

July 5, 1984

MECS O R D E R
No. 34 s. 1984

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

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. Pharm.) 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. Pharm.), 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 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-- (6.0.1-76)

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)

<u>FIRST SEMESTER</u>				<u>SECOND SEMESTER</u>			
<u>Subjects</u>	<u>Hours</u>		<u>Units</u>	<u>Subjects</u>	<u>Hours</u>		<u>Units</u>
	<u>Lec.</u>	<u>Lab.</u>			<u>Lec.</u>	<u>Lab.</u>	
<u>FIRST YEAR</u>							
Eng.1-Lstg./Rdg./Wrtg. Skills I	3		3	Eng.2-Lstg./Rdg./Wrtg. Skills 2	3		3
Math 1-College Algebra	3		3	Math 2-Trigonometry	3		3
Soc.Sci.1-Gen.Psycho.	3		3	Spanish 2-Int.Spanish	3		3
Sci.1-Gen.& Inorg.Chem.	3	6	5	Bio.Sci.1-Gen.Zoology	3	6	5
Sci.2-Gen.Bot.w/Taxon.	2	6	4	Phar.2-Pharm'l.Tech. & Calc.	2	3	3
Spanish 1-Elem.&spanish	3		3	Phar.Chem.1-Chem.& Phar. of Inorg.Med.w/ Qual.			
Phar.1-Orient.in Phar.	1		1	Chm.Anal.	3	6	5
P.E. 1	(1)		(1)	P.E. 2	(1)		(1)
ROTC	(1.5)		(1.5)	ROTC	(1.5)		(1.5)
			<u>22</u>				<u>22</u>
<u>SECOND YEAR</u>							
Eng.3-Eff.Wrtg.& Spkg. Skills	3		3	Eng.4-Survey of Phil. Lit.	3		3
Math 3-Biostatistics	2		2	Math 4-Intro.to Calculus	3		3
Spanish 3-Adv.Spanish	3		3	Soc.Sci.2-Phil. History and Public Service	3		3
Sci.3-Gen.Phys.w/Energy	3	6	5	Spanish 4-Selected Wrtgs.	3		3
Bio.Sci.2-Hum.Anat. & Physio.w/Fam.Plng.	3	3	4	Bio.Sci.3-Biochemistry	3	6	5
Phys.Sci.1-Org.Chem.	3	6	5	Phar.3-Pharm'l. Dosage Forms	3	3	4
P.E. 3	(1)		(1)	P.E. 4	(1)		(1)
ROTC	(1.5)		(1.5)	ROTC	(1.5)		(1.5)
			<u>22</u>				<u>21</u>
<u>THIRD YEAR</u>							
Soc.Sci.3-Socio Anthropo.	3		3	Soc.Sci.4-Phil.Gov't. & The New Const.	3		3
Phar.Bio.Sci.1a-Pharmacog.	2	3	3	Phar.Bio.Sci. 1b-Pharmacog.w/Phil.Med.Plants	2	3	3
Phar.Bio.Sci.2a-Pharmacol.and Therap.	3		3	Phar.Bio.Sci.2b-Pharmacol. and Clin.Pharm.	2	3	3
Phar.Chem.2-Chem. & Phar. of Org.Med.	2	3	3	Phar.4-Phys. Phar.	2	3	3
Phar.Chem.3-Quant.Chem. Anal.& Food & Drug Assay w/Instr.	3	6	5	Phar.5-Mfg.Pharm. & Drug & Cosmetic Qual. Control	2	6	4
Phys.Sci.2-Phys.Chem.	3	3	4	Phar.6-Hospital Phar.	2	3	3
			<u>21</u>	Phar.7-Hist. of Phar.	1		<u>1</u>
							<u>20</u>

FOURTH YEAR

Phar.Ad.1-Phar.Juris. & Ethics	2		2	Computer Science	2	3	3
Phar.Chem.4-Plant Chem.	2	3	3	Soc.Sci.6-Tax & Agr.Ref. w/ Current Issues & Nat. Dev.	3		3
Phar.Chem.5-Toxicology	2	3	3	Phar.8-Presc.Cpdg.,Disp. & Incomp.	3	3	4
Bio.Sci.4-Microbio. & Parasitology	2	6	4	Phar.Ad.2-Phar.Accounting	1		1
Research and Thesis Wrtg.	1	6	3	Phar.Ad.3-Phar.Eco. & Adm.	2		2
Pil.1-Lstg./Rdg./Wrtg./Skills	3		3	Phar.Bio.Sci.3-Pub.Health & Com. Dev.	1	3	2
Soc.Sci.5-Rizal's Life and Wrtgs.	3		3	Hum.1-Art Appreciation	3		3
			<u>21</u>	Pil.2-Themes in Pil.Lit.	3		<u>3</u>
							<u>21</u>

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 unit
- 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 Biological 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 - Phil. Hist. & Pub. Service	3 "
	Soc. Sci.3 - Socio-Anthropology	3 "
	Soc. Sci.4 - Phil. Gov't. & 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
	Physical Education 2/ROTC	1 " /1.5 "
	Physical Education 2/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 (9 hrs., 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 units (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., 2 lec., 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 "
	Phar. 8 - Pres. Cpdg., Disp. & Incompat	4 " (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 DESCRIPTION TITLE	COURSE DESCRIPTION	HOURS: WEN LEC.: LA1
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
Phar. 2	Pharmaceutical Technology and Calculations	Prescription interpretation, including words and symbols from Latin to English. It deals with the systems of weights 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
Phar. 3	Pharmaceutical Dosage Forms	The fundamental concepts of pharmaceutical dosage forms, particularly their classification and the principles and processes involved in their preparation.	3
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.	2
Phar. 5	Manufacturing Pharmacy and Drug and Cosmetic Quality Control	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 formulation to their distribution.	2
		Prerequisite: Phar. 3	

COURSE TITLE AND NO.	COURSE DESCRIPTIVE TITLE	COURSE DESCRIPTION	HOURS: WEEK LEC.: 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.	2 : 3 : 3
Phar. 7	History of Pharmacy	Prerequisite: Phar. 5 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. Rerequisite: Phar. 3 and 4	3 : 3 : 4
Pharmacy Business Administration	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 : : 2

COURSE TITLE AND NO.	COURSE DESCRIPTIVE TITLE	COURSE DESCRIPTION	HOURS		WEEK		CREDIT UNITS
			LEC	LAB	LAB	UNITS	
Phar. 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.	1				1
		Prerequisite: Phar. 1					
Phar. 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.	2				2
		Prerequisite: Phar. Ad. 1 and 2					
<u>Pharmaceutical Chemistry</u>							
Phar. 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.	3				5
		Prerequisite: Sci. 1					
Phar. Chem. 2	Chemistry and Pharmacy of Organic Medicinals	The course treats of the composition, constitution chemical and physical properties, pharmaceutical behavior, pharmacologic action, and therapeutic uses of organic medicinals and pharmaceutical products.	2				3
		Prerequisite: Sci. 1 and Phys. Sci. 1					

COURSE TITLE AND NO.	COURSE DESCRIPTIVE TITLE	COURSE DESCRIPTION	HOURS/ WEEK	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	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. 1 and Phar. Bio. Sci. 1b	2	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
Pharmaceutical Biological Science			2	3
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

COURSE TITLE AND NO.	COURSE DESCRIPTIVE TITLE	COURSE DESCRIPTION	HOURS LEC.	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.	2	3	3
		Prerequisite: Phar. Bio. Sci. 1a			
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.	3		3
		Prerequisite: Bio. Sci. 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 terminology and laboratory experiments dealing with drug activity and evaluation.	2	3	3
		Prerequisite: Phar. Bio. Sci. 2a			
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.	1	3	2
		Prerequisite: Math 3 and Bio. Sci. 4			

COURSE TITLE
AND NO.

COURSE DESCRIPTIVE TITLE

COURSE DESCRIPTION

HOURS : WEEK : CREDIT
: IEC : LAB : UNITS

Undergraduate
Research

Research and 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.

1 6 3

Prerequisite: Senior standing and adviser's consent

Biological Sciences

Bio. 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

Bio. Sci. 2

Human Anatomy 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.

3 3 4

Prerequisite: Bio. Sci. 1

COURSE TITLE AND NO.	COURSE DESCRIPTIVE TITLE	COURSE DESCRIPTION	HOURS : LEC	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 and 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
Bio. Sci. 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