REDEEMER'S COLLEGE OF
TECHNOLOGY AND MANAGEMENT

STUDENTS' HANDBOOK

SCHOOL OF

SCIENCE & TECHNOLOGY

DEPARTMENT OF

COMPUTER SCIENCE | SCIENCE LABORATORY & TECHNOLOGY

School of

SCIENCE & TECHNOLOGY

Department of

ARCHITECTURE | ESTATE MANAGEMENT | QUANTITY SURVEYING

HISTORICAL BACKGROUND OF RECTEM

The Redeemed Christian Church of God, Region 1 by the grace of God has a vision to build human capacity through imparting knowledge in the field of Science, Technology and Management to people of all races and to support the Educational Development of Nigeria in particular on the platform of the church. Part of the vision is to establish and operate a College of Technology/Polytechnic which will provide middle level Technical and Vocational training of the highest standard in order to create a pool of highly trained technicians/technologists that will support the Nation's engineering infrastructural development, as well as, the growth and development of the country's Small and Medium enterprises.

A steering committee headed by the Provincial Pastor Lagos Province 1, Pastor S. B. Olaniyan commenced the implementation strategy for the establishment of this great Institution in 2015. Thereafter, the Pioneer Management Team headed by Prof. S. A. Daramola was put in place to unfold the strategies of the Steering Committee.

Mission

The mission of RECTEM is to be a trail-blazer in Raising Champions, who will be first class professionals in the field of Science, Technology and Management for middle-level technological needs of the Nation.

Philosophy

The philosophy of RECTEM is to attain the ultimate height in providing middle level technical and vocational training of the highest standard in order to create a pool of highly trained technicians and technologists that will support the Nation's Engineering Infrastructural Development.

Objectives

The RECTEM is designed:

i. To develop a centre of academic excellence for training students to acquire qualification higher than secondary school level.
ii. To be the leading higher Educational Institution in Nigeria providing first-rate academic, professional and entrepreneurial education to our students.
iii. To provide candidates with skills and knowledge for work in any institution as well as the nation's small and medium enterprises.

FOREWORD BY THE RECTOR

The Redeemers College of Technology and Management (RECTEM) is an avant-garde technological institution poised to evolving a new drive in advancing national development through all round technical education. It is dedicated to providing its students with an education that combines rigorous academic study and the excitement of practical exploratory and discovery through real stimulation. In addition, extensive teaching and learning take place in interdisciplinary programs, laboratories, and centers whose work extends beyond traditional departmental boundaries.

We seek to develop in each member of the RECTEM community the ability and passion to work wisely, creatively, and effectively for the betterment of humankind and ensuring global relevance.

"Learning by doing," on combining liberal and professional and industrial education, and on the value of useful knowledge, continues to be at the heart of RECTEM's educational mission. We will innovate and invest in the future as we 'dare to think on new lines'."

Prof. S. A. Daramola
Rector

RECTEM has a deliberate policy to establish educational and research collaborations with other sister institutions, universities, governments, and companies throughout the nation and the world, and draws its staff and students from every corner of the globe. The result is a vigorous mix of people, ideas, and programs dedicated to improving the world's wellbeing

PIONEER PRINCIPAL OFFICERS OF THE COLLEGE

PROF S. A. DARAMOLA
BSc Hons, MSc (Arch), PhD (Housing), MNIA, MIEF (Canada), MARCHES (Nig), MENHR (Sweden)
Rector

DR T. A. OLANIYAN
BSc Tech (Mech Engrg.), MEd, PhD (Strategic Mgt) FISM, FIPS, MPM, MNIM, ACIPM
Deputy Rector

MRS E. I. AYORINDE
B.A (Eng/Dr Arts), MPublic Admin, MNIM, ACIM (UK), MIPAC (Canada), FWIMA (Nig)
Registrar

MR. T. O. AYANDA
BLS Hons, MLS, NLA, LRCN
Librarian

MR W. I. OLOYEDE
BSc (Acct), MBA, ACA, ACTI, FCA, CFAN, IFRS
Bursar

RECTEM PROGRAMMES

Redeemer's College of Science and Technology and Management (RECTEM) is structured into FOUR SCHOOLS and TEN academic departments with total of TWENTY-FOUR programmes, which include the ND and HND levels. RECTEM operates with four schools namely:

1. School of Engineering Technology
2. School of Sciences and Technology
3. School of Management
4. School of Environmental studies

SCHOOLS AND DEPARTMENTS

1. School of Management
   - *Department of* Accountancy
   - *Department of* Business Administration & Management

2. School of Environmental Design Technology
   - *Department of* Architectural Technology
   - *Department of* Estate Management & Valuation
   - *Department of* Quantity Surveying

3. School of Science & Technology
   - *Department of* Computer Science
   - *Department of* 4

4. School of Engineering
   - *Department of* Computer Engineering
   - *Department of* Civil Engineering
   - *Department of* Electrical/Electronics Engineering
   - *Department of* Mechanical Engineering

SERVICE DEPT.
   - *Department of* General Studies

GENERAL AND ACADEMIC REGULATIONS

1.0 RULES AND REGULATIONS GOVERNING EXAMINATIONS

1. Eligibility
   - All students who are registered for courses in a given Semester are eligible to sit for examination in those courses EXCEPT for students in the following categories:
   - A student who fails to attend up to 75% lectures or practicals in any course.
   - A student who is absent from the College for one (1) Semester without official notification and permission. Such a student is deemed to have withdrawn from the College.

2. Instruction to Students

Every student shall:

- Be admitted into the Examination Hall only on the production of the Student Identity Card, Examination Card and Receipt of payment of all fees.
- Ensure that he/she acquaints him/herself with and adhere strictly to the instructions governing examination including those printed on the front cover of the answer booklets.
- Have the full responsibility of ensuring, before the commencement of any examination or test that, nothing incriminating is found in his/her person.

2.0 MATRICULATION

The matriculation ceremony signifies the formal acceptance of new students of the College. All fresh students are required to take the Matriculation oath and sign Matriculation Register. Nobody can claim to be a student of the College until he/she has completed these formalities.

3.0 REGISTRATION:

a. All students including carry-over students must register at the beginning of each Semester.
b. Registration shall be in accordance with the rules and regulations which may be reviewed from time to time by the College.
c. Any continuing student who fails to register after four weeks of the date of the beginning of a session shall not be considered a bonafide student of the College.
d. Late registration shall carry a penalty as shall be determined by the College Academic Board from time to time.
e. No continuing student shall be allowed to register after the stipulated date of closure of registration except with special permission. Such permission shall be given only to students with cases of ill-health supported with authentic medical certificate.
f. No new student shall be allowed to register after Matriculation.
g. It is mandatory that students should register carry-over courses and do all course work, tests and assignments that may be given before the semester examination commences.
h. New students are required to make copies of their credentials available and present the originals for screening.

3.1 Procedure for Registration:

All new students shall be required to have their clearance forms endorsed by the Head of Department and counter-signed by the Dean of School. The procedure for registration shall include the following:

a. Payment of appropriate fees;
b. Clearance by the Department
c. Filing of the appropriate Registration Forms;
d. Obtaining the signature of the Course Adviser, Dean of School and that of the Registrar.

3.2 Change of Name:

No student shall be allowed to change the names by which he/she was admitted.

3.3 Withdrawal from the College:

a. A student shall normally be required to withdraw from the college, if his/her academic performance is below 1.00 G.P.A. at the end of a particular period as prescribed by the Academic Board.
b. Any student required to withdraw on account of the condition above, or is expelled for cases of misconduct or for examination malpractice shall not be eligible to be readmitted to the College at a future date.
c. *Temporary withdrawal:*
   i. A student may be granted on request, Leave of absence from the College for a maximum period of one academic year.
   ii. Requests for temporary withdrawal may be considered by the Academic Board from candidates with genuine problems. Permission may be granted provided that the applicant supports his/her application with acceptable evidence.
   iii. A student who withdraws on medical grounds will require an authenticated medical report of fitness from a recognized hospital before he can be readmitted.

4.0 PROCEDURE FOR RE-ASSESMENT OF SCRIPT

1. Any student having an unusual problem in connection with his/her examination or with the examination result and wish to complain may put his/her complaint forward to the Rector in writing and a copy to Dean of School within 2 weeks of the release of the examination result. The student is required to make the appeal /complaint not later than one month after the release of the results.
2. A fee of Five Thousand naira (? 5,000.00) per script must be paid to the College Bursary and the receipt of payment must accompany the letter of complaint from the student to the Rector.
3. The outcome of the Re-Assessment/ investigation should be made available to the complainant/student within Four (4) weeks of submission of complaints.

5.0 EXAMINATION SCORING AND GRADING SYSTEM

i. In the evaluation system, a student is credited with total Credit Unit – CU registered for in a semester. However, the Units Taken – UT, along with the Units Passed- UP for the number of courses and the corresponding grade point score- GP for each course taken in a semester will be used to determine the student's Weighted Grade Point. To calculate the Grade Point Average for the semester, the following formula applies:

- WGP = n CU*GP
- GPA = $\frac{\text{WGP}}{\text{TUT}}$
- Outstanding Units UO/S= UT-UP
- CGPA= $\frac{\text{CWGP (for all semesters)}}{\text{CTUT (for all semesters)}}$

If a student fails to take the examination for a course registered for in a semester, he/she earns a GP = 0 in that course. If a student is absent with official permission, he/she earns NE (No Entry) or IG (Incomplete Grade).

i. Key to Grades

The table below shows the letter grades in use, their corresponding percentage scores and Weighted Grades Points.

Score	Letter Grade	Weighted Grade Point (WGP)
75 – 100	A	4.00
70 – 74	AB	3.50
65 – 69	B	3.25
60 – 64	BC	3.00
55 – 59	C	2.75
50 – 54	CD	2.50
45 – 49	D	2.25
40 – 44	E	2.00
00 – 39	F	0.00

i. Classification of Diploma and Certificates

Diplomas are classified from Distinction to ordinary Pass according to the CGPA as shown below:

CGPA	Grade
3.50 and above	Distinction
3.00 - 3.49	Upper Credit
2.50 - 2.99	Lower Credit
2.00 - 2.49	Pass

However, Certificates are classified from Merit to ordinary Pass according to the CGPA / Grades shown below:

CGPA	Grade
3.00 – 4.00	Merit
2.00 - 2.99	Pass
0.00 - 1.99	Fail

i. *Continuous Evaluation*:
Total Course assessment scoring is normally a combination of 2 components – continuous assessment and final examination assessment with both on a maximum score of 100%. A pass mark is any score equivalent to or above 40%. Continuous assessment is cumulative of class tests, assignments, grading in practicals/laboratory work and constitutes not more than 40% of Total Grade. The final examination assessment is from the score derived from each course at the end of the semester; this constitutes 60% of Total Grade.

6.0 REGULATIONS GUIDING CARRY-OVER COURSES

i. A student who fails to attain the level of a pass or 40% in any course shall carry-over the course. The onus is on the student to ensure that he or she satisfies the course requirements by doing the appropriate course work assessments. A student shall be required to register for a carry-over course and attend lecture at the beginning of each semester for which the course is scheduled.
ii. A candidate shall be credited with his/her actual score in any examination of a carry-over course. The actual score shall not be reduced to 40%. The previous score earned by the student before the carry-over shall also be used to compute the GPA before the carry-over examination is taken.
iii. Subject to the condition for Probation and Withdrawal specified in these regulations, a student shall be allowed to repeat courses carried over provided that the total number of credit units carried during that semester does not exceed maximum required and that the grades earned at all attempts shall count towards the calculation of the GPA.

7.0 PROBATION

Any student who, at the end of any particular session of study, achieves below 1.00 Cumulative Grade Point Average (CGPA) shall earn a period of Probation for the Session.

8.0 INCOMPLETE GRADE/ NO ENTRY

i. A student who fails to satisfy the examiner(s) in project work/ assignment which is an integral part of the course but has otherwise successfully met the other requirements of the course, shall be given the incomplete grade(I) unit till such a time that all the requirements are met.
ii. After the sixth week of a semester, a student who withdraws or fails to complete the requirement of any course owing to unforeseen circumstances approved by the Academic Board, shall be given the incomplete grade(I) till such a student could repeat the course without any penalty.

9.0 COURSE MARK

A course mark in a given course will normally include the examination mark and the continuous assessment mark both combined and weighted according to a given rule.

10.0 PASS

- A pass is obtained in a course by scoring at least the minimum course mark of 40% in the programme.
- A pass in practical work is obtained by satisfying the conditions as prescribed in the course.

11.0 ADDING-AND-DROPPING COURSES

To add-and-drop courses implies that a student may add on to, or drop courses already registered for in a session, provided the sum total credit load for the session does not exceed the stipulated maximum, and provided that not more than 25% of the course has

already been taken; at any rate, not later than eight (8) weeks after the semester shall have commenced.

Note: A student may use the add-and-drop form, usually in the second semester, to register for a course, the pre-requisite of which has been passed in the first semester, provided the added course is a second semester course and provided the total credit load by the student does not (even after this addition) exceed the maximum stipulated forty-eight (48) credits in a session.

12.0 CREDIT UNIT

Credit unit is the weight attached to a course, depending on the number of lecture hours for the course per week, per semester. For example, one credit unit is equivalent to one hour of lecture per week, per semester or two hours of practical work or studio design per week per semester.

13.0 GRADUATION REQUIREMENT

a. Students are required to attend workshop/practical tutorials, lectures and seminars as scheduled for the course for which they have registered. To be eligible for the award of Diploma, a student must obtain the minimum credit units specified for each area of the specific programme. A minimum GPA of 1.00 is required for graduation. All registered students must, before graduation, also:
b. Undertake successfully the Students' Industrial Work Experience Scheme (SIWES);
c. Pass a minimum of three General Studies Courses. These include; Language and Communication skill and Nigeria Studies which are compulsory plus one elective chosen in consultation with the student's main department.

14.0 STUDENTS' INDUSTRIAL WORK EXPERIENCE SCHEME (SIWES)

The Students' Industrial Work Experience Scheme is a skill training programme designed to expose and prepare students for industrial work situation they are likely to meet after graduation from institution of higher learning.

The scheme aims at familiarizing students with work methods and exposing them to the needed experience in handling equipments and machinery that are not usually available in the educational institutions. Although the scheme is financed by the Federal Government, it is manned by the Industrial Training Fund (I.T.F). It is only students studying the approved courses that could be listed for sponsorship every year either from the Universities, Polytechnics and Colleges of Education. The duration for participation on the scheme is 4 months and is restricted to National Diploma One Students.

The operation of the Placement Office is a synergy between Deans of Schools and Head of Departments and the Communication Information Technology Management Unit (CITM) where Data are collected for preparation of student's placement list. Students are always given orientation training before their departure to their respective establishment.

The Students Industrial Work Experience Scheme (SIWES) is an effective instrument for exposing students to the realities of work situation in Nigeria especially and the world in general in their chosen professions, in order to achieve the much needed technology advancement of the nation.

15.0 CLUBS AND SOCIETIES

Students who wish to form a society or club should apply for registration to the Dean, Students Affairs. Details of the proposed name of the Society/Club, its officers and Constitution must be furnished when application is made. No Club/Society should operate until such approval has been granted by the Dean, Students Affairs.

All Clubs and Societies shall renew their registration at the beginning of every session. Failure to do this means the Club/Society is no longer functioning on campus and all their proposed activities would not be allowed to take place.

The list of all approved Clubs/Societies shall be published annually.

16.0 PROCESSING EXAMINATION MALPRACTICE

a. Any examination malpractice discovered before, during or after an examination shall be treated by the Examination Malpractice Committee (EMC).
b. Examination malpractice is not allowed during all tests and examinations. Any act of examination malpractice during course work assessment carries the same penalties as examinations. Any examination malpractice discovered before, during and after the examination shall carry the appropriate penalty.
c. Any candidate caught cheating or attempting to cheat shall make a written statement immediately. Such a statement must be signed by the candidate in question as well as by the invigilator(s) on duty.
d. Any candidate who refuses to make a written statement shall be deemed guilty of the alleged offence and shall be arraigned before the appropriate Examination Malpractice Committee, which shall recommend the appropriate disciplinary action to the Academic Board.
e. Invigilators are encouraged to report all cases of examination malpractice and the procedure is as follows;

- A candidate who is suspected to be cheating during an examination should be confronted with the act by the invigilator.
- The candidate should be made to write his/her statement on the accusation as well as his/her defence.
- Where material evidence is involved in the alleged offence, the student should also be made to endorse the evidence and write his/her matriculation/ examination number on it. Invigilators should keep the evidence and attach it to his/her reports.
- The invigilator(s) should write his/her own report(s) on the alleged offence. The invigilator's report should be as precise and concise as possible.
- The candidate's statement, the evidences and the invigilator's report should be forwarded to the Dean of the school from which the paper is offered. Where a candidate who is suspected of examination malpractice refuses to write a statement, the invigilator should go ahead to write and submit his/her own report.
- Invigilators should avoid any argument or confrontation with candidates during examinations.
- On no account should invigilators seize or destroy answer script or inflict any other form of punishment that may deny a candidate who is suspected of examination malpractice an opportunity of completing his/her examination.

16.1 Penal Code for Misconduct

S/N	OFFENCE	PUNISHMENT (maximum unless otherwise)
1.	Non-display of ID Card	Fine/Reprimand/Rustication
2.	Noise making	Fine/Strong Reprimand/Rustication
3.	Refusal to submit oneself for search by an invigilator	Rustication for one semester
4.	Mutilation or removal of any paper or answer script supplied	Rustication for one semester
5.	Unauthorized possession of the College's answer sheet (whether used or unused)	Rustication for one semester
6.	Use of scrap papers with written notes in the examination hall	Rustication for one session
7	Assault on any college official during or after examination	Expulsion
8.	Breaking into any office before, during or after examination	Expulsion
9.	Possession of dangerous weapons & illicit drugs	Expulsion
10.	Use of altered/forged ID cards with intent to deceive or mislead the authority	Rustication for one semester
11.	Failure to comply with an official reg ulation or order of designated authority	Rustication for one semester
12.	Unauthorized taking/possession of property of another person (stealing)	Rustication for two semester
13.	Assault (Violent/Physical/Verbal Attack)	Violent Attack- Expulsion Physical Attack- Rustication for a semester Verbal Attack - Letter of warning Sexual Assault- Rustication for a semester
14.	Cultism	Expulsion
15.	Any act of forgery (Credentials, College Receipts, Signature of Staff, etc.)	Expulsion
16.	Impersonation	Expulsion
17.	Act of Rape	Expulsion

Department of

Computer Science

17.0 COURSE DESCRIPTION

National Diploma Computer Science, ND (CSC)

- Mode of study : Full-time/Part-time
- Timetable : Day/Evening-Weekend
- Duration : 4 Semesters (Full Time), 6 Semesters (Part Time)
- Entry Requirements : Five SSCE/GCE/WASC Credits obtained at not more than two sittings to include Physics, English Language and Mathematics and any two of: Statistics, Geography, Further Mathematics, Chemistry, Economics/ Commerce, Biology/Agricultural Science, Government/History, Food and Nutrition, Computer Science
  JAMB Subjects are: 1. English Language, 2. Mathematics, 3. Physics, 4. Chemistry

Course Objectives:
The programme for the National Diploma in Computer Science is designed to provide training in the theory and application of computer science and provides a wide spectrum of application areas for the students. The Objectives of the course therefore are as follows:

(a) To produce Computer Science graduates whom are academically equipped to take advance courses in Computer Science and / or related areas, thus stimulating development and research in these areas and also who are capable of applying computer science and information technology in solving problems arising in industries, business, commerce, education, medicine, government and the society in general.

(b) To provide suitable service course for specialists in other disciplines to enable these specialists increase their competence, skill and level of proficiency on their various work fields. To make the students understand the IT tools as the modern development in information technology.

Course Units:

YEAR ONE: First Semester

Course Code	Course Title	L	P	CHW	CH	Prerequisite
COM 101	Introduction to computing	2	2	4	60	None
COM 112	Introduction to Digital Electronics	2	2	4	60	None
COM 113	Introduction to Programming	2	2	4	60	None
STA 111	Descriptive Statistics I	1	2	3	45	None
STA 112	Elementary Probability Theory	2	1	3	45	None
MTH 111	Logic and Linear Algebra	1	1	2	30	None
MTH 112	Functions and Geometry	2	1	3	45	None
OTM 112	Technical English I	2	2	4	30	None
GNS 111	Citizenship Education I	2	0	2	30	None
	Total	16	13	29	405	

Introduction to Computing [COM 101]
The history, Classification and impact of computers; computer hardware; computer Software; Computer data processing systems; Computer and data preparation method; Security and safety procedures within a computer environment; computer network; The internet.

Introduction to Digital Electronics [COM 112]
Number system, Codes and code conversion Boolean Algebra; Addition operation in the computer; Small–Scale Integrated Circuit; Small–Scale Integrated Circuit; counter and Data transfer.

Introduction to Programming [COM 113]
Features of a good program; Algorithms and Flowcharting; Principles of designing algorithms for common programming problem; Modular program design principles; Procedure in solving programming problems; The various levels of programming language; Debugging and maintaining program; Good programming practices.

Descriptive Statistics I [STA 111]
Definition, nature and application of statistics; Nature of statistical data, their types and uses; Procedures for collection of statistical data; Difference between total coverage and partial coverage in data collection; Methods of data compilation; and Methods of data presentation.

Elementary Probability Theory [STA 112]
Set and set operations; Mapping, functions and relations; Permutations and combinations as used in probability; Concept of a sample space; Basic concepts of probability.

Logic & Linear Algebra I [MTH 111]
Logic and abstract thinking; permutations and combinations; Binomial expansion of algebraic expressions; Algebraic operations of matrixes and determinants.

Functions & Geometry [MTH 112]
Concept of function and relations; special properties of functions; Algebra functions; Fundamental elements of trigonometry; Analytic geometry of a straight line; Concept of symmetry and their application to comic sections.

Technical English I [OTM 112]
Study skills in English Language; Nature of language and the basic rules of grammar; Literary works in English; Concept of communication; Oral and written presentations; Comprehension and interpretation.

Citizenship Education I [GNS 111]
Nigerian constitution; The Federal system of Nigeria; Rights & Obligations of Nigerian citizens; Nigeria Citizenship; and Fundamental objectives and directive principles of state policy of Nigeria.

YEAR ONE: Second Semester

Course Code	Course Title	L	P	CHW	CH	Prerequisite
COM 121	Scientific Programming Lang using OO Java	2	4	6	90	COM 101, 113
COM 122	Introduction to the Internet	2	2	4	60	COM 101
COM 123	Computer Application Packages I	2	4	6	90	COM 101
COM 124	Data structure and Algorithms	3	1	4	60	COM 113
COM 125	Introduction to Systems Analysis	2	1	3	45	None
COM 126	PC Upgrade & Maintenance	1	5	6	75	None
GNS 112	Citizenship Education II	2	0	2	30	GNS 111
	Total	14	17	31	465	

Scientific Programming Using O.O. JAVA [COM 121]
Java programming Basics; Numerical data in Java; Insatiable classes; Processing input with applet; Use selection statements; Conditional Statements; Characters and string; Array Processing in Java; Event driven programs; Inheritance and Polymorphism.

Introduction to Internet [COM 122]
Concept of Internet; Various services on the Internet; Internet connectivity; Obstacles to Internet growth in Nigeria.

Computer Application Packages I [COM 123]
The existing application packages. Word processing packages; Electronic spread sheets; Fundamentals of accounting packages; Presentation packages; Education, medical and other packages.

Data Structures & Algorithm [COM 124]
Data structure and tools for studying; Tools for studying data: Symbols, relations and graph; Sets relations and string structure; Data life cycle data representation, properties of ordered and occupancy; Properties of order and linear list; Simple linked lists; Non-linear structures; Sorting and searching techniques.

Introduction to Systems Analysis [COM 125]
System concepts; System analysis; Process of feasibility study; Basic guide lines for writing a feasibility study report; Systems implementation process; Systems Design; Data Base Design; Input Design and output design; Output design; System Implementation; Systems evaluation process; Systems maintenance process.

PC Upgrade & Maintenance [COM 126]
Upgrading and maintenance for PC; Limitation of a PC and scope for upgrading; Technical specifications for PC upgrading.

Citizenship Education II [GNS 112]
Government; Political Parties & Elections; Arms of Government; Constituted Authorities; National Identity; National Ethics & Discipline; and Environmental Protection

YEAR TWO: First Semester

Course Code	Course Title	L	P	CHW	CH	Prerequisite
COM 211	Computer Programming Using OO Basic	2	3	5	75	COM 113
COM 212	Introduction to systems Programming	2	3	5	75	COM 101
COM 213	Commercial Programming Lang using OO Cobol	2	3	5	90	COM 113
COM 214	File Organisation and Management	2	1	3	45	COM 101
COM 215	Computer Packages II	2	4	6	90	COM 123
COM 216	Computer Systems Troubleshooting I	1	4	5	75	None
OTM 217	Technical English II	2	1	3	45	OTM 112
	Total	13	19	32	480	

Computer Programming Using OO-BASIC [COM 211]
Integrated development environment; Visual basic programming concept; Statements, Operations, Expressions, and object variables; Control statement in OOP; Procedure and functions; Arrays and Structures; Classes and Functions; Data Files; Data Management Concepts in OO Basic; Design report formats; Dialog box concepts.

Introduction to Systems Programming [COM 212]
General concepts of systems programming; Assembler and Assembly Processes; Compilation process; Utilities and libraries; Functions of Operating System; I/O device handlers.

Commercial Programming Lang using OO-COBOL [COM 213]
Concept of OOCOBOL; Word types and Abstract data types in OOCOBOL; Divisions of OOCOBOL Program; Identification and Environment Divisions Entries; Data Division entries; OOCOBOL statements and the coding of the Procedure Division; Sequential file processing; Indexed file processing; Concepts of subprogram; Classes and objects in OOCOBOL.

File Organization and Management [COM 214]
Simple file organization concept; Concept of file operations; Storage devices and media; File access methods and the buffering techniques; File organizational structure and processing; File updating, protection and security.

Computer Packages II [COM 215]
Common graphics packages; Concept of computer aided design; Database management; Data analysis package.

Computer Systems Troubleshooting I [COM 216]
Fault diagnosis; Causes of computer start up failure; Memory failure symptoms; Hard drive failure symptoms; Floppy drive failure symptoms; CD-ROM failure Symptoms; Mouse and keyboard failure symptoms; Display system failure symptoms; Sound failure symptoms.

Technical English II [OTM 217]
Rules of grammar, Denotative and connotative use of words, Writing good essays, Comprehension and summary Writing, Literature in English. Registers, Correspondence, Writing for publication, Report writing.

YEAR TWO: Second Semester

Course Code	Course Title	L	P	CHW	CH	Prerequisite
COM 221	Computer Programming Using OO FORTRAN	2	4	6	90	COM 113, COM 101
COM 222	Seminar on Computer and Society	2	-	2	30	None
COM 223	Basic Hardware Maintenance	2	3	5	75	COM 112
COM 224	Management Information system	2	2	4	45	COM 101, 103
COM 225	Web Technology	2	4	6	90	COM 122
COM 226	Computer Systems Troubleshooting II	1	4	5	75	COM 216
STA 226	Small Business Start Up	2	1	2	30	None
COM 229	Project	-	4	4	60	COM 123
	Total	13	22	35	480	

Computer Programming using OO FORTRAN [COM 221]
Scientific programming language; Basic concepts of OOFOTRAN; Arithmetic Operations and Expressions; OOFORTRAN statements; Control statements; Use and application of arrays; Implementation of structured programming in OOFOTRAN; Use of pointers; Object features of OOFORTRAN.

Seminar on Computer and Society [COM 222]
Each student is expected to prepare, submit and make oral presentation of a seminar paper based on the conduct of an intensive literature review on a selected topic in any aspect of computer science for grading. The seminar title should be on the impacts of Computer in Society.

Basic Hardware Maintenance [COM 223]
Electric current theory; Function of circuit components; Basic general measuring equipments; Integrated circuit and terminologies; Preventative maintenance of hardware components; Diagnostic techniques involved in corrective maintenance; Computer installation procedure.

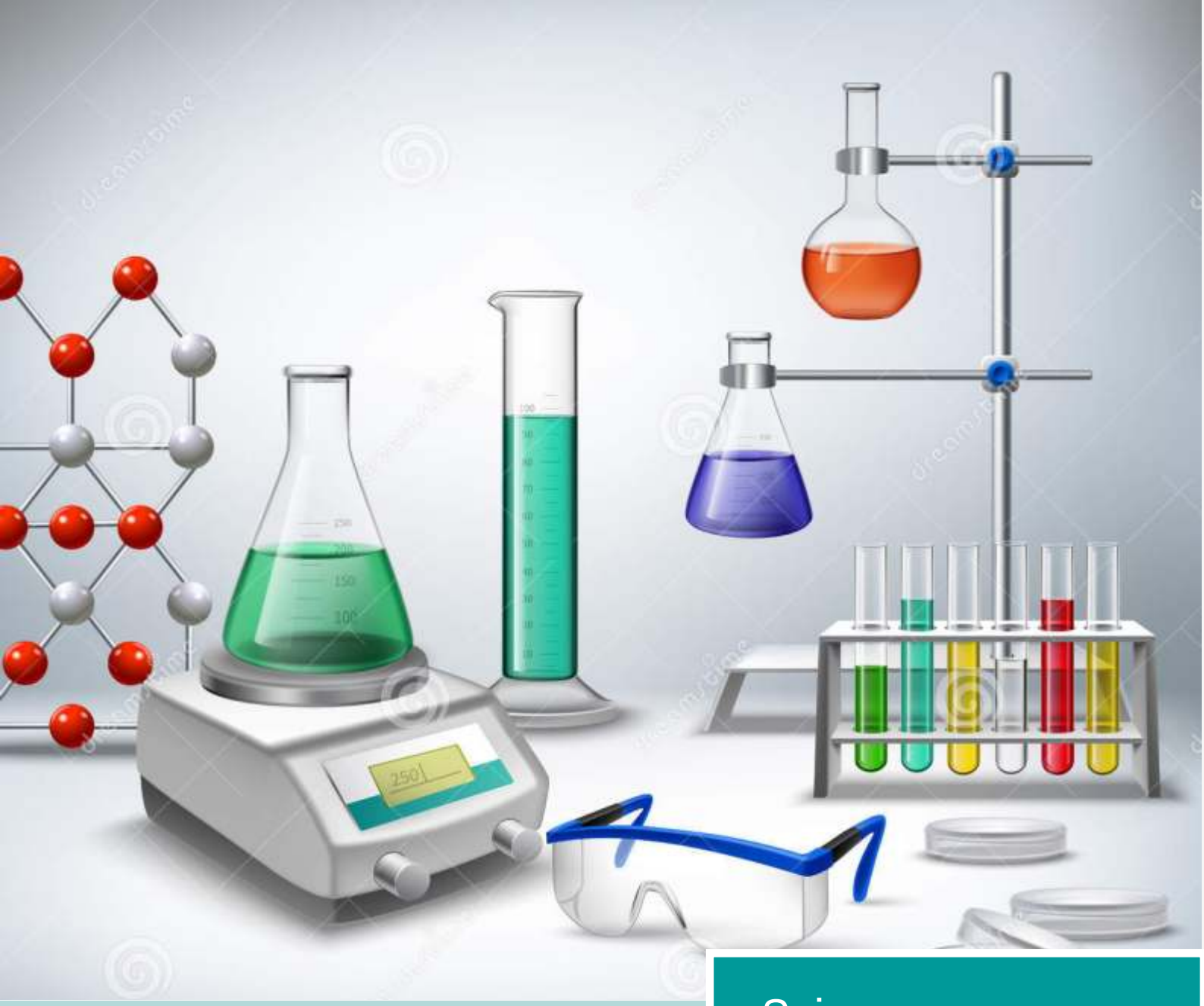
Management Information System [COM 224]
Different systems; Systems theory; Concept of management information; Features of management information systems (MIS); Concept of transaction processing; Concept of office automation; Different applications of MIS; Principles of decision making; Development cycle of an MIS; Principles of project management; Total systems.

Web Technology [COM 225]
The fundamental concepts of WWW; Hypertext mark-up language HTML; Scripting for HTML; DH TML; Cascading style sheets; Dynamic content. Web development tools; Multimedia; and XML.

Computer Systems Troubleshooting II [COM 226]
Serial, parallel and USB failure symptoms; Printers' failure symptoms problems; Dial up failure symptoms problems; Start-up failure symptoms; Illegal operational failure symptoms; Virus protection utility failure symptoms; Networks failure symptoms;

Small Business Start Up [STA 226]

Project [COM 229]
Students are expected to undertake practical projects in any aspects of computer science. The Bench/laboratory work precedes the write-up to be submitted in partial fulfillment of the requirement for the award of National Diploma. Students are guided by supervisors who are members of the department / faculty.



Department of

Science Laboratory Technology

17.0 COURSE DESCRIPTION

National Diploma Science Laboratory Technology, ND (SLT)

- Mode of Study: Full-time
- Timetable: Day
- Duration: 4 Semesters
- Entry Requirements: WASC, GCE (O/L), SSCE, NECO, NABTEB or equivalent with credits in English Language, Mathematics, Physics, Biology/Agricultural Science, Chemistry and one other subject from Technical Drawing, Metal or Wood work, Basic Electricity, Geography, Further Mathematics and Fine Art.
  JAMB Subjects are: 1. English Language, 2. Mathematics, 3. Physics, 4. Chemistry

Course Objectives:

The programme's goal is to produce technicians capable of carrying out various laboratory analysis and practical works under the supervision of a technologist. The course is intended to produce technicians who will;

- Assist in chemical analysis and quality control in: Industry (oil, food, brewing, detergent, textiles, etc.), Hospitals, Schools, Colleges and Research Institutions.
- Assist in Physics and Electronic laboratories with physical analyses and the maintenance of instrumentation.
- Assist in biological and biomedical analysis and experiments in hospitals, schools, colleges and research institutes.
- Prepare students for employment in related work such as sales, marketing, administration and management in the industries and also for self-employment.

Course Units:

YEAR ONE: First Semester

Course Code	Course Title	CU
STB 111	Plant and Animal Taxonomy	5
STB 112	Morphology and Physiology of Living Things	4
STC 111	General Principles of Chemistry	5
STC 112	Inorganic Chemistry I	4
STP 111	Mechanics	5
STP 112	Heat Energy	4
STP 113	Algebra for Science	2
STP 114	Electronic Logic for Science	2
STC 113	Technical English	2
GLT111	General Laboratory Techniques (i) Safety in the laboratory, and (ii) Care and maintenance of laboratory ware and equip.	2
	Total	35

Plant and Animal Taxonomy [STB 111]
General Classification of Plant kingdom; diagnostic features of thallophytes [algae and fungi]; distinguishing characteristics of the embryophtes [bryophytes, pteriolophytes, spermatophytes; classification identification and preservation of common flowering plants; general classification of the animal kingdom; diagnostic features of the following phyla: protozoa, plahelminthes, coelenterates, nematode, annelids,arthropoda identification and characteristics of the major classes of vertebrates [pisces, amphibian, reptile, mammalian]; preservation methods of common vertebrates and invertebrates

Morphology and Physiology of Living Things [STB 112]
Morphology life cycles and their economic importance; morphology, evolutionary relationship and economic importance of selected examples of phylum chorda protochordata and Eurochordata; morphology and physiology of values organs and systems in the animal kingdom.

General Principles of Chemistry [STC III]
Atoms, molecules, composition and structure; arrangement of elements in the periodic table; chemical thermo-dynamics; properties and reactions of acids bases and salts; fundamental concept of oxidation and reduction reactions; surface phenomena and colloid systems and chemical equilibrium.

Inorganic Chemistry I [STC 112]
Use of stoichiometry in chemical reactions; mole-mass number relationships; shapes of molecules of the main group elements [VSEPR]; basic concepts of UV/Visible Spectroscopy; transition metal chemistry; chemistry of group VII elements and the extraction and reactivity of the main group elements.

Mechanics [STP 111]
Phenomenon of surface tension; periodic motion and behaviour of fluids on motion.

Heat Energy [STP 112]
Construct and use different types of thermometers; different methods of determining specific heat capacity and application of Newton's cooling correction; behaviour of gases in terms of atomic and molecular motions and the application of different Modes of heat transfer.

Algebra for Science [STP 113]
The concept of logic and abstract thinking; The concept of permutations and combinations; Binomial expansion of algebraic expressions; The algebraic operations of matrixes and determinants.

Electronic Logic for Science [STP 114]
Binary, hexadecimal arithmetic and the coding scheme; fundamentals of boolan algebra and basic logic gates, their operations and applications.

Technical English I [STC 113]
Lab reports in scientific subjects using good English and appropriate layouts [formats]; professional correspondence; full report on a scientific investigation in an accepted format; poster on scientific topic and short lecture on a scientific topic.

General Laboratory Techniques I [GLT 111]
Laboratory hazards; basic safety rules; Radiation; laboratory ware & equipment; calibration of glassware; laboratory balances; microscope; heating equipment; cooling equipment; temperature measurement equipment; microtomy and the maintenance of microtomy tools; basic electrical appliances and the carc and maintenance of audio-visual equipment.

YEAR ONE: Second Semester

Course Code	Course Title	CU
STB 121	Cell Biology	5
STC 121	Organic Chemistry I	5
STC 122	Physical Chemistry	5
STP 121	Electricity and Magnetism	5
STP 122	Optics and Waves	3
STC 123	Analytical Chemistry	5
GLT 121	General Laboratory Techniques (iii) Preparation of Laboratory Side Shelf Reagents, and (iv) Separation Techniques and Sample Management	2
COM 123	Computer Packages I	4
	Total	34

Cell Biology [STB 121]
Cell as the basic unit of life; composition of the nucleus and the cytoplasm of the cell; different types of cell division and their significance; chemical reactions in a cell; different types of specialized cells and their functions; photosynthesis and respiration.

Organic Chemistry I [STC 121]
Classification of organic compounds; bonding: reaction and application of aliphatic hydro-carbons; chemical properties; preparation and uses of monosubstituled aliphatic hydrocarbons and general methods of petroleum refining.

Physical Chemistry [STC 122]
Relationship between energy distribution within a reacting system and the factors which affect rate of reaction; basic concepts of electrochemistry; effect of solutes on the properties of solvents and colligative proportion of solution.

Electricity and Magnetism [STP 121]
Concept of static electricity; capacity and use of capacitors in D.C. circuits; behaviour of moving charges in conditions; chemical effect of electric current and concepts of magnetic field.

Optics and Waves [STP 122]
Principles and applications of reflection and retraction at plane and curved surfaces; working principles of optical instruments; basic concepts of photometry and the phenomenon of wave, optics and sound waves.

Analytical Chemistry [STC 123]
The Analytical process; physical/chemical principles involved in separation methods; statistical analysis of experimental data; further understanding of titrimetric analysis including the use of non aqueous solvents and principles and applications of gravimetric analysis.

General Laboratory Techniques II [GLT 121]
Solutions and reagents; solvents and their application; storage, extraction dispensing, recovery; Basic sampling techniques; physical and disposal of chemicals in the laboratory; chemical principles in separation; collection, handling and preservation of biological lab specimens; setting up and management of tropical aquarium and animal house and preparation of herbarium.

Computer Application Packages I [COM 123]
Existing application packages; word processing packages; electronic spread sheets; fundamental of accounting packages; Presentation packages on education, medical and other packages.

YEAR TWO: First Semester

Course Code	Course Title	CU
STM 211	Microbiology	4
STB 211	Pest and Pests Control	3
STB 212	Pathology	3
STC 211	Inorganic Chemistry II	3
STC 212	Instrumental Analytical Chemistry and Quality Control	5
STP 211	Electronics	4
STP 212	Thermodynamics & Electromagnetism	3
*STS 211	*Citizenship Education and Use of Library	2
STP 213	Calculus for Science	2
COM 215	Computer Packages II	5
Total		34

**STS 211 Citizenship and use of Library is taken from GNS 201 Communication Skills*

Microbiology [STM 211]

History and scope of microbiology; microscope examination of microorganisms ; systematic microbiology; growth of microorganisms; isolation, cultivation and preservation of different Micro-organisms and various methods of control of micro-organisms.

Pests and Pest Control [STB 211]

Animal phyla containing pests; plant parasitic nematodes; characteristics and important orders of insects of agricultural importance; crop protection Techniques formulation, types, protection and modes of action of pesticides and hazards that may result from the use of pesticides.

Pathology [STB 212]

Common terminologies in parasitology; diseases caused by protozoan; parasitic platy helminthes of medicinal and veterinary importance; diseases caused by nematodes and nature of gland diseases and their transmission control.

Inorganic Chemistry II [STC 211]

Relation of alkali and alkaline metals to atom; electronic configuration of group I elements; electronic configuration of group II elements; electronic configuration of group IV elements; gradation in properties of elements; effects of the presence of group II metal ions in water; relationships in properties of elements III and group IV and occurrences properties and reaction of the halogens.

Instrumental Analytical chemistry & Quality Control [STC 212]

Principles of spectrophotometry; principles of atomic spectroscopy; principles of ion selective electrodes; principles of mass spectrometry; principles of NMR; techniques of HPLC and Gc and principles of quality control.

Electronics [STP 211]

Basic concepts of semiconductors; construction, operation land simple application of p-n junction diodes; construction, operation and characteristics of bipolar transistors and circuit properties of the three transistor configurations and the construction and characteristics of vacuum triales, tetrale and pentode values.

Thermodynamics & Electromagnetism [STP 212]

1st law of thermodynamics and its application; 2nd law of thermodynamics and its application; magnetic effect of current and its applications; concept of electromagnetic induction and its applications; and principles of a.c. circuits and their application.

* Citizenship Education and Use of Library [STS 211]
Nigerian constitution; The Federal system of Nigeria; Rights & Obligations of Nigerian citizens; Nigeria Citizenship; and Fundamental objectives and directive principles of state policy of Nigeria. Use of Library, Library concepts

Calculus for Science [STP 213]
Basic concepts of differential calculus and its application in solving scientific problems; know integration as the reverse differentiation and its application to scientific problems; first order homogenous linear ordinary differential equating with a constant coefficients as applied to simple circuits and the basic concepts of partial differentiation and apply same to scientific problems.

Computer Application Packages II [COM 215]
Common graphic packages; concept of computer aided design; database management and data analysis package.

YEAR TWO: Second Semester

Course Code	Course Title	CU
STB 221	Genetics	3
STB 222	Ecology	5
STC 221	Organic Chemistry II	5
STC 222	Biochemistry	5
STP 221	Maintenance and Repairs of Scientific and Electronic Equipment	4
GLT 222	General Laboratory Techniques Module (vii) Vacuum Techniques and Module (viii) Glassblowing	2
STS 221	Practical Project and Seminar	2
STA 225	Small Business Management I	8
	Total	34

Genetics [STB 221]
Basic concept in genetics; rudiments of mendelian genetics; concept of dominance and deviations from mendelian genetics; sex determination and sex linkage; mechanism of variation and sex linkage; mechanism of variation and mutation and basic concept in genetic engineering.

Ecology [STB 222]
Various ecological terminologies and types of habitats; concept of succession; problem confronting organisms in their habitat; concept of population ecology, soil as an ecosystem and pollutants and effect of pollution on the environment, vegetation and animal life.

Organic Chemistry II [STC 221]
Chemistry of ethers, chemistry of amines; chemistry of aromatic compounds; some chemical reaction of benzene; mechanism of electrophilic and nucleophilic substitution in aromatic compounds; chemistry of phenol; chemistry of carbonyl substituted bonzone; chemistry of benzoic acid; chemistry of benzoic acid derivatives; chemistry of benzamides and phthalic anhycrida; chemistry of aniline and chemistry of diazonium compounds and azodyes.

Biochemistry [STC 222]
Molecular organization of the living cell and its topochemistry; importance of water and the concepts of pH and buffers; properties, sources, uses and structure of carbohydrate; properties, structures and reaction of monosaccharide structure and uses of disaccharides and polysaccharides; nature, biological and industrial importance of lipids; structure, properties and function of protein; classification of amino acids; structure and behaviour of proteins; nature of enzymes and vitamins and minerals found in the living cell.

Maintenance and Repair of Science & Electronic Equipment [STP 221]
Concept of maintenance; and repairs of science and electronic equipment; identify some electronic components and know their specifications; soldering techniques; circuit layout on chassis and troubleshooting and fault isolation in science and electronic equipment.

General Laboratory Techniques III [GLT 222]
Vacuum production; vacuum pumps; vacuum gauges; glasses used as laboratory ware; glass hazards and precaution and construction of a simple glass ware.

Practical Project and Seminar [STS 221]
Each student is expected to prepare, submit and make oral presentation of a seminar paper based on the conduct of an intensive literature review on a selected topic in any aspect of science laboratory technology for grading. Furthermore, students are expected to undertake practical projects in any aspects of science laboratory technology including general laboratory techniques. The bench/laboratory work or survey precedes the write-up to be submitted in partial fulfillment of the requirement for the award of National Diploma. Students are guided by supervisors who are members of the faculty.

Small Business Management I [STA 225]
The nature of small scale enterprises, the legal framework for small scale enterprises, the role of governments in small scale enterprises in Nigeria, business plan for a small scale business enterprise, marketing management in a small business enterprise, financing of small business enterprises, financial management in a small business enterprise, credit control in small business enterprises. Sources of information; External and Internal; automated systems; Advantages of small business.

REDEEMER'S COLLEGE OF TECHNOLOGY AND MANAGEMENT

KM 46, Lagos - Ibadan Exressway, Mowe, Ogun State, Nigeria