

River Restoration in Europe (7.5 credits) **VVR170 and BIOR42**

COURSE OUTLINE 2012

Course management:

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Rolf



Jean



Lena

Office hours: The course managers are most easily reached via e-mail.

General overview: This course has developed from a SOCRATES (EU) project called “*River Channel Design and Environmental Protection in Europe*”. The main idea behind the project (and behind this course) is that, in order to accomplish better solutions regarding river restoration and management, it is essential to have professionals with different background working together. Therefore both students and teachers in this course enter the course with different educational and professional backgrounds.

Another important idea in the project (and also in this course) is that by bringing together experiences from many European countries, as well as from other regions in the world, we will all come to a better understanding of the various issues and processes involved in river restoration. It should be pointed out that **this course does NOT** attempt to give a full treatise on river restoration. In order to provide such a course we would need a full master’s programme. Our aims are more limited - see “objectives” below.

Background needed: As mentioned above, the course brings together students of different backgrounds and experiences. So far, students from biology/limnology, engineering/hydrology, landscape architecture, geography and geology have made the class core. For this year, at the time of writing this outline, the proportions of students from each group is not exactly known.

Objectives: After completing the course each student should:

- have enough knowledge of the physical / biological processes involved in river related problems to be able to communicate with other specialists;
- have a clear overall picture of river restoration / management approaches;
- have good knowledge concerning key rules and regulations related to river management (focused on Sweden);
- know where to find relevant information concerning river restoration / management;
- have good knowledge about existing problems and management methods of Europe.

Short overview of course content: Since integrated river management is now the focus of a growing number of dedicated programmes at both undergraduate and graduate levels around the world, content for this short course could only be selected to provide optimum coverage of key principles and concepts from both engineering and ecological components, as well as from the legal and sociological aspects of river management. Namely:

- Review of basic concepts in hydrology, hydraulics, sediment transport and lotic ecology;
- Introduction to river management / restoration goals and approaches;
- Overview of recent advances in river restoration methodology and techniques;
- Overview of key legal and administrative aspects of river restoration in Europe (EU), with focus on Sweden;
- Overview of experiences from around the world.

Course organisation and venue: The course, conducted one evening a week, is conducted through a combination of lectures (provided by the course managers and invited specialists from the academic, public and private sectors), individual and group-work sessions (during and external of class periods), students presentations and field trips (detailed information to be provided later) in the following proportion, for a total of 200 hours (7.5 Swedish credits = 5 weeks @ 40 hours / week):

- Lectures (including scheduled group work) 54 hours
- External individual and group work 122 hours
- Field trip (Scania: Klingavälsån, Simrishamn 8 hours, Saturday (*mandatory*))
- Field trip (Denmark: Skjernå, Silkeborg & Bredeå) 2 days, weekend (*highly recommended*)

Course venue is as follows:

- All lectures are in “Röda rummet”, Ecology Building, Sölvegatan 37, Lund.
- Lectures will take place on **Wednesdays** unless otherwise stated.
- Time: **18.00 – 20.45**. If the full three hours are not taken up by lecture, the remaining time will be used for discussion, consultations and group work.
- **PLEASE NOTE** : for security reasons, the main entrance door can only be unlocked between 17.45 – 18.15 on lecture days.

Official course language: English.

www: Complementary operational information and selected documents will be posted at the course web site (www.tvrl.lth.se/english see “education – our courses”).

Course Literature: The course literature has been divided in “*required*”, “*assignment I*” and “*assignment II / supplementary*” readings:

Required reading:

- Madsen B.L., 1995. Danish Watercourses — Ten years with the new watercourse act (collected examples of maintenance and restoration). Danish Environmental Protection Agency, Ministry of Environment and Energy, Denmark. Available for free at (link also found on course web site): <http://www2.mst.dk/Udgiv/publications/1995/87-7810-344-4/pdf/87-7810-344-4.pdf>
- Allan, J. D. and M.M. Castillo. 2007. Stream Ecology: Structure and Function of Running Waters. 2nd Edition Springer Chapters: 1-3, 7-8, 12-13.
- Lecture notes. Distributed as handouts during lectures and/or published on www (www.tvrl.lth.se/english see “education – our courses”).

Assignment I literature (available at the Ecology Library; selected pages distributed to groups):

- Boon P.J., B.R. Davies and G.E. Petts (ed.). 2000. Global Perspectives on River Conservation: Science, Policy and Practice. John Wiley & Sons Ltd. (Relevant Chapters: see Assignment 1);
- Urena J. 1999. River Design and Environmental Protection in Europe. Universidad de Cantabria. (Relevant Chapters: see Assignment 1).

Assignment II / supplementary literature (available from www or at the Ecology Library as reference books and/or in three ringbinders):

- Petersen R.C., Petersen L.B.-M. & Lacoursière J.O. 1992. A Building-block Model for Stream restoration. In River Conservation and Management. Boon, Calow & Petts (Eds). John Wiley & Sons Ltd.
- Vought L.B.-M., Dahl J., Pedersen C.L. & Lacoursière J.O. 1994. Nutrient retention in riparian ecotones. *Ambio* 23(6): 342-348.
- Gordon N. D., McMahon T.A. & Finlayson B.L.. 2004. Stream Hydrology. An Introduction for Ecologists. John Wiley & Sons
 - Chapter 4. Getting to Know Your Stream. 4.1.2;4.2.2;4.3.1;4.4.2
 - Chapter 5.6-5.8. Discharge measurements.5.7;5.8.1
 - Chapter 7. Patterns in shifting sands. 7.1; 7.2.5; 7.2.6; 7.3; 7.4
 - Chapter 8.2. Streamflow frequency analysis. John Wiley & Sons. 8.2.1 – 8.2.5
- Brookes A. & Shields F.D. 1996. River Channel Restoration. Guiding Principles for Sustainable Projects. John Wiley & Sons.
- Eiselová M. (Ed.) 2010. Restoration of Lakes, Streams, Floodplains, and Bogs in Europe. Series Wetlands: Ecology, Conservation and Management. Volume 3. Springer.
- Hunter C.J. 1991. Better Trout Habitats. A Guide to Stream Restoration and Management. Island Press.
- Newbury & Gaboury. 1993. Stream Analysis and Fish Habitat Design. A Field Manual. Newbury Hydraulics Ltd.
- The River Restoration Center, UK, RRC Manual, / http://www.therrc.co.uk/rrc_manual.php
- USDA (Federal Stream Corridor Restoration Handbook (NEH-653))
<http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/alphabetical/water/restoration/?&cid=stelpdb1043244>
- Several reports from Australian River restoration Centre [detailed links provided at course web site] <http://australianriverrestorationcentre.com.au/>

Assignments (more information will be provided separately): Two overlapping assignments will be carried out in small groups (number of participants per group to be determined) over the course period.

Assignment I, which is intended as an introduction to recent advances in river management (and associated terminology), consists of a comparative analysis of goals and approaches adopted in various developed / developing regions of the world. This assignment is based on selected readings and questions provided by the course managers, and is concluded by an overall class discussion where the different groups voice opinions on the basis of their analyses. This assignment also sets the background for the second assignment.

Assignment II is a fully applied exercise in channel design. This assignment will draw on the experience of key specialists involved (invited as lecturers). Each group will operate as a “consulting firm” and will propose and present a technically and ecologically sound restoration plan, which will be discussed with the relevant authorities (pending their respective availability).

Examination: A final three-hours written exam will comprise both theory and problem solving, and will cover material given in lectures, required readings and assignments. A mark equal or superior to 60% is necessary to pass the exam.

Mandatory attendance: The following course items have mandatory attendance (see also *Schedule*):

- Field trip 1
- Seminar: Assignment I
- Assignment II – Half time seminar
- Seminar: Assignment II – both occasions

Grades: The final grade will be a weighted average based on the two group-projects and the final written examination. Consequently, all three items must have been successfully completed to obtain the course grade ‘pass’ (*godkänt*). See also section “*Mandatory attendance*”. The weights used for grading are: Assignment 1 (0.2), assignment 2 (0.3), final exam (0.5).

Plagiarism: This course includes two assignments, which are reported through written reports and discussions/presentations at seminars. The students must avoid crossing over the boundary from good academic writing to plagiarism. The “*Policy of the Dept of Biology concerning academic conduct*” will be distributed as hard copy in class, while the following documents are provided (via links on the course web site) for guidance:

- LTH policy on plagiarism,

http://www.lth.se/anstalld/lth_handboken/utbildning_och_forskning/plagiering/

- Academic conduct (by LU library) / <http://www.lub.lu.se/en/student/academic-conduct.html>

- Harvard System of Referencing Guide; Anglia Ruskin University

<http://libweb.anglia.ac.uk/referencing/harvard.htm>

- Guide till Harvardsystemet; Höskolan I Borås (in Swedish),

<http://www.hb.se/wps/portal/blr/harvard/har.asp>

If there is reason to suspect a case of plagiarism, Lund University employees are obliged to report it to the Vice Chancellor. If students are in any doubt concerning the rules, please contact the teachers.

Lecturers:

<i>Rolf Larsson</i>	<i>Water Resources Engineering, Lund University</i>
<i>Jean Lacoursière</i>	<i>School of Education and Environment, Kristianstad University</i>
<i>Lena Vought</i>	<i>School of Education and Environment, Kristianstad University</i>
Tilla Larsson	Swedish Agency for Agriculture ('Jordbruksverket')
Kaj Rolf	SLU (Swedish Agricultural Univ.) Alnarp
Carl Hoffmann	Freshwater lab., Silkeborg, Denmark (Denmark excursion)

SCHEDULE - 2012

/All lectures (unless stated otherwise):

Wednesdays 18.00 – 20.45

“Röda rummet”, Ecology Building, Sölvegatan 37, Lund.

Date	Lecturer (s)	Topic (s)
18 Jan	Lena Vought Rolf Larsson Jean O. Lacoursière	Introduction. Course layout and practical info. Assignment I – Presentation River system: the manager’s perspective
25 Jan	Lena Vought Jean O. Lacoursière	River ecology Lotic ecology, concepts and aspects Assignment II: Introduction
1 Feb	Lena Vought Jean O. Lacoursière	Restoration Principles / methods
8 Feb	Rolf Larsson	Hydrology I Overview of engineering concepts relevant to river management
15 Feb	Rolf Larsson	Hydrology II Methods in frequency analysis, channel hydraulics, sediment water interaction
22 Feb	Rolf Larsson Lena Vought	EU Water Framework directive (RL 45 minutes) Assignment I - Group work. Consultation and Discussion of assignments

Date	Lecturer (s)	Topic (s)
29 Feb	Rolf Larsson	Seminar: Assignment I Group report presentations
7 Mar	* No lecture <i>/LTH exam week/</i>	Group work. Time for group work
10 Mar Saturday	Rolf Larsson Jean O. Lacoursière Lena Vought	Field trip 1. Skåne
		Note Saturday More information below.
14 Mar	Rolf Larsson Lena Vought	Assignment II – Half time seminar Group presentations and discussion
21 Mar	Tilla Larsson	Laws; Rules and regulations, water / environment Lecture + seminar
28 Mar	Rolf Larsson Lena Vought	International river agreements (LV 45 minutes) Assignment II - Group work. Consultation and Discussion of assignments.
4 Apr	++ No lecture ++	+++++ Easter break ++++++
11 Apr	* No lecture <i>/LTH exam week/</i>	Group work. Time for group work
18 Apr	Kaj Rolf	Natural materials in restoration Overview of techniques and experiences.
25 Apr	Rolf Larsson Lena Vought	Assignment II - Group work. Consultation and Discussion of assignments.
2 May	Rolf Larsson Lena Vought	Assignment II – Hand in deadline. <i>If requested:</i> Consultation and Discussion of assignments.
5/6 May Saturday Sunday	Rolf Larsson Lena Vought Jean O. Lacoursière	Field trip 2 Denmark
		Note Saturday+Sunday More information below.
9 May	Rolf Larsson Lena Vought	Seminar: Assignment II Presentation of reports
16 May	Rolf Larsson Lena Vought	Seminar: Assignment II – cont'd Presentation of reports
23 May	* No lecture <i>/LTH exam week/</i>	
30 May	Rolf Larsson Lena Vought	Examination (Ecology Building, Red Room)

SCHEDULE – ASSIGNMENTS (more information will be provided separately)

Assignment	Starting Date	Hand-in date	Seminars	Return date
I	18 January	29 February	29 February	14 March
II	25 January	2 May	9 & 16 May	30 May

SCHEDULE - FIELD TRIPS (more information will be provided separately)

No.	Date	Time	Site
1	10 March	9-16	Scania: Klingavälsån, Simrishamn Mandatory
2	5-6 May	8-19	Denmark: Skjernån, Silkeborg & Bredeån ¹ Optional – highly recommended

¹ In connection with the study tour to Denmark, a lecture by Dr. Carl Hoffmann on “*Denmark - Experiences, policies*” will be provided.

SCHEDULE – FINAL EXAMINATION

No.	Date	Time	Location
1	30 May	18.00 – 21.00	“Röda rummet”, Ecology Building
2 *	24 August	08.00 – 11.00	V:O1 (LTH)
3 *	xx January 2013	XX.00 – XX.00	NOTE: the date has not been set at the time of writing

* Resit. PLEASE observe that sign-up is mandatory. Can be done via e-mail.