



**CENTRE FOR GEOTECHNICAL & COASTAL ENGINEERING RESEARCH (CGCER)**  
**UNIVERSITY OF PORT HARCOURT**



**Post Graduate Diploma (PGD) Programme (Revised)**

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## **1. Introduction**

The Center for Geotechnical and Coastal Engineering Research, University of Port Harcourt proposes to run the Post Graduate Diploma (PGD) in Geotechnical & Coastal Engineering Programme as part of its mandate on “Human Capital Development through Research in the Geotechnical and Coastal Environment”.

## **2. Philosophy**

The Philosophy of the PGD Programme of the Center is to sustain the culture of turning In Engineering Graduates that would bridge the gap between the University and the Industry in the areas of Geotechnical and Coastal Engineering through Innovative Research and Development.

## **3 Vision**

To produce hands on ready industry and educationally driven Graduates whose knowledge would be very relevant in solving industry-based problems through innovative research breakthroughs in the Geotechnical and Coastal Environment.

## **4 Mission**

To bridge the educational Gap between Graduate and Undergraduate education. The PGD Programme would also bridge the skills gap between the industry and the class room worlds in the areas of Geotechnical and Coastal Engineering. .

## **5. Justification/Rationale**

Flood, Erosion and Ocean encroachment around Coastal civilizations have made infrastructural development in that domain highly challenging, hence man is forced to thinker ways of living with the Sea environment. Exploring challenging Soils, Marine arid Coastal environment therefore becomes inevitable, both for Geotechnical research and Infrastructural development.

Besides, the harsh Onshore Oil and Gas exploration, exploitation and processing activities deriving from Security threats and militancy in the host Onshore communities has forced International Oil and Gas companies (IOCs) to extend the frontiers of their activities Offshore,

into the deep waters region. This further necessitates advanced research activities into the Coastal environment.

## **6. Aim & Objectives**

### **Aim**

The Post Graduate Diploma (PGD) in Geotechnical & Coastal Engineering programme is aimed at preparing and training interested students to the requisite level of advanced studies, hence, bridging the gap between the undergraduate and the post graduate levels of studies.

### **Objectives**

To achieve the aim of the Post Graduate Diploma Programme in Geotechnical & Coastal Engineering, the following under listed objectives will be pursued:

1. Sourcing of highly qualified resource persons from both the academic and industrial worlds to deliver knowledge filled and experienced based lectures.
2. Organization of conferences, seminars and workshops in the relevant areas of interest.

## **7. Course Delivery**

ALL lectures for every Programme shall be administered / delivered on modular basis from 08.00am to 04.00pm (with One Hour (12.00b01.00) break) from Mondays to Fridays. That is, 40 hours lecture per week per Course which is approximately equal to 14 weeks Semester of Academic work for a 3 Credit Units (2- Hours lecture plus Hour Practical or Tutorial per week) Course. Examination for a Course is taken after the Lectures on Saturdays, while the Continuous Assessment is done within the lecture periods as Practical reports, Test, Group Discussions, Field Trips reports and Assignments.

## **8. Examination Regulations & Scoring / Grading System**

To qualify for sitting for a final Examination in a Course student is expected to have 75% lectures attendance of All Lectures in that Course. The overall Examination score in a Course shall be 100% which shall be comprised of:

Examination - 70%

Continuous Assessment- 30%

Every student is expected to score a minimum of 50% in the overall evaluation for a Course in order to PASS, otherwise he or she shall be deemed to have failed the Course. In which

case, the student is allowed a second final chance to retake a Supplementary Examination in the Course which cannot be scored above a C-Grade. The Examination Grading shall be:

<b>Score( %)</b>	<b>Grade</b>	<b>Grade Point</b>
70-100	A	5.00
60-69	B	4.00
50-59	C	3.00
0-49	F	0.00

## **9. Programme Structure**

1. The full-time option is for a minimum of 12 calendar months and a maximum of 24 calendar months
2. The part-time option is for a minimum of 24 calendar months and maximum of 36 calendar months.

## **10. Career Opportunities**

The main aim of the programmes of the Center is to produce a hands-on, Industry-ready Geotechnical Engineers and Coastal Engineers with a wide-range of Job Opportunities in Marine & Coastal Environment, Shorn Protection, Artificial Intelligence, Dams, Port & Harbour, Geotechnical Services, Ocean Survey, Construction, Consultancy, Coastal Infrastructure Research & Development.

## **11. Programme Requirement and Criteria for the Award of the PGD Certificate**

To realize the above objectives and qualify for the award of the Post Graduate Diploma, the student must take and pass all the prescribed courses in the chosen area of study, participate in any required field study, present research seminars and produce a supervised thesis on an approved research topic relevant to the aim and purpose of the Center establishment . . . . .

## **12. Entry /Admission Requirements**

To be admitted into the PGD in Geotechnical & Coastal Engineering programme a candidate must have graduated with at least a Third Class Degree in Civil, Mechanical, Marine Engineering or other related Engineering Discipline from any NUC Accredited University.

## **13. Course Listings**

The course listing for the Post Graduate Diploma (PGD) programme consists of Compulsory and Electives Courses in Geotechnical & Coastal Engineering.

### **13.1 Course listing for Post Graduate Diploma (PGD) in Geotechnical & Coastal Engineering**

These include:

S/Nos	Course Code	Course Title	Credit Units
1	GCE 701	Introduction to Geotechnical Engineering	3
2	GCE 702	Basic Coastal Engineering	3
3	GCE 703	Basic Structural Analysis	3
4	GCE 704	Basic Fluid Mechanics	3
5	GCE 705	Numerical Methods and Mathematical Modelling	3
6	GCE 706	Applied Statistics and Data Analysis	3
7	GCE 707	Engineering Geology	3
8	GCE 708	Engineering Hydrology and Hydrogeology	3
9	GCE 709	Foundation and Geotechnical Engineering Design	3
10	GCE 710	Coastal Engineering Design	3
11	GCE 711	Dynamics and Vibrations of Structures	3
11	GCE 712	Computer Aided Design in Coastal and Geotechnical Engineering	3
12	SGS 702	Management and Entrepreneurship	2
13	GCE 713	Technical Seminar	3
14	GCE 700	Research Project	6
<b>Total</b>			<b>45</b>

### **13.2 PGD Geotechnical & Coastal Engineering Programme Course Details**

#### **GCE 701 - Basic Coastal Engineering (3 Credits).**

Mechanics of wave motion; wave refraction, diffraction and reflection; wave forecasting; shore processes; planning of coastal engineering projects; design of seawalls, breakwaters, beach nourishment and fixed and floating installations; dredging; risk analysis.

#### **GCE 702 – Introduction to Geotechnical Engineering (3 Credits).**

Physical properties of soils, classification systems, soil exploration, permeability, consolidation, compaction, and shear strength; laboratory tests conducted to determine the physical and engineering soil properties needed for application in geotechnical engineering design.

### **GCE 703 - Basic Structural Analysis (3 Credits).**

Introduction to structural analysis; classification of structures; general description of plane frame; joints; supports; stability and determinacy; Basic concepts and assumptions for structural analysis; Equilibrium; Analysis of Statically Determinate Structures. Plane trusses. Beams and Frames (Axial force, shear force and moment diagrams in beams and frames). Deflections, Method of Superposition, principles of virtual displacement; principle of virtual force using energy method in beams, frames and trusses, Influence lines and moving loads, Analysis of statically indeterminate structures; by force method (method of consistent deformation) – frames and trusses, Introduction to stiffness method of analysis; slope deflection method; Moment distribution method, introduction to matrix methods; 1 DOF systems, trusses. Sway in moment distribution; yield line analysis and strip methods for slabs. Plastic methods of structural analysis. Introduction to limit state analysis of reinforced concrete and steel structures.

### **GCE 704 – Basic Fluid Mechanics (3 Credits).**

Fluid properties; statics; kinematics; ideal gas law; conservation of mass; linear momentum and Newton's Second Law; conservation of energy; Bernoulli's equation; control volume analysis, similitude and hydraulic models; homogeneous flow in pipes; fluid drag, boundary layer basics. Fluid measurements; determination of fluid properties; visualization of types of flow; experiments in closed conduit flow turbo machinery tests; open channel and gravity wave demonstrations

### **GCE 705 - Numerical Methods and Mathematical Modelling (3 Credits).**

Application of numerical methods to geotechnical-related engineering problems; development, evaluation and comparison of various techniques for root finding, curve fitting, numerical integration, simultaneous linear algebraic equations, matrix methods; probability and statistics and ordinary differential equations in geotechnical-related engineering applications.

### **GCE 706 - Applied Statistics & Data Analysis (3 Credits).**

An introduction to applied data analysis, designed to enable students to effectively collect data, describe data, and make appropriate inferences from data. Students are expected to communicate effectively about statistical results and to use a statistical software package for data analysis

### **GCE 707 – Engineering Geology (3 Credits).**

Principles of physical and engineering geology; properties of minerals, rocks and soils; active surface and subsurface processes; applications to the siting, design, construction, operation and maintenance of engineered works and the protection of the environment. A three day field trip is required (a field trip fee is charged at registration).

**GCE 708 - Engineering Hydrology & Hydrogeology (3 Credits).**

Occurrence, distribution and properties of natural waters of fee earth; measurement and engineering analysis of hydrologic phenomena including precipitation, stream flow and groundwater, hydrologic design of water resources development and management projects. Geologic conditions determining fee distribution and movement of ground water and their effect on fee hydrologic properties of aquifers.

**GCE 709 - Foundation and Geotechnical Engineering Design (3 Credits).**

A design course covering prediction of settlement, analysis of the stability of slopes, prediction of bearing capacity of shallow and deep foundation and determination of earth pressure acting on retaining structures. A general course in Geotechnical Engineering design for undergraduate and for graduate students not primarily interested in the Geotechnical field but the desiring additional study beyond the introductory undergraduate level.

**GCE 710 - Coastal Engineering Design (3 Credits).**

Loadings and Functions of ocean engineering structures, including sea walls, harbor structures, sea-going vessels, offshore structures and underwater vehicles; analysis of structures including trusses, beams, plates, shells and arches; introduction to stress and failure analysis; introduction to finite element analysis (FEA) including computational mechanics of ocean engineering structures, using FEA.

**GCE 712 - Computer Aided Design in Coastal and Geotechnical Engineering (3 Credits).**

The use of computer aided design packages in Coastal and Geotechnical engineering design – hydraulics, geotechnical engineering, work scheduling.

**SGS 702 - Management and Entrepreneurship (3 Credits).**

Business Environment, General Management, Financial Management, Entrepreneurship Development, Feasibility Studies, Marketing & Managerial Problem Solving.

**GCE 713 – Technical Seminar (3 Credits).**

Responsibilities and obligations of new Geotechnical &. Coastal.. Engineers; professional ethics; membership in professional societies and professional registrations; case studies and lectures presented by staff and practicing engineers.

**GCE 700 – Research Project (6 Credits).**

Every Student will be required to carry out a Research Project related to Geotechnical and/or Coastal Engineering under the close Supervision of a Supervisor. This Research Project will be examined at the end of its completion.

#### 14. Graduation Requirements

To be awarded the PGD degree in Geotechnical & Coastal Engineering, students' must have passed all prescribed courses with a total credit unit of 66 units.

#### 15. List of Participating Lecturers/Instructors

S/Nos	Names	Qualifications	Specialization	Rank
1	Ejezie, S.U.	Ph.D, MSc., BSc., R.Engr (COREN).	Geotechnical Engineering	Professor
2	Nwaogazie, I.L.	Ph.D, MSc., BSc., R.Engr (COREN).	Engineering Modeling	Professor
3	Teme, S.C.	Ph.D, MSc., BSc., (FNMGS).	Geology & Geotechnical Engg	Professor
4	Jimoh, Y.	Ph.D, MSc., BSc., R.Engr (COREN).	Geotechnical Engg	Professor
5	Oguara, T.M.	Ph.D, MSc., BSc., R.Engr (COREN).	Highway Engineering	Professor
6	Johnary, T.	Ph.D, MSc., BSc., R.Engr (COREN).	Engineering Structures	Professor
7	Igwe, E.A.	Ph.D. MTech., B.Tech., R.Engr (COREN)	Highway Engineering	Professor
8	Ossia, O.V.	Ph.D, MTech.,B.Tech., R.Engr (COREN).	Applied Mechanics	Professor
9	Nwofor, T. C.	Ph.D, M.Tech.,B.Tech. R.Engr (COREN).	Engineering Structures	Reader
10	Big-Alabo, A.	Ph.D, MSc., B.Eng., R.Engr (COREN).	Applied Mechanics	Senior Lecturer
11	Douglas, I.E.	Ph.D, MTech., R.Engr (COREN)	Marine Engineering & Turbines	Senior Lecturer
12	Orji, C.U.	Ph.D, MSc., B.Tech., R.Engr (COREN)	Marine Engineering	Senior Lecturer



13	Tamunodukobipi, D.	Ph.D, MTech., BTech., R.Engr (COREN).	Applied Rotodynamics	Senior Lecturer
14	Akandu, E.	Ph.D, MTech., BTech	Marine & Offshore Structures	Senior Lecturer
15	Eme, D.B.	Ph.D, M.Te.ch., B.Tech., R.Engr (COREN). •	Highway Engineering	Senior Lecturer
16	Nwaobakata, E.	Ph.D, M.Tech., B.Tech., R.Engr (COREN).	Highway Engineering	Senior Lecturer
17	Sule, S.	Ph.D, M.Tech., B.Eng., R.Engr (COREN).	Engineering Structures	Senior Lecturer
18	Awodigi, C. T.	Ph.D, M.Eng., B.Eng., R.Engr (COREN).	Engineering Structures	Senior Lecturer
19	Ugwoha, E.	Ph.D, MSc, BTech., R.Engr (COREN)	Environmental Engineering	Senior Lecturer
20	Kamalu, U.A.	Ph.D, MEng., BEng., R.Engr (COREN)	Electronics Engineering	Senior Lecturer
21	Ukpong, E.U.	Ph.D, MSc, BSc., R.Engr (COREN)	Geotechnical Engineering	Senior Lecturer
22	Nwaigwe, C.	Ph.D, MSc., BSc.	Computation Fluid Dynamics	Lecturer-1
23	Ibekwe, A.U.	Ph.D, M.Tech., B.Tech., R.Engr (COREN).	Marine Engineering Platforms	industry
24	Tam-Jones, Atuboyedia	Ph.D, M.Tech., B.Tech., R.Engr (COREN)	Highway Engineering	Industry
25	Henshaw, T.	Ph.D., MEng., BEng., R.Eng (COREN)	Water Resources	Industry
26	Ikebude, C.	Ph.D., MEng., BEng., R.Eng (COREN)	Water Resources	Lecturer 1
27	Okoni, B.	Ph.D, MSc, BSc	Computer Science	Lecturer 1

## 16 Facilities

### 16.1 Personnel

Being multi-disciplinary in nature, academic Faculty is drawn from different academia from relevant Disciplines at the University of Port Harcourt, Other Sister Universities and Industry. The current list of proposed teaching faculty is shown above. However, more Teachers, Instructors and Researchers-of high professional repute shall be co-opted as collaborators to build a center of Excellence in Geotechnical and Coastal Engineering. Besides, there are two Professorial Chairs domiciled in the Center; Namely: Enoch George Professorial Chair in Geotechnical Engineering and the GesiAssamaowei Professorial Chair in Coastal Engineering Research.

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### **16.2 Offices & Classrooms Space**

Besides, the Director's Office, there are two other Offices at ETF Gas Engineering Building for the Center of Geotechnical Engineering and Coastal Engineering which can house the Administrative staff of the Center. The Center also has another four (4) Classrooms domiciled at the Civil & Environmental

### **16.3 Library / Laboratory Facilities**

Currently, the Faculty of Engineering eLibrary, Donald Ekong (Uniport) Library and the World Bank Center of Excellence in Oilfield Chemicals (ACE-CEFOR) have full Access to Research Libraries (Online and Offline).