EGS 2310	GIS Spatial Analysis
EGS 2311	Digital image Analysis I
YEAR TOTAL	16
EGE 2313	Practical Attachment II (external) (12 weeks)

FOURTH YEAR

UNIT CODE	UNIT TITLE
EGS 2401	Geographic Information Systems Applications
EGS 2402	Environmental Impact Assessment and Environmental Audit
EGS 2403	Remote Sensing Applications
EGS 2404	Project (3 Units)
BCM 2436	Research Methodology
BCM 2437	Project Management
	Electives (Choose One Unit)
EGS 2405	Geostatistics
EGS 2406	Navigation Systems and Applications
EGS 2407	Environmental Resource management
Semester II	(Core Units)
BCM 2441	Land Economics and Management
BCM 2438	Entrepreneurship Skills
EGS 2408	Digital Elevation Modelling
EGS 2409	Satellite Positioning and Mobile GIS
EGS 2410	Geospatial Data Infrastructure
EGS 2411	Land Information Systems
	Electives (Choose One unit)
EGS 2412	Crime Mapping and Analysis
EGS 2413	GIS Demographic Analysis and Applications
EGS 2414	Digital image analysis II
YEAR TOTAL	16
GRAND TOTAL	**64**

Career Opportunities

Graduates of the B.Sc Geospatial Information Science Programme can find rewarding careers in the following fields among others:

- GIS development
- Real estate
- Public health
- Crime mapping and analysis
- National defence
- Sustainable development
- Natural resource planning and management
- Landscape architecture
- Archaeology
- Regional and community planning
- Transportation and logistics
- Location-based services and navigation
- Facilities and Utilities management

Applications of Geospatial information Science includes but not limited to the following:

- Sustainable environmental and natural resources management.
- Measurement and determination of orbits of artificial satellites.
- Measurement and determination of the dynamics of the earth's crust
- Determination and analysis of the earth's gravity field
- Precise positioning on, or near, the earth's surface using both terrestrial and satellite technology techniques
- Measurement and mapping of topography –topographic mapping.
- Resource mapping including mapping of the natural environment, land and marine resource using satellite remote sensing and GIS to allow planned and efficient exploitation, management.
- Navigation and guidance of craft using satellite and inertial navigation systems technology.
- Vehicle tracking and in intelligent transport systems its using satellite positioning techniques.
- Facilities and utilities management
- Precision alignment, setting up, and control of machinery with manufacturing and construction industry.
- Application of geometric and geospatial techniques in biomedical imaging and analysis.
- Surveys for design setting out and monitoring of deformations on large scale engineering projects.
- Design and development of software and database for geo-physical analysis including three-dimensional visualization of physical and built environment.
- Virtual reality modeling in such areas e-commerce, tourism, marketing, and property management.
- Web mapping and creation of dynamic, interactive, maps for use on the internet.

For more information contact:
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JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY

DEPARTMENT OF GEOMATIC ENGINEERING AND GEOSPATIAL INFORMATION SYSTEMS (GEGIS)

PREAMBLE

The core function of the department is to offer sound training and research in spatial information disciplines of geospatial engineering and geospatial information systems (GIS) through establishment of relevant programmes and short courses that address contemporary technological development needs in a rapidly evolving environment.

Over 80% of all information/data handled today is position/location based or associated. It thus includes a spatial component that is fundamental to its usefulness. Efficient management and utilization of spatial information is central to coherent and sustainable spatial physical development, efficient planned exploitation and management of natural resources and preservatives of a healthy environment. Spatial information acquisition, management, processing, analyzing and its efficient application is the core activity of geospatial engineering and GIS.

PROGRAMMES

Bachelor of science in Geomatic engineering and geospatial information systems (5 Years)
Bachelor of science in Geospatial Information Science (4 Years)
Master of Science in GIS and Remote Sensing (2 Years)
Master of Science in Environmental Information Systems.(2 Years)
Doctor of philosophy in Geoinformatics (3 Years)
Short courses in Geoinformation technologies including GIS and remote sensing (Tailor-Made)

Bachelor of Science in Geospatial Information Science

Introduction

Geospatial information science (GIS) brings together the disciplines of computing, surveying, mapping, cartography and visualisation, environmental science and statistics for the collection, analysis and modelling of spatially based or associated information. GIS is a rapidly developing discipline, and is applied in order to address problems and offer optimal solutions in an increasing range of applications where spatial, location / position based information is important.The programme places emphasis on modern techniques of geodesy, digital mapping, Remote Sensing, cartography, Geo-information, Satellite Positioning such as Global Positioning System (GPS) but also offers adequate foundation on traditional geoinformation data acquisition and processing techniques.

To prepare for Geospatial Information Science careers, many students perform internships with government agencies or private firms as part of their academic program. Students in the fourth year also carry out a supervised individual project and submit a written report. The advanced topics, project and research methodology may serve as an introduction to research skills that may be useful for postgraduate studies and research or specialised work in the discipline.

Scope of the Programme

Geospatial Information Science comprises essentially of the following and related activities or functions which may be performed on, above or below the surface of the Earth (land or water bodies):

- The determination of the size and shape of the earth and its gravity field and the measurement of all data needed to define the position, size, shape and topography contours of any part of the earth's surface.
- The position of the objects in space and the positioning and the monitoring of physical features, structures and engineering works,on,above or below the surface of the earth.
- The determination of boundaries of public or private land including national and international boundaries, and the registration of those lands with appropriate authorities.
- The design establishment and administration of geographic information systems GIS including land information systems and the collection, storage, processing, analyzing and management of data within those database systems.

Programme objectives

Include training a professional who :

- Has adequate theoretical knowledge about how to develop a geographic information system.
- Has advanced knowledge of GIS methodologies and applications.
- Has extensive training and experience in critical thinking, including solving spatial problems and presenting the results in different forms
- Has adequate knowledge about the use of GIS in diverse fields as a decision support system.
- Is well versed in some advanced topics and basic research skills to allow postgraduate studies and research in geospatial information science technologies.

ENTRANCE REQUIREMENTS

1. The University and Faculty of Engineering common regulations shall apply
2. The following shall be eligible for consideration for admission into the degree Programme:

I. Kenya certificate of secondary education (KCSE) applicants should satisfy all the requirements below:

(i) A candidate must have a mean aggregate of atleast grade C+ (PLUS)

(ii) The mean grade for the total score in the four cluster subjects must be at least C + (PLUS).

(iii) In the individual cluster subjects, a candidate must have atleast the scores given below ;

Alternative A		**Alternative B.**	
Mathematics	C+	Mathematic	C+
Physics	C+	Physical Science	B
Chemistry	C+	Biological Sciences	C+
Geography or Biology, or	C+	Geography or any	C+
Any Group IV Subjects.		Group IV Subjects	

II. Kenya Advanced certificate of Education (KACE) or the A– level equivalent should satisfy all the requirements below:

(i) Atleast two principal passes in Mathematics and Physics and

(ii) Atleast a total score of nine (9) points at the KACE or equivalent;

(iii) Atleast accredit pass in Chemistry at the KCE or its equivalent.

III. Diploma applicants:

A candidate must be a holder of JKUAT diploma in Engineering with atleast a credit pass in the relevant discipline.

IV. A holder of other qualifications recognized by the Senate as equivalent to I,II and III above.

* Entry point for Diploma holders with a pass is 1st year,credit pass is at 2nd year while that for higher diploma is at 3rd year.

COURSE OUTLINE

FIRST YEAR

UNIT CODE	UNIT TITLE
BCM 2101	Communication Skills
SMA 2170	Algebra
SMA 2171	Geometry
SMA 2172	Calculus I
SPH 2170	Physics I
SCH 2109	Chemistry I
CIT 2108	Introduction to Computer Science
EGS 2101	Geophysical Environment
BCM 2113	Development Studies
SMA 2173	Calculus II
SPH 2171	Physics II
SCH 2108	Chemistry II
CIT 2109	Computer Programming I
EGS 2102	Surveying I
EGS 2103	Engineering Drawing
EGS 2104	Introduction to Geospatial Science
SZL 2111	HIV/ AIDS
YEAR TOTAL	17

SECOND YEAR

UNIT CODE	UNIT TITLE
BCM 2214	General Economics
SMA 2270	Calculus III
CIT 2210	Computer Programming II
EGS 2201	Geodesy I
EGS 2202	Surveying II
EGS 2203	Photogrammetry I
EGS 2204	Geographic Information Systems I
EGS 2205	Cartography and Visualization I
CIT 2211	Introduction to Computer Graphics
SMA 2271	Statistics
BCM 2335	Principles of Management
EGS 2206	Geographic Data Projections
EGS 2207	Geographic Information Systems II
EGS 2208	Remote Sensing I
EGS 2209	Cartography and Visualization II
EGS 2210	Environmental Engineering
YEAR TOTAL	16
EGS 2213	Practical Attachment I (Internal) (8 Weeks)

THIRD YEAR

UNIT CODE	UNIT TITLE
SMA 2370	Calculus IV
SMA 2373	Numerical Methods
BCM 2334	Principles of Kenyan Law
EGS 2301	Remote Sensing II
EGS 2302	GIS Programming
EGS 2303	Engineering Surveying I
EGS 2304	Microwave Remote Sensing
EGS 2305	Water Resources and Management
BCM 2439	Real Property Law
EGS 2306	Web Mapping
EGS 2307	Transportation Planning
EGS 2308	Digital Mapping
EGS 2309	GIS Database Systems
EGS 2312	Urban and Regional Planning