



# **COVENANT UNIVERSITY**

## **DEPARTMENT OF PETROLEUM ENGINEERING PETROLEUM ENGINEERING PROGRAMME ACADEMIC HANDBOOK**

**2022 – 2026**

## **COVENANT UNIVERSITY**

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## WELCOME MESSAGE FROM THE CHANCELLOR

### Raising a New Generation of Leaders

“Seest thou a man diligent in his business? He shall stand before kings; he shall not stand before mean men”. (Proverbs 22:29 - KJV)

Covenant University is a Royal Academy birthed on the platform of a compelling vision to raise a new generation of leaders, especially for the Continent of Africa. It is indeed the birthplace of “kings and queens”. I do believe that the greatest need of the 21st Century is that of leadership, whereas leadership is not an endowment, it is a commitment to the future that makes a leader.



Our mission at Covenant University is to develop the man who will, in turn, develop his world. We see the character as the anchor of leadership. The ability makes a manager, but integrity makes a leader.

Our experience over the years strongly indicates the great potential we have as a University in instituting a world class-learning context that is rich in educational opportunities, research and scholarship. The heart-warming positive feedback from employers on the excellent and exemplary conducts of our graduates is one of the many concrete validations of the University's unique vision. We are, however, looking ahead to the future we envision in driving excellence across all our programmes by ensuring that the stage is well anchored to actualise our set vision of raising a new generation of leaders.

Only a serious approach guarantees a glorious result. There is no short cut to any place worth going. Edmund Hilary, the first man that conquered Mount Everest, said, “It is not the mountain that we conquered but ourselves”. Covenant University is indeed a place where you are taught how to conquer yourself as part of the process of becoming outstanding in life. Therefore, if leadership and excellence are your goals, then Covenant University is the right place for you.

Starting from the 2013/2014 Academic Session, every student of the University was made to undertake at least a Certificate/Diploma Course in Leadership in addition to his/her major discipline.

Therefore, the currency of the curriculum and the inclusion of Leadership Certificate will be one of the unique selling points.

You are welcome to Covenant University, a Royal Academy, a Leadership Training Varsity.

Dr. David O. Oyedepo

*Chancellor, Covenant University*

## FROM THE VICE-CHANCELLOR'S DESK

It is my great delight to welcome you to Covenant University where “*Eaglets*” are nurtured into “*Eagles*” as transformational leaders in their respective vocations and the society. Covenant is a vision-birther University with a compelling vision to raise a new generation of leaders in all fields of human endeavour, noting that leadership is a fundamental challenge to the advancement and development of Africa. We are on a mission to change the educational landscape of Africa through our departure philosophy; to create knowledge and restore the dignity of the black man through our curricula and pedagogy that are designed to be life-applicable. Our programmes are unique and in consonance with the unique products that we produce.

In our pursuit of this vision, our core values are the crucibles of our quality assurance processes in teaching, research, and community service. These core values—Spirituality, Possibility Mentality, Capacity Building, Integrity, Responsibility, Diligence, and Sacrifice—are the building blocks of our enterprise.

Further to our drive towards producing employable and industry ready graduates, our students continue to enrich their knowledge-base with respect to industry expectations through interaction with the Industry offered by the Town and Gown seminar series. Our custom built programmes—Entrepreneurial Development Studies (EDS), Total Man Concept (TMC) and Towards a Total Graduate (TTG), equip our students with unique skills to navigate life and becoming a total man.

In making the decision to pursue your undergraduate education at Covenant, you have chosen a distinctive institution with a rich spiritual heritage and academic prowess. Within a short period of 18 years, Covenant has demonstrated great potentials in instituting a world-class learning context that is rich in educational opportunities, research and scholarship. As a university acclaimed to be scholarly vibrant; with attestation of eight different rankings of Times Higher Education (THE) in one year, it is our desire to share and disseminate latest knowledge and ideas that are essential in driving the future of society and humanity.

During your time here, I encourage you to take an active role in your own academics, and understand that education at Covenant is as much about character, values, morals, and social responsibility as it is about intellectual development and critical thinking. Take the time to reflect on your total development as you pursue your dreams aspirations and vision. We will assist and support you in the process of becoming what God has destined for you. In doing so, we will also challenge you to stretch your mind, heart and spirit. This Handbook contains vital information and instructions that will help you to enjoy a most rewarding academic journey through your willing and delightful obedience.

Prof. Abiodun H. Adebayo  
*Vice-Chancellor, Covenant University*

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 THE NAME: COVENANT UNIVERSITY (CU)**

All over Africa, and Nigeria in particular, a great significance is attached to names. They portray meanings and convey important messages. Names reflect circumstances of birth or events. The word “Covenant” was chosen as an expression of the University’s total commitment and vows to make a Total Man of her students. It reflects the intention of the proprietors of the University to uphold a binding agreement with students to deliver their desires for excellence and career exploits by offering them the best in educational attainment and by offering their parents/guardians the best value for their investment. It is also common knowledge that every covenant is ratified by blood and, as a church-sponsored University, we consider the blood of Jesus Christ, which is the blood of the everlasting covenant, as our stronghold in the fulfilment of this awesome obligation. Covenant University vows to make of her graduates’ expert thinkers, leader-managers, and hyper-resourceful technocrats in all fields of human endeavour.

#### **1.2 OUR VISION**

To be a leading World-Class University, committed to raising a new generation of leaders in all fields of human endeavour.

#### **1.3 OUR MISSION**

To create knowledge and restore man's dignity through a Human Development concept of the Total Man, employing innovative, leading-edge, teaching and learning methods. We aim for application of research that promotes integrated, life-transforming values through Science, Technology and Human Capacity Building.

On October 21, 2002, the African educational landscape was radically altered by the formal entry of Covenant University (CU) into the Higher Education context. The University is located at Canaan Land, Ota, Ogun State, Nigeria. The University is a growing, dynamic vision-birther and vision-driven University, founded on a Christian mission ethos and committed to pioneering excellence at the cutting edge of learning.

The University’s specific mandate can be stated as follows:

- “Raising a new generation of leaders through a qualitative and life-applicable training system that focuses on value and skill development”.
- “Raising a new generation of leaders through a broad-based qualitative education built on sound biblical principles culminating in the birth of path-finders, pace-setters and trail-blazers”.
- “Raising a new generation of leaders who shall redeem the battered image of the black race and restore her lost glory as this trained army of reformers begins to build the old wastes, repair the wasted cities and raise the desolation of many generations”.

## **1.4 OUR FOUNDING PHILOSOPHY**

In response to the global demand for a departure from dogmatism to dynamism in the existing educational system, Covenant University is built on the following philosophical platform:

- A departure from form to skill
- A departure from knowledge to empowerment
- A departure from figures to future building
- A departure from legalism to realism
- A departure from “mathe-matics” to “life-matics”.

This is reflected in our motto: “Raising a New Generation of Leaders”.

## **1.5 OUR OBJECTIVES**

The objectives of the University are to:

- i. provide facilities for learning and give instructions and training in such areas of knowledge that will produce sound and mentally equipped graduates, who will provide intellectual leadership in academic institutions, industry and the public sector through the Total Man Concept approach;
- ii. develop and offer academic and professional programmes leading to the award of diplomas, first degrees and higher degrees, which emphasise planning, adaptive and technological maintenance, developmental and productive skills;
- iii. promote by research and other means, the advancement of knowledge and its practical application to social, cultural, economic, scientific and technological problems;
- iv. encourage and promote scholarship and conduct research in all fields of learning and human endeavour;
- v. disseminate scientific and technological knowledge among scientists, researchers, industries, trade services and other bodies; and
- vi. relate its activities to the technological, scientific and socio-economic needs of the people of Nigeria and to undertake other activities appropriate for a university of the highest standard.

## **1.6 OUR CORE VALUES**

Our Core Values as a University are the defining components of the Covenant University Vision and they reflect our beliefs in the encrypted truths that firmly define our purpose and the underlying ethos of our existence as a University.

As a University, we strongly uphold the practices embedded in our Core Values and strive to integrate these Values into all facets of our functions and operations as a University. We expect that students of Covenant University will visibly demonstrate and integrate the virtues embedded in these Core Values in their daily conduct as students who are being raised along the Vision lines of raising a New Generation of Leaders for the



Continent of Africa on the Total Man Concept-driven developmental platform. All students are expected to adhere strictly to the University's Core Values in their day-to-day activities within or outside the University.

The Covenant University Core Values are: Spirituality, Possibility Mentality, Capacity Building, Integrity, Responsibility, Diligence and Sacrifice.

**a. Spirituality**

This forms the bedrock of our existence as a University and defines every aspect of our operations and context. The Christian ethos underlies our activities and conducts at all times, and every student of Covenant University is expected to exhibit the character traits and dispositions of a Jesus-centred heritage. The Jesus - factor centred approach to all issues is non-negotiable and central in the pursuit of our mandate in raising a New Generation of leaders. To this end, therefore, students are to be committed to maintaining a high level of spirituality and act in such a manner as to facilitate their spiritual growth. Attendance at Chapel Services, which every student is expected to attend with a Bible, notebook and pen, are a compulsory and essential part of students' spiritual development. Students are also expected to demonstrate a deep reverence for God at all times.

**b. Possibility Mentality**

Students of Covenant University are expected to exhibit a royal carriage, attitude, habit and character, exuding self-confidence and dignity at all levels of interaction and in general conduct. They are expected to see themselves as persons of worth and value, taking pride in their uniqueness as individuals with a positive mind-set devoid of any trace of inferiority.

**c. Capacity Building**

This is related to commitment to a lifestyle of continuous academic and personal development, striving to be continuously relevant to the overall vision requirement of the University as well as her core mission, goals and objectives. Students are encouraged to constantly seek paths for self-improvement. Openness to learning new skills and taking on board new information is a trait expected of Covenant University students in order to have robustness and depth in the quality of their output.

**d. Integrity**

Students of Covenant University are expected to demonstrate traits of honesty, uprightness and trustworthiness at all times. They must ensure that they are accountable, transparent and open in all their dealings. They shall flag truth as a virtue at all times, particularly in conduct during examinations, obeying the rules and regulations of the University, being spiritually sound, morally upright and having a good conscience.

**e. Responsibility**

We are committed to inculcating a sense of responsibility in our students. We believe in the place of discipline for effective leadership. We expect our students to respond to issues as demanded, not as convenient. Here at Covenant University, our students are not

permitted to do what they like but what is right. Punctuality at lectures, as well as prompt response to assignments as demanded, is a desired trait of responsibility.

#### **f. Diligence**

Students of Covenant University are expected to be deeply committed to their assignments. We expect that they will extol the virtues of hard work and constantly strive towards excellent attainment in all they do.

#### **g. Sacrifice**

Sacrifice is the ultimate price for outstanding leadership. It is the quality of sacrifice that defines great leadership. We therefore expect students of Covenant University to go the extra-mile and pay the extra- price in the attainment of their set goals. Raising an altar of sacrifice in pursuit of their dreams is what must distinguish and define the Covenant University student.

### **1.7 THE TOTAL MAN CONCEPT**

The Total Man Concept (TMC) is Covenant University's custom-built Programme that constitutes the core concept of her academic programmes. This concept centres on “developing the man that will develop his world.” It is designed to make the student become intelligently conscious of his environment and thus be able to maximise his potential.

The programmes of the University are first directed at “the person” before his profession. In this way, the University will raise a generation of experts who possess the capacity to face and manage challenges.

The TMC Programme centres on three components of the human personality: the spirit, the mind, and the body:

#### **a) The Spiritual Man**

Spiritual development is to us a major force for the evolvment of the Total Man, as mental excellence and understanding are generated through the vital force in man, which is the Spirit of God and the Spirit of Intelligence. As a University sponsored by a Christian Mission, character formation is considered as a spiritual issue that is instilled by self-discipline and commitment to the principles enunciated by our Lord Jesus Christ.

Covenant University provides opportunities for spiritual development through various avenues, including spiritual formation programmes and counselling, and also by creating leadership opportunities.

#### **b) The Intellectual Man**

Covenant University students enjoy the highest standards of excellence through the institution of academic programmes that are innovative, creative and functional. Covenant University also encourages students to be inquisitive, bold and forthright in asking questions and facing the challenges of academic leadership. The Total Man concept is also promoted through the introduction of a system of compulsory, theoretical

and practical courses, all of which must be passed before one can be considered for a degree from the University. In addition to normal General Studies courses, we have included our own specially-designed courses in areas such as: biographical studies, entrepreneurship, family life, human development process, leadership development, mental development, success concepts, work ethics and Towards the Total Graduate (TTG) Programme.

### **c) The Physical Man**

The body is a vital component of the Total Man. Covenant University is committed to providing avenues for sound physical development via recreational activities that engage the body and also enhance personality development, stimulating the cultivation of lifestyles that are conducive to healthy living. We thus encourage students to participate in sporting activities.

## **1.8 THE TOTAL GRADUATE**

The Covenant University graduate will be mentally resourceful, intellectually reinforced, enterprisingly self-dependent, futuristically visionary and responsibility-sensitive to the changes demanded for the leadership role or dominion nature he is made for. He shall be a Total Man. Covenant University provides a serene, safe, secure, pleasant and ICT driven teaching and learning environment.

Academic programmes are free of strikes, shut-downs and union face-offs. Well-stocked libraries and laboratories, as well as unrestricted access to the internet for study and research purposes



**Our Campus**

Covenant University pioneered the introduction of:

- i. Entrepreneurial Development Studies (EDS) aimed at preparing the student for self-employment; and
- ii. the Total Man Concept (TMC) aimed at developing the Total Man – Spirit, Soul and Body.

Our graduates earn an additional certificate in leadership upon completion of their studies.



Covenant University Landscape

## **CHAPTER TWO**

### **UNIVERSITY ADMINISTRATION AND CONTROL**

Covenant University was established by the World Mission Agency (WMA), an arm of the Living Faith Church Worldwide Inc. The Board of Trustees of the Agency appoints the members of Board of Regents, which is the apex ruling body for the University. In his capacity as the *visioner* of the University, Dr. David Oyedepo serves as the life Chancellor of the University and the Chairman of the Board of Trustees of World Mission Agency.

The University's Vision of raising a new generation of leaders has necessitated the development of a unique approach to governance and management of the institution. Its founding philosophy is to specifically and emphatically promote change against the status quo, which had stagnated growth and development in the nation and in the African continent. The University is committed to a visionary resolution of these issues.

The other organs by means of which the University administration is carried out include: The Senate, and Management Board. Other statutory and academic Boards are as explained.

#### **2.1 BOARD OF REGENTS**

The Board of Regents is the Governing Council of the University. The Board serves as the apex ruling body of the University and exercises final authority and power in all policy, legal, administrative and financial matters of the University. It has the overall responsibility for the policies and operations of the University.

#### **2.2 THE CHANCELLOR**

The unique founding philosophy of change, which was birthed from the visionary base of the University, as well as the adopted strategies for its accomplishments, was considered crucial to the general and specific objectives of the University. The visionary direction and guidance had compelled the executive presence of the Chancellor who conceived the vision of the University. Consequently, the vision, as well as its governance imperatives, is shared with the faculty, staff and students at regular intervals. This vision has permitted and continues to permit stable formation, not only of the organisational structure but also of the management culture, as well as helping to inculcate the values and ethos of the University into members of the University community. The Chancellor of the University is the Chief Executive Officer of the University. He also serves as the Chairman of the Board of Regents.

#### **2.3 THE PRO-CHANCELLOR**

The Pro-Chancellor shall, as may be directed by the Chancellor, undertake spiritual oversight of the University in the light of the Institution's foundation of faith and fear of God which is fundamental to successful living. The Pro-Chancellor shall as may be directed by the Chancellor, undertake the oversight and entrenchment of the University Vision and mission in the faculty, staff, and students from the underlining perspective of the University core values. The Pro-Chancellor shall, as may be directed by the Chancellor, maintain a functional platform for the discharge of the governance

responsibilities of the Board. The Pro-Chancellor shall, as may be directed by the Chancellor, entrench a culture of efficient management of the resources and investments of the University, through the prompt discharge of the finance and general-purpose duties of the Board.

## **2.4 THE VICE-CHANCELLOR**

The Vice-Chancellor is the Chief Academic Officer of the University. In this capacity, he/she is the Chief Responsibility Officer for the University's operations. Academic administration is planted firmly in the highest academic authority of the University, which is the Senate. The Vice-Chancellor is the Chairman of the University Senate and exercises all powers granted him/her in the law that established the University in respect of guiding and directing the University's academic activities. He/she holds in trust the Chancellor's executive responsibilities and authority in all areas where the Chancellor so delegates.

## **2.5 THE REGISTRAR**

He is the Chief Administrative Officer of the University and oversees the administrative efficiency of the University, engaging historical records and regulations. The Registrar chairs the University's Administrative Board, which serves as the University's apex administrative organ and clearance house for all operational issues. He monitors rules, regulations and policies as well as make recommendations on policies to Senate and Board of Regents.

## **2.6 OTHER OFFICERS OF THE UNIVERSITY**

### **(a) THE DEANS OF COLLEGES AND SCHOOL OF POSTGRADUATE STUDIES**

Our colleges were established to provide teaching, research and community service activities in Departments/Programmes approved for them by the Senate. A College Management Board and College Academic Boards are established for each College to determine direction and supervise the conduct and grading of examinations and other academic responsibilities and they make recommendations to Senate on any academic matter, including curriculum development and examination results through the Deans. The Dean is the Chief Academic Officer of the College/School. He is the Chairman of the College Management Board and he coordinates and regulates the teaching responsibilities and the conduct of examinations within the available facility and specified guidelines. He is also responsible for co-coordinating the day-to-day administration of the College, including the organisation of students' admission, registration, matriculation and examinations.

### **b) THE SUB- DEANS OF COLLEGES**

Each College in the University is divided into three administrative units called Schools and a Deputy Dean heads each of them. The Deputy Deans oversee the coordination of activities of the School as they relate to the Colleges' Vision and Goals to ensure their foremost growth and development. They provide leadership and oversight for all the academic programmes of the Schools. They oversee strategic planning matters of the Schools and ensure that they are in tandem with the Vision of the University; continuous improvement of programmes and curriculum; promotion of community service activities;

ensuring efficient teaching and quality delivery and monitoring of class attendance, student evaluation reports as they relate to the Schools' context, teaching and learning environment among others.

## **CHAPTER THREE**

### **COLLEGE OF ENGINEERING**

There are presently four (4) Colleges in Covenant University – College of Business and Social Sciences (CBSS), College of Leadership Development Studies (CLDS), College of Engineering (CoE) and College of Science and Technology (CST). In 2014/2015 academic session, the College of Engineering (CoE) was carved out of the former College of Science and Technology.

#### **3.1 WELCOME ADDRESS FROM THE DEAN**

With anticipation in my heart and gratitude to God Almighty, I welcome you to the Petroleum Engineering programme of the College of Engineering (COE). The college presently has five departments. The Departments are: Civil Engineering, Electrical and Information Engineering, Mechanical Engineering, Petroleum Engineering and Chemical Engineering.

The college is walking in line with the vision of the university in helping to raise young stars, future leaders and world best engineers in all fields of endeavours for a better tomorrow. The college also has well-groomed lecturers ranging from professors, senior academic staff and well-trained technologist. The non-teaching staffs are also available to work in hand with the academic staff in the college for a better and ready result. The students are groomed to tackle different challenges in the engineering field.

Our programmes are fully enriched with good course outlines, which are well packaged to prepare our students for the successful practice of their profession anywhere in the world. The programmes are also to help the students achieve their full potentials and skills to the highest level. The programmes are fully accredited by the NUC and COREN.

On this note, I would like to say a very big welcome once again to the Petroleum Engineering programme in the College of Engineering.

**Prof. David O. Olukanni**

*Dean, College of Engineering, Covenant University*

#### **3.2 OVERVIEW OF THE COLLEGE OF ENGINEERING**

The College of Engineering (CoE) presently has five departments. The Departments are: Civil Engineering, Electrical and Information Engineering, Mechanical Engineering, Petroleum Engineering and Chemical Engineering. The Department of Civil Engineering offers programme in Civil Engineering, the Department of Electrical and Information Engineering ([eie.covenantuniversity.edu.ng](http://eie.covenantuniversity.edu.ng)) offers programmes in Computer Engineering, Electrical and Electronics Engineering, and Information & Communication Engineering, the Department of Mechanical Engineering ([mce.covenantuniversity.edu.ng](http://mce.covenantuniversity.edu.ng)) runs programme in Mechanical Engineering, the Department of Petroleum Engineering ([pet.covenantuniversity.edu.ng](http://pet.covenantuniversity.edu.ng)) runs programme in Petroleum Engineering while the Department of Chemical Engineering runs programme in Chemical Engineering.



The college is walking in line with the vision of the university in helping to raise young stars, future leaders and world best engineers in all fields of endeavours for a better tomorrow. The college also has well-groomed lecturers ranging from professors, senior academic staff and well-trained technologists. The non-teaching staffs are also available to work in hand with the academic staff in the college for a better and ready result. The students are groomed to tackle different challenges in the engineering field.

Our programmes are fully enriched with good course outlines, which are well packaged to prepare our students for the successful practice of their profession anywhere in the world. The programmes are also to help the students achieve their full potentials and skills to the highest level.



**College of Engineering Building**

### 3.3 DEPARTMENTS AND PROGRAMMES

The College of Engineering (CoE) presently has five departments. The Departments are: Civil Engineering, Electrical and Information Engineering, Mechanical Engineering, Petroleum Engineering and Chemical Engineering. The Department of Civil Engineering offers programme in Civil Engineering, the Department of Electrical and Information Engineering (eie.covenantuniversity.edu.ng) offers programmes in Computer Engineering, Electrical and Electronics Engineering, and Information & Communication Engineering, the Department of Mechanical Engineering (mce.covenantuniversity.edu.ng) runs programme in Mechanical Engineering, the Department of Petroleum Engineering (pet.covenantuniversity.edu.ng) runs programme in Petroleum Engineering while the Department of Chemical Engineering runs programme in Chemical Engineering. The Departments and Programmes in the College of Engineering, Covenant University are listed in the Table 1.

**Table 3.1: List of Departments and Programmes in the College of Engineering**

Department	Programme	Option	Degree
Chemical Engineering	Chemical Engineering		B.Eng.
Civil Engineering	Civil Engineering		B.Eng.
Electrical and Information Engineering	Computer Engineering		B.Eng.
	Electrical and Electronics Engineering		B.Eng.
	Information and Communication Engineering		B.Eng.
Mechanical Engineering	Mechanical Engineering		B.Eng.
Petroleum Engineering	Petroleum Engineering		B.Eng.

### 3.3 VISION

The vision of the College of Engineering (CoE) is to be a leading engineering centre of excellence involved in teaching, research and innovation.

### 3.4 MISSION

The mission of the College is to provide, through innovative teaching and research, sound engineering education aimed at producing a new generation of highly motivated, competent, skilful and innovative professional and academic engineers with a burning desire to tackle Africa's developmental challenges. The College strives to generate and provide high quality and high-tech knowledge in a student-friendly environment for the purpose of producing well-prepared leaders of tomorrow.

### 3.5 PHILOSOPHY

The College, philosophically, aims at producing students with profound engineering knowledge in different disciplines collaborating in deployment of a wide range of skills and knowledge to provide solutions to societal problems. Situated in a Christian mission University, the College is committed to the goals of learning and faith – learning as both the means to and the result of dogged scholarship; and faith as the personal appropriation of truth for godly living.



*Cross-Section of Faculty and Staff at An Academic Even*





*E-Learning Facility at the Centre for Learning Resources (Library)*



*Covenant University Library*

## **CHAPTER FOUR**

### **DEPARTMENT OF PETROLEUM ENGINEERING**

#### **4.1 WELCOME ADDRESS FROM THE HEAD OF DEPARTMENT.**

Welcome to the Department of Petroleum Engineering at Covenant University. The philosophy of the Department is anchored on Covenant University's philosophy, which is rooted in "*Raising a New Generation of Leaders*". With this, the goal of the Department is clearly defined as educating leaders in the field of Petroleum Engineering who are much sought after globally for their skills and critical thinking capability to solve challenges in the constantly evolving world that is dependent on energy for development.

The success story of our graduates lies in highly qualified faculty that are self-motivated, equipped laboratory, stocked library and access to online journal database of international publishers, a curriculum that incorporates use of standard industry software, and an active Society of Petroleum Engineers (SPE) student chapter that is supported and recognized by the industry and SPE International. These further create an enhanced atmosphere for our students to be well-grounded in the fundamentals of Petroleum Engineering and preparation to be productive at entry-level positions in reservoir, drilling and petroleum production engineering, and reservoir characterization job offers. The Petroleum Engineering programme in Covenant University is accredited by the National University Commission and Council for Regulation of Engineering in Nigeria (COREN).

#### **4.2 The HOD's Profile**



Oluwasanmi A. Olabode is a Senior Lecturer of Petroleum Engineering and an Alumni of Covenant University. Oluwasanmi holds a bachelor's degree in petroleum engineering from Covenant University (2010), master's in petroleum engineering (2014), University of Ibadan and a doctorate in Petroleum Engineering, Covenant University (2019). His core competence areas are reservoir engineering and characterisation, reservoir fluid characterisation, reservoir modelling and simulation, enhanced oil recovery, and petroleum economics. He has authored/co-authored over 30 publications with articles in high impact journals; a reviewer for journals and has successfully supervised over 40 undergraduate student projects, 1 master's student, and currently supervising a master's student. Oluwasanmi is an active researcher and heads a research cluster on Petroleum Reservoir. Dr. Olabode is a member of the Society of Petroleum Engineers (SPE), Nigerian Society of Engineers (NSE 47749), a Registered Engineer (R47132) and a member of the Nigerian Institute of Petroleum Engineers (NIPetE-PE2768).

#### **Dr. Oluwasanmi A. Olabode**

Head of Department & Senior Lecturer, Petroleum Engineering

#### **4.2.1 Vision**

The vision of the Department is to become a leading world-class Department of Petroleum Engineering that is committed to raising a new generation of industry-ready engineers known for their prowess in solving challenges presented by the constantly evolving oil and gas industry.

#### **4.2.2 Mission**

The mission of the Department is to nurture readily employable graduates that are productive at entry-level positions in the Oil and Gas Industry who are well-grounded in the fundamentals of Petroleum Engineering as well as tools and applications in solving real-world challenges.

#### **4.2.3 Philosophy**

The philosophy of the programme in the Department of Petroleum Engineering is in consonance with the overall philosophy of Covenant University, which can be summarized as *“Bringing up a new generation of Africans that will move the continent forward in all areas of endeavor”*. The Department adopts a very practical and realistic approach to the solution of all petroleum engineering problems based upon sound mastery of underlying theories and principles in order to produce graduates who will impact their society and environment positively and bring about the desired changes that would place Nigeria among the twenty most developed nations of the world by 2030 in alignment with the Sustainable Development Goals. As such, our products should be capable of making informed contributions to the resolution of technological engineering issues in a globalized environment.

#### **4.2.4 Aim of the Programme**

The aim of the Petroleum Engineering programme is to produce graduates that are well grounded in the fundamentals of Petroleum Engineering and productive at entry-level positions in reservoir, drilling and petroleum production engineering, and reservoir characterization.

#### **4.2.5 Objectives**

In order to actualize the philosophy and aim of the Department, the objectives are to:

- i.** Put in place curricula that cover broad and dynamic engineering principles, working knowledge of standard oil and gas industry software and working knowledge of entrepreneurial, marketing and management principles;
- ii.** Empower the graduates with necessary skills to create value and bring solutions needed to tackle challenges in the oil and gas industry;
- iii.** Make the graduates foremost petroleum engineers in the country and internationally through well-designed competency-based training programmes of teaching and research; and
- iv.** Facilitate acquisition of practical work experience in the industries.

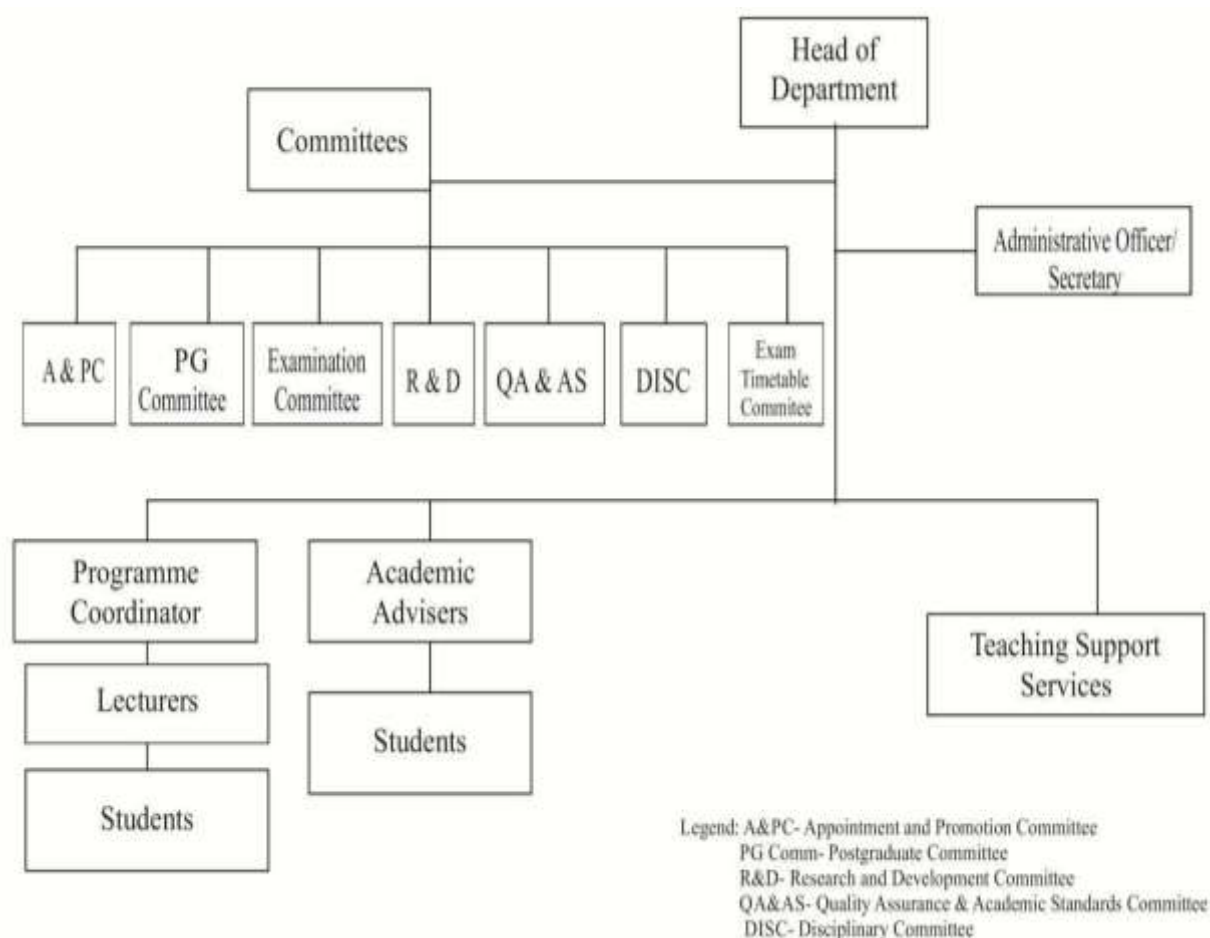
#### **4.2.6 Administration and Control and Students Welfare**

All academic staff and technologists in the department participate actively in decision making through regular meetings. The entire faculty and staff of the department have avenues to discuss

freely both formally and informally with colleagues and the Head of Department. Departmental decisions are taken collectively.

The Department appoints Level Advisers for each level (Class), who are in charge of registration, welfare and counseling of students. The Head of Department liaises with the advisers and other staff in the running of the Department. Furthermore, the Department constitutes some committees that address specific departmental issues, which include: Research and Development, Quality Assurance and Academic Standards, Disciplinary and Examinations Committee amongst others (Figure 4.1).

Academic advising is done at different levels for all students in the university. At the departmental level, the level advisers are primarily responsible for interacting with the students at a specified level and to ascertain that all issues bothering on academic matters are addressed promptly. Such typical issues include registration, continuous assessment and health challenges among others.



**Figure 4.1: Departmental Organizational Chart**



**Students Working in the Laboratory**



#### 4.2.7 List of Staff in the Department

Table 4.1 contains the list of full-time academic staff in the department while Table 4.2 contains the list of adjunct and visiting academic staff.

**Table 4.1.: List of Full-Time Academic Staff in the Department**

S/N	NAME	RANK/ DESIGNATION	PROFESSIONAL QUALIFICATION AND MEMBERSHIPS	AREA OF SPECIALIZATION
1	Dr. OLABODE Oluwasanmi A.	Senior Lecturer	Ph.D, M.Sc., B.Eng., MSPE, COREN (R. 47,132)	Reservoir Engineering Enhanced Oil Recovery Petroleum Economics Field Development Planning
2	Dr. ONUH Yunusa C.	Senior Lecturer	Ph.D., MSc., B.Sc., COREN (R. 31496)	Drilling/Production Engineering
3	*Dr. AKINSETE Oluwatoyin	Senior Lecturer	Ph.D., M.Sc., B.Eng., MNSE	Reservoir/ Production Engineering
4	*Dr. ADEYANJU O. A	Senior Lecturer	Ph.D., M.Sc., B.Eng., MNSE	Reservoir Engineering
5	Dr. ABRAHAM Damilola V.	Lecturer I	PhD., M.Sc., B.Eng., MNSE	Reservoir Engineering, Enhanced Oil Recovery
6	Dr. Humphrey DIKE	Lecturer I	Ph.D., M.Sc., B.Eng., MNSE	Drilling Engineering
7	Dr. MOSOBALAJE Olatunde Ola.	Lecturer II	Ph.D., MSc., B.Sc, MNSE	Reservoir Engineering, Geostatistics

**\* Lecturers on Sabbatical**

**Table 4.2: List of Visiting Academic Staff in the Department**

S/N	Name of Staff	Qualification	Professional Status	Designation
1	Prof. Falode O. A	Ph.D., M.Eng., B.Eng.	Reservoir Characterization, Reservoir Engineering, Petroleum	Professor (Visiting)
2	Dr. Okoro E. E	Ph.D., M.Eng., B.Eng.	Drilling Engineering	Senior Lecturer (Visiting)
3	Dr. Olamigoke O. O.	Ph.D., M.Eng., B.Eng.	Production Engineering	Senior Lecturer (Visiting)

**4.2.8 Technical Staff**

Table 4 contains the list of technical staff in the Department.

**Table 4.3: List of Technical Staff in the Department**

S/N	Name	Rank/ Designation	Qualifications	Duties Performed
1	Mr. DARAMOLA Olakunle C.	Senior Technologist II	Final Diploma Geology/Mining Technology	Drilling Fluid & Cement Laboratory
2	Mrs. OKENIYI Elizabeth T.	Senior Technologist I	HND Mining Engineering	Core Analysis Laboratory
3	Engr. OMODARA Oladele Julius	Senior Technologist	B.Eng, M.Eng., Chemical Engineering, M.Eng. Petroleum Engineering	Petroleum Production Engineering
4	Mr. ENIOLA Bolujo O.	Technologist II	B.Tech. Chemical Engineering, M.Eng. Petroleum Engineering	PVT Laboratory,
5	Mr. OSEREI Success G.	Technologist II,	BSc. Petroleum Engineering	Drilling Fluid & Cement Laboratory
6	Miss OKORO Bridget	Lab. Assistant	SSCE	Laboratory Attendant

#### **4.2.9 Non-Academic Staff**

Table 5 contains the list of non-academic staff in the Department

**Table 4.4: List of Non-Academic Staff in the Department**

<b>S/N</b>	<b>NAME</b>	<b>QUALIFICATION</b>	<b>DESIGNATION</b>
1	Mrs Olufunke Sojobi	B.Sc. (2006)	Assistant Registrar/Admin. Officer

## 4.3 PETROLEUM ENGINEERING PROGRAMME

### 4.3.1 Undergraduate Programme

PROGRAMME:	PETROLEUM ENGINEERING
DEGREE AWARDED:	B.Eng. (Honours) PETROLEUM ENGINEERING
DURATION:	5 Years (10 Semesters)

#### 4.3.1.1 Admission Requirements

- Credit level passes in five (5) subjects in the NABTEB/SSCE/GCE/NECO O/L or their equivalent must be obtained in not more than two sittings and must include Mathematics, English Language, Physics, Chemistry, and credit pass in either Further Mathematics, Biology or Technical Drawing.
- U.T.M.E Subjects include English Language, Mathematics, Chemistry and Physics.
- The candidates must fulfil all other Admission Requirements as prescribed by the Senate of Covenant University.

#### 4.3.1.2 Graduation Requirements

Students must take and pass a minimum of 231 Credit Units to graduate from the 5-year Bachelor of Engineering (B.Eng.) degree programme in Petroleum Engineering, as shown in Table 4.5.

**Table 4.5: Graduation Requirements for B.Eng. (Petroleum Engineering)**

Level	Core/ Compulsory	Electives	SWEP	Industrial Training (SIWES)	University Courses	NUC Courses	TOTAL
100	35	-	-	-	4	10	49
200	38	-	6*	-	4	6	48
300	43	-	-	6*	4	2	49
400	19	-	12**	6	2	-	39*
500	35	4			6	-	45
Total	171	4	12	6	20	18	231

\*Not used in row calculation but included in 400 level (i.e. total)

\*\*This includes 12 units of SWEP in 200 and 300 levels

## **4.4 STUDENT ACADEMIC INFORMATION**



**Cross-section of students/staff and guest speaker after a town and gown seminar series.**

### **4.4.1 DEFINITION OF A STUDENT**

A student in Covenant University is anyone who has been duly registered, having met all the requirements for admission to a programme of choice in the University and is actually involved in all academic and non-curricular activities on campus.

Such a person must be duly matriculated and resident on campus, except otherwise declared by termination/cessation of studentship or official policy declaration by Management, sequel to imposed penalty as contained in the Student Handbook.

If in the course of the semester or session a student is suspended, such a student shall lose all the rights of studentship during the period of suspension.

Again, if a parent indicates an intention to withdraw his or her ward from the University, such a student will be so allowed.

#### **4.4.2 ADMISSION POLICY**

The undergraduate programmes of the University are focused on raising a new generation of leaders equipped in their total personality to positively influence their community and restore hope to the citizens of their nations and to mankind. Assessment of academic potentials is not the only basis for a candidate's admissibility. As a Christian Mission University, intending students of the University must be God-fearing. Prospective students are expected to demonstrate in their conducts the Core Values of the University.

#### **4.4.3 UNDERGRADUATE ADMISSION REQUIREMENTS**

The minimum entry requirement for undergraduate programmes in Covenant University is the possession of credit level passes in 5 subjects at the Ordinary Level examination of **WAEC/NECO/NABTEB/IGCSE**. The subjects must include English Language and Mathematics.

These must have been obtained at not more than two sittings. There are other requirements that may be specific to a College and/or a Programme.

In addition to the above, candidates must fulfill the statutory requirement of sitting for the UTME examination of the Joint Admissions and Matriculation Board (JAMB) in the year they intend to apply for admission. It is mandatory for applicants to attain the prescribed cut-off mark in the UTME examination.

Applicants must also undergo the post-UTME screening exercise conducted by the University, i.e., the Covenant University Scholastic Aptitude Screening (CUSAS).

#### **4.4.4 INTERNATIONAL ADMISSIONS**

An international student at Covenant University is defined as any intending student applying to the University for consideration for admission who is:

1. a foreigner, i.e. a citizen of a country other than Nigeria;
2. a Nigerian who resides in a foreign Country/a Nigerian who is a citizen of a foreign country;
3. a Nigerian, in the diaspora, whose School Certificate, High School or O'Level examinations is /was not sat for or obtained in Nigeria but which has been translated or equivalent to Nigerian O'Level standards;
4. a Nigerian, who is also a citizen of another country, this shall be supported with documentation such as, international passport, birth certificate, etc.

To be eligible for consideration, applicants must fulfill the following requirements:

A. Obtaining, completing and return of the admission application form.

Submission of relevant results/certificates, and satisfying the minimum academic entry requirements.

B. Submission of a letter of reference from a spiritual leader.

Application forms for International Applicants can be completed online at <http://admission.covenantuniversity.edu.ng> at the prescribed fee. Payment can be made online through electronic payment platforms or through cash deposits at designated banks.

#### **4.4.5 COURSE-UNIT SYSTEM**

Covenant University runs the Course-Unit System, meaning that courses are quantified in units. Courses are run on a semester basis. Each academic session is divided into two semesters, namely Alpha Semester and Omega Semester. The Alpha and Omega semesters consist of at least 15 teaching weeks and three weeks of examination.

##### **4.4.5.1 Status of a Course**

A course is classified into three categories as follows:

- **Core or Compulsory courses** are courses that must be taken unconditionally and passed.
- **Required courses** are those courses registered for at the department and must be passed.
- **Optional or Elective courses** include those courses that may be taken to make up the minimum number of credits to be passed in order to graduate.

##### **4.4.5.2. Grading System**

Each course has three grading components (Table 4.6). These include:

- Percentage score grade.
- Letter grade.
- Grade point.

**Table 4.6: Components of Course Grading**

Percentage Score	Letter Grade	Point Grade
70 – 100	A	5
60–69	B	4
50–59	C	3
45–49	D	2
0–44	F	0

#### **4.4.5.3. Course Registration**

Bona-fide students of Covenant University must first meet the necessary requirements of having paid the prevalent tuition fees among others before they are qualified to embark on the course registration exercise of each semester/session. The modalities of course registration currently operational in the University are listed below:

##### **1. Registration within Approved Limits**

- i. A student is required to register and pass all prescribed courses from any programme for which he/she is enrolled in the University. However, all cases of failed courses shall be carried over at the next available opportunity.
- ii. Students who are carrying over courses shall be required to register the failed or dropped courses first. A combination of all failed/dropped courses and current semester's courses shall not exceed 25 units per semester.
- iii. The maximum number of units a student shall be allowed to register per semester is 25 units while the minimum is 15 units.

##### **2. Excess Unit Loads**

- i. To address the registration challenges being faced by students, especially those in the graduating class, the registration of six (6) extra units above the 25 maximum units per semester may be allowed provided such students' CGPAs are not below 3.0 on a scale of 5.0 scale or 2.4 on a 4.0 scale.
- ii. All applications for consideration to registering extra credit units above the approved maximum limit shall be directed to the Registrar for onward processing to the Senate Business Committee (SBC).



- iii. Any other request related to the aforementioned should be directed to the office of the Vice-Chancellor.

#### **4.4.6 ACADEMIC PROGRESSION OF STUDENTS**

The following shall apply regarding the academic progression of students from one level to another in Covenant University:

##### **4.4.6.1 Academic Classification**

The rating of a student's performance and categorization of the class of the degree shall be based on the cumulative grade point average obtained by each student in all prescribed courses and approved electives taken at Covenant University. The existing class of honors degree are as indicated below (Table 8):

**Table 4.7: Degree Classification**

<b>Class of Degree</b>	<b>Cumulative GPA</b>
First Class	4.50 – 5.00
Second Class Upper Division	3.50 – 4.49
Second Class Lower Division	2.40 – 3.49
Third Class	1.50 – 2.39

##### **4.4.6.2 Academic Standing**

A student who has satisfactorily completed all requirements for the degree with an end of session Cumulative Grade Point Average (CGPA) of not less than 1.50 and less than 20 credit units of failed courses, shall be deemed to be in **Good Standing (GS)**, and thus shall be promoted to the next academic level in the same course. A student whose CGPA is **less than 1.50 or has a minimum of 20 credit units of failed courses** shall be deemed to be **Not in Good Standing (NGS)**. This category of students shall not be promoted to the next academic level.

##### **4.4.6.3 Probation**

Probation is a status granted to a student whose academic performance fall below an acceptable standard. A student that is Not in Good Standing (NGS) but with CGPA of 1.0 - 1.49 is deemed to be on Probation and shall be allowed to remain in the same course level in order to retake only the courses that are failed during the first attempt at that level, while already passed courses

are retained. In addition, he/she will be allowed to register for any outstanding dropped courses. This provision is subject to the residency policy of the University.

#### **4.4.6.4 Withdrawal**

A student with a Cumulative Grade Point Average (CGPA) of less than 1.0 at the end of the session in his/her first attempt in a particular programme shall be asked to withdraw from that programme. Also, a student whose Cumulative Grade Point Average (CGPA) was below 1.5 at the end of a particular year of probation shall be required to withdraw from the University. However, in order to minimize waste of human resources, consideration is given to withdrawal from programme of study and possible transfer to another programme in the University bearing in mind the residency policy of the University. **In the circumstance of a change of programme of study, the student must satisfy the basic entry requirement (BRQ) for the new course.**

#### **4.4.6.5 Repeating Failed Course Units (Non-Graduating Class)**

Subject to the conditions for withdrawal and probation, a student could retake the failed course units at the next available opportunity, provided that the total number of credit units carried during that Semester shall not exceed 20, and the Grade Points earned at all attempts shall count towards the CGPA. Also, at the point of registration of courses, the failed/dropped courses MUST be registered first.

#### **4.4.6.6 Prerequisite for Progressing into the Graduating Class**

The maximum number of units a student shall be allowed to register per semester is 25 units while the minimum is 15 units. This provision is subject to the Residency policy of the University.

Please note that no student that is not likely to graduate on any ground should be allowed into the final class. All outstanding issues must be resolved at the penultimate year (300L and 400L respectively for a 4-year and 5-year programme).

Consequently, only students in the penultimate year with a minimum CGPA of 2.0 and pending units (failed/unregistered courses), which can be accommodated in the 25 units per semester of final year workload, shall proceed to the final year.

Students with more than 25 units of courses per semester shall remain in the penultimate class but may be allowed to register few final year courses after they have registered the failed/unregistered courses.

#### **4.4.6.7 Penultimate Class**

Students in the penultimate class would be allowed to register and take all failed and unregistered courses; if less than 25 units, they will be allowed to take courses from the final year.

#### **4.4.6.8 Probation for Lower Level**

100 level, 200 level and 300 level (for 5 years program) on probation would take only failed and unregistered courses for the semester.

#### **4.4.6.9 Transfer**

100 level students who could not make up a CGPA of 2.0 in the College of Engineering are expected to transfer to the College of Science and Technology. They would be accepted in the departments of industrial physics, industrial mathematics and industrial chemistry. Concerned students should please pick their change of course forms from the academic affairs.

#### **4.4.6.10 Release of Examination Results**

1. At the end of each semester, the Registrar shall publish a provisional list of successful students in course examinations soon after the recommendations of the College Boards to the Senate Business Committee have been considered and approved by Senate.
2. The Registrar shall publish the final year results of students for the award of degrees after Senate approval.

#### **4.4.6.11 Special Graduation Requirement**

For any student to be adjudged qualified to be certificated by Covenant University as her graduate, he/she is expected to have successfully gone through the **Towards a Total Graduate (TTG)** Course which is specially designed as a consolidated approach towards raising a new generation of leaders equipped in their total personality to positively influence their community and restore hope to the citizens of their nations and to mankind in general.

This course shall partly examine and provide teachings and counsel on the character status for Covenant University Students. There shall be a lecture component for this programme as well as appropriate examinations/tests to validate levels of comprehension in the course and the character disposition of the intending graduate. Attendance at all lectures and examinations/test is compulsory for graduating students. Students who fail the TTG programme shall not be deemed to have graduated until the failure is remedied.

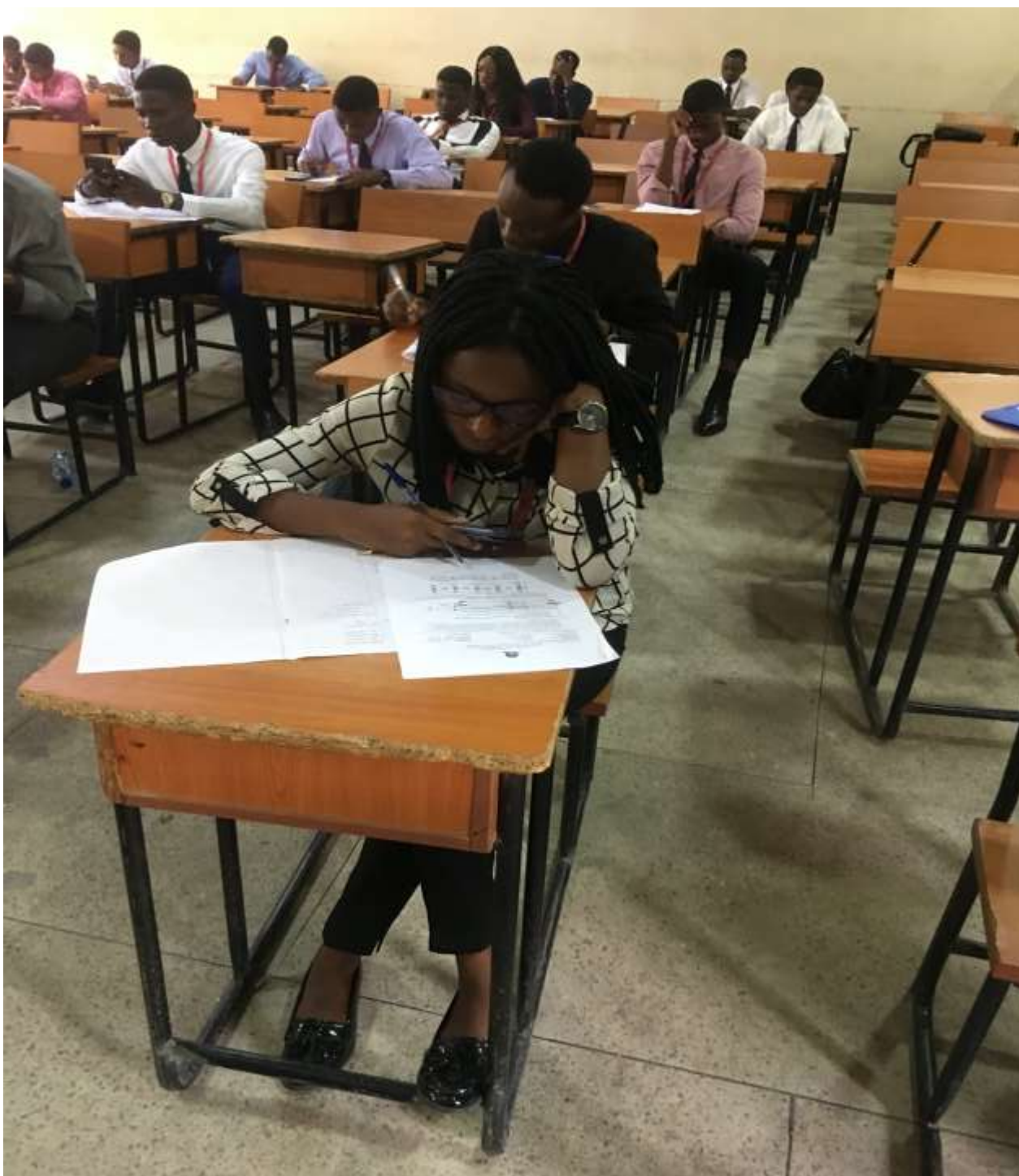
#### **4.4.6.12 Award of Covenant University Degree**

Covenant University has the right to refuse the award of its Degree to any student who has exhibited gross acts of misbehaviour in the University. The award of the University's Degree is

subject to both good academic and behavioural performance of the student throughout his/her studentship. A graduate of Covenant University must, therefore, be found worthy in character and learning.

#### **4.4.6.13 Regulations on Students' Examinations**

This presents the regulations governing all examinations at the University. This is to avoid those pitfalls that have tended to erode the public's confidence in University Degrees. Students are admonished to study well, attend lectures and cultivate the habit of personal reading and studying. All students should observe the regulations, as ignorance of them shall not be entertained.



**Covenant University Students During a Test**

#### **4.4.6.14 Admission to Examinations**

Only students who have been duly admitted, registered and matriculated with signed Student Code of Honour and made payment of the required fees will be allowed to take examinations, subject to the clauses below:

All such students must have a minimum of 75% attendance in the courses selected, before being allowed to take their examinations. Each lecturer keeps and uploads to the portal the class attendance register for courses taught. Any student that fails to meet the 75% attendance in any course would be deemed to have failed the course. The determination of the 75% eligibility requirements is also affected by student's compliance with attendance at other mandatory events, such as Chapel services, public and inaugural lectures, hostel roll-call etc.

Students who are serving any disciplinary action will not be allowed to retake any examination already written during the course of serving such penalties, except as decided at the discretion of University Management. Such examinations will be carried over to the next academic session by such students.

#### **4.4.6.15 Use of Assigned Seats by Students**

The invigilators shall assign seats to candidates. A candidate shall neither choose a seat for himself/herself nor refuse a seat assigned to him/her by the Invigilator.

#### **4.4.6.16 Dress Code during Examinations**

Students must comply with the dress code regulations during examinations, including the hanging of their current identity cards.

#### **4.4.6.17 Punctuality during Examinations**

Students are expected to report at the Examination Hall at least 30 minutes before the commencement of the examination. Students who report late to the examination hall may be admitted at the discretion of the Chief Invigilator, but no student shall be admitted 30 minutes after the commencement of the examination.

#### **4.4.6.18 Visiting the Conveniences during Examinations**

No student is allowed to leave the examination hall with the intention of returning, except to visit the conveniences. An appropriate examination attendant will accompany such a student.

#### **4.4.6.19 Unauthorized Communication during Examination**

Students must maintain utmost silence during examinations. No student is allowed to communicate with any other student during examinations. Students who need clarification are advised to raise their hands to draw the attention of the Invigilator.

#### **4.4.6.20 Personal Requirements**

Students are expected to go into examination halls with their biros, erasers, rulers, pencils and any other materials that are permitted. No borrowing of any material is allowed during examinations. Students are not allowed to bring any papers, books or bags into the examination hall. However, where a particular course requires the use of tables, graphs, etc., the University shall supply these during examinations. Also, scientific calculators, organisers, etc., are not allowed during examinations unless specifically permitted by course lecturers. Students are advised to search themselves before entering the examination halls.

#### **4.4.6.21 Use of Wrong Matriculation Number**

It is unlawful to sign in a wrong matriculation number, hence it is important for students to memories their matriculation numbers.

#### **4.4.6.22 Filling of Examination Answer Booklets**

Students are advised to ensure that the necessary documentation and instructions are followed before submitting their answer scripts to the Invigilator.

#### **4.4.6.23 Possession of Used or Unused Scripts**

Students are not allowed to take away any used or unused scripts from the examination hall as it constitutes a gross violation of Examination conduct. Such student will be made to face Students Disciplinary Committee (SDC). This is viewed as unauthorized access to Examination material.

#### **4.4.6.24 Submission of Examination Scripts**

No Student is allowed to leave the examination hall without handing over the examination script to the Invigilator. On handing over the script, the student must ensure that he/she signs out on the attendance register. However, students are not permitted to leave the examination hall without the permission of the Invigilator, who may wish to reconcile the number of scripts with the number of students present in the hall.

## **4.5 REGULATIONS ON STUDENTS' CONDUCT**

A high standard of personal discipline and integrity is expected of every student. Covenant University regards all acts of unethical, immoral, dishonest or destructive behavior as well as violations of University regulations, as serious offences. It is the responsibility of each student to know these regulations.

### **4.5.1 UNIVERSITY'S MANDATORY ATTENDANCE POLICY**

Covenant University has an accountability system in place to ensure that her students are accounted for at all times. This system was designed to enable the effective discharge of our in loco parentis obligations, and the University's attendance policies are sacrosanct for accountability sake.

These policies are all intertwined as default in one affects the other, and they cover attendance of the following:

- a. Lectures
- b. University General assemblies, which includes chapel services and other mandatory prayer meetings, welcome assembly, departure assembly, public and inaugural lectures, Founder's Day events etc.
- c. Daily roll call at the halls of residence

Consequently, defaults in any of these events jeopardize the University's ability to fulfill her leadership development objectives and therefore attracts punitive implications to the defaulters.

The University has invested in biometrics and other identity capturing mechanisms to ensure the authenticity and effectiveness of attendance data capturing and processing, and all students have been educated on the enrollment protocols and operational modalities.

However, provisions have been made to cater for condonable circumstances in which it is impossible to comply with the attendance policies. Students should familiarize themselves with the guidelines for seeking excuse permits for the approved condonable reasons.

The University Management will communicate the compliance updates of students to their parents and guardian on a weekly basis through emails and SMS, via registered parental email addresses and phone numbers. This is to ensure that parents are abreast of their conducts while on campus and to follow up as necessary.



#### **4.4.2 RESIDENCY CONDUCTS**



#### **Halls of Residence**

The residence life of students is a communal life where a student's moral character and conduct can be molded. The residency policy is to enhance peaceful coexistence amongst the students and facilitate good administration in the Halls of Residence.

#### **Resumption and Closure**

Students are expected to resume and vacate the campus as publicized by the University Management. Any student who refuses to resume on the set date of resumption, except for cases of ill health and other mitigating circumstances, which must have been duly reported to the Dean, Student Affairs prior to resumption, shall be liable for violating the Responsibility Core Value.

#### **Eligibility for Accommodation**

No student shall be granted accommodation unless he or she has completed the residency agreement forms, paid all required fees and been properly registered as a student of the University. It is The Dean, Student Affairs or his representative who assigns accommodation to students.

#### **4.5.3 EXEAT**

Exeats are given to students as necessary. There are three types of exeat: Canaan land Exeat, Day Exeat and Home Exeat. Canaan land Exeats are given to students by their Hall Officers on request while the day and home exeats are given on application to the Dean, Student Affairs through the Hall Officers. Applications for day and home exeats are only granted by the Dean or his/her representative, subject to parental confirmation. No student is allowed to be absent from the Hall of Residence without exeat.

#### **4.5.4 DRESS CODE**

The University attaches great importance to modest and decent dressing. Dressing adds value to a person's personality, self-confidence and self-worth. Indeed, "the way you dress is the way you are addressed." Dress code is one of the unique aspects of Covenant University's culture that students must imbibe to make their academic pursuits pleasurable. The dress code regulations subsist during the academic period, 8.00 am - 6.00 pm.

##### **4.5.4.1 Dress Code for Female Students**

1. Female students must be corporately dressed during normal lectures, public lectures, special ceremonies, Matriculation, Founder's Day, Convocation and examinations. To be corporately dressed connotes a smart skirt suit, skirt and blouse, or a smart dress with a pair of covered shoes. Casual wear is not allowed during University assemblies.
2. All dress and skirt hems must be at least 5 -10 cm (2-4 inches) below the knees.
3. Female students may wear decent "native" attire or foreign wear outside lecture and examination halls.
4. The wearing of sleeveless native attires or baby sleeves and spaghetti straps without a jacket is strictly prohibited in the lecture rooms and in the University environment.
5. Any shirt worn with a waistcoat or armless sweater should be properly tucked into the skirt or lose trousers. It should never be left flying under the waistcoat/armless sweater
6. The waistcoat /armless sweater must rest on the hip. "Bust coats", terminating just below the bust line are not allowed. However, shirts with frills are allowed.
7. Jersey material tops are not allowed for normal lectures and other University assemblies.
8. Skirts could be straight, flared or pleated. Pencil skirts and skirts with uneven edges are not allowed. Lacy skirts are better worn to church. None should be tight or body-hugging.
9. The wearing of dropping shawls or scarves over dresses or dresses with very tiny singlet-like straps (spaghetti strap) is strictly prohibited in the Chapel services, lecture and examination halls and in the University environment.
10. The wearing of strapless blouses or short blouses that do not cover the hip line is strictly prohibited in the lecture and examination halls and in the University environment.

##### **4.5.4.2 Dress Code for Male Students**

Male students are expected to dress corporately to the lecture halls, examination halls and University assemblies. To be corporately dressed connotes wearing a shirt and necktie, a pair of trousers, with or without a jacket, and a pair of covered shoes with socks. The tie knot must be pulled up to the top button of the dress shirt.

1. For national days such as Independence Day, the national dressing code may be observed. Any shirt with indecent inscriptions or any sign with hidden meaning is strictly outlawed.
2. Bandless trousers must never be worn without suspenders. Singlets and shorts above the knee are not allowed.
3. No male student is allowed to wear jumpy trousers i.e. trousers above the ankle in the University.
4. Folding, holding and pocketing of one's tie along the road, lecture halls, University assemblies, etc., is strictly prohibited in the University.
5. Wearing a tie with canvas is not allowed in the University environment. Jerry curls and treated hair are strictly prohibited.
6. Male students may wear "native" or traditional attire outside lecture hours and examination halls, especially during the weekend.
7. No male student is allowed to wear scarves, braided hair, earrings and ankle chains in the University.
8. Wearing of long-sleeved shirts, without buttoning the sleeves is not allowed.
9. Shirt collars should not be left flying while collarless shirts are not allowed.
10. Shirts must be properly tucked into the trousers.

#### **4.5.5 EXAMINATION MISCONDUCT**

Students are admonished not to be involved in any form of examination misconduct as cheating of any kind during examinations is strictly prohibited. Any action by a student, which prejudices the integrity and sanctity of the University examinations, shall be considered to be examination misconduct, punishable by appropriate disciplinary action.

This section summarizes what constitutes examination misconduct. Examination misconduct not covered in this section shall be appropriately addressed by the Student Disciplinary Committee.

##### **Impersonation**

Entering into an agreement with another student or any other person to undertake examination, test, laboratory work or other assignments on behalf of a student.

##### **Unorthodox Means**

Obtaining by any improper means examination papers and using such materials or distributing to other students.

**Falsification of Academic Records for Admission**

Falsifying academic records or submitting false credentials and documents for purposes of gaining admission into the University or for any other academic purpose.

**False Medical Certificate**

Submission of a false medical certificate, or obtaining such a certificate under false pretenses for examinations or any other academic purpose.

**Re-submission of Used Materials**

Submitting an essay, report or assignment to satisfy some, or all of the requirements of a course, when that essay, report or assignment has been previously submitted or is concurrently being submitted for another course whether in this University or any other institution.

**Writing on Unauthorized Materials**

Writing on any unauthorized paper or material(s) during an examination.

**Unauthorized Change of Seating Position**

Changing the assigned seating position in the examination hall without the permission of the Invigilator.

**Possession of Unauthorized Written Materials**

Possession of written or photocopies of relevant notes or notes written on any part of the body, clothing, instruments such as set square, slide rules, rulers, calculator, etc., or having notes written on chairs, tables, desks, neckties or drawing boards during examinations.

**Copying from Unauthorized Materials**

Copying from any book or note on to any part of clothing, body, table, desk or instruments like set square, slide rule, protractors, calculators etc.

**Consulting Recommended Books or Lecture Notes**

Consulting lecture notes or recommended textbooks in any format including digital or electronic during examinations.

**Passing Unauthorized Materials to Others**

Passing any unauthorized material to another student during examinations.

**Receiving Unauthorized Help from Others during Examinations**

Receiving or giving help to another student.

**Destruction of Unauthorised Materials**

Destruction of any unauthorized note or paper found on a student during an examination or refusal to hand over the same.

**Disobeying Examination Instructions**

Disobeying instructions from examination officials. This includes writing before the start of examination or after the call for students to stop writing in an examination.

**Refusal to Complete Misconduct Form**

Refusal to complete examination misconduct form.

**Smuggling of Answer Scripts**

Smuggling in or out of the examination hall, any answer script or continuation sheet or any question paper not meant to be taken out of the examination hall.

**Attacking Invigilator(s) or Lecturer(s)**

Attacking an invigilator or any examination official in or out of the examination hall or exhibiting an unruly behavior towards the Invigilator or Examination Official.

**Failure to Return Examination Booklets**

Failure to return examination booklets after examinations constitutes examination misconduct.

**4.5.6 EXAMINATION MISCONDUCT AND PENALTIES: Pg. 120 of Student Handbook**

S/N	Misconduct	Penalties
1	Cheating during examinations, tests, assignments, etc	Cancellation and forfeiture of marks plus penalty ranging from a letter of caution to expulsion, depending on the gravity of offence.
2	Impersonation	Expulsion
3	Plagiarism	Cancellation and forfeiture of marks plus penalty ranging from a letter of caution to expulsion, depending on the gravity of offence.
4	Unauthorised access to examination materials	Expulsion
5	Unauthorised collection of the item from another student during an examination without the knowledge of the invigilator	Letter of caution

6	Falsification of the evaluation form and other academic records or documents	Expulsion
7	Appearing for examination, without meeting attendance requirement	Letter of caution
8	Disobedience to instructions/disruption during an examination/harassment of invigilator	Disqualification from the examination plus penalty ranging from a letter of caution to expulsion, depending on the gravity of offence
9	Anti-safety behaviour during practicals, workshops, studio work, etc	Letter of caution
10	Attempted inducement of examiners and invigilators	Disqualification from the examination plus penalty ranging from suspension to expulsion
11	Possession/copying of any written materials relevant to the examination	Expulsion
12	Aiding and abetting examination misconduct	Expulsion
13	Destruction of evidence of examination misconduct	Expulsion
14	Refusal to complete examination misconduct form	The penalty ranges from suspension to expulsion, depending on the nature of examination misconduct.
15	Any previous arrangement made for access to examination materials whether it succeeds or not	Suspension to expulsion, depending on the nature of examination misconduct
16	Refusal to submit examination scripts	Failure in the examined course plus penalty ranging from suspension to expulsion
17	Any other misconduct recorded from time to time	Letter of warning to expulsion, depending on the nature of examination misconduct

#### **4.5.7 GENERAL**

##### **University General Assemblies**

University General Assemblies include the following:

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- a. Sunday Worship Services.
- b. Chapel Services.
- c. Founders Day Events, Public/Inaugural Lectures.
- d. Welcome and Departure assemblies.
- e. Other Special Academic or Spiritual Programmes organized by the University Authority.

These assemblies are mandatory for all students of the University. No student is allowed to remain in the room whenever there is a University General Assembly. Students are expected to be seated at least fifteen (15) minutes before the commencement of any General Assembly. The University does not condone any act of lateness. Students must ensure that they sign attendance, in and out, during any such assemblies.

#### **4.5.8 COUNSELLING SUPPORT**

Any student who experiences any emotional or social discomfort should feel free to speak with the Chaplain, the Director of the Counselling Centre, Dean, Student Affairs, Hall Mentors, Hall Officers, or any other officer designated to provide spiritual and emotional counselling to students. Every student is expected to relate well with other students and other members of the University Community.

Covenant University shall perform its role as 'in-loco-parentis' to students and shall assist students to develop spiritually, academically, emotionally, socially and physically during their studentship in the University. The Student Support Programme (SSP) also provides a rich anchor in this respect.

#### **4.5.9 CULTURAL ETHICS**

An important aspect of our culture is respect for elders. All Covenant University students are to give due respect and honor to their elders, faculty and staff of the University.

## **4.6 ACADEMIC STRUCTURE**

### **4.6.1 Course Structure**

The courses offered by Petroleum Engineering students in their five years of study, that is 100 level to 500 level, is presented in Tables 4.8(a-e), respectively.

### **4.6.2 Course Contents**

The courses and course contents that a student of Petroleum Engineering Department must offer successively before the student can graduate with B.Eng Petroleum Engineering from the Department are presented in Table 4.8 (a – e).



**Table 4.8a: 1000 Level Courses by Semester**

	ALPHA SEMESTER					OMEGA SEMESTER					
	Course Code	Course Title	Status	Units	Pre-Requisite	Course Code	Course Title	Status	Units	Pre-Requisite	Total Units
Compulsory Courses	MAT111	Algebra	C	3	-	MAT121	Calculus	C	3	-	
	MAT112	Trigonometry and Geometry	C	3	-	MAT122	Vector Algebra	C	3	-	
	PHY111	Mechanics and Properties of Matter	C	3	-	PHY121	Electricity and Magnetism	C	2	-	
	PHY112	Heat, Sound and Optics	C	3	-	PHY122	Atomic and Nuclear Physics	C	2	-	
	PHY119	Physics Practical I	C	1	-	PHY129	Physics Practical II	C	1	-	
	GEC117	Technical Drawing	C	1	-	CHM122	General Inorganic Chemistry	C	2	-	
	CHM111	General Physical Chemistry	C	3	-	CHM123	General Organic Chemistry	C	3	-	
	CHM119	General Chemistry Practical I	C	1	-	CHM129	General Chemistry Practical II	C	1	-	
	PET 110	Introduction to Petroleum Engineering I	C	1	-						
		<b>Sub-Total</b>		<b>19</b>			<b>Sub-Total</b>		<b>17</b>		<b>36</b>
University Courses	EDS111.	Entrepreneurial Development Studies I	V	1	-	EDS121	Entrepreneurial Development Studies II	V	1	EDS111	
	TMC111	Total Man Concept I	V	1	-	TMC121	Total Man Concept II	V	1	TMC111	
	TMC112	Total Man Concept – Sports I	V	0	-	TMC122	Total Man Concept – Sports II	V	0	TMC112	
		<b>Sub-Total</b>		<b>2</b>			<b>Sub-Total</b>		<b>2</b>		<b>4</b>
NUC Courses	CST111	Computer Applications and Library studies, I	U	2	-	CST121	Computer Applications and Library studies II	U	2	CST111	
	GST111	Communication in English I	U	2	-	GST121	Communication in English II	U	2	GST111	
					-	GST122	Communication in French	U	2	-	
		<b>Sub-Total</b>		<b>4</b>			<b>Sub-Total</b>		<b>6</b>		<b>10</b>
		<b>TOTAL</b>		<b>25</b>			<b>TOTAL</b>		<b>25</b>		<b>50</b>

**Table 4.8b: 200 Level Courses by Semesters**

	ALPHA SEMESTER					OMEGA SEMESTER					
	Course Code	Course Title	Status	Units	Pre-Requisite	Course Code	Course Title	Status	Units	Pre-Requisite	Total Units
Compulsory Courses	GEC210	Engineering Mathematics I	C	3	MAT121	GEC220	Engineering Mathematics II	C	3	GEC210	
	GEC211	Fundamentals of Electrical Engineering I	C	2	PHY121	GEC221	Thermodynamics	C	3	-	
	GEC212	Engineering Graphics	C	2	GEC117	GEC222	Computer Aided Design & Manufacture	C	2	GEC117	
	GEC213	Material Science in Engineering	C	2	-	GEC223	Fluid Mechanics I	C	3	-	
	GEC214	Applied Mechanics	C	3	-	GEC224	Strength of Materials	C	3	-	
	GEC215	Applied Computer Programming I	C	2	CST121	GEC225	Applied Computer Programming II	C	1	GEC215	
	GEC216	General Engineering Laboratory I	C	1	-	GEC226	General Engineering Laboratory II	C	1	GEC216	
	GEC217	Engineer-In-Society	C	2	-	GEC228	Fundamentals of Electrical Engineering II	C	2	GEC211	
	GEC218	Workshop Technology	C	2	-	GEC229	Student Workshop Experience Program (SWEP)	R	0	-	
	GEC219	Applied Mechanics Practical	C	1	-						
	PET 210	Introduction to Petroleum Engineering	C	1	-						
		<b>Sub-Total</b>		<b>21</b>			<b>Sub-Total</b>		<b>18</b>		<b>39</b>
University Courses	EDS211	Entrepreneurial Development Studies III	V	1	EDS121	EDS221	Entrepreneurial Development Studies IV	V	1	EDS211	
	TMC211	Total Man Concept III	V	1	TMC121	TMC221	Total Man Concept IV	V	1	TMC211	
	TMC212	Total Man Concept – Sports III	V	0	TMC122	TMC222	Total Man Concept – Sports IV	V	0	TMC212	
		<b>Sub-Total</b>		<b>2</b>			<b>Sub-Total</b>		<b>2</b>		<b>4</b>
NUC Courses	GST211	Logic, Philosophy and Human Existence	U	2	GST121	GST221	Nigerian People and Culture	U	2		
						GST222	Peace Studies and Conflict Resolution	U	2		
		<b>Sub-Total</b>		<b>2</b>			<b>Sub-Total</b>		<b>4</b>		<b>6</b>
		<b>TOTAL</b>		<b>25</b>			<b>TOTAL</b>		<b>24</b>		<b>49</b>

**Table 4.8c: 300 Level Courses by Semesters**

	ALPHA SEMESTER					OMEGA SEMESTER					
	Course Code	Course Title	Status	Units	Pre-Requisite	Course Code	Course Title	Status	Units	Pre-Requisite	Total Units
Compulsory Courses	GEC310	Engineering Mathematics III	C	3	GEC210	GEC340	Engineering mathematics IV (Numerical Methods)	C	3	GEC310	
	PET312	Petroleum Geology	C	3	-	GEC321	Engineering Economics	C	3	-	
	PET317	Formation Evaluation - Rock Properties	C	3		GEC324	Technical Communication	C	2		
	PET314	Drilling Engineering I	C	3	-	GEC329	Student Industrial Work Experience scheme (SIWES I)	R	0		
	PET318	Petroleum Production Engineering I	C	3		PET321	Structural Geology	C	2	PET312	
	PET316	Heat and Mass Transfer	C	3		PET323	Reservoir Engineering, I	C	3	PET317	
	MCE 317	Fluid Mechanics I	C	2	GEC 223	PET324	Drilling Fluid Technology	C	3	PET314	
						PET328	Computer Application and Machine Learning Petroleum Engineering	C	2	GEC225	
						PET327	Petroleum Engineering Laboratory I	C	3	-	
		<b>Sub-Total</b>		<b>20</b>			<b>Sub-Total</b>		<b>21</b>		<b>41</b>
University Courses	EDS311	Entrepreneurial Development Studies V	V	1	EDS221	EDS321	Entrepreneurial Development Studies VI	V	1	EDS311	
	TMC311	Total Man Concept V	V	1	TMC221	TMC321	Total Man Concept VI	V	1	TMC311	
	TMC312	Total Man Concept – Sports V	V	0	TMC222	TMC322	Total Man Concept – Sports VI	V	0	TMC312	
		<b>Sub-Total</b>		<b>2</b>			<b>Sub-Total</b>		<b>2</b>		<b>4</b>
NUC Courses	GST311	History and Philosophy of Science	U	2							
		<b>Sub-Total</b>		<b>2</b>							<b>2</b>
		<b>TOTAL</b>		<b>24</b>			<b>TOTAL</b>		<b>23</b>		<b>47</b>

**Table 4.8d: 400 Level Courses by Semesters**

	ALPHA SEMESTER					OMEGA SEMESTER					
Compulsory Courses	Course Code	Course Title	Status	Units	Pre-Requisite	Course Code	Course Title	Status	Units	Pre-Requisite	Total Units
	GEC410	Engineering Statistics	C	3	-	GEC427	SWEP II	R	6	-	
	PET410	Applied Geophysics and Petroleum Exploration	C	2	PET312	GEC428	SWEP III	R	6	GEC229	
	PET413	Reservoir Engineering II (with Machine learning option)	C	3	PET323	GEC429	SIWES – Industrial Training SIWES III	R	6	GEC329	
	PET414	Well logging and Interpretation (with Machine learning option)	C	3	-						
	PET411	Rock Physics and Formation Mechanics	C	3	PET317						
	PET419	Drilling Engineering II (with Machine learning option)	C	3	PET314						
	PET418	Petroleum Production Engineering II (with Machine learning option)	C	3	PET318						
	PET 431	Oil and Gas Property Evaluation and Project Economics	C	2	-						
		Sub-Total		22			Sub-Total		18		
University Courses	EDS411	Entrepreneurial Development Studies VII	V	1	EDS321						
	TMC411	Total Man Concept VII	V	1	TMC322						
	TMC412	Total Man Concept – Sports VII	V	0							
		Sub-Total		2							2
		TOTAL		24			Total		18		42

\* Zero unit of SWEP in 200 and 300 Levels included as 6 units each in 400 Level

\*\* This includes 12 units of SWEP in 200 and 300 Levels

**Table 4.8e: 500 Level Courses by Semesters**

	ALPHA SEMESTER					OMEGA SEMESTER					
Compulsory Courses	Course Code	Course Title	Status	Units	Pre-Requisite	Course Code	Course Title	Status	Units	Pre-Requisite	Total Units
	GEC517	Engineering Law	C	2	-	PET524	Petroleum Reservoir Modeling and Simulation	C	3	PET323	
	PET510	Enhanced Oil Recovery	C	2	PET323	PET520	Petroleum Refinery Technology	C	3	-	
	PET531	Petroleum Production Engineering III	C	3	PET418	PET527	Petroleum Engineering Laboratory II	C	3	PET317	
	PET533	Petroleum Reservoir Engineering III	C	3	PET413	PET529	Research Project	C	6		
	PET534	Drilling Engineering III	C	3	PET417						
	PET536	Offshore Operations	C	2	-						
		Sub-Total		15			Sub-Total		15		
Electives	Note: Select 3 Units from these electives.					Note: Select 3 Units from these electives					
	PET537	Multiphase Oil & Gas Flow in Pipes	E	3	MCE317	PET543	Oil and Gas Field Development Planning/Project Design	E	3	PET431	
	PET539	Petroleum Products Transport and Storage	E	3	-	PET544	Process Systems Technology	E	3		
	PET 538	Petroleum Data Analytics and Machine Learning	E	3	PET 328	PET542	Oil Industry Hazards & Pollution Control	E	3	-	
	PET530	Natural Gas Processing Systems	E	3	-						
		Sub-Total		3			Sub-Total		3		6
University Courses	EDS511	Cost Engineering	V	2	-	EDS521	Engineering Valuation	V	2	EDS511	
	TMC511	Total Man Concept IX	V	1	TMC411	TMC521	Total Man Concept X	V	1	TMC511	
	TMC512	Total Man Concept – Sports IX	V	0	TMC412	TMC522	Total Man Concept – Sports X	V	0	TMC512	
		Sub-Total		3			Sub-Total		3		6
		TOTAL		21			TOTAL		21		42

## 4.6.3 Course Description/ Synopsis

### 4.6.3.1 Detailed Course Description – 100 Level

#### ALPHA SEMESTER – 100 LEVEL

##### **GEC117: Technical Drawing I** (1 Unit: PH 45)

Introduction to engineering drawing as a means of communication, use of drawing instruments, drawing paper format, types of lines and their uses in engineering drawing, plane geometry, circles and tangents, conic sections, Loci (cycloid, epicycloids, hypocycloid, involute, Archimedean spiral, Eclipse, hyperbola, parabola, including approximate method), theory of projection, parallel projection, orthographic projection, axonometric projection, perspective projection multiview representation, 1st and 3rd angle projection, isometric drawings, oblique drawings, Freehand sketching.

##### **MAT111: Mathematics I** (3 Units: LH 45)

Algebra of set theory: Definition of concepts, laws of algebra of sets, Venn diagram and application. Real Numbers: Rational numbers, theory of surds, sequences and series (including AGP), binomial theorem, theory of quadratic, cubic and quartic equations, indices and logarithms, mathematical induction, partial fractions, theory of equations, inequalities and polynomials (including factor and remainder theorems). Complex Numbers: Algebra of complex numbers, Argand diagram, multiplication and division of numbers in polar form,  $n$ th root of unity, and DeMoivre's theorem, expansion of  $\sin n\theta$ ,  $\cos n\theta$ ,  $\tan n\theta$ .

##### **MAT112: Mathematics II** (3 Units: LH 45)

Trigonometry and analytic geometry in (2-D & 3-D): Elements of trigonometry, circular measure, elementary treatment of circles, coordinate geometry: straight lines in (2B-D); plans. Functions and relations: permutation and algebra of functions, Binary operations, Permutations and combinations, elementary treatment of logic.

##### **PHY111: Mechanics and Properties of Matter** (3 Units: LH 45)

Units and dimensions, scalars and vectors, particle kinematics, Newton's laws, friction, work, energy, centre of mass, simple harmonic motion, rigid body dynamics, Kepler's laws, pressure in fluids, intermolecular forces, Hooke's law, Young's modulus, fluid flow streamline turbulence, Stokes's law, surface tension.

##### **PHY112: Heat, Sound and Optics** (3 Units: LH 45)

Temperature, thermometers, heat transfer, PVT –surfaces, Kinetic theory, first and second laws of thermodynamic, transverse and longitudinal waves, standing waves, intensity, beats. Doppler Effect, Electromagnetic spectrum. Huygens's principle, images formed by a single surface thin lenses, aberrations, the eye, optical instruments, interface, single slit, diffraction grating, polarization, Malus' law.

**PHY119: Physics Practical I****(1 Unit: PH 45)**

A selection from the following experiments use of measuring instruments, viscosity, surface tension oscillations about an equilibrium position, Hooke's law, moment of inertia, focal lengths of lenses, refractive index, optical instruments, the sonometer heat capacity, volume expansion and latent heat.

**CHM111: General Physical Chemistry****(3 Units: LH 45)**

Historical development of the atom: atoms, Dalton's atomic theory, atomic masses. Fundamental particles of the atom atomic structure. Modern electronic theory of atoms. Periodicity of the elements. Stoichiometry mole concept, chemical formulas, equations and calculations. State of matter; gas, liquid and solid. Chemical energetics and thermochemistry. Chemical kinetics, equilibria and electrochemistry.

**CHM119: General Chemistry Practical****(1 Unit: PH 45)**

Quantitative inorganic and organic analysis for elements in Groups I, II, IIIA, IIIB, IV. Chemical analysis for functional groups: acidic, ketonic carboxylic, etc.

**PET110: Introduction to Petroleum Engineering - I** **(1 Unit: LH 30, TH 0, PH 0)**

World energy, Characteristics of hydrocarbons, Formation and historical development, Introduction to petroleum industry, Phases in petroleum engineering (exploration, drilling, reservoir, production, formation evaluation, etc).

**GST111: Communication in English I****(2 Units: LH 30)**

This course focuses on developing effective study skills, the library and other information sources, communication skills, listening and speaking skills.

**CST111: Computer Applications and Library Studies I****(2 Units: LH 15, PH 30)***Libraries and Society:*

History of the development of libraries, the roles of libraries in various communities, cultural and educational revival, the role of libraries in adult literacy programmes, user studies, planning library services in developing countries.

*Library Resources and their Role in Education:*

Information bearing media: books, serials, cartographic materials, CD-ROMs, sound recordings, motion pictures, graphics, machine readable data, use of library materials by teachers and students.

*Reference Sources and Services:*

Introduction to reference and Bibliography. Definition and concept of reference services, characteristics and uses of different types of reference materials; selection and evaluation of reference works.

*Conservation of Library Materials:*

History of paper and printing, causes of damage to paper with emphasis on tropical areas, processes of book repair or restoration, preservation and repair of non-book materials, library crimes and security.

*Using the Covenant University Library.*

Identification of PC parts and peripheral devices: functions, applications, and how to use them. Safety precautions. Procedure for booting a PC. Filing system: directory, sub-directory, file,

path, and how to locate them. Word processing: principle of operation, application, demonstration and practical hands-on exercises in word processing using a popular word processing package. Internet: services available, principle of operation, application, demonstration and hand-on practical exercises on e-mail and www using popular packages.

**CIT111: Microsoft Office Specialist on Microsoft Office 2013 in WORD**

Create and manage documents, Format text, paragraphs, and sections, Create tables and lists, Apply references, Insert and format object.



## OMEGA SEMESTER – 100 LEVEL

### **PHY121: Electricity and Magnetism**

**(2 Units: LH 30)**

Coulomb's law, ohm's law, Gauss' Law, capacitors, Ohm's law, Kirchoff's laws, Electrical energy, DC bridges, potentiometer, magnetic effect of current, electromagnetic induction, moving coil and ballistic galvanometers, multi-meters, DC and AC motors and generators, hysteresis, power in AC circuits, semiconductors, conductivity and mobility, rectification.

### **PHY122: Atomic and Nuclear Physics**

**(2 Units: LH 30)**

Theory of atomic structure., Thompson, Rutherford and Bohr's theories, the hydrogen atom, properties of the electron,  $e/m$ , CRO, Millikan's experiment, properties of the nucleus, natural radioactivity, wave particle duality of light, x-rays, photo electricity, thermionic emission, diode valve.

### **PHY129: Physics Practical II**

**(1 Unit: PH 45)**

A selection from the following experiments, potential difference and internal resistance of cells, uses of potentiometer circuit, the meter bridge, simple direct current measuring instruments, Planck's constant, radioactivity.

### **MAT121: Mathematics V – Calculus**

**(3 Units: LH 45)**

Functions of Real Variables: Graph, Limits and Concepts of Continuity. Techniques of Differentiation of Algebraic and Trigonometric Functions, Higher Order Derivates, Maxima and Minimal, Leibnitz Rule, Application of Differentiation. Integration as Inverse of Differentiation, Methods of Integration, Definite Integra. Application to Areas, Volumes, Moment of Inertial. Approximate Integration: Trapezoidal and Simpson's Rule. Taylor's and Mclaurin's Theorems, partial Differentiation and Implicit Differentiation.

### **MAT122: Mathematics VI - Vector Algebra**

**(3 Units: LH 30)**

3-Dimensional Cartesian Coordinate Systems. Definition and Representation of Vectors, Algebra of Vectors, Multiplication of a Vector by a Scalar, Addition of Vectors, Scalar Products of two Vectors, Direction Cosines, Calculus of Vector Functions, Differentiation of Vector Function, Integration of Vector Function. Conic: Circles, Parabola, Ellipse and Hyperbola.

### **CHM122: General Inorganic Chemistry**

**(2 Units: LH 30)**

Periodic table and periodic properties, chemical bonding, structures of solids. The chemistry of selected representative elements. Quantitative analysis, hybridization.

### **CHM123: General Organic Chemistry**

**(3 Units: LH 45)**

Bonding in organic molecules: covalent and ionic bonding, intermolecular forces, hydrogen bonding, relationship between type of bonding and physical properties. Alkanes: structure, nomenclature, conformation, petroleum, natural gas, combustion, fuels, octane rating, reforming. Unsaturated hydrocarbons: alkenes, alkynes, laboratory methods of preparation, reactions at double bond; aromatic hydrocarbons, sources, electrophilic substitution, synthetic fuels, Fischer-Tropsch process. Stereochemistry: Configurational and Constitutional isomerism. Organic halogen compounds: characteristic reactions and uses, chain reactions, organochloro pesticides, refrigerants. Alcohols, phenols, and ethers: properties, reactions, and

uses; commercial production of phenol, ethanol, and ethylene glycol. Carbonyl compounds: aldehydes and ketones, properties, reactions and uses; commercial preparations of acetone. Carboxylic acids: acidity, esters, fats, oils, detergents, micelles, surfactants. Nitrogen compounds: amines, diazo compounds, nitro compounds and explosives, amides, nitriles. Carbohydrates: sugars, starch, cellulose, wood. Amino acids: structure and general properties.

### **CHM129: General Practical Chemistry II**

**(1 Unit: PH 45)**

Qualitative inorganic and organic analysis for elements in Groups I, II, IIIA, IIIB, IV. Chemical analysis for functional groups: acidic, ketonic, carboxylic, etc.

### **CST121: Computer Applications and Library Studies II**

**(2 Units: LH 15, PH 45)**

*Audio-visual resources:*

Variety and forms, selection organization and uses, operation and care of both hard and software's. In-house production of audio-visual resources. This demands a lot of cooperation between library staff and lectures.

*Documentation:*

Definition, genesis and growth; basic functions, theory and techniques of analyzing, storing and retrieving information through manual and mechanical applications; abstracting; indexing principles and methods.

*Serials Librarianship:*

Types of serials, importance of serials, selection, organization and uses, storage of serials, print and microform, ISSN, users access through abstracts and indexes.

*Library Automation:*

Computers literacy, different types of computers, programming, designs. Value of computers in the library, OPAC, Online database, Internet, search engines, digitization, virtual library etc.

Overcoming Library Abuse:

Spreadsheet: principle of operation, application, demonstration and practical hand-on exercises in spreadsheet using a popular spreadsheet package. Database Management: principle of operation, application, demonstration and practical hand-on exercises in using a popular relational Database Management package. Report presentation Software package: principle of operation, application, demonstration and practical hand-on exercises in using a popular report presentation package such as Power Point package. Mini-Project to test proficiency in use of the software packages.

### **GST121: Communication in English II**

**(2 Units: LH 30)**

This course focuses on introducing basic aspects of English grammar, developing effective reading and writing skills across disciplines. Style in communication. Revision and self-editing strategies.

### **GST122: Communication in French**

**(2 Units: LH 30)**

The course is designed to enable students to acquire basic conversational/speaking and writing skills. Attention will therefore be focused on the basic grammatical structure and relevant items of vocabulary (lexical items) of the language. The course will be essentially oral but there will also be (reading) comprehension composition (writing) exercises. Module 1: Essentials of the French Language, Pronunciation versus spelling/orthography, pronunciation and recognition of French sounds, Greetings and introducing self, Module 2: Meeting people and introducing them,

Describing people: Professions and nationalities, Describing self: family and school, Telling age: days of the week and month of the year, Describing places: countries and cities/towns, Mid-semesters Examination. Module 3: Making request, Making travel arrangements, Departure and arrival at destination, Ordering a meal in a restaurant, Shopping for clothes and other items, Banking transaction of visitor tourist, Revision, and (End of Semester) Examinations.

**CIT121: Microsoft Office Specialist on Microsoft Office 2013 in EXCEL**

Create and manage worksheets and workbooks, create cells and ranges, create tables, Apply formulas and functions, Create charts and objects

#### 4.6.3.2 Detailed Course Description – 200 Level

##### ALPHA SEMESTER – 200 LEVEL

##### **GEC210: Engineering Mathematics I**

**(3 Units: LH 45)**

Functions, inverse trigonometric functions and principal values, hyperbolic & its inverse, graphs. Concepts of continuity and differentiability. Mean-value theorem. Taylor's series expansion. Integration by parts. Sequences: real numbers, monotone, convergence, limits. Infinite series: convergence tests, addition, multiplication. Power series, radius of convergence, integration, differentiation. Real and imaginary parts, the complex plane, terminology and notation. Complex algebra, DeMoivre's theorem, powers and roots of complex numbers. Euler formula. Elementary functions of a complex variable, polynomials, rational, exponential, trigonometric, hyperbolic, logarithmic, inverse trigonometric and inverse hyperbolic functions. Vectors in  $R_n$  space, addition and scalar multiplication, linear combination of vectors, idea of linear dependence and independence. Dot and cross products, triple products, lines and planes.

##### **GEC211: Fundamentals of Electrical Engineering I**

**(2 Units: LH 30)**

Fundamentals of electric, electromagnetic and electrostatic circuits. Transients in RC and RL dc circuits. Steady-state dc circuit analysis: Source conversion, Kirchhoff's laws, Mesh analysis, nodal analysis, Thevenin and Norton theorems, superposition principle, star-delta transformation, Maximum power transfer. Steady-state ac circuit analysis: Phasors and phasor diagrams, Power triangle, power factor and power factor improvement, frequency response of RLC circuits, resonance. Introduction to simple diode and transistor circuits and characteristics: Amplification & rectification. Introduction to digital systems.

##### **GEC212: Engineering Graphics**

**(2 Units: LH 15, PH 45)**

Introduction, Uses and types of Engineering drawing, Dimensioning, Principle of Tangency, Orthographic projection, Isometric projection, Oblique projection (with harder examples), Auxiliary Views, Sectioning, True length of Lines and shapes, Interpenetration of Solids, Development of Surfaces, Introduction to Electronic drafting and Architectural drawings. Freehand or Technical drawings (with harder examples), Machine Drawing, Graphical calculus, electrical and communication, and IT symbols and introduction to assembly drawing, working drawings.

##### **GEC213: Materials Science & Engineering**

**(2 Units: LH 30)**

Introduction, Atomic structure & interatomic bondings. The structure of crystalline solids. Imperfections in solids. Diffusion. Mechanical properties of metals. Dislocations and strengthening Mechanisms. Corrosion; effects and control. Failure phase diagrams. Phase transformations in metals. Development of microstructure and alteration of mechanical properties. Thermal processing of metal Alloys. Metal alloys. Structure, Properties, characteristics, applications and processing of polymers, ceramics and composites. Electrical properties.

**GEC214: Applied Mechanics****(4 Units: LH 45, PH 45)**

**Statics:** Principles of mechanics. Forces, Moment Couples, Laws of Mechanics. Coplanar forces and their resultants. First and Second Moments of area. Centroids. Distributed line loads and their resultants. Application of vectors to resolution of forces. Equilibrium of particles. Free body Diagrams.

**Dynamics:** Kinematics of particles and rigid body kinematics in plane motion. Application of Newton's laws of motion. Rigid body translation, rotation about fixed axis and the velocity and acceleration of general plane motion. Relative motion of two particles. Dependent motion of particles. Instantaneous centre of rotation. Kinetics of particles, kinetic energy; principles of work and energy impulse and momentum analysis.

**GEC215: Applied Computer Programming I****(2 Units: LH 15, PH 45)**

Software development life cycle (SDLC): Definitions, SDLC models: Waterfall model, V-shaped model, Incremental Model, Spiral Model. Program Design: Algorithms: Key features of algorithms and different ways of presenting algorithms. Flow charting of algorithms.

Linux System Architecture: Determine and configure hardware settings, boot the system and shutdown system using run levels. Linux installation and Software management: design hard disk layout and install software using the Debian, RPM and Yum package managers. GNU and UNIX commands: work on the command line for text streaming and file management. Device and Linux File Systems: Create and manage file systems and file permissions. Shell Programming: customise environment using shell scripts.

Introductory C Programming concepts: operators and expression, data input and output, control statements, functions, arrays, pointers, structures and unions, data files and low level programming, create and solve simple science and engineering problems using C programming

**GEC216: Engineering Laboratory 1****(1 Unit: PH 45)**

Laboratory investigations and report submission on selected experiments and projects drawn from introduction to Electrical Engineering, Materials Science, Applied Mechanics, Applied Computer Programming I and Workshop Technology Courses.

**GEC217: Engineer-In-Society****(2 Unit: LH 30)**

Science, Technology and Development: Ethical concepts of development. Indicators of development, and the role of science and technology. The contribution of the Government to the process of development and the Nigerian experience in the process of economic development (Nigerian Five Year Development Plans, successes and setbacks). Limits of growth, appropriate technology and a new world of science and technology. Science, Technology and Society: The inter-relationship of social ethics and values, and science and technology. Societal needs and resources in the genesis and development of science and technology. Social problems, impact assessment, and control of science and technology. Responsibilities of engineers. Science, Technology and Environment: Disruption or enhancement of environmental quality through harmful or sound science and technology in relation to air, space, water, land, populations, agriculture, industry, wild life, human settlements, culture, education, etc. Ethics and Professionalism: Theistic and secular concepts of personal, social and professional ethics. Codes of conduct of engineers. Motivation, control, responsibility, rewards and accountability of engineers and development of an ethical engineering professionalism. Council of Engineers and Engineering Societies.

**GEC218: Workshop Technology****(2 Units: LH 15, PH 45)**

Introduction to engineering workshop practice covering mechanical, electrical, information engineering, civil, chemical, and petroleum engineering. Machine operation practice. Use of hand tools, and safety measures in these fields.

**PET210: Introduction to Petroleum Engineering - II (1 Unit: LH 30, PH 0, TH 0)**

Economics of the industry, Politics of oil (OPEC and international markets), Development of petroleum in Nigeria, Contracts and agreements, Concept of units and dimensions, Carbon Capture Utilization & Sequestration/Storage (in Depleted Oil & Gas Reservoirs & Saline Aquifer)

**GST211: Logic, Philosophy and Human Existence****(2 Units: LH 30)**

The aim of this course is to expose students to the meaning of philosophy and a brief survey of its branches. While discussing its major branches, emphasis will be on Logic. The topics to be taught in this respect will include Symbolic logic, Quantificational theory and Logical rules. Other sub-topics will include arguments and evidence, fallacies, statements and sentences, laws of thought, rules of inference and deduction and analogical reasoning. The course will also provide valuable insights into the origin and content of traditional logic.

**CIT213: AutoCAD Certified User - AutoCAD**

Apply Basic Drawing Skills, Use Drawing Aids, Edit Entities, Work With Curves, Object Visibility and Appearance, Use Blocks and Xrefs, Use Hatching And Gradients, Create and Edit Text, Dimensioning, Layouts and Annotative Objects, Printing and Plotting

**OMEGA SEMESTER – 200 LEVEL****GEC220: Engineering Mathematics II****(3 Units: LH 45)**

Partial Differentiation: Functions of several variables, continuity and partial derivatives. Total differentials, approximate calculations using differentials. Chain rule. Implicit differentiation. Series representation of functions (Maclaurin & Taylor's), Taylor's Theorem. Extremum problems, (analytic method) without and with constraints, Lagrange multipliers, global extremum. Ordinary Differential Equations: Definition, degree, order, linear, non-linear, solution. First order equations, separable variables, equations reducible to separable form, exact equations, integrating factors, homogenous differential equations. Modeling of engineering systems leading to first order differential equations- electric circuit, mixing/dilution, radioactive decay, bacterial culture. 2<sup>nd</sup> order differential equations with constant coefficients, homogeneous, non-homogeneous, complementary functions, particular integrals, D-operator method. General linear second-order differential equations (without using matrices). Power series solution, Legendre's differential equation. Modeling of engineering systems leading to 2<sup>nd</sup> order differential equations- electric circuit, mechanical oscillations-free and forced, resonance.

Matrices and Determinants: Solution of system of linear equations by determinants. Linear dependence and independence, rank of a matrix. General system of linear equations, existence and properties of solution, Gaussian elimination. Matrix inverse by elementary matrices, adjoint, and partitioning methods. Characteristic polynomial, characteristic equation, eigenvalues and eigenvectors.

**GEC221: Thermodynamics (3 Units: LH 45)**

Basic concepts, energy and energy conversions and surroundings, temperature of scales, quantitative relations of zeroth, first, second and third laws of thermodynamics. Steady flow energy equations. Heat and work. Behaviour of pure substances and perfect gases. Applications of the first law. Use of steam tables and charts.

**GEC222: Computer Aided Design & Manufacture (2 Units: LH 15, PH 45)**

Introduction to CAD/CAM, Area of its applications and important. How CAD/CAM works. Extensive introduction to CAD package i.e. AutoCAD. Hand-on practical approach is used especially for CAD application.

**GEC223: Fluid Mechanics 1 (3 Units: LH 45)**

Introduction: Properties of fluids: Density, Pressure, surface tension, viscosity, compressibility etc. Fluid statics. Buoyancy of floating bodies. Fluid dynamics. Basic conservation laws. Friction effects and losses in laminar and turbulent flows in ducts and pipes. Dimensional analysis and dynamic similitude.

**GEC224: Strength of Materials (3 Units: LH 45)**

Forces, moments. Equilibrium of simple structures and machine parts. Hookes's law stresses and strains due to loading and temperature change. Stress circle. Deflection of beams. Shear forces and bending moments. Analytical and graphical methods for structures.

**GEC225: Applied Computer Programming II (1 Unit: PH 45)**

C Language Overview and Program Structure, Arduino C and Data types, PIC Microcontroller. Decision making in C. Program Loops in C. Functions in C. Storage Classes and Scope. Introduction to Pointers. Using Pointers Effectively. Structures, Unions and Data Storage. Arduino Libraries. Interfacing with the Outside World. Introduction to OOP C++.

The aims of this course are to acquire hand-on skills of C Programming for Computer Aided Engineering in the industry and to construct simple C programs using microcontrollers such as Arduino and Microchip PIC

**GEC226: Engineering Laboratory II (1 Unit: PH 45)**

Laboratory investigations and report submission on selected experiments and projects drawn from introduction to electrical Engineering, Materials science, Applied Mechanics, Applied computer Programming I, and Workshop Technology courses.

**GEC228: Fundamentals of Electrical Engineering II (2 Units: LH 30)**

Analysis of Magnetic circuits, Hysteresis and eddy currents, three phase circuits, three-phase power measurement, Transformer theory; short-circuit and open-circuit tests, voltage regulation, efficiency. Electrical machines; constructional features and operation of dc generators and motors; single-phase and 3-phase motors and generators, electric energy utilization for lighting and heating. Tariffs.

**GEC229: Student Workshop Experience Programme (SWEP) SIWES I (6 Unit: PH 270)**

*\*\* Course registered in 400 Level Omega Semester but conducted during the long vacation*

Introduction to practices and skills through supervised hands-on workshop exercises in each engineering departments: Mechanical Engineering (Fabrication, welding, Machining, Foundry, Automotive operations, etc.), Chemical Engineering (bar and liquid soap, creams, paints, etc), Civil Engineering, Computer Engineering (soldering and desoldering, building of different circuits, etc.), Petroleum Engineering, Electrical Electronics (surface and conduit wiring, etc), Information and Communication Technology (DSTV and Dish installation).

Working in the construction site if available during the period. Introduction to Networking Operation Center (Satellite Broad casting), Bakery Operation (Bread Production), Water Table, sachet and Hebron Juice Production, Printing Technology, Firefighting Exercise and other available related general engineering practice on campus. These exercises include familiarization with basic tools, troubleshooting. Safety precautions in handling devices in each workshop.

### **GST221: Nigerian People and Culture**

**(2 Units: LH 30)**

The concept of culture. Study of Nigerian history, culture and arts in pre-colonial times. Social beliefs and the Nigerian's perception of his world. Culture areas of Nigeria and their characteristics. Evolution of Nigeria as political unit. Indigene/settler phenomenon. Concepts of trade, economic self-reliance and social justice. Individual and national development, norms and values. Negative attitudes and conducts (cultism and related vices). Re-orientation of moral and national values as well as moral obligations of citizens. Environmental problems.

### **GST222: Peace Studies and Conflict Resolution**

**(2 Units: LH 30)**

The concept of conflict: Definitions, Constructive and Destructive angles to understand conflict. The causes of conflict: Contradicting value systems, Competition for scarce resources, Psychological needs of people, Perception (self, others, circumstances, interests), Manipulations of information. Conflict Handling Styles: Avoidance, Confrontation, Role-Playing, Third-Party decision-making, Joint-Problem Solving, Compromising. The life angle of conflict: From Organization-transformation. The concept of peace: Definition of concept; Peace-making, Peace-keeping. Power and conflict: Types of power - Expert power, Referent power, Legitimate power, Reward power, Coercive power.

### **CIT222: Autodesk Certified Professional - AutoCAD**

Apply Basic Drawing Skills, Use Drawing Aids, Edit Entities, Work With Curves, Object Visibility and Appearance, Use Blocks and Xrefs, Use Hatching And Gradients, Create and Edit Text, Dimensioning, Layouts and Annotative Objects, Printing and Plotting



#### 4.6.3.3 Detailed Course Description – 300 Level

##### ALPHA SEMESTER – 300 LEVEL

##### **GEC310 Engineering Mathematics-III (3 Units: LH 45)**

Matrices and Determinants: Matrices, some special matrices, matrix operations. Determinants and some useful theorems. Laplace's development. Solution of system of linear equations by determinants. Linear dependence and independence, rank of a matrix. General system of linear equations, existence and properties of solution, Gaussian elimination. Matrix inverse by elementary matrices, adjoint, and partitioning methods. Characteristic polynomial, characteristic equation, eigenvalues and eigenvectors. Diagonalization of matrices, application to system of first order linear differential equations. Multiple Integrals: Iterated integrals, multiple integrals over elementary regions. Change of variables, Jacobians. Differentiation of integrals involving a parameter, Leibniz's rule.

Vector Algebra: Vector field, gradient and directional derivative, divergence, curl. Line and surface integrals, Stoke's theorem. Volume integrals, divergence theorem. Orthogonal transformations, scale factors, basis vectors. Cylindrical and spherical polar coordinate systems, gradient, divergence and curl in these systems. Fourier Series: periodic functions, trigonometric series. Fourier coefficients, Parseval's theorem, Functions of arbitrary period, even and odd functions. Half range expansion. Complex form of Fourier series. Integral Transform: Derivation of transforms and inverses (Fourier and Laplace). Applications of these transforms in boundary and initial value problems. Z transforms. Partial Differential Equations: Elementary properties of Gamma, Beta, Error, Bessel functions and Legendre polynomials. Basic concepts of partial differential equations. Classification of 2nd order linear partial differential equation into basic types. The principle of superposition. The wave, diffusion and Poisson's equations. Boundary and initial-value problems. D'Alembert's solution for wave equation. Method of separation of variables. Bi-harmonic equation

##### **PET312: Petroleum Geology (3 Units: LH 45)**

Minerals & rocks, Plate tectonics, Geological time & history, Weathering, erosion, & deposition, Geological cycles, Sedimentary processes (sediment transport and deposition and Diagenesis), Reservoirs, Petroleum prospecting, Use of Geological Data, Structural geology & petroleum, Origin, migration, & accumulation of petroleum and gas, Reservoirs, Geology of Sedimentary basin (Basins in Nigeria and Africa), PETREL (State of the art industrial software) Fundamentals and PETREL Geology, Building of 3D Geological Models using PETREL.

**PET317: Formation Evaluation – Rock Properties****(3 Units: LH 45)**

Overview of formation evaluation- Definition; petrophysical parameters; Formation evaluation techniques (Mud logging, Wireline logging, Coring, Drill stem testing, Measurement-while-drilling and logging-while-drilling, NMR, Borehole Imaging); Advantages and disadvantages of various methods. Mud logging: Definition; Mud logging information (Rock characterization, rate of penetration, gas and oil detection, e.t.c. Wireline logging: Historical background, Logging operations, Types of logging methods and tools. Conventional Core Analysis: porosity, saturation and permeability measurement. Special Core Analysis (SCAL)- wettability, Capillary Pressure and Relative Permeability measurement. Introduction to Well Testing and Drill stem testing. Introduction to NMR, MWD, LWD, and Borehole Imaging. Data Integration: Integration of data from various sources (log, core and well test) for the evaluation of hydrocarbon reservoirs

**PET314: Drilling Engineering I****(3 Units: LH 45)**

Techniques for oil well drilling. Drilling rigs; equipment, hoisting, drill string, casing drill bits. Circulating system, drilling fluids, drilling hydraulics. Well head equipment. Drilling and casing programs. Drilling performance. Offshore drilling rigs.

**PET318: Petroleum Production Engineering I****(3 Units: LH 45)**

Properties of oil and Gas: Composition of oil and natural gas; classification of crude oil; natural gas. Well Completion: Tubing; types, tubing equipment, uses of tubing, calculations; use of wirelines, packers-types, uses; multiple zone completion; well heads – casing and tubing hangers; Christmas tree. Cruptive Production: Gas-oil ratio (GOR); productivity index; fluid flow and pressure losses; multiphase formation volume factor (Bt). Perforation: bullet perforation; jet perforation. Artificial Production: Gas lift; pumps.

**PET316: Heat and Mass Transfer****(3 Units: LH 45; PH 45)**

Models of heat transfer, general heat conduction equation, steady state conduction, unsteady heat transfer by convection, natural and forced, laminar and turbulent. Heat transfer by radiation, fundamentals of black and gray bodies, combined models of heat transfer, radiation exchange between surfaces. Heat exchangers, conductors and dryers. Mass transfer fundamentals, diffusion and convection mass transfer.

**MCE317: Fluid Mechanics****(2 Units: LH 25, TH 5, PH 0)**

Thermodynamic and dynamic principles applied to fluid behaviour, stagnation conditions, speed of sound, Mach number and classification of flow, isentropic, Rayleigh, Fanno, Prandtl-Meyer and shock. Stream function and velocity potential. Vortex and circulation, viscous flow, boundary layers, separation and turbulent flow. External flows, lift and drag, thin air foil theory, finite wing theory and airflow design.

**GST311: History and Philosophy of Science****(2 Units: LH 30)**

The focus of this course shall be in the discipline of science, which at present, is held in high esteem as the greatest agent of development in the 21<sup>st</sup> century. This course is a survey of the philosophical foundation of science. Major topical issues in Philosophy of science will be treated. It will begin with a brief account of the role of metaphysics in scientific explanation, and determinism in the sciences. The student shall therefore be expected to, among other things,

examine the main areas of philosophy; the meaning and characteristics of science, explanations in science, its objectives, methods, laws and theories with the view to justifying or debunking the superiority that has been accorded to the discipline of science over other discipline, that is where this becomes necessary. The course will also treat the philosophical thoughts of thinkers like Karl Popper, Copernicus, Newton and Fereyband.

### **CIT313: Certified SOLIDWORKS Associate (CSWA) I**

Sketch entities - lines, rectangles, circles, arcs, ellipses, centrelines; Sketch tools - offset, convert, trim; Sketch relations; Boss and cut features - extrudes, revolves, sweeps, lofts; Fillets and chamfers; Linear, circular, and fill patterns; Dimensions; Feature conditions – start and end; Mass properties; Materials; Inserting components; Standard mates - coincident, parallel, perpendicular, tangent, concentric, distance, angle; Reference geometry – planes, axis, mate references; Drawing views; Annotations.

## **OMEGA SEMESTER 300 LEVEL**

### **GEC340: Engineering Mathematics IV - Numerical Methods (3 Units: LH 45)**

Numerical Methods: Finite difference. Interpolation. Numerical differentiation and integration. Numerical solution of ordinary differential equations, Trapezoidal, Simpson, Runge Kutta methods. Newton Raphson method for roots of equations. System of simultaneous linear equations. Linear simultaneous equations, Gaussian elimination, Gauss-Seidel iterative method, Jacobi Method, evaluation of determinant and inverse matrix. Eigensystem analysis: system stability, eigenvalue sensitivity, stability of Gauss-Seidel solution, amplitude and time scaling for model studies. Use of numerical analysis software packages to solve simple engineering problems. Use of software packages such as MATLAB/SIMULINK, MULTISIM/LABVIEW

### **GEC324: Technical Communication and Research Methodology (2 Units: LH 30)**

Introduction to Communications: Principles of effective communication in interpersonal and mass communication process. Verbal, graphical and numerical communications. Written Communication: Principles of technical writing. Types of technical writing, referencing and citation. Styles of writing. Graphs; diagrams presentation. Statistical information presentation. Macro level, and micro-level. Oral Communication: Public speaking skills, multi-media presentation skills. Facilitator and participant skills in meetings. Negotiating skills. Idea-generating skills. Manuscript speaking and presentation involving media and telecommunications. Reading skills: Effective reading skills: extracting main ideas and speed-reading, chunk/cluster-reading and word-attack techniques of technical reading materials. Equipment Manual Writing and Presentation: Component diagrams, assembling, description, and multi-language presentation. Basic troubleshooting information, and technical support information. Marketing strategy.

### **GEC321: Engineering Economics (3 Units: LH 45)**

The nature and scope of economics. Basic concepts of engineering economy. Interest formulae, Discounted cash flow, present worth, equivalent annual growth and rate of return comparisons. Replacement analysis. Breakdown analysis. Benefit-cost analysis. Minimum acceptable rate of return. Judging attractiveness of proposed investment.

**PET321: Structural Geology****(2 Units: LH 30)**

Folds and faults, Stratigraphy, Deformation mechanisms, Regional arches and domes, Diapirs, Effects of structures in reservoirs (joints, stylolites and faults), Contouring techniques, Using dip in mapping, Thickness in deviated wells, Isopach and isocore maps, Fault-plane maps, Heave and throw, Use of PETREL (State of the art industrial software) for interpretation of structures and creation of isopach and isocore maps.

**PET323: Reservoir Engineering I****(3 Units: LH 45; PH 45)**

Thermodynamic review of the properties of ideal and real gases, Compressibility equation, Oil and gas formation volume factor, Gas-oil ratio, Composition of oil and gas, Classification of reservoir fluids (black oil, dry gas, wet gas, condensates, water), Equations of state, PVT analysis, Phase behaviour, phase rule and its applications to pure substance, binary and multicomponent systems, vapour-liquid equilibria, Use of IPM – PVTP, Fluid Characterization suite.

**PET324: Drilling Fluid Technology****(3 Units: LH 45; PH 45)**

Functions, types, properties, contaminants and composition of drilling fluids, Clay mineralogy, borehole stability (shale/fluid interactions), Mud properties, testing, classification and chemical analysis, Rig maths, Drilling hydraulics, hole cleaning and hydraulic optimization, Drilling mud calculations, control of mud properties, Drilling mud problems: differential sticking, loss circulation, corrosion, Well completion fluids, Drilling mud performance.

**PET328: Computer Applications in Petroleum Engineering****(2 Units: LH 30)**

Introduction to Computer Programming, The Toolbox (Python 3 and Git and Github Desktop, Getting Started with Python (Basic Python Objects, Conditional Execution, Repeated Execution, Functions), Python Data Structures (Strings, Lists, Tuples, Dictionaries), Application Projects (Oil Reservoir Volumetrics, Material Balance Analysis, PVT Properties).

**PET327: Petroleum Engineering Laboratory I****(3 Units: PH 135)**

Determination of drilling fluid properties: physical properties (density – mud balance; rheology – marsh funnel & viscometer; drilling fluids oil, water & solids contents – retort kit; sand content; resistivity of drilling mud, filtrates & filter cake for soluble salts quantification & identification; filtration loss control etc.); chemical properties (pH – hydrogen ion concentration; reactive clays quantity – methylene blue test; cation exchange capacity, etc.), flow meter rig (fluid flow through orifice plate & venturi tub for differential pressure, flow rate and discharge coefficient determination); and Rig maths.

**GEC329: Student Industrial Work Experience Scheme (SIWES) II****(6 Units: PH 270)**

During the SIWES each student will undergo practical on the job training and experience at a higher level of responsibility than industrial training I, in an engineering industry approved for its relevance to the student's major for a minimum of 10weeks during long vacation following 300level.

**CIT321: Certified SOLIDWORKS Associate (CSWA) II**

Sketch entities - lines, rectangles, circles, arcs, ellipses, centrelines; Sketch tools - offset, convert, trim; Sketch relations; Boss and cut features - extrudes, revolves, sweeps, lofts; Fillets and chamfers; Linear, circular, and fill patterns; Dimensions; Feature conditions – start and end; Mass properties; Materials; Inserting components; Standard mates - coincident, parallel, perpendicular, tangent, concentric, distance, angle; Reference geometry – planes, axis, mate references; Drawing views; Annotations

#### 4.6.3.4 Detailed Course Description – 400 Level

##### ALPHA SEMESTER – 400 LEVEL

##### **GEC410: Engineering Statistics**

**(3 Units: LH 45)**

Probability and Statistics: Probability space, theorems. Conditional probability and independence. random variables, discrete and continuous distributions, mean and variance. Bernouli, Binomial, Poisson, hypergeometric, exponential, normal distributions and their characteristics. Examples of experimental measurement and reliability. Elementary sampling theory for normal population. Central limit theorem. Statistical inference (point and interval estimation and hypothesis testing) on means, proportions and variances. Power and operating characteristics of tests. Chi-squares test of goodness of fit. Simple linear regressions.

##### **PET410: Applied Geophysics and Petroleum Exploration**

**(2 Units: LH 30)**

The scope of Geophysics, Solid earth geophysics, the shape of the earth, geomagnetism, Marine Geophysics, Isostasy, Geophysical Instruments, Field data processing, Geophysical logging of borehole, Geophysical prospecting, Seismic surveying, Seismic methods (reflection, refraction), Seismic instrumentation, Relationship between seismic velocities and pore pressure, AVO, Electrical method, Using PETREL for Seismic data reconnaissance & interpretation, surface gridding, surface editing & operations and 3D structural modelling.

##### **PET413: Reservoir Engineering II**

**(3 Units: LH 45)**

Reservoir fluid properties, Reservoir fluid distribution, classification and drive mechanisms, Darcy's law, Oil displacement concepts, Estimation of oil- and gas-in-place, Recovery, Material balance equation (MBE) and water influx, Differential equations of radial flow in porous medium. Use of IPM – MBAL, Reservoir and Analytical Simulation suite.

##### **PET414: Well Logging and Interpretation**

**(3 Units: LH 45)**

Principles and applications of well logging, Open hole log analysis and formation evaluation (electrical, resistivity, SP, Archie's equation, density-neutron, sonic, gamma ray, calliper logs), Mud logging, Logging-while-drilling (LWD), Introduction to cased-hole log evaluation, Well log interpretation, Use of combination logs, cross plots, production logging, Computer processing of logs, Well visualization & interpretation using PETREL (State of the art industrial software package), Well log analysis using PETREL (State of the art industrial software package), Use of Techlog (State of the art industrial software package) for well logging interpretation.

##### **PET411: Rock Physics and Formation Mechanics**

**(3 Units: LH 45)**

A review of Basic geological concepts principles. Principles of Stress and Strain: Basics of stress and strain, Mohr circles, Effective stress concepts and the importance of pore pressure, In-situ stress tensor. Stress field variations – structural effects, Stress measurements and analysis. Pore Pressure Evaluation and Estimation: Basic concepts, Causes of over pressure. Analysis Concepts: NCT, Bowers, Centroid-Effect, Analysis workflow. Mechanical Rock Behavior: Mechanical properties – elasticity and other stress-strain behaviour, failure and beyond, thermal effects, influence of faults and fractures. Laboratory vs. log vs. field data.

Geomechanical Modeling: Concepts and tools, 1D/2D modeling. Geomechanics as applied to Petroleum Engineering: Wellbore stability, compaction/subsidence, completions (sanding), completions (stimulation) etc.

### **PET419: Drilling Engineering II**

**(3 Units: LH 45)**

**Pressure Control and Blowout Prevention:** The need to control pressure; BOP valves; stack, choke line and choke manifold; choice of BOP system; control of kick; subsurface pressures and mud hydrostatic pressure; data for executing kick control; indications of kick; methods of circulating out a kick – Balanced Bottom Hole Pressure method (BBHP), Advanced well control (driller's method, engineer's method, stripping, snubbing, bull-heading); kick when tripping, gas out mud. Introduction to underbalanced drilling (UBD). **Cementing:** Equipment; hole conditions; volume calculations and rate of circulation; squeeze cementing; cement plug.

**Fishing:** Fishing tools; objects lost in the hole; fishing methods.

**Casing Design:** Mechanical properties – tension, collapse and burst; designing a casing string. Drilling economics (optimization and optimization techniques).

### **PET418: Petroleum Production Engineering II**

**(3 Units: LH 45)**

Surface completion: Gathering systems; service and cleaning systems; design and testing of flow lines. Well inflow (IPR), tubing (VLP), and wellhead (THP) performance relationships, Deliverability curves, Productivity index, Use of IPM – PROSPER, Well Modeling and design suite. Emulsion problems; oil emulsions; emulsifying agents and de-emulsifiers; choice and dosage of de-emulsifiers. Separation and separators; heat treatment. Dehydration: need for dehydration of gas; dew-point depression; absorption with glycol and absorption with solids.

### **PET431: Oil and Gas Property Evaluation and Project Economics (2 Units: LH 30, TH 5, PH 0)**

The structure of the petroleum industry; economic geography – impact of oil resources on the economy of oil producing countries. Oil concessions and Leases in Nigeria and government participation, Oil organization. OPEC, its history and workings, relevance in present world oil market membership. Nigerian petroleum and gas policy. Origins and objectives of the formation of NNPC, its subsidiaries and functions. A review on decision methods: payback period, discounted cash flow, Internal rate of return, e.t.c. Applications of Probability Distributions, Binomial and Normal Distributions Arrivals, Rate currencies and Services requirements. Multiple kinds of objects and economic outcomes. Appraisal of uncertain ventures; Statistical appraisal method for several ventures. Uncertainty and Risk Analysis: Decision Trees and Economic models: Analysis of a probability tree. Comparing Alternatives; retaining partial working interest versus overriding royal interest. Evaluating acceptance of a farm-out. Stochastic decision trees forecasting and planning. Evaluation of future production by performance trends: Decline curves, theoretical relations. Simulation – the Monte Carlo Method. Petroleum Fiscal Arrangement and their economic models: production sharing Contract, Joint venture, e.t.c. Fiscal Cost analysis: CAPEX, OPEX. How does cost influence the oil and gas industry and its project: Understand the scope and structure of the industry? Projects and programmes management. The difference between value engineering and cost reduction. Basis for project planning, cost estimation and techniques. Cost data Management: Cost modelling process, benchmarking. Construct parametric log – log charts using regression analysis. Use of @Risk software.

**CIT414: Aspen Plus and Aspen HYSYS**

Introduction to HYSYS: Getting started with HYSYS; definition of HYSYS. How to enter and re-enter the simulation environment. The use of Flow sheet. EoS Mathematical formulations. Creating a simulation. Accessing HYSYS. Defining the simulation Basis. Installing and defining a stream. Analysing a fluid property using a case study. Changing a fluid package. Exercise/practice problems. Adding unit operations. Connecting pumps with streams. Specifying pump efficiency. Estimating pump outlet temperature when the inlet temperature and efficiency are known. Aspen Plus Process Modeling. Learn steady-state process simulation, process analysis and optimization using Aspen Plus. Building MS Excel User Interfaces Learn how to embed and link MS Excel using Aspen Plus. Develop equation models with excel using Custom Modeler. Heat Transfer Modeling. Dryer Optimization: Minimize Energy Demand of Belt Dryers. Distillation Modeling and Improving Product Recovery in Distillation Column. Physical Properties for Process Engineers. Migration.



## **Omega Semester – 400 LEVEL**

### **GEC429: Student Industrial Work Experience Scheme (SIWES) III (IT) (6 Units: PH 270)**

During the SIWES each student will undergo practical on the job training in an engineering industry approved for its relevance to the student's major for a minimum of 28 weeks starting immediately after the first semester examinations at 400 level. A programme of training will be drawn by the College and the Industry for each student, and a prescribed log book with daily recording of the student activities is to be kept by each student and appropriately signed. At the end of the programme, a written report is to be submitted to the college and each student to present a seminar on his/her industrial experience. Each student must pass a prescribed certification examination during the industrial training.

#### **4.6.3.5 Detailed Course Description – 500 Level**

##### **ALPHA SEMESTER – 500 LEVEL**

##### **GEC517: Engineering Law**

**(2 Units: LH 30)**

Introduction and sources of law. Formation of contracts. Liabilities in torts: assaults, negligence and strict liability. Professional role and liabilities of Engineers. Contract of Employment: independent contractors, workmen compensation. Property law. Partnership. Intellectual property, copyright, trademarks and patent. Registration and incorporation of companies and effects. Case studies relating to professionals. Arbitration.

##### **PET510 Enhanced Oil recovery**

**(2 Units: LH30)**

Secondary recovery, Water flooding, Sweep efficiency, Stiles method, Dykstra-Parsons method, Enhanced oil recovery (EOR), Principles of displacement: rock properties, fluid properties in reservoir, phase behaviour, displacement efficiencies, Miscible and Immiscible displacements, Gas methods, miscible slug, enriched gas-high pressure lean gas, CO<sub>2</sub> flooding, nitrogen and other inerts, Chemical methods, miscellar-polymers, polymer augmented waterflood, permeability alteration, Thermal methods, steam stimulation, steam drive, in-situ combustion, Use of IPM – MBAL, Reservoir and Analytical Simulation suite. Use of Eclipse (industrial software).

##### **PET531: Petroleum Production Engineering III**

**(3 Units: LH 45)**

Problem-well analysis: Work over techniques; well stimulation; fracturing and acidizing. Sand control: gravel packing; sand consolidation. Introduction to coiled tubing operations, Pipelines and transportation; maximum pipeline capacity; other transportation systems. Metering of oil and gas; problems associated with flow measurement; flow measurement systems; liquid level controllers.

##### **PET530: Natural Gas Processing**

**(3 Units: LH 45)**

Gas laws; phase behaviour of natural gas system; gas from condensate and oil fields; field separation processes; dehydration and sweetening of natural gas; scale problems; gas liquification.

##### **PET533: Reservoir Engineering III**

**(3 Units: LH 45)**

Water influx, steady-state, pseudo steady state (Hurst), transient (Van Everdingen and Hurst), Solutions of the diffusivity equation, Well testing: drawdown, build-up, multirate, interference, pulse, and drill-stem test (DST) tests, Production tests, pressure tests, back pressure tests on gas wells, productivity tests on oil wells, Superposition and Horner plots, Gas well testing, Coning of water and gas, effects of partial penetration.

##### **PET534: Drilling Engineering III**

**(3 Units: LH 45)**

Drilling parameters: Choice of drilling program and drilling rig; mechanical parameters and their optimization – drilling bits; hydraulic parameters – mud viscosity, density, filtrate and bit nozzles. Directional Drilling: Uses of directional drilling: deviating tools; vertical profile, horizontal profile; deviation measurements, Coiled tubing operations. Offshore Drilling:

Underwater BOP stack, marine risers, underwater well-head, floater stability; heave compensators.

**PET536: Offshore Operations**

**(2 Units: LH 30)**

Offshore drilling: Offshore prospecting; offshore rigs; stationary and floating rigs; rig movement and stability; drilling from a floating vessel; subsea BOP stack; marine risers; subsea wellhead. Offshore production: subsea well completion methods; offshore processing equipment and design; loading systems and other transportation. Offshore operations: logistics, contingency planning; oil spill and oil removal.

**PET538: Petroleum Data Analytics and Machine Learning (3 Units: LH 35, TH 10, PH 0)**

Introduction to Data Analytics and Machine Learning, Fundamentals of Statistics and Probability. Python Libraries (NumPy, SciPy, Matplotlib, Pandas, Scikit-learn), Exploratory Data Analysis and Data Visualization. Machine Learning Algorithms (Linear Regression, Logistic Regression, Decision Trees, Random Forest, Principal Component Analysis, Clustering), Capstone Projects (Exploratory Data Analysis and Probability Distribution of a Petrophysical Database, Data-Driven Modelling of Reservoir Performance). Applications of coding language tools in selected mathematical (numerical methods) and petroleum topics. Application of Python programming language in selected mathematical and petroleum engineering topics, Development of basic simulators. Artificial Intelligence (AI) and Machine Learning (ML) with Python packages applied to Data-Driven Reservoir Modelling and solution tools to other petroleum engineering domain areas.

**PET 537: Multiphase Oil and Gas Flow in Pipes**

**(3 Units: LH 35, TH 10, PH 0)**

Principles of two-phase flow: The general energy equation, Evaluation of friction losses, Single-phase flow, Variables used on two-phase flow, flow patterns, Horizontal pressure loss prediction methods, Prediction of horizontal flow patterns, Flow through restrictions, Modeling of multiphase flow phenomenon using state of the art Industrial software package – LedaFlow.

**PET 539: Petroleum Products Transport and Storage (3 Units: LH 35, TH 10, PH 0)**

Transportation of crude oil, Pipelines, tankers – loading and unloading techniques, Offshore loading systems, International regulations on tanker transportation, Custody transfer storage of crude oil tank farm operations – gauging, sampling, quality control, underground storage – caverns, porous rocks, Gas transportation: compressors, pipelines, liquefied natural gas transportation, Storage of natural gas, pressure tanks, re-injection in porous rocks, storage in caverns, Storage of LNG.

**EDS512: Cost Engineering**

**(2 Units: LH 30)**

Cost and schedule management- an engineering function. Supporting skills and knowledge. Role of cost engineer during evaluation phase. Role of cost engineer during the basic design phase. Role of cost engineer in contractor selection. Role of cost engineer during detailed engineering design phase. Role of cost engineer during construction. Cost engineering function as distinct from Design engineering function. Canon of ethics for cost engineers. Basic capital

cost estimating. Basic operating cost estimating. Basic project planning and scheduling. Cost engineering terminology. Cost engineering standards.

## **OMEGA SEMESTER – 500 LEVEL**

### **PET524: Petroleum Reservoir Modelling and Simulation (3 Units: LH 45)**

Purpose of reservoir simulation. Concepts of Simulation; Darcy's law, fluid in porous media. Reservoir simulation equations. Finite – difference model. Solution of the simulator equations. Matrix of simultaneous equations; Data preparation: fluid data, rock data, production data, flow rate data. Making a simulation study. History matching. Basic principles of reservoir modelling, Application of numerical techniques and orthogonal collocation method. 3D & property modelling and volume calculations using PETREL (State of the art industrial software). Use of Eclipse (industrial software) for reservoir modelling and simulation.

### **PET520: Petroleum Refining Engineering (3 Units: LH 45)**

Petroleum processing equipment, Storage tanks, Rectification columns, heat exchange apparatus, pipe furnaces, pipelines and fittings, compressors and pumps, Preliminary processing, Thermal processes: thermal cracking, coking, pyrolysis, Catalytic processes: brief description, catalytic cracking, catalytic reforming, hydrogenation processes, hydrogen cracking, Properties of crude oil fractions, General overview of refining processes, Distillation, Flashing.

### **PET527: Petroleum Engineering Laboratory II (3 Units: PH 135)**

Determination of porosity via gas expansion, Rock permeability determination using both gas and liquid permeameter, Permeability determination under steady state radial flow of packed column, Permeability determination under steady state radial flow using sand bed, Determination of coefficient of permeability underground water flow, Determination of resistivity of laboratory prepared brine and formation factor (ff) at ambient condition of temperature and pressure, Rig flow meter demonstration unit, Determination of refractive index, Determination of fluid saturations, Measurement of gas volume at ambient conditions

### **PET529: Project (6 Units: PH 270)**

The project work is to be completed in this second phase. Each student is to submit a proper written report (binded 3 hardcopies, and a CD-ROM of electronic copy). The project is presented and defended at a seminar. Students may choose to work on individual design projects or team design projects. These projects consist of largely industry-sponsored projects as part programming, CAD/CAM application (turning problem, surface milling, machining of curved surfaces).

### **PET544: Process Technology (2 Units: LH 30)**

Pressure losses in pipes. Pressure losses in armature and fittings. Pumps. Heat exchangers. Nozzle theory and mass transfer. Combustion processes. Heat transfer, Conduction; convection; condensation, heat exchangers. Distillation. Particle fall in liquids cyclones.

**PET542: Oil Industry Hazards and Pollution Control (3 Units: LH 35, TH 10, PH 0)**

Gaseous, liquid, and solid pollution control, Design and objectives of pollution control system, Waste recycling, Case studies.

**PET543: Oil and Gas Field Development Planning/Project Design (3 Units: LH 35, TH 10, PH 0)**

Elements of planning. Application to Green, Brown and Marginal oil fields. TECOP consideration. Development concepts and selection. Well planning. Synergy in petroleum asset management. Subsurface development realizations. Surface development options. Development sequence. Elements of project management. TQM and ISO 14001 requirements. Risk register and risk management. Integrated operations philosophy and planning. HSE • Use of Eclipse (industrial software).

**EDS522: Engineering Valuation/Appraisal (2 Units: LH 30)**

Objectives of valuation work/valuer's primary duty and responsibility. Valuer's obligation to his or her client, to other valuer's, and to the society. Valuation methods and practices. Valuation reports. Expert witnessing. Ethics in valuation. Valuation/Appraisal standards. Price, cost and value. Depreciation and obsolescence. Valuation terminology. Appraisal reporting and review. Real property valuation. Personal property valuation. Machinery and equipment valuation. Oil and gas valuation. Mines and quarries valuation.

#### **4.6.3.6 Detailed Course Description – NATIONAL UNIVERSITIES COMMISSION (NUC) COURSES**

##### **ALPHA SEMESTER – 100 LEVEL**

##### **CST111: Computer Applications and Library Studies I (2 Units: LH 15, PH 30)**

Libraries and Society:

History of the development of libraries, the roles of libraries in various communities, cultural and educational revival, the role of libraries in adult literacy programmes, user studies, planning library services in developing countries.

Library Resources and their Role in Education:

Information bearing media: books, serials, cartographic materials, CD-ROMs, sound recordings, motion pictures, graphics, machine readable data, use of library materials by teachers and students.

Reference Sources and Services:

Introduction to reference and Bibliography. Definition and concept of reference services, characteristics and uses of different types of reference materials; selection and evaluation of reference works.

Conservation of Library Materials:

History of paper and printing, causes of damage to paper with emphasis on tropical areas, processes of book repair or restoration, preservation and repair of non-book materials, library crimes and security.

Using the Covenant University Library.

Identification of PC parts and peripheral devices: functions, applications, and how to use them. Safety precautions. Procedure for booting a PC. Filing system: directory, sub-directory, file, path, and how to locate them. Word processing: principle of operation, application, demonstration and practical hands-on exercises in word processing using a popular word processing package. Internet: services available, principle of operation, application, demonstration and hand-on practical exercises on e-mail and www using popular packages.

##### **GST111: Communication in English I (2 Units: LH 30)**

This course focuses on developing effective study skills, the library and other information sources, communication skills, listening and speaking skills.

##### **OMEGA SEMESTER – 100 LEVEL**

##### **CST121: Computer Applications and Library Studies II (2 Units: LH 15, PH 45)**

Audio-visual resources:

Variety and forms, selection organization and uses, operation and care of both hard and soft ware's. In-house production of audio-visual resources. This demands a lot of cooperation between library staff and lectures.

Documentation:

Definition, genesis and growth; basic functions, theory and techniques of analyzing, storing and retrieving information through manual and mechanical applications; abstracting; indexing principles and methods.

**Serials Librarianship:**

Types of serials, importance of serials, selection, organization and uses, storage of serials, print and microform, ISSN, users access through abstracts and indexes.

**Library Automation:**

Computers literacy, different types of computers, programming, designs. Value of computers in the library, OPAC, Online database, Internet, search engines, digitization, virtual library etc.

**Overcoming Library Abuse:**

Spreadsheet: principle of operation, application, demonstration and practical hand-on exercises in spreadsheet using a popular spreadsheet package. Database Management: principle of operation, application, demonstration and practical hand-on exercises in using a popular relational Database Management package. Report presentation Software package: principle of operation, application, demonstration and practical hand-on exercises in using a popular report presentation package such as Power Point package. Mini-Project to test proficiency in use of the software packages.

### **GST121: Communication in English II**

**(2 Units: LH 30)**

This course focuses on introducing basic aspects of English grammar, developing effective reading and writing skills across disciplines. Style in communication. Revision and self-editing strategies.

### **GST122: Communication in French**

**(2 Units: LH 30)**

The course is designed to enable students to acquire basic conversational/speaking and writing skills. Attention will therefore be focused on the basic grammatical structure and relevant items of vocabulary (lexical items) of the language. The course will be essentially oral but there will also be (reading) comprehension composition (writing) exercises. Module 1: Essentials of the French Language, Pronunciation versus spelling/orthography, pronunciation and recognition of French sounds, Greetings and introducing self, Module 2: Meeting people and introducing them, Describing people: Professions and nationalities, Describing self: family and school, Telling age: days of the week and month of the year, Describing places: countries and cities/towns, Mid-semester Examination. Module 3: Making request, Making travel arrangements, Departure and arrival at destination, Ordering a meal in a restaurant, Shopping for clothes and other items, Banking transaction of visitor tourist, Revision, and (End of Semester) Examinations.

## **ALPHA SEMESTER – 200 LEVEL**

### **GST211: Logic, Philosophy and Human Existence**

**(2 Units: LH 30)**

The aim of this course is to expose students to the meaning of philosophy and a brief survey of its branches. While discussing its major branches, emphasis will be on Logic. The topics to be taught in this respect will include Symbolic logic, Quantificational theory and Logical rules. Other sub-topics will include arguments and evidence, fallacies, statements and sentences, laws of thought, rules of inference and deduction and analogical reasoning. The course will also provide valuable insights into the origin and content of traditional logic.

## **OMEGA SEMESTER – 200 LEVEL**

### **GST221: Nigerian People and Culture**

**(2 Units: LH 30)**

The concept of culture. Study of Nigerian history, culture and arts in pre-colonial times. Social beliefs and the Nigerian's perception of his world. Culture areas of Nigeria and their characteristics. Evolution of Nigeria as political unit. Indigene/settler phenomenon. Concepts of trade, economic self-reliance and social justice. Individual and national development, norms and values. Negative attitudes and conducts (cultism and related vices). Re-orientation of moral and national values as well as moral obligations of citizens. Environmental problems.

### **GST222: Peace Studies and Conflict Resolution**

**(2 Units: LH 30)**

The concept of conflict: Definitions, Constructive and Destructive angles to understand conflict. The causes of conflict: Contradicting value systems, Competition for scarce resources, Psychological needs of people, Perception (self, others, circumstances, interests), Manipulations of information. Conflict Handling Styles: Avoidance, Confrontation, Role-Playing, Third-Party decision-making, Joint-Problem Solving, Compromising. The life angle of conflict: From Organization-transformation. The concept of peace: Definition of concept; Peace-making, Peace-keeping. Power and conflict: Types of power - Expert power, Referent power, Legitimate power, Reward power, Coercive power.

## **ALPHA SEMESTER – 300 LEVEL**

### **GST311: History and Philosophy of Science**

**(2 Units: LH 30)**

The focus of this course shall be in the discipline of science, which at present, is held in high esteem as the greatest agent of development in the 21<sup>st</sup> century. This course is a survey of the philosophical foundation of science. Major topical issues in Philosophy of science will be treated. It will begin with a brief account of the role of metaphysics in scientific explanation, and determinism in the sciences. The student shall therefore be expected to, among other things, examine the main areas of philosophy; the meaning and characteristics of science, explanations in science, its objectives, methods, laws and theories with the view to justifying or debunking the superiority that has been accorded to the discipline of science over other discipline, that is where this becomes necessary. The course will also treat the philosophical thoughts of thinkers like Karl Popper, Copernicus, Newton and Fereyarband.



#### **4.6.3.7 Detailed Course Description – UNIVERSITY WIDE COURSES**

##### **ALPHA SEMESTER – 100 LEVEL**

###### **EDS111 - Entrepreneurial Development Studies I (1 Unit)**

Definition of entrepreneurship, Difference between entrepreneurship and an entrepreneur, Types of entrepreneurship, Who can be an entrepreneur, Benefits and functions of an entrepreneur, Motivations for being an entrepreneur, History of entrepreneurship in Nigeria, the role of entrepreneurship to the Nigeria economic development, Key roles entrepreneurs can play in the development of the Nigerian economy, Demand for entrepreneurship in Nigeria, Management, Entrepreneurship and Intrapreneur, Becoming a successful entrepreneur, Environment of Entrepreneurship, Entrepreneurship and the Nigerian environment, Challenges and Causes of Failure in Entrepreneur Ventures in Nigeria, Constraints faced by entrepreneurs in Nigeria, Entrepreneurship Classification; Identify the different types of entrepreneurship that exists, Identify the merits and demerits associated with different types of entrepreneurship, Demand for money by Nigerian youths, Managing money effectively, Nigerian youths and crave for money, Time Management.

###### **TMC111 - Total Man Concept I - Principles and Parameters of Life (1 Unit)**

Exploration and definition of life, Life: purposes and pursuit, Defining Quality of life, Understanding the “good life, Visions and Dreams, Goal Setting, Potentials and Motivation. Steps to soaring, Anchors of life: Moral, ethical values and principles, Prescriptions for living right from biblical/cultural paradigms, Body Segment: Recreation.

###### **TMC112 - Total Man Concept - Sports I (0 Unit)**

Jogging: This help in many ways, our focus here on the benefit of jogging is for physical fitness that reduced risk of Osteoporosis. Osteoporosis is the condition when the bones become increasingly porous and brittle. It can result to bone fractures and deformities.

Aerobics exercise: This is said to be any activity that can get the heart rate going and keeps it at a sustained rate over a period of time. Eg twenty minutes. An aerobic activity helps to increase cardiorespiratory fitness which is one of the fine essential components of physical fitness.

Being aerobically fit you can feel it as you go about.

Swimming (safety measures): the importance of swimming lessons for water safety cannot be overstated. Everyone and especially young people should be able to swim. Swimming has a lot of benefits which include health benefit, psychological benefit, most importantly safety benefit which involved discipline that is adhering to the rules governing swimming and learning of basic skills

##### **OMEGA SEMESTER – 100 LEVEL**

###### **EDS121 - Entrepreneurial Development Studies II (1 Unit)**

Generating Entrepreneurial ideas and translating same with action, Fundamental changes that stimulate entrepreneurship, Entrepreneurship Equation, Components of Entrepreneurial ventures, Elements of entrepreneurship/The Entrepreneurial process and Entrepreneurial

Windows, Contributors of Entrepreneurship, The Sources and Approaches to the study of Entrepreneurship, Salaried employment vs Entrepreneurship, Youths Entrepreneurship, Female Entrepreneurship and Productivity.

#### **TMC121 - Total Man Concept II - Self-Discovery Strategies (1 Unit)**

Introducing Self-discovery principles, understanding self-discovery and its importance, Steps to self-discovery, Locus of control and attributions. Understanding self-esteem and self-esteem enhancement, building positive self-concept and self-image, Rubrics for self-actualization, Understanding the make-up of the self: spiritual, physical, psychological and cultural dimensions. Self in the context of human system: intra/inter systemic levels, breaking free from the tyranny of “shoulds” and “musts”, Attitudes and thoughts, Understanding the developmental stages of human kind.

#### **TMC122 - Total Man Concept – Sports II (0 Unit)**

Jogging: This help in many ways, our focus here on the benefit of jogging is for physical fitness that reduced risk of Osteoporosis. Osteoporosis is the condition when the bones become increasingly porous and brittle. It can result to bone fractures and deformities.

Aerobics exercise: This is said to be any activity that can get the heart rate going and keeps it at a sustained rate over a period of time. Eg twenty minutes. An aerobic activity helps to increase cardiorespiratory fitness which is one of the fine essential components of physical fitness.

Being aerobically fit you can feel it as you go about.

Athletic (track & short quarter mile races): Institutional athletics programme represent a multi financial industry and are generally linked to school branding and reputation. Athletic programme drive enrolment and heightens institutional profile, and often resulting in financial windfall for those whom their students engaged in.

### **ALPHA SEMESTER – 200 LEVEL**

#### **EDS211 - Entrepreneurial Development Studies III (1 Unit)**

Biological studies of management giants/ business thinkers in Nigeria, Africa and Europe. Marketing Practice and Entrepreneurship Evolution of marketing, Roles of marketing, Five divisions of marketing, Responsibilities in marketing, Marketing and Sales, Relevance of Entrepreneurship and SMEs and Introduction to International Trade, Definitions of SMEs, Advantages and disadvantages, Contributions of SME are to economic development, Institutions and programmers’ in support of SMEs, Risk Management, Profit Maximization, Definition of International Trade, Drivers of the current international business operations, Forces that make international business environment, International business environment model, Documentary credit in international trade.

#### **TMC211 - Total Man Concept III - Total Self Development Paradigms (I Unit)**

Understanding Self-Development, Personal visions and missions, Self-empowerment skills and Strategies, Drive, Passion and Focus, Building Boundaries and Bridges, Positive and creative thinking Life histories of great thinkers, Self-motivation strategies, Personal capacity building, self-auditing and futuristic self-projections, Body Segment: Physical exercises.

### **TMC212 - Total Man Concept -Sports III (0 Unit)**

Jogging: This help in many ways, our focus here on the benefit of jogging is for physical fitness that reduced risk of Osteoporosis. Osteoporosis is the condition when the bones become increasingly porous and brittle. It can result to bone fractures and deformities.

Flexibility Exercise: Flexibility can be said to be the freedom and ease of motion performed within an individual normal anatomical range.

To improve one's flexibility, range at a joint or muscles persons should engage in exercises that involves; flexion, adduction, extension and circumduction at the various joints.

Athletics (Field Events): Institutional athletics programme represent a multi financial industry and are generally linked to school branding and reputation. Athletic programme drive enrolment and heightens institutional profile, and often resulting in financial windfall for those whom their students engaged in.

## **OMEGA SEMESTER – 200 LEVEL**

### **EDS221 - Entrepreneurial Development Studies IV (1 Unit)**

Biological studies of management giants/ business thinkers in Nigeria, Africa and Europe. Students will be made to study the lives and characters of different world class, entrepreneurs like Mark Zuckererg, Mukesh Ambani, and Femi Otedola and so many others, Marketing Practice and Entrepreneurship, Evolution of marketing, Roles of marketing, Five divisions of marketing, Responsibilities in marketing, Marketing and Sales, Relevance of Entrepreneurship and SMEs and Introduction to International, Trade, Definitions of SMEs, Advantages and disadvantages, Contributions of SME are to economic development, Institutions and programmers' in support of SMEs, Risk Management, Profit Maximization, Definition of International Trade, Drivers of the current international business operations, Forces that make international business environment, International business environment model, Documentary credit in international trade.

### **TMC221 - Total Man Concept IV - Success Parameters (1 Unit)**

The focus of this course is on the identification of building blocks of self-development in the context of personal visions, mission and personal capacity building. Major self-motivational blocks, the power and place of focus, the place of the human thought process and how to enhance thinking and reasoning for creativity. Understanding Self-Development, Personal visions and missions, Self-empowerment skills and Strategies, Drive, Passion and Focus, Building Boundaries and Bridges, Positive and creative thinking Life histories of great thinkers, Self-motivation strategies, Personal capacity building, self-auditing and futuristic self- projections, Body Segment: Physical exercises.

### **TMC222 - Total Man Concept – Sports IV (0 Unit)**

Jogging: This help in many ways, our focus here on the benefit of jogging is for physical fitness that reduced risk of Osteoporosis. Osteoporosis is the condition when the bones become increasingly porous and brittle. It can result to bone fractures and deformities.

Games (Table – tennis): This centre on the mastery of basic skills, game situation as well as rules and regulation governing the various sports that will be attempted.

Focuses are also being on appreciation of various sports and the spirit of sportsmanship that is 'win or loss' taking it in good fate.

Athletic (Field Events): Institutional athletics programme represent a multi financial industry and are generally linked to school branding and reputation. Athletic programme drive enrolment and heightens institutional profile, and often resulting in financial windfall for those whom their students engaged in.

## **ALPHA SEMESTER – 300 LEVEL**

### **EDS311 - Entrepreneurial Development Studies V (1 Unit)**

Introductory class/Biographical studies of management giants/ business thinkers; in Nigeria, Africa and Europe; Quality Control under Entrepreneurship, Customer Service and Customer's relationship; Introduction to Material Management, Impact of modern technologies on Entrepreneurial Venture in Developing Countries; The importance and development of modern technologies for EDS, Acceleration Industrialization through active promotion and development of SMEs; Role of SMEs in economic development, Developing a technology service system for SMEs Managerial challenges of SMEs; Managing the business growth; different types of business growth, Characteristics of the different types of business growth: Problems associated with growth.

### **TMC311 - Total Man Concept V - Man in his Socio-Environmental Contexts (1 Unit)**

This course examines Man in different environmental contexts – the biblical, biological, cultural and ecological. The emphasis here is the civic and social responsibilities of man in society and the expectations of community living. The place of social relationships, diversity, issues of difference and conflict. The topics include; Origins and historical perspectives of man, Ecological trends, issues and ecosystems, Man and Society: social, historical and current political contexts, Globalization and economic systems, Social relationships and Conflict Resolution, Societal pressure and influences, Individualism and collectivism, Community service, responsiveness and charity supports, Parameters of responsible citizenship, Body Segment: Body Posture.

### **TMC312 - Total Man Concept - Sports V (0 Unit)**

Aerobics (Cardio respiratory) Aerobics exercise: This is said to be any activity that can get the heart rate going and keeps it at a sustained rate over a period of time. Eg twenty minutes. An aerobic activity helps to increase cardiorespiratory fitness which is one of the fine essential components of physical fitness. Being aerobically fit you can feel it as you go about.

Games (modified sports): Modified level of sports prepares student for the real activity itself and beyond. The philosophy of modified is to maximize participation and playing time for students. The level focuses on growth of basic skills and sportsmanship. During these events we make every attempt to include as many students on possible teams.

Athletics (Field Events): Institutional athletics programme represent a multi financial industry and are generally linked to school branding and reputation. Athletic programme drive enrolment and heightens institutional profile, and often resulting in financial windfall for those whom their students engaged in.

## **OMEGA SEMESTER – 300 LEVEL**

### **EDS321: Practical Side of Entrepreneurship VI (1 Unit: LH 45)**

Objective: To expose the students to a greater depth in the practical aspects of entrepreneurship, particularly the development of skills. The aim is to distinguish Covenant University graduated from graduates of other institutions of higher learning.

Practicum: All students are sent to the entrepreneurial village in-groups for skill acquisition in different specialization fields. Mini trade fairs will be organized where the students will display all their products. This program includes both theoretical and practical aspects of entrepreneurship. Production and Quality control of entrepreneurship material Management will be taught. These specialized fields include: tailoring, carpentry, millinery (hat making), mechanical, catering, shoe making, interior decoration, software development, candle and soap making, fishery, farming, snail rearing, poultry farming, piggery, textile development (tie & dye), cooking, paint manufacturing, photography, ice-cream making, saloon and barbing etc.

### **TMC321: Total Man Concept VI (1 Unit: LH 15)**

This course follows directly from TMC 311 and provides a further exploration of man and his specific civic, social and ecological and family responsibilities. The place of global trends, community service and family responsibilities vis-à-vis preparation for life in society and family context are explored closely. Focus will also be given to the demands of preparing for the context of the work place, job interviews and demands of world of work.

### **TMC322: Total Man Concept – Sports V (0 Unit)**

The focus if TMC – sports is the physical fitness of man. It involves games, sports and athletics.

## **ALPHA SEMESTER – 400 LEVEL**

### **EDS411 - Entrepreneurial Development Studies VII (1 Unit)**

This course is channeled towards exposing the students to the practical aspect of Entrepreneurship particularly the development of skills and to real issues in entrepreneurship 1- 111. The course contents include; Biological studies of business thinkers, entrepreneurs and management: giants, Incorporating the company: practical steps and issues involved, Feasibility studies in Entrepreneurship, Issues involved in partnership and companies registration, Funding of entrepreneurial activities, The Impact of Associations, Institutions and Civil Societies on EDS development in LDCs, Social responsibility and entrepreneurship, Government involvement in entrepreneurship and the impact of entrepreneurship in the public sector, Presentation of Business Proposal and feasibility report.

### **TMC411 Total Man Concept VII - Leadership Development II (1 Unit)**

This is a continuation of TMC321. This second part of the course on leadership development examines the biographical details and leadership traits or styles of some biblical and historical figures and identifies some specific lessons for developing leadership traits and sensitivity. Specific character studies will examine the leadership style of Jesus, Moses, Nehemiah, Paul, Joseph, Esther Alexander the Great, Nelson Mandela, Julius Nyerere, Mother Teresa, Mahatma Ghandi, Martin Luther, Martin Luther King Jnr. Nnamdi Azikwe, Obafemi Awolowo, David Oyedepo etc., Body Segment: Preventive Health Habits.

**TMC412 - Total Man Concept - Sports VII (0 Unit)**

Game (Soccer & Volleyball): This centre on the mastery of basic skills, game situation as well as rules and regulation governing the various sports that will be attempted. Focuses are also being on appreciation of various sports and the spirit of sportsmanship that is ‘win or loss’ taking it in good fate.

Aerobics exercise: This is said to be any activity that can get the heart rate going and keeps it at a sustained rate over a period of time. Eg twenty minutes. An aerobic activity helps to increase cardiorespiratory fitness which is one of the fine essential components of physical fitness.

Being aerobically fit you can feel it as you go about. Muscle tone improves as you work on the proper running techniques.

**ALPHA SEMESTER – 500 LEVEL****TMC511: Total Man Concept IX****(1 Unit: LH 15)**

Profile building (Part 1). The emphasis of this course is on experimental learning and it involves pulling together the main stands of TMC from 1st year to 4th year. It will introduce a personal dimension by exploring the idea of service from a student-centered learning perspective. There will be practical exercises, workshop, projects, journal keeping and detailed character study.

**TMC512: Total Man Concept - Sports IX (0 Unit)**

Game (Soccer & Volleyball): This centres on the mastery of basic skills, game situation as well as rules and regulation governing the various sports that will be attempted. Focuses are also being on appreciation of various sports and the spirit of sportsmanship that is ‘win or loss’ taking it in good fate.

Aerobics exercise: This is said to be any activity that can get the heart rate going and keeps it at a sustained rate over a period of time e.g. twenty minutes. An aerobic activity helps to increase cardiorespiratory fitness which is one of the fine essential components of physical fitness.

Being aerobically fit you can feel it as you go about. Muscle tone improves as you work on the proper running techniques.

**OMEGA SEMESTER – 400 LEVEL****TMC521: Total Man Concept X****(1 Unit: LH 15)**

Profile building (Part 2). This course follows directly from TMC511 and continuous to explore the personal connections students have made with TMC as a course of study via practical exercises on the specific themes that are addressed during the lecture. The question and discourse emanating from this exercise will enable students to develop their own perspective to the issues of life.

**TMC522: Total Man Concept - Sports X****(0 Unit)**

Jogging: This helps in many ways, our focus here on the benefit of jogging is for physical fitness that reduced risk of Osteoporosis.

Osteoporosis is the condition when the bones become increasingly porous and brittle. It can result to bone fractures and deformities.

Game (Basketball & Handball): This centres on the mastery of basic skills, game situation as well as rules and regulation governing the various sports that will be attempted. Focuses are also being on appreciation of various sports and the spirit of sportsmanship that is 'win or loss' taking it in good fate.

#### **4.7 LABORATORIES AND WORKSHOP**

Since the establishment of the Department, most of the laboratories have either been upgraded or augmented with new instrumentation and machineries to better accomplish the program objectives. The current physical facilities are very suitable and adequately serve the programmatic needs in addition to meeting the objectives of the program. The laboratory facilities to support the delivery of the Petroleum Engineering program are distributed as follows: eight (8) laboratories, and two workshops. The laboratories and workshops are majorly for the use of the Department, but some are shared with other Departments. These laboratory and workshops are:

1. Drilling Mudl Laboratory (Exclusively for the Department).
2. Reservoir Laboratory (Exclusively for the Department).
3. Core Analysis Laboratory (Exclusively for the Department).
4. PVT Analysis Laboratory (Exclusively for the Department).
5. Unit Operation Laboratory (Chemical Engineering, shared)
6. Concrete/Cement Laboratory (Civil Engineering, shared)
7. Computer Laboratory (Exclusively for the Department).
8. CST Computer Laboratory (Shared)
9. Central Research Laboratory (For the Department but other departments have access)

The laboratory equipment available are as indicated below (Tale 4.9 a – h).



## 4.7.1 LABORATORIES AND WORKSHOP

**Table 4.9a: Drilling Mud Laboratory**

S/N	Description of Equipment	Quantity	Model
1	4 Scale Mud balance	10	115-00
2	Electronic Toploading Balance	8	pro sp 601
3	Dynamic Linear Swellmeter	1	150-80-1
	with Compactor	1	
4	HP Computer	1	
5	Canon Printer	1	
6	Marsh funnel Viscometer	3	
7	Hamilton Bench Mixer	6	IG936
8	Retort Kit	2	165-14-3
9	Blender	4	
10	Roller Oven	1	172-00-1
11	Rotary Viscometer	5	visco 800
12	High Pressure High Temperature Filter Press	1	
13	Tool Box [ Mechanical]	1	
14	API Filter Press	3	06B06659
15	Lubricity Tester	2	111-00-1
16	Methylene Blue Test Kit	3	168-00-1
17	Sand Content Kit	13	
18	Stirrer Hot Plate	9	US152
19	Resistivity meter	2	130-87
20	Emulsion Stability Meter	1	ESM-30B
21	Acno 6 pH Meter	1	147-06
22	Butane Gas Cylinder	3	
23	Nitrogen Gas Cylinder	6	
24	Deep Freezer	1	
25	Digital Indoor / outdoor Thermometer	3	
26	Hannan pH Meter	1	pH211
27	Stop Watch	12	
28	Micrometer Screw Guage	4	
29	Venier Caliper[Manual]	3	
30	Venier Caliper [ Digital ]	4	
31	Tool Box [Eletrical]	1	
32	Heating Mantle 250ml	2	EM0250/CE
33	Heating Mantle 500ml	2	EM0500/CE
34	Digital Viscometer (Brookfield)	1	RVDVE
35	Digital Analytical Chemical Balance	1	PW254



**Figure 4.1: Demonstration of dynamic linear swell meter and compactor**

**Table 4.9b: Reservoir Laboratory**

S/N	Description of Equipment	Quantity	Model
36	Hydrostatic Bench	1	F9092
37	Fluidization/Permeability Apparatus (demonstration of Darcy's experiment and computation of grain size by hydraulic flow theory)	1	
38	Programmable Refractometer	2	
39	Dew Point Thermohygrometer	1	
40	Digital Thermometer	1	
41	Portable Centrifuge	1	MINO/50
42	Genlab Oven	1	
43	Hydrology Apparatus (Well interference test, drawdown pressure profile for circular and rectangular drainage shape, permeability of unconsolidated sand bed)	1	P6530/137
44	Laboratory Centrifuge [UNISCOPE]	1	
45	Vacuum Pump[Econovac]	1	



**Figure 4.2: Demonstration of flow in porous media in unconfined sand-bed used for showing the effect of radial inflow, rectangular inflow, well interference test and pressure profile attributed to draw-down for vertical and horizontal well configurations**

**Table 4.9c: Core Analysis Laboratory**

S/N	Description of Equipment	Quantity	Model
46	Core Drill Machine	1	33-XL
47	Core Saw Machine	1	MS1420E
48	Core Porosimeter with Pump	1	350
49	Capillary Pressure. Apparatus	1	CPPP 200
50	Reservoir Permeability Tester (Reservoir and Ambient Conidtions) Core flooding System	1	PM306
51	Advance Resistivity System ARS 200	1	
52	Liquid Permeameter	1	
53	Gas Permeameter	1	
54	Trolly	1	
55	Digital Planimeter	1	
56	Regular Planimeter	1	RPT 340
57	Reservior Permeability Tester	1	
57	Dean Stack Extractor	6	
58	Manual Core Saturator	1	TS-010-001-0
59	Core Trimming Saw	1	
60	Lenovo Laptop (for Advance Resistivity Meter)	1	
61	Refractometer		



**Figure 4.3: Demonstration of core flooding under reservoir and ambient conditions and determination of permeability with either liquid of gas.**

**Table 4.9d: Unit Operations Laboratory (Chemical Engineering) Shared Facility**

S/N	Description of Equipment	Quantity	Model
62	Liquid Flow Meter Rig	1	
63	Air Flow Meter Test Rig	1	



**Figure 4.4: Demonstration of the use of the flow-meter rig**



**Figure 4.5: Demonstration of Air flow - meter test rig**



**Table 4.9e: PVT ANALYSIS LABORATORY**

<b>S/N</b>	<b>DESCRIPTION OF EQUIPMENT</b>	<b>QUANTITY</b>	<b>TEACHING</b>	<b>RESEARCH</b>	<b>MODEL</b>	<b>UTILITY LEVEL</b>
62	PVT Fluid Eval	1	OK	OK	00:30:DE:OD:1A:C0	Medium
63	High Pressure Pump	1	OK	OK	BTSP-175-15-SS	Medium
64	Manual Gasometer	1	OK	OK	5465 - 320510	Medium
65	Vaccum Pump	1	OK	OK	MDL80b4	Medium
66	HP-HT Desnity Cell	1	OK	OK		Medium
67	Electronic Balance	1	OK	OK	B417544282	Medium
68	HP-HT Viscometer	1	OK	OK	RBV 1000	Medium
69	Liquid condensation Trap	1	OK	OK	AP-360-001-2	Medium
70	Gasometer Booster	1	OK	OK	ST025-4595-C	Medium
71	HP Laptop Personal Computer for High Pressure Pump with dedicated software for data acquisition	1	OK	OK	RPT 340	Medium
72	Dell Laptop data acquisition system for the Fluid Eval	1	OK	OK		Medium

**Table 4.9f: Computer Modelling and Simulation Laboratory**

S/N	Description of Equipment	Quantity	Model
64	Workstation Computer	4	High-end computers [MS Windows 7 SP1 - (64-bit) Professional, Dual quad-core processors, 64 GB RAM, dual monitors, Graphics-NVIDIA Quadro K5000, HDD 300 GB] Dell



**Figure 4.6:**


## 4.7.2 Photograph and Description of Equipment

### 4.7.2.1 Drilling Mud Laboratory Equipment




List of Equipment	Description/Use	Pictures
<b>Drilling Mixers and Cups</b>	Graduated cup for measuring mud volumes and mixing	
<b>Marsh Funnel</b>	The <b>Marsh funnel</b> is a simple device for measuring viscosity by observing the time it takes a known volume of liquid to flow from a cone through a short tube.	
<b>Direct Indicator Viscometer</b>	The instrument used to measure viscosity and gel strength of drilling mud. Multi-speed device.	



## Drilling Mud Laboratory Equipment




<p><b>Roller Oven</b></p>	<p>Roller Ovens are primarily designed for laboratory use. These roller ovens provide an excellent method of aging drilling fluid samples.</p>	
<p><b>Retort Kits</b></p>	<p>A retort, sometimes called a still, is used to determine the quantity of liquids and solids in a drilling fluid.</p>	
<p><b>Resistivity Meter</b></p>	<p>The Resistivity Meter is a portable measuring device designed to give a quick, reliable measurement of the resistivity of a small sample expressed in ohm-meters.</p>	

## Drilling Mud Laboratory Equipment

<p><b>pH Meter</b></p>	<p>pH measurement of samples</p>	
<p><b>Mud Balance</b></p>	<p>Measurement of density (weight) of drilling fluid, cement or any type of liquid or slurry.</p>	
<p><b>Analytical Balance</b></p>	<p>It is designed to measure small mass in the sub-milligram range</p>	

Drilling Mud Laboratory Equipment		
<b>Standard Filter Press</b>	<p>Low pressure filter press design features a cell body to hold the mud sample, a pressure inlet, and a base cap with screen and filter paper. Suitable for filtration measurement in both field and laboratory use</p>	
<b>HTHP Standard Filter Press</b>	<p>High Pressure High Temperature filter press design features a cell body to hold the mud sample, a pressure inlet, and a base cap with screen and filter paper. Suitable for filtration measurement in both field and laboratory use</p>	
<b>Viscometer</b>	<p>Viscometers, sometimes referred to as rheometers, are used to measure fluid properties</p>	

## Drilling Mud Laboratory Equipment

<p><b>Lubricity Tester</b></p>	<p>A lubricity test was designed to simulate the speed of rotation of the drill pipe and the pressure with which the pipe bears against the wall of the hole.</p>	
<p><b>Compactor</b></p>	<p>It prepares the sample in wafer form so the expansion may be measured</p>	
<p><b>Linear Swell Meter</b></p>	<p>It is used in examining the interaction between water based fluids and mineral samples containing reactive clays under simulated conditions while fluid is in motion</p>	

#### 4.7.2.2 Core Analysis Laboratory

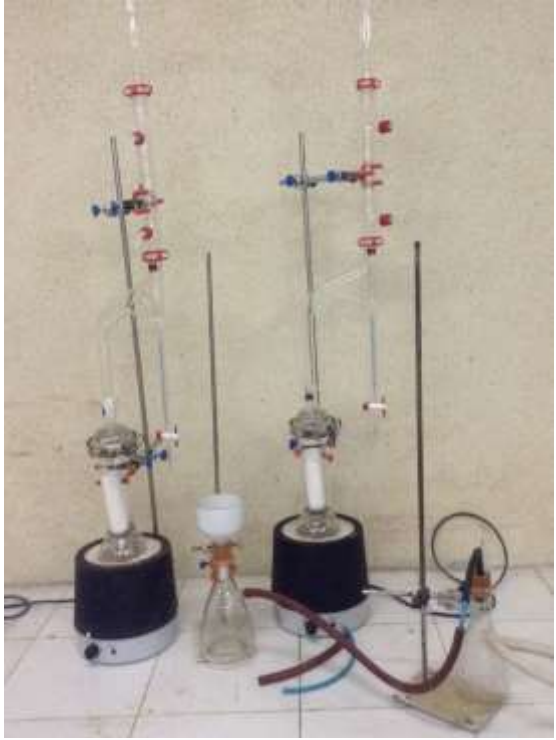


List of Equipment	Description/Use	Pictures
<b>Core Milling Machine</b>	Versatile bench top diamond impregnated radial blade utilized either to cut core samples in two halves or to trim rock samples	
<b>Core Slabbing Crosscut and Band Saws</b>	Versatile diamond impregnated radial blade utilized either to slab core samples in two halves or to trim full diameter rock samples	
<b>Core Trimming Machine</b>	Bench top tool designed to cut core samples to pre-set lengths	






## Core Analysis Laboratory

<p><b>Refractometer</b></p>	<p>Measure the refractive index and concentration of liquids, gels and solids</p>	
<p><b>High Pressure Core Saturator</b></p>	<p>Saturator sequentially performs vacuum and saturation cycles on both plug and whole core size samples.</p>	

## Core Analysis Laboratory





<p><b>Dean Stark Apparatus</b></p>	<p><b>Dean-Stark apparatus;</b> is a piece of laboratory glassware used in synthetic chemistry to collect water (or occasionally other liquid) from a reactor. It is used in combination with a reflux condenser and a batch reactor for continuous removal of the water that is produced during a chemical reaction performed at reflux temperature</p>	 <p>A photograph of a Dean-Stark apparatus setup. It consists of two round-bottom flasks mounted on magnetic stirrers. Each flask is connected to a vertical reflux condenser. The condensers are further connected to a Dean-Stark trap, which is a specialized glass component designed to separate and collect water or other immiscible liquids from the reaction mixture. The setup is supported by metal stands and clamps.</p>
<p><b>Liquid and Gas Permeameters</b></p>	<p>Core permeability determination at ambient condition (Fanchi Core Holder)</p>	 <p>A photograph showing two blue electronic control units for permeability measurements. These units are connected to a central Fanchi Core Holder, which is a specialized chamber used to hold the sample core. The setup is used for determining the permeability of a core sample under ambient conditions.</p>
<p><b>Porosimeter</b></p>	<p>Porosity determination at ambient condition by inert gas</p>	 <p>A photograph of a porosimeter, a device used for determining the porosity of a sample. It features a large circular pressure gauge on the right side and a digital display on the left. The sample is placed in a chamber within the device, and inert gas is used to measure the volume of pores. The device has various control knobs and switches on its front panel.</p>

## Core Analysis Laboratory


<p><b>Planimeters</b></p>	<p>a mechanical device for measuring areas of regions in the plane which are bounded by smooth boundaries</p>	
<p><b>Advanced Core Resistivity System</b></p>	<p>Core resistivity determination at ambient and reservoir condition</p>	
<p><b>Reservoir Permeability Tester (Core Flooding System)</b></p>	<p>Core flooding device at reservoir conditions by liquid and/or gas</p>	





### 4.7.2.3 Petroleum Reservoir and Production Engineering Laboratory

List of Equipment	Description/Use	Pictures
<b>Liquid Flow Meter Rig</b>	Demonstration of specific characteristics of different types of flow meter used in measuring flow through pipes	
<b>Air Flow Meter Test Rig</b>	Measurement of Gas flow in pipes	
<b>Fluidization &amp; Permeability Apparatus</b>	Permeability determination of unconsolidated sand bed and grain size determination by Kozney & Carmen	
<b>Hydrology Apparatus</b>	Well interference test, drawdown pressure profile for circular and rectangular drainage shape, permeability of unconsolidated sand bed.	

## Computer Workstation Laboratory

List of Equipment	Description/Use	Pictures
<b>4 - High-end computers [MS Windows 7 SP1 - (64-bit) Professional, Dual quad-core processors, 64 GB RAM, dual monitors, Graphics-NVIDIA Quadro K5000, HDD 300 GB] Dell</b>	Installed standard industry software, Schlumberger PETREL, IPM Suite (GAP, MBAL, PROSPER...)	

#### 4.7.2.4 PVT Analysis Laboratory

List of Equipment	Description/Use	Pictures
<b>High pressure pump</b>	The pump is specially designed to generate and control fluid pressure; it encompasses an efficient brushless motor-driven piston having low friction sealing.	
<b>HP-HT VISCOMETER model RBV 1000</b>	The rolling ball viscometer determines the viscosity of samples collected either down hole or at the surface. It uses the rolling ball principle where the travel time of a piston is used to obtain viscosity data, which are derived from correlation with curves of fluids with known viscosities	

## PVT Analysis Laboratory

### **EDUCATIONAL PVT CELL – Educational Fluid Eval**

The educational Fluid Eval is a compact PVT cell designed for small volume PVT, thermodynamic properties and phase behavior studies of black oil and gas condensate samples. The PVT cell is composed of an efficient fluid mixer mounted on the piston, a dedicated visual head, two sampling valves, an accurate pressure transducer and an electric heater enabling a homogeneous temperature control. A digital camera system monitors the liquid/gas interface through the sapphire windows




PVT Analysis Laboratory		
<b>GASOMETER WITH GOR MEASUREMENT FACILITIES</b>	Measures gas volume at ambient conditions. The apparatus comes fully equipped with a glass tube, floating piston, crank, two valves, temperature probe, pressure sensor and encoder for volume measurement, display panel and two years spare parts and consumable items	
<b>HP HT DENSITY CELL</b>	The HP HT density cell handles reservoir fluids at pressures and temperatures up to 10 Kpsi and 175 °C, respectively. The principle consists of transferring the sample into the cell at reservoir conditions and weighing it using a high resolution balance.	
<b>LIQUID CONDENSATION TRAP</b>	Designed to trap heavy compounds which might be produced during the liberation of the gas phase from reservoir to atmospheric conditions	



## CHAPTER FIVE

### 5.1 FACULTY PROFILES

	<b>Engr. Dr. Olabode Oluwasanmi</b>
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#### Education

Degree	Discipline	Institution	Year
<b>Ph.D.</b>	Petroleum Engineering	Covenant University	2019
<b>M.Sc.</b>	Petroleum Engineering	University of Ibadan	2014
<b>B.Eng.</b>	Petroleum Engineering	Covenant University	2010

#### Academic Experience

From – To	Institution	Rank/Title
<b>2021-Present</b>	Covenant University	Senior Lecturer
<b>2019-2021</b>	Covenant University	Lecturer I
<b>2015-2019</b>	Covenant University	Assistant Lecturer

#### Non-Academic Experience

Company	Title	Description of Position	Year-Year
<b>Addax Petroleum Development of Nigeria Limited</b>	Production Engineer (Intern)	Production Data Management and Design of Production Performance and Analysis Report	2009-2009 (6 months)

#### Certifications and Current Membership in Professional Organizations

- Member of the Nigerian Society of Engineers, 2018 (NSE 47749)
- Member of the Council for the Registration of Engineering in Nigeria (R47132)
- Member of the National Institute of Petroleum Engineers (NIPetE, PE2768)

#### Service Activities

- Head of Department (2023- date)
- Level Adviser (2017-2022), 2023-date
- Postgraduate Coordinator (October 2022 – March 2023)
- Departmental Timetable officer (2019-2022)
- Departmental Examination Officer (2022)

#### Selected Publication

- Simulation studies on optimizing oil productivity in oil rim reservoirs under gas cap blow down production strategy. **Oluwasanmi Olabode**, Pelumi Adewunmi, Uzodinma Odera, Gideon Famurewa, Princess Ogba, Chukwuemeka Amah, Petroleum, 2022, <https://doi.org/10.1016/j.petlm.2022.08.001>.
- Dataset on Modelling a Synthetic Oil Rim Reservoirs for Optimizing Oil Production during Gas Cap Blow Down Strategy. **Olabode oluwasanmi**, Ajagunna Samuel, Nnorom Ebuka, Awelewa Kehinde, Odera Bassey, Umunna Precious, (2022). Data in brief, doi.org/10.1016/j.dib.2022.108652.



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**Rank** [Lecturer I](#)

### **Education**

Degree	Discipline	Institution	Year
Ph.D.	Petroleum Engineering	Covenant University	In View
M.Sc.	Petroleum Engineering	African University of Science and Technology	2011
B..Eng.	Metallurgical Engineering	Ahmadu Bello University	2006

### **Academic Experience**

From – To	Institution	Rank/Title	Full time/Part time
2017-Present	Covenant University	Lecturer I	Full time
2016-2017	Covenant University	Lecturer II	Full time
2013-2016	Covenant University	Assistant Lecturer	Full time

### **Non-Academic Experience**

Company	Title	Description of Position	Year-Year	Full time/Part time
Airtel Nigeria, Kaduna	MIT	Market and Strategic Developer	2012	Contract
Geo-Tech, Kaduna	Field Engineer	Water conductivity Detector	2009	Contract
<b>Kaduna Science Academy</b>	Physics & Technical Tutor	Teach students physics and technical drawing, organize science competition	2009	Full time

### **Certifications and Current Membership in Professional Orginations**

1. Registered Engineer - Council for Regulation of Engineers in Nigeria (COREN), R.31,496
2. Society of Petroleum Engineers (SPE)
3. Nigeria Society of Engineers (NSE)

### **Honours and Awards**


- Certificate in Business and Innovation (Best innovative Idea) in African University of Science and Technology (AUST) 2011
- Certificate of National service. (National youth service corps) 2008
- Certificate of Recognition. (Nigerian Christian Corpers' Fellowship). 2008
- Certificate of merit and recognition. (N.A.P.T.I.P) 2008
- Certificate of service. (Engineering Students Fellowship) 2006
- Certificate of Training. (United Nigerian Textiles Plc, Kaduna, I.T). 2005

### **Service Activities**

- Budget Officer, Department of Petroleum Engineering (2014–Present)
- Member: College of Engineering Hooding Committee, Covenant University (2014–2017)
- Academic Adviser, Covenant University (2013–Present)

### **Professional Development**

- **COREN** - “Engineering Workshop” (2016)
- **Nigerian communications Commission (Digital Bridge Institute workshop):** Microsoft Professional (2016)

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	<b>Rank</b>	<a href="#">Lecturer II</a>

### **Education**

Degree	Discipline	Institution	Year
PhD.	Petroleum Engineering	Covenant University	2019
M.Sc.	Petroleum Engineering	African University of Science and Technology, Abuja	2011
B.Tech.	Chemical Engineering	Ladoke Akintola University of Technology, Ogbomoso	2005

### **Academic Experience**

From – To	Institution	Rank/Title	Full time/Part time
2015-present	Covenant University	Lecturer II	Full time
2013-2015	Covenant University	Assistant Lecturer	Full time

### **Non-Academic Experience**

Company	Title	Description of Position	Year-Year	Full time/Part time
Fudia Petrochem Limited, Lagos	Lube Sales Engineer	Implementation of Lubricants Sales Plan. Facilitating the provision of high-level after-sales technical services (used-oil analysis) to customers	2007-2010	Full time
The Freedom Group, Benin City	Corporate Officer	Creation and Management of Databases. Software Management: updating and upgrading.	2006-2007	Full time

### **Certifications and Current Membership in Professional Organizations**

4. Society of Petroleum Engineers (SPE International). Membership Number: 3495171
5. Nigerian Society of Engineers. Membership Number: 3495171


### **Service Activities**

- Volunteer Reviewer and Judge: SPE African Regional Student Paper Contest, 2015-2016

### **Professional Development**

- Nigerian International Petroleum Summit, ICC, Abuja, 19 – 23 February, 2018
- 2nd Annual International Education Conference, ICC, Abuja, 31 Oct. – 4 Nov. 2011
- Nigerian Oil and Gas Conference and Exhibition, ICC, Abuja, 21 – 24 Feb. 2011



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	<b>Rank</b>	<a href="#">Lecturer II</a>

#### Education

Degree	Discipline	Institution	Year
Ph.D	Petroleum Engineering	Covenant University	2021
M.Sc.	Petroleum Engineering	African University of Science & Technology, Abuja (FCT)	2014
B.Eng.	Chemical Engineering	Ahmadu Bello University, Zaria	2011

#### Academic Experience

From – To	Institution	Rank/Title	Full time/Part time
2015-present	Covenant University	Lecturer II	Full time

#### Non-Academic Experience

Company	Title	Description of Position	Year-Year	Full time/ Part time
Hamilton Technologies	Drilling Mud Engineer	Work with the Lead mud engineer at the drilling location, assist in coordinating all fluids activities on rig-site in conjunction with the Lead Engineer	2015-2015	Part time
Nigerian Breweries, Kaduna	Industrial Trainee	Contributing to assigned projects on different application levels.	2010-2010	Part time
Innovative Technology, Kaduna	Software Trainee	Pipeline integrity assessment, coordinated field support services, responsible for project execution	2010-2010	Part time
Kaduna State Water Board, Kaduna	Industrial Trainee	Water quality assessment and quality control (QAQC)	2006-2006	Part time

#### Certifications and Current Membership in Professional Organizations

6. Member, Society of Petroleum Engineers (SPE)
7. Member, Nigerian Society of Chemical Engineers (NSChE)

#### Honours and Awards


- Recipient of the African Development Bank/ Nelson Mandela Institution Scholarship, MSc (2013 – 2014).

#### Service Activities

- Student Adviser, Department of Petroleum Engineering, Covenant University. (2016-Present)
- Member: Covenant University Health, Safety and Environment Committee (2016–present)
- Assistant Examination Officer, Department of Petroleum Engineering, (2015-2017)

#### Professional Development

- HSE - “Competency Development Training” (11-15 March, 2013)
- Basic Drilling Mud Engineering workshop (January 24- February 23, 2015)

	<p align="center"><b>Engr. Dr. Dike, Humphrey Nwenenda</b></p> <p>✉: Department of Petroleum Engineering, Covenant University, Km 10, Idiroko Rd., Ota, Ogun State ☎: +234803-084-8758; 0908-103-9020 ✉: humphrey.dike@covenantuniversity.edu.ng dike.humphrey@yahoo.com <a href="#">ResearchGate : Dike, Humphrey N.</a> <a href="#">Scopus</a> <a href="#">ORCID:0000-0001-5373-2844</a></p>
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### Education

Degree	Discipline	Institution	Year
<b>Ph.D.</b>	Petroleum and Gas Engineering	University of Port Harcourt	2020
<b>M.Sc.</b>	Petroleum and Gas Engineering (Gas Option)	University of Port Harcourt	2013
<b>PGDE</b>	Education	University of Port Harcourt	2015
<b>B.Tech.</b>	Petroleum Engineering	Rivers State University of Science and Technology, Port Harcourt	2008

### Academic Experience

From – To	Institution	Rank/Title
<b>2022-Present</b>	Covenant University	Lecturer I
<b>2021-2022</b>	Madonna University, Enugu Campus	Lecturer II
<b>2015-2016</b>	University of Port Harcourt	Research Assistant
<b>2008-2009</b>	Kaduna Polytechnic, Kaduna	Graduate Assistant (G.A)

### Non-Academic Experience

Company	Title	Description of Position	Year-Year
<b>KORD RESOURCES NIG. LIMITED</b>	Field/Logistic Engineer	Logistic and Chain supplies (Oil-field Chemicals, AGO etc.)	2009-2011
<b>Obio/Akpor L.G.A., Rivers State</b>	Chief Executive Officer	Administrative Functions	2013, 2014-2015

### Certifications and Current Membership in Professional Organizations

- Member of the Nigerian Society of Engineers, 2018 (**NSE 48338**)
- Member of the Council for the Registration of Engineering in Nigeria (**R.60,821**)
- Associate Environmental Professional – National Registry of Environmental Professionals (NREP) USA. Reg. No: (**AEP:A2130**)
- Certificate of Accomplishment in Drilling Fluids Engineering (2010)

### Service Activities

- Level Adviser, 2022-date
- Departmental Time-Table Officer/ Representative, 2022–date
- Member, Departmental QAQC Committee 2022-date
- Co-Ordinator Departmental Committee for IEA/OBE ACCREDITATION (2023)

### Honours and Awards

Recipient of World Bank Africa Scholarship, Africa Centre of Excellence University of Port Harcourt,

### Selected Publication

- Babalola Aisosa Oni, Samuel Eshorame Sanni, Anayo Jerome Ibegbu, Olusegun Stanley Tomomewo, **Humphrey Nwenenda Dike** (2023): Pyrolytic-gasification of biomass and plastic accompanied with catalytic sequential tar reformation into hydrogen-rich gas. Journal of the Energy Institute. DOI: <https://doi.org/10.1016/j.joei.2023.101287>
- Dike, Humphrey Nwenenda**, Dosunmu, Adewale, Kinigoma, Boma, Akaranta, Onyewuchi (2019): Effect of cashew Nut Shell liquid Esters on Kcl/Polymer/ Glycol Drilling Fluid Flow Properties. International journal of Technological & Scientific Research Engineering [www.ijtsre.org](http://www.ijtsre.org); ISSN: 2581-9259, 2(3).



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### Education

Degree	Discipline	Institution	Year
<b>Ph.D.</b>	Petroleum Engineering	University of Ibadan	2015
<b>M.Sc.</b>	Petroleum Engineering	University of Ibadan	2001
<b>B.Sc.</b>	Petroleum Engineering	University of Ibadan	1997

### Academic Experience

From – To	Institution	Rank/Title
<b>2018-Present</b>	University of Ibadan	Senior Lecturer
<b>2015-2018</b>	University of Ibadan	Lecturer I
<b>2012-2015</b>	University of Ibadan	Lecturer II

### Non-Academic Experience

Company	Title	Description of Position	Year-Year
Shell Petroleum Development Company (SPDC)	Reservoir Engineer (NYSC)	Material Balance Studies for Reserve Estimation and Analysis Report	1997-1998 (12 months)

### Certifications and Current Membership in Professional Organizations

- iv. Member of the Nigerian Society of Engineers, 2012 (NSE 27055)
- v. Member of the Council for the Registration of Engineering in Nigeria (R31056)
- vi. Member of the Society of Petroleum Engineers (SPE 3497666)

### Service Activities

- vi. Postgraduate Coordinator and Examination Officer (August 2019 – January 2022)
- vii. Undergraduate Coordinator and Examination Officer (2013 – July 2019)
- viii. 500 Level and Postgraduate Level Adviser (2015 – January 2022)
- ix. Member, Faculty of Technology Timetable & Curriculum Committee (2014 – July 2021)

### Selected Publication

- Experimental and Factorial Design Analysis of Viscosity and Fluid Loss Control of Water-Based Mud Treated with Pineapple Leaves. **Akinsete Oluwatoyin Olakunle** and Hussein Omeiza Aliu, *Egyptian Journal of Petroleum* (2023).  
<https://doi.org/10.1016/j.ejpe.2023.02.003>
- Predictive Analytical Model for Hydrate Growth Initiation Point in Multiphase Pipeline System. **Akinsete Oluwatoyin**, Obode Elizabeth, and Isehunwa Sunday (2023). *Petroleum Science and Engineering*. <https://doi.org/10.11648/j.pse.20230701.13>
- Experimental Investigation of Wax Inhibition Tendency of Jatropha Oil in Niger Delta Waxy Crude-Oil. **Akinsete O. O.**, Sunday Mathew Owoseni, and Aliyu Adebayo Sulaimon *Petroleum Science and Technology* (2023).  
<https://doi.org/10.1080/10916466.2022.2149800>



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### Education

Degree	Discipline	Institution	Year
<b>Ph.D.</b>	Chemical Engineering	University of Lagos	2016
<b>M.Sc.</b>	Petroleum Engineering	University of Ibadan	2004
<b>B.Sc.</b>	Petroleum Engineering	University of Ibadan	1990

### Academic Experience

From – To	Institution	Rank/Title
<b>2022-Present</b>	Covenant University	Senior Lecturer
<b>2020-2022</b>	University of Lagos	Senior Lecturer
<b>2017-2020</b>	University of Lagos	Lecturer I

### Non-Academic Experience

Company	Title	Description of Position	Year-Year
<b>Baroid Nigeria Limited</b>	Drilling Mud Engineer	Design, Implementation and Monitoring of Drilling Mud Programs	1992- 2002

### Certifications and Current Membership in Professional Orginations

- vii. Member of the Nigerian Society of Engineers, 2007 (NSE 24506)
- viii. Member of the Council for the Regulation of Engineering in Nigeria, 2012 (R.20947)
- ix. Member of the international Society Petroleum Engineers, 1995 (SPE 3485659)

### Service Activities

#### Selected Publication

- Adeyanju O.A.** and Olatunde A. O. (2022). “Optimization of Cuttings Transport Performance in Horizontal and Highly Deviated Wells” Journal of Nature Science and Sustainable Technology. Volume 16 Issue 4, 2022 Q4. Publisher: Nova Science Publishers, Inc.
- Adeyanju O.A.** and Adeosun, T. A. (2021) “The Effect of Centrifuge On the De-Emulsification of Water-in-Crude Oil Emulsion” Journal of Nature Science and Sustainable Technology. Volume 15 Issue 4, 2021 Q4. Publisher: Nova Science Publishers, Inc.



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### **Education**

Degree	Discipline	Institution	Year
Ph.D.	Petroleum Engineering	University of Port Harcourt	2017
M.Sc.	Petroleum and Gas Engineering	University of Port Harcourt	2013
B..Eng.	Chemical Engineering	Nnamdi Azikiwe University	2007

### **Academic Experience**

From – To	Institution	Rank/Title	Full time/Part time
2020-Till Date	University of Port Harcourt	Senior Lecturer	Full time
2017-2020	Covenant University	Senior Lecturer	Full time
2015-2016	University of Port Harcourt	Research Assistant	Part time

### **Non-Academic Experience**

Company	Title	Description of Position	Year-Year	Full time/ Part time
ZKJ Energy Partners LTD	Consultant	Training and Research Consultant	2021-present	Part time
Serock Oil Servicing	Consultant	Research Consultant on Flow Assurance and Oil Field related issues	2019-present	Part time
EL Serve Energy Resources Limited	Mud Engineer	Research and design quality fluids and additives that will minimize exploration cost	2014-present	Part time
Shell Aret Adams Chair in Petroleum Engineering	Research Associate	Providing support for OPTIWELL Software used by Shell Petroleum Development Company in solving Well Instability challenges, developed by Shell Aret Adams Chair in Petroleum Engineering	2008-2014	Full time

### **Current Membership of Professional Originations**

8. Registered Engineer - Council for Regulation of Engineers in Nigeria (COREN), R. 32,925
9. Society of Petroleum Engineers (SPE) - 4632555
10. Registered Environmental Specialist – National Registry of Environmental Professionals (NREP) Reg. No: A1272

### **Honours and Awards**

- Best Presenter 4th International Petroleum Downstream Conference/ Exhibition on Gas, Petroleum Refining, Petrochemical and Fertilizers; Presidential Hotel Port Harcourt, August 19-20, 2015
- Recipient of World Bank Africa Scholarship, Africa Centre of Excellence University of Port Harcourt, PhD (2015 – 2017)

### **Service Activities**

- Departmental PG Co-Ordinator, University of Port Harcourt (2022-present)
- Ag. HOD Department of Petroleum Engineering, Covenant University (2020)
- Level Adviser: Department of Petroleum Engineering, Covenant University (2017-2020)
- Member: College of Engineering Award and Ceremony Committee (2019-2020)
- Ag.- Departmental PG REP: Department of Petroleum Engineering (2017–2019)
- Member: College of Engineering Publication Committee, Covenant University (2017–2019)

### **Selected Publications and Presentations from the Past Five Years**

1. **Emmanuel E. Okoro**, Ekene Ikeora, Samuel E. Sanni, Victor J. Aimikhe, Oscar I. Ogali (2022): Adoption of machine learning in estimating compressibility factor for natural gas mixtures under high temperature and pressure applications. *Flow Measurement and Instrumentation* 88, 102257. <https://doi.org/10.1016/j.flowmeasinst.2022.102257>
2. **Emmanuel E. Okoro**, Sandra Iwuajoku, Samuel E. Sanni, Kevin C. Igwilo (2022): Assessment of Frictional Torque and Lubricity of Waste-tire Bio-oil as Lubricant Additive for Stuck Pipe. *Journal of King Saud University – Science* 34, 102318. <https://doi.org/10.1016/j.jksus.2022.102318>
3. **Emmanuel E. Okoro**, Samuel E. Sanni, Tamunotonjo Obomanu, Paul Igbinedion (2022): Predicting the Effect of selected Reservoir Petrophysical Properties on Bottomhole Pressure via Three Computational Intelligence Techniques. *Petroleum Research*. <https://doi.org/10.1016/j.ptlrs.2022.07.001>
4. Isaac Ajimosun, **Emmanuel Okoro**, Olafuyi Olalekan (2022): Modeling the Critical Pressure Below which Sand Production will occur Based on Extended Mogi-Coulomb Failure Criterion. Paper presented at the SPE Nigeria Annual International Conference and Exhibition, Lagos, Nigeria, August, SPE-211953-MS <https://doi.org/10.2118/211953-MS>
5. **Emmanuel E. Okoro**, Samuel E. Sanni (2022): Intelligent and Knowledge-based waste management: Smart decision-support system. *Current Trends and Advances in Computer-Aided Intelligent Environmental Data Engineering*. Elsevier and Academic Press.
6. **Emmanuel E. Okoro**, Ewarezi A. Efajemue, Samuel E. Sanni, Oluwasanmi A. Olabode, Oyinkepreye D. Orodu, Temiloluwa Ojo (2022): Application of thermotolerant petroleum microbes at reservoir conditions for enhanced oil recovery. *Petroleum*, <https://doi.org/10.1016/j.petlm.2022.01.008>
7. **Emmanuel E. Okoro**, Uyiosa Igbinedion, Victor Aimikhe, Samuel E. Sanni, Okorie E. Agwu (2022): Evaluation of influential parameters for supersonic dehydration of natural gas: Machine learning approach. *Petroleum Research*, 7(3): 372-383. <https://doi.org/10.1016/j.ptlrs.2021.12.005>
8. Okorie Ekwe Agwu, **Emeka Emmanuel Okoro**, Samuel E. Sanni (2022): Modelling oil and gas flow rate through chokes: A critical review of extant models. *Journal of Petroleum Science and Engineering* 109775, <https://doi.org/10.1016/j.petrol.2021.109775>
9. Temitope F. Ogunkunle, **Emeka Emmanuel Okoro**, Oluwatosin J. Rotimi, Paul Igbinedion, David I. Olatunji (2021). Artificial Intelligence model for predicting geomechanical characteristics using easy-to-acquire offset logs without deploying logging tools. *Petroleum*, <https://doi.org/10.1016/j.petlm.2021.10.002>
10. **Emmanuel E. Okoro**, Samuel E. Sanni, Ikechukwu S. Okafor, Kevin C. Igwilo, Sociis T.A. Okolie, Moses E. Emetere (2021): Application of Cellulosic Fibrous Material from Agro Waste as Filtrate Loss Modifier in Aqueous Mud-Morphology at HTHP Conditions. *International Journal of Engineering RESEARCH IN Africa*, Vol. 56, 51-63.
11. **Emmanuel E. Okoro**, Rachael Josephs, Samuel E. Sanni, Yuven Nchila (2021): Advances in the use of Nanocomposite Membranes for Carbon Capture Operations. *International Journal of Chemical Engineering* Volume 2021, <https://doi.org/10.1155/2021/6666242>
12. **E. E. Okoro**, N. P. Gareca, L. L. Uranga, S. E. Sanni, M. E. Emetere, O. D. Orodu (2021): Synthesis of Nanosilica and its application as Water Based Mud Rheology Enhancer. *IOP Conf. Series: Materials Science and Engineering* 1107 (2021) 012213. doi:10.1088/1757-899X/1107/1/012213





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### Education

Degree	Discipline	Institution	Year
<b>Ph.D.</b>	Petroleum Engineering	University of Ibadan	2014
<b>M.Sc.</b>	Petroleum Engineering	University of Ibadan	2007
<b>B.Sc.</b>	Chemical Engineering	Obafemi Awolowo University	2000

### Academic Experience

From – To	Institution	Rank/Title
<b>2022-Present</b>	Covenant University	Visiting Senior Lecturer
<b>2019-Present</b>	University of Lagos	Senior Lecturer
<b>2016-2019</b>	University of Lagos	Lecturer I
<b>2011-2022</b>	University of Ibadan	Teaching Assistant

### Non-Academic Experience

Company	Title	Description of Position	Year-Year
<b>Havilah Hydrocarbon Resources Management, Lekki, Lagos</b>	<b>Head, Technical Support</b>	<b>Petroleum Engineering Design, Project Supervision</b>	2011-2016
<b>Havilah Hydrocarbon Resources Management, Lekki, Lagos</b>	<b>Staff Reservoir Engineer</b>	<b>Reservoir Engineering Analysis, Economic Valuations</b>	2009-2013
<b>Shell Petroleum Dev. Company</b>	<b>Research Intern</b>	<b>Oil Rim Development Guideline</b>	2008-2009

### Certifications and Current Membership in Professional Organizations

x.Registered Engineer, Council for the Registration of Engineering in Nigeria (R35193)

xi.Member, Society of Petroleum Engineers (3342090)

### Service Activities

x.Level Adviser (2021-Date)

xi.Departmental Result Officer (2017-2022)

### Selected Publication

1. **Olamigoke O.** The Presence of Microplastics in Ocean Waters and Deep Marine Sediments: Implications for the Gulf of Guinea. Current Trends in Eng Sci. 2023;3:1022 <https://doi.org/10.54026/CTES/1022>.
2. **Olamigoke O, James I.** Advances in Well Control: Early Kick Detection and Automated Control Systems. In. Drilling Engineering and Technology - Recent Advances, New Perspectives and Applications. 2022 DOI: <http://dx.doi.org/10.5772/intechopen.106800>
3. **Olamigoke O, Onyeali DC.** Machine learning prediction of bottomhole flowing pressure as a time series in the volve field. International Journal of Frontiers in Engineering and Technology Research, 2022;2(2),20–29: <https://doi.org/10.53294/ijfetr.2022.2.2.0039>



## Dr. Olusola T. Kayode

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### Education

Degree	Discipline	Institution	Year
<b>Ph.D.</b>	Applied Geophysics	Covenant University	2021
<b>M.Sc.</b>	Applied Geophysics	Covenant University	2015
<b>MAGp</b>	Exploration Geophysics	University of Lagos	2010
<b>B.Sc.</b>	Geology	University of Ado-Ekiti	2002

### Academic Experience

From – To	Institution	Rank/Title
<b>2021-Present</b>	Covenant University	Lecturer 2
<b>2013-2020</b>	Covenant University	Assistant Lecturer

### Non-Academic Experience

Company	Title	Description of Position	Year-Year
<b>Chevron Nigeria Limited</b>	Intern with the research unit	Petrophysical analysis /well logs interpretations	2016-2017
<b>Quad Mudlogging Nigeria Limited</b>	Assistant Project Manager	Bidding of core sampling contracts from major oil producers	2009-2012
<b>Geoscience Solutions/ Dharmatthan Nigeria Limited</b>	Geoscientist	Seismic data interpretation, well log analysis etc.	2006 - 2008

### Certifications and Current Membership in Professional Organizations

- i. Member of the Nigerian Association of Petroleum Explorationists 2002 (NAPE)
- ii. Member of the Society of Exploration Geophysics 2018 (SEG)
- iii. Member of the American Association of Petroleum Geologists 2001 (AAPG)
- iv. Member of the American Geophysical Union 2021 (AGU)

### Selected Publications

1. **Kayode, O. T.,** Aizebeokhai, A. P., Odukoya, A. M. (2022). Geophysical and contamination assessment of soil spatial variability for sustainable precision agriculture in Omu-Aran farm, Northcentral Nigeria. Heliyon 8 (2), e08976.
2. **Kayode, O. T.,** Ogundeyi, E. F., Odukoya, A. M., Aizebeokhai, A. P. (2022). Assessment of chromium and nickel in agricultural soil: implications for sustainable agriculture, IOP Conference Series: Earth and Environmental Science 93 012014, 1-8.