SCHOOL OF INDUSTRIAL TECHNOLOGY

INSTRUCTIONAL PLAN

Course : IBK412 ENVIRONMENTAL BIOPROCESS TECHNOLOGY

Semester : SEMESTER I, ACADEMIC SESSION 2019/2020

Lecture time	Tuesday (8-10 am), Thursday (11-1 pm)
Tutorial time	-

No.	Lecturer	Email address	Teaching load
1.	DR HUSNUL AZAN TAJARUDIN	azan@usm.my	1.5 credit
2.	DR MUAZ MOHD ZAINI MAKHTAR	muazzaini@usm.my	1.5 credit

No.	Course Learning Outcomes (CLO)	PO	LT	SS	Assessment Method
1.	Able for give suggestion to solve complex environmental problem and pollution via biological process	PLO6	C2		03, 32, 13
2.	Understanding the right sampling method to test rate of pollution and appropriate parameters to analyses for fulfill requirements of Malaysia and International standard	PLO3	C2	CTPS3	13
3.	Understanding issue of environmental pollution and related regulation.	PLO1	C4	EM 2	03, 32

Week	Date	Lecturer	Topics	Assessments	CLO
1.	12/10	**HAT**	**Chapter 1: Introduction of Environmental Bioprocess Technology** • Introduction • Environmental Biotechnology • Pollution and Biotechnology Treatment		CLO2
2.	20/10	**MZ**	**Chapter 2: Environmental Monitoring** • Sampling • Physical Analysis • Chemical Analysis • Biological Analysis • Biosensor		CLO2
3.	27/10	**MZ**	**Chapter 2: Environmental Monitoring** • Sampling • Physical Analysis • Chemical Analysis • Biological Analysis • Biosensor	Test 10 %	CLO2
4.	29/10	**MZ**	**Chapter 3: Sewage and Wastewater Treatment** • Sewage • Activated sludge treatment • Lagoons • Modification to existing process • Nitrification and denitrification • Anaerobic digestion	Assignment 7.5 %	CLO1
5.	3/11	**MZ**	**Chapter 3: Sewage and Wastewater Treatment** • Sewage • Activated sludge treatment • Lagoons • Modification to existing process • Nitrification and denitrification • Anaerobic digestion	Test 10 %	CLO2
6.	12/11	**MZ**	**Chapter 4: Bioremediation** • Advantages and disadvantages of Bioremediation • Bioremediation Technology • Application of Bioremediation	Assignment 7.5 %	CLO1
7.	17/11	**MZ**	**Chapter 4: Bioremediation** • Advantages and disadvantages of Bioremediation • Bioremediation Technology • Application of Bioremediation	Project 15 %	CLO1
8.		**SEMESTER BREAK**			
9.	19/11	**HAT**	**Chapter 5: Clean Technology** • Recycling • Landfill • Incineration • Composting • Artificial Wetland	Assignment 7.5 %	CLO2
10.	3/12	**HAT**	**Chapter 5: Clean Technology** • Recycling	Test 10 %	CLO2

			• Landfill • Incineration • Composting • Artificial Wetland		
11.	17/12	**HAT**	**Chapter 6:** Natural resource recovery and Biofuel • Oil Recovery • Bio recovery precious metals • Biogas • Landfill gas • Bioethanol • Bio hydrogen • Biofuel	Assignment 7.5 %	CLO3
12.	24/12	**HAT**	**Chapter 6:** Natural resource recovery and Biofuel • Oil Recovery • Bio recovery precious metals • Biogas • Landfill gas • Bioethanol • Bio hydrogen • Biofuel	Project 15 %	CLO3
13.	7/1	**HAT**	**Chapter 6:** Natural resource recovery and Biofuel • Oil Recovery • Bio recovery precious metals • Biogas • Landfill gas • Bioethanol • Bio hydrogen • Biofuel	Test 10 %	CLO3
14.	14/1	**HAT**	**Chapter 6:** Natural resource recovery and Biofuel • Oil Recovery • Bio recovery precious metals • Biogas • Landfill gas • Bioethanol • Bio hydrogen • Biofuel		CLO3
15.	21/1	**HAT**	**Chapter 6:** Natural resource recovery and Biofuel • Oil Recovery • Bio recovery precious metals • Biogas • Landfill gas • Bioethanol • Bio hydrogen • Biofuel		CLO3
16.		**REVISION WEEK**			

17-19		**EXAMINATION**
20-24		**SEMESTER BREAK**

Final Examination (60%) (Answer 4 questions)

Question	Topics	CLO	Lecturer
1	NOT APPLICABLE		
2	NOT APPLICABLE		
3	NOT APPLICABLE		
4	NOT APPLICABLE		
5	NOT APPLICABLE		

Coursework Assessment (40%)

	Jenis	Kod	%
(i)	Test	13	40
(ii)	Assignment	03	30

	Jenis	Kod	%
(iii)	Project	32	30
(iv)			

Prepared by:	Endorsed by:	Approved by:	Archived by:
Course Coordinator	Program Chairman	Dean	Asst. Registrar
Date:	Date:	Date:	Date: