CIVE 525 WATER ENGINEERING FOR INTERNATIONAL DEVELOPMENT

Instructor	Jeffrey D. Niemann Engineering A226, 491-3517, jniemann@engr.colostate.edu Office hours: Mon 1-3 pm, Thu 12-1 pm, or by appointment
Prerequisites	CIVE 401 Hydraulic Engineering or CIVE 438 Environmental Engineering Concepts
Canvas	Readings, handouts, assignments, and grades will be posted
Recommended Textbooks	Water for the World Technical Notes U.S. Agency for International Development, 1982 http://www.lifewater.org/technical-library (also accessible from Canvas) Field Guide to Environmental Engineering for Development Workers Mihelcic, J.R., L.M Fry, E.A. Myre, L.D. Phillips, L.D., and B.D. Barkdoll American Society of Civil Engineers Press, Reston, Virginia, 2009
Grading	Homework 36% Project 12% Midterm Exam 26% Final Exam 26% Plus/minus grading will be used
Homework	Due <u>at the start of class</u> on the due date Late homework is <u>not</u> accepted Solutions are posted on the website after due date Show your work and explain your results
Project	Design and construction of a ram pump To be completed in groups Engineering A11 (Concrete Lab) will be available for construction and testing Ram pumps will be judged during the last week of class Late projects are <u>not</u> accepted
Exams	Midterm exam is given during the class period Final exam is given during the scheduled final exam period Reference to books and notes is allowed for both exams Exams are not cumulative

Academic Integrity	Course adheres to the CSU academic integrity policy (p. 7 in general catalog)
	      and the student conduct code
	All course submissions aside from the project must be entirely your own
	      individual work, but discussion with others is allowed

Subject	Class	Topic	USAID Notes	Textbook
Introduction	1	Development Needs	None	
	2	Development Approaches	None	Chaps. 1-2
	3	Project Implementation	HR: 2M, 2P, 2I, 3M	Chaps. 3-4
Water Supply Systems	4	Water Requirements	RWS: 1P1	9.1-9.3
	5	Selecting a Water Source	1M, 1P3	9.4
	6	Assessing Water Quality	1P2, 3P1, 3P2, 3P3	None
		Labor Day		
	7	Water Quality Testing		
	8	Treatment & Distribution	3M, 3P4, 4M, 4P1, 4P2	None
	9	Well Site Selection	2M, 2P3	16.1-16.4
	10	Hand-Dug Wells	2P2, 2D1, 2C1	
	11	Project Introduction	None	None
	12	Drilled Wells	2D3, 2C3	16.5-16.7
	13	Well Completion	2C6, 2C7, 2C8, 2C9	16.9
	14	Spring Boxes	1D1, 1C1, 1O1	15.1-15.3
	15	Stream Intakes & Rainfall Catchments	1P4, 1P5, 1D3, 1C3, 1O2	Chap. 17
	16	Sedimentation Basins	3D2, 3C2, 3O2	18.3-18.5
	17	Sand Filters	3D1, 3D3, 3C3, 3O3	18.6
	18	Gravity Transmission Lines	4P3, 4D1, 4D3	11.1-11.2
	19	Pumped Transmission Lines	4P4, 4P5, 4D2	None
	20	Transmission Line Design	4C1	11.3-11.4
	21	Storage Tanks	5P1, 5D1, 5D2, 5C2, 5O1	14.1-14.6
	22	Disinfection Units	3D4, 3O4	18.7
	23	Distribution Systems	4C5, 4O5	11.2
Sanitation Systems	24	Selecting Disposal Methods	SAN: 1M1, 1M2, 2M, 1P, 2P	19.1-19.2
	25	Wastewater Production	2P2	19.3
	26	Soil Suitability	2P3	None
	27	Pit Privies	1D1,1D2,1D3	20.1
	28	Other Privies	1D4,1D5,1D6	20.2
	29	**Midterm Exam** (Fri., Oct. 28)		
	30	Washwater Disposal & Cesspools	1D7, 2D2	21.1-21.4
	31	Septic Tanks	2D3, 2C3, 2O3	None
	32	Subsurface Absorption	2D1, 2C1	None
	33	Constructed Wetlands	2D8, 2C8	23.1-23.3
	34	Stabilization Ponds	2D5, 2D6, 2C5, 2O5	22.1-22.4
	35	*Project Construction (Lab)*	None	None
	36	Sewer Systems	2D4, 2C4, 2O4	None
	37	Sewer Design	None	None
	38	*Project Construction (Lab)*	None	None
		Fall Break		
Conclusion	39	*Project Testing (Lab)*	None	None
	40	Special Topics	None	None
	41	*Project Testing (Lab)*	None	None
	42	*Project Competition (Lab)*	None	None
	43	Special Topics	None	None
	44	*Project Competition (Lab)*	None	None
		Final Exam (Wed., Dec. 14, 4:10 pm – 6:10 pm)		