GÖTEBORGS UNIVERSITET

Pollution And Land Management (PALM course series)

1. Delta Environments, 3-5 credits

Course period:	Last day for application:
1-29 October 2015 (each Thursday)	September 15, 2015

Course leader / Address for applications:

Rod Stevens, stevens@gvc.gu.se

Course description (Advertisment for Ph.D. students):

1) ***Physical and geochemical controls on environmental dynamics.***
   Natural variability in combination with global change and regional anthropogenic disturbances make deltas highly vulnerable to sea-level change, flooding, pollution and habitat loss. Water and sediment transport provide a basis for understanding the impact of individual and combined processes. The interdependency of organic and inorganic geochemistry, mineralogy and grain size will be dealt in connection with the carrier function as well as the biological and geochemical reactivity of the sediment matrix. Remote sensing and environmental classification will be done early in most case studies. The concept of functional facies can be adapted to this purpose, and also incorporate the 3D processes central for groundwater and many other land resources. Although particular focus on the Niger Delta is planned, other examples will be taken up, depending in part on participant interests.
2) ***Integrated resource and risk management.***
   Regional exploitation and vulnerability of multiple resources can be characterized and combined with planning goals using system structural analysis and multi-criteria evaluation tools. Relative regional risk ranking is a variation of this approach and exercises with Excel macros will be used for participants to apply these principles to their areas of interest. The functional-facies classification of land resources will provide one interconnection between the information of natural delta processes and resource management applications. Flooding and pollution risks will also be consider with respect to local and upstream and global disturbances, especially in regard to water and sediment discharge, climate change and sea-level rise. Additional stress arises from urbanization, fishing, aquaculture, agriculture, deforestation and multiple pollution sources, making relative risk ranking a crucial (and certainly non-trivial) step in decision support.

Note: Although this initial course will not focus on the biological components, these can ideally be taken up in a future, expanded course or though parallel and complementary courses.

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Give a short description of the course as an advertisement for the web.

This part-time, blended-learning course introduces knowledge from natural and social sciences essential for management of the physical resources in delta environments. Web-based tutorials and webinars (each Thursday in October) will utilize the modelled structure and insight of decision-support systems to evaluate and combine delta environmental features with the human demands on both resource exploitation and sustainability.

Interdisciplinary participation is encouraged and favorable for the cooperative exercises in several tutorials. This breath will be combined with in-depth literature and short projects with either social or natural science focus (for 3 hp) or in both areas (for 5 hp).

Responsible department and other participation departments/organisations:
Department of Earth Sciences
Teachers: Rodney Stevens (Course leader and main contact) Enuvie Akpokodje Others: to be announced
Examiner: Rodney Stevens

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Third cycle education

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1. Confirmation

The syllabus was confirmed by the Head of the Department of Earth Sciences, 2015-02-27.

Disciplinary domain: Environmental Science
Department in charge: Department of Earth Sciences
Main field of study: Environmental Science (incl. natural and social sciences)

2. Position in the educational system

Elective course; third-cycle education.

3. Entry requirements

Undergraduate degree (Bachelor's degree)

4. Course content

The instruction involves web-based tutorials, webinar seminars, computer exercises, selected readings in both social and natural science, and a short project. An optional field trip is planned for the Gothenburg area.

5. Outcomes

After completion of the course the Ph.D. student is expected to be able to ...

1. Knowledge and understanding
Participants will gain knowledge about the processes, transport pathways and effects of mass fluxes in different types of delta settings, as well as an introduction to applied use of this knowledge in resource management.

2. Skills and abilities
Modelling and system analysis tools are to be used for both natural science and resource-management issues related to delta environments.

3. Judgement and approach
Human exploitation of natural resources and their sustainable management will be considered from multiple perspectives.

6. Required reading
The reading list is supplied separate to the syllabus.

7. Assessment
An individual oral or written exam ("take-home") will conclude the course.
Participation in at least 80% of the webinar seminars is mandatory. web-based activit
Tutorial exercises are also mandatory.

A Ph.D. student who has failed the exam twice has the right to change examiners, if it is possible. A written application should be sent to the Department. The maximum number of examinations is limited to five occasions.

8. Grading scale
The grading scale comprises Fail, (U), Pass (G)

9. Course Evaluation
The course evaluation is carried out together with the Ph.D. students at the end of the course, and is followed by an individual, anonymous survey. The results and possible changes in the course will be shared with the students who participated in the evaluation and to those who are beginning the course.

10. Language of instruction
The language of instruction is English.