EVT 230 Treatment Technologies

Course Description: A course on principles and applications of mainstream treatment technologies used to prevent, monitor, and control pollution from industries and government facilities. Topics include: physical, chemical, thermal, and biological treatment methods. Students provide transportation to off-campus field trips.

Prerequisites(s): EVT 170 **Corequisite(s):** No corequisite

Lecture Hours: 2	Lab Hours: 2	Credit Hours: 3
Lab Fee: 70	Supplemental Fee: 0	Purpose:
☐ Transfer Assurance Guide Course (TAG)	☐ Transfer Module Course (TM)	
Course Format: Lec/Lab	Grading: A/B/C/D/F/I	
Delivery Method: □ Web	□ Hybrid	□ Classroom
Semesters Offered: X□ Fall	□ Spring	X□ Summer

Course Primary Text:

Title: Standard Handbook of Hazardous Waste Treatment and Disposal,	Edition: 2nd
Author(s): Harry M. Freeman, editor	
Publisher: McGraw-Hill	

Supplemental Materials:

2018 AALSO Field Guide: A Field Guide to Water Quality Practices,
Common System Components, and Practical Mathematics
Authored by: 2018 Field Guide Committee
San Francisco, CA 2018
**AALSO = Aquatic Animal Life Support Operators; www.AALSO.org*
AALSO Water Quality Technician Level 1 Certification will be awarded to students successfully completing this course and passing the AALSO WQ Level 1 exam

Course Outcomes:

1	b. An ability to apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require limited application of principles but extensive practical knowledge;

2	e. An ability to identify, analyze, and solve narrowly defined engineering technology problems;
3	f. An ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;
4	g. An understanding of the need for and an ability to engage in self-directed continuing professional development;
5	h. An understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity; and
6	i. A commitment to quality, timeliness, and continuous improvement.
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Course Topics:

Week 1	Introduction Lab - Discussion of Waste Types & Treatment Objectives Video: Physical Treatment Technologies Cincinnati State Library	Freeman -Sections 3, 12, 13 AALSO – Ch. 1, 2, 3
Week 2	**QUIZ** , Homework, Discussion Natural Treatment (constructed wetlands) Nitrogen Cycle: Nitrification, Denitrification Biological Treatment of Liquid Organic Waste Video: Biological Treatment Technologies **Paper Topics Due**	AALSO – Ch. 4,5, 9.2.1, 9.2.2 Freeman -Sections 9.1, Handouts
Week 3	Thomas More Field Biology Station Natural Treatment - constructed wetlands Biological indicators Water sampling, testing & analysis	AALSO – Ch. 6, Handouts
Week 4	**QUIZ** , Homework, Discussion Biological Treatment of Liquid Organic Waste conti Newport Aquarium – behind the scenes WQ Tour	Freeman -Section 9.1

	Paper Outlines Due
Week 5	**QUIZ** , Homework Discussion AALSO – Ch. 17 Freeman -Sections 9.2, 9.3 In Situ Biological Treatments Handouts & Biological Solid Waste Treatments (Bioremediation, composting, landfarming) Stoichometry Review SD#1 Dry Creek WWTP Facility tour
Week 6	**QUIZ** , Homework Discussion Freeman - Section 8.1, 8.2, 8.3, Handouts Incineration (Thermal Treatments) Solids Handling; Anaerobic Digestion Video: Thermal Treatment Technologies
Week 7	**QUIZ** , Homework Discussion, Review for Midterm MSD, Gest Street Plant Tour (including solids handling)
Week 8	**MIDTERM EXAM** US EPA Experimental Stream Facility & Lower East Fork WWTP
Week 9	Metals Abatement: Freeman- Section 7.2, 7.4, 12.7 Chemical Liquid Waste Treatments Phytoremediation Video: Chemical Treatment Technologies
Week 10	**Quiz**, Homework, Discussion Freeman – Sections 6.1 & 6.5 Phase Transfer Technologies Ion Exchange Lab –at Valicor
Week 11	Center Hill Facility Tour AALSO – Ch.9.3.1, 9.3.2, 10.2, 10.3 Freeman -Section 4.4, 7.3 Physical Solid Waste Treatment
Week 12	**Quiz**, Homework Discussion Stabilization Projects (Fernald Preserve) Advanced Groundwater Treatment (Ion Exchange)
Week 13	Tour: Cincinnati Water Works Facility including GAC, Labs & TOC demo **Quiz**

Week 14	Exit Survey/Roundtable Discussion Student Presentations **and Papers Due**
Week 15	Student Presentations conti. **FINAL EXAM** **AALSO Certification Test**

Methods of Evaluation/Assessment

□x Formative: x□ Summative

List assessment activities (e.g. quizzes, discussions, essays, research papers, debates, oral presentations, exams):

Homework
Quizzes
Midterm
Final
Research Paper
Presentation

Course Keeper: Dr. Ann Gunkel Date Completed: 4/16/19