**EHS 2109 EXCRETA AND WASTEWATER MANAGEMENT AND TREATMENT**

**(3 CU)**

**Course description:** The course describes wastewater and excreta, their disposal, industrial liquid waste and their disposal and health risks and diseases associated with poor management of wastewater and excreta disposal. It also deals with relevant national and international policies and regulations related to excreta and wastewater management.

**Course Objectives**

By the end of this course, the student should be able to:

1. Describe the sources, types, composition and characteristics of wastewater and sewage.
2. Explain the principles, methods and importance of good drainage.
3. Describe sources of wastewater and excreta material.
4. Explain wastewater and excreta management as a problem in developing countries especially in the East African Community.
5. Describe the basic principles in excreta and wastewater management.
6. Describe the disposal facilities and treatment for wastewater and excreta.
7. Demonstrate the ability to carry out sampling and analysis of wastewater and sewage.
8. Recognise problems related to excreta disposal.

**Detailed Course Outline**

* Terminologies used in wastewater and excreta management
* Types, characteristics and sources of wastewater and excreta
* Wastewater drainage systems
* Analysis of wastewater and sewage and effluent standards
* Sewer systems
* Unit operations in wastewater treatment (Trickling filters, activated sludge units, stabilization ponds, constructed wetlands
* Industrial wastewater and safety measures
* Legislation relating to drainage and wastewater management
* Excreta and wastewater management in emergency situations
* Design and construction of different types of sanitary latrines.
* Principles of excreta disposal
* Nuisances and health hazards from poor disposal of excreta
* Field visits
* Laboratory work

# Mode of delivery:

* Lectures, laboratory work and field visits.

**Mode of Assessment**

- Continuous assessment **(40%)**.

- End of semester exam: MCQ’s, short answer and long assay questions **(60%)**.

**Suggested Reading List**

1. Lecture handouts and additional materials on reserve at the MUSPH Resource Centre.

2. Nadakavukavien. A; *Man and Environment- A Health Perspective* 3rd Ed. Waveland Press Inc.

3. Ponofsky. H; “*Earth’s endangered ozone” Environmental magazine* , vol.20 No.3, 1978

Jackson H.H & Moris G. P. et al. *Environmental Health*; Reference book; Butterworths, London. 1989.

4. Sandy Caircross & Feachem Richard G; *Environmental health- an introductory text*; John Wiley & sons, N.Y., 1982

5. Sandy Cairncross and Feachem Richard G; *Environmental Health Engineering in the Tropics* John Wiley & sons, N.Y., 2002

6. Salvato Joseph, *Environmental Engineering & Sanitation* 4th Ed, John Wiley & sons 1992.

7. Blackman, W.C., *Basic Hazardous Waste Management*, 3rd Ed, Lewis Publishers, CRC Press, Boca Raton, Fla., 2001.

8. White J. B. *Wastewater Engineering* Edward Arnold Publishers

9. Pruss A., Giroult E. and Rushbrook P. (eds) *Safe Management of Wastes from health-care activities*. WHO

10. State of Environment Reports for Uganda - NEMA