ỌBÁFẸ́MI AWÓLỌ́WỌ̀ UNIVERSITY
ILÉ-IFỌ̀, ỌṢUN STATE, NIGERIA

Students' Handbook
Computer Science and Engineering Department
FACULTY OF TECHNOLOGY

August 30, 2017

Contents

Chapter 1

Introduction

This booklet is intended to serve as a general source of information for the undergraduate students of Computer Science and Engineering. When students are admitted into a programme in the Computer Science and Engineering Department of the Ọbáfẹ́mi Awólọ́wọ̀ University, Ilé-Ifẹ̀, they are required to undergo a rigorous but well structured course of study which is expected to develop them mentally, physically and morally. Each and every activity is designed to bring out the best out of every student by making them develop their various talents and skills. Students will also be made aware of socio-cultural issues that will allow them to function intelligently in a civilised community.

As it is the case in many universities, students are expected to interact with teaching and technical staff as well as other students throughout their period of stay in the University. These interactions will assist students in their chosen course of study. In order to benefit fully from the opportunities provided by the Ọbáfẹ́mi Awólọ́wọ̀ University, Ilé-Ifẹ̀, however, there are some administrative procedures and regulations in the University to which students should acquittance themselves with. These and related issues are documented in this handbook.

This handbook is divided into several chapters and sections each of which will introduce readers to the structure, regulations and administration of the University's as well as provide some hints on how to handle common problems within the University environment. Students are however advised strongly to contact their Academic Adviser before taking any major decision in respect of their academic work. This document is not an alternative to your

Figure 1.1: **Road 1**: Entrance to the University

Academic Part Advisers or The Head of Department. The information provided by the Head of Department, or any person acting on behalf of the Head of Department, takes precedence over the information provided in this handbook. As much as possible, we have tried to make information in this document as accurate as possible. The universitys Programmes Handbook contains all the necessary details in respect of programme offered in various Faculties and Departments. You are also strongly advised to consult the most resent official rules and regulations before completing registration and other forms or processes. In case of any conflict or doubt please do contact your Academic Part Adviser.

1.1 Brief History

1.1.1 History of the University

The Government of Western Nigeria first announced in 1960 her intention to establish a University in Western Nigeria that would be of the highest standard. Its policy would be to open its doors to students from all parts of the Federating units in Nigeria and the world. This perhaps informs the local and global appeal that are evident in the philosophy of the conception of the University.

The site selected for the University was Ilé-Ifẹ̀, in the then Ọ̀yọ́ State, now Ọ̀sun State. Ilé-Ifẹ̀ is a town about 80 kilometres northern east of Ìbàdàn, the Ọ̀yọ́ State capital. The estimated population of Ilé-Ifẹ̀ is now about 430,000 persons. Ilé-Ifẹ̀ is famous as the center of an ancient civilization and the origin of the *Káàró OÒjíre*

(Yorùbá) people. A number of ancient landmarks and historical works of arts are now at the Ifẹ̀ Museum, which also contains the renowned Ifẹ̀ busts.

It was intended that temporary buildings should be put up on the site to enable teaching to commence in October 1962, while the permanent buildings were being planned and erected. However, when the Federal Government transferred the Ìbàdàn Branch of the Nigerian College of Arts, Science and Technology to the University, it was decided that it would not be necessary to put up temporary buildings at Ilé-Ifẹ̀ and the University was temporarily located on the site of the Ìbàdàn branch of the College.

Teaching began in October 1962 with an initial enrolment of Two hundred and Forty-four (244) students. At that time, the teaching, administrative and technical staff, majority of who had either transferred from the Nigerian College or were newly recruited from abroad, numbered about eighty (80). The University started with five Faculties: (i) Agriculture, (ii) Arts, (iii) Economics and Social Studies (now Social Sciences), (iv) Law and (v) Science. New Faculties have since been added, namely; the Faculty of Education, established in October 1, 1967, the Faculty of Pharmacy established in October 1, 1969, the Faculty of Technology, established in 1970, and the Faculty of Administration which replaced the former Institute of Administration with effect from October 1, 1979. The Faculty of Health Sciences (now College of Health Sciences) was established in October 1 1970 and the Faculty of Environmental Design and Management was established on April 6, 1982.

1.1.2 History of the Faculty of Technology

At the time the Faculty of Technology at Ife came into existence in 1970, the University set itself the goal of developing areas of Technology and Engineering that were not adequately covered by other Universities in the country. This was why it started by first developing programs in Agricultural Engineering, Chemical Engineering, Computer Science, Electronic Engineering, and Food Science and Technology. By 1974, the Technology planning and development unit was established primarily to conduct policy research on how to harness science and technology for economic development. Its establishment underscored the critical need for research capability and advisory capacity to assist government and other policy making-bodies in reaching decisions about the allocation and mon-

itoring of resources for the development of scientific and technological capabilities in Nigeria and in other less developed countries. It was however realised from the beginning that by the time the programme in Agricultural Engineering is fully developed considerable amount of equipment would have been accumulated for teaching the science and practice of Civil and Mechanical Engineering. Thus, it became clear that these traditional areas of engineering needed to be developed. In 1977, the University decided to nurture Civil Engineering in the Department of Agricultural Engineering and Mechanical Engineering in the Department of Chemical Engineering. The demand for Metallurgical Engineers and Scientists in the country, and the search for minerals in various parts of the country, which gained momentum in the 70s, with the need for local expertise in the evaluations and exploitation of minerals, informed the establishment of the Department of Metallurgical and Materials Engineering in 1978.

Today the listed Departments and Unit in the Faculty includes:

1. Department of Agricultural Engineering
2. Department of Chemical Engineering
3. Department of Civil Engineering
4. Department of Computer Science and Engineering
5. Department of Electronic and Electrical Engineering
6. Department of Food Science and Technology
7. Department of Mechanical Engineering
8. Department of Metallurgical and Material Engineering

The evolution of the faculty and its attainments over the years has always been a source of pride to the University and its teeming Alumni, who now occupy strategic places in the national economy. Nearly every Department in the Faculty is the oldest department of its kind in Nigeria, and some in Africa. Indeed, the Faculty is a clear leader in training skilled manpower for key sectors of the national economy.

Currently, two postgraduate programmes (Postgraduate Diploma (PGD) and Master of Technology (M.Tech)) were designed to cater for some specialized need areas like Computer Science and Engineering, and Electronic and Electrical Engineering.

Our university is generally perceived as the leading ICT institution in the country. A good number of our Electronics and Electrical Engineering and Computer Engineering graduates are highly regarded, and dominate the industry. The department of

computer science and engineering, which is the first and indeed the foremost department of computer science and engineering in Nigeria has been providing training support on Information and Communication Technology (ICT). We want to stress that the ability to achieve these feats was based on the quality of teaching, research and various laboratory works at which the faculty is acknowledged internationally.

1.1.3 History of the Department

The Department of Computer Science was established in 1970 in order to meet the nations needs for skilled manpower in this rapidly expanding field. After a study of the requirements of industry, commerce, government and research organizations, two undergraduate programme were established and the first students graduated from these programmes in June 1976. A postgraduate diploma course in Computer Science was introduced in 1974 with the first graduates in 1976. A third undergraduate programme in Computer Engineering was introduced in 1982. In the beginning, lecturers were drawn from Mathematics and Electrical and Electronics Engineering Departments both in teaching of the courses and serving as external examiners to moderate the examinations. The Department has since trained her own indigenous staff members. Some were trained abroad while others were trained locally. These form the great majority of lecturers within the Department today.

The continuing goal of the Department has been to ensure the relevance of teaching and research to real and immediate needs of the nation. For this reason, the Department maintains close contacts with computing centre in commerce, industry and government. Practising professionals from such organizations have played an active role in curriculum development and have provided valuable exposure to their current experience through seminars and guest teaching.

1.2 Programmes in the Department

Three undergraduate programmes are offered by the Department with each leading to the degree of single or combined honour in Bachelor of Science (B.Sc).

(a) Honours degree in Computer Engineering
(b) Honours degree in Computer Science/Mathematics
(c) Combined Honours degree in Computer Science/Economics

A core of Computer Science courses which provide a sound knowledge of hardware, software and applications is in general, common to all programmes. Student pursuing the Computer Science programmes also acquire the in-depth knowledge of mathematics skills require for the formulation and solution of problems in Science and Applied Sciences with Computing Skills. Students offering the Economics programme receive training in micro and macro economics principles, business management skills, required for the sound application of computer to the data processing requirements of banks, insurance, commerce, government, etc. Students attending the honours degree course in Computer Engineering will receive intensive instruction across the whole spectrum of Computer Science, and exposure to relevant areas of Mathematics and Electronics. In addition, they will be able to choose an area of specialization such as Advanced Computer Engineering or Advanced Software Application. During the long vacations following Parts III and IV, the students are sent on Industrial Attachment and during their final year they undertake an individual project on a topic of their choice. Graduates from these courses can expect to find employment as specialists in Computer Engineering, Hardware Applications, Scientific or Commercial Programming, Computer Software etc. They will have received sufficient specialist training for them to be immediately useful in government, history or research establishments, without the need for further re-orientation. Graduate from this course can expect to find employment as specialists in Computer Engineering Hardware Applications, Scientific or Commercial Programming, Computer Software etc.

Students who obtained the Combined Honours degree in Computer Science/Economics or Computer Science would have received a thorough background in Computer Science including Numerical Techniques, Software and systems analysis as well an having acquired the Mathematics skills necessary to apply those disciplines in scientific applications. It is anticipated that such students will meet Nigeria's need for scientific programmes and find employment in Engineering, Production Industries including Petrol-chemicals, Research establishments. Government Statistics Services and Universities.

As earlier stated the Department runs three programmes namely, Computer Science/Economics, Computer Science, and Computer Engineering. Interactions with industry, commerce, government, and research organizations revealed that an area of growing need is Computer Information Technology geared toward the production of

Hardware Systems Engineers, Software Systems Engineers, System Analysts, Programmers and Information Systems professionals.

Graduates of these programmes are highly regarded, and dominate the industries. They occupy strategic places in the national economy and form the bedrock of operations in Nigerias Information and Communication Technologies industry. It is envisaged that graduates of these programmes will continue to meet Nigeria's Electronic Data Processing (EDP) needs and find employment in industry, commerce and governments where there are needs for professionals in the various fields of Information and Communication Technologies (ICT). Over the years, there has been a remarkable thrust in the area of research within the Department. The areas of research include Information Systems, Software Engineering, Software Development Methodologies, Health Informatics, Numerical Computation, Operations Research, Simulation and Modelling Techniques, Distributed Operating Systems, Computing and Intelligent Systems Engineering, Microprocessor Technology and Digital Systems, Data Communication Networks, Data Warehousing, Mobile Computing.

The Department has not only produced leading professionals in the industries but has significantly impacted on national development through manpower training and capacity building for other tertiary institutions. This contribution of the Department has earned the Ọbáfẹ́mi Awólọ́wọ̀ University such a status that generally it is adjudged to be the leading ICT institution in the country.

1.3 Officials of The University

1.3.1 Officers of the University and Faculty

The officers of the University and Faculty are the personnel responsible for the administration of all arms of the University including the Faculties and Department. As at August 2017, the names and officers of the University and Faculty are listed in Table 1.1.

1.4 Department Staff

At the moment, the Department's teaching and research activities are supported by a number of Academic, Technical and Administrative staff member. Faculty and University based courses, and

Table 1.1: Officers of the University and Faculty

ser No.	Office	Names
1.	Visitor	His Excellency, Muhammadu Buhari, GCFR, President, Federal Republic of Nigeria.
2.	Chancellor	His Royal Highness Alhaji (Dr.) Yahaya Abubakar (The ETSU Nupe)
3.	Pro-Chancellor	Dr. 'Yẹmí Ògúnbìyí
4.	Vice Chancellor	Prof. Èyítọ́pẹ́ Ògúnbọ́dẹdé
5.	Deputy Vice-Chancellor (Academic)	Prof. A. S. Bámiṛẹ́
6.	Deputy Vice-Chancellor (Administration)	Prof. C. O.Àjílà
7.	Chairman, Committee of Deans	Prof. M. A. O. Àlùkò
8.	Registrar	Mr. D. O. Awóyẹmí
9.	The University Librarian	
10.	The University Bursar	Mrs. J. A. Akeredolu
11.	Dean, Faculty of Technology	Prof. B. I. Imasogie
12.	Vice Dean, Faculty of Technology	Dr. B. S. Ògúnsínà
13.	Acting Head of Department	Dr. O. A. Ọdẹ́jọbí

special departmental course, are taught by support staff from other Departments in the University. This include associate staff in the Departments of Electronic & Electrical Engineering, Agricultural Engineering, Materials Science and Engineering, The African Institute of Science Policy and Innovation as well as other collaborating Departments from the Faculties of Science and Social Sciences. Qualified academic staff from sister universities and research institutes are regularly engaged on a part-time or sabbatical basis to teach course(s) as the need arises.

1.4.1 Departmental Staff members

The Department is staffed with well qualified and dedicated individuals who work together as a team in the delivery of teach, research and community develop goals of the University. The data on the list of Academic, Technical and Administrative staff members of the Department are provided in Appendix A in Tables 8.1

through 8.5. Their areas of specialisation and the professional qualification of staff members are well reflected in the research areas in the Department.

1.5 Mission, Vision, and Objectives

1.5.1 Our Motto

The Motto of the Ọbáfẹ́mi Awólọ́wọ̀ University is "For learning and Culture". The learning in reference is the mental engagement and development that enhances your understanding of issues in the local context and their relation to global issues. The culture in reference is the African culture, particularly as it relates to good neighbourliness, the desire to accept and live peacefully with all people irrespective of their social, cultural, religious or financial background or persuasion. The will to be moderate in all things and a principle commitment to non-violence.

1.5.2 Our Mission

To create a teaching and learning community for imparting appropriate skills and knowledge, behaviour and attitude, advance frontiers of knowledge that are relevant to national and global development, engender a sense of selfless public service, and promote and nurture the African culture and tradition.

1.5.3 Our Vision

The vision is to a top rated University in Africa, ranked among the best in the world, whose products occupy leadership positions in the public and private sectors of the Nigerian global economy, that has harnessed modern technology, social, economic and financial strategies, built strong partnerships and linkages within and outside Nigeria and whose research contributes substantial proportion of innovations to the Nigerian economy.

1.5.4 Strategic Objectives

1. To produce graduates of international standard, with appropriate knowledge and skills in their field of study, who will be highly employable and able to employ themselves;

2. To provide high quality research and development activities that will promote the development of the Nation and enhance the image of the University and he researchers;

3. To harness modern technology especially ICT and modern social, economic and financial strategies to run a cost efficient and effective academic programme and institutional management;

4. To provide services that has relevance to and impact on he local community and the Nation;

5. To provide conditions of study, work and living in the University Community hat are of appropriate standard;

6. To expand access to tertiary education in the face of unmet demand;

7. To operate as an equal opportunity educational institution, sensitive to the principle of gender equity and non-discriminatory on the basis of race, ethnicity, religion or physical disability.

1.5.5 Roll of Honours for Students

Senate at a special meeting on Wednesday November 1, 2006 decided that Roll of Honours for Students be instituted in the University to enhance discipline and good performance among students. All students are enjoined to strive to be on the Honours Roll. The Honours Roll should be at three levels, namely:

1. Departmental Honours Roll

2. Provosts/Deans Honours Roll

3. University/Vice-Chancellors Honour Roll.

The details are as follows:

(i) The beneficiaries must have a minimum CGPA of 4.0 for Departmental Honours Roll; 4.25 for Provosts/Deans Honours Roll; and 4.5 for Vice-Chancellors/University Honours Roll in all the Faculties except the Faculty of Pharmacy and College of Health Sciences where the candidates are expected to have a cumulative average of 60% and 62%, respectively.

(ii) The beneficiary must maintain this grade annually to continue to enjoy the award.

(iii) The recommendations must be processed along with results of Rain Semester examinations.

(iv) The student must be of good conduct.

(v) He/she must not have outstanding or carry-over courses and must not be repeating the year.

(vi) No student on Leave of Absence shall enjoy the Annual Roll of Honours Award.

(vii) No student that has a disciplinary problem shall enjoy the award.

(viii) The award shall be based on the recommendation of the Departmental Board of Examiners and the Faculty Board of Examiners, while that pertaining to the Vice- Chancellor/University shall be processed through the Committee of Deans.

(ix) Name of beneficiaries shall be displayed as follows:

(a)	Departmental Honours Roll	Departmental Notice Board
(b)	Provosts/Deans Honours Roll	Faculty Notice Board
(c)	University/Vice-Chancellors Honour Roll	Floor 'O Secretariat Building

(x) Each beneficiary shall be given a certificate.

Chapter 2

Facilities, Organisations and Structures

2.1 Locations and Facilities

The Computer Science and Engineering Department is located in the Computer Buildings Complex and other adjourning buildings. The computer building is a three-storey building designed in the form of a microcomputer system. The massive one-storey building in front can be regarded as the keyboard while the impressive three-storey building behind represents the system unit on a monitor. The computer buildings house a number of academic and non-academic units. Some of these academic units and their locations are as follows:

2.1.1 The Computer Building Complex

The Department share the use of the Computer Buildings Complex with other Units of the University including the Faculty of Technology offices, The computer Centre, The University Research Council offices, and The African Institute for Science and Innovation Policy.

Third Floor
- Office of the Dean, Faculty of Technology

Figure 2.1: Section of the Computer Buildings

- Ọbáfẹ́mi Awólọ́wọ̀ University Network Control Centre (OAU NCC)
- Offices of Some Staff of the Department

Second Floor
- General office, Department of Computer Science & Engineering
- General office, African Institute of Science and Innovation Policy (AISIP)
- Departmental Board Room
- Offices of Some Staff in African Institute of Science and Innovation Policy (AISIP) and Computer Science and Engineering Department

First Floor
- Offices of Academic Staffs in the Department of Computer Science & Engineering.
- Offices of some staff in the university computer center

Ground Floor
- Various Hardware and Software Laboratories.
- National Association of Computer Students (NACOSS) office

Figure 2.2: Section of the Computer Buildings

2.2 Laboratories and Equipment

The teaching and research activities in the Department is supported by a set of functioning, state-of-the-art small to medium size Microcomputer/Workstation laboratories. The laboratories are equipped with current facilities in terms of software running on a number of dedicated, fast and powerful computer and hardware. The laboratory data are provided in Table 2.1.

The communication facilities provided by the Information Technologies and Communication Unit (INTECU) supports teaching and research in computer network and communications. The Petroleum Development Trust Funds (also called STEP-B) laboratory, set up a few years ago, has also been useful in supporting teaching and research in Computer Network and related computing services. The recently commissioned African Center of Excellence (ACE) in Software Engineering provides a number of facilities and resources for teaching and research in software design and implementation.

Aside these, each research group in the Department has a laboratory to support its research activities. The University is also gearing towards setting up a number of a small general-purpose workstation laboratories with Open source resources to support teaching, learning and research in the Department.

Table 2.1: Computer Science and Engineering Laboratories

Ser. No.	Laboratory Name	Size (No. of Work Stations)
1.	Computer Engineering Laboratory	50
2.	Software Engineering Laboratory	35
3.	Artificial Intelligence Laboratory	10
4.	Faculty Alumni Laboratory	25
5.	Health Informatics Systems Laboratory	10
6.	Postgraduate Students Laboratory	20
7.	Microprocessor Laboratory	30
8.	Computer Programming Laboratory	150
9.	PTDF (STEP B) Laboratories	100
10	HP Lab.	28
11.	Cloud Computing Laboratory	500
12.	ACE Laboratory A & B	750

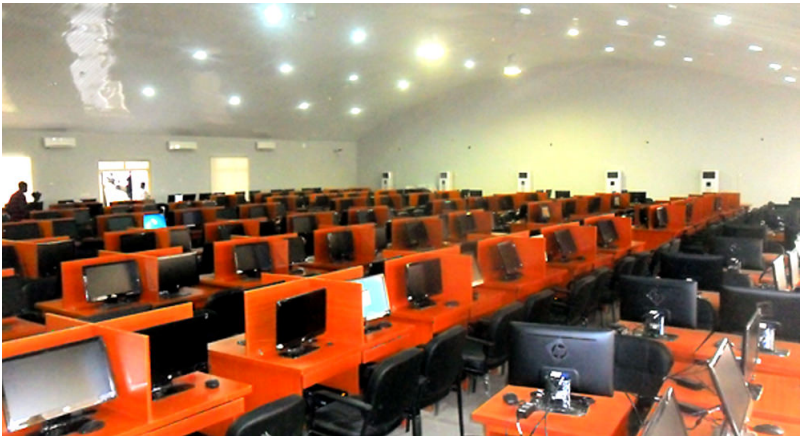

Figure 2.3: Section of the Computer Laboratory

2.3 The Division of Students' Affairs

2.3.1 Guidance and Counselling Unit

The Students' Affairs Unit is located adjacent to the Ajósè Lecture Theater (AJLT) near Faculty of Agriculture buildings. The Divi-

sion of Students' Affairs has Professional Councillors who are committed to helping students grow in self-understanding in the process of integrating their personal and academic experiences. The services are free to students and are confidential (i.e. not used as part of his/her other University records). The services include personal counselling, group counselling, study skills improvement, tests anxiety reduction, personal crisis intervention, psychological testing, career and occupational counselling and settlement of grievances between students. Where necessary, consultations are made with campus organizations, specialist and academic Departments, to ensure that students' problems are resolved satisfactorily.

The Counsellors can be contacted in Rooms 9 and 10, Division of Students' Affairs between 10.00 am and 2.00 pm Monday to Friday.

2.3.2 Scholarship and Financial Assistance

The Division of Students' Affairs serves as a link between students and sponsoring authorities, both within and outside Nigeria. Students are advised to check the Notice Boards in their respective Faculties as well as those at the Division of Students' Affairs Building for advertisements and other relevance information. Liaison is also maintained between students and governments at various levels for scholarship and bursaries.

2.3.3 Work study

Students with financial challenges relating to the payment of their tuitions and fees can approach the Students Affairs Unit for assistance. The Work study assistance will enable students to work few hours in a week for the payment of a token towards their personal upkeep.

2.4 Hezekiah Olúwasanmí Library

The Hezekiah Olúwasanmí Library (HOL) is located between the Odùduwà Hall (near the Amphi-theatre), and the Senate building. Its huge and spacious walkway is visible when the building is approached from the Senate Building by the side of the University Bookshop. The HOL is an imposing structure consists of the North and South wings, which are connected by walkways on two levels.

2.4.1 Membership

Membership of the Library is available, on completion of a registration card, to all students, members of the Senior Staff of the University and such other persons as may be determined by the Library Committee or the University Librarian on behalf of it. Students are required to renew their registration at the beginning of each academic year.

Library Cards and Borrowers Tickets are not transferable; books issued on them remain the responsibility of the person whose name appears on them. A lost Library Card Borrowers Ticket may be replaced on submission of a written application. For more information, please contact the library manual.

2.5 University Health Centre

There is a Health Centre on camps (situated close to students halls of residence) that provides medical care which includes both outpatient and in-patient care. These services are available to all students. It is mandatory that all students register in the Health Centre upon admission to the University in order to benefit from these services. Students are advised to lodge all their health complaints with the Health Centre and in situation where a student receives medical attention outside the Health Centre, such student should inform the Health Centre before and after the treatment. This is particularly important as regards tests/examinations as the Department would not accept medical certificates obtained outside the Health Centre without proper endorsement by the Director of Medical Services at the Health Centre. It is therefore important to lodge adequate records of your health conditions as appropriate

Beyond this, you need to manage your health and take proper care of yourself during your stay in the University. There is adequate facilities for sport and other physical exercises in the University. Do find the time to use them for enhancing your physical health and developments. Note that the Harmattan season is usually cold and dry. Ensure that you have warm clothing during that period. Students with asthmatic conditions should also ensure that they have an adequate supply of their inhalers during the Harmmatan season. The Raining season usually very wet and humid. A good umbrella or rain coat will be very useful during the raining season.

2.6 Academic advisory system

In a session, perhaps the staff that you will be in most contact with in the Department is your Part Academic Adviser. This is the person charged with the responsibility of giving you the most appropriate advice and encouraging you to making the best decision on all problems relating to your academic work. Due to the cordial relationship between students and staff, your Part Adviser may also extend his/her duty to attend to you and your sponsors by providing information, advices and general guidance as and at when due. If your Part Adviser cannot help you in solving a particular problem, you may be directed to another staff (or the Head of Department) make sure you go to who ever you are directed to and do not hide information from those who are in a position to help you.

2.6.1 When you have a problem

Coming into a new environment, in this case a university community, you are expected to face new challenges and tackle problems, many of which you are not very familiar with in your high schools. Students have reported different problems ranging from difficulty in managing their time, inability to concentrate, difficulty in reading and inability to cope with the demands of normal university workload. It is natural to attempt to solve your problem on your own; in fact you are encouraged to do that. If, however, it becomes obvious that you are unable to proffer the appropriate solution to your problems, you must contact your Part Academic Adviser immediately without delay. Do not wait until the problem becomes too complicated. Your academic problems should be given particular attentions. Do not wait too long and do not travel home due to a problem that can be tackled and solved within the university campus. Be careful with your properties and money. The Department may not be able to assist you if you run into financial problems. Make sure you budget for and retain enough resources particularly when the examination is near.

You are strongly advised to avoid unnecessary travelling during school session; it is not safe, you may even miss your test or examination during such travel. If you must travel home for any urgent reasons, please do inform your Part Adviser in writing (may be through a friend). If your travelling relates to health problems, you need to report at the Health Centre immediately you return so

that your medical record can be properly updated. You will need a sick letter to cover the period of your absence due to illness. It is important to document any health problem that you may have during any academic period because your course lecturer and any other person or body may demand for it. Please note that the only valid medical report is that issued by the Health Center of the Ọbáfẹ́mi Awólọ́wọ̀ University. Thus any medical report you bring from home must first be lodged at the Health Center for validation. The production of a valid medical report can save you from a number of problems.

Do not run away from school and do not deceive your Academic Part Adviser, parents, or teachers. You will not gain anything good by so doing. The Department, and indeed the University, may not be able to assist any student who foments trouble outside the university campus. You are therefore strongly advised to stay out of trouble or any conflict within/outside the university campus. Students leaving in rented apartments outside the university campus are particularly warned to be very careful. University regulations may not be applicable outside the university campus nor do they operate on private property.

In the past some students have reported problems with different degree of complexities. Each candidates problem will be handled based on the merit and situation of the case. The table below shows some problems and how it has been handled in the past.

In most cases your Academic Part Adviser may not be able to help you when you have financial problems. This suggests that you must be prudent with money and other resources given to you from home. A number of cases have been reported to the Department in which some students are involved in physical confrontation with other students with whom they share rooms. You are advised, to live in peace with your room mates. You may lose your accommodation or even your studentship, if you engage in frequent fights within or outside the University premises, including in the halls of residence.

2.6.2 Students with special needs

Sound mental health is a precondition for admission into a Degree programme in Ọbáfẹ́mi Awólọ́wọ̀ University. However, students with various degree physical conditions have been admitted into the University in the past. Many of them have graduated with good grades from various programmes. Specifically, a number of

Table 2.2: Problems and suggested solution

Ser. No.	Problem	Contact for Solution
1.	A course	See course lecturer or coordinator
2.	Result	See the lecturer or coordinator of the course
3.	Accommodation /problem with room-mate	See the Hall wardens and Hall executive if need be.
4.	Time table	See your Departmental Time Table Coordinator
5.	Personal	See your Part Academic Adviser
6.	Students Association	See your association officials, if this fails see your Head of Department
7.	Scholarship	Go to Directorate of students affairs
8.	Academic performance.	See your Part Academic Adviser
9.	Academic performance.	See your Part Academic Adviser
10.	Letters of recommendation	See your Part Academic Adviser
11.	Leave, Sick, Absence	See your Part Academic Adviser
12.	Threat to life and property	Report to nearest Security officer.

physically challenged students have graduated from Computer Science & Engineering Department and some are currently registered as full time students in the Department.

It is important to note that most of these students have performed excellently well. If you have any physical disabilities, it is important that you give the Health Center adequate information about your situation, including your regime of drugs, special therapies, etc. Thereafter, you should inform your Academic Part Adviser, who will guide and advise you on how to cope within the University environment.

Asthmatic students are particularly advised to inform the Department of their situation and make **sure they have their inhaler with them at all times**. If you use any special equipment, such as Wheelchair or crushes, you must ensure that they are in very good condition at all times. If your physical condition requires such, a helper will be allowed to stay with you in the halls of residence. Some Hall/rooms, are specially allocated to students with physical challenges. You are therefore advised to request for an accommodation that will not hinder or delay your access to academic areas.

In the event that you have problem accessing lecture hall, practical classes, test or examination venue, please lodge a written complaint to the lecturer of the course and submit a copy of such complaint to your Academic Part Adviser. The written compliant should reach the appropriate official at least two weeks before the expected activity.

In some situation lecture venue may be changed to favour students with physical challenges. This may not be possible in many other situations. If you find it difficult getting to lecture venue, please contact the lecturer of the course. In the meantime, however, collect lecture notes from your colleagues in order to make sure you have up-to-date lecture notes.

Blind students will require tape recorder and cassettes to take lectures as well as typewriters to write test and examination. Brail textbooks are also necessary. At the moment, the Department does not have special arrangement or provision for this type of facility. Blind students are therefore advise to make arrangement for all necessary materials. Left-handed students and students who are short sighted may locate their sit appropriately, for example in the front row and side walks of lecture halls, for comfort.

2.6.3 Students' Association

There are a number of student organisations such as the student wing of Nigerian Society of Engineers (NSE) and National Association of Computer Science Students (NACOSS) that students in the Department can join. The Student Union is the umbrella body to which all students may belong. There are also many social clubs and religious groups within the University. Before you join any group, however, you are advised very strongly to be sure that such organisation is duly registered with the Directorate of Student Affairs. You should also collect the manifesto of the organisation and read them to understanding before becoming a member. Joining a secret cult or any other organisation which its activity will make you to act contrary to University regulations may expose you to various dangers and bring sorrow to your family and friends.

If you are in doubt about the activity of any organization you wish to join, make sure you contact the Directorate of Student Affairs to seek advise. It is important to note that your parents and sponsors sent you to this University in order to obtain a degree, not to join groups or cult. Your academic work should therefore be your primary goal as long as you remain a registered student.

Any activity that will affect your academic performance should be avoided as much as possible.

2.6.4 Communication channels

Within a University community there are a large number of people who have to interact in many different ways, from time to time. Hence there is the need to communicate in the most convenient manner. The use of public address system is limited to the Halls of residence and some lecture halls. Therefore, most communications are carried out via writing and exchange of written materials. You can get relevant information through the following sources:

1. Notice boards (Hall of residence, Senate Building, Department, Walk ways, etc.)
2. Billboard
3. Email/internet: Website, e-mail, Whatsup, Facebook
4. Classroom (by lecturer)
5. Hall/Public Address System
6. Student Class Representative
7. Laboratory Classes

It is your duty to regularly check these sources of information in order to keep abreast of happening in the University.

Chapter 3

Academic Performance Measurement

3.1 University Examination Regulation

One of the things that will engage your attention for the major part of your academic life in this University is examination. In order to keep up to the expectation of your sponsors, particularly your parents, you need to perform creditably well in your examinations. Examination is not an everyday affair but it has to be prepared for on a daily basis. It is therefore important that you read your books and carry out all assignments promptly. On a daily basis you should make sure you understand what was covered in each lecture and seek help immediately you have any problem, first from your colleagues and if necessary from your tutors and teachers. Also, on weekly basis you should review what was done during the week and try your hands on self-test questions as well as typical and past examination/test questions.

It is important for you to have current information in respect of your lecture, tutorial, practical, test and examination venues, date and time. Be in close contact with dedicated and serious students in your class. Be very careful with your textbooks, notebooks as well as other materials (e.g. calculator) that can help you in your examination, particularly around and during examination period. Avoid going into the examination hall with calculators, pens and other materials that you are not familiar with. Avoid bringing objects and materials that are prohibited with you into examination

hall. Your mobile phones, sophisticated calculators and pen, electronic caps or other clothing, as so on should not be brought into the examination hall. If you are not sure of the prohibition of any material or object, please do ask the examination invigilator before the commencement of the examination.

If you are writing an open book examination, make sure you are familiar with all the materials you are taking into the examination hall and ensure that you write your names on such materials.

The Department may not be able to help you if you misplace your materials and /or your identity cards. Check all your pockets before going into examination/test hall to make sure you are not unknowingly carrying any prohibited materials into the examination. You will be held responsible for all objects found with you during the examination. Start and stop your examination when the examiner informs you to do so. Submit your answer script only to the University examiners. Do not go out of the examination hall with answer scripts that you intend to submit.

The following subsections contains useful information about examinations that you are expected to be aware of as a student in this University.

3.1.1 Registration for University Examination

(a.) A candidate for the University examination must have registered for the courses in the prescribed format not later than the closing date prescribed for registration for the semester. Any candidate who fails to register for course(s) at the appropriate time as prescribed by Senate will not be allowed to take any examination in such course(s). Any examination taken without registration shall be null and void.

(b.) Students who register for courses are committed to the number of units registered for and are expected to take examinations in such courses. A student fails to take an examination will be scored"0F" for the number of units registered for and in the courses for which not partake in the prescribed examination.

(c.) Any student who does not have any course or courses to offer in a particular Semester should apply for leave of absence for that Semester.

(d.) A candidate who has less than the minimum number of course unite (at the moment 15 units) in a particular Semester should

apply for permission to register for less than the minimum number of units. The applications will be processed to the Faculty Board, through the Academic Part Adviser, the Departmental Examination Committee and the Faculty Board of Studies. To this end students should apply very early in the Semester to avoid their applications being rejected. Failure to apply as an at when due constitutes a breach of regulation which may result in the non-processing of the candidates results.

(e.) A candidate who cannot register for courses during the prescribed period for registration because of an illness, must ensure that medical report on his/her illness is forwarded by him/her or his/her parents/sponsors to reach the Dean of the faculty not later than four weeks after the end of the normal registration period as scheduled in the University Calendar. Such a medical report should be authenticated by the Director of Medical and Health Services for it to be considered valid. Such a candidate shall be exempted from the penalties of late registration. All applications should be routed through the Head of Department.

(f.) Students must attend a minimum of 75% of course instructions including lectures, tutorials and practicals, where required, to qualify to sit for examination in any course. Candidates who fails to meet this requirement may not be allowed to write the examination and the continuous assessment grade, if any, will be returned as the final grade.

(g.) A candidate for the University examination in a particular degree programme should not be regular candidate for another degree in this or any other University concurrently. Any candidate so discovered shall forfeit his/her studentship.

Note that all the examination applications indicated above must be processed to the Faculty Board, through the Academic Part Adviser, the Departmental Examination Committee and the Faculty Board of Studies. To this end students should apply very early in the Semester to avoid their applications being rejected.

3.1.2 Dates of University Examination

(a.) University examinations shall be held at the end of Harmattan and Rain Semesters for all courses offered in either of the two

Semesters.

(b.) The dates of all Semester Examinations shall be fixed by Senate on the recommendation of the Committee of Deans. Such dates shall be published in the University Calendar, and once published, shall not be altered except with the express approval of the Senate.

3.1.3 Examination Accommodation

(a) All University examinations shall be held in rooms approved by the University Time- Table Committee as suitable for the purpose. The rooms shall be prepared as follows:

(i) As much as possible, the University Time-Table Committee should endeavour to accommodate all candidates who are to write papers in the same course in one room.

(ii) Where all candidates for the same course cannot be seated in one room, and are likely to be split into different rooms, the Head of Department must be informed in good time to make arrangement for sufficient number of invigilators.

(iii) Sitting arrangement shall be standardised and specific distances maintained between one candidate and the other to prevent cheating.

(iv) The Harmattan and Rain Semester Teaching and examination Time-Table shall be made available to students at the beginning of each Semester to guide them in selecting courses, particularly electives for which they can register.

(v) The Directorate of Academic Affairs shall reissue the Examination Time-Table for all courses to be examined at least 4 weeks before the first day of the examination period.

(vi) The final examination Time-Table shall be displayed on notice boards two weeks to the examination after reactions from Departments and there shall be no adjustments thereafter without the express permission of the Registrar.

(vii) Computer Based Test and Examinations (CBT/ CBE) will normally hold in locations where computing machines are installed and the modalities for the examination will be as announced by the University Administration from time to time.

(b) The Director, Academic Affairs shall supply to the Deans office answer books and other approved writing materials e.g. drawing paper, square ruled paper and graph paper for collection by Chief Examiners.

3.1.4 Medical Attention

The Registrar shall arrange with the Director of Medical and Health Services for at least one of the University Medical officers to be on call for the purpose of attending to candidates who may require medical attention for the whole period of the Examination.

3.1.5 Use of Typewriter, Braille or Dictation

When physically challenged candidate in any University examination desires to use typewriter, Braille machine or to dictate his/her answers, the Registrar, in consultation with the Head of Department and if necessary the Director of Medical and Health Services shall arrange for the typing or dictation of his answers under supervision at the candidate's expense. In addition, the Head of Department shall arrange an appropriate venue for the candidate.

3.1.6 Invigilator arrangements

(i.) Each Head of department shall be required to make arrangement for the invigilator of courses taught in his/her Department. In case of courses with large student enrolment, the Head of Department should make arrangement in consultation with the dean and cognate Departments.

(ii.) An invigilator shall be allocated for an average of fifty candidates provided that there shall be at all time no fewer than two invigilators in each room. One of the invigilators shall be designated senior invigilator for an examination room. Any invigilator who is absent or late without good cause shall be reported by the Head of Department to the Vice-Chancellor.

(iii.) The time appointed for the examination in each paper as indicated in the examination Time-Table must be strictly adhered to. When it is absolutely necessary to reschedule an examination, the Head of Department will do so after consultation with the Director of Academic Affairs who will

publish it, giving affected candidates a minimum of 48 hours notice of change.

(iv.) The invigilator shall hold up and show to the candidates before opening in their presence, the sealed packets of question papers at the commencement of the examination in the subject to which the packet relates.

(i.) No candidate shall be allowed to enter an examination room earlier than thirty minutes before the commencement of the examination.

(ii.) No candidate shall be allowed to enter the examination room later, or to leave an examination room earlier than thirty minutes after the beginning of an examination session. Any candidate who seeks entry into the examination room after the first thirty minutes may be allowed to do so by the invigilator, but such cases shall be reported in writing to the Head of department. Candidates who arrive late shall not be allowed extra time except in special circumstances in which the candidate had duly notified the examiner or invigilator in writing such as instances of unresolved clashes in the Time-Table.

(iii.) Until the time when candidates are allowed to leave the examination room, no copy of any question paper shall be removed from the examination room.

(iv.) In case a candidate has to leave the examination room temporarily he shall be accompanied by an invigilator.

(v.) Candidates should leave their signed signature slips on their tables and must wear their identity cards throughout the period of examination.

(vi.) After the first half hour has elapsed, the invigilator shall check and sign the attendance sheets in duplicate. These signed sheets shall be considered the final list of candidates in that examination, and one copy shall be delivered by hand to the Registrar while the other is enclosed in the same envelope containing the answer books.

(vii.) While the examination is in progress, no persons other than the chief Examiner/Coordinator, the invigilators, the Registrar or his representative and Medical officers shall be allowed

to enter the examination room except that the examiner(s) in each paper shall be present during the first thirty minutes of the examination and at such other times as may be requested.

(i.) The invigilator shall maintain constant vigilance throughout the examination session at which he is in attendance. Senior invigilators shall consider any misconduct or reason for suspecting misconduct or any irregularity that may be brought to their notice in connection with any examination offences. They shall also send a report to the Head of Department immediately on the completion of the paper in respect of which the misconduct took place. The Head of Department shall report same to the Vice-Chancellor for disciplinary action within 24 hours.

(ii.) At the close of an examination, candidates shall handover their answer scripts to the invigilator and not leave them on the desk for invigilator to collect. The invigilator should move from row to row collecting the script from candidates and on no condition should candidates be allowed to leave the room while their scripts are lying on their desks. The invigilator shall check the candidates' answer books against the attendance lists to ensure that the scripts are complete. He shall then parcel and seal the answer books together with four copies of the relevant question paper and the copy of the signed attendance sheet and deliver them to the Head of Department.

3.1.7 Absence from Examination

Candidates must present themselves at such University examinations for which they have registered. Candidates who fail to do so for reason other than illness or accident shall be bound by the following regulations:

(a.) Any student who fails to register for courses during one semester without permission should be deemed to have scored "0F" in the minimum number of units required for fulltime student (i.e.15 units)

(b.) Candidates who registered for courses, attended classes regularly, did all practical and tests but did not take required

Semester examinations should be given a continuous assessment grade in each of the affected courses and a grade or "0F" in the examination which they should have taken, but which they did not take.

(c.) Candidates who have less than 15 units to graduate but who fail to take required examinations should be deemed to have "0F" in the outstanding courses only provided such candidates obtained permission to register for less than 15 units.

(d.) Any candidate who on account of illness, is absent from a University examination may be permitted by the Senate on the recommendation from the appropriate Faculty Board, to present himself for such examination at the next available opportunity provided that:

(i) A full-time student in the University shall report any case of illness to the University Health Centre at all times;

(ii) When a student falls ill during examination he should first report to the Director, medical and Health Services before attending any hospital outside University. A report of sickness should be made to the Registrar within a week and a medical certificate for validation of his illness within three (3) weeks.

(iii) When a student falls ill before examination he shall be under an obligation to send a medical report countersigned by the Director, Medical and Health Services within one week of such illness. Any time outside this period, shall be considered on its own merit.

(iv) The Director of Medical and Health Services should, within 48 hours, submit report on a candidate who is ill during an examination and is taken to the Health Centre or refereed by it to the hospital for treatment.

(v) A candidate applying for leave absence on medical grounds must forward his application together with a medical report to the Dean of his Faculty through his Head of department. The Medical report must be countersigned by the Director of Medical and Health Services. All applications for Leave of Absence must be taken by the appropriate Faculty Board.

3.1.8 Examination Offences and Penalties

1. A candidate shall not be allowed during an examination to communicate by word or otherwise with any other candidates nor shall he leave his place except with the consent of an invigilator. Should a candidate act in such a way as to disturb or inconvenience other candidates; he shall be warned and if he persist he may at the discretion of the invigilator be excluded from the examination room. Such an action by the invigilator must also be reported in writing through the Head of Department to the Vice-Chancellor within 24 hours.

2. It shall be an examination offence for any student, staff or any person whatsoever to impersonate a candidate in any University examination. Any student or staff of the University found guilty under this regulation shall be subject to disciplinary action by the appropriate authority of the University. The candidate impersonated shall also be liable of an infraction of this regulation where it is established directly from circumstantial evidence that the impersonation is with his knowledge or connivance.

3. No candidate shall take into an examination room, or have in his possession during an examination any book or paper or printed or written documents, whether relevant to the examination or not, unless specifically authorised to do so. An invigilator has authority to confiscate such documents.

4. Mobile phones are not allowed in examination halls

5. A candidate shall not remove from an examination room any papers, used or unused except the question paper s and such book and papers if any as he is authorised to take into the examination room.

6. Candidates shall comply with all “direction to candidates” set out on an examination answer book or other examination materials supplied to them. They shall also comply with direction given to them by an invigilator.

7. Candidate shall not write on any paper other than the examination answer books. All rough work must be done in the answer books and crossed out neatly. Supplementary answer books, even if they contain only rough work must be tied inside the main answer books.

8. When leaving the examination room, even if temporarily, a candidate shall not leave his written work on the desk but he shall hand it over to an invigilator. Candidates are responsible for the proper return of their written work.

9. Smoking shall not be permitted in examination room during examination sessions.

10. Any candidate staff who attempts in any way to unlawfully have or give pre-knowledge of an examination questions or to influence the marking of script or the award of marks by the University examiner shall be subject to disciplinary action by the appropriate authority of the University.

11. If any candidate is suspected of cheating, receiving assistance or assisting other candidates or of infringing any other examination regulations, a written report of the circumstance shall be submitted by the invigilator to the Vice-Chancellor within 24 hours of the examination session. The candidate concerned shall be allowed to continue with the examination.

12. Any candidate suspected of examination malpractice shall be required to submit to the invigilator a written report immediately after the paper. Failure to make a report should be forwarded along with the invigilators report to the Vice-Chancellor.

13. Where a Head of Department fails to forward a report on examination malpractice to the Vice-Chancellor such action would be considered as misconduct.

14. When the Vice-Chancellor is satisfied on the basic of the reports forwarded to him that any candidate has a case to answer, he shall refer the case to the Central Committee on Examination Malpractice.

3.2 Examination Malpractices and other Offences

1. An examination offence would attract appropriate penalty including outright dismissed from the University.

2. Where the Vice Chancellor has reason to believe that the nature of any question or the content of any paper may have

become known before the date and time of the examination to any persons other than the examiners of the paper, the Board of Examiners, and any official of the University authorised to handle the paper, he may order the paper or setting of a new paper and shall report the any disciplinary measure against any student or students involved as he may deem appropriate.

3. If in the opinion of an invigilator, circumstances arise which render the examination unfair to any candidate he must report the matter to the Vice-Chancellor within 24 hours after the examination. Where such matter is reported to the Vice-chancellor he may take such action as he deems fit. If he directs that another examination be held, that examination shall be the examination for the purpose of this regulation.

4. Any candidate or member of staff may complain to the Vice-chancellor that an examination has been improperly conducted. The Vice-Chancellor shall investigate the complaint and report the result of his investigation to the Senate which shall take such action as it may deem appropriate, including with-holding a result or deprivation of the award of a degree, diploma etc. as laid down in Status 17. However, where it is shown to the satisfaction of the Committee of Dean that any alteration or amendment of a University regulation involving a change in a course of study or in examination requirements has caused hardship to a candidate in any examination, the Committee of Dean shall make such provisions as it deems fit for the relief of each hardship and report same to Senate.

Chapter 4

Computation of Performance

The University operates the Course Unit System (CUS) which is also used in the assessment of students' performance in the Faculty of Technology. In the course unit system, students are expected to register for courses with specified units. The result at the end of each academic period will depend on their performance in each of the courses. Courses with higher units will affect your performance more than courses with lower units. The maximum number of units you can register for in one academic semester is 24 while the minimum is 15. You will need special permission for units outside this range. Under the guidance of your Academic Part Adviser, you should select appropriate courses and register for them within the period stipulated by the university.

It is important to inform your Academic Part Adviser of any course you are having outstanding, if such information is available to you. Note that you may not register for a course until you have passed all the pre-requisites for the course. Some courses also have co-requisites, along with which thee course must be registered for. Failure to submit your registration materials to your Academic Part Adviser may lead to serious problems with your results. As a means of feedback to guide you on your academic performance, you need to understand how to compute your results. This is explained in the following section.

4.1 Definition of Important Abbreviations

Each course has a unit. A course is specified by a numerical value which states how much weight the course will carry in terms of work loads. A unit may be any of the following weekly activities:

- One hour of lecture (L)
- One hour of Tutorial (T)
- Three hours of Practical (P)

The unit of a course is coded as (L-T-P) meaning Lecture, Tutorial and Practical hours. A 3 unit course described as (2-1-0) implies that you are expected to do two hours of lecture, one hour of tutorial and no practical classes every week for one semester. One semester (Harmattan or Rain) is made up of approximately 15 weeks. A course also has a course code, title and a status. The course code is a three-character string, which identifies the Department where it is serviced, and a three-digit course number. The semester as well as the level at which the course is offered can be read from the last three digits of a course code. Odd number coded courses are Harmattan (H) semester courses while even number codes are Rain (R) semester courses. The course title is a short description of the course. For example CSC 301 is a course offered in the Department of Computer Science & Engineering (CSE). It is a 300 level course that is offered in Harmattan semester only. The title of the course is "Low Level Languages".

Note that Special Elective courses are not used to compute your final results but you have to pass them before you graduate. Minimum of 12 units special elective courses are required before graduation.

4.1.1 Calculating your Performance

To calculate your result, you need to understand the abbreviated terms in Table 4.1:

4.1.2 Scoring system

The scoring system currently being used in the Faculty of Technology of this University is as shown in Table

Table 4.1: Interpretation of Codes

Codes	Meaning	Explanation
GPA	Grade Point Average	This is a real number (rounded accurately to two decimal places) which indicates how well you have performed in one academic Semester. As an illustration, a student with GPA of 4.20 in one semester can be said to have scored 4.20 points out of 5.0 possible points or (4.20/5.00) in that Semester only.
CGPA	Cumulative Grade Point Average	This is a number (rounded accurately to two decimal places) which indicates your overall performance. It is usually rated over five. As an illustration, a Part IV student with CGPA of 4.2 can be said to have scored 4.2 points out of 5.0 possible points accumulated from the beginning of your academic year.
TNU	Total Number of Units	This is the number of units (including special electives) you registered for in one semester
CTNU	Cumulative Total Number of Units	This is the total number of units (including special electives) you have registered for so far in your course.
PROB	Probation	Student on academic probation. This will happen if a student scores a CGPA less than 1.00 in any academic semester.
TOS	Termination of Studentship	Studentship terminated; student is advised to leave the institution. This may occur if a candidate fails to register for two consecutive Semesters without acceptable and documented reasons.
WTDR	Advised to Withdraw	Student is advised to withdraw from university academic programme. This will occur if a student scores a CGPA of less than 1.00 in two consecutive semesters.
NRI	No Registration Information	Student has no registration information. This can occur if the student did not register or fails to submit registration documents a appropriate.
AR	Awaiting Result	The result of a course that the student registered for has not been received at the Department.

Table 4.2: Score interpretation

Score Range	Grade Code	Grade Description	Grade Point
70 to 100	A	Excellent	5
60 to 69	B	Very Good	4
50 to 59	C	Good	3
45 to 49	D	Average	2
40 to 44	E	Weak	1
39 to 00	F	Fail	0

Table 4.3: Grade point average interpretation

Score Range	Grade Code	Code
4.5 to 5.0	First Class	1
3.50 to 4.49	Second Class Upper	2^1
2.40 to 3.49	Second Class Lower	2^2
1.50 to 2.39	Third Class	3
1.00 to 1.49	Pass	P

The grading system used in the University is based on the average of the total Grade Point (GP) obtained by the student. The accumulation of the GPAs at any point in an academic period provides a numerical indication of the performance of the student. The following table contains the grade average and their respective descriptions:

The formula for calculating Total Credit Point (TCP) is given as:

$$TCP = \sum_{i=1}^{n} CreditPoint(i) \times CourseUnit(i) \tag{4.1}$$

Literally speaking, this formula implies that the Total Credit Point is calculated by multiplying each credit point by the course unit. Here n is the number of courses. For example if a student scores 65B in a 3 unit course, the credit point is calculated as: $4 \times 3 = 12$. This is because 65 is a score in the range 60 to 69 which is grade B and with point value 4 (See Table 4.2). If the same student scores 70A in a 1 unit course the credit point will be calculated as: $5 \times 1 = 5$. This is because 70 is a score in the range 70 and above, which is grade A with 5 points. The TCP for these two courses the sum of the TCP for each course; that is $12 + 5 = 17$. In this manner, the TCP of all the courses that the

candidate offered must be added to get the TCP for a Semester.

The Total Number of Unit (TNU) is calculated as:

$$TNU = \sum_{i=1}^{n} CourseUnit(i) \tag{4.2}$$

The interpretation of this formula implies that the course units for all the courses registered for in the Semester must be added to calculate the Total Number of Units. For the above example, with two course with units 5 and 1, the TNU is $4 + 1 = 5$.

The formula for calculating the Grade Point Average (GPA) for a Semester is given by:

$$GPA = \frac{TCP}{TNU} \tag{4.3}$$

In the case of the two courses considered above the GPA will be $\frac{17}{5} = 3.40$.

The cumulative value for the CTCP and the CTNU is computed by considering all the courses that the student has offered so far in the University. That is to say, by adding all the Credit Point we have CTCP and by adding all the Units we will have CTNU. CGPA then will be computed as:

$$CGPA = \frac{CTCP}{CTNU} \tag{4.4}$$

Note that courses which are Special Electives are not included in the computation of TCP and GPA.

4.1.3 An Example of CGPA Calculation

Let us consider the case of a student named Kèlání Aríkúhọ̀ with Registration Number CSC/1996/444 who has just completed Part I. His Part I Harmattan Semester result is as shown in Table 4.4.

In the Harmattan Semester, the candidate Kèlání Aríkúhọ̀'s will have a Total Credit Point (TCP) of:

$$3 \times 4 + 5 \times 4 + 2 \times 1 + 3 \times 3 = 12 + 20 + 2 + 9 = 43$$

. His Total Number of Unit (TNU) will be calculated as

$$4 + 5 + 1 + 3 = 13$$

.

Table 4.4: Kèlání Aríkúhọ's Results Calculation

Course Code	Units	Score	Grade	Grade Point	Credit Point	Remark
MTH 101	4	56	C	3	$3\times4=12$	
CHM 101	5	65	B	4	$4\times5=20$	
PHY 101	3	59	C	3	$3\times3=9$	
PHY 101	1	47	D	2	$1\times2=2$	
SEO 001	2	–	–	–	–	Special Elective
SER 001	2	–	–	–	–	Special Elective

And the Credit Point Average

$$GPA = \frac{TCP}{TNU} = \frac{43}{13} = 3.31 \tag{4.5}$$

At the end of the Harmattan Semester alone,Kèlání Aríkúhọ is in Second Class Lower Division Grade level. If Kèlání Aríkúhọs Part I Rain Semester result is as shown in Table 4.5.

Table 4.5: Kèlání Aríkúhọ's Results Calculation

Course Code	Units	Score	Grade	Grade Point	Credit Point	Remark
MTH 102	4	66	B	3	$4\times4=16$	
CHM 102	5	60	B	4	$5\times4=20$	
PHY 102	3	60	B	3	$3\times4=12$	
PHY 108	1	70	A	2	$1\times5=5$	
SEO 002	2	–	–	–	–	Special Elective
SER 002	2	–	–	–	–	Special Elective

Then, in the Rain Semester, this candidate has a Total Credit Point TCP of:

$$4\times4+5\times4+4\times3+4\times3+5\times1=16+20+12+5=53$$

. The Total Number of Unit (TNU) for the candidate the Rain Semester is $4+5+3+1=13$.

And the Credit Point Average

$$GPA = \frac{TCP}{TNU} = \frac{53}{13} = 4.08 \tag{4.6}$$

Thus the GPA of Kèlání Aríkúhọ̀'s Results for the the Rain Semester alone is 4.08.

Now the Cumulative Total Credit Point is the sum of his credit points for all the Semesters, i.e. $CTCP = 43 + 53 = 96$.

His Cumulative Total Number of Unit is the sum of all the units of the courses he has registered for (excluding Special Electives): $CTNU = 13 + 13 = 26$.

Thus the Cumulative Grade Point Average (CGPA) for the two Semester for Kèlání Aríkúhọ̀ is

$$CGPA = \frac{CTCP}{CTNU} = \frac{96}{26} = 3.69 \tag{4.7}$$

At the end of the second Semester of Part I, Kèlání Aríkúhọ̀'s CGPA is 3.69, which places him in Second Class Upper Division grade.

With the above examples you should be able to compute your result at any given Semester. In case you are having issues with this computation please contact your Academic Part Adviser. Please ensure you bring your own attempt at the computation to your Academic Part Adviser when you visit.

In respect of your result and documents please note the followings:

1. Keep a small diary or booklet in which to record your results, courses, scores, grades, etc.

2. Keep a file where you will document a copy of all your assignments, returned test scripts, practical reports, course registration forms, etc. This is important as a back-up for your academic records.

3. Keep a copy of your medical/sick leave, leave of absence, etc, safely in a file.

Chapter 5

The Degree Programmes in The Department

The Computer Science and Engineering Department runs three(3) Degree programmes leading to the awards of the BS.c. honours in as follows:

(i.) B.Sc. Computer Engineering

(ii.) B.Sc. Computer Science

(iii.) B.Sc. Computer Science with Economics.

5.1 Entry requirements

5.1.1 Entry Requirements for Part I

Admission to Part I (part one) is by Unified Joint Matriculation Examination (UJME). To be eligible to take the examination, candidate must normally have the West African School Certificate or its equivalent, with credits in at least 5 subjects including English, Mathematics, Physics and Chemistry.

Student may be eligible for admission into Part II if they have any of the following, in addition to the University/Faculty General Admission requirements:

(i) Good Pass at the G.C.E. Advanced level or equivalent in Chemistry, Physics, Pure Mathematics or Applied Mathematics (Combined).

OR

(ii) National Diploma in Computer Science or related studies at upper credit.

Higher National Diploma in Computer Science or related studies at upper credit level may also be considered for Admission to the appropriate class.

5.2 Requirement for the Award of Degree

The Minimum Units Required for Graduation is respect of the award of the following Degrees are: (i) B.Sc. (Hons) Computer Engineering – minimum total of 207 units; (ii) B.Sc. (Hons) Computer Science – minimum total of 201 units; (iii) B.Sc. (Hons) Computer Science with Economics – minimum total of 202 units. These are the details for each of the total units.

5.2.1 B.Sc. (Hons) Computer Engineering

In order to be eligible for B.Sc. (Hons) Computer Engineering, a candidate must satisfactorily complete a minimum total of 207 units including:

(a.) 12 units of Special Electives as prescribed by Senate regulations, including SEO 003, SEO 004, SER 001 and SER 002.

(b.) 30 units of Part I Physics, Chemistry and Mathematics courses of Science Foundation Option A or exemption from those courses.

(c.) 48 units of Computer Engineering courses

(d.) 35 units of Computer Science courses

(e.) 5 units of Agricultural Engineering courses, comprising AGE 202 and AGE 302

(f.) 9 units of Chemical Engineering courses, comprising CHE 201, CHE 305 and CHE 306.

(g.) 4 units of Civil Engineering courses, comprising CVE 202 and CVE 401

(h.) 18 units of Electronic and Electrical Engineering courses, comprising EEE 201, EEE 202, EEE 291, EEE 292, EEE 301, EEE 302, EEE 305 and EEE 409 or EEE411

(i.) 8 units of Mathematics courses, comprising MTH 201 and MTH 202

(j.) 13 units of Mechanical Engineering courses, comprising MEE 203, MEE 204, MEE 205, MEE 206 and MEE 303

(k.) 3 units of Metallurgical and Materials Engineering courses, comprising MME 201

(l.) 7 units of Technology Planning and Development courses, comprising TPD 101, TPD 501, TPD 502 and TPD 503

(m.) 15 units of Industrial Training courses, comprising CPE 200, CPE 300 and CPE 400.

5.2.2 B.Sc. (Hons) Computer Science

In order to be eligible for B.Sc. Computer Science, a candidate must satisfactorily complete a minimum total of 201 units including:

(a.) 12 units of Special Electives as prescribed by Senate regulations, including SEO 003, SEO 004, SER 001 and SER 002

(b.) 30 units of Part I Physics, Chemistry and Mathematics courses of Science Foundation Option A or exemption from those courses.

(c.) 62 units of Computer Science courses.

(d.) 32 units of Computer Engineering courses.

(e.) 39 units of Mathematics courses, comprising MTH 201, STT 201, MTH 202, STT 202, MTH 205, MTH 301, MTH 302, MTH 306, plus 12 units of Mathematics electives (approved options).

(f.) 2 units of Civil Engineering course, CVE 401

(g.) 4 units of Mechanical Engineering MEE 203and MEE 204.

(h.) 5 units of Technology Planning and Development courses, comprising TPD 101, TPD 501 and TPD 502

(i.) 15 units of Industrial Training courses, comprising CSC 200, CSC 300 and CSC 400.

5.2.3 B.Sc. (Hons) Computer Science with Economics

In order to be eligible for B.Sc. Computer Science with Economics, a candidate must satisfactorily complete a minimum total of 202 units including:

(a.) 12 units of Special Electives as prescribed by Senate regulations, including SEO 003, SEO 004, SER 001 and SER 002.

(b.) 30 units of Part I Physics, Chemistry and Mathematics courses of Science Foundation Option A or exemption from those courses.

(c.) 62 units of Computer Science courses.

(d.) 32 units of Computer Engineering courses.

(e.) 32 units of Economics courses, comprising SSC 102, ECN 201, ECN 202, ECN 203, ECN 204, ECN 301, ECN 302, ECN 313, ECN 314, ECN 401 and ECN 421.

(f.) 8 units of Mathematics courses, comprising MTH 201 and MTH 202.

(g.) 2 units of Civil Engineering course, CVE 401

(h.) 4 units of Mechanical Engineering MEE 203 and MEE 204.

(i.) 5 units of Technology Planning and Development courses, comprising TPD 101, TPD 501 and TPD 502.

(j.) 15 units of Industrial Training courses, comprising CSC 200, CSC 300 and CSC 400.

Chapter 6

Outline of Programme by Parts and Semester

The Part I courses described in the following tables are common to all computer science and engineering programmes. From Part II onwards, however, each programme has its set of courses that students must register, partake in and pass before graduation.

Table 6.1: PART I: HARMATTAN SEMESTER

Group	Course Code	Course Title	Prerequisite / corequisite	L-T-P	Units
Compu -lsory Courses	MTH 101	Elementary mathematics I		4-1-0	5
	PHY 101	General Physics I		3-0-0	3
	PHY 107	Experimental Physics IA		0-0-3	1
	CHM 101	Introductory Chemistry I		3-1-0	4
	CHM 103	Practical Chemistry I		0-0-3	1
	CSC 101	Introduction to Computing I		2-0-0	2
General Studies	TPD 101	Engineers in Society		1-0-0	1
	SE			2-0-0	2
	SE			2-0-0	2
Total		9 Course		**17-2-6**	**21**

Table 6.2: PART I: RAIN SEMESTER

Group	Course Code	Course Title	Prere quisite / coreq- uisite	L-T-P	Units
Compu -lsory Courses	MTH 102	Elementary mathematics II		4-1-0	5
	MTH 104	Vector		2-0-0	2
	PHY 102	General Physics II		3-0-0	3
	PHY 108	Experimental Physics IB		0-0-3	1
	CHM 101	Introductory Chemistry II		3-1-0	4
	CHM 104	Practical Chemistry II		0-0-3	1
	CSC 102	Introduction to Comput- ing II		2-0-0	2
General Studies	SE			2-0-0	2
	SE			2-0-0	2
Total		9 Course		**18-2-6**	**22**

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Table 6.3: PART II: HARMATTAN SEMESTER

Group	Course Code	Course Title	Pre-requisite / Coreq-uisites	L-T-P	Units
(a) Core/ Com-pulsory Courses	CSC 201	Computer Programming I		2-0-3	3
	CPE 203	Introduction to Digital Computer System I		2-0-0	2
	MTH 201	Mathematical Methods I	MTH 102	3-1-0	4
	MEE 203	Engineering Drawing I		1-0-3	2
	MEE 205	Engineering Mechanics I		2-1-0	3
	CHE 201	Intro. to Thermodynam-ics		2-1-1	3
	EEE 201	Applied Electricity I	PHY 102	2-0-0	2
	EEE 291	Applied Electricity Lab. I		0-0-3	1
(b) G.S.	SE	Special Elective		2-0-0	2
Total				16-3-9	22

Table 6.4: PART II: RAIN SEMESTER

Group	Course Code	Course Title	Pre-requisite/ Co-requisites	L-T-P	Units
(a) Core Courses	CSC 202	Computer Programming II	CSC 201	1-0-3	2
	CPE 204	Introduction to Digital Computer System II	CPE 203	2-0-0	2
	MTH 202	Mathematical Methods II	MTH 201	3-1-0	4
	MEE 204	Engineering Drawing II	MEE 203	1-0-3	2
	MEE 206	Engineering Mechanics II	MEE 205	2-0-0	2
	AGE 202	Workshop Practice		1-0-3	2
	EEE 202	Applied Electricity II	EEE 201	2-0-0	2
	EEE 292	Applied Electricity Lab. II	EEE 201	0-0-3	1
	CVE 202	Strength of Materials	MEE 205	2-0-3	3
(b) G.S.	SE	Special Elective		2-0-0	2
Total				16-2-12	22

Table 6.5: LONG VACATION

Group	Course Code	Course Title	Pre-requisite / Co-requisites	L-T-P	Units
Core Course	CPE 200	Student Industrial Work Experience Scheme I		0-0-9	3

Table 6.6: PART III: HARMATTAN SEMESTER

Group	Course Code	Course Title	Pre-requisite/ Co-requisite	L-T-P	Units
(a) Core/ Com-pul-sory Courses	CPE 301	Low Level Languages	CSC 201	2-0-3	3
	CPE 303	Introduction to Computer Engineering		2-0-0	2
	CSC 307	Numerical Computation I	MTH 201	2-0-0	2
	CPE 309	Computer Engineering Lab. I		0-0-3	1
	EEE 301	Physical Electronics	EEE 201	2-0-0	2
	EEE305	Electric Circuit Theory I	EEE202	2-1-0	3
	MEE 303	Fluid Mechanics I	MEE 206	2-0-3	3
	CHE 305	Engineering Analysis I	MTH 202	2-1-0	3
	MME 201	Elements of Engineering Materials		2-0-3	3
(b) G.S.	SE	Special Electives		2-0-0	2
Total				18-2-12	24

Table 6.7: PART III: RAIN SEMESTER

Group	Course Code	Course Title	Pre-requisite/ Co-requisite	L-T-P	Units
(a) Core/ Com-pul-sory Courses	CSC 302	Object-Oriented Pro-gramming	CSC 201	2-0-3	3
	CSC 306	Intro. to Human-Computer Interaction Design	CPE 301	2-0-3	3
	CSC 308	Numerical Computation II	CSE 307	2-0-0	2
	CPE 310	Introduction to Agent based Systems		1-0-3	2
	CPE 314	Computer Engineering Laboratory II	CPE 309	0-0-3	1
	CPE 316	Introduction to Artificial Intelligence	CPE 301	1-0-3	2
	EEE 302	Electronics Engineering	EEE 301	2-1-0	3
	AGE 302	Statistics for Engineers		2-0-0	2
	CHE 306	Engineering Analysis II	CHE 305	2-1-0	3
(b) G.S.	SE	Special Electives		2-0-0	2
Total				16-2-15	23

Table 6.8: LONG VACATION

Group	Course Code	Course Title	Prerequisites/ Co-requisites	L-T-P	Units
Core Course	CPE 300	Student Industrial Work Experience Scheme II		0-0-9	3

Table 6.9: PART IV: HARMATTAN SEMESTER

Group	Course Code	Course Title	Pre-requisite /Co-requisite	L-T-P	Units
(a) Core Courses	CSC 315	Data Structures and Analysis of Algorithms	CPE 301	2-1-0	3
	CPE 401	Computer Architecture and Organization	CPE 301	3-0-0	3
	CSC 403	Principles of Compilers	CSC 201	2-1-0	3
	CPE 405	Introduction to Microprocessor Tech. & Microprogramming	CPE 204	3-0-0	3
	CPE 409	Microprocessor Design Laboratory	CPE 303	0-0-6	2
	CSC 415	Operating Systems and system programming	CSC 201	2-1-0	3
	CVE 401	Technical Report Writing		2-0-3	3
Total				14-3-9	20

Table 6.10: PART IV: RAIN SEMESTER AND LONG VACATION

Group	Course Code	Course Title	Pre-requisites/ Co-requisites	L-T-P	Units
(a) Core Courses	CPE 400	Student Industrial Work Experience Scheme III		0-0-18	6

Table 6.11: PART V: HARMATTAN SEMESTER

Group	Course Code	Course Title	Pre-requisites/ Co-requisites	L-T-P	Units
(a) Core Courses	CPE 5031	Individual Project I		0-0-9	3
	CSC 505	Object Oriented Modeling	CSC 302	2-0-0	2
	CPE 509	Hardware Design Laboratory	CPE 405	0-0-6	2
	CPE 511	Computer based Real-Time System Design		2-0-3	3
	CPE 517	Digital Computer Networks	CPE 401	3-0-0	3
	CPE 521	Modeling & Simulation	CSC 308	1-0-3	2
	TPD 501	Industrial and Engineering Economics		2-0-0	2
	TPD 503	Production/Operations Management & Industrial Law		2-0-0	2
	EEE	Plus 3 Units of Electronics course from the following: EEE 409 Servomechanism and Control EEE 411 Communications Principles		2-1-0	3
Total				16-1-21	22

Table 6.12: PART V: RAIN SEMESTER

Group	Course Code	Course Title	Pre-requisites/ Co-requisites	L-T-P	Units
(a) Core Courses	CPE 502	Hardware Systems Studies	CPE 401	2-1-0	3
	CPE 504	Individual Project II	CPE 503	0-0-9	3
	CPE 506	Industrial Applications Studies		2-0-0	2
	CPE 508	Computer System Project Management		2-0-3	3
	CPE 510	Natural Language Processing & Applications		2-0-3	3
	TPD 502	Technology Policy		2-0-0	2
	CSC	Plus 4 Units of Computer Science courses from the following: CSC 514 Computer Graphics CSC 520 Expert Systems CSC 522 Information Storage & Retrieval CSC 524 Techniques in Data Analysis		 2-0-0 2-0-0	 2 2
Total				12-3-9	20

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Table 6.13: PART II: HARMATTAN SEMESubsectionTER

Group	Course Code	Course Title	Prerequisite/ Coreq-uisite	L/T-P	Units
(a) Core Courses	CSC 201	Computer Programming I		2-0-3	3
	CPE 203	Introduction to Digital Computer System I		2-0-0	2
	MTH 201	Mathematical Methods I	MTH 102	3-1-0	4
	MTH 205	Introduction to Algebra		2-1-0	3
	STT 201	Introduction to Statistics		2-1-0	3
	MEE 203	Engineering Drawing I		1-0-3	2
(b) G.S.	SE	Special Elective		2-0-0	2
Total				14-3-6	19

Table 6.14: PART II: RAIN SEMESTER

Group	Course Code	Course Title	Pre-requisites/ Co-requisites	L-T-P	Units
(a) Core Courses	CSC 202	Computer Programming II	CSC 201	1-0-3	2
	CPE 204	Introduction to Digital Computer System II	CPE 203	2-0-0	2
	CPE 206	Digital Laboratory I		1-0-3	2
	MTH 202	Mathematical Methods II	MTH 201	3-1-0	4
	MTH 306	Groups and Rings		2-1-0	3
	STT 202	Probability Distribution I		3-1-0	4
	MEE 204	Engineering Drawing II		1-0-3	2
(b) G.S.	SE	Special Elective		2-0-0	2
Total				15-3-9	21

Table 6.15: LONG VACATION

Group	Course Code	Course Title	Prerequisite/ Co-requisites	L-T-P	Units
Core Course	CSC 200	Student Industrial Work Experience Scheme I		0-0-9	3

Table 6.16: PART III: HARMATTAN SEMESTER

Group	Course Code	Course Title	Pre-requisites/ Co-requisites	L-T-P	Units
(a) Core Courses	CPE 301	Low Level Languages	CSC 201	2-0-3	3
	CSC 305	Introduction to Database systems		2-0-3	3
	CSC 307	Numerical Computation I	MTH 201	2-0-0	2
	CSC 311	Introduction to Information Systems		2-0-0	2
	CSC 315	Data Structures & Analysis of Algorithms		2-1-0	3
	CSC 317	Automata Theory & Computability		2-0-0	2
	MTH 301	Mathematical Methods III		2-1-0	3
	SE	Special Electives		2-0-0	2
Total				16-2-6	20

Table 6.17: PART III: RAIN SEMESTER

Group	Course Code	Course Title	Pre-requisites/Co-requisites	L-T-P	Units
(a) Core Courses	CSC 302	Object-Oriented Programming	CSC 201	2-0-3	3
	CSC 304	Business & Commercial Programming		2-0-0	2
	CSC 306	Introduction To Human-Computer Interaction Design	CSC 201	2-0-3	3
	CSC 308	Numerical Computation II	CSC 307	2-0-0	2
	CPE 310	Introduction to Agent based Systems		2-0-0	2
	CSC 312	Systems Analysis & Design Methodologies	CPE 301	2-1-0	3
	CPE 316	Intro. to Artificial Intelligence		2-0-0	2
	MTH 302	Mathematical Methods IV		2-1-0	3
	SE	Special Electives		2-0-0	2
Total				14-3-6	21

Table 6.18: LONG VACATION

Group	Course Code	Course Title	Prerequisite/ Co-requisites	L/T-P	Units
Core Course	CSC 300	Student Industrial Work Experience Scheme II		0-0-9	3

Table 6.19: PART IV: HARMATTAN SEMESTER

Group	Course Code	Course Title	Pre-requisites/ Co-requisites	L-T-P	Units
(a) Core Courses	CPE 401	Computer Architecture & Organization	CPE 204	3-0-0	3
	CSC 403	Principles of Compilers	CPE 301	2-1-0	3
	CPE 405	Introduction to Microprocessor Tech. & Microprogramming		3-0-0	3
	CSC 407	Techniques in Software Development		1-0-3	2
	CSC 415	Operating Systems Principles		2-1-0	3
	CVE 401	Technical Report Writing		2-0-3	3
Total				15-2-6	17

Table 6.20: PART IV: RAIN SEMESTER AND LONG VACATION

Group	Course Code	Course Title	Prerequisites/ Coreq-uisites	L-T-P	Units
(a) Core Courses	CSC 400	Engineering Valuation & Student Industrial Work Experience Scheme III		0-0-18	6

Table 6.21: PART V: HARMATTAN SEMESTER

Group	Course Code	Course Title	Pre-requisites/ Co-requisites	L-T-P	Units
(a) Core Courses	CSC 501	Introduction to Operations Research		2-0-0	2
	CSC 5032	Individual Project I		0-0-9	3
	CSC 505	Object Oriented Modeling		2-0-0	2
	CSC 515	Database Design and Management		2-0-0	2
	CPE 517	Digital Computer Networks	CPE 401	3-0-0	3
	CSC 523	Mathematical Programming		2-0-0	2
	TPD 501	Industrial and Engineering Economics		2-0-0	2
	CSC	Plus 2 Units of Computer Science course from the following: CSC 507 Computers in Society CPE 521 Modelling & Simulation CSC 513 Principles & Applications of Data mining		2-0-0	2
	MTH	Plus 2 Units of Maths course from the following: MTH 209 Introduction to Real Analysis MTH 210 Mechanics		2-0-0	2
Total				17-0-9	20

Table 6.22: PART V: RAIN SEMESTER

Group	Course Code	Course Title	Prerequisites-Coreq-uisites	L-T-P	Units
(a) Core Courses	CPE 502	Hardware Systems Studies	CPE 401	2-1-0	3
	CSC 504	Individual Project II	CSC 503	0-0-9	3
	CPE 506	Industrial Applications Studies		2-0-0	2
	CPE 508	Computer System Project Management		2-1-0	3
	CPE 510	Natural Language Processing & Application		2-1-0	3
	TPD 502	Technology Policy		2-0-0	2
	CSC	Plus 4 Units of Computer Science courses from the following: CSC 514 Computer Graphics CSC 520 Expert Systems CSC 522 Information Storage & Retrieval CSC 524 Techniques in Data Analysis		2-0-0	2
Total				14-3-9	20

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Table 6.23: PART II: HARMATTAN SEMESTER

Group	Course Code	Course Title	Prerequisites Coreq-uisites	L-T-P	Units
(a) Core Courses	CSC 201	Computer Programming I		2-0-3	3
	CPE 203	Introduction to Digital Computer System I		2-0-0	2
	ECN 201	Principles of Economics I		2-1-0	3
	ECN 203	Introduction to Applied Economics I		2-1-0	3
	MTH 201	Mathematical Methods I	MTH 102	2-1-0	4
	MEE 203	Engineering Drawing I		1-0-3	2
(b) G.S.	SE	Special Elective		2-0-0	2
Total				14-3-6	19

Table 6.24: PART II: RAIN SEMESTER

Group	Course Code	Course Title	Pre-requisites/ Co-requisites	L-T-P	Units
(a) Core Courses	CSC 202	Computer Programming II	CSC 201	1-0-3	2
	CPE 204	Introduction to Digital Computer System II	CPE 203	2-0-0	2
	CPE 206	Digital Laboratory I		1-0-3	2
	MTH 202	Mathematical Methods II	MTH 201	2-1-0	4
	ECN 202	Principles of Economics II	ECN 201	2-1-0	3
	ECN 204	Introduction to Applied Economics II	ECN 203	2-1-0	3
	MEE 204	Engineering Drawing II		1-0-3	2
(b) G.S.	SE	Special Elective		2-0-0	2
Total				15-3-6	20

Table 6.25: LONG VACATION

Group	Course Code	Course Title	Pre-requisite/ Co-requisites	L-T-P	Units
Core Course	CSC 200	Student Industrial Work Experience Scheme I		0-0-9	3

Table 6.26: PART III: HARMATTAN SEMESTER

Group	Course Code	Course Title	Pre-requisites/ Co-requisites	L-T-P	Units
(a) Core Courses	CPE 301	Low Level Languages	CSC 201	2-0-3	3
	CSC 305	Introduction to Database systems		2-0-3	3
	CSC 307	Numerical Computation I	MTH 201	2-0-0	2
	CSC 311	Introduction to Information Systems		2-0-0	2
	CSC 315	Data Structures and Analysis of Algorithms		2-1-0	3
	CSC 317	Automata Theory & Computability		2-0-0	2
	ECN 301	Microeconomic Theory I		2-1-0	3
	ECN 313	Statistical Theory I		2-1-0	3
SE		Special Electives		2-0-0	2
Total				18-3-6	23

Table 6.27: PART III: RAIN SEMESTER

Group	Course Code	Course Title	Pre-requisites/ Co-requisites	L-T-P	Units
(a) Core Courses	CSC 302	Object-Oriented Programming	CPE 301	2-0-3	3
	CSC 304	Business & Commercial Programming		2-0-0	2
	CSC 306	Intro. to Human-Computer Interaction Design	CSC 201	2-0-3	3
	CSC 308	Numerical Computation II	CSC 307	2-0-0	2
	CPE 310	Introduction to Agent based System		2-0-0	2
	CSC 312	Systems Analysis & Design Methodologies		2-0-0	2
	CPE 316	Intro. to Artificial Intelligence		2-0-0	2
	ECN 302	Microeconomic Theory II		2-1-0	3
	ECN 314	Statistical Theory II		2-1-0	3
Total				18-2-6	22

Table 6.28: LONG VACATION

Group	Course Code	Course Title	Pre-requisite/ Co-requisites	L-T-P	Units
Core Course	CSC 300	Student Industrial Work Experience Scheme II		0-0-9	3

Table 6.29: PART IV: HARMATTAN SEMESTER

Group	Course Code	Course Title	Pre-requisites/ Co-requisites	L-T-P	Units
(a) Core Courses	CPE 401	Computer Architecture and Organization	CSE 204	3-0-0	3
	CSC 403	Principles of Compilers	CPE 301	2-1-0	3
	CPE 405	Introduction to Microprocessor Tech. & Microprogramming	CPE 204	3-0-0	3
	CSC 407	Tech. in Software Development	CSC 302	1-0-3	2
	CSC 415	Operating Systems Principles		2-1-0	3
	CVE 401	Technical Report Writing		2-0-3	3
	ECN 401	Macroeconomic Theory II		2-1-0	3
Total				15-3-6	20

Table 6.30: PART IV: RAIN SEMESTER AND LONG VACATION

Group	Course Code	Course Title	Pre-requisites/ Co-requisites	L-T-P	Units
(a) Core Courses	CSC 400	Engineering Valuation & Student Industrial Work Experience Scheme III		0-0-18	6

Table 6.31: PART V: HARMATTAN SEMESTER

Group	Course Code	Course Title	Pre-requisites/ Co-requisites	L-T-P	Units
(a) Core Courses	CSC 501	Intro. to Operations Research		2-0-0	2
	CSC 5033	Individual Project I		0-0-9	3
	CSC 505	Object Oriented Modeling		2-0-0	2
	CSC 515	Database Design & Management		2-0-0	2
	CPE 517	Digital Computer Networks	CPE 401	3-0-0	3
	CSC 523	Mathematical Programming		2-0-0	2
	TPD 501	Industrial & Engineering Economics		2-0-0	2
	CSC	Plus 2 Units of Computer Science course from the following: CSC 507 Computers in Society CPE 521 Modeling and Simulation CSC 513 Principles & Applications of Data mining		2-0-0	2
	ECN 421	Applied Economics Statistics		2-1-0	3
Total				17-1-9	21

Table 6.32: PART V: RAIN SEMESTER

Group	Course Code	Course Title	Pre-requisites/ Co-requisites	L-T-P	Units
(a) Core Courses	CPE 502	Hardware Systems Studies	CPE 401	2-1-0	3
	CSC 504	Individual Project II	CSC 503	0-0-9	3
	CPE 506	Industrial Applications Studies		2-0-0	2
	CPE 508	Computer System Project Management		2-1-0	3
	CPE 510	Natural Language Processing & Application		2-1-0	3
	TPD 502	Technology Policy		2-0-0	2
	CSC	Plus 4 Units of Computer Science courses from the following: CSC 514 Computer Graphics CSC 520 Expert Systems CSC 522 Information Storage & Retrieval CSC 524 Techniques in Data Analysis		2-0-0	2
Total				14-3-9	20

Chapter 7

Course Contents

The courses and their contents are as listed in the following subsections.

CSC101: INTRODUCTION TO COMPUTING I (2 UNIT [2-0-0])

a. Definition of computer and computer related concepts such as programme, computer software: Systems and application programmes; minicomputers, mainframes and supercomputer.

b. Discussion of selected application of personal computers: word processing, database management, spreadsheet, graphics, data analysis.

c. Comprehensive history of modern computer technology. Evolution of microcomputer systems. History of computer programme

d. Number system: Binary, Decimal, Hexadecimal. Binary arithmetic; Addition, subtraction, multiplication, division.

e. Social impact of computers: positive impacts, negative impacts.

CSC 102: INTRODUCTION TO COMPUTING II (2 UNIT [1-0-3])

a. An introduction to computing with emphasis on the practical usage of the personal computers; concepts of computer hardware, software firmware.

b. Definition of the following terms: bits, bytes, word, word length, data, information, records, fields, files, database. Data types and organization. Data coding; ASCII Problem-solving process. Algorithms; flowcharting.

c. Basic logic gates and their operation. Examples with elementary logic circuits.

d. Introduction to a scripting programming language.

CSC 201: COMPUTER PROGRAMMING I (3 UNITS [2-0-3])

a. Brief survey of programming paradigms Procedural programming Object-oriented programming, Functional programming Declarative programming, non-algorithmic programming Scripting languages. The effects of scale on programming methodology.

b. Programming the computer in current version of FORTRAN: Declarative statements; Input and Output statements; Program compilation and execution; Control and conditional statements; Loops and iteration; Functions, Routines and Sub-programmes.

c. Input/Output; File processing; Port addressing.

d. Program testing and debugging techniques.

CSC 202: COMPUTER PROGRAMMING II (2 UNITS [0-0-6]) (Pre; CSC 201)

This is a programming laboratory course consisting of applications of programming, through case study problems. Students are expected to carry out four laboratory assignments and make two oral presentations after the completion of the second and the fourth assignments. Programmes will be developed using FORTRAN 90 or latest version of FORTRAN.

a. Laboratory Assignment I: Programming basics- Data type, basic programme structure; Compiling and executing programmes in text and graphics environment.

b. Laboratory Assignment II: Loop, arrays, searching and sorting.

c. Laboratory Assignment III: Function, Routine, Subroutine subprogramme: multiple procedure calls from a main programme

d. Laboratory Assignment IV: Extensive programming problem with Application to students field of study and interest.

CPE 203: INTRODUCTION TO DIGITAL COMPUTER SYSTEMS I (2 UNITS [2-0-0])

a. Binary arithmetic operations addition, subtraction, multiplication, division. Binary point. Floating point and fixed point. Basic logic gates, symbols, truth tables. Boolean Algebra; Theorems, Minimization methods, Karnaugh maps (up to six variables) etc.

b. Logic expressions, minimization, sum of product forms.

c. Physical considerations (gate delays, fan-in, fan-out).

d. Error correlation, parity.

e. Introduction to type of circuits- combinatorial and sequential.

f. Introduction to instruction format: OPCODE OPERAND. Binary representation: bits, nibbles, bytes: character representation: numeric, non-numeric, alphanumeric, EBCDIC, BCD, ASCII, ANSI.

CPE 204: INTRODUCTION TO DIGITAL COMPUTER SYSTEMS II (2 UNITS [2-0-0]) (Pre; CSE 203)

a. Fundamental building blocks (logic gates, flip-flops, counters, registers, PLA/PAL)

b. Design of combinatorial circuits with emphasis on application.

c. Design of sequential circuits, synchronous and asynchronous.

d. Design of simple CPU, peripheral devices (I/O), memory/storage devices

e. Stored-program concept.

CPE 206: DIGITAL LABORATORY (2 UNITS [0-0-6]) (Pre; CSE 203)

a. Experience with digital systems design tools: Truth tables, Karnaugh maps (up to six variables)

b. Experience with the use of Programmable Array Logic and Programmable Logic Array.

c. Design, implementation, and testing of the following: Circuits using basic logic operations; devices based on Combinational logic: Devices using simple latches and flip-flop (Using, for example, TTL devices)

d. Experiments with Binary adders, synchronous counters, updown counters.

CSC 221: COMPUTER APPRECIATION (3 UNIT [1-1-3]) (Pre; NONE)

(Specifically design for students in Social Sciences, and Arts)

a. Definition and attributes of computers: What computers can do and cannot do. Overview of milestone in the history of computers.

b. Types of computer: -analogue, digital, hybrid; classification/ categorization: mainframes, minis, mirco, super computers.

c. The structure, components, and operation of computer system: components of micro-computer systems; input devices, output devices, extra memory; serial access stores, random access stores; software, etc. System and application programmes. Computer operation; text manipulation, calculation, logical functions; text and data analysis; computer instruction; etc.

d. Binary number system and binary arithmetic

e. Process of problem solving with computers: flowcharting, etc. Introduction to Programming in BASIC.

f. Computer application: Wordprocessing (Ms Word or Corel Word perfect) , Statistical analysis(EPI info, SPSS or SAS), database management(DBASE or Ms Access) Desktop publishing(Corel Draw/ Harvard graphics).

g. Office Automation.

CPE 301: LOW LEVEL LANGUAGES (3 UNITS [2-0-3]) (Pre: CPE204)

a. Bits, bytes, and words, Numeric data representation and number bases, Fixed- and floating-point systems, Signed and twos-complement representations, Representation of nonnumeric data (character codes, graphical data), Representation of records and arrays

b. Basic organization of the von Neumann machine. Detailed architecture of a microprocessor (Intel, Zilog, or Motorola) Control unit; instruction fetch, decode, and execution, Instruction sets and types (data manipulation, control, I/O)

c. Assembly/machine language programming, Instruction formats, Addressing modes Subroutine call and return mechanisms.

d. Controls-Loops and Switches. Macro Instructions. Interrupts and modular programming, Input/Output. File Structures and Storage

e. Control Relocatable Code, Linking/Loading. Device driver writing.

f. Introduction to C programming language as modern tools for low level programming. Port addressing in C. Bit slicing, Bit concatenation. Advanced memory management in C.

CSC 302 OBJECT-ORIENTED PROGRAMMING (3 UNITS [2-0-3]) (Pre: CSC 201)

a. Definition of alphabet, syntax and semantics as used in selected higher-level language. Explanation of the terms; Variables, data types, expressions, and assignment statements, Simple I/O, Conditional and iterative control structures.

b. Multidimensional arrays; pointers, pointer to pointer, dynamic data structures and memory allocation

c. Functions and parameter passing, Structured decomposition.

d. Development of programmes for solving basic economic, engineering and scientific problems.

e. Programming with relevant and current OOP languages.

f. Implementation of object-oriented concepts; encapsulation and information-hiding, Separation of behavior and implementation, classes and subclasses, Inheritance (overriding, dynamic dispatch), Polymorphism (subtype polymorphism vs. inheritance), Class hierarchies.

g. Control structures, Arrays, Methods, Applets.

h. Graphics and event handling

i. Programme testing and exception handling

CPE 303: INTRODUCTION TO COMPUTER ENGINEERING (3 UNITS [3-0-0])

a. Definition of computer hardware engineering: Scientific basis of computer engineering, hardware components of computer system, factors influencing computer hardware design, Electronics of computer engineering: Basic active logic circuits, Integrated Circuit families. ECL, MOS, CMOS, TTL, DRL, etc.

b. descriptionCharacteristics and circuit, parameter e.g. Fan-in/Fan-out, Speed/Power factor, logic levels, noise immunity etc. General operating principles of circuits.

c. descriptionApplication of Boolean algebra to the design and analysis of combinational logic networks. Synchronous and asynchronous operations. Analysis and synthesis of sequential switching circuits, Registers.

d. descriptionDesign of firmware: ROM, PROM, EPROM, EEPROM technologies, design and development of devices drives.

e. descriptionHardware development tools: Hardware specification/definition language (HDL/HSL).

CSC 304: BUSINESS AND COMMERCIAL PROGRAMMING (3 UNITS [1-1-3])

a. Application: separation of Data and Processing, File Manipulation - Sorting, searching, merging techniques and procedures - common data structure programme libraries, utilities and support software.

b. File maintenance. File Processing: Overview of I/O system architecture, logic file organizations, mapping logical organization onto physical storage, Back-up procedure, file recovery. Higher level language data management facilities.

c. Introduction to structured programming concepts, overview of SP theory, well-formed and proper programs, design components for structured programs, introduction of a class style.

d. VISUAL BASIC (or COBOL) Language: Input data and form definition - record and file descriptions, processing - record selection, file manipulations, calculation, store minimization. User interface design, event driven process implementation.

CSC 305: INTRODUCTION TO DATABASE SYSTEMS (3 UNITS [2-1-0])

a. Database and databases users

b. Database system concepts and architecture; data modeling using Entity-Relationship (ER) and Enhanced Entity-Relationship (EER) model, Record storage and primary file organization, index structures for files

c. Overview of database languages; SQL (data definition, query formulation, update sublanguage, constraints, integrity); Query optimization

d. QBE and 4th-generation environments, Embedding non-procedural queries in a procedural language

e. Database security and authorization

f. Data warehousing and data mining

g. Introduction to Object Query Language

CSC 306: INTRODUCTION TO HUMAN-COMPUTER INTERACTION DESIGN (3 UNITS [2-1-0])

An introduction to the concepts underlying the design of human-computer interaction: usability and affordances, systemic design methods, user conceptual models and interface metaphors, human cognitive and physical ergonomics, information and inter activity

structures, design tools and environments. Structured around a set of case studies in which notable interface designs, and/or projects are analyzed as illustrative of underlying principles. Discussion of cases and interface analysis and design exercises.

CSC 307: NUMERICAL COMPUTATIONS I (3 UNITS [2-0-3])(Pre: CSC201)

a. Numerical Data representation on computer, Computer as a number crunching tool Floating-point number representation and arithmetic.

b. Error, stability, convergence.

c. Theory of computational solution to problem: numerical algorithm formulation and design, numerical software systems.

d. Introduction to use of Octave or Matlab in numerical computation and engineering applications. Emphasis is on the use of software to solve real problems.

e. Iterative solutions of non-linear systems: (Newtons Method)

f. Numerical solution of linear systems

g. Numerical computation of Eigenvalues and eigenvectors

CSC 308: NUMERICAL COMPUTATIONS II (3 UNITS [2-0-3]) (Pre: CSC 307)

a. Curve fitting; function approximation

b. Numerical differentiation and integration (Simpsons Rule, etc.)

c. Explicit and implicit methods

d. Differential equations (Eulers Method, etc.)

e. Linear algebra

f. Finite differences

CPE 309: COMPUTER ENGINEERING LABORATORY I (1 UNIT [0-0-3])

a. Computer Engineering Design and implementation techniques; Safety and operational integrity; Hardware Circuits valuation and evaluation. Computer circuit packaging.

b. Design and implementation laboratories: Basic logic operations; Combinational logic; Asynchronous counters; Synchronous counters; Up-down counters; Codes and code converters.

c. Design and implementation of a microprocessor

d. Introduction to embedded systems

CPE 310: INTRODUCTION TO AGENT BASED SYSTEM (2 UNITS 1-0-3))

a. Introduction to agent based technology: Definition of agents, Successful applications and state-of-the-art agent-based systems; Agent architectures: Simple reactive agents, Reactive, planners, Layered architectures, Example architectures and applications.

b. Agent theory, Commitments, Intentions, Decision-theoretic agents, Markov decision processes (MDP).

c. Software agents, personal assistants, and information access, Collaborative agents, Information-gathering agents, Believable agents (synthetic characters, modeling emotions in agents)

d. Learning agents, Multi-agent systems, Economically inspired multi-agent systems, Collaborating agents, Agent teams, Agent modeling, Multi-agent learning, Introduction to robotic agents, Mobile agents.

CSC: 311: INTRODUCTION TO INFORMATION SYSTEM (2 UNITS [2-0-0])

a. History of information communication and information system

b. Definitions and basic concepts of IS.

c. Component, Structure, Configuration and management of Information System

d. The Internet and Internet based services; Internet base application development

e. The World Wide Web(WWW) and Website development: page design and development (MS Outlook)

f. Fundamentals of HTTP based programming.

CSC 312: SYSTEMS ANALYSIS AND DESIGN METHODOLOGIES (3 UNITS [2-1-0])

Vital steps in systems analysis: Techniques of systems analysis. General Systems.

Considerations: Data capture; Data management; Data security; Communications systems Maintenance, User involvement; Project handling and control.

CPE 314: COMPUTER ENGINEERING LABORATORY II (1 UNITS [0-0-3]) (Pre: CPE 309)

a. Interfacing with personal computers: ADC/DAC configuration, port addressing, device driver coding, RS-232C.

b. Tuned circuits; Single-stage transistor amplifier; I-C operational amplifier

c. Microcomputer based control and co-ordination.

d. Environment signal Sensors and actuator interfacing

e. Robotic system interfacing

CSC 315: DATA STRUCTURES & ANALYSIS OF ALGORITHMS (3 UNITS [2-1-0]) (Pre: CSC 202)

a. Basic structures for data representation -Data definition languages.

b. Sequential and linked storage allocation, for linear lists, for multi-linked structures, for string processing techniques, Trees implementation, traversal, mathematical properties, balanced, trees, heaps, hash tables

c. Efficient algorithms for sorting, searching, and selection. Algorithm analysis: worst and average, case analysis. Recurrences and asymptotic

d. Algorithm design techniques: divide-and-conquer, dynamic programming, greedy algorithms, amortized analysis

e. Primitive types, Arrays, Records, Strings and string processing, Data representation in memory, Static, stack, and heap allocation, Runtime storage management, Pointers and references, Linked structures, Implementation strategies for stacks, queues, and hash tables

f. Algorithms for fundamental graph problems such as depth-first search, connected components, topological sort, and shortest paths. Possible additional topics: network flow, string searching, parallel computation

g. C/C++ Programme to implement basic data structure and their manipulation.

CPE 316: INTRODUCTION TO ARTIFICIAL INTELLIGENCE (2 UNITS [1-0-3])

a. History of artificial intelligence, Philosophical questions: Definition of AI, The Turing test Searles Chinese Room thought experiment, Ethical issues in AI, Fundamental definitions Optimal vs. human-like reasoning, Optimal vs. human-like behavior.

b. Modeling the world; the role of heuristics.

c. Knowledge representation and reasoning: Review of propositional and predicate logic Resolution and theorem proving, Nonmonotonic inference, Structured representation, Frames and objects, Description logics, Inheritance systems, Nonmonotonic reasoning, Non classical logics, Default reasoning, Belief revision, Preference logics, Integration of knowledge sources, Aggregation of conflicting belief, Reasoning on action and change, Situation calculus, Event calculus, Temporal and spatial reasoning(breadth-first, depth-first, depth-first with iterative deepening).

d. Softcompuring: Fuzzy sets and possibility theory, neural networks, genetic algorithm.

e. Two-player games (minimax search, alpha-beta pruning; illustration with Ayo)

f. Introduction to robotics and AI planning

g. Developments in artificial intelligence, natural language understanding, knowledge representation, expert systems, pattern recognition, the language LISP or PROLOG.

CSC 317: AUTOMATA THEORY AND COMPUTABILITY (2 UNITS [1-0-3])

Finite-state machines, Context-free grammars, Tractable and intractable problems Uncomputable functions, the halting problem, Implications of uncomputability Deterministic Finite automata (DFAs), Non-deterministic finite automata (NFAs) Equivalence of DFAs and NFAs, Regular expressions.

The pumping lemma for regular expressions, Push-down automata (PDAs), Relationship of PDAs and context-free grammars, Properties of context-free grammars, Turing machines, Non-deterministic Turing machines, Sets and languages, Chomsky hierarchy, The Church-Turing thesis.

CSC 333: COMPUTER APPLICATIONS (2 UNITS [2-0-0])

a. Review of Computer Systems: etc. - Fundamental concepts: Boolean algebra; codes BCD, EBCDIC, ASCII, Extended ASII, code convention, terminologies, etc. compiler, information technology, information systems, computer program, data, information, knowledge, files and databases, etc.

b. Overviews of business information systems: How business firms use information systems, basic business systems, manufacturing and production systems, sales and marketing, human resources, finance and accounting.

c. Management Support Systems. Management information systems; decision support systems, etc.

d. What Computers are used for: Office automation - Wordprocessing, desktop publishing and optical disk storage, scanner, disk-stored document, facsimile machine (fax), groupware; Banking, airline seat reservation, hotel reservation systems:

computers and the police, health informatics, information retrieval, statistical literary research; keywords, signatures, identification, access control, file access: future trends, etc.

e. The computer threat: Ethical, social and organizational issues, the computer virus crisis.

f. Standard Packages - Database and file management, Spreadsheet, Statistical packages, Windows.

CPE 401: COMPUTER ARCHITECTURE AND ORGANIZATION (3 UNITS [3-0-0])

a. Definition. Structural and functional characteristics of computer system components.

b. Organization and design of digital computing systems; description of current typical computing structure, processor micro-architecture and pipelining; cache and virtual memory organizations CPU configuration and possible architecture software/ hardware tradeoffs.

c. Introduction to SIMD, MIMD, VLIW, EPIC, Systolic architecture, Interconnection networks (hypercube, shuffle-exchange, mesh, crossbar), Shared memory systems, Cache coherence, Memory models and memory consistency.

d. Superscalar architecture, Branch prediction, Pre-fetching, Speculative execution, multithreaded architecture, Scalability, symmetric multiprocessors; and parallel computers.

CSC 403: PRINCIPLES OF COMPILERS (3 UNITS [3-0-0])

a. Definition; Basic concepts of compiler.

b. Application of regular expressions in lexical scanners, Parsing (concrete and abstract syntax, abstract syntax trees).

c. Application of context-free grammars in table-driven and recursive-descent parsing

d. Symbol table management, code generation by tree walking

e. Compilation approaches - Multipass, Single Pass, Load and Go; Compiler implementation - Scanning, syntax directed table driven.

f. Architecture-specific operations: instruction selection and register allocation

g. Optimization techniques

h. The use of tools in support of the translation process and the advantages thereof Program libraries and separate compilation Building syntax-directed tools

CPE 405: INTRODUCTION TO MICROPROCESSOR TECHNOLOGY AND MICRO-PROGRAMMING (3 UNITS [3-0-0])

a. I/O fundamentals: handshaking, buffering, programmed I/O, interrupt-driven I/O

b. Interrupt structures: vectored and prioritized, interrupt acknowledgment

c. External storage, physical organization, and drives

d. Buses: bus protocols, arbitration, direct-memory access (DMA)

e. Introduction to multiprocessor configuration and parallel processing

f. Multimedia support

g. RAID architectures

h. Microprocessor architecture and microprogramming model. Design requirements for microinstructions and instruction repertoire.

CSC 407: TECHNIQUES IN SOTFWARE DEVELOPMENT (2 UNITS [1-0-3])

a. Software Design Concepts and principles, design of software quality, abstraction, refinement, modularity, software architecture, control hierarchy, structural partitioning, data structure.

b. Design methodology, data, architectural, transformation mapping. Post processing design; optimization; interface design, Foundations of human-computer interaction: Human-centered development and evaluation.

c. Procedural design: structure programming, graphical notation, tabular notation. Program Design Language (PDL), A PDL example.

d. Object-oriented design: Concept of patterns and the use of APIs; modeling tools such as class diagrams, CRC cards, and UML use cases.

e. Software: re-use and re-engineering

f. Client/server Software Development

g. Computer aided Software Development.

CPE 409: MICROPROCESSOR DESIGN LABORATORY (2 UNITS [0-0-6])

Students are expected to undertake a number of tasks in microcontroller design and implementation projects, designed to apply knowledge gained in microprocessor architecture and microprogramming course

CSC 415: OPERATING SYSTEMS AND SYSTEM PROGRAMMING (3 UNITS [3-0-0])

a. Role and purpose of the operating system

b. History of operating system development

c. Functionality of a typical operating system

d. Mechanisms to support client-server models, hand-held devices

e. Design issues (efficiency, robustness, flexibility, portability, security, compatibility)

f. Influences of security, networking, multimedia, windows: Structuring methods (monolithic, layered, modular, micro-kernel models): Abstractions, processes, and resources: Concepts of application program interfaces (APIs): Application needs and the evolution of hardware/software techniques: Device organization: Interrupts: methods and implementations: Concept of user/system state and protection, transition to kernel mode

g. File systems: Management of secondary stores, Examples of operating systems VM, OS, DOS/VS, WINDOWS, UNIX, LINUX, etc. A detailed study of two systems most commonly used in the country.

CSC 501: INTRODUCTION TO OPERATIONS RESEARCH (2 UNITS [2-0-0])

a. Linear programming

b. Integer programming

c. The Simplex method

d. Probabilistic modeling

e. Queuing theory, Petri nets Markov models and chains

f. Optimization, Network analysis and routing algorithms.

g. Prediction and estimation, Decision analysis, Forecasting, Risk management, Econometrics, microeconomics, Sensitivity analysis, Dynamic programming, Sample applications, Software tools.

CPE 502: HARDWARE SYSTEM STUDIES (3 UNITS [1-1-3])

a. Design and implementation of simple systems that utilize the following devices: Multiplexer/Demultiplexer; MODEMS, ADC, DAC.

b. Hardware circuit reliability: Graceful degradation; MTTR, MTBF, etc.

c. Computer selection for a given application, economic versus technical considerations.

d. A survey of fundamentals with emphasis on hardware and systems concepts.

e. Interfaces and configurations.

CSC 503/504: (CPE 503/504) INDIVIDUAL PROJECT I/II ((3 UNITS [0-0-9]) each)

This offers an opportunity for graduating year students to apply theoretical, conceptual and practical knowledge gained to solve selected problem, either within the Technology itself or any other area of application subject to approval of the Department of Computer Science and Engineering and viability of adequate supervision. At the end of the project, the student submits a report. This course is a compulsory requirement for the three programmes offered in the Department.

CSC 505: OBJECT-ORIENTED SYSTEMS DESIGN (2 UNITS [2-0-0])

Software design and construction in context of large OOP libraries. Taught in Java. Topics: review of OOP, the structure of Graphical User Interface (GUI) OOP libraries, GUI application design and construction, OOP Software Development strategies, approaches to programming in teams

CSC 506: INDUSTRIAL APPLICATION STUDIES (3 UNITS)

These are special application courses arranged with industry for the students in-depth experience of industrial type problems. A mini-system is defined and solution proposed. Students are required to apply knowledge acquired over the course of their training in proposing solution to industrial type problems. At the end of each course the student submits a detailed system report. The student gives one seminar on each problem solved. Different seminar is organized with speakers from the Industry to intimate the students with Industry requirements and expectations. Also, postgraduate research works are presented to expose students to possible research areas for future endeavours.

CSC 507: COMPUTERS IN SOCIETY (2 UNITS [2-0-0])

a. Introduction to the effects of the application of computers on social life: in education, medicine, business, science and research, etc. Effects on skills evaluation and employment.

b. Social implications of networked communication (WWW).

c. Growth of, control of, and access to the Internet and International issues

d. Computer usage appropriate for education; Promises and achievements of artificial intelligence; the computerized society; limitations of computers; human failures; Professional responsibility.

e. Computer crime; history and examples of computer crime Cracking (hacking) and its effects. Viruses, worms, and Trojan horses Crime prevention strategies

CSC 508: COMPUTER SYSTEM PROJECT MANAGEMENT (2 UNITS [2-0-0])

a. Definition of computer project and project management.

b. Components and features of a good computer based project management technique. Computer network administration.

c. Function of members and team management, team processes, team organization and decision-making, roles and responsibilities in a software team, role identification and assignment, team problem resolution.

d. Project tracking

e. Software Project scheduling, Budgeting and Planning; Project organization.

f. Software measurement and estimation techniques, Risk analysis.

g. Software quality assurance

h. Software configuration management

i. Project management tools

CPE 509: HARDWARE DESIGN LABORATORY (2 UNITS [0-0-6])

Students are expected to undertake a number of mini projects, designed to apply knowledge in digital computer systems design and implementation.

CPE 510: NATURAL LANGUAGE PROCESSING & APPLICATION (2 UNITS [2-0-0])

a. Deterministic and stochastic grammars, Parsing algorithms, Corpus-based methods, Information retrieval, Language translation.

b. Fundamentals of natural language modeling (using a local language; Yoruba, Hausa, Igbo, or any other African Language).

c. Speech recognition; isolate, connected and continuous speech; definition, methods, problems, examples; speaker recognition.

d. Speech synthesis; articulatory, format, concatinative, definition, methods, problems, examples.

e. Speech understanding; definition, methods, problems, examples.

f. Natural language based interface to intelligent systems

g. Web based speech interface design.

CPE 511: COMPUTER BASED REAL-TIME SYSTEMS (3 UNITS [3-0-0])

a. Definition of real-time systems; soft real-time and hard real-time systems, Configuration of real-time systems.

b. Simple Physical Analogue: Basic elements; Adder, coefficient multiplier, integrator; Effects of constants; Solution of simple equations; Arm gains on adders and integrators. Electronics of basic analogue computers: Passive computer circuits; Direct-coupled amplifiers; The differentiator; Magnitude and time scaling.

c. Real-time process and task scheduling, Memory/disk management requirements in a real-time environment, Failures, risks, and recovery

d. Special problems in real-time systems design and implementation

CSC 513: PRINCIPLES & APPLICATIONS OF DATA MINING (2 UNITS [2-0-0])

a. Introduction to Data Mining. What is data mining? Directed and undirected data mining Models. Profiling and prediction. Data Mining Methodology. Why has a methodology?

b. Developing intuition about data, Decision Trees, Neural Networks, Origins of neural networks, Neural networks compared with regression. The algorithms used to train neural networks

c. Data preparation requirements for neural networks. Picking appropriate inputs for neural networks. Creating neural network models using SAS Enterprise Miner

d. Memory Based Reasoning. Survival Analysis. Link analysis

CSC 514: COMPUTER GRAPHICS (2 UNITS [2-0-0])

a. Hierarchy of graphics software

b. Using a graphics API

c. Simple color models (RGB, HSB, CMYK)

d. Homogeneous coordinates

e. Affined transformations (scaling, rotation, translation)

f. Viewing transformation, Clipping

g. Programming examples in the creation and manipulation of graphics object.

h. Animation (2D and 3D)

CSC 515: DATABASE DESIGN AND MANAGEMENT (2 UNITS [2-0-0])

a. Functional dependency; Normal forms (1NF, 2NF, 3NF, BCNF); Multivalued dependency (4NF); Join dependency (PJNF, 5NF)

b. Data modeling; Conceptual models (including entity-relationship and UML) Object-oriented model.

c. Relational data model. Mapping conceptual schema to a relational schema Entity and referential integrity

d. Relational algebra and relational calculus.

e. Distributed data storage, Distributed query processing, Distributed transaction model, Concurrency control, Homogeneous and heterogeneous solutions, Client-server

CPE 517: DIGITAL COMPUTER NETWORKS (3 UNITS [3-0-0])

a. History of computer networks, principles of computer network: definitions, micro-computer networks Network classification; Topology.

b. Introduction to LANs and WANs Layered protocol design, ISO/OSI, IEEE 802 Reference model. Case studies: ARPANET, DECNET, SNA;

c. Network Communication media: Twisted pair; cable; satellite; Voice communication, Digital communication. Radio communication

d. Network computing, Distributed multimedia

e. Improvements in World Wide Web (WWW) technology.

CSC 520: EXPERT SYSTEMS (2 UNITS [2-0-0])

a. Expert systems: definition; Basic concepts; basic architecture of expert system, expert system development life cycle, construction of expert systems.

b. Tools for building expert systems: Object oriented tools, expert system shell.

c. Reasoning and Knowledge engineering in expert system development, Structured representation, Frames and objects, Description logics, Inheritance systems, Non-monotonic reasoning: Non-classical logics, Default reasoning, Belief revision, Preference logics, Integration of knowledge sources, Aggregation of conflicting belief, Reasoning on action and change, Knowledge representation for diagnosis, qualitative representation.

d. Knowledge Elicitation in expert system

e. Practical implementation of expert system using PROLOG or LISP.

CPE 521: MODELLING AND SIMULATION (2 UNITS [2-0-0])

a. Simulation Programming environments, Requirements analysis and design modeling tools Testing tools.

b. Configuration management tools Tool integration mechanisms

c. Basic concepts in computer simulation, methodology, experimental design, simulation languages.

CSC 522: INFORMATION STORAGE AND RETRIEVAL (2 UNITS [2-0-0])

a. Characters, strings, coding, text Documents, electronic publishing, markup, and markup languages Tries, inverted files, PAT trees, signature files, indexing

b. Morphological analysis, stemming, phrases, stop lists Term frequency distributions, uncertainty, fuzziness, weighting Vector space, probabilistic, logical, and advanced models Information needs, relevance, evaluation, effectiveness Thesauri, ontologies, classification and categorization, metadata

c. Bibliographic information, bibliometrics, citations Routing and (community) filtering Search and search strategy, information seeking behaviour, user modeling, feedback Information summarisation and visualization. Digital libraries.

d. Integration of citation, keyword, classification scheme, and other terms

e. Protocols and systems (including Z39.50, OPACs, WWW engines, research systems)

CSC 523: MATHEMATICAL PROGRAMMING (2 UNITS [2-0-0])

a. Counting arguments Sum and product rule, Inclusion-exclusion principle, Linear programming: Convex sets and linear forms.

b. Graphical solution of linear programming problems. The basic simplex algorithm. The dual problems. Integer linear programming.

c. Arithmetic and geometric progressions, Fibonacci numbers, The pigeon hole principle,

d. Permutations and combinations, Basic definitions, Pascals identity, The binomial theorem, Solving recurrence relations, Common examples, The Master theorem.

CSC 524: TECHNIQUES IN DATA ANALYSIS (2 UNITS [2-0-0])

a. Data collection and coding. Data cleaning - completeness, range, consistency.

b. Design of algorithms for statistical analysis; count, sum, mean, standard deviation, analysis of variance, Frequency, cross-tabulation, multiple regression.

c. Design of algorithm for implementing Non parametric statistical test. Case studies using SPSS or PSTAT or SAS packages.

d. Software implementation of statistical algorithms.

e. Interpretation of results.

Chapter 8

APPENDIXES

A: Department Staff members

Table 8.1: Departmental Academic Staff

Ser. No.	Names	Rank	Qualifications	Area of Specialisation	Office No.
1.	Adágúnodò, E. R.	Professor	B.Sc.; M.Sc. Ph.D(Ife)	Operating Systems, Computer Networks	118
2.	Adéróuńmú, G.A.	Professor	B.Sc.; M.Sc. Ph.D(Ife)	Computer/Data Communications	119
3.	Sóríyàn, H.A.	Professor	B.Sc.; M.Sc. Ph.D(Ife)	Information Systems	106
4.	Ọdẹ́jọbí, O. A.	Reader/ Ag.HOD	B.Sc(Ife)(1^{st}Class); Ph.D(Aston, UK)	Computing & Intelligent Systems Engineering	109
5.	Afọlábí, B. S.	Reader	B.Sc(Ife); MPhil, Ph.D(France)	Computing & Information Systems	116
6.	Olúwarántí, A. I.	Reader	B.Sc; M.Sc., Ph.D(Ife)	Mobile and Wireless Computing	117
7.	Olúwatópẹ́, A. O.	Reader	B.Sc; M.Sc., Ph.D(Ife)	Computer/Data Communications	319
8.	Ọlájubú, E. A.	Senior Lecturer	B.Sc; M.Sc., Ph.D(Ife)	Computer/Data Communications	104
9.	Àjàyí A. O.	Senior Lecturer	B.Sc; M.Sc., Ph.D(Ife)	Intelligent Systems/ Programming	107
10.	Awóyẹlú I. O.	Senior Lecturer	B.Sc; M.Sc., Ph.D(Ife)	Data Ware-housing	120

Table 8.2: Departmental Academic Staff .. Continued

Ser. No.	Names	Rank	Qualifications	Area of Specialisation	Office No.
11.	Bello S. A.	Senior Lecturer	B.Sc; M.Sc., Ph.D(Ife)	Cloud Computing/ e-commerce	108
12.	Ìdòwú, P. A.	Senior Lecturer	B.Sc; M.Sc., MPhil(Aston), Ph.D(Ife)	Cloud Computing/ e-commerce	320
13.	Elúdiórà, S. I.	Senior Lecturer	B.Sc; M.Sc., Ph.D(Ife)	Machine Translation	321
14.	Ikono, R. N.	Senior Lecturer	M.Sc., Ph.D(Ife)	Health Informatics	103
15.	Olúfokùnbí, K. C.	Lecturer I	B.Sc; M.Sc., Ph.D(Ife)	Software Engineering	110
16.	Asaiah, F. O.	Lecturer I	B.Sc; M.Sc., Ph.D(Ife)	Language Processing	203
17.	Ìyàndá, R. A.	Lecturer I	B.Sc; M.Sc., Ph.D(Ife)	Language Processing	103
18.	Akínyẹmí, B. O.	Lecturer I	B.Sc; M.Sc., Ph.D(Ife)	Cloud Computing	119
20.	Ninan, O. D.	Lecturer I	B.Sc; M.Sc., Ph.D(Ife)	Language Processing	008
21.	Saani, M.L.	Lecturer I	B.Sc; M.Sc., Ph.D(Ife)	Computer Networks	108
22.	Àkànbí, L. A.	Lecturer I	B.Sc; M.Sc., Ph.D(Ife)	Computing and Intelligent systems	321

Table 8.3: Departmental Academic Staff .. Continued

Ser. No.	Names	Rank	Qualifications	Area of Specialisation	Office No.
23.	Akhigbe, B. I.	Lecturer I	B.Sc; M.Sc., Ph.D(Ife)	Human machine Interaction	105
24.	Gambo, I.P.	Lecturer I	B.Sc; M.Sc., Ph.D(Ife)	Information Systems	105
25.	Odùkòyà, H.O.	Lecturer I	B.Sc(1^{st}Class); M.Sc., Ph.D(Ife)	Numerical Computations, Analogue Computing	016
26.	Aina, S	Lecturer I	B.Sc; M.Sc., Ph.D(U.K.)	Computer Networkings	203
27.	Ọmọ́dùnbí, T. O.	Lecturer I	B.Sc; M.Sc., Ph.D(Ife)	Information Systems	009
28.	Afọlábí, A. O.	Assistant Lecturer	B.Sc; M.Sc.(Ife)	Health Informatics	200
29.	Akinadé, O. O.	Assistant Lecturer	B.Sc; M.Sc.(Ife)	Intelligent systems Engineering	124
30.	Àmòó, A. O.	Assistant Lecturer	B.Sc; M.Sc.(Ife)	Software Engineering	009
31.	Oyègókè, F. O.	Assistant Lecturer	B.Sc; M.Sc.(Ife)	Software Engineering	010
32.	Ayẹni, S.	Assistant Lecturer	B.Sc; M.Sc.(Ife)	Mobile Computing	124
33.	Òkégbilé, S.	Assistant Lecturer	B.Sc 1^{st}Class; M.Sc.(Ife)	Mobile Computing	124
34.	Lawal, A. B.	Assistant Lecturer	B.Sc; M.Sc.(Ife)	Mobile Computing	003

Table 8.4: Departmental Technical Staff members

Ser. No.	Names	Rank	Qualifications	Office No.
1.	Ọ̀la, H.A.O	Chief Technical Officer	HC(Physics/Elect) (Ifẹ̀ 1989, PGD (FUTA), 2004	M31
2.	Salami, M. A.	Principal Technologist	OND Science Lab. Tech, 1990; HC(Physics/Elect) 1992; iLab Cert. 2009	007B
3.	Abùlóyè, E. J.	Chief Workshop Supervisor	Basic Engr.C& G, 1976; Instr. Maint. Craft Stud. C & G, London, 1976; Fed. Lab. Test Part I, 1995	100
4.	Owuye, F. T.	System programmer	B.Sc; M.Sc.(Ife)	015
5.	Òní, O. M.	Technical Officer	ND Comp Sc., 2001; HND (Ọ̀fà) 2005; BSc. Computer Engr. (LAUTEC) 2015	206
6.	Ògúntókun, S. O.	Assistant Technical Officer	OND Comp. Sc. (Ẹdẹ), 2005; Comp. TIA A+ Cert. Prof., 2006; HND (Ẹdẹ) 2008; BSc.(Edu) Maths (Adó), 2013	PTDF
7.	Towobola, O. F.	Computer Operator	OND Dat. Proc.(Debis) 1992, WAEC, 1989; BSc. (NOU), 2017	206

Table 8.5: Departmental Administrative Staff members

Ser. No.	Names	Rank	Office No.
1.	Mrs. GBÀDÀMỌ́SÍ Adijat Ìyábọ̀	Confidential Secretary I	207
2.	Mrs. AWÓWỌLÉ, Ìdòwú	Executive Officer	208
3.	Mrs. IGWEGBE, Eunice Chinasa	Secretariat Assistant	208
4.	Mr. ADÉỌ̀YÀ, Olúgbénga Dàmọ́lá	Senior Clerical Officer	207

B: Students' Applications Guidelines

University regulations make it mandatory for all students to formally apply for the consideration of various matters affecting their academic work whenever such conditions arise. All applications for the consideration of such matters should be written to the Head of Department through Academic Advisers. The following are some of the conditions requiring formal applications:

1. **Application for Permission to Register for Less Minimum Number of Units** (application should be submitted during the normal registration period for the affected semester)
2. **Application for Leave of absence for the current semester** (application should be submitted during the normal registration period for the affected semester and not later than 2 weeks after the commencement of lectures)
3. **Notification to Resume Studies** (Any student who has enjoyed Leave of Absence is required, on resumption of his studies, to so notify the University. Such notification should be submitted during the normal period of registration for the semester of resumption)
4. **Application for Deferment of SIWES** (Application should be submitted during the normal period of registration for the affected semester)

Please note that:

(a) Applications should be submitted in triplicate (3 copies).

(b) Applications must be submitted not later than second week of the Semester for which the application is done.

(c) Applications must be signed and endorsed by the student making the application.

(d) Applications must be dully approved by the Students Academic Advisers.

(e) Inclusion of a Table in respect containing the respective data as listed below for each application is compulsory.

For each application, the application must provide relevant pieces of information as follows:

1. Application for permission to Register for Less than Minimum Number of Units
   - (i.) Registration Number
   - (ii.) Full name (surname first in capitals)
   - (iii.) Part
   - (iv.) List of course being registered for, together with their units
   - (v.) Total number of units
   - (vi.) Reason (e.g. only courses left to graduate, only outstanding course for the semester, etc.)
   - (vii.) Affected semester and session
   - (viii.) Date of application.
2. Application for Leave of Absence (current semester)
   - (i.) Registration Number
   - (ii.) Part
   - (iii.) Full name (surname first in capitals)
   - (iv.) Duration of Leave of Absence (semester and session)
   - (v.) Reason (includes ill-health, financial problem, Late Transfer/Registration/Admission, no course to offer, etc)
   - (vi.) Date of application.
3. Notification to Resume Studies
   - (i.) Registration Number
   - (ii.) Full name (surname first in capitals)
   - (iii.) Part
   - (iv.) Reason for original leave (includes ill-health, financial problem, Late Transfer/Registration/Admission)

(v.) Date of Approval of Leave (semester and session)

(vi.) Duration of Leave of Absence (number of semesters)

(vii.) Date of application.

4. Deferment of SIWES

(i.) Registration Number

(ii.) Full name (surname first in capitals)

(iii.) Part

(iv.) Reason for application

(v.) Affected semester and session

(vi.) Date of application.

RECOMMENDED PROCEDURE FOR PROCESSING STUDENTS APPLICATION

1. Student will write their applications and complete the Clearance From on the advice of their Part Adviser. The Part Adviser will ensure that each application is sufficiently detailed to contain all required information. Each application should be accompanied by relevant documents as necessary. The application should be addressed to the Head of Department through the Part Adviser.

2. The Part adviser, after endorsing the application, will within 24 hours (excepting weekends and holidays), pass it on to the Departmental Secretary for further action by the Head of Department.

3. The application will be accompanied by an appropriate clearance form and forwarded to the Examination Processing Unit for comments.

4. The application, together with the comments of the Examination Processing Unit, will be returned to the Head of Department (within 24 hours, excepting weekends and holidays) for further action.

5. After consideration by the Faculty Board, the office of the Head of Department will convey the outcome for each application to the affected student, Part Academic Adviser and the Examination Processing Unit for implementation.