ability to conduct the analysis of environmental pollutants (water)	The analysis of water quality parameters	Lecture and discussion	3x50 minutes	Work individual and/ in groups	
6	Be able to demonstrate the ability to conduct the analysis of environmental pollutants (air)	The analysis of air quality parameters	Lecture and discussion	3x50 minutes	Work individual and/ in groups	
7	Be able to demonstrate the ability to conduct the analysis of environmental pollutants (soil)	The analysis of parameters of soil	Lecture and discussion	3x50 minutes	Work individual and/ in groups	
8	Mid-term Examination					
9, 10, 11	Be able to compare the characteristics of different sanitation streams and assess their potential pollution and health impacts	• Waste classification including the waste hierarchy • Typical sanitation streams and their characteristics • Why the characteristics vary from stream to stream	Lecture and discussion	3 x (3x50) minutes	Work individual and/ in groups	

Week	Indicator of Learning Achievements of Subjects	Topics	Method of Learning	Course Time	Assignment and Evaluation	Reference
		• Potential pollutions issues association with sanitation streams • Potential public health issuesassociated with sanitation streams • Review sanitations streams as a raw material				
12	Be able to evaluate the legislation in relation to these sanitation streams	Review current legislation in relation to sanitation streams via reviewing Shit Flow Diagrams	Lecture and discussion	3x50 minutes	Work individual and/ in groups	
13, 14, 15	Be able to evaluate the results gained from laboratory test of to identify samples taken from various sanitation streams	• Laboratory induction • Test to be undertaken parameters including chemical, physical and biological parameters	Lecture and discussion	3 x (3x50) minutes	Work individual and/ in groups	
16	Final Examination					

6. References

1. Popek, E.P, Samplling and Analysis of Environmental Chemical Pollutants: A Complete Guide, 2003, Academic Press, Elsevier Science, USA
2. Potnaik, P., Environmental Analysis: Chemical Pullutants in Air, Water, Soil and Solid Wastes, 2010, 2nd Edition, CRS Press, Taylor & Frances Group, USA.
3. Barbooti, M.M., Environmental Applications of Instrumental Chemical Analysis, 2015, Apple Academic Press Inc., Canada
4. Down, R.D. and Lehr., J.H., Environmental Instrumentation and Analysis Handbook, 2005, Wiley Interscience, A John Wiley & Sons Inc. Publication, Canada.
5. Zhang, C., Fundamentals of Environmental Sampling and Analysis, 2007, Wiley Interscience, A John Wiley & Sons Inc. Publication, Canada.
6. American Public Health Association, American Water Works Association, Water Environmental Federation, 1998,"Standard methods for examination of water and wastewater", 20th edition. American Public Health Association, Washington, DC.

7. Badan Standar Nasional Indonesia. SNI untuk Tata Cara Sampling dan analisisbeberapa parameter lingkungan.
8. Sawyer, C. N, Perry, L. McCarty, dan Gene, F. P. 2003. “Chemistry for environmental engineering and science”, 5thed., McGraw-Hill, Singapore.
9. Tchobanoglous, G., H. Theisen, and S. Vigil (1993), Integrated Solid Waste Management: Engineering Principles and management Issues, McGraw-Hill, New York
10. Other related scientific articles

7. Annex

Scoring Instrument: Mid-term examination: 35%; Final Examination: 35%; Assignment: 30%