Republika ng Pilipinas
(Republic of the Philippines)
MINISTRI NG EDUKASYON, KULTURA AT ISPORTS
(MINISTRY OF EDUCATION, CULTURE AND SPORTS)
Maynila

August 22, 1985

MECS O R D E R
No. 51, s. 1985

POLICIES AND STANDARDS FOR PHARMACY EDUCATION

To: Bureau Directors
Regional Directors
Presidents, State Colleges and Universities
Heads of Private Schools, Colleges and Universities
Deans, Colleges of Pharmacy

1. The inclosed policies and standards, approved by this Office upon the recommendation of the Bureau of Higher Education after consultation with representatives from the Philippine Association of Colleges of Pharmacy (PACOP), the Board of Pharmacy, the Professional Regulation Commission (PRC), and the Philippine Pharmaceutical Association, is in support of the New Four-Year Curriculum in Pharmacy Education as embodied in MECS Order No. 34, s. 1984.

2. This set of policies and standards embodies the general principles and guidelines for the establishment and operation of pharmacy education institutions and the revised pharmacy curriculum which took effect first semester, SY 1984-1985.

3. In order to make pharmacy education responsive to the demands of a changing society and the search for a national identity, each pharmacy education institution should have a built-in mechanism for a continuous self-assessment of its instructional, research and extension service capabilities and program thrusts.

4. Every pharmacy education institution should give these policies and standards the widest publicity possible among the academic community and its clientele.

5. This Order supersedes all existing rules and standards related to pharmacy education.

6. Compliance with these policies and standards by all concerned is requested.

(SGD) JAIME C. LAYA
Minister

Incl.:
As stated
Reference:
MEC Order: (No. 34, s. 1984)
Allotment: 1--(D.O. 1-76)
To be indicated in the Perpetual Index under the following subjects:
CHANGE
Course of Study, COLLEGIATE
CURRICULUM
POLICY
SOCIETY or ASSOCIATIONS

POLICIES AND STANDARDS FOR PHARMACY EDUCATION

The following policies and guidelines shall govern the operation of pharmaceutical education programs in colleges and universities of the Philippines.

Article I

Authorization

SECTION 1. Only schools, colleges and universities duly authorized by the Ministry of Education, Culture and Sports shall operate the pharmacy education courses.

SECTION 2. All curricular programs in pharmacy education must have prior authorization from the Ministry of Education, Culture and Sports.

SECTION 3. The policies and standards are herein prescribed for all colleges of pharmacy duly authorized/recognized by the Ministry of Education, Culture and Sports.

Article II

Mission Statement

SECTION 1. The main concern of pharmacy education is to provide the country with pharmacists who are scientifically competent to deliver the full spectrum of pharmaceutical services required in health care delivery.

SECTION 2. At the end of the course the student should have:

2.1 acquired and developed the knowledge and competencies in scientific research methods and processes, and in the development, formulation and utilization of drugs for the prevention, diagnosis and treatment of diseases of man and animals;

2.2 developed the skills in identifying, analyzing, compounding, dispensing, manufacturing and storage of drugs and their dosage forms;

2.3 acquired and developed the knowledge, attitude and skills necessary to contribute to the overall social, mental and physical health of the community and the country.

Article III

Administration

SECTION 1. The pharmacy school or college shall administered by a full-time dean with the following qualifications:

1.1 a Filipino citizen;
1.2 a registered pharmacist in the Philippines;
1.3 a holder of at least the Master of Science in pharmacy degree;
1.4 has at least three (3) years of competent teaching experience and supervision in pharmacy.

SECTION 2. The general function and responsibilities of the Dean of Pharmacy are:

2.1 To assist the school head in the attainment of institutional goals of instruction, research, and community extension services, and in all matters affecting the general policies of the institution;

2.2 To exercise educational leadership among his faculty by:

a) initiating programs for curriculum development;

b) initiating and instituting a faculty development program;

c) recommending appointment, promotion, teaching load, or separation of faculty members in his college;

2.3 To assign and orient the faculty to act as advisers to students in their program of studies and to approve their subject load;

2.4 To supervise, coordinate, and consult with heads of students' personnel services, particularly regarding the admission of students in accordance with the prescribed criteria on selection, admission, promotion and retention of students in the pharmacy program;

2.5 To help formulate policies in his department and to recommend necessary rules and regulations for their effective implementation;

2.6 To institute a definite program of supervision in order to raise the efficiency of instruction; e.g., evaluation of instructional materials, strategies, facilities and equipment;

2.7 To exercise supervision over all activities, curricular and co-curricular, of his department in coordination with other officials concerned;

2.8 To assume total responsibility for implementing the requirements for graduation;

2.9 To recommend the acquisition of necessary equipment, facilities, and supplies.

Article IV

Faculty

SECTION 1. The faculty must have the academic preparation appropriate to their teaching assignment, They must:

1.1 Be holders of a Master's degree in their major field and/or allied subjects, and must have credentials on file and available when called for;

1.2 Show evidence of competence in teaching their field of specialization;

1.3 Have at least one year of satisfactory teaching experience and /or efficient performance in the practice of the profession;

1.4 Be registered pharmacists in the Philippines;

1.5 Be active member of accredited scientific and professional organizations.

SECTION 2. When vacancies occur in the teaching force of the college during the school year, substitute or replacement with the same required or higher qualifications should be employed.

SECTION 3. The following conditions of employment should be observed:

3.1 The remuneration of the faculty, as a general rule shall be commensurate with their rank, academic preparation, experience in teaching and research, and comparable with others who teach baccalaureate courses. Salaries must be paid in full on regular basis and on time. No salary shall be paid on the basis of class enrolment or in the form of shares of stocks.

3.2 Probitionary period of not more than three (3) years shall be required of full-time faculty, Faculty members who have successfully passed their probationary period shall be considered permanent.

3.3 At least sixty percent (60%) of the pharmacy education courses shall be taught by full-time instructors except for highly technical or specialized courses, with prior approval of the Ministry of Education, Culture and Sports.

SECTION 4. The faculty, through its faculty ranking system, shall be assigned academic ranks in accordance with their academic training and scholarly maturity. The usually recorgnized ranks are: instructor, assistant professor, associate professor and professor.

4.1 The ranking criteria are based on:

a) Training
b) Experience
c) Efficiency
d) Productive scholarship
e) Character and personality
f) Research
g) Teaching competence

4.2 The qualifications for each rank are:

a) Professor

1) Training - Doctor's degree (Ph.D. or equivalent);

2) Teaching competence - outstanding;

3) Experience - Eight or more years related to teaching of a highly specialized nature;

4) Efficiency - Evidence of successful work in position held, past or present;

5) Research - Research interests (completed/ on-going);

6) Productive Scholarship - Publications/ Manuscripts/studies made;

7) Character and personality - Good moral character and personality.

b) Associate Professor

1) Training - Doctor's degree preferred, but at least a Master's degree

2) Teaching competence - Very satisfactory;

3) Experience - Five to seven years related to teaching of a highly specialized nature;

4) Efficiency - Evidence of successful work in position held, past or present;

5) Research - Research interests (completed/ on-going);

6) Productive Scholarship - Publications/ Manuscripts/studies made;

7) Character and Personality - Good moral character and personality.

c) Assistant Professor

1) Training - Doctor's degree preferred, but at least a Master's degree;

2) Teaching competence - Very satisfactory;

3) Experience - Two to four years related to educational work and/or in profession related to teaching;

4) Efficiency - Evidence of successful work in position held, past or present;

5) Research - Research interests (completed/ on-going);

6) Productive Scholarship - Publications/ Manuscripts/studies made;

7) Character and personality - Good moral character and personality.

d) Instructor

1) Training - Master's degree;

2) Experience - At least one yeqr in pharmacy practice;

3) Character and personality - Good moral character and personality.

SECTION 5. As a general rule, a new member of the faculty begins as instructor, and is subsequently promoted, if deserving. However, a faculty member may be employed/appointed with the rank of assistant professor if warranted by his qualifications.

SECTION 6. For effective operation of the college/school, a faculty development program shall be established for the improvement or development of the profession. This program may be carried out by:

6.1 Awarding an annual scholarship grant to a deserving full-time permanent faculty member for a year of graduate study in his major field;

6.2 Providing incentives for study towards the Doctoral degree by giving at least a 30% reduction in tuition fee, if the university offers the Doctoral program or through other forms of assistance;

6.3 Allowing attendance/participation in seminars, conferences, and other in-service training programs on official time.

SECTION 7. The teaching load of the college faculty shall be as follows:

7.1 The teaching load of deans should not exceed twelve (12) hours of lecture per week;

7.2 For faculty members, the regular full-time teaching load shall be a minimum of 15 hours/week or its equivalent of 30 hours for laboratory courses;

7.3 Government employees who serve as part-time instructors may be given a maximum teaching load of 12 units;

7.4 Part-time instructors employed elsewhere may carry a total load of not more than 15 units in all the schools where they teach.

Article V

Curriculum
(See attached)

SECTION 1. The minimum requirements for the Bachelor of Science in Pharmacy curriculum is flexible and may be ammended or revised subject to the approval of the Ministry of Education, Culture and Sports;

SECTION 2. The revised four-year B.S. Pharmacy curriculum shall be used by colleges/universities with government authority/recognition to operate the pharmacy education program.

Article VI

Instructional Standards

SECTION 1. The institution must maintain a high standard of instruction, utilizing appropriate and updated syllabi and instructional procedures which contribute to sound pharmacy education. A system of supervision should be instituted and implemented for the purpose of evaluating teaching competence.

SECTION 2. The institution must have a competent instructional staff of good moral character classified into various professional ranks on the basis of academic and intellectual qualifications.

SECTION 3. The institution shall provide for a systematic and continuing plan of evaluation of student's progress through a marking system that if consistent and congruent to the objectives set up by the College/University.

SECTION 4. The pharmacy curricular program may adopt any textbook which is of fairly recent edition and which reflects current trends in the pharmacy profession and which does not violate Philippine Laws. Adopted basic textbooks may be changed only once in every three (3) years.

SECTION 5. The Dean should see to it that the students are provided with the necessary textbooks and instructional materials. If the students cannot acquire said textbooks, the deans should make arrangement with the administration so that sufficient textbooks may be place in the library for student's use.

SECTION 6. Variety of teaching strategies appropriate to particular situations must be utilized.

SECTION 7. The Ministry of Education, Culture and Sports does not issue specific requirements for promotion of students, except that no student should be given credit for the completion of a course unless he/she has fulfilled the requirements for entrance/admission, as attended classes faithfully and regularly, and acquired reasonable proficiency in each subject. The promotional records should be kept in the school within the following semester, for examination in case of any grievance or complaint.

SECTION 8. The ratio of faculty to students in science laboratory classes should be a maximum of 1:35.

SECTION 9. Evaluation must be an integral part of the teaching-learning process and the students informed of results. A variety of test and measurements methods must be utilized.

SECTION 10. In the internship training program (required preparatory th the board exam) where the student develops professional pharmacy skills by a systematic application of scientific knowledge to actual life situations in the communities, hospitals and industried, the following conditions should be considered:

10.1 There must be a close correlation of theoretical knowledge to the internship training program;

10.2 The internship training program should be organized around the objectives of the pharmacy curriculum;

10.3 In determining the adequacy and effectivity of the training program, the following factors must be considered:

a) background knowledge, skills and attitudes of the students in the three (3) training areas;

b) hospital, community, industrial affiliation should be accredited by the Bureau of Food and Drug;

c) ratio of students to available and existing facilities in accredited Community, Hospital and Industrial affiliations;

d) student interns must have rendered training for 160 hours in each of the three areas and an additional 480 hours for the chosen areas as their major field.

10.4 There must be a coordinated relationship between the head/chief of community, hospital and industrial affiliations and the dean of the college/school of pharmacy.

Article VII

Library

SECTION 1. Every College/University offering the pharmacy education program should have library resources relevant to general and pharmacy education, adequate in quality and quantity to meet the needs for scholarship and research of faculty and students. It should progressively develop and grow in accordance with the College's/University's development and expansion plans.

SECTION 2. There should be an adequate number of books of the latest edition for the professional pharmacy subjects.

SECTION 3. There should be adequate subscription to scientific and pharmaceutical journals as well as periodicals for different subject disciplines.

SECTION 4. The library collection should include the latest editions of official compendia like the United States Pharmacopeia (USP), National Formulary (NF), Remington's Pharmaceutical Sciences (RPS), the Philippine National Formulary (PNF), Asian Pharmacopeia, and Philippine Pharmacopeia.

SECTION 5. The quantity of books and reference materials in the library should be in proportion to the enrolment and be responsive to the needs of the students.

SECTION 6. The library should provide adequate reading space in proportion to the student population.

Article VIII

Research

SECTION 1. The college/university must encourage and support research activities in the field of pharmacy and comply a competent and qualified research staff.

SECTION 2. Faculty members assigned to do research activities shall be credited with an equivalent teaching load for time engaged in research activities.

SECTION 3. The institution should encourage and support research among its students and faculty members for the improvement of the pharmacy profession.

Article IX

Laboratory Facilities

SECTION 1. The curriculum offered by the school concerned is the main determining factor in the design and construction of its physical and plant facilities.

SECTION 2. The school/college of pharmacy should provide lecture and laboratory rooms, facilities, materials and equipment that are adequate not only for instructional and experimental work but also for researches.

2.1 There should be adequate equipment, facilities and materials for the particular laboratory science courses it offers;

2.2 Adequate space to accommodate the largest class using the laboratory room should be provided;

2.3 Laboratory work should be conducted in laboratory rooms designed purposely for particular science courses;

2.4 There should be safe storage area for laboratory supplies and materials;

2.5 There should be provision for the safety from injury of students and faculty, as well as the school and its property, from the hazards of fire and other accidents.

SECTION 3. The efficiency of laboratory instruction is determined not on mere possession of laboratory space, equipment and materials but on the basis of their adequacy and quality, their productive use, and the interests, competencies, and alertness of the instructional and research staff of the institution to scientific progress.

3.1 Laboratory rooms should:

a) be well-lighted, well-ventilated, provided with accessible safety devices and first aid facilities, and with two exits;

b) have adequate working and free spaces for the convenience of students;

c) have a minimum floor space of one (1) meter per 1-2 students;

d) provide one (1) locker per 1-4 students.

3.2 Separate laboratories for the physical and biological sciences should be provided.

3.3 Facilities in the science laboratory should include:

a) a continuous and adequate supply of water and gas;

b) safety, emergency, and first aid devises, such as: fire extinguisher and first aid kit/cabinet that are available and easily accessible, and emergency shower.

3.4 Equipment and supply should:

a) be adequate for each laboratory course, based on the types and number of students;

b) be in good working order at all times;

c) include other teaching aids as needed for efficient instruction in the laboratory.

3.5 Experiments to be performed in a given laboratory subject should:

a) be adequate in scope to cover the concepts and theories to be taught and learned;

b) emphasize investigation and inquiry;

c) be so designed as to be undertaken by the students with the minimum of instruction from the teacher.

3.6 Laboratory table tops should be acid-resistant.

SECTION 4. Specific laboratories and equipment for the following laboratory science courses should be provided:

4.1 Physics

4.2 Chemistry courses:

a) General Chemistry

b) Analytical Chemistry: qualitative, quantitative, and Testing and Assaying

c) Organic Chemistry

d) Biochemistry

e) Physical Chemistry

Equipment for chemistry laboratories should include:

a) 10 analytical balances for a group of 20 students at one time

b) 1 weighing scale per 5-10 students

c) 1 thin layer chromatograph

d) fume hood/exhaust system

4.3 The Biological Sciences:

a) Botany

b) Zoology

c) Physiology and Pharmacology

d) Microbiology

Equipment for biological science laboratories should include:

a) 10 microspopes for a class of 40 at one time

b) sterilizer

c) centrifuge

d) refrigerator

e) incubator

4.4 The Pharmaceutical Sciences:

a) Pharmaceutical Technology

b) Physical Pharmacy

c) General Pharmacy

d) Compounding and Dispensing

e) Manufacturing Pharmacy

f) Plant Chemistry

g) Toxicology

h) Pharmacognosy

i) Pharmacology

j) Pharmaceutical Dosage Forms

k) Drug Assay and Quality Control

Equipment for pharmaceutical science laboratories should include:

a) 1 prescription balance per 15 students

b) 1 rough balance per 15 students

c) for Manufacturing pharmacy - tablet machine, ampule filler or equivalent pH meter, spectrophotometer calipher, refractometer, polarimeter

4.5 Research - Equipment include those listed above.

SECTION 5. Provision should be made for maintaining live plants and animals and for the study of microorganisms.

5.1 Special equipment should be provided for the techniques utilized in microbiology.

5.2 Adequate space should be provided in the school campus for botanical/medicinal gardens, including a green house, if possible.

5.3 Facilities for housing laboratory animals should be available, maintain sanitary and aesthetic conditions in the areas provided for this purpose.

Article X

Admission, selection, and Retention of Students

SECTION 1. The applicant for admission to a degree course in Pharmacy must:

1.1 Have graduated from a general secondary course authorized by the government.

1.2 Have passed the NCEE.

1.3 Have satisfactorily complied with the admission requirements of the school.

1.4 Never have been convicted or found guilty or any misconduct involving moral character.

SECTION 2. As a general rule, no applicant shall be enrolled in the pharmacy course unless he presents the required school credentials before the end of the enrollment period.

SECTION 3. Requirements for the admission, selection and retention of students shall be determined by the Dean or by the Committee on Admissions.

Article XI

Graduation of Students

SECTION 1. The candidate for graduation must:

1.1 Complete all the required number of units in the Pharmacy curriculum as prescribed by the institution where he/she is enrolled;

1.2 Have had, immediately preceding graduation, a minimum residence of one year, with an academic load of not less than 30 units in the college from where the student is graduating;

1.3 Comply with other graduation requirements prescribed by the institution.

Article XII

Accreditation Standards for Pharmacy Internship

SECTION 1. To qualify for the board examination in pharmacy, a candidate shall have completed an internship program consisting of at least nine hundred sixty (960) hours, one-half of which shall be spent equally distributed in a prescription pharmacy, a pharmaceutical manufacturing laboratory, and a hospital pharmacy duly accredited by the Council of Pharmaceutical Education for purposes of pharmacy internship, and the rest of the hours of internship in any or all of the said establishments at the choice of the candidate.

SECTION 2. The pharmacy internship program in the three areas shall be served by the interns under the supervision of registered pharmacists.

2.1 The community drugstore for internship in pharmacy must:

a) have been in operation for at least five (5) years;

b) show evidence of meeting the minimum requirements of the Bureau of Food and Drug for opening a drugstore;

c) be managed by a registered pharmacist who grows in the profession through continuing education.

2.2 The manufacturing pharmacy laboratory must:

a) be registered with the Bureau of Food and Drug with the appropriate licence to operate (LTO);

b) have continuity of operation;

c) have varied product line;

d) have adopted the principles of good manufacturing practice (GMP);

e) have an accredited quality control laboratory;

f) be accessibly located;

g) be amenable to participate in the internship program.

2.3 Hospital pharmacy internship shall be conducted in hospitals accredited by the Ministry of Health and in which the educational benefits to the intern are considered of paramount importance in relation to the service benefits which the hospital may obtain from the interns.

2.3.1 The pharmacy service/department shall:

a) comply with the requirements of the Ministry of Health standards for licensure of hospitals under R.A. 4226 as approved by the Bureau of Food and Drug;

b) have at least one legally qualified pharmacist for a maximum of three (3) interns;

c) be adequately staffed so that the intern's time will not be utilized for non-professional duties;

d) provide services in the following pharmaceutical practice:

d.1 administration with standard operating p procedures;

d.2 in-patient and general dispensing;

d.3 out-patient dispensing;

d.4 manufacturing;

d.5 preparation of sterile pharmaceuticals;

d.6 drug information;

d.7 narcotic control.

e) have adequate library facilities for information on drugs.

2.3.2 The pharmacist-in-charge must have at least one year experience as hospital pharmacist, or earned at least three (3) unit credits of hospital pharmacy.

REPUBLIKA NG PILIPINAS
Ministri ng Edukasyon at Kultura
KAWANIHAN NG LALONG MATAAS NA EDUKASYON
(Bureau of Higher Education)
M a y n i l a

July 5, 1984

MECS C R D E P
No. 34, s.1984

THE NEW FOUR-YEAR CURRICULUM IN PHARMACY LEADING TO THE DEGREE OF BACHELOR OF SCIENCE IN PHARMACY (B.S.Phar.)

To: Bureau Directors
Regional Directors
Presidents, State Colleges and Universities
Heads of Private Schools, Colleges and Universities

1. Presidential Decree No. 1926, amending Republic Act No. 5921, calls for the reduction of the length of existing Bachelor of Science in Pharmacy (B.S.Phar.) course from five (5) to four (4) years.

2. The inclosed curriculum for the new four-year course leading to the degree of Bachelor of Science in Pharmacy (B.S.Phar.) jointly prepared in line with the mandate of law by representatives of the Philippine Association of Colleges of Pharmacy, the Board of Pharmacy, the Philippine Pharmaceutical Association, and the Bureau of Higher Education, MECS, has been approved by this Office for implementation as follows:

1984-85 - First Year;
1985-86 - First and Second Years;
1986-87 - First to Third Years; and
1987-88 - First to Fourth Years.

3. Students who are classified as First Year during the SY 1984-85 shall be allowed to follow the new four-year curriculum. Internship shall be maintained as a pre-requisite for Board Examination and should be taken either within the prescribed four-year period as suggested in the inclosed curriculum or after the fourth year but prior to Board Examination at the option of the school and/or student.

4. The colleges and universities with government authority or recognition to offer the five (5) year Bachelor of Science in Pharmacy course shall use the same authority extended to them without the need for new application.

5. All institutions offering the Bachelor of Science in Pharmacy course are encouraged to follow up the 170 curricular-unit requirements as approved through the inclosed curriculum. Any additional internal requirements to satisfy institutional philosophy and program thrusts should be taken up with the MECS for proper adjustments and approval. The adoption by a school of the approved curriculum as prescribed through this Order will not require further approval by the MECS.

6. The cooperation of all concerned is enjoined.

(SGD.) JAIME C. LAYA
Minister

Incl.: As stated

Reference:
B.Pr.S. Circular No. 7, s. 1961

Allotment: 1-3-4-- (0.0.1-76)

To be indicated in the Perpetual Index under the following subjects:

Course of Study, COLLEGIATE
CURRICULUM
LEGISLATION

FOUR-YEAR CURRICULUM LEADING TO THE DEGREE
BACHELOR OF SCIENCE IN PHARMACY (B.S.P.)
(EFFECTIVE WITH THE FIRST YEAR, 1984-1985)

FIRST SEMESTER

Subjects	Hours Lec.	Lab.	Units
FIRST YEAR			
Eng. 1-Lstg./Rdg./Wrtg. Skills I	3		3
Math 1-College Algebra	3		3
Soc.Sci.1-Gen.Psycho.	3		3
Sci.1-Gen& Inorg.Chem	3	6	5
Sci.2-Gen.Bot.w/Taxon.	2	6	4
Spanish 1-Elem.Spanish	3		3
Phar.1-Orient.in Phar.	1		1
P.E. 1	(1)		(1)
ROTC	(1.5)		(1.5)
			22
SECOND YEAR			
Eng.3-Eff.Wrtg.&Spkg. Skills	3		3
Math 3-Biostatistics	2		2
Spanish 3-Adv.Spanish	3		3
Sci.3-Gen.Phys.w/Energy	3	6	5
Bio.Sci2-HumAnat. & Physio.w/Fam.Plng.	3	3	4
Phys-Scil-Org.Chem.	3	6	5
P.E.	(1)		(1)
ROTC	(1.5)		(1.5)
			22
THIRD YEAR			
Soc-Sci.3-Socio Anthropo.	3		3
Phar.Bio.Sci.1a-Pharmacog.	2	3	3
Phar.Bio.Sci.2a-Pharmacol.and Therap.	3		3
Phar.Chem.2-Chem. & Phar. of Org.Med.	2	3	3
Phar.Chem.3-Quant.Chem. Anal.& Food & Drug Assay w/Instr.	3	6	5
Phy.Sci.2-Phys.Chem.	3	3	4
			21

SECOND SEMESTER

Subjects	Hours Lec.	Lab.	Units
FIRST YEAR			
Eng.2-Lstg./Rdg./Wrtg. Skills 2	3		3
Math 2-Trigonometry	3		3
Spanish 2-Int.Spanish	3		3
Bio.Scil-Gen.Zoology	3	6	5
Phar.2-Pharm'l.Tech. & Calc.	2	3	3
Phar.Chem.1-Chem. & Phar. of Inorg.Med.w/Qual. Chm.Anal.	3	6	5
P.E. 2	(1)		(1)
ROTC	(1.5)		(1.5)
			22
SECOND YEAR			
Eng.4-Survey of Phil. Lit.	3		3
Math 4-Intro.to Calculus	3		3
Soc.Sci.2-Phil.History and Public Service	3		3
Spanish 4-Selected Wrtgs.	3		3
Bio.Sci3-Biochemistry	3	6	5
Phar.3-Pharm'l. Dosage Forms	3	3	4
P.E. 4	(1)		(1)
ROTC	(1.5)		(1.5)
			21
THIRD YEAR			
Soc.Sci.4-Phil.Gov't. & The New Const.	3		3
Phar.Bio.Sci. 1b-Pharmacog.w/Phil. Med.Plants	2	3	3
Phar.Bio.Sci.2b-Pharmacol. and Clin.Phar.	2	3	3
Phar.4-Phys. Phar.	2	3	3
Phar.5-Mfg.Phar. & Drug & Cosmetic Qual. Control	2	6	4
Phar.6-Hospital Phar.	2	3	3
Phar.7-Hist. of Phar.	1		1
			20

FOURTH YEAR

Phar.Ad.1-Phar.Juris & Ethics	2		2
Phar.Chem.4-Plant Chem.	2	3	3
Phar.Chem.5-Toxicology	2	3	3
Bio.Sci.4-Microbio. & Parasitology	2	6	4
Research and Thesis Wrtg.	1	6	3
Pil.1-Lstg./Rdg./Wrtg./ Skills	3		3
Soc.Sci.5-Rizal's Life and Wrtgs.	3		3
			21

Computer Science	2	3	3
Soc.Sci.6-Tax & Agr.Ref. w/ Current Issues & Nat. Dev.	3		3
Phar.8-Presc.Cpdg.,Disp. & Incomp.	3	3	4
Phar.Ad.2-Phar.Accounting	1		1
Phar.Ad.3-Phar.Eco. & Adm.	2		2
Phar.Bio.Sci.3-Pub.Health & Com. Dev.	1	3	2
Hum.1-Art Appreciation	3		3
Pil.2-Themes in Pil.Lit.	3		3
			21

Suggested Internship Schedule:

Summer after the second year . . . . . 320 Hrs. - Community Pharmacy

First semester break of the third year . . . 160 Hrs. - Community Pharmacy

Summer after the third year . . . . . 160 Hrs. - Manufacturing Pharmacy
160 Hrs. - Hospital Pharmacy

First semester break of the fourth year . . . . . 160 Hrs. - Community Pharmacy

Four-Year Curriculum Leading to the Degree Bachelor of Science in Pharmacy (B.S.P.)

Course Requirements

Summary:

I.	General Education Courses	74 units
II.	Other Required Science and Mathematics Courses	32 "
III.	Pharmaceutical and Applied Science Courses	61 "
IV.	Undergraduate Research	3 "
	T O T A L	170 units

I. General Education Courses (excluding 4 units Phys.Ed.) . . . . . 74 units

A. Language and Literature . . . . . 30 units

1. English . . . . . 12 units

Eng. 1 - Lstg./Rdg./Wrtg.Skills 1 . . . . 3 units
Eng. 2 - Lstg./Rdg./Wrtg.Skills 2 . . . . 3 "
Eng. 3 - Effective Wrtg. & Spkg.Skills. . 3 "
Eng. 4 - Survey of Phil. Lit. . . . . 3 "

2. Pilipino . . . . . 6 units

Pil. 1 - Lstg./Rdg./Wrtg.Skills . . . . . 3 units
Pil. 2 - Themes in Pil. Lit. . . . . 3 "

3. Spanish . . . . . 12 units

Spanish 1 - Elem. Spanish . . . . . 3 units
Spanish 2 - Int. Spanish . . . . . 3 "
Spanish 3 - Adv. Spanish . . . . . 3 "
Spanish 4 - Selected Wrtgs . . . . . 3 "

B. Natural Sciences and Mathematics . . . . . 23 units

1. Physical and Sciences . . . . . 14 units

Sci. 1 - Gen. & Inorg. Chem. . . . . 5 units
(9 hrs.; 3 lec., 6 lab.)
Sci. 2 - General Botany with Taxonomy. 4 "
(8 hrs.; 2 lec.; 6 lab.)
Sci. 3 - Gen. Physics w/ Energy . . . 5 "
(9 hrs.; 3 lec.; 6 lab.)

2. Mathematics . . . . . 6 units

Math 1 - College Algebra . . . . . 3 units
Math 2 - Trigonometry . . . . . 3 "

3. Computer Science . . . . . 3 units
(5 hrs.; 2 lec.; 3 lab.)

C. Social Science . . . . . 18 units

Soc. Sci. 1 - General Psychology . . . . . 3 units
Soc. Sci. 2 - Pol. Govt. & Pub. Service . . . . . 3 "
Soc. Sci. 3 - Socio-Anthropology . . . . . 3 "
Soc. Sci. 4 - Phil. Constitution & the New Const. . . 3 "
Soc. Sci. 5 - Rizal's Life & Wrtgs. . . . . 3 "
Soc. Sci. 6 - Tax & Agr. Reform w/Current Issues & Nat. Dev. . . . . 3 "

D. Humanities - Art. Appreciation . . . . . 3 units

E. Physical Education/ROTC . . . . . 4 units/(6) units

Physical Education 1 / ROTC . . . . . .1 unit/1.5 units
Physcial Education 2/ROTC . . . . . .1 " /1.5 "
Physical Education 3/ROTC . . . . . .1 " /1.5 "
Physical Education 4/ROTC . . . . . .1 " /1.5 "

II. Other Required Science and Mathematics Courses . . . . . 32 units

A. Biological Science . . . . . 13 units

Bio Sci. 1 - General Zoology . . . . . .5 units
(5hrs., 3 lec., 6 lab.)
Bio.Sci 2 - Hum. Anat. & Physio w/ Family Planning . . . . . .4 "
(6 hrs., 3 lec., 3 lab.)
Bio.Sci.3 - Biochemistry . . . . . .5 "
(9 hrs., 3 lec., 6 lab.)
Bio Sci 4 - Microbio. & Parasit. . . . . .4 "
(8 hrs., 2 lec., 6 lab.)

B. Physical Sciences . . . . . 9 units

Phys. Sci 1 - Organic Chemistry . . . . . 5 units
(9 hrs., 3 lec., 6 lab.)
Phys. Sci. 2- Physical Chemistry . . . . . .4 "
(6 hrs., 3 lec., 3 lab.)

C. Mathematics . . . . . 5 units

Math 3 - Biostatistics . . . . . 2 units
Math 4 - Intro. to Calculus . . . . . 3 "

III. Pharmaceutical and Applied Science Courses . . . . . 61 units

A. Pharmacy . . . . . 23 units

Phar. 1 - Orientation in Pharmacy . . . . . 1 unit
Phar. 2 - Pharm'l. Tech. & Calc. . . . . 3 units
(2 hrs., 2lec., 3 lab.)
Phar. 3 - Pharm'l. Dosage Forms . . . . . 4 "
(6 hrs., 3 lec., 3 lab.)
Phar. 4 - Physical Pharmacy . . . . . 3 "
(5 hrs., 2 lec., 3 lab.)
Phar. 5 - Mfg. Phar. & Drug & Cosmetic Qual. Cont. 4 "
(8 hrs., 2 lec., 6 lab.)
Phar. 6 - Hospital Pharmacy . . . . . 3 "
(5 hrs., 2 lec., 3 lab.)
Phar. 7 - History of Pharmacy . . . . . 1 unit
Phar. 8 - Pres. Upds., Disp. & Incompat . . . . . 4 units
(6 hrs., 3 lec., 3 lab.)

B. Pharmacy Business Administration . . . . . 5 units

Phar. Ad. 1 - Phar. Juris & Ethics . . . . . 2 units
Phar. Ad. 2 - Phar. Accounting . . . . . 1 unit
Phar. Ad. 3 - Phar. Eco. & Adm. . . . . 2 units

C. Pharmaceutical Chemistry . . . . . 19 units

Phar. Chem. 1 - Chem & Phar. of Inorg. Med. w/ Qual. Chem. Anal . . . . . 5 units
(9 hrs., 3 lec., 6 lab.)
Phar. Chem. 2 - Chem. & Phar. of Org. Med. . . . . 3 units
(5 hrs., 2 lec., 3 lab.)
Phar. Chem. 3 - Quant. Chem. Anal. & Food & Drug Assay w/ Instr. . . . . 5 "
(9 hrs., 3 lec., 6 lab.)
Phar. Chem. 4 - Plant Chemistry . . . . . 3 "
(5 hrs., 2 lec., 3 lab.)
Phar. Chem. 5 - Toxicology . . . . . 3 "
(5 hrs., 2 lec., 3 lab.)

D. Pharmaceutical Biological Sciences . . . . . 14 units

Phar. Bio. Sci. 1a - Pharmacognosy . . . . . 3 units
(5 hrs., 2 lec., 3 lab)
Phar. Bio. Sci. 1b - Pharmacog. w/ Phil. Med Plants . . . . . 3 "
(5 hrs., 2 lec., 3 lab.)
Phar. Bio. Sci. 2a - Pharmacol. & Therap. . . . . 3 "
Phar. Bio. Sci. 2b - Pharmacol and Clin.Pharmacy . . 3 "
(5 hrs., 2 lec., 3 lab.)
Phar. Bio. Sci. 3 - Pub. Health & Com. Dev. . . . . 2 "
(4 hrs., 1 lec., 3 lab.)

IV. Research and Thesis Writing . . . . . 3 units
(7 hrs., 1 lec., 6 lab.)

TOTAL . . . . . 170 units

COURSE TITLE AND NO.	COURSE DESCRIPTIVE TITLE	COURSE DESCRIPTION	HOURS/WEEK LEC.	HOURS/WEEK LAB.	CREDIT UNITS
Phar. 6	Hospital Pharmacy	An introductory course which explores basic hospital theory techniques and administrative procedures, and acquaints the student with pharmacy as a hospital department and a patient service unit. Topics covered include: drug distribution systems, extemporaneous and bulk compounding methods, pharmacy policy and procedural manuals, and other contemporary hospital pharmacy issues. Prerequisite: Phar. 5	2	3	3
Phar. 7	History of Pharmacy	The course discusses the origins, evolution, present status and future possibilities of the pharmacy profession, with consideration of the development of chemistry, medicine, and other related disciplines. It includes the historical development of pharmacy in the Philippines, the biographies of leading Filipino pharmacists and chemists, the evolution of drugstores, the history of pharmaceutical education, organizations and institutions, and of herbal medicine in the Philippines.	1		1
Phar. 8	Prescription, Compounding, Dispensing and Incompatibilities	The course provides theoretical and practical knowledge regarding therapeutic regimens and the techniques and judgment aspects of prescription practice, such as the methods and the various phases of compounding and dispensing of prescriptions and the systematic study of incompatibilities Prerequisite: Phar. 3 and 4	3	3	4
<u>Pharmacy Business Administration</u>					
Phar. Ad. 1	Pharmaceutical Jurisprudence and Ethics	The course is designed to acquaint the student with those laws which are applicable to the practice of pharmacy, such as the chapter of the Revised Administrative Code known as Pharmacy Law, Revenue Regulation No. V-38 and other laws related to pharmacy, recently approved by the President of the Philippines.			2

COURSE TITLE AND NO.	COURSE DESCRIPTION TITLE	COURSE DECRIPTION	HOURS/WEEK LEC.	HOURS/WEEK LAB.	CREDIT UNITS
Phar. 1	Orientation in Pharmacy	The course orients the student to pharmaceutical education, to the pharmacy curriculum, and to the profession/practice of pharmacy.	1		1
Phar. 2	Pharmaceutical Technology and Calculations	Prescription interpretation, including words and symbols from Latin to English. It deals with the systems of weights and and measures and the physical processes and mathematical calculations used in the compounding and dispensing of drugs and medicines, such as equivalents and conversion, calculation of doses, percentage preparations, dilution and concentration, and isotonic and electrolyte solutions.	2	3	3
Phar. 3	Pharmaceutical Dosage Forms	The fundamental concepts of pharmaceutical dosage forms, particularly their classification and the principles and processes involved in their preparation. Prerequisite: Phar. 2	3	3	4
Phar. 4	Physical Pharmacy	An analysis of applications of basic physico-chemical principles and methodology as they relate to drug dosage form design, preparation, stabilization, and evaluation. The course also considers the relationship of these principles to selected therapeutic problems. Prerequisite: Phys. Sci. 2	2	3	3
Phar. 5	Manufacturing Pharmacy and Drug and Cosmetic Quality	The course familiarizes the student with the organization of a manufacturing pharmacy laboratory and provides experience in manufacturing of pharmaceutical dosage forms on a pilot scale, emphasizing the requirements of the Bureau of Food and Drug in good manufacturing practice. It includes the methods involved in the control of the quality of drugs and cosmetics from their [illegible] to their distribution. Prerequisite: Phar. 3	2	6	4

COURSE TITLE AND NO.	COURSE DESCRIPTIVE TITLE	COURSE DESCRIPTION	HOURS REC.	WEEK LAB.	CREDIT UNITS
har. Ad. 2	Pharmaceutical Accounting	The course presents the rudiments of bookkeeping designed to enable the student of pharmacy to keep records of the business transaction of the drugstore. It includes the theory and principles of debit and credit, the journal and ledger, preparation of trial balance, the presentation of profit and loss statement in a simple form and the uses of the various accounting statements and schedules. Prerequisite: Phar. 1	1		1
har. Ad. 3	Pharmaceutical Economics and Administration	The course provides some basic tools in the economics and business management of a drugstore. It includes selecting the site for the drugstore, financing the drug business, layout of the drugstore, selection of stocks, administration and management of the retail and wholesale drug business, other business organizations and their application to local drug enterprises. Prerequisite: Phar. Ad. 1 and 2	2		2
harmaceutical Chemistry					
har. Chem. 1	Chemistry and Pharmacy of Inorganic Medicinals with Qualitative Chemical Analysis	The course covers the chemistry and pharmacy of inorganic medicinals, with special attention on their preparation, properties, testing and uses. It also discusses the concepts and chemical reactions related to the qualitative analysis of inorganic compounds. Prerequisite: Sci. 1	3	6	5
har. Chem. 2	Chemistry and Pharmacy of Organic Medicinals	The course deals of the composition, constitution chemical and physical properties, pharmaceutical behavior, pharmacologic action, and therapeutic uses of organic medicinals and pharmaceutical products. Prerequisite: Chem. 1 and Phys. Sci. 1	2	3	3

COURSE TITLE AND NO.	COURSE DESCRIPTIVE TITLE	COURSE DESCRIPTI	HOURS WE LEC.	LA.	CREDIT UNITS
Phar. Chem. 3	Quantitative Chemical Analysis and Food and Drug Assay w/ Instrumentation	The course deals with the principles of quantitative analytical chemistry, both theory and practice, and the application of analytical procedures, including the newer analytical techniques utilizing special instruments for crude drugs, volatile oils, alkaloids, enzymes, and other pharmaceutical products. Prerequisite: Phar. Chem. 1	3	6	5
Phar. Chem. 4	Plant Chemistry	The course surveys the chemical compounds elaborated by plants and involves the extraction, isolation, and identification of the different constituents of plants under study. Prerequisite: Phys. Sci. and Phar. Bio. Sci. 1b	2	3	3
Phar. Chem. 5	Toxicology	An introduction to toxicology with emphasis on materials as well as system affected. The course discusses the classification of poisons and the preventive aspects, and the various analytical procedures applied in the separation and detection of toxicological materials. It also covers drug interactions. Prerequisite: Phar. Chem. 3 and Phar.Bio.Sci. 2b	2	3	3
Pharmaceutical Biological Science Phar. Bio. Sci. 1a	Pharmacognosy	The course covers the identification, morphological structure, constituents and uses of official and non-official drugs of biologic origin, including the roots, rhizomes, barks, wood, and leaves of plants, and other products of plants and animals. Prerequisite: Sci. 2 and Phys. Sci. 1	2	3	4

COURSE TITLE AND NO.	COURSE DESCRIPTIVE TITLE	COURSE DESCRIPTION	HOURS/WEEK LEC.	HOURS/WEEK LAB.	CREDIT UNITS
Phar.Bio. Sci. 1b	Pharmacognosy with Philippine Medicinal Plants	The course is the continuation of Phar.Bio. Sci. 1a covering the flowers, fruits, seeds, plant products, antibiotics, and other drugs, including Philippine medicinal plants. Prerequisite: Phar. Bio. Sci. 1a	2	3	3
Phar.Bio.Sci.2a	Pharmacology and Therapeutics	The course deals with the fundamentals of pharmacology including pharmacokinetics, pharmacodynamics and selected areas of pharmacotherapeutics, and includes the classification of drugs with respect to their actions, uses, and toxicity, posology, factors modifying responses to drugs, and dose response relationships. The major disease states and modification of disease through rational drug therapy are discussed. Prerequisite: Bio. Sci. 3	3		3
Phar.Bio.Sci. 2b	Pharmacology and Clinical Pharmacy	The application of the knowledge of pharmacology in the actual treatment of patients; the identification of drug interactions and adverse drug reactions; and the rationale of drug therapy. The course also includes some medical terminologies and laboratory experiments dealing with drug activity and evaluation. Prerequisite: Phar. Bio. Sci. 2a	2	3	3
Phar. Bio.	Public Health and Community Development	The course covers aspects of public health, including organization and administration, communicable disease control, epidemiology, demography, biometrics, and environmental health problems. It emphasizes the role of the pharmacist as an integral part of the public health team in particular and in community development in general. Prerequisite: Math 3 and Bio. Sci. 4	1	3	

COURSE TITLE AND NO.	COURSE DESCRIPTIVE TITLE	COURSE DESCRIPTION	HOURS/WEEK LEC.	HOURS/WEEK LAB.	CREDIT UNITS
Undergraduate Research					
	Research & Thesis Writing	The course involves research participation at the undergraduate level and covers discussion of research methods and techniques used in scientific investigation and provides the student with experience in independent research and scientific reporting. It includes the written and oral presentation and defense of student theses. Prerequisite: Senior standing and adviser's consent	1 c	6	3
Biological Sciences					
Bi. Sci.1	General Zoology	The course is a general introduction to zoology, covering the general principles of animal biology such as the finer structures of the body and their organization into special systems that carry on essential life functions, and the more general phases of animal existence-reproduction, heredity, distribution, evolution, and the classification and naming of animals.	3	6	5
Bi. Sci 2	Human Abatomy and Physiology with Family Planning	The course provides a basic understanding of human anatomy and the principles of physiology with emphasis placed on the maintenance or normal functions and form of the human body. It describes the different human organ systems and integrates family planning in the discussion of the human reproductive system. Prerequisite: Bi. Sci.1	3	3	4

COURSE TITLE AND NO.	COURSE DESCRIPTIVE TITLE	COURSE DESCRIPTION	HOURS/WEEK LEC.	HOURS/WEEK LAB.	CREDIT UNITS
Bio. Sci. 3	Biochemistry	The course covers the structure and function of biomolecules which are uniquely associated with life, with particular attention placed on the biosynthesis of nucleic acids and proteins. It discusses the metabolic role of carbohydrates, lipids and nitrogen compounds and the importance of vitamins in maintaining normal metabolic activity. Aspects of clinical biochemistry are introduced to enhance the understanding of disease states. Prerequisite: Bio. Sci.2 & Phys. Sci.1	3	6	5
Bio. Sci. 4	Microbiology and Parasitology	The course deals with general and systematic medical microbiology and parasitology and focuses on topics which are relevant to the practice of pharmacy. Special attention is given to: sterilization and disinfection; antibiotics and chemotherapeutic agents; the main infectious diseases of man of bacterial viral, fungal, protozoan, and helminthic etiology; immunology and epidemiology of infectious diseases; hypersensitivity to drugs, bacterial components, and other agents; prevention and treatment of infectious diseases; and the microbiology of water and some food products. Prerequisite: Bio. Sci. 1	2	6	4
Scie. 2	General Botany with Taxonomy	The course deals with the nature of plants, particularly their structure, the processes which make the living plants run, the processes which contribute to self-perpetuation of plants and the classification of plants.	2	6	4

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