

MINI PROJECT (WASTE WATER)



Wastewater is any water that has been adversely affected in quality by anthropogenic influence. Wastewater can originate from a combination of domestic, industrial, commercial or agricultural activities, surface runoff or stormwater, and from sewer inflow or infiltration.

Wastewater treatment is closely related to the standards and/or expectations set for the effluent quality. Wastewater treatment processes are designed to achieve improvements in the quality of the wastewater. In order to comply with the quality that have been set by DOE regulation, industrial wastewater treatment should covers the mechanisms and processes used to treat wastewater that is produced as a by-product of industrial or commercial activities. After treatment, the treated industrial wastewater (or effluent) may be reused or released to a sanitary sewer or to a surface water in the environment.

As an environmental engineer of wastewater plants, your task is to design a waste management and pollution control process plant with the recommendation guideline below:

Introduction (20 Marks):

1. List all of your waste sources, type and parameters
2. Discuss the emission effect with respect to Environmental Quality Act

Contents (70 Marks)

1. Analyze the wastewater sample from petrochemical industry and compare with the DOE regulation. Then, explain the finding, according to wastewater characterization have performed in the lab. Each group must have a different type of industrial wastewater sample.
2. Perform the wastewater characterization study
 - a. COD analysis
 - b. BOD analysis
 - c. pH
 - d. Total Suspended Solid (TSS)
 - e. Ammonia-Nitrogen, Nitrate-Nitrogen
 - f. Turbidity
 - g. Heavy Metals
 - h. Temperature
3. Design waste treatment process plant with engineered system assumption and reliable references beginning with the waste discharge from industry until the final effluent discharge to the ecosystem;
Please include:
 - a. The treatment involved
 - b. Calculations

- c. Sizing of equipment
- d. Cost estimations
- e. Any suggestions if necessary; eg: outsourcing etc

Summary (10 Marks)

Summarized waste treatment design

Remarks:

- Form a group of 5 students (max) mix with different genders
- The total mark for this group project is 100%. It will contribute 10% of total marks from the BKF3543 course module.
- Please state and explain your data, assumption, figure, table and etc. clearly with reference sources to avoid any possible marks deduction. All of the reference sources (tables and figures) must attach in Appendix. (Hint: The question start with symbol (*) must include the reference sources).
- Answer the questions in hardcopy except the calculations (excel calculation) in softcopy.
- Short, simple and technically accurate report is preferred. Limit pages for report not more than 20 pages (excluding appendices).
- Suggested reference:
 - Environmental Engineering, McGraw Hill, Peavy, Rowe and TchobanoglousDavis, A.C. and Masten., 2003. Principles of Environmental Engineering. 4th Edition, McGraw Hill, New York
 - Peavy, H.S., Rowe, D.R and Tchobanaglou, G., 1985 Environmental Engineering McGraw Hill, New York.
 - Sawyer, C.N., McCarty, P.L and Parkin, G.F., 1994. Chemistry for Environmental Engineering. 4th Edition, McGraw Hill
 - Shaheen, E.I.1992. Technology of Environmental Pollution Control. 2nd Edition, Pennwell, Tulsa, Oklahoma
 - Any relevant Environmental Engineering journals