Fluvial Ecosystems: River Science & Management

Course outline for 2011

NRE 520 (Lecture): MJ Wiley [mjwiley@umich.edu]
Lecture: 6:00pm to 7:30pm, Mo & We, 2024 Dana

NRE 521 (Lab): KS Park [ecopark@umich.edu] & MJ Wiley
Lab: 1pm to 5pm, Fr, G556 Dana

For NRE 520 (lecture):

Strongly recommended text

[A] Luna Leoplod.1994. 2005. A view of the river. Harvard University Press. 298 pp. ISBN 0-674-01845-1

or/and

[B] J. David Allan & Mario M. Castillo. 2nd Edition. 2007. Stream ecology. Springer. 436 pp. ISBN 978-1-4020-5582-9

Recommended text:

[C] Stanley A. Schumm. River variability and complexity. 2005. Cambridge University Press. 220 pp. ISBN 0-521-04099-X

For NRE 521 (lab):

Required text for 521 (lab section) students:

[D] Nancy D. Gordon et al. Stream hydrology for ecologists. 2nd ed. John Wiley & Sons Ltd. 429pp. ISBN 978-0-470-84385-1

Week of	Mon	Wed	Fri Lab	Supplemental Readings
Sept 5	--	Intro to Rivers & organizational issues	Short intro session	[A]1; [B] 1
I.	***River Patterns and Processes***			
Sept 12	Scales & Patterns in hydrology	Hydrologic processes: routing & storage	**Flows & loads** **Local study system**	[A] 2,3,5,7 [B] 2; [C]1
Sept 19	Patterns in B&C geomorphology	River hydraulics	**Channel surveying** **Local study system**	[A] 4,8,10,13; [B] 3,5 [C] 2,3
Sept 26	Chanel building processes: erosion, deposition & transport	The fluvial system: process-response, equilibrium and change, controls	**Biological sampling** **Local study system**	[A] 11,12,14; [B] 3,5 [C] 4-7
Oct 3	Patterns in biology: longitudinal, lateral, vertical	What shapes river biology? bioenergetic constraints	**Biological sampling** **Local study system**	[B] 5,10,14
Oct 10	River solute & heat loads: nutrients & temperature	What shapes river biology? disturbance & physical templates	Field sampling Sample processing	[B] 4,11
Oct 17	**[Fall Break]**	Biologic feedback in the fluvial system (Midterm Exam take home)	**Weekend Trip**	[C] 13,14,15,181,19
II.	***Topics in River Management***			
Oct 24	types of rivers: classifications & generalization	Water quality & biological assessment	Field sampling Sample processing	[B]13
Oct 31	Land use impacts on rivers	Channel management & restoration	GIS methods in river science	[C]8
Nov 7	Dams: Hazards, services & connectivity	River & Estuarine Fisheries	Sample processing	TBA
Nov 14	Guest Speaker	Guest Speaker	Data analysis	TBA
Nov 21	Guest Speaker	<Thanksgiving Break>	--	TBA
III.	***International Perspectives on river management***			[A]6
Nov 28	Europe	Asia	**Urban streams trip**	PL teams
Dec 5	S. America	Africa	Open Lab	PL teams
Dec 12	The future of rivers: fluvial ecosystems in the Anthropocene		-- No Lab	
TBA=to be announced on CTOOLS; PL Teams= primary lit review team presentations				

Lecture Grading: Takehome Midterm (30%); Final (35%); 6 problem sets (30%); participation (5%)

Lab Grading: (5) Field exercises (50%); short analytical paper 1 (20%); comparative systems paper (30%)