

CONSTRUCTED WETLANDS FOR WATER QUALITY CONTROL

Course Outline

Instructor: Paul McGinley TNR 224F (Inside the “Groundwater Center”) 346-4501 / pmcginle@uwsp.edu

Meetings: 4 – 5 PM Tuesday & Thursday in TNR 252

The course description is “design and construction of wetland areas for water quality control.” Our focus in this course will be to:

- 1) Review examples of wetlands used for water quality control
- 2) Examine water quality functions of wetlands and their potential for water quality improvement
- 3) Apply different methods of quantifying wetland treatment function
- 4) Critically evaluate the likely treatment of a specific compound in a wetland

We plan to examine different wetland treatment systems within a discussion of the physical, chemical and biological processes that occur within treatment wetlands. The course will meet twice weekly for lecture, discussion and problem-solving. Grading is based on the in-class problems/assignments (15%), short quizzes on the 2nd and 4th Thursdays (10%), an individual project (40%) and a final quiz (35%).

Week	Topic
1	<i>Introduction to Treatment Wetlands Terminology & Examples Hydrology & Hydraulics</i>
2	<i>Hydrology/Hydraulics Continued Design and Construction</i>
3	<i>Contaminant Removal / Physical Removal Suspended Solids</i>
4	<i>Chemical and Biological Removal Oxygen Demanding Substances Organic Compounds / “Emerging” Compounds</i>
5	<i>Biological Pathogens Nitrogen</i>
6	<i>Nitrogen & Phosphorus</i>
7	<i>Phosphorus & Presentations</i>
8	<i>Presentations & Final Quiz (Thursday March 14)</i>

Course References

(Dotro) Dotro, G., Langergraber, G., Molle, P., Nivala, and other. Treatment Wetlands. Volume 7 in the Biological Wastewater Treatment Series. IWA Publishing (available online through UWSP library).

(K&W) Kadlec, R.H. and S.D. Wallace. 2009. Treatment Wetlands, Second Edition. CRC Press.. (available online through UWSP library)

(EPA2000) USEPA. 2000. Constructed Wetlands Treatment of Municipal Wastewaters. EPA/625/R-99/010 (D2L D2L and you can find online)

Mitsch, W.J. and J.G. Gosselink. 2000. Wetlands. John Wiley and Sons, New York.

(Shannon) Shannon, R.D., O.P. Flite, M.S. Hunter. 2000. Subsurface flow constructed wetland performance at a Pennsylvania campground and conference center. Journal of Environmental Quality 29:2029-2036. (D2L)

Kadlec, R.H. 2009. Wastewater treatment at the Houghton Lake wetland: Hydrology and water quality. Ecological Engineering 35:1287-1311. (D2L)

(Mitsch1995) Mitsch, W.J., J.K. Cronk, Z. Wu and R.W. Nairn. 1995. Phosphorus retention in constructed freshwater riparian marshes. Ecological Applications 5:830-845. (D2L)

(Mitsch2005) Mitsch, W.J., J.W. Day, L. Zhang and R.R. Lane. 2005. Nitrate-nitrogen retention in wetlands in the Mississippi River Basin. Ecological Engineering 24:267-278. (D2L)

(N&H2000) Nichols, D.S. and D.A. Higgins. 2000. Long-term wastewater treatment effectiveness of a northern Wisconsin peatland. Journal of Environmental Quality 29:1703-1714. (D2L)