

INSTITUT SUPERIEUR DE TECHNOLOGIES

Sarl au capital de 10 000 000

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Diplômes reconnus par le CAMES

Vingt (20) ans au service de la formation des ressources humaines

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BACHELOR OF ENGINEERING IN GEOTECHNICAL ENGINEERING

1. TITLE OF PROGRAMME

The programme shall be Bachelor of Engineering in Geotechnical Engineering **B.Eng. (BGE)**

2 PREAMBLE

2.1 Background

The recent concerns for energy and the environment have led to increased activity in the field of Geotechnical Engineering. The practice of Geotechnical Engineering requires a knowledge of geology, soil and rock mechanics, and experience. Geotechnical Engineering at IST BURKINAFASO focuses on soil mechanics, which concerns the engineering behavior of soil and its application to the design and performance of earth and earth-supported structures. These studies involve the measurement of stress-strain, strength and permeability properties of soil and the development of theories based on these measured properties to predict the response of structures to static and dynamic loading. Environmental Geotechnics emphasizes the geotechnical and environmental aspects of contaminant management, by considering the characteristics of contaminants and the problems encountered in designing and constructing facilities to manage or contain them. Although geotechnical engineers involved in waste management issues must be increasingly aware of the inter-disciplinary nature of their undertakings, an understanding of soil behaviour, waste characteristics and contaminant-soil interaction is a basic building block for more specialized studies.

Geotechnical engineers apply scientific principles and engineering methods for developing civil engineering infrastructure on the surface and within the ground including prediction, mitigation and prevention of geological hazards. The major in geotechnical engineering is unique in Burkinafaso and designed to meet the demands of mining companies, geotechnical consultations and construction managers, who look for graduates with a qualification in geotechnical engineering. The courses offered as part of this major will extend fundamental knowledge of the geotechnics of soils and rock to explore more complex processes, such as those associated with tunnels, mining operations, dams, roads, underground structures and waste management facilities.

2.2 Justification

Combined with our graduate program, students will be equipped with the background knowledge and training to analyze, design, and construct structures, and to provide solutions to problems in geotechnical engineering and environmental geotechnics.

2.3 Target Group

The targeted group includes holders of:

Advanced Level Certificate of Education;

Diplomas in Engineering and other related Science and Technology fields;

Degrees in the Physical Sciences.

3. Programme Objectives

3.1. General Objectives

Graduate study in geotechnical engineering at IST BURKINAFASO emphasizes the integration of the principles of soil mechanics and the art of foundation and earth structure engineering. Theory is prominent, but it is constantly and critically re-evaluated with respect to its limitations and applicability to the practice of good geotechnical engineering

3.2. Specific Objectives

The geotechnical engineering program provides background knowledge and training to prepare students to analyze, design, and construct structures, and to provide solutions to problems in geotechnical engineering and environmental geotechnics. The subjects include engineering behavior of soil and rock, geomechanics, foundations, earth support structures, dams, tunnels, slope stability, geotechnical earthquake engineering and soil dynamics, site improvement, geosynthetics, groundwater, pollutant transport, chemical behavior of soil, and waste disposal facilities. Laboratory experiments and computer analyses/modeling are incorporated.

Duration of the Programme: 4 years and one Year for advanced Diploma student

Programme Structure

Courses codes	Courses Names	Credit Units
	Year one	
	Semester one	
BBA111	Introduction to research science	4
BSC119	Communication skills	4
BGE110	Engineering mathematics	4
BGE112	Physics (theories and lab)	4
BGE102	Earthquake resistant building	4
BGE100	Working drawing	5
BGE113	Geosciences	5
	Semester Two	
BGE114	Geographic Information Systems	4
BGE210	Introduction to Exploration Geophysics	4

BGE211	Ethics and professional engineering	4
BGE221	coastal engineering	3
BGE222	Computer application	5
BGE224	Structural Dynamics and Earthquake Engineering	5
BGE223	Field work	5
		60
	Year Two	
	Semester one	
BGE225	Computer aided design I and II	4
BGE229	Engineering drawing	4
BGE226	Materials and methods of building construction	4
BGE227	Advanced Materials Technology	4
BGE228	Time Series Data Analysis for Geophysical Applications	4
BGE200	Retaining Structures and Slopes	5
BGE201	Engineering Behavior of Soils	5
		30
	Semester Two	
BGE202	Numerical Methods in Geotechnical Engineering	4
BGE203	Pavement Engineering	4
BGE204	Geotechnical Engineering of Dams	4
BGE222	Slope Instability	4
BGE221	Advanced Foundation Engineering	4
BGE231	Geotechnical Models and Site Investigation	5
BCEE232	Structural Stability	5
		60
	Year Three	
	Semester One	
BBA312	Steel and Composite Structures	3
BGE313	Computational Structural Mechanics	3
BGE314	Deformation Monitoring Surveys	4
BGE315	Ground Improvement & Monitoring Techniques	4
BGE327	Geomechanics	4
BGE326	Structural Dynamics	4
BGE320	Rock & Slope Engineering	4
BGE321	Transportation Applications of Geophysics	4
	Semester Two	
BGE322	Surface Waves (MASW) and Ground Penetrating Radar (GPR)	5
BGE323	Ground Retaining Structures	5
BGE410	Surveying	5
BGE329	Geotechnical Analysis	5
BGE327	Surface Waves (MASW) and Ground Penetrating Radar (GPR)	5

BGE330	Ground Retaining Structures	5
		60
	Year Four	
	Semester One	
BGE330	Ground Retaining Structures	5
BGE429	Engineering Geology and Geotechnics	5
BGE417	Statics and Mechanics of Geological Materials	5
BGE411	Soil Science	5
BGE419	Environment Geological Engineering	5
BGE412	Hydrology and Hydraulics Design	5
	Semester Two	
BGE421	Urban Geospatial Analysis	3
BGE422	GIS & Remote Sensing	3
BBE427	Internship	4
BBE428	Thesis and Defense	20
		60
GCU		180