UNIVERSITY OF PORT HARCOURT

DEPARTMENT OF CHEMICAL ENGINEERING

HANDBOOK

FOR

B. ENG DEGREE PROGRAMME

2016-2018

1.0 INTRODUCTION

1.1 Background

The Federal government of Nigeria founded the University of Port Harcourt in 1975 as a Faculty of the University of Lagos. The Faculty gained the university status in 1977. The academic units of the university are organized into Colleges, Faculties and Departments. One of such academic units is the Faculty of Engineering.

Engineering may be taken herein as the science and mass application by which the properties of matter and sources of energy are made useful to man in structures, machines, plants and products; engineers ensure safety for all in the society in these products. For short, an engineer is an inventor, an innovator, a builder, and a problem solver. He turns scientific knowledge into goods and services that are useful to man. Engineering is one of the few vocations recognized worldwide as a profession.

An aspiring student who wants to make a career in Engineering profession must be faced with two questions: “why be an engineer?” and what does it take to be an engineer?” the first question needs to be explained to him/her in such a manner that would enable him/her appreciate what an engineer does. When you become an engineer, you get a chance to solve important problems confronting your local government areas, cities, countries and the world today. Wherever the obstacles to progress are technical, wherever buildings and bridges are needed, wherever new processes and products are waiting to be invented or modified, etc. engineers are there. They have chosen to be involved in the development of devices and systems, from research through design, development and testing to manufacture, marketing and maintenance.

What does it take to be an engineer? Not any kinds of person can study Engineering. You can be an engineer if you have a ”curiosity” about the world, a strong interest in mathematics and science, and a desire to make a difference by way of solving problems. If you are looking for a career with unlimited opportunity, if you enjoy the challenges of mathematics, science and satisfying novel societal needs, then engineering is for you!

There is a specific branch of Engineering for every interest. Here at the Faculty of Engineering, University of Port Harcourt, we presently have seven branches or programmes: Chemical, Civil and Environmental, Electrical/Electronic, Mechanical, Petroleum and Gas engineering. There is every opportunity for our programmes to grow in number and strength to meet new challenges and societal needs. The Faculty of Engineering of our university has a locational advantage, positioned in the petroleum and gas rich Niger Delta, and thus, the society has great expectations on its mandate in research and development, and supply of skilled manpower.

As an engineer, you may be involved in research and development, teaching/training, design, construction or manufacturing, technical sales and marketing, facility maintenance, information technology, or management; you may become a manager, a project director, or a company director. And because the primary constituency of an engineer is always the society in which he/she dwells, you may even become a politician**.**

The Chemical Department admitted her first batch of students in the 1982/83 session. Since then, over 1700 graduates, with five of them, first class honours. However, many of the graduates are working with some key industries around Port Harcourt and beyond. Evidences are available to show their performances at their place of work.

The Department commenced her postgraduate programmes in the 1995/96 session: Postgraduate diploma(PGD), Master of Engineering (M.Eng) and Ph.D. degree programmes. The department has since been graduating students at postgraduate level.

1.2 Philosophy and Objectives of the Chemical Engineering Department

The philosophy behind the Chemical Engineering programmes is aimed at training and bringing up engineers who would be knowledgeable in basic physical-biological sciences and would be to apply these knowledge to engineering principles for conversion of raw materials and energies' into more useful forms that would benefit man and her environment.

However, these objectives are further streamlined,

(i) To stimulate students interest in chemical engineering science.

(ii) To produce manpower for the industries

(iii) To develop and train research oriented graduates

(iv) To equip graduates with the requisite skills to make them self-reliant.

1.3 Admission Requirements

Candidates applying to the undergraduate programme in Chemical Engineering should have five credit pass in Chemistry, Physics, Mathematics, English language and Biology(or agricultural science) at WAEC and or NECO at not more than two sittings.

Candidates are also expected to have a minimum score of 200 out of 400 in both the UME and post UME before they can be admitted into the department.

1.4 Chemical Engineering Programme Structure

The programme structure in chemical engineering requires five academic calendar years (of ten semesters) of which nine of the ten semesters are actually used for formal class room/laboratory studies. One semester (in the fourth year) and the two long vacations (at the end of third and fourth year) are used for industrial training. At the fifth year of studies, students are assigned research project topics and design project topics which they are expected to defend at the end of the tenth semester under an external examiner not below the rank of a senior lecturer.

2.0 ACADEMIC AND SENIOR TECHNICAL STAFF

2.1 Past/Present Deans

S/N	Name	Period	Designation
1.	Engr. Prof. Chi. U. Ikoku	1983-1999	Dean
2	Engr. Prof. Y.O. Beredugo	1999-2000	Acting dean
3	Engr. Prof. Nwaogazie, Ify. L.	2000-2002	Dean
4	Engr. Prof. A.O. Kuye	2002-2004	Dean
5	Engr. Prof. C. Umezuruike	2004-2005	Dean
6	Engr. Dr. A. Dosunmu	2005-2006	Acting dean
7	Engr. Prof. D.P.S Abam	2006-2008	Dean
8	Engr. Prof. D. Appah	2008-2009	Dean
9	Engr. Prof. J.U Okoli	2009—2011	Dean
10	Engr. Prof. S.U Ejiezie	2011-2013	Dean
11	Engr. Prof. D. Appah	2013-2015	Provost
12	Engr. Prof. O.M.O. Etebu	2015-date	Dean

2.2. Past and Present Heads of Departments

S/N	Name	Period	Designation
1	Dr. C.O Onu	1984-86	Ag. Head
2	Dr. L.J Thomas Ogbuji	1986-88	Ag.Head
3	Dr. C. Okoroafor	1988-90	Ag. Head
4	Dr. A. Lawal	1990-91	Ag. Head
5	Dr. N.O Umesi	1991-92	Coordinator
6	Dr. A.O Kuye	1992-94	Ag. Head
7	Dr. E.T Iyagba	1994-99	Ag. Head
8	Dr. N.O Umesi	1999-2001	Ag. Head

9	Dr. F.O Chukwuma	2001-2003	Ag. Head
10	Dr. A.J Adeyinka	2003-2005	Ag. Head
11	Dr. C.C Opara	2005-2007	Ag, Head
12	Dr. L. Uyigue	2007-2010	Ag. Head
12	Engr. Prof. F.O Chukwuma	2010-2014	Head
13	Engr. Dr. B.O Evbuomwan	2014-2016	Ag. Head
14	Engr. Dr. M.K Oduola	2016-Date	Ag. Head

2.3 Academic Staff

Department of Chemical Engineering

S/N	Name of Staff	Rank/Designation , Date of first Appointment	Qualification, Dates obtained and specialization, membership of professional association
1	Kuye, A.O.	Professor 1st Oct. 1985	B.Sc (1978) M.Sc (1981), Ph.D(1984). Computer-aided design. FNSChE, MNSE, R.Eng.(3290)
2	Okpala, K. O	Professor Jan 2010	B.Sc(1975), M.Sc(1977), Phd(1981) Separation Processes/Reaction Engineering. FNSChE, MNSE, R.Eng (13,499)

3	Iyagba, E.T.	Professor, , Nov. 1980	B.Sc (1979), M.Sc (1983) Ph.D (1986), Reaction/ Catalysis MNSE, MNSChE, R.Eng (21,866)
4	Chukwuma, F.O.	Professor 1984	B.SC(1979), M.SC(1981), Ph.D(1983).Separation Processes and Process Control. MNSChE, R.Eng (16966)
5	Etebu, O.M.O	Professor 1993	B.Sc (1982) Chem.Eng, M.Eng (2007) Chem.Eng, MBA (2002) Management, M.Eng. (2001) Mech Eng., M.Sc (1985) Industrial Engineering, Ph.D (1997) Mech Eng. R. 8615
6	Joel O.F	Professor 2008	B.Eng (1987), M.Eng (1993), Ph.D. Chem/Petrochem Eng. R. 9471
7	Ikienkisimama, S.S	Senior Lecturer 1991	B.Eng (1991) Chem Eng., M.Eng (1996) Petroleum Eng., Ph.D (2008) Chem.Eng.
8	Uyigue, L.	Senior Lecturer 1993	B.Eng (1991), M.Eng. (1995), PhD(2004). Polymer/Biodiesel Eng, MNSE. R.Eng (15615)

9	Evbuomwan, B.O.	Senior Lecturer 1994	B.Eng(1987),M.Eng (1993), Ph.D(2008). Separation Processes, MNSE. R.Eng (13727)
10	Oduola, M.K	Senior Lecturer 2007.	M.Sc,(1996) Ph.D(2005). Reaction Engineering. MNSChE R. Eng(18680)
11	Otaraku I, J	Senior Lecturer 2004.	MSc (1985), PhD(1990). Petrochemical,Reaction/ Catalysis.mAIChE, mSIC
12	Josiah, P.N.	Lecturer I 1997	B.Eng (1991), M.Sc (1995). PhD(In View) Chemical Engineering. MNSE
13	Oseghale C. I	Lecturer I 2004.	BSc(1995),DchE(2000), MENG(2004). PhD(In View) Chemical Engineering. R.13434
14	Nwambo Y.P.	Lecturer I 2006	B. Tech.(1994), M. Sc(2002).PhD (InView) Chemical Engineering. MNSE (25736), R. 32103
15	Oji A. A	Lecturer I 2008.	B.Eng (1997). M.Eng (2002). PhD(2016) Chemical Engineering. MNSE. R.32922
16	Ajoku, G.A.O	Lecturer I	B.Sc(1995),DchE(1999)

		2008.	M.Eng(2003). PhD (**In View**) Chemical Engineering. MNSE
17	Edeh, I.	Lecturer II 2008	B. Eng. (2003), M. Eng. (2009). PhD (2016) Chemical Engineering. MNSE (26810)
18	Achadu, M.	Lecturer I 2008	B. Eng (2000), M. Eng (2011).PhD (**In View)** Chemical Engineering.
19	Raheem, A.	Lecturer I 2008	B. Eng (1995), M. Eng.(2011). PhD (**In view)** Chemical Engineering. R.23768
20	Unidiandeye, J.	Lecturer II 2014	B. Eng (2007), M. Eng.(2011). PhD (**In View)** Chemical Engineering. R.Eng (27,659)
21	Enujekwu, F.M	Assist. Lecturer 2014	B. Eng. (2010). M.ENG(2016) Chemical Engineering.
22	Anaele, J. V	Assist. Lecturer 2014	B. Eng. (2010). M.ENG(2016) Chemical Engineering

2.4 Technical Staff

S/N	*Name*	**Rank / Designation, Date of First Appointment**	**Qualifications,**
1	*Mrs. Onyemuwa I. S*	Chief Technologist 1985	HND (IMT) B. ENG (Chemical) 2010, R.Eng (1212ET)
2	*Mr. T. N. Oko*	Chief Technologist 1986	HND (1983) B. ENG (Chemical)
3	*Mr. Charles Onyeukwu*	Technologist I 1990	HND (PH) 2001
4	*Uzoechi Akuoma B. (Miss)*	Technologist I 2008	HND (PH) 2005
5	*Mr. G. E. Job*	Technologist I 2008	HND (Auchi) B. ENG (UPH)
6	*Mr. J. B. Egere*	Technologist I 2008	HND (uniport) B. Sc/MSc (Pure & Indus Chem)
7	*Nnanna Grace N (Mrs)*	Laboratory supervisor (1995)	SSCE, NECO
8	*Amadi Victoria W.(Mrs)*	Laboratory supervisor 1995	SSCE
9	*Mrs Odoemena Monica*	Laboratory supervisor (1995)	SSCE 1983

10	*Mr. Gbeneewoo Suanu*	Laboratory Assistant	SSCE. B. Sc Anatomy
11	*Mr. Ntigiri Mene*	Laboratory Assistant	SSCE
12	*Miss Ihunda Pricess C.*	Head Laboratory Attendant	SSCE
13	*Mrs Augustine Kufre U.*	Laboratory Assistant	SSCE
14	*Anelf H. Raphael*	Laboratory Assistant	SSCE

2.5 Administrative Staff

SN	Name of Staff	Rank/Designation and Date of First Appointment	Qualification and Dates Obtained
1	Mrs. Ekuhule, Edna	Chief Secretary Assistance. 12/02/83	SSCE,1996, Pitman Advance Type writing. 1994
2	Soni-Uboh, Isiomah	Admin, Officer March 2011	B.A (1997), M.A(2009) , Ph.D(IN VIEW)
3	Mr Okwu, Ernest, B	Admin, Assistant 1/12/98	B.Sc (2009)
4	Mrs Owhorji, T	Confidential Secretary, 2008	SSCE, 2003, B.Sc 2010
5	Npinimal, Saturday	Caretaker – 8-08-91	F.S.L.C.
6	Onyeche, G.	Caretaker.- 20-11-89	“

7	Amadi, Wellington.	Messenger – 18 – 10-82	WASC. 2003

3 ACADEMIC POLICIES

3.1 Highlights

The following extracts have been taken from the document "*General* Regulations And Statement of Academic Policies, University of Port Harcourt 2016". This document was issued first in 1977, revised in 1983 to reflect the reorganization from a school to a Faculty-Department system; and revised in 1990 to reflect changes in line with the NUC Minimum Academic Statements. The present revision reflects changes made by Senate in 1995 and from 2002 to 2014. The name of the document is now changed from ''Statement of Academic Policies'' to "*General* Regulations And Statement of Academic Policies'' to reflect the all- embracing content of the document. Students are advised to familiarize themselves with this document. General Remarks has been included to alert the fresh student on the implications of the new grading system in relation to his/her final degree classification, and the virtue of and reward for hard work, honesty and abstinences from vices: examination malpractice and cultism.

3.2 Grading System

The following system of Grade Points shall be used for all Colleges/ Faculties:

Mark/score		
	Letter Notation	*Grade Point (GP)*
70% & above	A	5.00
60-69	B	4.00
50-59	C	3.00
45-49	D	2.00
40-44	E	1.00
0-39	F	0.00

Students are obliged to sit for examinations in all registered courses. Any student who fails to sit for a course examination without satisfactory reason earns the grade of "F" and must re-register for the course

3.3 Computation of Grade Point Average

Every course carries a fixed number of Credit Units (CU); one Credit Unit being when a class meets for one hour every week for one semester, or three hours every week in the laboratory, workshop or field.

Quality Points (QP) are derived by multiplying the Credit Units for the course by the Grade Points (GP) earned by the student: e.g. in a course with 3 Credit Units in which a student earned a B with 4 Grade Points, the Quality Points are: 3 x 4 = 12.

Grade Point Average (GPA) is derived by dividing the Quality Points for the semester by the Credit Units for the semester: e.g. in a semester where the student earned 56 Quality Points for 18 Credit Units, the GPA is: 56/18 = 3.11.

Cumulative Grade Point Average CGPA) is derived by adding the Total Quality Points (TQP) to date and dividing by the Total Credit Units (TCU) to date: e.g. if the TQP are 228 and the TCU are 68, the CGPA is: 228 ÷ 68 = 3.35.

Detailed example of how to calculate GPA and CGPA is shown below**:**

First Year, Semester One

Course Code	Credit Units (CU)	Letter Grade	Grade Point (GP)	Quality Points (QP)	Grade Point Average (GPA)	Cumulative Grade Point Average (CGPA)
HSA 100	3	B	4	12	QP = 66	TQP = ∑QP
HSA 101	2	C	3	6	CU =17	= 66
HSA 102	1	C	3	3	GPA =	TCU ∑CU
HSA 103	4	B	4	16	66 ÷ 17	= 17
HSA 104	5	A	5	25	= 3.88	CGPA
HSA 105	2	D	2	4		= 66/17
Total	**17**			**66**		= 3.88

First Year, Semester Two

Course Code	Credit Units (CU)	Letter Grade	Grade Point (GP)	Quality Points (QP)	Grade Point Average (GPA)	Cumulative Grade Point Average (CGPA)
HSA 106	5	E	1	5	QP = 48	TQP = ∑QP
HSA 107	4	D	2	8	CU = 17	= 66 + 48
HSA 108	5	B	4	20	GPA =	= 114
HSA 109	0	F	0	0	48÷17=	TCU ∑CU
HSA 110	3	A	5	15	2.82	=17+17 = 34
						CGPA
Total	20			48		= 114 ÷34 = 3.55

Second Year, Semester One

Course	Credit	Letter	Grade	Quality	Grade	Cumulative

Code	Units (CU)	Grade	Point (GP)	Points (QP)	Point Average (GPA)	Grade Point Average (CGPA)
HSA 210 HSA 211 HSA 212 HSA 213 HSA 214	2 3 5 5 3	E C B C A	1 3 4 3 5	2 9 20 15 15	QP = 61 CU = 18 GPA = 61÷18= 3.39	TQP = ∑QP = 175 TCU = 52 CGPA = 175 ÷52 = 3.37
Total	18			61		

Second Year, Semester Two

Course Code	Credit Units (CU)	Letter Grade	Grade Point (GP)	Quality Points (QP)	Grade Point Average (GPA)	Cumulative Grade Point Average (CGPA)
HSA 215 HSA 216 HSA 217 HSA 218 HSA 219 HSA 109	3 4 5 0 3 3	B C B F C D	4 3 4 0 3 2	12 12 20 0 9 6	QP = 59 CU =18 GPA = 59 ÷ 18 = 3.28	TQP = ∑QP = 234 TCU ∑CU = 70 CGPA = 234/70 = 3.34
Total	**18**			**59**		

Note: HSA 109 has been passed in second year, semester Two. The CU is therefore used in the candidate passed and the failure in Year One Semester Two computed as 0 credit unit.

The procedure is repeated for the 2nd , 3rd, 4th and 5th years, given rise to CGPA computation at graduation.

Note: Since 2005, students can graduate with a minimum of two failed courses but the CU of such failed courses must be used in the computation of the CGPA.

(i) Grades obtained in all approved courses of a student's prescribed programme, excluding audited courses, shall be used to compute the GPA.

(ii) When a student transfers from one Faculty to another, only the grades obtained in the courses in the new prescribed programme of study will be used to compute the CGPA. Courses which were completed before the change of programme and which are not part of the new prescribed programme will be treated as audited courses.

(iii) When a student transfers from another University, only the grades obtained in the University of Port Harcourt will be used to compute the CGPA

3.4 Continuation, Probation and Withdrawal

(i) **Continuation Requirement**

The continuation requirement for undergraduate students in the University is a CGPA of 1.50 at the end of every academic year.

(ii) **Probation**

Probation is a status granted to a student whose academic performance falls below an acceptable standard. A student whose Cumulative Grade Point Average (CGPA) is below 1.50 at the end of a particular year of study earns a period of probation for one academic session

(iii) **Limitation of Registration**

Students on probation cannot not register for more than 15 units per semester. The purpose of the restriction is to give the students a chance to concentrate on improving their performance.

(iv) **Warning of Danger of Probation**

Students should be warned by their Department if at the end of any semester their GPA falls below 1.50

(v) Repeating Failed Course(s)

Subject to the conditions for advised – withdrawal from programme and or probation, a student must repeat the failed course(s) at the next available opportunity, provided that the total number of credit units carried during that semester does not exceed 24.

(vi) Temporary Withdrawal from Study

(i) Any student who has genuine reason(s) to apply for temporary withdrawal from study should apply to the university in writing through the Department and Faculty/College stating the reason(s) for his/her application, and needs to obtain approval from senate.

The application should specify the period (session) to be away and the session for resumption of study. The Head of Department of the student should furnish the Faculty with the CGPA of the student at the time of the request and this must be presented to the senate of the university.

3.5 Auditing of Courses

Students may attend a course outside their prescribed programme. The course shall be recorded in their transcript only if they have registered for it with the approval of the Head of their Department and the Dean of

their Faculty and taken the prescribed examination. An audited course shall not be used in calculating the CGPA.

3.6 Criteria for Graduating Students

Students except those in engineering shall be allowed to graduate with a maximum of any two (2) failed courses, provided these are not Research Projects, Design Project, Teaching Practice, Students Industrial Work Experience Scheme (SIWES), GES Courses, Year abroad Programme and Community Service Courses

The following courses:. Research Projects, Design Project, Teaching Practice, Students Industrial Work Experience Scheme (SIWES), GES Courses, Year abroad Programme and Community Service Course must be used in computing the degree results.

Pass grades shall replace fail grade and the pass grade shall be used to compute the CGPA. The maximum grade to be earned in respect of replacement of fail grade with a Pass grade is `C`.

3.7 Academic Advisers

Every student is attached to an Academic Adviser who is a member of the a academic staff and who will advise him/her on academic affairs as well as on personal matters. Academic Advisers are expected to follow their students' academic progress and provide counseling to them. It is the duty of the Head of Department to assign an Academic Adviser to each student at the beginning of each session. Academic Advisers should give clear information on the notice-boards or on their officer doors about appropriate times and places at which they will be available to students who wish to consult them.

3.8 Classification of Degrees

The degree shall be awarded with 1st, 2nd Upper, 2nd Lower, or 3rd Class Honours, (or as a Pass degree for old students *) The Cumulative Grade Point Average (CGPA) for these classes shall be:

Class of Degree	Cumulative Grade Point Average (CGPA)
1st Class	4.50 – 5.00
2nd Class Upper	3.50 – 4.49
2nd Class Lower	2.40 – 3.49
3rd Class	1.50 - 2.39
Pass	1.00 – 1.49

***** *Old students are those enrolled in second or higher level course prior to the 2015/2016*

3.9 Examination Regulations

Examiners should ensure that the question papers are prepared under conditions of maximum security and are ready on time. For all examinations, well-packaged question papers must be accompanied by a list of Supervisors. Invigilators and the relevant forms. The Examiners should ensure that the question papers, adequately packaged and sealed, are submitted to the Supervisor at least one hour before the start of the examination.

Subject only to administrative supervision by the Office of the Provost/Dean/Director, the conduct of course examinations shall be the responsibility of the Head of Department. The Head of Department should ensure that examination questions are moderated.

For each examination there should be a supervisor and invigilators in a ratio of at least one invigilator to 50 students, including both male and female invigilators.

It is the responsibility of the Parent Department to appoint supervisors and invigilators. The list should be forwarded to the Head of the Teaching Department not later than one week before the commencement of semester examinations. Students should be seated according to their Departments and they should be invigilated by academic staff from their Departments.

Supervisors should be appointed from the rank of Senior Lecturer and above and invigilators should be other members of academic staff. Part-time teachers, where necessary, are also regarded as Internal Examiners.

Supervisors must identify and check students into the examination hall using the authenticated register of students for that course. The student must show the invigilator his/her registration/identity cared on entry to every examination. He/she must leave these on the desk throughout the examination for easy inspection by the invigilator.

All examination scripts used by the students must be endorsed by the supervisor at least 30 minutes after the commencement of the examination.

The invigilator must ensure that no student removes from the examination venue any paper or other examination material except the printed question papers where it is allowed. Answer booklets are the property of the University and must not be in the possession of students.

During examinations the security must be stepped up, especially around examination centres, to ensure the safety of staff and students. The Security Department is to ensure that no persons not involved in the examinations are allowed to loiter around the hall.

No unregistered student is allowed to take any examination.

A student should be in the examination room at least 30 minutes before the start of the examination. A student who is up to 30 minutes late shall be admitted, but shall not be given any extra time. A student who arrives more than 30 minutes after the start of the examination shall not be admitted. A student may be allowed to leave the examination room temporarily before the end of the examination, but must NOT.

(a) Do so during the first hour of the examination except in cases of emergency like illness;

(b) Do so unaccompanied OR with his scripts.

All students must write their name and matriculation number and sign the attendance register within the first hour of the examination.

All students must write their matriculation number (not name) at the appropriate places on the cover and pages of the answer booklet.

No student shall keep any handbag, briefcase, books, notebooks, or paper near him/her during the examination.

No student shall directly or indirectly give or accept any assistance during the examination, including lending, borrowing any material.

No student shall continue writing when, at the end of the allotted time, the invigilator orders all students to stop writing.

A student shall avoid noise-making and/or communicating with any other student or with any other person, except with the invigilator, if necessary.

Students who disrupt an examination at any venue will have their ‘examination cancelled’. And they will be required to re-register for the course.

At the end of the examination the Supervisor/Invigilator should ensure that the scripts are checked, properly packaged, and returned along with relevant forms to the Chief Examiner.

A member of staff who fails to turn up for invigilation shall be queried for this act the first time, if this is repeated during another period of examination, the member of staff will lose the next promotion and be warned in writing by the Vice Chancellor.

The Head of Department shall report any defaulting invigilator to the Provost/Dean, whose responsibility it is to forward the report to the Vice Chancellor.

These examination regulations apply to all students studying for the award of University of Port Harcourt degrees, and where appropriate to all staff.

3.10 Procedure for Investigation of Examination Malpractices

Definition of Examination Malpractice

Examination malpractice shall be defined as all forms of cheating which directly or indirect falsify the ability of the student. These shall include cheating within or outside an examination hall, and any involvement in all illegal examination-related offences. Forms of cheating are categorized as follows:

3.10.1 Cheating within an examination hall/room

1. Copying from one another/exchanging question/answer sheets.

2. Bringing in prepared answers, copying from textbooks, notebooks, laboratory specimens or any other instructional aids smuggled into the examination hall.

3. Collaboration with an invigilator/lecturer where it involves the lecturer providing written/oral answers to a student in the examination hall.

4. Oral/written communication between/amongst students.

5. Bringing in prepared answers written on any part of the body.

6. Receiving information, whether written or oral, from any person(s) outside an examination hall.

7. Refusal to stop writing at the end of the examination.

8. Impersonation.

9. Non-submission of answer scripts at the end of an examination.

10. Illegal removal of answer scripts from the examination

11. Manipulation of registration forms in order to sit for an examination for which the student is not qualified.

12. Sitting for an examination for which the student is not qualified as a result of manipulation of registration forms

13. Entering an examination hall/room with an electronic device e.g. handset, i-pad, i-pod, etc. except non- programmable calculators, whether it has been used or to cheat or not

3.10.2 Cheating outside the examination hall/room

1. Plagiarism is a form of examination malpractice and should be investigated and punished. Plagiarism is the use of another

person's work without appropriate acknowledgement both in the text and in the references at the end.

2. Colluding with a member of staff to obtain or on his own initiative obtaining set questions or answers beforehand.

3. Colluding with a member of staff to modify or on his/her own initiative modifying students' score cards, answer scripts and/or mark sheets.

4. Colluding with a member of staff in order to submit a new, prepared answer script as a substitute for the original script after an examination.

5. Writing of projects, laboratory and/or field reports on behalf of a student by a member of staff.

6. Soliciting for help after an examination.

7. Secretly breaking into a staff office or departmental office in order to obtain question papers, answer scripts or mark sheets, or substituting a fresh answer scripts for the original script.

8. Refusing to co-operate with the Faculty Investigating Panel or the Senate Committee on Examinations Malpractices in the investigation of alleged examination malpractices.

3.10.3 Other Examination Related offences

1. Producing a fake medical certificate.

2. Assault and intimidation of the invigilator within or outside the examination hall.

3. Attempting to destroy and/or destroying evidence of examination malpractice.

4. Intimidation/threats to extort sex/money/other favours from students by a member of staff in exchange for grades.

3.10.4 Investigation of Examination Malpractice

Any unauthorized material found in the possession of a student shall be seized by the invigilator after the student has signed it, acknowledging that is was retrieve from him/her. Refusal to sign is tantamount to acceptance of guilt.

Where the student refuses to sign, the Invigilator should make a clear statement on the answer sheet and sign.

The student shall, however, not be prevented from finishing the examination.

The Invigilator shall, immediately after the examination, submit a written report to the Head of the Department conducting the examination.

The Department conducting the examination shall set up a committee/panel to examine the merit of the case.

If the Departmental Board feels that a prima facie case has been established, the cases shall be presented to the Faculty Board which shall appoint a panel to investigate the case and report back to the Faculty.

If the Faculty is satisfied that a case has been established, the case should be reported to the Senate Committee on Examination Malpractices (SCEM).

The Senate Committee on Examination Malpractices (SCEM) shall investigate the case and report to Senate for decision.

The investigation of examination malpractice should takes an much time as it takes to dispose of the matter, but it must not go beyond the end of the semester following the one in which the offence was allegedly committed. Meanwhile, the student allegedly involved in an examination malpractice shall be allowed to register for course and take examinations in them. But results of the courses shall not be released by the parent or any other department until investigation has been completed and his/her innocence established by Senate.

3.10.5 Punishment for Examination Malpractice

(a) Any student found guilty of any form of examination malpractice in section **3.10.1** shall be liable to expulsion from the university.

Note:

(i) The university shall communicate senate decisions on examination malpractice to all affected students and their sponsors in writing thereafter shall have the information published on all notice boards within the University, university weekly, University website and may be in the print media.

(ii) Decisions of senate on examination malpractice shall take effect from the date on which they were taken except otherwise stated

(b) A member of staff involved in aiding and abetting students in examination malpractice amounts to gross misconduct and shall be made to face appropriate disciplinary sanctions.

3.10.6 Secret Societies/Cults

Secret societies/cults are anti-social and are banned by the University. Any student proved to belong to a secret society will be expelled.

3.11 General Remarks

All the students admitted into the 1st year of the Faculty of Engineering programmes must have met the entry requirements, and thus, eligible to pursue the available careers in the Faculty. However, experience has shown that many of these students relax their efforts in the early years of study, apparently assuming that, like the practice in the primary and secondary schools, they would make up the lost efforts in their later years of study. This assumption is false in the Nigerian University System**.**

Here, at the University of Port Harcourt, every registered course (except officially dropped):

(i) requires a minimum of 70% attendance to lecture/tutorial (L) and/or laboratory/Practice (P);
(ii) must be continuously assessed through assignments, tests, etc;
(iii) must culminate in an examination, and
(iv) must have a grade returned for every student who registered for it, which must comprise of at least 30% from the continuous assessment and 70% from the examination.

Each course in the programme contributes toward the Cumulative Grade Point Average (CGPA) with its weight (credit units). In the Faculty of Engineering, the weights for courses may be 1, 2 or 3 credit units as the

case may be, except for the final year project whose weight is 6 credit units. The Industrial Training courses offered during the 3rd and 4th year long vacations and the second semester of year 4,and for which reports are presented, have zero credit unit but are recorded as Pass or Fail.

Most top job opportunities in the industry are usually reserved for graduates with excellent or very good degree classification (1st class or 2nd class upper division). For example, to be qualified to become a lecturer in the University, one's first degree must not fall below 2nd class upper division. And to qualify for admission into a post-graduate degree programme at the University of Port Harcourt, one's first degree must not fall below a 'high' 2nd class lower division (that is, his/her final CGPA must not be below 3.0).

Therefore, for the ambitious student, hard work begins from year 1 and spans through year 5. Few low grades can thwart his/her ambition. However, one should always be true to his/her abilities, and not resort to cheating to claim what does not belong to him/her.

Students are therefore advised to completely avoid vices (such as secret cultism and examination malpractice) that will ultimately put them out of course and disrepute. They are rather encouraged to be obedient, humble and law-abiding and to act in such a manner as to achieve their primary purpose of advancing their education.

4 THE CURRICULUM

4.1 Course Structure and Course Schedule

The Department runs a five-year undergraduate programme leading to the award of a bachelors Degree in Chemical Engineering (**B. ENG.).** Generally, the programme can be divided into two broad areas:- Basic Engineering Courses and Core Engineering Courses

- **Basic-Engineering Courses:** This covers courses taken in years one and two. These are general foundation courses for all engineering disciplines. This programme is dominated by common Science, General Studies and Engineering courses required by all engineering students.

- **Core Engineering Courses**: This covers courses taken from year three to year five. The courses taken at this level are professional engineering courses mainly from within the Faculty of Engineering.

Apart from these, the students undertake 3-month industrial training at the end of their year three and 6 months industrial training in the second semester of year 4. During the industrial training period, the students are supervised by both lecturers and industry-based supervisors More information on industrial is provided in item 1.7.

Details on the individual programmes of study: course schedule and course descriptions, are presented subsequently. The Faculty common courses denoted as ENG courses, the General Studies courses (denoted as GES courses), and the Science courses (denoted as CHM for Chemistry; MTH for Mathematics; and PHY for Physics). The departmental course codes are CHE for Chemical Engineering; CEG for Civil Engineering; EVE for Environmental Engineering; EEE for

Electrical/Electronic Engineering; MEG for Mechanical Engineering; GNG for Gas Engineering and PNG for Petroleum Engineering.

Course Codes and Course Titles and Structure for Chemical Engineering Programme

YEAR ONE

First Semester				
Course Code	Course Title	L	P	C
GES 100.1	Communication Skills in English	3	-	3
GES 102.1	Introduction to Logic & Philosophy	2	-	2
CHM 130.1	General Chemistry I	2	3	3
PHY 101.1	Mechanics and Properties of Matter	3	-	3
PHY 102.1	Physics Laboratory I	-	3	1
MTH 110.1	Algebra and Trigonometry	3	-	3
MTH 120.1	Calculus	3	-	3
ENG 101.1	Engineering Drawing I	1	3	2
Total		**17**	**09**	**20**

Second Semester				
GES 101.2	Computer Appreciation & Applications	2	-	2
GES 103.2	Nigerian Peoples and Culture	2	-	2
CHM 131.2	General Chemistry II	2	3	3
CHM 132.2	Intro. to Principles of Organic Chemistry	3	-	3
PHY 112.2	Electricity and Magnetism	3	-	3
PHY 103.2	Physics Laboratory II	-	3	1
MTH 124.2	Coordinate Geometry	3	-	3
ENG 102.2	Engineering Drawing II	1	3	2
ENG 103.2	Engineer-in-Society	1	-	1
ENG 104.2	Manufacturing Tech./Workshop Practice	1	3	2
Total		**18**	**12**	**22**

YEAR TWO

PHY 216.1	Vibration, Waves and Optics	3	-	3
CHM 250.1	Inorganic Chemistry I	2	3	3
CHM 260.1	Organic Chemistry 1	2	3	3
ENG 201.1	Engineering Mathematics I	3	-	3
ENG 202.1	Engineering Mathematics II	2	-	2
ENG 203.1	Engineering Mechanics	3	-	3
ENG 210.1	Basic Electrical Engineering	3	-	3
CHE 211.1	Introduction to Chemical Engineering	1	-	1
Total		**16**	**15**	**21**

Second Semester				
CHM 240.2	Physical Chemistry	2	3	3
ENG 206.2	Engineering Mathematics III	3	-	3
ENG 207.2	Basic Fluid Mechanics	2	-	2
ENG 208.2	Basic Strength of Materials	2	-	2
ENG 209.2	Basic Thermodynamics & Heat Transfer	3	-	3
ENG 205.2	Engineering Laboratory I	-	3	1
ENG 211.2	Engineering Laboratory II	-	3	1
ENG 212.2	Community Service	-	3	1
ChE 212.2	Chemical Engineering Process Analysis	3	-	3
Total		**18**	**9**	**21**

YEAR THREE

First Semester				
ENG 204.1	Basic Engineering Materials	2	-	2
ENG 213.1	Engineering Computer Programming	1	3	2
ENG 301.1	Engineering Mathematics IV	3	-	3

ENG 302.1	Technical Writing and Presentation	2	-	2
CHE 311.1	Chemical Reaction Kinetics	3	-	3
CHE 313.1	Chemical Engineering Thermodynamics	3	-	3
CHE 315.1	Transport Phenomena I	3	-	3
CHE 317.1	Separation Processes I	3	-	3
Total		**20**	**3**	**21**

Second Semester				
ENG 303.2	Engineering Mathematics V	2	3	3
CHE 312.2	Separation Process II	3	-	3
GES 300.2	Fundamentals of Entrepreneurship	2	-	2
CHE 314.2	Transport Phenomena II	3	-	3
CHE 316.2	Process Instrumentation	1	3	2
CHE 318.2	Chemical Reaction Engineering	3	-	3
CHE 320.2	Chemical Engineering Laboratory I	-	9	3
Total		**14**	**15**	**19**

Long Vacation				
Eng 300.3	Industrial Training 1	-	-	3

YEAR FOUR

First Semester				
ENG 401.1	Engineering Mathematics VI	3	-	3
ENG 402.1	Engineering Economics	2	-	2
PNG 403.1	Natural Gas Engineering	3	-	3
CHE 411.1	Separation Process III	3	-	3
CHE 413.1	Chemical Engineering Thermodynamics II	2	-	2
CHE 415.1	Transport Phenomena III	2	-	2
CHE 417.1	Introduction to Polymer Processing	3	-	3

CHE 421.1	Chemical Engineering Laboratory II	-	09	3
Total		**18**	**11**	**23**

Second Semester				
ENG 400.2	Industrial Training 1I	-	-	9
GES400.2	Enterpreneurship Project	-	-	2

YEAR FIVE

First Semester				
ENG 501.1	Professional Practice and Procedures	2	-	2
ENG 502.1	Engineering Management	2	-	2
CHE 511.1	Principles of Chemical Eng. Plant Design	2	-	2
CHE 513.1	Process Dynamics and Control	3	-	3
CHE 515.1	Process Optimization	3	-	3
CHE 517.1	Chemical Engineering Analysis	3	-	3
CHE 55.1	Chemical Engineering Elective I	3	-	3
Total		**18**	**-**	**18**

Second Semester				
CHE 512.2	Technical Seminar	-	3	1
CHE 514.2	Intro. to Biochemical Engineering	3	-	3
CHE 516.2	Chemical Process Technology	3	-	3
CHE 518.2	Chemical Process Design	1	6	3
CHE 520.2	Final Year Project	-	18	5
CHE 55.2	Chemical Engineering Elective II	3	-	4
Total		**10**	**27**	**19**

Chemical Engineering Electives (3 Credit Units each)	
CHE 550.0	Technology of Fossil Fuel Processing
CHE 551.0	Industrial Management and Loss Prevention
CHE 552.0	Industrial Pollution Control
CHE 553.0	Computer Applications in Chemical Engineering
CHE 554.0	Quality System Management
CHE 555.0	Soap and Detergent Technology
CHE 556.0	Food Processing Technology
CHE 557.0	Particulate Technology

4.2 Course Content

Faculty-wide Courses

General Studies Courses (GES)

GES 100.1: Communication Skills in English (3 Credits)

Study skills and methods including use of language and use of the library. Listening comprehension skills. Reading skills. Using grammar in reading and writing. Writing skills. Examination techniques.

GES 101.2 Computer Appreciation and Applications (2 Credits)

History of Computers. Generations and classification of computers. IPO model of a computer. Components of a computer system – hardware and software. Programming languages, organization of data. Data capture techniques. Introduction to computer networks. Software and its application. Use of keyboard as an input device. DOS, Windows, word processing, spreadsheets. Application of computers in Medicine, Social Sciences, Humanities, Education and Management Sciences.

GES 102.1: Introduction to Logic and Philosophy (2 Credits)

The nature, definition and branches of Philosophy. Philosophy and other disciplines. Nature of philosophical problems. Periods in the history of Philosophy. Philosophy and national development. Types of argument and reasoning. Inferences.

GES 103.2: Nigerian Peoples and Culture (2 Credits)

The concept of culture. Pre-colonial cultures and languages of Nigeria. Principles of kinship, descent and marriage in Nigeria cultures. Nigerian economic institutions. Nigerian political institutions. Education and development in Nigeria. Religion in Nigerian culture. Culture, environment and health practices in Nigeria.

GES 300.2; Fundamentals of Entrepreneurship

Control of, history and the development of entrepreneurship, the entrepreneurship qualities and Characteristics, the opportunities; Starting and developing new business ventures, legal ownership; feasibility Studies; role of small and medium scale enterprise (SME) in the economy, role of government in entrepreneurship, business location and layout, accounting for SME, financing SME, managing of factors of SME, Marketing in SME, risk management of SME, Success and failure factors of SME prospects and challenges of entrepreneurship and intraprenueuship; ethical behavior in small business.

GES 400.2: Entrepreneurship Project

The Students are given project topic to write on. **Pre-requisition: GES 300.2**.

Science Courses (CHM, MTH, PHY)

CHEMISTRY (CHM)

CHM 130:1: General Chemistry 1 (3 credits)

Basic principles of matter and energy from the chemist's point of view. A broadly based course suitable fro students from various schools as well as those from the faculty of science. Topics to be covered will include atomic theory and molecular structure stoichiometry, the periodic classification of the elements, atomic structure, chemical bonding properties of gases, solids, liquids and solutions, chemical equilibrium, ionic equilibria, chemical thermodynamics, electro-chemistry and chemical kinetis. (includes laboratory sessions.)

CHM 131.2: General Chemistry II (3 credits)

Application of the principles of chemical and physical change to the study of the behaviour of matter and the interaction between matter. Course content includes, the chemistry of representative elements and their common compounds with emphasis on gradation of their properties- brief chemistry of the first series of transition elements, general principles of extraction of metals; introductory nuclear chemistry. (includes Lab Session.)

CHM 240.2: Physical Chemistry (3 Credits)

Introduction to basic physical chemistry. The emphasis is on the properties of gases, the three laws of thermodynamics and the principles of chemical kinetics and electrochemical cells.

PHYSICS (PHY)

PHY 101.1: Mechanics and Properties of Matter (3 Credits)

Topics covered in this course will include the following: motion in one dimension, motion in a plane, work and energy, conservation laws, collisions, solid friction, rotational kinematics and rotational dynamics, equilibrium of rigid bodies oscillations, gravitation, fluid statics and fluid dynamics. Surface tension, elasticity and viscosity. Pre-requisite: WASC credit in Physics, PHY 300 or equivalent

PHY 102: 1: Physics Laboratory Practice (1 Credit.)

Laboratory exercises drawn from PHY 101.1

PHY 112.2: Electricity and Magnetism (3 Credits)

This is an introductory course on electricity and magnetism. Topics covered will include the elastic field. Gauss law. Electric potential, capacitors and dieletric, current and resistance, electromotive force and circuits, the magnetic field, Ampere's law, Faraday's law of induction.

PHY 103.2: Physics Laboratory II (1 Credit)

The experiments carried out in this course will cover areas discussed in Phy 112.2. These experiments include verification of the laws of electricity .measurement of the electrical properties of conductors; D.C. and A.C> circuit properties, series and parallel resonant circuits; transformer characteristics; and other electrical circuit problems.

PHY 216. 1: Vibration, Waves and Optics (3Credits)

This course is an introduction to oscillations and waves phenomena. Topics covered will include vibrations and waves, types of waves, sound waves and wave optics.

MATHEMATICS/COMPUTER SCIENCE (MTH)

MTH 110.1: Algebra and Trigonometry (3 credits)

Elementary notions of sets, subsets, Union. Intersection, Complements; Ven Diagrams. Real numbers, integers. Rationals and Irrationals, Mapping of a set. Real Functions and their compositions. Quadratic Functions. Cubic Function. Roots of quadratic and cubic functions. Partial Fractions. Equations with complex roots. Complex number, Geometric representation of complex numbers, De Moirvers, series and sequences. Principles of mathematical induction. Binomial theorem. Trigonometric functions of angles. Circular functions. Addition theorems. Double and half angles.

MTH 120:1: Calculus (3 Credits)

Function of a real variable, graphs, limits and idea of continuity. The derivative as limit of rate of change. Technique of differentiation: Methods of change. Technique of differentiation: Methods of integration. Definite integrals. Application to areas, volumes.

MTH 124.2: Coordinate Geometry (3 Credits)

Straight lines, circles, parabola, ellipse, hyperbola. Tangents, normal. Addition of Vectors. Scalar and vector products. Vector equation of a line and plane. Kinematics of a particle. Components of velocity and acceleration of a particle moving in a plane. Force, momentum, laws of motion, under gravity, projectiles, resisted particle motion, elastic, string, simple pendulum impulse. Impact of two smooth sphere, and a sphere on a smooth sphere. Addition of Vectors.

ENGINEERING SCIENCE COURSES (ENG)

ENG 101.1: Engineering Drawing I (2 Credits)

Introduction to drawing instruments, scales, draughting aids and their proper use. Size of paper and drawing layout. Dimensioning, line work and lettering. Geometrical constructions and Engineering graphics. Development of geometrical figures and intersection of solids and curves. Introduction to projections.

ENG 102.2: Engineering Drawing II (2 Credits)

Orthographic projections in first and third angles. Isometric Projection; sections and sectioning, auxiliary views and staggered sectioning. Freehand sketching. Conventional practices with Simple examples, including threads and threaded fasteners, cam profiles and Assembly drawing from detailed components.

ENG 103.2: Engineer-in-Society (1 Credit)

History of Engineering and technology and the Philosophy of Science. Development of the Engineering industry up to the present day. Safety and health at work. The role of engineers in Nation Building. Food production, housing, transportation, employment opportunities, energy supply, communication and social infrastructure, etc. The choice of Engineering solutions and decision-making process, risk analysis, etc. Lectures by invited professionals.

ENG 104.2: Manufacturing Technology/Workshop Practice (2 Credits)

Manufacturing methods with metal materials (cold and hot workings) such as deep drawing; wire drawing; spinning and rolling; extrusion. Machine-tool manufacture (turning, milling

and shaping, etc), Fabrication by welding and threaded fasteners and riveting, etc, metal-casting; Manufacture of plastic products (moulding and blowing). Use of hand-tools, bench work and measuring instruments. Fitting and joining processes (soldering, brazing) wood-working and machinery. Surface finishes, forging, etc

ENG 201.1: Engineering Mathematics I (Mathematical Analysis (3 Credits)

Functions of several variables: functions pf 2, 3 or more variables, partial derivatives, differentials, total differentials, application to approximate computations, Higher-order partial derivatives and differentials. Differentiation of composite, and implicit functions of several variables. Extrema and conditional extremum. Change of variables. Multiple integrals: Double and triple integrals, analysis in Cartesian coordinates, change of variables to polar, cylindrical, and spherical coordinates, curvilinear coordinates, application to problems of mechanics. Integral dependent on parameters, improper integrals, line integrals, Green's formula, conditions for independence of line integral on path, application of problems of mechanics and thermodynamics. Surface integrals , fluid flux across a surface, properties, Stroke's formula. Field theory, vector field and vector lines. Applied series: Expansion of power series, applications of Taylor's series, Fourier series orthogonal systems of functions, the Parseval's relation. Hilbert space, orthogonality with weight function, Fourier integral, Fourier transformation, applications. Special Functions, Gamma, Beta, Error, Bessel, Legendre and hypergeometric functions. Introduction to analytic functions, Cauchy-Riemann equations, conformal mappings.

ENG 202.1: Engineering Mathematics II (Linear Algebra and Analytic Geometry) (2 Credits)

Surfaces and curves in space, sylinders, cones, and surfaces of revolution. First and second-order algebraic surfaces, ellipsoids, hyperboloids and paraboloids. Systems of linear equations: Determinants, minors and cofactors, evaluation methods. Vector space, linear spaces, Euclidean space, orthogonality, change of basis, inverse matrix, eigenvectors and eigenvalues of a matrix, rank. Linear mappings, symmetric, bilinear and quadratic forms. Differentiation and integration of matrices. Applications of matrix algebra.

ENG 203.1: Engineering Mechanics (Statics and Dynamics) (3 Credits)

Basic concepts and principles of mechanics, equilibrium of particles in 2- and 3 – dimensions, moment and couple , system of forces, equilibrium of rigid bodies, friction – wedges, screw, wheel bolts and statically determinate structure - beams, trusses, frames and machines. Linear and curvilinear motions, acceleration, Kinetics of parties, Newton's Second law, impulse, momentum, impact and restitution, work, energy, power and efficiency.

ENG 204.1: Basic Engineering Materials (2 Credits)

Atomic and crystal structure, s Crystal imperfections and impurities in solids. Fundamentals of crystallography. Atomic vibrations and diffusion. Mechanical properties – Engineering and true stress – strain curves, ultimate strength, ductility, impact strength, hardness. Electrical properties- conductivity, semi-conductivity and super-conductivity. Optical and magnetic properties of materials. Simple phase diagrams of alloys, with emphasis on the iron-iron carbide system. The relationship between structure and properties. Creep, fatigue. Heat

treatment processes. Stability of materials in the services environment – corrosive media, sub-zero and elevated temperatures, irradiation. Basic criteria for the selection of materials for Engineering applications. Engineering properties of wood, concrete, ceramics, polymers, and non-ferrous metals and allovs.

ENG 205.2: Engineering Laboratory I (1Credits)

Assigned laboratory exercises to reflect the basic Engineering courses in Applied Mechanics, Materials Science, Fluid Mechanics, Strength of materials. Thermodynamics and Heat transfer. Guidance on specific experiments and calculations will be provided by the various Lecturers.

ENG 206.2: Engineering Mathematics III (Differential Equations) (3 Credits)

Ordinary differential equations; First-order equations, examples of Engineering models, equations with variables separable, Bernoulli's equation; exact equations; the envelops of a family of curves, singular solutions, Clairaut's and Lagrange's equations, orthogonal and isogonal trajectories. Second-and higher-order equations and systems of equations, transformation of higher-order equations to system of first-order equations, first integrals. Linear equations, general theory, boundary value problems. Euler's equations, geometrical and physical interpretation of solutions. Operators and the operator method of solving equations, system of linear equations. Operational calculus, Laplace transform, theory and application to initial-value problems. Introduction to partial differential equations elliptic, hyperbolic and parabolic equations.

ENG 207.2: Basic Fluid Mechanics (2 Credits)

Fluid properties, fluid statics, principles of fluid flow and applications, flow measurements. Real fluid flow, curvilinear flow (2-dimensional). Dimensional analysis and similitude. Pipe flow and friction factors. Boundary layers and drag.

ENG 208.2: Basic Strength of Materials (2 Credits)

Force equilibrium – free body diagrams, centroids and second moment of area. Concept of stress and strain; stress-strain diagram. Axially loaded members, composite bars; temperature stresses; relation between elastic constants. Thin cylindrical spherical and conical pressure vessels, cylindrical shells with rings, torsion of circular shafts and power transmission of shafts. Axial force, shear force and bending moment diagrams. Pure bending of beams, bending stresses in composite beams, shearing stresses in beams, complex stresses; principal stresses.

ENG 209.2: Basic Thermodynamics and Heat Transfer (3 Credits)

Engineering Thermodynamics: Basic concepts definitions, thermodynamic properties; the thermodynamic system units; equations of state for perfect and real gases, and gas mixtures, thermodynamics work and heat; the First law of thermodynamics, energy equations and analysis; basic thermodynamic processes and cycles for ideal gas, pure substance and mixtures; reactive systems; thermodynamic relations; the Second law of thermodynamics and introduction to irreversible processes. Heat Transfer Basic concepts, heat transfer modes and rate processes. Fourier's law of heat conduction; Newton's law of cooling; Stephan-Boltzmann law of thermal radiation and configuration factor algebra; stationary heat conduction in simple geometries and composite bodies; correlational equations for convective heat transfer, boiling and

condensation; heat transfer by combined modes; insulation and intensification of heat transfer; electrical and triple analogies; introduction to heat exchangers.

ENG 210.2: Basic Electrical Engineering (3 Credits)

Circuit elements (R, L, C,) DC and AC circuits and signals Electrostatics and Electromagnetism, Basic circuit laws and theorems. Three phase circuits, power and power factor. Electrical and electronic measurements and measuring instruments. Introduction to machines. Introduction to Electronics; Semi-conductors.

ENG 211.2: Engineering Laboratory II (1 Credit)

Assigned laboratory exercises to reflect the basic Engineering course in Electrical/Electronics. Guidance on specific experiments and calculations will be provided by the Lecturer.

ENG 212.2: Community Service (1 Credit)

Civil works beneficial to the University community and its environs including but not limited to farming, road building and maintenance, landscaping, planting of flowers and hedges, grass-cutting and general cleaning of campus and its environs, concreting and laying of seating and footpath slabs.

ENG 213.1 Computer Programming for Engineers (2 Credits)

Computers, Computing and Engineering, Algorithms, flour chart and pseudo code. Computer languages, programming in Fortran? Or later versions. Debugging techniques. Computer code security. Laboratory: Hands-on experience on computers through the use of Compilers to run programs' and to solve simple analysis problems in fluid, the thermodynamics, heat transfer and electrical systems.

ENG 300.3: Industrial Training I (0 Credit: Pass or Fail)

The practical exposure of the student through direct participation in the work of an industry, to real life working condition. During the training, the student acquires a familiarity with Engineering works, organization. Physical layout, and the flow of information, materials and operations. This information is expected to complement and integrate the student's classroom instruction and laboratory/workshop exercises. Duration: 3 months.

ENG 301.1: Engineering Mathematics IV (Probability and Statistics) (3 Credit)

Theory of probability: Motivation, probability models, probability axioms, combinatorial problems. Conditional probability, independence of events, Bernoulli trials. Discrete and continuous random variables, mass, distribution, and generating functions, random vectors, independent random variables, exponential distribution, reliability, failure density, hazard function, some important distributions, functions of two random variables, transform methods, computation of mean time to failure, inequalities and limit theorems. Conditional distribution and expectation, Stochastic process, Bernoulli, Poission, and Renewal processes, availability analysis, random incidence. Introduction to discrete and continuous Markov chains. Measures of central tendency. Statistical inference, parameter estimation, Hypothesis testing. Regression, correlation and analysis of variance. Elements of experimental design.

ENG 302.1: Technical Writing and Presentation (2 Credits)

Data gathering and presentation. Technical correspondence: letters of inquiry and replies, letters of application and memoranda. Illustrating technical writing using tables, graphs,

diagrams, equations and appendices. Report writing: progress reports, proposals, students project, thesis and dissertations. Oral and visual presentation. Computer-aided technical writing and presentation; word processing and word-processing software packages.

ENG 303.2: Engineering Mathematics V (Numerical Methods and Computer Applications) (3 Credits)

Review of the number systems and error analysis. Numerical schemes, error analysis, computer algorithms and programs for the solution of the following problems: interpolation by polynomial; nonlinear equations; systems of linear equations, determinants and matrix eigenvalue problem; approximations; data fitting, orthogonal polynomials, least-squares. splines and fast Fourier transforms; differentiation and integration; difference equations; differential equations by Runge-kutta and other methods; boundary-value problems in ODE. Introduction to the finite-difference method for partial differential equations.

ENG 400.2: Industrial Training II (6 Credits)

The practical exposure of the student through direct participation in the work of an industry, to real life working condition. During the training, the student acquires a familiarity with Engineering works, organization, physical layout, and the flow of information, materials and operations. This information is expected to complement and integrate the student's classroom instruction and laboratory/workshop exercises. Duration: 6 months.

ENG 401.1: Engineering Mathematics VI (Mathematical Modeling and Operations Research) (3 Credits)

Basic concepts, methodology, structures, information support and systems approach. Synthesis, analysis, validation and

computer simulation of mathematical models. Mathematical modeling of Engineering design objects at micro-, macro- and meta-levels; synthesis, analysis and optimization of design objects. Models for Engineering decision making in design and operations, including environmental, social and economic considerations. Optimisation of design and operations: unconstrained and constrained problems, sensitivity analysis; linear, integer, goal, geometric, dynamic, nonlinear and stochastic mathematical programming. Allocation, routing, searching, project scheduling, sequencing, replacement, inventory, gaming and queuing problems. Computer-aided mathematical modeling of Engineering design and operations. Application software packages.

ENG 402.1: Engineering Economics (3 Credits)

Scope of Engineering investment decisions; compounding, discounting, and economic equivalence; cash flow analysis and inflation. Choosing between alternatives: methods for evaluating investments; depreciation, taxes, and cost of capital; comparing alternative investments; replacement analysis, budget and budget control, evaluation of public projects. Decisions and cost analysis; lease-or-buy decisions; economic feasibility study of Engineering projects. Computer-aided Engineering economics.

ENG 501.1: Engineering Professional Practice and Procedure (2 Credits)

Registration of engineers, duties and code of conduct and practice. Ethics, professional responsibilities and practice of Engineering in Nigeria. Typical problems and solutions in various areas of Engineering. Engineering projects, planning, feasibility studies and their relevance, guide-predesign survey and stages of Engineering design project scheduling Law:

sources and branches of Nigeria Law, courts and tribunals. Law of contracts, the engineer as an expert witness. Industrial legislation concerned with incapacity or injury, working conditions, wages, redundancy, Trade Unions, structure, right and liabilities. Industrial disputes, safety and environmental protection.

ENG 502.1: Engineering Management (2 Credits)

Organizational structure, goals and functions. Project planning and control. Cost Engineering; capital and operation cost estimating, contingencies and allowances. Production forecasts. Phases and constraints, decline functions. Productivity improvement, Purchasing and materials management. Maintenance management, Contract management.

PROGRAMME COURSES

CHEMICAL ENGINEERING (CHE)

CHE 211.1: Introduction to Chemical Engineering (1 Credit)

Introduction to Engineering as a career; Definition and brief history of Chemical Engineering. Areas of Chemical Engineering: function of the chemical engineers with respect to the public, industry and environment. Taking a career in Chemical Engineering; who is qualified. Chemical Engineering and natural materials development, bench scale to industrial scale operations; design of conversion processes. Introduction to use of diagram to illustrate flow of materials and energy during processing; processes and process variable description, process data representation and analysis. Mass relationship in triangular diagrams, conversion of equations. Industrial safety (hazardous chemicals; safety precautions).

CHE 212.2 Chemical Engineering Process Analysis(3 Credits)

Introduction to Engineering calculations. Processes and process variables. Processes and process descriptions. Process data representation and analysis. Industrial stoichiometry (limiting reactant, excess reactant, excess reactant, degree of completion, percentage conversion). Materials and energy Balances on batch, semi-batch and continuous systems in steady and/or unsteady state. Gases, vapours, liquids and solids. Their mixtures. Vapour liquid equilibrium (Raoult's Law, relative and percent saturation, condensation due point). Steam (enthalpy-temperature chart, steam table, etc). Compustion calculations (solid, liquid and gaseous fuels, excess air, waste gas analysis. Applications to the chemical process Industries. Sources of data. Dimensional analysis.

CHE 311.1 Chemical Reaction Kinetics and Catalysis (3 Credits)

Classification of reactions; variables affecting reaction rates, definition of reaction rate, Homogeneous reactions (elementary and non-elementary reactions molecularly and reaction order, rate constant, temperature dependency theories, activation energy, interpretation of batch-reactors data, Graphical treatment of complex kinetics; Constant-volume batch reactor (irreversible reactions of zero 1^{st}, 2^{nd} and nth order, series and parallel reactions, overall order for half-life data, reversible reactions of 1^{st} and second order). Homogeneous and auto catalytic reactions, absorption (preparation and properties of absorbents, physical and chemical absorption, equilibrium isotherms). Heterogeneous catalysis (surface reactions, selectivity, catalyst poisoning, concentration and temperature gradients. **Pre-Requisite CHM 240.2, CHE 212.2**

CHE 313.1 Chemical Engineering Thermodynamics I (3 Credits)

Fundamental concepts of chemical thermodynamics; Second law of thermodynamics and entropy; Reversibility and entropy; Thermodynamics diagrams; Heat effects of thermodynamic processes; Definition of thermodynamic potentials of internal energy, enthalpy, Helmholtz free energy and Gibbs free energy; Chemical potential , equilibrium and the phase rule; Meaning of fugacity and activity; Fugacity and activity coefficients; Partial molar property and Gibbs-Duhem equation; Ideal solutions, Thermodynamics of reacting systems. **Pre-Requisite ENG 209.2, CHE 212.2**

CHE 315.1 Transport Phenomena I (3 Credits)

Fundamentals of transport phenomena (fields, flux density, field intensity, rate equation, conservation laws – Newton's, and Fick's); laminar and turbulent flow of incompressible viscous fluids (sothermal flow over a flat plate, in tubes; non-isothermal flow); Flow in non-circular tubes; Non-Newtonian fluids; Heat transport – stationary and non-stationary heat conduction, Molecular diffusion in fluids; Interphase mass transfer; Diffusion in solids. **Pre-Requisite ENG 207.2, ENG 209.2, CHE 212.2**

CHE 317.1 Separation Processes I (3 Credits)

Interface mass transfer. Gas-Liquid operations; Equipment for gas-liquid operations; Humidification operations; Isothermal gas absorption; Binary distillation, Hydrodynamics of packed columns. **Pre-Requisite CHM 240.2, ENG 206.2, CHE 212.2**

CHE 312.2 Separation Processes II (3 Credits)

Multistage tray towers. Multi-component systems. Low pressure distillation; Liquid extraction; Drying of solids; Crystallization; Absorption and ion exchange; Reverse

osmosis; water-cooling. **Pre-Requisite CHE 317.1, ENG 206.2, CHE 212.2**

CHE 314.2 Transport Phenomena II (3 Credits)

Boundary-layer theory, Navier-Stokes equation and applications in chemical Engineering, problems; Turbulent flow in pipes and channels; one-dimensional compression flow ; Energy equation; Free and forced convective heat transfer (over a flat plate, in a tube); Convective mass transfer, Introduction to multiphase phenomena (bubble dynamics, cavitation, fundamentals of two phase flow). **Pre-Requisite CHE 315.1, CHE 212.2**

CHE 316.2 Process Instrumentation (2 Credits)

Measuring instruments for level, pressure, flow, temperature and physical properties; Moisture measurement; Chemical composition analyzers and measurements, Gas chromatography; Mass spectrometer; FIIR; Inductively-Coupled Plasma Transform Spectrophotometer, Atomic Absorption and Flame Emission Spectrophotometer, Sampling systems and procedures. **Pre-Requisite PHY 103.2**

CHE 318.2 Chemical Reactions Engineering (3 Credits)

Review of kinetics of homogenous reactions, variable and constant volume systems; Classification and type of reactors (batch, mixed, plug flow as examples of ideal reactors); Design equations and calculations for single and multiple reaction and reactor systems; Temperature and pressure effects. Deviations from ideal reactor performance; Residence time distribution and conversion dispersion models; Tanks-in-series model; Design calculations. Introduction to design for heterogeneous systems, the global rate and laboratory reactors. Design of heterogeneous catalytic reactions, Fluid-solid non catalytic reactions. **Pre-Requisite CHE 212.2, CHE 311.1**

CHE 320.2 Chemical Engineering Laboratory I (3 Credits)

Laboratory experiments in transport phenomena, kinetics and separation processes. **Pre-Requisite CHE 317.1, CHE 212.2, CHE 315.1**

CHE 411.1 Separation Processes III (3 Credits)

Solvent extraction; Extractive and azeotropic distillation. Multi-component gas absorption. Distillation of multi-components mixture. Novel separation processes. Patterns of change and computational approaches. Energy requirements of separation processes. Optimal design and operation of separation processes. **Pre-Requisite CHE 312.2, CHE 317.1**

CHE 413.1 Chemical Engineering Thermodynamics II (3 Credits)

Thermodynamic properties of homogenous mixture; phase equilibria; chemical reaction equilibria, thermodynamics analysis of processes. **Pre-Requisite CHE 313.1**

CHE 415.1 Transport Phenomena III (2 Credits)

Mechanism of radiative heat transfer and comparisons with conductive and convective transfers; Determination of heat transfer coefficients and application to the design of heat exchange equipment. Convective mass transfer (analogy with heat transfer). Mass transfer with chemical reaction; Simultaneous heat and mass transfer. **Pre-Requisite CHE 315.1, CHE 314.2**

CHE 417.1 Polymer Science and Technology (3 Credits)

Basic structures of polymer. Physical states and Transitions; Polymerization processes; Molecular weight of polymers. Viscous flow; Mechanical properties at small Deformations; Ultimate properties; Failure, Tests, Creep Failure, fatigue, fabrication processes; Carbon chain polymers; Heterochain

polymers, Analysis and identification of polymers. Pre-requisite: Good academic standing. **Pre-Requisite: Good Academic Standing.**

CHE 421.1 Chemical Engineering Laboratory II (3 Credits)

Further laboratory experiments in transport phenomena, kinetics, separation processes, reactor systems and control systems. **Pre-Requisite: CHE 318.2**

CHE 511.1 Principle of Chemical Engineering Plant Design (2 Credits)

General stages of a chemical Engineering plant project; Design development types of design; Feasibility study; Equipment selection, specifications and inter-role; Source of design data; Process charts and flow sheets; Mechanical design of process vessel and piping; Strategies used in designing to optimize production yield and minimized costs; Comparison of different processes – factors to be considered; Production cost analysis to include the technique linear programming; Materials and fabrication selection; Material and energy balances – overview; Stoichiometry; Combustion reactions; Environmental consideration – plants location, layout and safety, Case study of a production process; Projects report – format and layout. **Pre-Requisite: Good Academic Standing.**

CHE 513.1 Process Dynamics and Control (3 Credits)

Process Dynamics – Time domain Dynamics; Transfer functions (frequency and Laplace domain dynamics); Control: controller types and modes of operation (on/off. proportional , proportional / integral, proportional/derivation, proportional /integral /derivation, cascade control); Feedforward and feedback control; Introduction to multivariable control. Block and signal flow diagram. Analytical and graphical stability

criteria, Analog computation; Control value (type, characteristics, positioners); Transmitter and transducers, Controller's timing; Overall process control (control schemes and modes of main variable and unit operations; Overall plant process control schemes. **Pre-Requisite: ENG 202.1, ENG 206.2**

CHE 515.1 Process Optimization (3 Credits)

Chemical Engineering applications of the calculus of variations, maximum principle, dynamic programming, optimization of stage systems. Single and constrained optimization techniques. Discrete events. **Pre-Requisite: ENG 202.2**

CHE 517.1 Chemical Engineering Analysis (3 Credits)

Applied ordinary and partial differential equations. Chemical Engineering operations and their numerical solutions. Statistics: type of observation. ANOVA and design of experiments. Tests of significance Regression analysis. **Pre-Requisite: ENG 202.2**

CHE 512.2 Technical Seminar (I Credit)

Presentation and discussion of literature review of current topics in chemical Engineering to be assigned to the students. It should normally be different from the students research topic. **Pre-Requisite: Good Academic Standing.**

CHE 514.2 Introduction to Biochemical Engineering (3 Credits)

Role of chemical Engineering in microbial technology; Micro-organisms in food and industrial chemicals Production; in waste treatment and environmental management; and in pharmaceutical and enzymes development; Introduction to microbiology – cell structure, classification of micro-organisms, growth and influencing factors, metabolism, Bio-

kinetics, Transport phenomena in bio-conversion systems; Integrated bio-conversion systems – analysis and design; Equipment for industrial biological processes; Bio-reactor types – batch, fed – batch and continuous; Introduction to the modeling of bio-conversion systems. **Pre-Requisite: CHM 240.1, CHM 260.1**

CHE 516.2 Chemical Process Technology (3 Credits)

Process calculations on management of material and energy ,Integration of process steps and equipment in industrial practice; Practical steam generation (solids, oil and gas-fired boilers, water and fire-tube boilers, economizers, super heaters, distribution systems – color coding, condensate return, efficient operation); Boiler-feed water treatment (chemical ion-exchange method), Sampling techniques (solid, liquids, gases); Review of the manufacturing processes of selected heavy chemical and intermediates such as acid and fertilizers, vegetable oils, brewing and fermentation, cement and refractors, iron and steel, metal ores etc. The review is to include raw materials, processing, utilities, products and by-products, manpower, market demand and pollution control. **Pre-Requisite: CHM 250.1, CHM 260.2, CHE 212.2**

CHE 518.2 Chemical Process Design (5 Credits)

Here, the undergraduate curriculum is coordinated and brought together to accomplish, by team effort, the basic dream of the process-engineer; the design of a integrated process. This process involves drawing up a flow sheet, preparation of heat and material balances and detailed design of some plant items. A complete individual student report, which should include details of energy and manpower needs, costing economics, construction and start-up, and pollution control considerations

must be submitted. **Pre-requisite: CHE 511.1 or Good Academic Standing.**

CHE 520.2 Research Project (4 Credits)

An individually supervised research project on any chemical Engineering (or related) subject chosen by the student-lecturer team.

CHE 550.0 Technology of Fuel Processing (Credits)

Source, availability, and characterization of fossil fuel (petroleum, including natural gas, coal, tar sands). Modern processing technology. Choice of product lines and products. Alternative product lines and products, and product specification to be emphasized.

CHE 552.0 Industrial Pollution Control (3 Credits)

A detailed qualitative and quantitative study of pollution in the chemical process industry. Emphasis is on waste water and air pollution.

CHE 553.0 Mathematical Techniques in Chemical Engineering (3 Credits)

Microcomputer basic and terminologies; Operating systems; Introduction to different programming languages basic, Fortran, Pascal, Assembly, C etc. Introduction to electronic spreadsheet, data base programmes. Word processing and desk top publishing. Recent developments in hardware and software.

CHE 554.0 Quality Systems Engineering (3 Credits)

Quality: definition and concept; Standardization; Quality systems (ISO 9000 series, TQM, TQC etc); Quality planning; Quality function deployment; Quality measurement and evaluation; Certification and Accreditation schemes;

Competitive bench-marking; Quality assurance in design, Sampling schemes; Production planning and control; Applications of ISO 9000 Certification in selected Engineering production and services; Quality manuals (development and use); Introduction to HACCP; Quality improvement techniques; Quality and the environmental (ISO 11000 series or BS7750).

CHE 555.0. Soap and Detergent Technology (3 Credits)

Definitions; Historical outline; Types of soaps and detergents; Their domestic and industrial applications; Mechanism of detergency; Modern formulations; Oils and fats; Manufacture of soap by direct saponification; Manufacture of fatty acids; Production of solid detergent powders; Manufacture of non-soap detergents; Equipment used in industrial production.

CHE 556.0 Food Processing Technology (3 Credits)

Basic methods of food production and preservation; physical; Chemical, biological and thermodynamics properties of food materials; Transport phenomena in food processing; Production processes for selected foods; Introduction to food package and transportation.

CHE 557.0 Particulate Technology (3 Credits)

Physical properties of particles; Particles in industrial processing; Flow of particles in a fluid; Stoke's and Newton's laws; Flow through packed beds; Fluidization; Flocculation; Filtration; Particle size reduction techniques; Screening and classification of particles. Modern methods of particles size measurement (microscopic, Coulter – counter, x-rays etc). Solids transport; Introduction to powder technology.

STUDENT'S ACADEMIC RECORDS

Name:…… Mat. No:……
State of Origin:……..……Date of Birth:……..
Marital Status:…….

Year One 1st Semester

Course Code	Course Title	CR	Mark	Grade	QP
GES 100.1	Communication Skills in English	3			
GES 102.1	Introduction to Logic &Philosophy	2			
CHM 130.1	General Chemistry I	3			
PHY 101.1	Mechanics and Properties of Matter	3			
PHY 102.1	Physics Laboratory I	1			
MTH 110.1	Algebra and Trigonometry	3			
MTH 120.1	Calculus	3			
ENG 101.1	Engineering Drawing I	2			
Total		**20**			

Year One 2nd Semester

Course Code	Course Title	CR	Mark	Grade	QP
GES 101.2	Computer Appreciation & Applications	2			
GES 103.2	Nigerian Peoples and Culture	2			
CHM 131.2	General Chemistry II	3			
CHM 132.2	Intro. to Principles of Organic Chemistry	3			
PHY 112.2	Electricity and Magnetism	3			
PHY 103.2	Physics Laboratory II	1			
MTH 124.2	Coordinate Geometry	3			
ENG 102.2	Engineering Drawing II	2			
ENG 103.2	Engineer-in-Society	1			
ENG 104.2	Manufacturing Tech./Workshop Practice	2			
Total		**22**			

TCU = **TQP =** **GPA =**

STUDENT'S ACADEMIC RECORDS

Name:…… Mat. No:……
State of Origin:……..……Date of Birth:……..
Marital Status:…….

Year Two 1st Semester

Course Code	Course Title	CR	Mark	Grade	QP
PHY 216.1	Vibration, Waves and Optics	3			
CHM 250.1	Inorganic Chemistry I	3			
CHM 260.1	Organic Chemistry 1	3			
ENG 201.1	Engineering Mathematics I	3			
ENG 202.1	Engineering Mathematics II	2			
ENG 203.1	Engineering Mechanics	3			
ENG 210.1	Basic Electrical Engineering	3			
CHE 211.1	Introduction to Chemical Engineering	1			
Total		**21**			

Year Two 2nd Semester

Course Code	Course Title	CR	Mark	Grade	QP
CHM 240.2	Physical Chemistry	3			
ENG 206.2	Engineering Mathematics III	3			
ENG 207.2	Basic Fluid Mechanics	2			
ENG 208.2	Basic Strength of Materials	2			
ENG 209.2	Basic Thermodynamics & Heat Transfer	3			
ENG 205.2	Engineering Laboratory I	1			
ENG 211.2	Engineering Laboratory II	1			
ENG 212.2	Community Service	1			
ChE 212.2	Chemical Engineering Process Analysis	3			
Total		**21**			

TCU = **TQP =** **GPA =** **CGPA =**

STUDENT'S ACADEMIC RECORDS

Name:…… Mat. No:……
State of Origin:……..……Date of Birth:……..
Marital Status:…….

Year Three 1st Semester

Course Code	Course Title	CR	Mark	Grade	QP
ENG 204.1	Basic Engineering Materials	2			
ENG 213.1	Engineering Computer Programming	2			
ENG 301.1	Engineering Mathematics IV	3			
ENG 302.1	Technical Writing and Presentation	2			
CHE 311.1	Chemical Reaction Kinetics	3			
CHE 313.1	Chemical Engineering Thermodynamics	3			
CHE 315.1	Transport Phenomena I	3			
CHE 317.1	Separation Processes I	3			
Total		**21**			

Year Three 2nd Semester

Course Code	Course Title	CR	Mark	Grade	QP
ENG303.2	Engineering Mathematics V	3			
CHE 312.2	Separation Process II	3			
GES 300.2	Fundamentals of Entrepreneurship	2			
CHE 314.2	Transport Phenomena II	3			
CHE 316.2	Process Instrumentation	2			
CHE 318.2	Chemical Reaction Engineering	3			
CHE 320.2	Chemical Engineering Laboratory I	3			
Total		**19**			

Long Vacation				
Eng300.3	Industrial Training 1	-	-	3

TCU = **TQP =** **GPA =** **CGPA =**

STUDENT'S ACADEMIC RECORDS

Name:…… Mat. No:……
State of Origin:……..……Date of Birth:……..
Marital Status:…….

Year Four 1st Semester

Course Code	Course Title	CR	Mark	Grade	QP
ENG 401.1	Engineering Mathematics VI	3			
ENG 402.1	Engineering Economics	2			
GES 400.1	Entrepreneurship Project	2			
PNG 403.1	Natural Gas Engineering	3			
CEE 411.1	Separation Process III	3			
CHE 413.1	Chemical Engineering Thermodynamics II	2			
CHE 415.1	Transport Phenomena III	2			
CHE 417.1	Introduction to Polymer Processing	3			
CHE 421.1	Chemical Engineering Laboratory II	3			
Total		**23**			

Year Four 2nd Semester

Course Code	Course Title	CR	Mark	Grade	QP
ENG 400.2	Industrial Training 1I	9			
GES 400.2	Entrepreneurship Project	2			

TCU = **TQP =** **GPA =** **CGPA =**

STUDENT'S ACADEMIC RECORDS

Name:…… Mat. No:……
State of Origin:……..……Date of Birth:……..
Marital Status:…….

Year Five 1st Semester

Course Code	Course Title	CR	Mark	Grade	QP
ENG 501.1	Professional Practice and Procedures	2			
ENG 502.1	Engineering Management	2			
CHE 511.1	Principles of Chemical Eng. Plant Design	2			
CHE 513.1	Process Dynamics and Control	3			
CHE 515.1	Process Optimization	3			
CHE 517.1	Chemical Engineering Analysis	3			
CHE 55.1	Chemical Engineering Elective I	3			
Total		**18**			

Year Five 2nd Semester

Course Code	Course Title	CR	Mark	Grade	QP
CHE 512.2	Technical Seminar	1			
CHE 514.2	Intro. to Biochemical Engineering	3			
CHE 516.2	Chemical Process Technology	3			
CHE 518.2	Chemical Process Design	5			
CHE 520.2	Final Year Project	4			
CHE 55.2	Chemical Engineering Elective II	3			
Total		**19**			

TCU = **TQP =** **GPA =** **CGPA =**

Class of Degree = _____

STUDENT'S ACADEMIC RECORDS

Name:…… Mat. No:……
State of Origin:……..……Date of Birth:……..
Marital Status:…….

Year Six 1st Semester

Course Code	Course Title	CR	Mark	Grade	QP

Year Six 2nd Semester

Course Code	Course Title	CR	Mark	Grade	QP

TCU = **TQP =** **GPA =** **CGPA =**

Class of Degree = _____

STUDENT'S ACADEMIC RECORDS

Name:…… Mat. No:……
State of Origin:……..……Date of Birth:……..
Marital Status:…….

Year Seven 1st Semester

Course Code	Course Title	CR	Mark	Grade	QP

Year Seven 2nd Semester

Course Code	Course Title	CR	Mark	Grade	QP

TCU = **TQP =** **GPA =** **CGPA =**

Class of Degree = _____

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