



UNIVERSITI TEKNOLOGI MARA

CMT635: WATER AND WASTEWATER TECHNOLOGY

Course Name (English)	WATER AND WASTEWATER TECHNOLOGY APPROVED
Course Code	CMT635
MQF Credit	3
Course Description	This course provides comprehensive coverage of fundamental and principle for both water (e.g., drinking water) and wastewater (i.e., industrial and municipal) sources. Foundation and characteristics of water and wastewater will be explained and details. The treatment methods discussed are a combination of physical, chemical and biological techniques. Water and wastewater plant residuals management will also be discussed during this course.
Transferable Skills	Scientific thinking Critical thinking
Teaching Methodologies	Lectures, Reading Into Writing Task, Problem Based Learning (PBL), Self-directed Learning
CLO	CLO1 Discuss the concepts and theories of water and wastewater. CLO2 Explain various applications of water and wastewater treatment technologies. CLO3 Categorize the problems associated with water and wastewater treatment technologies.
Pre-Requisite Courses	No course recommendations
Topics	
1. Introduction to Water and Wastewater 1.1) Definition of Water and Wastewater 1.2) Source of Water and Wastewater 1.3) The Importance of Water and Wastewater Studies	
2. Water and Wastewater Quality 2.1) National Water Quality Standard (NWQS) and Water Quality Index (WQI) 2.2) Sampling and Preservation 2.3) Physical Parameters 2.4) Chemical Parameters 2.5) Biological Parameters	
3. Water Treatment Technology 3.1) Introduction to Water Treatment Technology 3.2) Aeration 3.3) Coagulation and Flocculation 3.4) Sedimentation 3.5) Filtration 3.6) Hardness Removal 3.7) Disinfection	
4. Wastewater Treatment Technology 4.1) Introduction to Wastewater Treatment Technology 4.2) Preliminary Treatment 4.3) Primary Treatment 4.4) Secondary Treatment	
5. Secondary Treatment by Suspended Growth Biological Processes 5.1) Oxidation Ditch 5.2) Oxidation Pond and Lagoon 5.3) Sequencing Batch Reactor (SBR) 5.4) Activated Sludge	

6. Secondary Treatment by Attached Growth and Hybrid Biological Processes

- 6.1) Trickling Filter
- 6.2) Biotower
- 6.3) Rotating Biological Contactor (RBC)

7. Tertiary and Advanced Treatment

- 7.1) Phosphorus Removal
- 7.2) Nitrogen Removal
- 7.3) Membrane Filtration
- 7.4) Effluent Disinfection

8. Wastewater Plant Residuals Management

- 8.1) Sludge Handling
- 8.2) Sources and Characteristics of Solids and Biosolids
- 8.3) Sludge Conditioning and Dewatering
- 8.4) Sludge Thickening and Storage

Assessment Breakdown	%
Continuous Assessment	60.00%
Final Assessment	40.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Reading Response	Students have to write executive summary based on a selected research article.	20%	CLO3
	Test	Test 1. Consist of multiple choice and essay questions.	20%	CLO1
	Test	Test 2. Consist of multiple choice and essay questions.	20%	CLO2

Reading List	Reference Book Resources	<ul style="list-style-type: none"> Rice, E.W. Bridgewater, L. American Public Health Association American Water Works Association Water Environment Federation 2012, <i>Standard Methods for the Examination of Water and Wastewater</i>, 22 Ed., American Public Health Association Washington, DC, New York Mackenzie L Davis, 2017, 2017, <i>Water and Wastewater Engineering</i>, McGraw-Hill
Article/Paper List	This Course does not have any article/paper resources	
Other References	This Course does not have any other resources	