

# Geoinformatics (GFM.4)

at UCLAS, Dar es Salaam, Tanzania



The task of managing land use and the earth's resources is gaining increasing importance due to the rising world population and economic growth. To keep pace with demand, planners and resource managers make considerable use of computerised Geographical Information Systems (GIS). GIS users such as planners, resource managers and scientists depend on the availability of well-structured data. Satellite images are often used as data sources, along with conventional techniques that use aerial photographs. Technical means and systems are needed to extract and manipulate data from sources so as to produce maps and other output.

To achieve this, it is essential that an organisation be staffed by capable personnel at all levels. This course is intended to train staff in rapidly changing map and geo-information production environments.

## Target group

The course is intended for staff (i.e. at national and regional agencies, local authorities) that is responsible for the implementation of production tasks and for the supervision of the production of spatial information (both in paper and in digital form).

## Course objective

The aim of the course is to provide participants with the theoretical education and practical training needed to contribute to the production of maps and geo-information, and also with in-depth knowledge of one specific aspect of the production process.

## Course content and structure

Preparatory modules during the first two weeks ensure that all participants are at the required level in mathematics and computer use. The course is then composed of a series of core modules and specialisation modules.

After completion of the core modules, specialisation modules in three directions are offered. Each lasts 16 weeks and enables participants to acquire skills specific to their primary professional tasks in their home organisations. All specialisations lay considerable emphasis on understanding the basic principles of geo-information production techniques, and provide the opportunity for hands-on experience with leading commercial software packages.

### Core modules

The core modules deal with mapping and geo-information production; the principles of capturing, handling and presenting geodata; and the integration and maintenance of geodata. Emphasis is on the use of aerial photographs and satellite images, and considerable attention is given to the geometric aspects, cartographic visualisation and website design. These modules are designed to ensure that participants gain an insight into the multidisciplinary structure of a modern production environment, and an appreciation of their own particular role within this environment.

An important theme running through the course is "the integration of skills". After the specialisation period, participants of all three specialisations are actively encouraged to interact and cooperate with partners from allied disciplines in order to achieve "group goals". Such activities are designed to stimulate a broader appreciation of the total production process. This part of the course lasts five weeks and includes study excursions to appropriate organisations in Tanzania and neighbouring countries.

The final part of the course is devoted to a six-week individual production-oriented project, and participants are encouraged to use data from their home organisations.

### Specialisation modules

Specialisation modules are offered in three directions, namely: Digital Photogrammetry (will be offered only if the number of applicants is sufficient) and Remote Sensing, GIS Operation, and Cartography and Geo-Information Visualisation.

#### Digital photogrammetry and remote sensing

Using aerial photographs and satellite images, this specialisation provides participants with the theoretical education and practical training needed to apply image-processing techniques for geo-information production. Advances in airborne and spaceborne sensor systems, satellite positioning, digital photogrammetry, computer vision and Internet services have led to new integrated data capture techniques. Digital photogrammetric workstations are the standard instruments for the photogrammetry exercises and there is also a digital image-processing laboratory, equipped with software packages for processing remotely sensed data. Data collection methods using GPS (global positioning system).

#### GIS operation

This specialisation provides participants with the theoretical education and practical training needed to build and manage spatial databases and perform spatial analysis using

database management systems (DBMS) and GIS tools. GIS tools provide specialised functions for spatial data input, processing, analysis and output, while DBMS tools provide more advanced functions for storing and managing large spatial databases. Participants learn the necessary skills to integrate the two sets of tools for purposes of spatial database management and spatial data analysis.

Although DBMS and GIS tools provide powerful functions for spatial database management and spatial data analysis, a GIS specialist still needs to acquire basic programming skills in order to customise the GIS interface and develop functions not yet available.

### Cartography and geo-visualisation

This specialisation provides participants with the theoretical education and practical training needed to contribute to the cartographic visualisation of geo-information by means of screen displays or hard copies. The individual modules deal with cartographic design, production technology, topographic mapping, thematic, web cartography and cartographic project.

### Admission requirements

Applicants for the Diploma course should have completed their secondary education in a discipline related to the course specialisation and have at least three years' relevant practical experience. As all practicals are digitally oriented, experience with MS Windows is also a prerequisite.

As the course is given in English, proficiency in the English language is a prerequisite. Those who have English as a mother tongue, or were taught in the English language up to university level are exempted from an English language test. The minimum requirements are as follows: TOEFL Paper-based test 500, TOEFL Computer-based test 173, British council/IELTS 5.5, Michigan 75, Cambridge CPE/CAE. Only internationally recognised test results are accepted.

### The Institutes

#### UCLAS

The University College of Lands and Architectural Studies (UCLAS) is offering courses in building economics, urban and rural planning, geomatics, land management and valuation, environmental engineering and architecture.

#### ITC

The International Institute for Geo-Information Science and Earth Observation (ITC) is the largest institute for interna-

tional higher education in the Netherlands. It runs training programs in the development and application of geo-information science and earth observation.

Based on mutual interest between UCLAS and ITC a joint diploma course on Geoinformatics (GFM4) was launched in September 2004. The course is run at UCLAS campus in Dar es Salaam, Tanzania. The course deals with the technology that supports the processes of acquisition, analysis and visualization of spatial data.

### Financial matters

	Local participants	International participants
Tuition fee	4,000	5,000
Accommodation and living costs	300 per month	500 per month
Book allowance, and stationary	300	300
Student Union	20	20

Prices are in US\$ and are subject to change

### Assessment and certification

Diplomas are awarded to participants who have fulfilled the conditions and passed the examinations required in accordance with the official Diploma assessment rules of the Institutes. These documents are accompanied by course records that list the results for the specific subjects.

**Course duration** Nine (9) Months

**Starting date** 21 August 2006

### More information

For detailed information please visit:

[www.uclas.ac.tz](http://www.uclas.ac.tz)

or

[www.itc.nl/itc\\_worldwide/educationpartners.aspx](http://www.itc.nl/itc_worldwide/educationpartners.aspx)

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University College of Lands and Architectural Studies



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