HARMONIZED CURRICULUM
FOR TRAINING OF PHARMACY TECHNICIANS
IN THE ECOWAS REGION
The thought to harmonize the existing training programmes for Pharmacy technicians within the ECOWAS Region, though much more lately compared to that for the training of pharmacists themselves, is very laudable. This is so because it formidably makes holistic the harmonization of programmes for training pharmacists and Pharmacy-auxiliaries. After recognizing the subtlety of not only the complementary role of the technician to the functional tasks of the pharmacist but its indispensable importance, based on concretely convincing argument advanced by the PO/Pharmacy, it was felt yet timely to harmonize the programmes for training of Pharmacy technicians.

Cognizant of the rapid speed with which all that bear stake in the training of this grade of pharmaceutical health practitioners put in so as to get its harmonization on par with those of Pharmacy (-proper) and other healthcare disciplines, the Director-General (DG) of WAHO commends them for their expended dexterity thereof. Particularly representatives of existing Pharmacy technician training institutions, representatives of Pharmacists and Nurses Councils (which are otherwise called Pharmacy and Nursing Boards) and of course staff of WAHO that participated in the process cannot be forgotten.

It is ardently hoped that, following the approval of this curriculum by the ECOWAS AHM, all provisions enshrined herein will be implemented by all member countries and that others wherein no institutions exist for the formal training of Pharmacy technicians will be encouraged to commence establishment of same. To this end, WAHO stands ready to render whatever facilitation may be requested of it by any Pharmacy technician training institution of any of the ECOWAS countries.

Director General
WAHO
The role of the Pharmacist technician is undoubtedly a big part of the changing role of the pharmacist, the latter which thus requires a modified curriculum for the training of today’s pharmacist that will correspondingly compensate for the needed changes. Likewise there exists a similitude for the role and training of the Pharmacy technician. Some brief argument for this is narrated below.

Although the pharmacist could simply but yet accurately be described as the health professional who is trained to prepare and dispense drugs, the role mentioned in this definition description (Family Health Magazine, 2013) is only a part of the pharmacist’s job description which itself has been changing. Not only is it that the role, particularly that of the today’s pharmacist, is changing but it has assigned many functional requirements to the pharmacist. For instance, of the thousands of (e.g.) prescription medicines that now exist, s/he is expected to be familiar with all as well as understand the effects of over-the-counter (OTC) drugs, vitamins, herbal and other natural medicinal products. More than this, they, as an integral part of the process of rational prescribing initiated by the physician in ensuring that the right patient gets the right medication, in the right strength, and in the right way as well as monitor the wide spectrum of said medications when so prescribed, must be familiar with the standards of treatment for many disease conditions such as diabetes, asthma and infections. And so is required of them to be on the alert for any interactions between drugs, foods and medical conditions. Succinctly put, the focus of the pharmacist’s work or role has changed from a type of work that is based on commercial business to a profession that is more patient care-oriented.

Just as the role of the pharmacist has not merely changed but diversified today, the trend of her/his training has correspondingly changed. This change is in terms of the duration, the pedagogic and learning materials and the methodology of the training. Of note and no exception, relative to the training and/or learning tool, is technology – particularly use of the computer. An example is the use of the computer to enter prescription or demographic information, to take inventory of stock and to place orders.

Despite the availability of the technological tools and approaches employed by the pharmacist, s/he can only be efficient and effective on the job provided there is a relevantly trained person to assist her/him: this role is the primary function served by the Pharmacy technician. The Pharmacy technicians are, hence, a big part of the changing role of the pharmacist. In fact and as a vivid example, the work that the Pharmacy technician does enables the pharmacist (under whom s/he works) to spend more time with clients and to ensure that the right medication in the right dose is reaching the right patient. Technicians are therefore one main reason why more pharmacists can get out from behind the counter to discuss individual concerns with their patients and other would-be attended subjects and provide more education about managing chronic conditions.

Another important role, though rarely thought of and/or about which there considerably exists no adequate literature, of the Pharmacy technician and the reason for which her/his training needs to be taken very seriously much more than before is that s/he has a mutual role to play in the education/training of pharmacists (or best called, pharmacists-proper). In an article of the American Journal of Pharmaceutical Education, Mack argues that (Mack, 2008) the practice of Pharmacy dictates that Pharmacy technicians will have an impact on the (Pharmacy) student’s practice-based experience. Some examples provided by Mack are (1) that the degree of mastery of activities such as processing, dispensing, and billing is likely to be influenced by the types of interactions between student pharmacists and practising Pharmacy technicians, although it is
thought that it is the ultimate responsibility of the Pharmacy educator/practising pharmacist to provide the (Pharmacy) student with adequate opportunities for growth and development such as the run of these roles. (2) The Pharmacy student gains experience in the intravenous (IV) room or the filling station as s/he pairs with Pharmacy technicians. It suffices then to say that the level of training and motivation of the Pharmacy technician deserve attention from all investments, including their stake holding sources, in the quality of Pharmacy student training and that consideration must be given to the Pharmacy technician’s attitude toward teaching and the expectations communicated to the Pharmacy technician about student training.

It is in the context of the aforementioned scenario that WAHO was alarmed by the fact that most ECOWAS member countries lack training institutions for the formal training of Pharmacy technicians. In addition, WAHO has also noted that there are marked differences in the quality of existing Pharmacy technician training programmes in the region. To address such a lack and dissimilarities or disparities, just as was earlier observed and done in the case of the training of pharmacists, it has decided to facilitate harmonisation of training programmes, including curricula, for Pharmacy technicians in the region.

The provisions contained herein this document are contents of a harmonized curriculum for the training of Pharmacy technicians in the ECOWAS region. It is minced into seven important broad parts. Parts 1, 2 and 3 respectively talk about the general provisions (e.g. philosophy, objectives, nomenclature of the to-be-awarded qualification at end of the training, admission requirements/conditions and duration of the training programme); general structure of the programme (umbrella subject areas) and evaluation structure including accreditation. The last four parts respectively dwell on the infrastructural and human resource requirements; format of description of courses; the titles, objectives contents, methodology of delivery and the references of the teaching materials and the credits assigned to the work in each course.
<table>
<thead>
<tr>
<th>Abbreviation/Acronym</th>
<th>Expansion</th>
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<tbody>
<tr>
<td>AHM</td>
<td>Assemblies of Health Ministers</td>
</tr>
<tr>
<td>A.S.</td>
<td>Associate of Science (Degree)</td>
</tr>
<tr>
<td>Bac. Sc.</td>
<td>Baccalauréat Scientifique</td>
</tr>
<tr>
<td>DG</td>
<td>Director- General</td>
</tr>
<tr>
<td>ENT</td>
<td>Ear, Nose and Throat</td>
</tr>
<tr>
<td>ECOWAS</td>
<td>Economic Community of West African States</td>
</tr>
<tr>
<td>Litr. Desgn</td>
<td>Literal Designation</td>
</tr>
<tr>
<td>LPTSP</td>
<td>La License Professionnel de Technicien supérieur en Pharmacie</td>
</tr>
<tr>
<td>LPTP</td>
<td>La License Professionnel de Technicien en Pharmacie</td>
</tr>
<tr>
<td>Numr. Desgn</td>
<td>Numerical Designation</td>
</tr>
<tr>
<td>OOAS</td>
<td>Organisation Ouest Africaine de la Santé</td>
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<tr>
<td>OTC</td>
<td>Over-the-counter</td>
</tr>
<tr>
<td>PCN</td>
<td>Pharmacists Council of Nigeria</td>
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<tr>
<td>PO</td>
<td>Professional Officer</td>
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<tr>
<td>PO/</td>
<td>Professional Officer for</td>
</tr>
<tr>
<td>SSSC</td>
<td>Senior Secondary School Certificate</td>
</tr>
<tr>
<td>WAHO</td>
<td>West African Health Organisation</td>
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<td>West African Senior Secondary School Certificate Examination</td>
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APPENDIX
I.1 Philosophy and Objectives of the Program for Pharmacy Technicians Training

1.1.1 Philosophy

The philosophy of training of Pharmacy Technicians is to produce well-trained and well-qualified professionals who work under the supervision of the pharmacist.

1.1.2 General Objective

The ultimate goal of the program is to train a certain staff with the skills needed to assist in an efficient and responsible manner in compliance with the rules of the pharmacist, under whose responsibility he works.

1.1.3 Specific Objectives

At the end of the training a graduate should be able, under the responsibility of the pharmacist and in this regard, to:

i. Participate in the management of a pharmacy at all levels of the health system

ii. Ensure and promote information, education and communication about medicines to the population and health professionals

iii. Promote evaluation, improving quality of service at a pharmacy

iv. Perform pharmaceutical preparations

v. Provide Medicines Control

1.2 Nomenclature

The diploma issued is:

- The Professional Pharmacy Technician Bachelor’s Degree (Francolusophone Countries)
- Associate of Science (A. S.) Degree for Pharmacy Technicians (Anglophone Countries)

1.3 Minimum Eligibility

Minimum Admission Requirements are:

• SSSC / WASSCE Certificate (Anglophone)
• Bac. Sc. (Francolusophone)

1.4 Duration of Training Program

Duration of study: 3 years
1.5 Level of Harmonisation for Pharmacy Technician Training Programmes

a. This harmonized curriculum is for the purpose of regional integration and not necessarily uniformity of programmes.

b. Core and Elective Courses: Participating countries/schools should decide on what constitutes core and elective courses. Thereof, the correct load of the core courses should be at least 60% of total credit required to graduate. Implied, where any of the courses herein listed is already contained in the curriculum of a Pharmacy technician training institution of an ECOWAS member country, it could be offered as specified by said Pharmacy technician training institution.

c. Member countries are to adopt and feel free to modify its provisions so as to suit their needs. As such, institutions therein are at liberty to prescribe textbooks, for their programmes, in addition to what are herein recommended or their contemporaneously latest editions and other learning and teaching aides, where mention of these was not made for any of the courses.

d. Any Pharmacy technician school that implements 70% and above, shall be deemed to have complied with the conditions of harmonization.
PART II:
GENERAL STRUCTURE OF THE PHARMACY TECHNICIAN TRAINING PROGRAMME

The Pharmacy technician training programme is structured so as to provide the student with knowledge in the following areas of training:

2.1 General Studies
2.2 Basic Sciences
2.3 Pharmaceutical Sciences
2.4 Biomedical Sciences
2.5 Management and Administration Sciences
2.6 Public Health Disciplines
2.7 Practical Training: Practical Attachment / Externship
PART III:
EVALUATION STRUCTURE

The evaluation will consist of that of the students and the programme.

3.1 Student Evaluation:

- Written Examination (continuous assessment / oral and end-of-semester examination)
- Practical Evaluation
- Validation of externship

• Each training course will be assessed by a combination of continuous tests and tests of the end of the semester.

• The evaluation will consist of continuous tests, quarterly compositions, reports and or laboratory tests (written, oral or practical supervision, attendance, etc., depending on the institution).

• The evaluation of the end of training will consist of written and oral tests and practical exams.

• The minimum passing grade for all courses registered for per a given academic term and cumulative grade point for promotion to another higher level shall be fifty percent (50%).

3.2 Programme Evaluation

- Regional Council for Training of Health Professionals
- Scientific Council
- Review Workshop
- National authority on education
- Pharmacy Board / Council

The method of program evaluation may include review workshops.

3.3 Accreditation Programme

An accreditation system should be put in place to ensure the quality of teaching and program outputs. This should be implemented by the same authorities mentioned in provision 3.2.
PART IV:
HUMAN RESOURCE AND INFRASTRUCTURAL REQUIREMENTS

4.1 Academic Staff

• Depending on the number of students enrolled, the instructor - student ratio is 1 / 10.
• Every and each instructor must have an advanced degree and / or appropriate professional qualification.

4.2 Academic and Physical Space

• There shall be appropriate auditoria, classrooms, laboratories, reading rooms and offices for the staff and other research areas.
• For their externship, students shall be attached to only hospitals, pharmacies and other relevant sites accredited by the national Pharmacy practice regulatory authority. Hospitals and accredited pharmacies.

4.3 Library and Information Resources

• There must be a school library with books, newspapers and periodicals for appropriate reference in all areas of Pharmacy. Access to the Internet is highly desirable.

4.4 Laboratories and Equipment

• There must be well-equipped laboratories with facilities for effective learning as required by the curriculum.

4.5 Teaching and Learning Methodology

• Problem solving Case studies should be integrated in order to instill in the students the self-learning attitude that promotes the ability to learn throughout life required by the environment and the challenges of the future.
PART V:
FORMAT OF DESCRIPTION AND CODING OF COURSES

5.1 Description of Courses

The description of the courses should be of such that it is developed along the following sequence or contains all elements mentioned therein:

1. Code and Title of courses and subject areas as applicable in in-country /institution
2. Objective (s)
3. Topic/s (Content /s)
4. Delivery (Teaching methodology)
5. Evaluation
6. Reference books/materials

5.2 Course Coding

Each course should have a code and a descriptive title. Although each in-country Pharmacy technician training institution has the liberty to devise its own course coding system, the code should have, at least, a literal component and a numerical part following it.

For instance, supposing that the literal part is a four-letter portion which is derived from a “re-arranged” abbreviation of the name of the core subject (e.g. Chemistry, Botany, Zoology, Pharmacology, etc.). one could have, for instance, CHEM, MCHE, CPHA, COPH, etc. to respectively represent Chemistry, Medicinal Chemistry, Clinical Pharmacy and Community Pharmacy.

Also supposing that the numerical part of the course code is a either only a four-digit number or a five digit-number (where the course appearance serial number is respectively a one-digit or a two-digit number) , the following could be obtained: the first digit represents the year in which the course is offered; the second indicates the course area (e.g. Mathematics & Statistics; Physics & Chemistry; Biology; Pharmaceutical Sciences, Methodology, etc.) of a given academic term; the third digit (for a one-digit serial number) or two-digit serial number represents, by semester, the serial number of the course whereas the fourth or fifth digit (in the case of a four or five-digit number) indicates the semester wherein it is offered.

NB: The serial numbers for the courses areas are the respective numbers indicating the chronological sequence of their appearance, per a given semester, as found on the Spread sheet in part VII showing the credits for the courses.

Thus MATH 1111: indicates that this is a Mathematics course that is taught in first year of the programme under Course Area #1 as course 1 in the first semester.

BOTA 1242: Botany-I (fully described as General Botany), is a course taught in the second semester of year 1, as course number #4, under course area # 2.

CHEM 2111: Chemistry (fully described as Organic Chemistry-II), is a course taught under course area # 1 and as course #1 in the first semester of the second year.
PHCO 3371: Pharmacology-I (fully described as General & Molecular Pharmacology), is a course taught in the third year under Course area #3 and as course 7 in the first semester.

PHCO 3111: Pharmacology-II (fully described as Applied Pharmacology), is a course taught as course number 1 under course area number 1 in the first semester of year 3.

COMM 2131: Communication Skills (fully described as Oral and Writing Techniques) is a course taught, as course 3 under course area 1, in the first semester of year 2.

PHAR 34101: Pharmacy-IV (Fully described as Pharmacy Law & Ethics) indicates that this is the 10th course offered under course area #4 in the first semester of year 3.
PART VI: OBJECTIVES AND CONTENTS OF COURSES PER SUBJECT AREAS

6.1 General Studies Courses

LANG 1121: Foreign Language (English/French/Portuguese)-I

Objectives:

1. To facilitate communication within ECOWAS.
2. To facilitate the exploration of academic and professional print and electronic resources.

Contents:

Countries must choose a foreign language with a focus on medical terminology (English, French, Portuguese).

RECOMMENDED TEXTBOOKS


**LANG 1122: Foreign Language (English/French/Portuguese)-II**

**Objectives and Content:** Same as those for Foreign Language-I.

**RECOMMENDED TEXTBOOKS**

Same as those for Foreign Language-I.

**MATH 1111: Mathematics-I (Basic Mathematics)**

**Objective:** Review of the basics of Arithmetic, Algebra and Geometry to address content of the course Math II of the program.

**Contents:**

1. Integers;
2. Fractions;
3. Divisions of whole numbers and decimals angles;
4. Proportions (percentages, ratios, etc.) and the closed figures (circle, triangle, rectangle; polygon, etc.) and their properties (e.g., volume calculations, surface, etc.);
5. Studies functions (integers, logarithmic, derivatives, vector, differential).

**RECOMMENDED TEXTBOOKS**


Objective: To introduce the student in applied mathematics: In retailing; The pricing of prescription drugs; In Inventory; and Control and Monitoring of Inventory Movements.

Content: Calculation of:

1. Doses;
2. Price;
3. Margins;
4. Proportions;
5. Dilutions;
6. Concentrations, including
   - Volumes,
   - The weight of volumes,
   - Volumes by weight;
   - Molarities;
   - Molalities;
   - Densities;
   - Powders.

RECOMMENDED TEXTBOOKS


6.2 Basic Sciences

BOTA 2213: Botany (Fundamentals of Botany)

Objectives: To introduce students to the basic principles of Botany.

Content:

1. Overview of the cells and the systematic classification
   - Summary comparison between cells and different kingdoms hierarchy within the kingdoms;
2. Fungi and lichens;
3. Pteridophytes;
4. Gymnosperms (plants with naked ovules);
5. Angiosperms;
6. Approach of the ecological environment;
7. Nomenclature;
8. Harvesting methods of preservation;
9. Morphology and recognition of plants;

RECOMMENDED TEXTBOOKS


INFM 1251: Informatics (Computer Basics for the Pharmacy Technician)

Objectives: This course is designed to provide an introduction to the main Windows applications (but any other relevant contemporary computer program), its interface, its tools and features.

Contents:

1. Operation, navigation and customization principles Windows interface;
2. The organization of files and folders;
3. The use of multimedia devices;

RECOMMENDED TEXTBOOKS


PHYS 1231: Physics (Theories and Concepts in Physics)

Objective:

To help student understand various theories and concepts of Physics that s/he might encounter during her/his training.

Contents:

1. Mechanics and properties of matter;
2. Thermophysics, sound and optical;
3. Electromagnetism.

RECOMMENDED TEXTBOOKS


CHEM 1241: Chemistry-I (General Chemistry)

Objectives: To remind students of the general principles of General Chemistry.

Contents:

1. Structure of the material
   - Atomic structure of atoms, chemical bonds, moles, atomic and molecular masses;
2. Chemical reaction
   - Balance of a chemical reaction, chemical kinetics, chemical equilibrium;
3. Ionic equilibria
   - Acid-base equilibria, solubility equilibria, equilibrium complexations;
4. Redox reactions
   - Oxidants, reducing the redox couple and the oxidation-reduction reactions, the potential redox, the oxidation number, oxidation in aqueous solution).
RECOMMENDED TEXTBOOKS


CHEM 1232: Chemistry-II (Mineral or Inorganic Chemistry)

Objectives:

1. To review the student in the fundamentals of General and Inorganic Chemistry;
2. Understand the use of inorganic compounds in pharmacy

Contents:

1. Basis of the periodicity of chemical elements;
2. The emphasis on the study of the elements of Group IA through Group VIIA and the inner group elements such as iron and their compounds;
3. Complexes of the above mentioned elements and their medicinal application (e.g. chelating agents);
4. Organometallic Chemistry;
5. Molecular orbitals;

RECOMMENDED TEXTBOOKS


CHEM 2224: Chemistry-III (Organic Chemistry)

Objectives: To introduce students to the fundamental principles of Organic Chemistry

Contents:

1. Organic elemental analysis (qualitative analysis, quantitative analysis);
2. Basic principles of the nomenclature and classification of organic chemistry;
3. Carbon skeleton (the carbon atom and the carbon skeleton, concepts of functional groups, and isomers with stress on stereoisomerism);
4. Alkanes;
5. Alkenes;
6. Alkynes;
7. Aromatic compounds;
8. Alcohols;
9. Aldehydes and ketones;
10. Carboxylic acids and derived functions;
11. Amines;
12. Terpenes

RECOMMENDED TEXTBOOKS


**RECH 2214: Research (Introduction to Research)**

**Objective:** Introduction to research methodology.

**Content:**

1. Introduce the student s to research methodology.
2. Introduction to research;
3. Development of research project/issues
4. Research Methodology
5. Different steps of a report/memoir
6. Publication and dissemination of research results.

**RECOMMENDED TEXTBOOKS**


6.3 Pharmaceutical Sciences

PHAR 1361: Pharmacy-I (Introduction to the Pharmaceutical Profession)

Objective: To enable the student to understand the concept of the pharmaceutical profession

Contents:

1. Definition of pharmacy;
2. Place of the pharmacist and Pharmacy technician in the health system;
3. History of Pharmacy:
   - Role of the pharmacist in general,
   - Evolution of Pharmacy training through the centuries;
4. The different types of pharmacies;
5. Pharmacy in the current context (as a profession and practice).

RECOMMENDED TEXTBOOKS


**PHAR 3345: Pharmacy-II (Pharmaceutical Calculations)**

**Objective:** To introduce the student to basic pharmaceutical calculations generally encountered.

**Contents:**

1. Calculations required for sterile and non-sterile mixtures;
2. Dilution of concentrated solutions;
3. Allegation and dose of parenteral drugs;
4. Medicines administration protocols;
5. An infusion package;
6. Infusion pump;
7. Calculating the duration / speed of infusion;
8. Calculating the molecular weight of a medicament;
9. Calculating the dose of a medicament.

RECOMMENDED TEXTBOOKS


   978-0763834654).

   Ltda.

   Médicas Sul Ltda.


   Boca Raton: CRC Press.


PHAR 3355: Pharmacy-III (Metrology)

Objectives:

This course aims to provide students with the knowledge and skills necessary to perform
accurate measurements of weight and volume pharmacy.

Contents:

1. Good practice in a pharmacy in the pharmacopoeia standards;
2. The weights;
3. Volumetric measurements;
4. Instruments Calibration and calculation of uncertainties.
RECOMMENDED TEXTBOOKS


PHAR 3385: Pharmacy-IV (Community Pharmacy: Community Pharmacy Practice for Pharmacy Technicians)

Objective: This course aims to enable the student to achieve competency in the practical aspects of Pharmacy in the community settings.

Content:

1. Management Skills in the Pharmacy (e.g. inventory control, drug / product storage, and medication distribution, etc.);
2. Responding to Symptoms ;
3. Supplying Medication ;
4. Patient counseling including use or application of Pharmacy systems and technology that improve patient safety and offering of other aspects of enhanced services;
5. Teaming or collaborative roles of the technician and pharmacist in providing community Pharmacy services;
6. Medicines Use-review
7. Contractual Framework for Community Pharmacy;
8. Multidisciplinary Working;
9. Continuing Professional Development

RECOMMENDED TEXTBOOKS


PHAR 3365: Pharmacy-V (Hospital Pharmacy: Hospital Pharmacy Practice for Pharmacy Technician)

Objective: The course is designed to provide the student with a comprehensive knowledge of the various forms of Pharmacy-related hospital work as well as its application.

Content:

1. History and evolution of hospital practice;
2. Summary-insights of the technician’s duties in the hospital setting;
3. Specific roles and responsibilities typical in the hospital environment;
4. IV and other extemporaneous preparations;
5. Management including storage, inventory and dispensing of other medicinal dosage forms and non-drug health ancillary items;
6. Use of prescription-related symbols, abbreviations and terminologies including jargons;
7. Automated prescription filling including prescription assessment and evaluation;
8. Supervisory roles such as pharmacist-led overseeing in-service-training;
9. medication-delivery devices;
10. Interpersonal professional interaction including communication (e.g. decorum, appearance, punctuality, mutual colleaguebility, etc.) with other members of the hospital team;
11. Networking and interviewing techniques;
12. Pharmacist-led healthcare of patients;
13. Other relevant medication-based duties.

RECOMMENDED TEXTBOOKS


**PHAR 3375: Pharmacy-VI (Institutional Pharmacy: Institutional Pharmacy Practice for PharmacyTechnicians)**

**Objective:** The course is tailored to provide the student with a comprehensive overview of the essential components of health-system Pharmacy practice including health delivery systems, hospital pharmacy and other practice settings.

**Content:**

1. History, evolution and types of institutional Pharmacy practice
2. Home care,
3. Long-term care including mycobacterium diseases and HIV infections/AIDS management
4. Hospice and palliative care,
5. Ambulatory care
6. Managed care
7. Principles of career development
8. Implementation and monitoring of therapeutic plans and evidence-based Medicine
9. Collaborative Practice / Interprofessional alliances and teambuilding.

**RECOMMENDED TEXTBOOKS**


**PHAR 3336: Pharmacy-VII (Pharmaceutical Legislation/Pharmacy Law and Ethics)**

**Objective:** To know the aspects of:

1. Legislation;
2. Regulations;
3. Ethics of Pharmacy practice.

**Contents:**

1. Pharmacy Act/Law and its objectives;

2. Legislation and regulatory bodies: the College of Pharmacists and its committees, food and drug standards under counseling, drug control, etc.;

3. Interpretation of the words / phrases used in Pharmacy Act/Law;

4. Classification of pharmacy / drug scheduling, a person authorized to deliver sensitive drugs;

5. Prescription containers and labels, the supply of medicines in hospitals and similar Institutions;

6. Outpatient prescription drugs supply;

7. Production control, stability of drugs on the storage etc.
RECOMMENDED TEXTBOOKS


CHEM 3326: Chemistry-IV (Pharmaceutical Chemistry)

Objective: This course is intended to introduce the student to Pharmaceutical Chemistry and knowledge of the structures and physicochemical properties of drugs (e.g. interaction between them and water) and to also allow her/him to run simple analysis of medicines.

Content:

1. Introduction: Nomenclature and chemical and therapeutic classification of drugs.
2. Structures of the chemical classes of drugs: Chemotherapeutics (anti-infective antibiotics, anti-infective non-antibiotics) and pharmacodynamic agents.

Stress will be made on the sulphonamides including the sulfones; Lactam antibiotics and non-lactam antibiotics (e.g. respectively the penicillins and cephalosporins and chloramphenicol,
etc.), other anti-infectives such as the antimalarials, anthelminthics, anti-inflammatories and other analgesics.

RECOMMENDED TEXTBOOKS


PHCO 2333: Pharmacology-I: (General Pharmacology)

Objective: To enable the student to learn the basics of General Pharmacology.

Contents:

1. Overview of Pharmacology:
   - The routes of drugs/medicines administration,
   - Pharmacokinetics,
   - The mechanism of action of drugs;

2. Overview of the drug:
   - Definitions,
   - Development of the drug;
   - Preparation, composition and classification;
   - Concept of essential drugs;
   - Generic medicine;
   - Use of drugs;
   - Pharmacovigilance;
   - Adverse effects;
   - Prescription orders and rules, etc..
RECOMMENDED TEXTBOOKS


PHCO 2334: Pharmacology-II (Systemic Pharmacology-I)

Objective: To enable the student to know the pharmacological properties of drugs.
Contents: The therapeutic classes of drugs:

1. Analgesics;
2. Anti-inflammatory;
3. Antibiotics;
4. ARVs;
5. Contraceptives;
6. Antacids;
7. Anticancer and other drug classes etc.;
8. Pest Control.

RECOMMENDED TEXTBOOKS


PHCO 3325: Pharmacology-III (Systemic Pharmacology-II)

**Objective:** This course, a continuation of Special Pharmacology-I, is designed to enable the student to further know the pharmacological properties of drugs.

**Contents:** The therapeutic classes of drugs:
- The cardiovascular system drugs;
- The central nervous system drugs, anesthetics, etc..

**RECOMMENDED TEXTBOOKS**


**PHCT 2343: Pharmaceutics-I (Pharmaceutics/Pharmaceutical Technology-I)**

**Objective:** To let the student learn the basics of Pharmaceutics:

1. The various operations and dosage forms;
2. The techniques for preparing medicines.

**Contents:**

1. Definitions;
2. Pharmaceutical operations;
3. The different dosage forms;
4. Raw materials (active ingredients, excipients / adjuvant / colorants, preservatives) and packaging of preparations;
5. Measurement operations in Pharmacy;
6. The different drug-dosage forms:
   - Solid forms,
   - Dry
   - Soft,
   - Liquid
   - Powders, etc.

**RECOMMENDED TEXTBOOKS**

PHCG 2344: Pharmacognosy

Objective: To let the student learn the essential active substances derived from plant and animal kingdoms for formulation/preparation into drug forms.

Contents:

1. Overview of Pharmacognosy;
2. The drug carbohydrates:
   - Monosaccharides,
   - Disaccharides and Polysaccharides,
   - Heterogeneous polysaccharides,
   - Gums and mucilages;
3. Drug glycosides
4. Plants lipids;
5. Plants resins, oleoresins and balm;
6. Alkaloids;
7. Iridoid plants;
8. Essential oils;
9. Animal products (insulin, fats, oils, etc.).
10. Introduction to traditional medicine.

RECOMMENDED TEXTBOOKS

Health Organisation.


**TXCL 2353: Toxicology (General Toxicology)**

**Objective:**

Introduce students to concepts of:
- Basic of Toxicology;
- Toxic effects of drugs.

**Contents:**

1. General Toxicology:
   - Definitions,
   - History,
   - Different types of poisoning (food, inhalation, gas, medicines, etc.)
   - Different types of toxicities (acute, chronic, etc.).
2. Drug poisoning and antidotes.

**RECOMMENDED TEXTBOOKS**


**INFM 1242: Informatics II (Pharmacy Software for Pharmacy Technicians)**

**Objective:** To introduce the student to the practical use of Pharmacy software and other computer program applicable in Pharmacy.

**Contents:**

1. Windows environment;
2. Word-processing Software;
3. Spreadsheets (Excel);
4. Specific software (patient management software, Order management software, drug stock inventory-management software);
5. Internet browsing;
6. Introduction to Pharmacy software use- drug distribution and familiarity with different software (e.g. Community Pharmacy software);
8. Creating or updating new files of drugs (including directives or legislation and selection, based on the current inventory of generic products)
9. Third party’s medical information including that of prescription billing and settlement of online prescriptions.

**RECOMMENDED TEXTBOOKS**


PHQC 3335: Quality Control (Pharmaceutical Quality Control)

Objective: To introduce students to the fundamentals of the technical quality control of drugs

Contents:

1. Overview of quality control
   - Definitions, interests, goals, steps, type;
2. Tools for quality control
   - International rules for the administration of drugs, MA, certifications WHO regulatory
     provision at national level, etc.;
3. Materials and methods of control of matter;
4. The Treasury;
5. The ISO14971 standard;
6. Control charts;
7. Quality pharmaceuticals and generic multiple source insurance.

RECOMMENDED TEXTBOOKS


6.4 Biomedical Sciences

NUTR 3216: Nutrition (Nutrition and Dietetics)

Objectives: Provide Pharmacy technician sufficient knowledge in nutrition, diet and their importance in pharmaceutical patient care.

Content:

1. Carbohydrates;
2. Proteins;
3. Fats and oils;
4. Micronutrients, including vitamins and minerals;
5. The interaction of food and drugs;
6. Related to patient care.

RECOMMENDED TEXTBOOKS


**NURS 1492: Nursing (Nursing Care)**

**Objectives:**

1. To introduce the student to methods of correct noting of vital signs and interpretation of their recorded results.
2. To introduce to the student techniques of proper administration of injections employed in medical routines.

**Content:**

1. Techniques of blood pressure, pulse and body temperature measurement and urine collection;
2. Techniques of plotting results of collected clinical vital signs;
3. Analysis and interpretation of plot of the data on the noted vital signs;
4. Techniques of proper administration of injections.

**RECOMMENDED TEXTBOOKS**


**TECH 1252: Technology (Laboratory Technology)**

**Objective:** To introduce students to good laboratory practice

**Content:**
1. General Technology (glassware, energy, fluids, Production, regulation and control of temperature, chemical products, laboratory plastic materials)
2. Applied Technology materials (Study of analytical procedures, automation in medical laboratory service, primary maintenance level)
3. Good Laboratory Practice
4. Occupational Health and Safety Laboratory
5. Quality control
6. Laboratory animals (Breeding, Reproduction, Use).

RECOMMENDED TEXTBOOKS


ANAT/PHSY 1471: Anatomy / Physiology-I

Objectives: The course aims to introduce students to organize the various functions of the human body.

Contents:

1. The musculoskeletal system;
2. Cardiovascular system;
3. Nervous system;
4. Respiratory system;
5. Digestive tract;
6. The urogenital tract;
7. Sense organs (ENT, eye, skin, etc.). etc.

RECOMMENDED TEXTBOOKS


PATH 2223: Pathophysiology/Semiology (Medical and Surgical)

**Objective:** Knowing the most common medical and surgical pathology with emphasis on their therapeutic management; Prevention and counseling (orientation).

**Contents:**

1. Infectious diseases (parasitic, bacterial, viral and fungal);
2. Pathologies
   - Respiratory,
   - Dermatological
   - Digestive
   - Cardiovascular;
3. Allergic immune;
4. Dentistry and Dental Diseases;
5. Disorders
   - Eye and ENT;
6. Psychiatric disorders;
7. Addiction;
8. Endocrine and metabolic diseases;
9. Blood diseases, etc.

RECOMMENDED TEXTBOOKS


BCHE 2473: Biochemistry (General Biochemistry)

Objective: To introduce the student to the general principles of biochemistry applicable to the Pharmacy.

Contents:

1. Definition of Biochemistry
2. Basic biochemistry:
   - Definitions, classification, concepts of food science, the thermodynamic enzymology

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(courses on enzymes and coenzymes, enzyme kinetics and correlation of their deficiencies and / or inhibition and anomalies in relation to disease states)
- Introduction to the application of the use of enzymes in the production of medicines and other useful products (fermentation).

RECOMMENDED TEXTBOOKS


BIOL 1481: Biology-I (Human Cell Biology)

Objective: To introduce students to the fundamentals of human biology.

Contents:

1. General:
   - Definition, tissues and equipment
2. Cells (anatomy and structure, nucleoprotein, lipoprotein membrane);
3. Cell Biology (exchange membrane)
4. Molecular Genetics

RECOMMENDED TEXTBOOKS


BIOL 1472: Biology-II (Microbiology / Virology)

Objectives:

1. This course aims to introduce students to the major groups of micro-organisms (eukaryotes and prokaryotes, viruses) and their relationship to humans and animals and their health.

2. The importance of micro-organisms in drug development will be emphasized.

Contents:

1. Morphology of micro-organisms;
2. The classification of viruses, rickettsiae, bacteria, fungi;
3. Reproductive patterns of viruses, rickettsiae, bacteria, fungi, and aseptic control of viruses
and microbial agents and their economic importance to the health and other utility; 
4. Class of prions (proteins of infection).

RECOMMENDED TEXTBOOKS


BIOL 2463: Biology-III (Parasitology / Mycology)

Objective:

Introduce students to the study of parasitic currents and parasitic infections and their treatment

Contents:

1. Introduction to Parasitology;
2. Different types of parasites:
   - Protozoa (rhizopods, flagellates, sporozoites, ciliates)
   - The metazoans: helminths (trematodes, cestodes, nematodes), mollusces, arthropods (arachnids, crustaceans, insects)
   - Mushrooms

RECOMMENDED TEXTBOOKS


BIOL 2483: Biology-IV (Immunology)

Objective: To introduce the student to:

1. Basic principles of human immune system;
2. Common immune disorders.

Contents:

1. Definition and classification of immunity;
2. General principles of natural immunity;
3. Definitions of various terms in immunity
   - Antigens,
   - Antibodies
   - Phagocytosis,
   - Antigen-antibody reactions
   - Endotoxin and exotoxin,
4. Methods for determining antibodies (CD4, T cell, B cell, etc.).

RECOMMENDED TEXTBOOKS


BIOL 2493: Biology-V (Hematology)

Objective: To introduce the student to the study of blood and its components and their applications in diagnosis.

Contents:

1. Definitions and terminology in hematology;
2. The ABO system, rhesus system;
3. Blood cells (erythrocytes, leukocytes, platelets);
4. Plasma
5. Hemoglobin,
6. Erythropoiesis
7. Granulopoiesis,
8. Homeostasis
9. Blood diseases,

RECOMMENDED TEXTBOOKS


MEDE 1482: Medicine (First Aid / Emergency Medical Response)

Objective: To provide the Pharmacy technician, as a rescuer, the knowledge and skills that are needed to provide first aid to an injured or a subject in a medical emergency, so as to avoid complications.

Contents:

1. General principles of first aid;
2. Behavior to adopt in the event of
   - Respiratory distress;
   - Circulatory distress;
3. On the achievement of higher nervous functions;
4. From food poisoning or ingestion of chemicals or objects;
5. In skeletal involvement;
6. Of asthma or epilepsy;
7. Clearance and handling injuries.

RECOMMENDED TEXTBOOKS


6.5 Management And Administrative Sciences

MANG 2554: Management-I (General Management)

Objective: Introduce the pharmacy technician to the basics of management.
Contents:

1. Definition and scope of management;
2. Management process:
   - Planning,
   - Conduct
   - Time management, material and human resources (focus on the different types of
     organizational structures, operational procedures);
3. Leadership styles of leaderships (e.g. democratic, autocratic, etc.).
4. Notion of behavior;
5. Conflict management;
6. Delegation and supervision;
7. Motivation;
8. Performance Evaluation

RECOMMENDED TEXTBOOKS

1. Alain Rusterholtz (2009). Bonnes pratiques de management : Applicables à l'industrie
   pharmaceutique. Puteaux La Défense: Blouse Blanche.
   141869-5).
   Éditions le Moniteur des pharmacies.
   Organizações, 3ª edição. Porto: Vida Económica-editorial Sa. ASIN: B00FXRI27S.
   Washington: American Pharmacists Association. ASIN: B00A9XLHNC.
MANG/MARK 3566: Management-II (Pharmaceutical Marketing)

Objective: To introduce the students to the concepts, approaches and methods of marketing

Content:

1. Fundamentals of Marketing;
2. Environment and issues of the pharmaceutical industry;
3. Management of credit portfolio;
4. Strategies techniques of marketing;
5. Market Survey and analysis;
6. Resources and sales forces
7. Market Promotion and Communication;
8. Competition consideration

RECOMMENDED TEXTBOOKS


MANG 2564/LOGM: Management-III (Logistics Management of Medicines)

Objective:

This course is designed to introduce students in most other areas of management practices: inventory management and procurement procedures in Pharmacy, focusing on hospital and community practice.

Contents:

1. Inventory management practices in hospital and community pharmacies;
2. Procurement procedures and other relevant areas of management (e.g. planning, managing third tender for contracts for nursing home care, e-commerce and organizing clinic days patients);
3. Introduction to Logistics Management;
4. The system of logistics management information;
5. The assessment of the status of stocks;
6. Systems of maximum-minimum inventory control;
7. Notions of quantification, forecasting, receiving and storage;
8. Inventory;
9. Management tools in stock;
10. Regulatory requirements for effective management of medicines;
11. Managing the cold chain;
12. Study of some management software;
13. Procedures
   - Withdrawal of batches of drugs
   - Complaint
   - Removal of expired drugs
   - Destruction of expired drugs.

RECOMMENDED TEXTBOOKS


**MANG/MAHS 3576: Management-IV (Health Services Management)**

**Objective:** To introduce the student to health service management.

**Content:**

1. Basic concepts and principles
2. Staffing
3. Job description
4. Delegation of responsibilities
5. Work schedule / plan
6. Material management
7. Development of action plan
8. Implementation of activities
9. Evaluation of activities
RECOMMENDED TEXTBOOKS


MANG 3556: Management-V (Administrative Writing)

Objective: To introduce the student to the techniques of correspondence.

Contents:

1. General introduction to business writing;
2. Writing techniques;
3. The different types of administrative correspondence;
4. Technical report writing, reporting, the minutes;
5. Technical drafting various types of documents (CV, cover letter, etc.).

RECOMMENDED TEXTBOOKS


**ACCT 2574: Accounting (Introduction to Accounting)**

**Objective:** To introduce students to:

1. The Basics of Accounting
2. Accounting application to various business organizations;
3. Emphasis on tariffs on medicines and related items in the management settings pharmaceutical stores.

**Content:**

1. Definition of accounting and branch accounting.
2. Annual Accounts (Financial Record for example, profit and loss, balance sheet, representing different business entities, etc.).
3. Management accounting (e.g. cost base, pricing based on cost, budget control, etc., focusing on pricing prescription.)
4. Management of public finances (e.g. the cost of capital, working capital management, etc.).

**RECOMMENDED TEXTBOOKS**


6.6. Public Health

PUBH 1691: Public Health-I (Environmental Health)

Objective: To help students understand the importance of the pharmacy technician in environmental health.

Contents:

1. Definition of hygiene concepts;
2. Personal hygiene;
3. Collective health;
4. Hygienic handling;
5. Water hygiene;
6. Health and safety in the laboratory;
7. Hospital hygiene;
8. Roles of pharmacy technicians in public health;
9. Strategy for disease prevention;
10. Drugs used for contraception;
11. Role of the pharmacy technician in the promotion and health education of the population.

RECOMMENDED TEXTBOOKS


PUBH 3695: Public Health-II (Community Health)

Objective: To help students understand the importance of the pharmacy technician in community health.

Content:

1. Notions of IEC / BCC;
2. Basic concepts of epidemiology;
3. Epidemiological strategy;
4. The influence of health interventions;
5. Concepts of health, disease, mortality;
6. Health indicators (prevalence, index, etc.).
7. Using statistical tests based on the difference between the observed and expected values.

RECOMMENDED TEXTBOOKS


PUBH 3686: Public Health-III (Health Policy)

Objective: To introduce the student to national health policy

Content:

1. The national health policy (fundamentals: history, vision, goal)
2. The national health system (administrative structures, technical structures, district Health System)
3. The Primary Health Care
4. National Health Development Plan (PNDS) and health policy
5. National programs and health projects

RECOMMENDED TEXTBOOKS


STAT 26103: Public Health-IV (Statistics: Introduction to Biostatistics)

Objectives: This course introduces the student to Basic Statistics and its applications.

Content:

1. Introduction to Biostatistics;
2. Frequencies, mean, mode, median, standard deviation, variance, histogram, linear regression;
3. Probability and normal distribution and some applications of the foregoing;
4. Introduction to statistical software (SPSS, Excel, SAS, etc.).

RECOMMENDED TEXTBOOKS


### 6.7 Practical Training: Practical Attachment / Externship

**EXTE 2784: Externship for Pharmacy Technicians-I**

**Objective:** This attachment period is intended to enable the student, while still continuing with her/his programme of study, to have a ‘hands-on’ trainingor student exposure experience in a regulatorily recognized sector such as a manufacturing industry, a laboratory, hospital dispensary, community pharmacy, Pharmacy practice regulatory body/administration or any other related sector.
Content: Allowing the student to be adequately knowledgeable with the functioning of a retail pharmaceutical establishment, hospital environment and with the management as well as the supply of medicines, etc., it covers the following:

1. Development and enhancement of the student’s attitudes towards an outpatient setting;
2. Exposure of the student to the pharmacy’s commitment to disease-based pharmaceutical management;
3. Importance of patient counseling;
4. Enabling the student to acquire the ability to communicate with patients and clients, physicians, and other health care professionals, concerning medication and related health matters;
5. Demonstration, to the student, the professional attitude necessary to the practice of Pharmacy including that of Pharmacy technicians and the roles of the pharmacist within society;
6. Inculcating into the student virtues such as empathy, respect, and concern toward diverse patient populations;
7. Familiarization of the student with the various laws governing Pharmacy practice and to demonstrate how pharmacists and technicians abide by these laws;
8. Knowledge of the promotion of the safe use of medication.

RECOMMENDED TEXTBOOKS


EXTE 3795: Externship for Pharmacy Technicians-II

Objectives & Content: As continuation of same, these are the same as for Externship for
Pharmacy Technicians-I.

RECOMMENDED TEXTBOOKS

Same as for Externship for Pharmacy Technicians-I.

EXTE 3796: Externship for Pharmacy Technicians-III

Objectives & Content: As continuation of same, these are the same as for Externship for Pharmacy Technicians-II.

RECOMMENDED TEXTBOOKS

Same as for Externship for Pharmacy Technicians-II.
### PART VII:
LIST OF COURSES FOR THE HARMONIZED PHARMACY TECHNICIAN
TRAINING PROGRAMME IN THE ECOWAS REGION

Courses for the Harmonized Pharmacy Technician Training Programme

<table>
<thead>
<tr>
<th>Course Code</th>
<th>General Title</th>
<th>Full Descriptive Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT</td>
<td>Accounting</td>
<td>Accounting: Introduction to Accounting</td>
</tr>
<tr>
<td>ANAT / PHSY</td>
<td>Anatomy/Physiology I</td>
<td>Anatomy/Physiology-I</td>
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<tr>
<td>ANAT / PHSY</td>
<td>Anatomy/Physiology II</td>
<td>Anatomy/Physiology-II</td>
</tr>
<tr>
<td>BCHE</td>
<td>Biochemistry</td>
<td>Biochemistry : General Biochemistry</td>
</tr>
<tr>
<td>BIOL</td>
<td>Biology</td>
<td>Biology I : Human Biology (cellular)</td>
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<tr>
<td>BIOL</td>
<td>Biology</td>
<td>Biology II : Microbiology / Virology</td>
</tr>
<tr>
<td>BIOL</td>
<td>Biology</td>
<td>Biology III : Parasitology / Mycology</td>
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<tr>
<td>BIOL</td>
<td>Biology</td>
<td>Biology IV : Immunology</td>
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<td>Biology</td>
<td>Biology V : Haematology</td>
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<td>Botany</td>
<td>Botany: Fundamentals of Botany</td>
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<td>CHEM</td>
<td>Chemistry</td>
<td>Chemistry I : General Chemistry</td>
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<td>Chemistry</td>
<td>Chemistry III : Organic Chemistry</td>
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<td>CHEM / PCHE</td>
<td>Chemistry</td>
<td>Chemistry IV : Pharmaceutical Chemistry</td>
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<td>CQPH</td>
<td>Quality Control</td>
<td>Quality Control: Pharmaceutical Quality Control</td>
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<td>EXTE</td>
<td>Externship</td>
<td>Externship I: Pharmacy Technician Externship-I</td>
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<td>EXTE</td>
<td>Externship</td>
<td>Externship II: Pharmacy Technician Externship II</td>
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<td>EXTE</td>
<td>Externship</td>
<td>Externship III: Pharmacy Technician Externship-III</td>
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<td>INFM</td>
<td>Informatics</td>
<td>Informatics – I : Computers Basics</td>
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<td>Informatics</td>
<td>Informatics II : Pharmacy Software</td>
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<td>Language (English/French/Portuguese) – I</td>
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<td>LANG (ENGL/ FREN/ PORT)</td>
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<td>Language (English/French/Portuguese) – II</td>
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<td>MANG</td>
<td>Management</td>
<td>Management I : General Management</td>
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<td>MANG / MARK</td>
<td>Management</td>
<td>Management II : Pharmaceutical Marketing</td>
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<tr>
<td>MANG/LOGM</td>
<td>Management</td>
<td>Management III : Pharmaceutical Logistics Management (Logistic Management of Drugs)</td>
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<td>MANG/MAHS</td>
<td>Management</td>
<td>Management IV : Health Services Management</td>
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<td>MANG/AMWR</td>
<td>Management</td>
<td>Management V : Administrative/Business Writing</td>
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<td>Mathematics I : Basic Mathematics</td>
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<td>Mathematics</td>
<td>Mathematics II : Applied Mathematics (in Pharmacy)</td>
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<td>MEDE</td>
<td>Medicine</td>
<td>Medicine : First Aid / Emergency Medical Intervention/Emergency Medical Response</td>
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<td>NURS</td>
<td>Nursing</td>
<td>Nursing Care</td>
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<td>NUTR</td>
<td>Nutrition</td>
<td>Nutrition : Nutrition and Dietetics</td>
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<td>PATH</td>
<td>Pathophysiology</td>
<td>Pathophysiology: Medical &amp; Surgical Pathophysiology/Semiology</td>
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</table>
Courses for the Harmonized Pharmacy Technician Training Programme

<table>
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<tr>
<th>Course Code</th>
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<tr>
<td>PHAR 1361</td>
<td>Pharmacy</td>
<td>Pharmacy I: Introduction to the Pharmacy profession</td>
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<tr>
<td>PHAR / CALP 3345</td>
<td>Pharmacy</td>
<td>Pharmacie II : Pharmaceutical Calculations</td>
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<td>PHAR / METR 3355</td>
<td>Pharmacy</td>
<td>Pharmacy III : Metrology</td>
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<td>PHAR / PCOM 3385</td>
<td>Pharmacy</td>
<td>Pharmacy IV : Community Pharmacy</td>
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<td>PHAR / PHOS 3365</td>
<td>Pharmacy</td>
<td>Pharmacy V: Hospital Pharmacy</td>
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<td>PHAR / PINS 3375</td>
<td>Pharmacy</td>
<td>Pharmacy VI : Institutional Pharmacy</td>
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<td>PHAR / PLEG 3336</td>
<td>Pharmacy</td>
<td>Pharmacy VII : Pharmacy Legislation (Pharmacy Law)</td>
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<tr>
<td>PHCG 2344</td>
<td>Pharmacognosy</td>
<td>Pharmacognosy</td>
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<td>PHCO 2333</td>
<td>Pharmacology</td>
<td>Pharmacology I : General Pharmacology</td>
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<td>PHCO 2334</td>
<td>Pharmacology</td>
<td>Pharmacology II : Systemic Pharmacology I</td>
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<td>Pharmacology</td>
<td>Pharmacology III : Systemic Pharmacology II</td>
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<td>PHCT 2343</td>
<td>Pharmaceutics</td>
<td>Pharmaceutics I: Pharmaceutics/Pharmaceutical Technology (Galenic Pharmacy)-I</td>
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<td>PHCT 3346</td>
<td>Pharmaceutics</td>
<td>Pharmaceutics II: Pharmaceutics/Pharmaceutical Technology (Galenic Pharmacy)-II</td>
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<td>PUBH 1691</td>
<td>Public Health</td>
<td>Public Health I : Environmental Health</td>
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<td>PHYS 1231</td>
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<td>Research</td>
<td>Research : Introduction to Research-I</td>
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<td>Statistics</td>
<td>Statistics: Introduction to Biostatistics</td>
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<td>TECH 1252</td>
<td>Technology</td>
<td>Technology : Laboratory Technology</td>
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<tr>
<td>TXCL 2353</td>
<td>Toxicology</td>
<td>Toxicology: General Toxicology</td>
</tr>
</tbody>
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VIII:
PHARMACY TECHNICIAN TRAINING COURSES
Courses Sequencing and their Assigned Credits
per Academic Term
# Courses and their Assigned Credits: Harmonized Pharmacy Technician Training Programme

<table>
<thead>
<tr>
<th>FIRST YEAR (1st Semester, S1)</th>
<th>Teaching Method</th>
<th>Student</th>
<th>Total Workload</th>
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<td></td>
<td>Lectures</td>
<td>Practicals</td>
<td>Tutorials</td>
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Courses and their Assigned Credits: Harmonized Pharmacy Technician Training Programme

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Courses and their Assigned Credits: Harmonized Pharmacy Technician Training Programme

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**PART IX:**
**GLOSSARY**

**AHM:** *Assemblies of Health Ministers*, the gathering of Health Ministers of ECOWAS member countries and including WAHO’s partners which serves as the forum whereby (e.g.) actions, proposals or resolutions from WAHO are censored, adopted and eventually approved.

**A.S. (Degree):** Associate of Science (A.S.) Degree for Pharmacy Technicians is the academic qualification awarded to one who has successfully completed a Pharmacy technician training in an Anglophone ECOWAS Country, pursuant to provisions of this curriculum.

**BAC Sc:** *Baccalauréat Scientifique* (Fr), this is an academic qualification (a diploma/certificate) which is awarded to students at the end of their high/actually senior secondary school (called *lycée* in French) studies and which serves most usually as the principally required document for admission to university studies in France and France-colonized or Francophone countries. Differentiated from the other types or series (*Série* or *Streams*, as referred to in French) such as the *Série économique et sociale* (ES), *Série littéraire* (L) and *baccalauréat technologique* of Baccalauréat général (General Baccalaureat) for respectively *Economics* and *Social sciences, Literature* and *Technology*, this is awarded to students who, as of the penultimate year of their high school studies, choose and pass science subjects such as Mathematics, Physics, Chemistry and Biology or, where required or available, engineering science subjects. Moreover, depending the discipline undertaken or chosen during their university degree studies, this qualification plus 3 - 4 years (i.e. **Bac + 3 - 4 years**) of successful studies thereafter earns the student an academic qualification that is equivalent to Anglophone countries' undergraduate (i.e. Bachelor's) degree. Or the **BAC + a qualification** of a duration of 4 - 5 years will award the student a Master's degree whereas that of (i.e. **Bac +**) a duration of at least 6 years qualifies the student for receipt of a professional Doctorate (e.g. Doctor of Pharmacy, PharmD.) degree.

**CR:** *Credit Hour*, also CH., the unit by and in which academic engagement (contact hours of lectures) is gauged. Practically, 20 contact hours of lecture time equals one credit.

**PO:** *Professional Officer*, of WAHO employee-categories, head of a program ranking above an “M” category but below a director level.

**SSSC:** Senior Secondary School (Examination) Certificate. In Anglophone ECOWAS Countries, this is a high school-leaving academic qualification that is awarded to students who sit and successfully pass the West African Senior School Certificate Examination (WASSCE) - *q.v. WASSCE* below.

**STF:** *Sous totale formateur* (Fr), Subtotal of grade points by the trainer.

**TD:** Travaux dirigés (Fr), Tutorials.

**TP:** Travaux pratiques (Fr), Practicals.

**TPA:** Travail personnels de l’apprenant/de l’auditeur (Fr.), Student's input.

**UE:** Unité d’enseignement (Fr), Teaching Unit.

**VHT:** Volume horaire totale (Fr), Total credits.
WAHO: *West African Health Organization*, founded from the merger of erstwhile two West African subregional health organisations (i.e. Anglophone ECOWAS countries' WAHC and Francophone ECOWAS countries' OCCGE), this is the specialized institution of ECOWAS that is concerned with harmonisation of all aspects of health (e.g. harmonisation of curricula for and accreditation of training programmes of all categories of health professionals, harmonisation of codes of ethics and of regulations for the practice of all categories of health professionals, harmonisation of health policies, facilitating the enhancement of national healthcare services, etc.) within said community.

WASSCE: *West African Senior Secondary School Certificate Examination* (Certificate), this is a high school-leaving academic qualification that is awarded to students who sit and successfully pass the *West African Senior School Certificate Examination* (WASSCE), itself a standardized examination administered by the West African Examinations Council (WAEC) to senior high/secondary school students and is a compulsory required qualification for admission to universities in Anglophone West Africa. This certificate can be given upon completion of anyone of the only two types of the exams - namely the November/December-administered one which was formerly referred to as the General Certificate Examinations (GCE) or the May/June-administered WASSCE which is otherwise known as the Senior School Certificate Examinations (SSCE). Thus, in value or recognition, the West African Senior Secondary School Exam Certificate (WASSCE/WASSEC) is the same as the SSSC.
APPENDIX

Appendix i: References

i. Hard Copies*


Family Health Magazine - PHARMACY CARE


*Those made available at time of meeting.

ii. Online References

British Columbia Pharmacy Technician Programme

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Appendix ii:
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