UNIVERSITY OF PORT HARCOURT

FACULTY OF SCIENCE

DEPARTMENT OF COMPUTER SCIENCE

STUDENT'S HANDBOOK

2015/2016

Department of Computer Science
Faculty of Science
University of Port Harcourt
Port-Harcourt, Nigeria.

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INTRODUCTION

Background

The Department of Computer Science, University of Port Harcourt was demerged from the Department of Mathematics/Statistics/Computer Science in 2005/2006 session. The first admission of students to a degree program in Computer Science from the parent Department was in 2001/2002 Session. Since its inception, the Department of Computer Science has been offering courses, for the award of a Bachelor of Science Degree in Computer Science even though some subject areas were recognized. Such areas include Artificial Intelligence, Computer Network, Management Information System and Software Engineering, among others. The Department was conceived as a means of developing manpower to meet the demand for increased computerization nationwide.

The Department started with a few academic and non-academic staff with only two PhD holders in Computer Science (Prof. E. O. Nwachukwu and Dr. O. Owolabi). The pioneer Head of Department was Professor E. O. Nwachukwu (2005 – 2009). He handed over to Dr P. O. Asagba (2009 – 2011), In line with the policy of Ajienka's administration of having Professors only as Heads of Departments; Professor E. O. Nwachukwu again took over from Dr. P. O. Asagba in (2011-2013) and then Dr. C. Ugwu, took over in (2013-2015). Dr. B.O. Eke took over in (2015-2016). Dr. (Mrs) L. N. Onyejegbu is the current Head of Department (2016-Date)

Achievements

The Computer Science Department's programme had full accreditation in 2007 under the Headship of Professor E. O. Nwachukwu who is a Fellow of both Computer Registration Council of Nigeria (FCPN) and Nigeria computer Society (FNCS), and a member of the Nigeria Society of Engineers (MNSE). The Department now has a complement of eleven (11) full time PhD holders in Computer Science who are all members of CPN, and NCS.

As at date, the Department of Computer Science is running programmes leading to the award of B.Sc., PGD, M.Sc, and Ph.D degrees. Since its inception in 2005, the Department has produced a total of 15 PhD's. In addition, the Department has graduated 106 M.Sc, 71 PGD, and 533 B.Sc degree candidates.

The Department is also hosting a General Studies Course (GES 101: Computer Appreciation and Application) with an Assistant Director appointed from the Department. B. B. Baridam is the current Assistant Director.

Our graduates have been performing excellently well in the industry, the public service, and the academia. In fact the University of Port Harcourt Information and Communication Technology Centre (ICTC) is being controlled by our former students. Furthermore, Seven (7) of our products are already senior lecturers and currently the Ag.Head of Department.

The Department has Software Laboratories/Lecture rooms, a Hardware Laboratory, and a Software Research Laboratory all adequately equipped to properly expose students to practical work. Our research interests include Computer Networks, Software Engineering, Management Information System, Artificial Intelligence, Computer Security, Expert Systems, Language Processing and E-learning Systems.

Philosophy and Objectives of the Degree Programme

The programmes in the Department have been designed to equip graduates with theoretical and practical skills for a variety of entrepreneurial careers in the Computing, Software Development, Information Technology, Management Information systems, Computer Networking and related disciplines. The B.Sc programme is designed to instil in graduates, sound and critical understanding of the concepts and methodologies in Computer Science that meet current and anticipated

needs of the society in these subject areas. Training is geared towards subject specific knowledge complemented with the acquisition of skills and field experiences that adequately prepare the graduate for self-employment, work in relevant government organizations and/or in the private sector as well. The training covered by the programme includes but is not restricted to the basics of ICT communication and people skills; emphasis on problem solving modules leading to acquisition of entrepreneurial skills relevant to the 21st century graduate, industry and society. At the end, the graduate is fully equipped for graduate work as well as being competent to apply basic scientific logic in the management of human and other natural resources in a sustainable manner. The main objectives are:

- To create in students the awareness and enthusiasm for Computer Science and its capabilities in our information age.
- To involve the students in an intellectually stimulating and satisfying experience of learning and studying.
- To provide a broad and balanced foundation in Computer Science knowledge and practical skills.
- To develop in students through an education in Computer Science a range of transferable applicable skills of information technology in all aspects of human endeavor.
- To generate in students an appreciation of the importance of Computer Science in an industrial, economic, technological and social context.
- To provide students with knowledge and skills base for further studies in computer science or multi–disciplinary studies involving Computer Science and Information Technology.

Academic Programmes

The Department of Computer Science offers a 4-Year B.Sc. (Hons.) degree programme in Computer Science. This is in addition to the following Post Graduate programmes:

- Post Graduate Diploma in Computer Science (PGDCS)

- M.Sc in Computer Science and
- PhD in Computer Science.

The curriculum for the first year of the degree program is broad, consisting of general and science-based courses. The second year curriculum incorporates courses from mathematical disciplines, in order to give a good grounding in the mathematical sciences, and also introduce programming principles. The curriculum for the last two years is more specialized, aiming at producing graduates who are able to relate to the most current developments in Computing and Information Technology. In order to achieve these, the second semester of Year 3 and the following long vacation are devoted to a 6-month Industrial Training.

In the final year, each student is expected to do a project that must include the writing of a fairly large program, using a suitable programming language or development tool.

Academic Staff of the Department of Computer Science

S/N	Name	Qualification	Specialty	Designation
1.	Nwachukwu E. O.	B.Sc. (Eng) Ife, M.Sc, Ph.D. (Manchester)	Software Engineering, Networks, E-Learning, AI	Professor
2.	Chiemeke S. C.	B.Sc. (Lagos) M.Sc. (Lagos) PhD (Akure)	Software Engineering, AI	Professor
3.	Monima, Briggs C.	B.Sc (London) MSc (New Jessy) PhD (London),	Computer Networks, Software Engineering	Professor
4.	Eze F.U.	BSc. (NAU) M Sc (NAU) Ph.D (NAU)	Computer Modeling and Simulation	Associate Professor

5.	Asagba P. O.	B.Sc. (UNN) M.Sc.(Benin) Ph.D. (UPH)	Network Security, Programming, Database Mgt. System	Senior Lecturer
6.	Uzoh O. F.**	B.Sc (UNN) M.SC, Ph.D (UPH)	Computer Modeling and Simulation	Senior Lecturer
7.	Ejiofor V. I.**	B.Sc, MSc, PhD (NAU)	Database Mgt, MIS, Programming	Senior Lecturer
8.	Ugwu C.	B.Sc. (UPH) M.Sc. (UPH) Ph.D. (UPH)	Computer Modeling and Simulation AI, Algorithm	Senior Lecturer
9.	Onyejegbu L. N.	B.Sc. (NAU) M.Sc. (NAU) Ph.D. (UPH)	AI, E-Learning, Software Engineering	Senior Lecturer/ Ag.HOD
10.	Eke B. O.	B.Sc., M.Sc. Ph.D. (UPH)	Software Engineering, Application Development.	Senior Lecturer
11.	Ogheneovo E. E.	B.Sc. (UPH) M.Tech. (FUTA) Ph,D. (UPH)	Programming & Software Engineering, Database Mgt. System	Senior Lecturer
12	Ejiofor C. I.	B.Sc. (NAU) M.Sc.(NAU)	Software Engineering, Data Mining, Information Retrieval	Senior Lecturer
13.	Onuodu F. E.	B.Sc. (FUT Minna) M.Sc. (UPH)	Artificial Intelligence, Data Mining	Lecturer I
14.	Baridam B. B.	B.Sc. (UPH) M.Sc. (UPH)	Programming and Software Engineering, AI	Lecturer I
15.	Izevbizua P. O.	B.Sc. (Benin) M.Sc. University of Sunderland (U.K)	Software Engineering, Networking	Lecturer I

16.	Egbono F.	B.Sc (USSR) M.Sc. (USSR) PhD (ESU)	Computer Systems, Distributed Database, Networking	Lecturer I
17.	Wobidi E.	B.Sc. (UPH) M.Sc. (Lagos)	Database Mgt. System	Lecturer II
18.	Ochei L. C.$^{++}$	B.Sc. (UYO) M.Sc. (Benin)	Software Engineering, Web Application	Lecturer II
19.	Okengwu U.	Bsc (UPH), Msc (UPH) Ph.D (UPH)	Software Engineering	Lecturer II
20.	Ogunsakin R. S.	B.Sc. (UPH) M.Sc. (UK)	Networking	Lecturer II
21.	Ugbari A.	Bsc (RSUST), Msc University of Brighton (U.K)	Computer Systems, Distributed Database, Networking	Assistant Lecturer

** Adjunct Lecturer

$^{++}$ Lecturer on Study Leave

Graduate Assistant

1.	Oghenekaro U. L.	Bsc (UPH), Msc (UPH)	Computer Systems	Graduate Assistant

Departmental Librarian

1.	Enyindah Promise	Bsc (UPH),	Librarian	Departmental Librarian

Senior Staff: Non-Teaching

S/NO	NAMES OF STAFF	QUALIFICATION	DESIGNATION
1.	Emecheta N. C.	B. Tech (FUTO) M.Sc. (Benin)	Chief Programmer

2.	Odokuma E.E.	BSc (UPH) M.Sc. (UPH)	Programmer I
3.	Musa M.O.	BSc (UPH) M.Sc. (Benin)	Programmer I
4.	Ekeocha A. C.	B.Eng (UPH)	Senior Technologist
5.	Adams E. P.	ND (Bori) HND (UPH)	Senior Technologist
6.	West I. S.	B. Tech (RSUST)	Technologist I
7.	Amadi C. U	B. Ed. (UPH)	Assistant Registrar
8.	Barisi I.	B.Sc. (RSUST)	Personal Secretary
9.	Okere, E. C	B.Sc (UPH)	Chief Clerical Officer

Junior Staff: Non-Teaching

S/NO	NAMES OF STAFF	QUALIFICATION	DESIGNATION
10.	Wali, G. A	B.Sc (UPH)	Senior Clerical Officer
11.	Opusunju, S. G.	SSCE	Senior Laboratory Assistant
12.	Nwaji J.	SSCE	Computer Operator
13.	Ejekwu C.	FSLC	Caretaker
14.	Nsirim, A.	SSCE	Head Lab. Attendant
15.	Odika, N.	FSLC	Laboratory Assistant
16.	Ohaka, M. N.	FSLC	Laboratory Assistant
17	Nwikoleh, B. S.	SSCE	Lab Assistant
18	Osobinanwu , N.	FSLC	Messenger_Cleaner

ACADEMIC POLICIES

Introduction

The following have been extracted from the document "Statement of Academic Policies, University of Port Harcourt 2012". This document was first issued in 1977, revised in 1983 to reflect the reorganization from a school system to a Faculty system; and revised in 1990 to reflect changes in line with the NUC Minimum Academic Standards. The present revision reflects changes made by Senate between 1995 and 2004. Students are advised to familiarize themselves with this document.

Department Entry Requirement

Admission into the degree programme will normally be through the Unified Tertiary Matriculation Examination (UTME). The required UTME subjects for entry into the Department of Computer Science are English, Mathematics, Physics, and Chemistry. The minimum requirement for entry into a Bachelor Degree Program in the Department is the SSCE or WASC or GCE O/L or equivalent with credits (in at most two sittings) in English, Mathematics, Physics, Chemistry, and Biology. Attention of each student is drawn to the document "*Statement of Academic Policies*" for the University of Port Harcourt general entry requirements.

Registration of Courses

Every student is required to register for all courses during the time stipulated, which is usually within the first week of resumption, except where otherwise indicated. Students who cannot register during the specified time may however, register later but all registration exercise must be completed within the time allowed for late registration.

Course registration is done on-line. It is the responsibility of the student's parent department. When registering, students should ensure that they re-register all previously failed courses in which the programme requires a pass and meet the prescribed requirements for

each course registered. Furthermore, the total credit units registered should not be less than 15 or more than 24 per semester.
Any registration completed after the time specified will be null and void and will not be credited to the student even when he/she had taken and passed the examination in the course. Students are not allowed to sit for examinations in courses for which they had not previously registered. Such actions are fraudulent and culprits will be appropriately disciplined.

Any genuine request for late registration must be made in writing to the Head of Department only through a form obtainable from the registry. A late registration fee, whose amount is reviewed each year in line with the cost of living, must be paid to the Bursary. Late registration will only be allowed when the appropriate receipt is documented on the form.

Application for adding or dropping a course must be made on the prescribed Add/Drop Forms and certified by the Registrar after obtaining the approval of the Head of Department concerned, not later than four weeks before the examination in each semester. Any change of course made by altering the registration form will be null and void.

Grading System
The following system of Grade Points shall be used.

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".

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 Credits 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 = 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 as presented in the Table overleaf:

Typical Example for GPA and CGPA Computation.

First Year, Semester One

Course Code	Credit Units (CU)	Letter Grade	Grade Pointt (GP)	Quality Point (QP) = (CU x GP)
GES 100.1	3	B	4	12
MTH 110.1	3	C	3	9
MTH 120.1	3	C	3	9
PHY 101.1	3	F	0	0
PHY 102.1	1	E	1	1
FSB101.1	3	D	2	6
CHM 130.1	3	A	5	15
CSC 180.1	2	A	5	15
Total	**21**			**67**

Calculation of GPA For First Semester:

Total Credit Unit, TCU = ∑CU = 21

Total Quality Point, TQP = ∑QP = 67

Grade Point Average (GPA) = TQP/TCU = ∑QP/∑CU

=67/21

= 3.19

First Year, Semester Two

Course Code	Credit Units (CU)	Letter Grade	Grade Point (GP)	Quality Point (QP)
GES 101.2	2	B	4	8
GES 102.2	2	D	2	4
GES 103.2	2	A	5	10
MTH 114.2	3	B	4	12
MTH 124.2	3	A	5	15
PHY 103.2	1	C	3	3
PHY 112.2	3	E	1	3
Total	**16**			**55**

Calculation of GPA for Second Semester:

Total Credit Unit, TCU = ∑CU = 16

Total Quality Point, TQP = ∑QP = 55

Grade Point Average **(GPA)** = TQP/TCU = ∑QP/∑CU

=55/16

= 3.44

Calculation of CGPA at the end of the First year, (First and second Semesters):

Total Credit Unit, TCU = ∑CU = (21 + 16) = 37

Total Quality Point, TQP = ∑QP = (55 + 67) = 122

Cumulative Grade Point Average **(CGPA)** = TQP/TCU =∑QP/∑CU

=122/37

= 3.30

N:B: The following points are noteworthy for GPA and CGPA computation:

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

ii. Where a student has registered more than the allowed number of free elective courses, only the grades obtained in the allowed number of elective courses, chosen in the order of registration, will be used in computing the CGPA. Other elective courses will be treated as audited courses and will not be used in calculating the CGPA.

iii. Where a student was registered for a course but the result is unavailable, due to no fault of the student, no result will be recorded for that course and the student will-register for it in the next academic year.

iv. When a student transfers from one Department 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.

Continuation, Probation and Withdrawal

The essential points on the subject matter are as highlighted below:

i. **Continuation Requirement**
   The continuation requirement 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 may not register for more than 18 units per semester. The purpose of the restriction is to give the students a chance to concentrate on improving their performance and thus raising their CGPA.

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 Unit(s)**

Subject to the conditions of withdrawal and probation, a student must repeat the failed course unit(s) at the next available opportunity, provided that credit units carried during that semester does not exceed 24, and the Grade Points earned at all attempts shall count towards the CGPA.

vi. **Temporary Withdrawal from Study**

A student may apply for temporary withdrawal from study for a period of one year, which may be renewed up to a maximum of 2 years.

vii. **Withdrawal**

A student whose Cumulative Grade Point Average is below 1.50 at the end of one year's probation shall be required to withdraw from the programme.

Auditing of Courses

Students may attend courses outside their prescribed programme. The courses 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 the Faculty and taken the prescribed examination. An audited course shall not be used in calculating the CGPA.

Academic Advisers

Every student is attached to an Academic Adviser who is a member of the 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 office doors about appropriate times and places at which they will be available to students who wish to consult them.

Classification of Degrees

The degree shall be awarded with 1st, 2nd Upper, 2nd Lower, or 3rd Class Honour. The cumulative Grade Point Average (CGPA) for these classes shall be;

	Cumulative Grade Point Average (CGPA)
Class of Degree	**New Students**
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

General Remarks

All the students admitted into the first year of the Department of Computer Science must have met the entry requirements, and thus, eligible to pursue the available careers in the Department. However, experience has shown that many students relax their efforts in the early years of study, apparently assuming that 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 assignment, 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 (CGP) with its weight (credit units). In the Department, weights for courses may be 1, 2 or 3 credit units as the case may be; except for Industrial Training and the final year project whose weights are 6 credit units respectively.

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

In terms of the letter grades earned in all the courses offered in a given academic programme of study, 1^{st} class, 2^{nd} class upper division and 'high' 2^{nd} class lower division simply mean, receptively:

(i) The *1^{st} class* is equivalent to the attainment of at least 'A', 'B' average (a minimum final CGPA of (5+4)/2 = 4.50) during the course of study. To achieve this, one must earn very few 'Cs', say, two or three and more 'As' than 'Bs' in all the courses. Earning even one 'E' grade and/or 'Ds' can be fatal.

(ii) The *2^{nd} class upper division* is equivalent to the attainment of at least 'B', 'C' average (a minimum final CGPA of 4+3)/2 = 3.50) during the course of study. To achieve this, one must earn very few 'Ds', say, two or three, and many 'Bs' and 'As'. Earning few 'Es' and 'Ds' can be fatal.

(iii) The *'high' 2^{nd} class lower division* is equivalent to the attainment of an average grade of 'C' (a minimum final CGPA

of 3.0) during the course of study. To achieve this, one must be an average student throughout the programme of study.

Therefore, for the ambitious student, hard work begins from year 1 and spans through year 4. Few low grades can thwart your 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. Appendix A presents some of the penalties for a false ambition (Examination Malpractice). 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.

NOTE:

1. Students should note that all prescribed courses must be passed before graduation. If there is any failed course at the end of the first 4 years, an extra year has to be used to remedy the failed courses. This process is repeated at the end of the 5^{th} year if a course is still not passed. At the end of the 6^{th} year, the student must leave the university with a "fail out".
2. A student who abandons his/her programme after 4 years will earn a grade of "F" for each course being carried over in the 5^{th} and 6^{th} years. The student will "fail out" at the end of the 6^{th} year.

DEGREE PROGRAMME
B.Sc (Hons.) Computer Science
Courses Offered

Year 1
First Semester

Course No	**Course Title**	**Credit Units**
GES100.1	Communication skills in English	3
GES102.1	Introduction to Philosophy and Logic	2
MTH 110.1	Algebra and Trigonometry	3
MTH 120.1	Calculus	3
PHY 101.1	Mechanics and Properties of Matter	3
PHY 102.1	Laboratory Practices I	1
CSC 180.1	Introduction to Computer science and BASIC programming	2
Elective	**Any one of**	
CHM 130.1	General Chemistry I	3
FSB 101.1	General Biology I	3
Total		**20 Units**

Second Semester

Course No	**Course Title**	**Credit Units**
GES 101.2	Computer Appreciations and Application	2
CSC 182.2	Computer Applications with Practical	2
CSC 183.2	Introduction to Problem Solving	2
MTH 114.2	Introduction to Set, Logic and Numbers	3
MTH 124.2	Coordinate Geometry	3
GES 103.2	Nigerian Peoples and Culture	2
PHY 112.2	Introduction to Electricity and Magnetism	3
PHY 103.2	Laboratory Practices II	1
STA 160.2	Descriptive Statistics	3
Total		**21 Unit**

Year II

First Semester

Course No	Course Title	Credit Units
MTH 270.1	Numerical Analysis	3
STA 260.1	Introduction to Probability and statistics	3
CSC 280.1	Introduction to Computer Programming (Fortran)	3
CSC 281.1	Computer System Fundamentals	2
CSC 283.1	Introduction to Information Systems and File Structures	2
CSC 284.1	Introduction to Logic Design	2
CSC 288.1	Structured Programming	2
Elective	**Any one of**	
MTH 210.1	Linear Algebra	3
MTH 230.1	Modern Algebra	3
Total		20 **Units**

Second Semester

Course No	Course Title	Credit Units
CSC 282.2	Database Programming	2
CSC 285.2	Digital Designs and Microprocessor	2
CSC 286.2	Data Structures	2
CSC 287.2	Object Oriented Programming I (C++)	2
FSC 2C1.2	Community Service	1
MTH 224.2	Mathematical Methods I	2
MTH 250.2	Elementary Differential Equations	3
Elective:	**Any one of**	
STA 262.2	Mathematical Statistics I	3
PHY 351.2	Electronics 1	3
Total		**17 Units**

Year III

First Semester

Course No	Course Title	Credit Units
GES 300.1	Fundamentals of Entrepreneurship	2
CSC 395.1	Introduction to Software Engineering	3
CSC 382.1	Computer Architecture I	2
CSC 394.1	Operating Systems	3
CSC 396.1	Automata theory, Computability & Formal Languages	3
CSC 397.1	Computational Methods	2
STA 370.1	Operations Research	3
Total		**18 Units**

Second Semester

Course No	Course Title	Credit Units
CSC 300.2	Industrial Training	9
Total		**9 Units**

Year IV

First Semester

Course No	Course Title	Credit Units
GES 400.1	Entrepreneurship	2
CSC 480.1	Database Management	3
CSC 481.1	Object Oriented Programming II (Java, Ruby, and Python)	2
CSC 482.1	Compiler Construction	2
CSC 483.1	Algorithms and Complexity Analysis	2
CSC 486.1	System Analysis and Design	3
CSC 496.1	Programming Languages (4^{th} and 5^{th} Generation)	2
CSC 498.1	Computer Network & Data Communications	3
Total		**19 Units**

Second Semester

Course No	Course Title	Credit Units
CSC 491.2	Computer Modeling and Simulation	2
CSC 492.2	Computer Graphics	2
CSC 493.2	Internet and Web Application	2
CSC 494.2	Introduction to Artificial Intelligence	3
CSC 495.2	Computer Architecture II	2
CSC 497.2	Project Management	2
CSC 470.2	Project	6
Total		**19 Units**

DEGREE PROGRAMME
B.Sc (Hons.) Computer Science
Courses Offered (Part-Time)

YEAR 1
FIRST TERM

Course Code	Course Tittle	Credit Units
CSC 180.1	Introd. To Computer Sci & Basic Program	2
STA 160.1	Descriptive Statistics	3
MTH 110.1	Algebra and Trigonometry	4
MTH 120.1	Calculus	3
PHY 101.1	Mechanics and Properties of Matter	3
PHY 102.1	Laboratory Practice	3
		15 UNITS

SECOND TERM

Course Code	Course Title	Credit Units
GES 101.2	Computer Appreciation and Application	2
GES 100.2	Communication Skills in English	3
GES 102.2	Introduction to Philosophy and Logic	2
GES 103.2	Nigerian Peoples and Culture	2
Elective	**Any one of**	
CHM 130.2	General Chemistry 1	3
FSB 101.2	General Biology 1	3
		12 UNITS

THIRD TERM

Course Code	Course Title	Credit Units
CSC 182.3	Computer Applications with Practicals	2
CSC 183.2	Introduction to Problem Solving	2
MTH 114.3	Introduction to set Logic & Numbers	3
MHT 124.3	Coordinate Geometry	3
PHY112.3	Introdution to Electricity and Magnetism	3
PHY 103.3	Laboratory Practice II	1
		12 UNITS

YEAR II

FIRST TERM

Course Code	Course Title	Credit Units
CSC 283.1	Introd. To Information Systems & file structure	2
Csc 284.1	Introduction to Logic Design	2
CSC 286.1	Data structure	2
MTH 210.1	Linear Algebra	3
MTH 270.1	Numerical analysis	3
STA 260.1	Introd.to Probability & Statistics	3
		15 UNITS

SECOND TERM

Course Code	Course Title	Credit Units
CSC 280.2	Introduction to Computer Programming	3
CSC 281.2	Computer System Fundermentals	2
CSC 282.2	Database Programming	2
CSC 285.2	Digital Design & Microprocessor	2
CSC 288.2	Structured Programming	2
		11 UNITS

THIRD TERM

Course Code	Course Title	Credit Units
FSC 2C1.3	Community Service	1
CSC 287.3	Object Oriented Programming I, (C++)	2
MTH 224.3	Mathematical Method I	2
MTH 250.3	Elementary Differential Equations	3
ELECTIVE	**One Course From**	
STA 262.3	Mathematical Statistics I	3
PHY 351.3	Electronics I	3
		11 UNITS

YEAR III

FIRST TERM

Course Code	Course Title	Credit Units
GES 300.1	Fundamentals of Entrepreneurship	2
CSC 382.1	Computer Architecture I	2
CSC 394.1	Operating Systems	3
CSC 395.1	Intro. to Software Engineering	3
CSC396.1	Automata Theory, Computability, and Formal Language	3
		13 UNITS

SECOND TERM

Course Code	Course Title	Credit Units
CSC397.2	Computational Methods	3
STA 370.2	Operations Research	3
CSC 300.2	Industrial Training (Starts)	
		6 UNITS

THIRD TERM

Course Code	Course Title	Credit Units
CSC 300.3	Industrial Training (Continues)	9
		9 UNITS

YEAR IV
FIRST TERM

Course Code	Course Title	Credit Units
CSC 480.1	Database Management	3
Csc 482.1	Compiler Construction	2
CSC 483.1	Algorithms	2
CSC 486.1	System Analysis and Design	3
CSC 496.1	Programming Languages (4^{th} and 5^{th} Generation)	2
		12 UNITS

SECOND TERM

Course Code	Course Title	Credit Units
CSC 481.2	Object Oriented Programmings II (JAVA, Rubby, and Python)	3
CSC 491.2	Computer Modelling and Simulation	2
CSC 492.2	Computer Graphics	2
CSC 495.2	Computer Architecture II	2
		9 UNITS

THIRD TERM

Course Code	Course Title	Credit Units
GES 400.3	Enterpreneurship	2
CSC 493.3	Internet & Web Applications	2
CSC 494.3	Introduction to Artificial Intelligence	3
CSC 498.3	Data Communication & Network	3
CSC 497.3	Project Management	2
		12 UNITS

YEAR V

Course Code	Course Title	Credit Units
CSC 470.1	Project	6

		6 UNITS

COURSE DESCRIPTION

GES 100.1 Communication Skill in English
The course seeks to develop in the students a well-informed attitude to the English Language and to equip them with the knowledge of English communication and study skills that will facilitate their work in the University and beyond.

GES 102.1 Introduction to Logic & Philosophy
A brief survey of the scope, notions, branches and problems of philosophy, symbolic logic, specific symbols in symbolic logic, Conjunction, Affirmation, negation, disjunction, equivalence and conditional statements, Law of thought, The method of deduction, using rule of inference and bi-conditions, Quantitative theory.

MTH 110.1 Algebra and Trigonometry
Element notions of sets, Subsets, Union, Intersection, Compliments, Venn Diagrams. Real Numbers Integers, Rational and Irrational, Mappings 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, Principle of mathematical induction, Binominal theorem. Trigonometry functions of angles. Circular functions. Addition theorems. Double and half angles. PRE-REQUISITE (O/LEVEL OR SSCE MATHS).

MTH 120.1 Calculus
Function of a real variable, graphs, limits and idea of continuity, The derivative as limit of rate of change, Techniques of differentiation, Extreme curve sketching; integration as an inverse of differentiation, Methods of integration, Definite integrals, Application to areas, volumes.

PHY 101.1 Mechanics and properties of matter

Topics covered in this course will include the following: Motion in one dimension, motion in a plane, work and energy, conservation laws, collision, solid friction, rotational kinematics and rotational dynamics, equilibrium of rigid bodies, oscillations, gravitation, fluid static and fluid dynamics, Surface tension, viscosity and hydrostatics.

CSC 180.1 Introduction to Computer Science and BASIC Programming

History and development of computers: functional components of a computer, characteristics of a computer, Number systems, Boolean Algebra, Flowcharts; algorithms; Symbolic names, lists and arrays, subscripts, expressions and control statements in computer programming, Programming in BASIC, Computer application, strategy for computer programming, Rules that guide the writing of BASIC programs/statements. Library functions, User-defined functions, Subprograms & subroutine in BASIC.

Practical Section

A student must pass a practical course to be administered in the computer laboratories which will emphasis on the implementation of the programming constructs taught in the class before he or she will pass the course. The aim is to inculcate in students' the ability to solve problems related to the programming language taught and to increase the Entrepreneurial skills of the students.

CHM 130.1 General Chemistry

Basic principles of matter and energy from the chemist's point of view, A broad based course suitable for students from various schools as well as those from the Faculty of Science, Topics to be covered include matter and units of measurement, atomic theory and molecular structure, stoichiometry, the periodic classification of the elements, atomic structure, chemical bonding, thermo chemistry, properties of gases and gas laws, solids, liquids and solutions.

FSB 101.1 General Biology 1
Characteristics of life, Investigations in Biology, the scientific method; the substance of life, the unit of life (including methods of study); activities of cells, the control of metabolic activities; basic principles of inheritance (Genetics), Evolution.

GES 101.2 Computer Appreciation and Application
History of computers, Generation and classification of computers; IPO model of a computer; components of a computer system hardware and software; programming language; organization of data; data computer techniques; introduction to computer network. Use of Keyboard as an input device: DOS, Windows, Word Processing, and Spreadsheet: Application of Computers to Medicine, Social Sciences, Humanities, Education and Management Sciences.

CSC 182.2 Computer Applications
Overview of application packages, modes of acquisition, criteria for package acceptability, Application software family, a typical word processing software- Ms Word document creation, save, text, editing, formatting, creation and handling of tables. A typical database management system packages – Access. Functions of DBMS. Advantages of DBMS, types of DBMS. Advantages of DBMS over manual processing spread sheet- feature of spread sheet, limitations areas of application of spreadsheet, Desktop publishing, software packages-CorelDraw or PageMaker, features, Educational packages (CAL, CAI), PowerPoint, Microsoft outlook.
Practical Section
A student must pass a practical course to be administered in the computer laboratories which will emphasis the implementation of the programming constructs taught in the class before he or she will pass the course. The aim is to develop students' ability to solve problems related to the application packages taught and to increase the Entrepreneurial skills of the student.

MTH 114.2 Introduction to Sets, Logic and Algebra

MTH 114.2a Set Theory – with proofs of set theoretic theorems involving union, intersection, and compliments of sets, Difference sets, De Morgan's Laws, Power Sets; Poset Diagrams, Cardinality of a set, Product sets and relations on sets, Logic – Statements and statement formula, connectives and truth tables. Implication and equivalence. Quantifiers and quantified statements truth functions. Substitution and replacements in statements. Elementary notions of prepositional and predicate logic proofs. Rules of inference Technology (direct, indirect, eliminations and contradiction).Demonstration of proof.

MTH 114.2b

1. Relations and Equivalence relations on a set Mappings – types of mappings (injective and subjective and bijective mappings. Inverse mappings, composition of mappings. Permutation on a set.
2. Peano axioms. Integers – divisibility, division algorithm, g.e.d., congruence modulo, Diophantine equation, Primes and prime decomposition. Chinese remainder theorem.
3. System of Linear Equations, Solution of Linear Equation, Matrices and Systems of Linear Equation. Row operations on matrices and echelon forms. Determinants of a matrix PRE-REQUISITE (SSCE/MTH 110.1)

MTH 124.2 Coordinate Geometry

Straight lines, circles, parabola, ellipse, hyperbola. Tangents, normal. Addition of Vectors. Scalar and Vector products. Vector equation of a line and place. 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 vertical motion, elastic string, simple pendulum impulse. Impact of two smooth sphere. Addition of Vectors.

GES 103.2 Nigeria Peoples & Culture

The overall objective of this course is to help students understand the concept of culture and its relevance to human society especially as it relates to development. In more specific terms, the course will be designed to help the students know the history of various Nigerian cultures beginning with pre-colonial Nigeria society. Colonialism constitutes a vital watershed in Nigerian history. Thus the course will identify the influence of colonialism on Nigerian culture, and focus on contemporary Nigerian culture explaining issues that relate to the political economic, educational, religious and social institutions in the nation. The course outline includes the concept of culture; pre-colonial culture and languages of Nigeria; principles of kinship, descent and marriage in Nigerian culture; the colonial impact; Nigerian economic institutions; education and development in Nigeria; religion in Nigerian culture; culture, environment and health practices in Nigeria; intergroup relations.

PHY 112.2 Introducing to Electricity and Magnetism

This is the introductory course on Electricity and Magnetism Topics covered all will include: the Electric field, Gauss's Law, Electric potential, Capacitor and Dielectric, current and resistance electromotive force and circuits, the magnetic field, Ampere's Law, faraday's Law of induction.

Text: Electromagnetism and Modern Physics for physical Science by Evwaraye and Mgben.

PHY 103.2 Laboratory Practices 11

The experiment carried out in the course will cover areas discussed in PHY 112.2. These experiments include verifications of the current 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.

MTH 210.1 Linear Algebra
Vector space over the real field. Subspaces, linear independence, basis and dimension. Linear transformations and their representation by matrix – range, null space, rank. Singular and non-singular transformation and matrices. Systems of linear equation and change of basis, equivalence and similarity. Eigenvalues and eigenvectors. Minimum and characteristic polynomials of a linear transformation (Matrix). Caley-Hamilton Theorem. Bilinear and quadratic PRE-REQUISITE) MTH 110.1 or MTH 114.2).

MTH 230.1 Modern Algebra
Review of mappings relations, permutations, equivalence relations on a set. Review of Integers – divisibility, division algorithm congruence modulo and Diophantine equation. Binary operations, algebraic structures- groups, semi groups, ring groups with examples, groups and sub groups. Cossets in groups. Lagrange's theorem and application. Cycle sub groups and cyclic group. Normal sub groups. Hormorphism of groups quotient groups. Concrete examples of groups.

STA 260.1 Introductions to Probability and Statistics
Definition of probability, frequency and probability of events. Equally likely events counting techniques. Conditional probability. (Baye's Theorem) independent events, random variables, probability distributions. The central limit theorem, mathematical expectation, moments, the mean, variance, variance of a sum, covariance and correlation, conditional expectation. Analysis of variance plus contingency table plus parametric inference, Pre-requisite (MTH 110.1/MTH 120.1).

MTH 270.1 Elementary Numerical Analysis
Solution of algebraic and transcendental equations. Curve fitting. Error analysis. Interpolation and approximation. Zeros or non-linear equations 'to one variable'. Systems of linear equations. Numerical differentiation

and integral equations. Initial value problems for ordinary differential equation. Prerquistic1: MTH120.1.

CSC 280.1 Introduction to Computer Programming

Principles of programming. Program design, algorithms, flowcharts, pseudo codes. Programming with FORTRAN: declarations, input/output, loops, decisions, arithmetic/assignment statements. Arrays and subroutines.

Practical Section

A student must pass a practical course to be administered in the computer laboratories which will emphasis on the implementation of the programming constructs taught in the class before he or she will pass the course. The aim is to develop the students' ability to solve problems related to the programming language taught and to inculcate Entrepreneurial skills to the students.

CSC 281.1 Computer Systems Fundaments

The Von-Neumann computer. Simple computer organization. ALU Registers: accumulator register, instruction register, instruction pointer. The instruction fetch-execute cycle. Microinstructions, Microprograms, Microprogram Execution. Hard-wired Microprograms. Memories: memory cycles, memory buffer register, word lengths, memory hierarchies-RAM, LI cache, L2 cache. The bootstrap loader. Loaders and link editors.

CSC 283.1 Information Systems and File Structures

Data hierarchy: bits bytes, data types, records, files. File design: serial and sequential files, random and index sequential files. File maintenance: master files, transaction files, etc. Tape and disk devices: timing, record blocking, etc.

CSC 284.1 Introduction to Logic Design

Numerical representations; Digital and analogue systems; Representing binary quantities-fixed number representations, floating-point

representations; Digital circuits/logic circuits; Parallel and serial transmission; Memory; Digital computers. Binary-to-decimal conversions decimal-to-binary conversions; Binary arithmetic; BCD code; Alphanumeric codes-ASCII, EBCDIC, Unicode, etc.; Parity codes, parity method for error detection.

CSC 288.1 Structured Programming

Principles of good programming style, expression; structured programming concepts; control flow-invariant relation of a loop; stepwise refinement of both statement and data; program modularization (Bottom up approach, top-down approach, nested virtual machine approach); languages for structured programming debugging testing verifying code inspection; semantic analysis. Test construction.

Program verification, test generation and running. The use of PASCAL to illustrate these concepts. String processing, Record Structures, file Processing, Dynamic data types for lists, etc. Recursion for tree search, sorting, etc. writing efficient programs. Turbo PASCAL project management facilities.

Practical Section

A student must pass a practical course to be administered in the computer laboratories which will emphasis the implementation of the programming constructs taught in the class, before he or she will pass the course. The aim is to improve students' ability to solve problems using the programming technique taught and to enhance the Entrepreneurial skills of the students.

CSC 282.2 Database Programming

Characteristics of business programming. Records, files. File creation, accessing. Record accessing, insertion, updating, deletion. Searching and retrievals. Programming with dBase, and MS Access, or other suitable language. Introduction to SQL.

Practical Section

A student must pass a practical course to be administered in the computer laboratories which will emphasis the implementation of the

programming constructs taught in the class before he or she will pass the course. The aim is to develop students' ability to solve problems related to the application of database taught and to inculcate Entrepreneurial skills to the students.

CSC 285.2 Digital Design and Microprocessor

Practical design and operation of the laboratory equipment. Digital signal generation and transmission. Sequential circuit contd. Flip flips or latches. Registers and counters. Arithmetic circuits-parallel and serial binary adders-half adders and full adders. Binary substracters-half subtractors and full subtractors and synthesis of simple synchronous control mechanisms. Data and address bases: Addressing and accessing methods. Memory segmentation , practical methods of timing-pulse generation. Comparison of Commonly used codes e.g ASCII, BCD, EXCESS-3 etc parity generation and detection; code generators.

CSC 286.2 Data Structures

Bits, Bytes, words, linear structures and lists structures; arrays, tree structures, sets and relations, higher level language data types and data-handling facilities. Techniques for storing structured data list, files, tables trees, etc., their space and access time properties, algorithm for manipulating linked lists, binary, b-trees, b*trees, and A VIAL trees. Algorithm for transversing and balancing trees.

CSC 287.2 Object Oriented Programming I

Preprocessor directives, library naming and access, comments, statements. Data types, constants, variables, expressions and assignment statements. String class. Input/output statements. Selection, repetition. Functions. Arrays. File manipulation, Pointers, and Classes. Use C language, or C++ to illustrate these concepts.

Practical Section

A student must pass a practical course to be administered in the computer laboratories which will emphasis the implementation of the

programming constructs taught in the class before he or she will pass the course. The aim is to inculcate in students' the ability to solve problems related to the programming language taught and to instill the Entrepreneurial skills of the students.

MTH 224.2 Mathematical Methods 1

Review of differentiation and integration and their applications and mean value theorem. Taylor series. Real-valued functions or two or three variables. Partial derivatives chain rule, extreme Lagrange multipliers. Increments, differentials and linear approximations. Evaluation of line, integrals, multiple integrals. Integrals transform and applications. Pre-requisite: MTH 120.1.

MTH 250.2 Elementary Differential Equations

First order ordinary differential equations. Existence and uniqueness. Second order ordinary differential equations with constant coefficients. General theory of nth order linear equations. Laplace transform solution of initial-value problem by Laplace transform method. Sturm Liurville problems and applications. Simple treatment of partial differential equations in two independent variables. Application of O.D.E. to physical, life and social sciences. Pre-requisite: MTH 120.1

MTH 262.2 Mathematical Statistics 1

Distribution of random variable, the probability density function, the distribution function, the moment generating function, characteristic function, factorial moments. Chebyshev's inequality.
Conditional probability and Stochastic independence marginal and conditional distributions, the correlation coefficient covariance. Distribution of functions of random variables. Sampling theory, transformation of variables of the discrete and continuous types, the t and F distributions, the moment generating function technique. Pre-requisite: MTH 260.1

GES 300.1 Fundamentals of Entrepreneurship
History and the development of entrepreneurship, the entrepreneur Qualities and characteristics; the entrepreneur and business environment; identify business opportunity; starting and developing new business ventures; Legal forms business ownership and Registration. Types of business Ownership; Feasibility Studies; Role of Small and Medium Scale Enterprise (SME) in the Economy; Role of government on Entrepreneurship; Business Location and Layout; Accounting for SME: Financing SME; Managing SME; Marketing in SME; risk Management of SME; Success and Failure factor of SME; Prospects and Challenges of Entrepreneurship; Ethical Behaviour in Small Business.

CSC 395.1 Introductions to Software Engineering
Introduction; Software Lifecycle, Software Methodologies and Methods, Agile development, Estimation, Software planning, Risk Management, Requirements Engineering, Goal Modeling, UML in requirement analysis, principles of object-orientation, design patterns.

CSC 382.1 Computer Architecture 1
Basic logic design and Circuits; Data representation; instruction formats; Computer Architecture; Study architecture of an actual simple mini-computer. Assembly languages and assemblers-the two-stage operation of the assembler. Machine instruction sets. Bootstrap Programs and Link Editors.

CSC 394.1 Operating Systems
Principles of operating systems; Types of operating systems, batch, multi- programming multiprocessing. Processes, inter processor communication, synchronization, deadlocks storage management and resource allocation illustrated from a popular operating system such as UNIX.

Practical Section

A student must pass a practical course to be administered in the computer laboratories which will emphasis on the implementation of the programming constructs taught in the class before he or she will pass the course. The aim is to encourage students' ability to solve problems related to the programming language taught and to increase the Entrepreneurial skills of the students.

CSC 396.1 Automata theory, Computability and Formal Languages

The role of programming language. Benefits of high level language. Programming paradigms: imperative, logic, functional and object-oriented programming. General/multi purpose programming languages. Language design and language evaluation criteria. Program structures and representations. Types, objects and declarations. Expressions and statements. Subprograms. Data structures. Input/output. Introductory notions in formal languages. Relationship to programming languages. Issues in programming languages; syntax, semantics, language constructions – declarations, statements, variables binding, loop. Blocks, procedures, parameter parsing, scope of variables. Grammars, productions, parsing and pattern matching. Translating infix and postfix expressions.

CSC 397.1 Computational Method

Computational Geometry-convex hull, triangulation, curves and surfacing. Formal specification, Bunches and bunch theory, pigeonhole principles, surjection, injections, inverses, composition, reflexivity, equivalence relations, transitivity, cardinality – relate practical examples to appropriate termination detection. Implications of uncomputability, tractable and intractable problems. Optical computing – integrity models such as Biba and Clark – Wilson.

STAT 370.1 Operations Research
Definition and scope of operations research. Elementary inventory models, replacement maintenance and reliability problem. Linear programming formulations and simplex methods. Allocation problems (Simplex, assignment and transportation algorithms) and their applications to routing problems. Queuing theory, game theory, sequencing problems. (Pre- Requisite MTH 260.1)

CSC 300.2 Industrial Training
The course is expected to give students an opportunity in public and private institutions/establishments during the second semester and the long vacation to learn and gain knowledge on the basic and applied aspects of Computer Science. All students are attached to the organizations for six months whereas those on probation are not eligible for the training.

CSC 480.1 Database Management
Basic concepts. Data integration. Data independence. Functions and architecture of a DBMS. Data models. Storage structures and access strategies. Relations and relational operations. Relational algebra and calculus. Normalization. Security and integrity issues. Relational systems, INGRES, DBASE entity – relationship model. E-R. diagrams. Semantic and semantic nets. IKBS's

CSC 481.1 Object-Oriented Programming II
Object-Oriented programming structures and principles. Practical illustration with Java, Ruby, and Python programming languages. Preprocessor directives, library naming and access, comments, statements. Data types, constants, variables, expressions and assignment statements. String class. Input/output statements. Selection, repetition. Functions. arrays. Files manipulation. Classes and object-oriented design.

Practical Section

A student must pass a practical course to be administered in the computer laboratories which will emphasis the implementation of the programming constructs taught in the class, before he or she will pass the course. The aim is to encourage students' ability to solve problems related to the programming language taught and to inculcate the Entrepreneurial skills to the students.

CSC 482.1 Compiler Construction

Translators; compilers, assemblers, interpreters, preprocessors. Functional blocks of a complier. The compilation process – Lexical analysis, syntax and semantic analysis. Code generation, code optimization. Error detection and recovery. Lexical analysis, transition diagrams. Review of context – free grammars. Parsing context –free expressions. Top-down and bottom-up praising. LL(K) & LR parsing. Operator –precedence paring. Symbol table structures.

CSC 483.1 Algorithms and Complexity Analysis

Design and specification of algorithms. Efficiency of algorithms: running and memory usage, polynomial time and super-polynomial time algorithms. Analysis of algorithms: best-case, average-case, worst-case analyses. Asymptotic programming, randomized algorithms. Searching: sequential and binary search. Sorting algorithms: bubble, insertion quick sort, merge sort, heap sort. Exponential algorithms: performance optimization.

CSC 486.1 Systems Analysis And Design

Introduction to systems analysis, structured and object-oriented analysis and design, structured and object-oriented tools, the systems life cycle. Organizational structure. Systems investigation. Feasibility studies. Determination and evaluation of alternatives designs of input, and output. Documentation. Choice of system characteristics (Hardware and software). Testing, conversion. Parallel runs. Evaluation of system performance. Maintenance.

CSC 496.1 Programming Languages

Introduction to 4th and 5th Generation Programming Languages, The role and comparison of programming languages generations. Benefits of Fourth and Fifth Programming languages. Data manipulative - based fourth generation language- Structured Query Language Programming, logic based Fourth Generation Languages-Ruby and /or Python, Advanced Queries and Object-Oriented Query handling. General purpose/multi-purpose representations in 4GL – Input/output, Types, objects and declarations. Expression and statements. Methods, Practical Illustrations.

Practical Section

A student must pass a practical course to be administered in the computer laboratories which will emphasis on the implementation of the programming constructs taught in the class before he or she will pass the course. The aim is to encourage students' ability to solve problems related to the programming language taught and to increase the Entrepreneurial skills of the students.

CSC 498.1 Computer Network and Data Communications

Introduction, waves Fourier analysis, measure of communication channel characteristics, transmission media, noise and distortion, modulation and demodulation; multiplexing TDM FDM and FCM. Parallel and serial transmission (synchronous vs anachronous). Bus structures and loop systems, computer network. Examples and design consideration: data switching principles; broadcast techniques; network structure for packet switching, protocols, description of network e.g. ARPANET, DSC etc.

Practical Section

A student must pass a practical course to be administered in the computer laboratories which will emphasis the implementation of the techniques and constructs taught in the class, before he or she will pass the course. The aim is to encourage students to apply techniques taught to solve problems related to the environment and to increase the Entrepreneurial skills of the students.

CSC 491.2 Computer Modeling And Simulation

The concepts and techniques used in computer modeling and simulation; simulation method (methodology) and a suitable language; generation and transformation of random numbers; parameter estimate design experiment; factorial design optimization.

Practical Section

A student must pass a practical course to be administered in the computer laboratories which will emphasis on the implementation of the programming constructs taught in the class before he or she will pass the course. The aim is to encourage students' ability to solve problems related to the programming language taught and to increase the Entrepreneurial skills of the students.

CSC 492.2 Computer Graphics

Hardware aspect; plotters microfilm, plotters displays, graphic-tablets, light pens, other graphical input aids. Facsimile and its problems. Refresh display, refresh buggers, changing images light pen interaction. Two and three dimensional transformation perspective. Clipping algorithms, hidden live removal, Holden surface removal; Warnock's method, shading, data reduction for graphical input. Institution to hand writing and character recognition. Curve synthesis and fitting. Contouring ring structures versus doubly linked lists. Hierarchical structures; Data structure; organization for inter-active graphics.

Practical Section

A student must pass a practical course to be administered in the computer laboratories which will emphasis on the implementation of the programming constructs taught in the class before he or she will pass the course. The aim is to encourage students' ability to solve problems related to the programming language taught and to increase the Entrepreneurial skills of the students.

CSC 493.2 Internet and Web applications

The definition of the internet. The origin, history and development of the Internet. The network protocol used on the Internet- the Internet protocol. The Five layers of the TCP/IP protocol, stack-application layer, transport layer, network layer, data link layer, physical layer. The Internet components: Most used facilities in the Internet; Email, U-tube, View data system, Telecom fencing. etc The Internet Service provider (ISP), Intranets, Extranets, Web master. Governance of the messaging (e-mail), electronic data interchange (EDI), Areas of internet application- teleworking, distance education, virtual (e-learning) classroom, entertainment, sports, news, e-governance, etc Internet age system. Advantage and Disadvantages of the Internet. The lecturer may opt to use HTML or JAVA scripts for illustrations.

Practical Section

A student must pass a practical course to be administered in the computer laboratories which will emphasis on the implementation of the programming constructs taught in the class before he or she will pass the course. The aim is to encourage students to solve problems related to the topics covered and to increase the Entrepreneurial skills of the students.

CSC 494.2 Introduction to Artificial Intelligence

Definition of Artificial Intelligence. Scope and applications of Artificial Intelligence. Problem solving techniques; searching. Logic and inference knowledge-base systems. Natural languages. Pattern Recognition and vision systems. Expect system-architecture, construction and use.

CSC 495.2 Computer Architecture II

Memory system; general characteristics of memory operation / Technology – magnetic recording, semiconductor memory, charge coupled devices, magnetic bubble; memory addressing, memory hierarchy, virtual memory control systems, Hardware control, introduction to the methodology of fault-tolerant computing.

CSC 470.2 Project

The students should carry out a research work on a computer-based or related problems which should be structured to have five chapters: chapter one – Introduction, chapter two- Literature Review, chapter three – Analysis and Design, chapter four - Implementation and Documentation, and chapter five - Summary, Conclusion and Recommendations, followed by Reference, Appendix A – Program code; and appendix B – sample outputs. The students should be able to write a sizable code in the course of their research. The oral defense must be power point slide presentation.

APPENDICES
SENATE'S POLICIES ON EXAMINATIONS MALPRACTICE

A.1 Definition of Examination Malpractice

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

A.2 Cheating within an Examination Hall/Room

- Copying from one another or exchanging questions/answer sheets.
- Bringing in prepared answers, copying from textbooks, notebooks, laboratory specimens and any other instructional aids smuggled into the hall.
- Collaboration with Invigilator/Lecturer, where it involves the lecturer-invigilator providing written/oral answers to a student in the examination hall.
- Oral/written communication between and amongst students.
- Bringing in prepared answer written on any part of the body.
- Receiving information whether written or oral from any person(s) outside an examination hall.
- Refusal to stop writing at the end, within half a minute in an examination.
- Impersonation.
- Illegal removal of answer scripts from the examination hall.
- A check-off system of students who have actually submitted answer scripts should be devised.

** Extracts from the University Statement of Academic Policies*

A.3 Another Form of Examination Malpractice

Plagiarism is form of examination malpractice and should be investigated and punished in the same way as cheating in the

examination hall/room. Plagiarism is the use of another person's work (i.e. in writing term papers, final year project, seminar presentation, etc) without appropriate acknowledgement both in the text and in the references at the end.

A.4 Punishment for Examination Malpractice

Any student found guilty of examination malpractice after due process shall be dismissed from the University. This decision shall be pasted on all notice boards throughout the University and shall be contained in each Faculty Prospectus so as to give it the widest possible publicity.

B. Examination

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

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

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

IV. No unregistered student should be allowed to take examination.

V. A student should be in examination room at last 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 times. 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 and with his scripts.

VI. Every student must write his name, registration number and sign the attendance register within the first hour of the examination.

VII. Each student shall write his number (not name) at the appropriate places on the cover and pages of the answer booklet.

VIII. No student shall leave any handbag, brief case, books notebooks and paper near him/her during the examination.

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

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

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

XII. Students who disrupt an examination at any venue will have their examination cancelled and they will be required to re-register

XIII. These regulations apply to all students studying for the award of University of Port Harcourt degrees, diplomas and certificate.

C. Procedure for Review of Scripts by Aggrieved Students

I. Any student who is aggrieved about the grading result of a course examination may petition his/her head of department in the first instance through the Dean. The Head of Department shall refer the petition to the Dean of the Faculty who shall cause the scripts to be re-assessed and the scores presented to the Faculty Board for determination.

II. A student applying for a review of answer scripts shall be required to pay N500.00 to the Bursary Department before commencement of the review.
III. If the appeal results in a significant improvement (i.e. a change in letter grade) on the student's original grade, the fee so paid shall be refunded to the student within 30 days from the release of the result. The student whose letter grade is marked lower, losses his money.
IV. Application for review of answer script must be made not later than one month from the date of publication of results by the faculty.
V. The application must be personal, i.e. an appeal by someone for the review of someone else's script shall not be entertained
VI. No result/ grade approved by the Faculty Board shall be changed without reference to the Faculty Board.
VII. No result/grade approved by Senate shall be changed without reference to Senate.
VIII. Application for a change of grade must be accompanied in writing by:

(a) Clearly defined reasons for the change.
(b) Evidence that the request has been considered and approved by department/Faculty Board.

D. Procedure for Investigation of Examination Malpractices

Any unauthorized material found in the possession of a student shall be seized it, acknowledging that it was retrieved from him. Refusal to sign is tantamount to

I. Acceptance of guilt.
II. Where the student refuses to sign, the Lecturer (Invigilator) should make a clear statement on the answer sheet and sign.
III. The student, however, shall not be prevented from finishing the examination.

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

V. The report shall include the following information slated overleaf:

NAME OF STUDENT/STAFF;
STUDENT'S REGISTRATION/MATRICULATION NUMBER;
STUDENT'S/STAFF'S DEPARTMENT;
COURSE NUMBER (if applicable);
VENUE OF EXAMINATION (if applicable);
LOCATION OF EXAMINATION MALPRACTICES;
DATE AND TIME OF EXAMINATION (if applicable);
EXAMINATION OFFENCE (with evidence/ statement if any);
CHIEF INVIGILATOR/INVIGILATOR'S SIFNATURE;
WITNESS SIGNTURE (if any);
STUDENT'S COMMENTS (if possible);
STUDENT'S SIGNATURE (if possible);

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

VII. If the Departmental Board feels that a prima facie case has been established, the case shall be investigate the case and report back to the Faculty.

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

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

X. The investigation of examination malpractices should take as must time as it takes to dispose the matter; but it must not go beyond the end of the semester following the one in which the offence was allegedly involved in an examination malpractices shall be allowed to register for curse and take examinations in them. But results of the courses shall not be reported/ released

by his or any other department until investigation has been completed and his innocence established by Senate.

E. Punishment/Measures Against Examination Malpractices

I. Any student found guilty of examination malpractices after due process should be dismissed from the University.

II. This decision should be communicated to all students and their sponsor before the commencement of each session. The information should be pasted on all notice boards throughout the University and should also be contained in each Faculty prospectus so as to give it the widest possible publicity.

III. The decision should take effect immediately and should be duly published as soon as students return to classes.

IV. For students involved in an examination malpractice and proven guilty, Senate should take ultimate decision, while for staff; the appropriate Disciplinary Committee (as specified in the Conditions of Service) should forward its recommendation to Council.