



**PEATWISE**

# INVENTORY OF EXISTING CURRICULA

2003



## **INVENTORY OF EXISTING CURRICULA**

### **1 University of Leicester: Review of relevant courses**

Courses are taught at several levels and using a variety of delivery modes:

- Full-time undergraduate;
- Full-time postgraduate;
- Part-time undergraduate;
- Part-time postgraduate;
- Distance learning.

#### **1.1 Full-time undergraduate course**

Examples of full-time undergraduate courses are:

- BSc Biological Sciences;
- BSc Environment & Ecology.

The full-time undergraduate courses are taught over a period of 3 years.

The study load is expressed in credits. The total load of the full-time undergraduate course is 360 credits, i.e. 120 credits at Level 1, 120 credits at Level 2 and 120 credits at Level 3 (incl. 30 or 40 credits from research dissertation). The relation between the credit system used at UNILEI and the European Credit Transfer System (ECTS) is:

#### **Study load criteria at UNILEI**

1 credit = 7.5 hours  
1 ECTS = 28 hours  
1 credit = 0.27 ECTS

Examples of undergraduate modules are:

Year 1: Environment & Society  
Year 1: Diversity of Plants & Animals  
Year 2: Ecology of Populations & Communities  
Year 2: Quaternary Environmental Change  
Year 3: Applied Ecology  
Year 3: Nature Conservation

A 10 credit module requires 75 hrs student study time, i.e. lectures (about 20 hrs) plus practices, etc. Between 50-75% of study time is for private study.

## **1.2 Full-time postgraduate course**

Examples of full-time postgraduate courses are:

- MSc Natural Resource Management;
- MSc Geographical Information Systems;

The full-time postgraduate courses are taught over a 12 month period. The total credits are 180 (at Level 4), i.e. 60 credits (PG Certificate), 120 credits (PG Diploma) plus 60 credits from a research dissertation (MSc)

Examples of postgraduate modules are:

- Research & Communication Skills;
- Water Basin Management;
- Sustainable Management of Biodiversity;
- Management & Project Planning.

A 10 credit module requires 75 hrs student study time, e.g. lectures, practices etc. and private study (50-75%)

## **1.3 Part-time undergraduate courses**

Part-time undergraduate certificate courses are for example:

- Certificate in Practical Ecology & Wildlife Conservation;
- Certificate in Bird Conservation & Field Ornithology.

Total credits are 120 at Level 1, equivalent to first year full-time undergraduate. Post-time undergraduate courses are taught over two years, i.e. in evening lectures/seminars, weekend practical exercises and field visits.

Examples of certificate modules are:

- Principles of Ecology;
- Techniques in Field Ecology;
- Managing Habitats and Species;
- Ecology of Rivers and Lakes.

A 10 credit module is equivalent to an undergraduate module in terms of total study hours.

An example of a part-time undergraduate certificate by Distance Learning is the Certificate in Global Ecology and Wildlife Conservation. This certificate programme was launching in the autumn of 2003. The total credits are 120 (Level 1). The programme is intended to be taught over a 2 year period, but there are options for fast tracking. The modules and course book posted out to students and regular contact is by e-mail, e.g. Study Support Questions and an Internet Blackboard site. The programme includes occasional practical and residential courses.

#### **1.4 Part-time postgraduate courses**

An example of a part-time postgraduate certificate by Distance Learning is the Certificate in the Conservation of Biodiversity. This programme is under development and will be launching in 2004. The total credits are 60 (Level 4) and it is intended to be taught over a 1 year period with options for fast tracking. Like the distance learning part-time undergraduate certificates the modules and course book are posted out to students and there is regular contact by e-mail, e.g. Study Support Questions and via an Internet Blackboard site. The programme includes occasional practical and residential courses.

#### **1.5 Synergy between UNILEI and PeatWise project**

The synergy between the on-going activities at UNILEI and the Peatwise project are:

- Preparation of Distance Learning modules at undergraduate and postgraduate levels based on current full-time and part-time course provision;
- Use of electronic media to facilitate student contact, teaching and discussion (Blackboard), and;
- (Ultimately) Delivery and assessment of courses entirely by electronic means.

## 2. University of Malaysia Sarawak

### 2.1 At UNIMAS

#### Study load criteria at UNIMAS

1 credit  $\approx$  14 contact hours  
1 contact hour requires 2 hours self-study  
→ 1 credit  $\approx$  40 hours

The existing academic programme similar to the proposed programme is the M. Env. Sc. Programme in Land Use and Natural Resource Management (SLUSE). SLUSE is a capacity building academic programme for the promotion of sustainable land use and natural resource management. The SLUSE Programme is a coursework master's programme comprising of 12 months of lectures and 4 months of dissertation works. The focus of the programme is on land use and water resource management. It consists of 13 courses from three modules: Interdisciplinary Module, Experiential Module and Core Module. The courses offered are:

- JSM1 Ecological System: Concept & Issues (3 Credits);
- JSM2 Land Use and Natural Resource Management (3 Credits);
- JSM3 Tropical Forestry and Agricultural System (3 Credits);
- JSM4 Applied Environmental and Resource Economics (2 Credits);
- JSM5 Monitoring Using Earth Observation (Eo) and GIS (4 Credits);
- JSM6 Environmental Management Instruments and Systems (4 Credits);
- JEM1 Interdisciplinary Methodology (4 Credits);
- JEM2 Interdisciplinary Field Work and Report/Project Paper (5 Credits);
- CML1 Ecological Science (3 Credits);
- CML2 Green Management and Technology (3 Credits);
- CML3 Sustainable Soil Resource Management (3 Credits);
- CML4 Water Resource Management (5 Credits);
- CML5 Research Project (Dissertation) (10 Credits).

The SLUSE programme has to date produced 49 graduates from 2 cohorts. The 3<sup>rd</sup> cohort of 24 students is currently finishing their study. A 'selling point' unique to SLUSE is that the 2-week field course component is always conducted jointly with the master student counterparts from SLUSE programme in Denmark.

## 2.2 At Other Local Institutions

Masters degrees in water resources and environment-related programmes are offered by the following institutions:

- UTM Water Resource Engineering; Env. Engineering;
- UKM Environmental Management; Env. and Development;
- UPM Sustainable Land Resource Management, Masters in Env. Science;
- UM Environmental Technology;
- UNIMAS Sustainable Land Use and Natural Resource Management;
- UNITEN Environmental Management;
- UNITEM Integrated Water Resources Management (IWRM, to be launched shortly).

As indicated, none of these existing programmes overlaps with the proposed Programme in terms of specificity to peat ecosystem.

## 2.3 Inventory of Existing Academic Infrastructure and Resources

UNIMAS commitment to the development and implementation of taught and post-graduate programmes has been well sustained since its establishment 10 years ago. The academic programme at UNIMAS is offered by eight faculties, complemented by five research institutes through their research activities.

There are 430 academic Staff of various disciplines at UNIMAS. Among these, the number of academic staff that are directly relevant to the proposed PEATWISE Programme are about 15. They are sourced from five different faculties and one research institute, namely:

- Institute of Biodiversity and Environmental Conservation (IBEC);
- Faculty of Resource Science and Technology (FRST);
- Faculty of Social Sciences (FSS);
- Faculty of Engineering (FE);
- Faculty of Information Technology (FIT);
- Faculty of Economics and Business (FEB).

### *Campus*

The present UNIMAS campus has the necessary infrastructure to cater for about 5500 students. The facilities available in the campus include a library (Centre for Academic Information System, CAIS), science, engineering, medical and language laboratories, and an excellent IT network. The Phase I development of UNIMAS Permanent Campus (currently under construction) is capable of accommodating about 10 000 students.

### *Academic Support Facilities*

The proposed programme is to be hosted by the Faculty of Resource Science and Technology (FRST). The spacious permanent building for FRST is expected to be completed in August 2004, in time for the first intake of PEATWISE students. The new faculty block and the existing and newly acquired facilities include:

- Office and Classroom;
- Teaching Aids (AV equipment, reprographic facilities etc);
- Field Work Support Facilities (Water quality (HACH) kit, hydraulic modelling package, hydro lab surveyor and data logging system, GPS, flow meters, depth finders etc.);
- Research and Laboratory Facilities [soils laboratory, chemistry laboratory, GIS laboratory, water quality laboratory, hydrology lab (at the Engineering Faculty) , museum and herbarium facilities, maps & satellite images, PCs and Arc view licenses;
- IT support Facilities (including LAN).

#### *Academic Information Reference Facilities*

UNIMAS Centre for Academic and Information Services (CAIS) provides a comprehensive infrastructure of computer services to enable access to information and bibliographic collections. Registered students and staff will have access to a wide range of information and reference materials and computing services.

#### *Resource Persons (tentative)*

- Prof Dr Murtedza Mohamed – Centre for Technology Transfer & Consultancy;
- Assoc Prof Dr Lau Seng – Fact of Resource Science & Technology;
- Assoc Prof Dr Dimbab Ngading – Fact of Social Science;
- Prof Salim Said – Fact of Engineering ;
- Assoc. Prof. Dr. Frederik J. Putuhena - Fact. of Engineering;
- Assoc Prof Dr Hamsawi Sani - Fact of Resource Science & Technology;
- Dr Gabriel Tonga Noweg – Fact of Social Science;
- Prof Wan Sulaiman Wan Harun - Fact of Resource Science & Technology;
- Dr Nabil Bessaih – Fact of Engineering;
- Dr Lee Nyanti - Fact of Resource Science & Technology;
- Dr Petrus Bulan - Fact of Resource Science & Technology.

#### *Possible Guest Lecturers*

- Dr Tie Yiu Liong (Agrosol Sdn Bhd, Sarawak);
- James Dawos Mamit (Natural Resource & Environment Board, Sarawak);
- Yogeswaran Mailvaganam (Geological Survey Department - retired);
- Counterparts from Wageningen University.

In Appendix 7 a list of reference materials (tentative) is presented.

### 3 University of Palangka Raya

#### 3.1 Human Resources and Educational Infrastructure

##### *Human Resources*

The number of academic Staff at UNPAR (2003) is 640, consisting of 399 undergraduates, 221 masters and 20 PhD's doctors. 24 Staff members are currently studying for a master or PhD at an Indonesian or foreign university. The Staff members with PhD degree are in the fields: Economics and Agronomy (each 3), Social Science and Environmental Education (each 2) and Resource Economics, Anthropology, Chemistry, Forestry, Plant Breeding, Fishery/limnology, Soil Science and Biology (each 1).

##### *Infrastructure*

The main campus of UNPAR covers 89 hectare and has 278 hectares for expansion located near to the main campus. At the main campus the central office (Rectorate), faculty office, classroom buildings, research centre office, community service office, central library, laboratories, experimental field, sport centre, university hall, guess house etc. are located. Outside of the main campus, UNPAR has 5000 hectares of Educational Forest located 68 km north of Palangka Raya with facilitates such as building for teaching and fieldwork activity.

The infrastructures includes:

<b>Building</b>	<b>Building Area (m<sup>2</sup>)</b>	<b>Remarks</b>
Classroom	13.130	24 buildings
Central Office (2 floors)	2.000	
Faculty Office	3.200	4 faculties
Research Centre	400	
Community Service	200	
Central Library (2 floors)	1.200	
Laboratory	3.635	11 buildings
Experimental house	300	Field/screen
Educational Forest	450	
Guess House	170	
Sport Facility	3.000	

Laboratory and Supporting Facilities includes:

<b>Faculty</b>	<b>Laboratory/Unit</b>
Agriculture	Agronomy Lab. Computer Centre (6 unit PC Intel P4) Plant Protection Forest Product Technology Fishery/Limnology

	Analytical Chemistry/Soil-Plant Analysis Field Lab for Peat (5 ha) Screen house Fish Pond Computer Unit (2 unit PC Intel P4)
Economic	Computer Centre (22 units PC P4)
Engineering	Soil Mechanics Concrete Architecture Studio IT Unit (40 units C Intel P4 with Internet facility)
Teacher Training & Education	Mathematic and Natural Science Lab. Physic Lab. (3 unit PC Intel P4) Chemistry Lab. (2 unit PC Intel P4) Educational Studio Basic Laboratory (Biology, Chemistry, Physic)
University	Computer Centre (12 units PC Intel P3) Centre for International Co-operation in Management of Tropical Peatlands (CIMTROP) Language Centre
Others	15 units PC Intel P4 8 units LCD Projector-distributed in several units 32 unit Overhead Projector-distributed in several units

### 3.2 Existing Curriculum

#### *Credit System*

The credit system applied at the University of Palangka Raya follows the national credit system of Indonesia called “Semester Credit System-SCS” (*Sistem Kredit Semester*). One SCS means that the module is to be taught for 50 minutes and applied in the classroom meeting, while or provide 60 minutes can be added for a practical work course (field or laboratory work) for 60 minutes. In addition to the classroom meeting or practical work, the students should spend 60 additional minutes for self study per lecture within the period of one-week. For examples, module A, 2 SCS (2-0) means that it has 100 minutes classroom (2 x 50) without practical time, while module B, 3 SCS (2-2), is given in 100 minutes classroom (2 x 50) and 120 minutes of practical work (2 x 60). In one semester, each module is equivalent to about 16 classroom meetings.

For undergraduates, the range of SCS that can be taken is between 18 and 24 SCS, and the student should spend their time between 33 hours (=18 x [50+60] minutes) and 68 hours (=24 x [50+60+60] minutes) per weeks or between 528 and 1088 hours per semester.

### *Undergraduate programme*

For the undergraduate programme at UNPAR, several modules are taught at the Department of Fisheries, the Department of Forestry, and the Department of Agronomy, and the Faculty of Agriculture. The modules are:

1. Introduction to GIS (Forestry-optional), 2 SCS (2-0):
  - a. Definition and principle of GIS;
  - b. Background and importance of GIS;
  - c. Data source: data collection and compilation, remote sensed data processing, processing and digitising of secondary data;
  - d. Data management: input process, data processing, data manipulation and analysis, output process, Digital Elevation Model-modelling based;
  - e. GIS application in forestry and land use: Model design for Forest land use functions, Forest damaged evaluation and monitoring, Forest inventory.
  
2. Peatland Management (Agronomy), 3 SCS (2-2):
  - a. Definition of Peatland;
  - b. Formation, classification and distribution;
  - c. Chemical and physical characteristics, fertility;
  - d. Utilisation of peat soil: agriculture and non-agriculture;
  - e. Peatland management in Indonesia: coastal and inland peat;
  - f. Peatland management: factor that should be considered;
  
3. Hydrology for Agriculture (Agronomy, for Soil science specialist), 3 SCS (2-2):
  - a. Rainfall: measurement, data analysis;
  - b. Infiltration: definition and importance; measurement; methods to increase infiltration;
  - c. Run off;
  - d. River flow: measurement of discharge and data analysis;
  - e. Groundwater;
  - f. Evaporation and transpiration; factor affecting evapotranspiration, measurement;
  - g. Drainage and irrigation: definition and scope, irrigation and drainage methods, water quality, efficiency of irrigation.
  
4. Forest ecology (Forestry), 3 SCS (2-2):
  - a. Definition and scope of ecology;
  - b. Forest ecosystem as a trees community;
  - c. Forest vegetation classification;
  - d. Relation between trees communities and environments;
  - e. Forest types in Indonesia;
  - f. Tree species selecting for forest estate.
  
5. Aquatic ecology (Fisheries), 3 SCS (2-2):
  - a. Definition and principle of aquatic ecosystem;
  - b. Carrying capacity and constraints;
  - c. Biogeochemical cycle and energy flow;
  - d. Adaptation, acclimatisation, bioritmic, phenology, territoriality, migration, concept of bio-saline and eutrophycation;
  - e. Determinant factor on population changes, community and succession process;

- f. Species diversity and ecological behaviour of aquatic resources relates to fisheries activity.

Note: There is not always consistency in the lecturing of these topics. Especially at the Faculty of Agriculture there is no fixed staff to lecture these subjects. As a result, the contents of the lectures and practical work may vary from year to year. Equipment constraints contribute to this situation.

#### *Master programme*

For the master programmes, as part of the collaboration with other Indonesian universities, there is no curriculum available that already contains the subjects identified in the Peatwise project. However several modules, including their syllabi, are available at other universities in Indonesia, i.e.:

- *Ecology* (IPB): Definition and scope of ecology, principle and concepts of ecosystem, energy in ecosystem, biogeochemical cycle, limiting factors and organisation at community level and population, system ecology: system approach and mathematical model in ecology, habitat approach: freshwater, marine and terrestrial, Natural resources, Pollution and environmental health, Remote sensing as a tool for ecosystems management, Applied ecology.
- *Resources Economics* (IPB): Natural resources allocation, population growth, dynamics of social and community changes and the scarcity of resources, Decision on utilisation of natural resources, The use and interpretation of economics on resources allocation for community prosperity, Analysis of natural resources allocation on spatial and temporal, Property rights that affect efficiency and sustainable use of natural resources.
- *Remote sensing and GIS* (IPB): Basic concept of remote sensing: theory of electromagnetic spectrum (EMS), interaction between EMS and object, type of satellite and sensor, remote sensing for spatial management/allocation, remote sensing for assessment of natural resources, remote sensing for detection of environment, basic concept of GIS, GIS for planning and implementation of development.
- *Peat Soil* (IPB): Process of formation; Classification; Distribution, Chemical and Physical characteristics, Productivity. Utilisation of peat soil for agriculture and non-agriculture. Peatland management in Indonesia.
- *Water resources and hydrology* (UGM): Water resources, planning for water use, traditional and national law on control of water use and distribution, protection of water pollution.
- *Design of water resources system* (IPB): Type of water resources, analysis of water sources characteristics, Exploitation and processing technique of water resources based on conservation and economic principle.

## 4 Wageningen University and Research Centre

### 4.1. Introduction

At the WUR, there are currently (2003) 16 BSc programmes, of which 3 have a direct relevance for the Peatwise project, being Soil, Water and Atmosphere, International Land and Water Management and Environmental Sciences. Next, there are 27 MSc programmes, of which 5 have a strong relevance for the Peatwise project, being Environmental Sciences, Geo-Information Science, Hydrology and Water Quality, International Land and Water Management and Soil Science. The lectures of these programmes are taught in English.

In addition to the regular study programmes, the students have the option of putting together a flexible Master study programme. The flexible programme is not part of a single study programme. The magnitude of such a programme must - like a regular Master programme - be at least 84 credits.

The MSc programmes have a free choice portion. Subjects may be included from other Dutch universities and schools of higher professional education or from institutions abroad. Certain limitations and extra rules apply to these situations.

### 4.2. Study Load and Credits

The nominal study load is expressed in credits. One credit represents the study load norm of 40 hours study (including lectures, practical work and self-study). In the European context, there is a point system for the academic recognition of study programmes: the European Credit Transfer System (ECTS). The conversion factor of credits to ECTS-credits is 1.43 (rounded off to half credits).

The study load per academic year is 42 credits.

The study load of an MSc programme is 84 credits/120 ECTS credits. It is thus assumed that a student requires 2 years of 42 weeks per year with 40 hours of study per week to complete the MSc programme.

#### **Study load criteria at WUR**

1 credit = 40 hours  
1 ECTS = 28 hours  
1 year = 42 weeks = 42 credits = 60 ECTS

### 4.3. Study Planning

An academic year is divided into 5 periods:

- Periods 1, 2, 3 and 4: each 8 weeks (study load of 8 credits);
- Period 5: 10 weeks (study load of 10 credits).

The courses offered in periods 1 to 4 have a magnitude of 4 or 8 credits, with the exception of skill subjects. The magnitude of the various parts of the programme in period 5 can differ from 1 to 10 credits.

In principle, the various parts of the programme are scheduled in such a way that they can be taught and tested within a single period.

For each part of the programme, there are three opportunities each year to take an interim examination.

No courses are taught during the holiday periods.

The planning of individual education forms (such as theses and internships) and education that does not lend itself to scheduling (such as distance learning, brush-up courses, summer courses etc), takes place by means of individual agreements between students and instructors, wherever possible in mutual consultation.

### 4.4. MSc Programmes

#### *Set-up of MSc*

An MSc study at WUR is constructed of the following curriculum 'building blocks':

- Internship: 16 - 20 credits;
- Thesis: 20 - 26 credits;
- Prerequisites: A maximum of 8 credits for each part of the study programme for which prerequisite knowledge is required;
- Academic Master Cluster: 8 - 10 credits.

The thesis and the internship together amount to a maximum of 42 credits (students can choose to expand this in individual cases).

#### *Academic Master Cluster*

In the Academic Master Cluster (8-10 credits), general academic skills and academic research and/or design skills at a high level are applied to a scientific area that is relevant to the Master study programme, possibly in the form of external research or design work. The educational aims, to the extent that they concern academic skills, are established at the university level for the Academic Master Cluster. The Cluster is comprised of a compact block of subjects or a number of related subjects taken in different time periods. The specific content of the Academic Master Cluster is determined in consultation with the student's supervisor.