563010 Advanced Remote Sensing (4 op, 3 ov)

COURSE TIME:
IV period (13.3–8.5.2008). Physicum Building: lectures on Thursdays from 10.15–12.00 (E207) and exercises on Thursdays from 13.15–17.00 (A113).

RESPONSIBLE TEACHERS:
Barnaby Clark (course organizer), Alemu Gonsamo, Dr Janne Heiskanen

TARGET GROUP AND PRELIMINARY KNOWLEDGE:
The course is targeted for those who have completed 'Remote Sensing Methods (56301)' and want to learn more about satellite remote sensing in support of land cover studies. 11 students will be accepted onto the course.

COURSE DESCRIPTION:
This course introduces advanced methods in remote sensing of land cover at multiple scales.

Course topics include (*NB: see schedule below for lecture titles*):

- Collection of field data is support of remote sensing
- Atmospheric and topographic corrections for satellite data: when is it necessary and how to do it?
- Estimation of land cover and vegetation attributes from satellite data: alternatives for image classification
- Global-scale land cover and vegetation data
- Methods in land cover change detection

STUDY METHODS AND GRADING:
Successful completion of the course requires regular attendance to the lectures and exercises. Each student will also participate in course group work involving the submission of a short report and a presentation at the end of the course. As a consequence, there is NO exam. Groups can choose from a selection of appropriate topics for the course work. Maximum 6 separate groups (1 or 2 students per topic). Grading (1–5) is based on the returned exercises and course work.

Course content and schedule:

NOTES: Exercises should be completed by students in the time available, i.e. within 3 ½ hours (includes 15 minute break 15:45-16:00).

13th March Lecture 1 Lecture 2 *Exercise 1*	▪ *General Introduction to the Course* (Barnaby Clark) ▪ *Field Based Spectral and Multiangular Measurements* (Barnaby Clark) ▪ *Optical Field Instruments for Leaf Area Index (LAI) Estimation* (Alemu Gonsamo) ▪ Estimation of leaf area index (LAI) using optical field instruments and imaging spectroscopy
20th March Lecture 3 *Exercise 2*	▪ *Atmospheric and Topographic Correction Techniques for Satellite Imagery* (Barnaby Clark) ▪ Implementing a DOS radiometric correction and topographic normalization to Landsat 7 ETM+ data
27th March Lecture 4 *Exercise 3*	▪ *Remote Sensing of Land Cover and Vegetation over Large Areas: continuous fields-v-discrete classes, temporal-v-spatial resolution, and physical-v-empirical models* (Janne Heiskanen) ▪ Estimating land cover and vegetation attributes
3rd April Lecture 5 *Exercise 4*	▪ *Methods in Land Cover Change Detection* (Barnaby Clark) ▪ Land cover change detection in the Taita Hills, Kenya
10th April Morning Session Afternoon Session	▪ Introduction to course work, formation of study groups and allocation of coursework topics (Barnaby Clark) ▪ Commencement of group coursework under supervision. A113 & Barnaby Clark available until 17:00
17th April Lecture 6 Afternoon Session	▪ **Guest lecture**: *Advanced Classification Methodologies and Recent Trends in Image Classification* (Markus Törmä, Helsinki University of Technology) ▪ Group work 5 minute status report & outline plan for work, plus use of A113 & Barnaby Clark until 17:00
24th April Afternoon Session	▪ NO morning session ▪ A113 & Barnaby Clark available 13-17:00 for course work supervision
1st May	▪ Vappu – official holiday!
8th May	▪ 1 hr. Group Work Presentations; max 6 sessions 10-12; 13-17