PROPOSED CURRICULUM FOR THE BACHELOR OF SCIENCE IN PHARMACY PROGRAM

FACULTY OF PHARMACY (1871)

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Ph.D. in Development Education

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Today's society characterized by rapid change

Pharmacy Curriculum needs continuing assessment and revision:

- equip the students with skills and human values

❑needed to become responsible and effective professionals.

- ever-increasing demand

❑for well-trained pharmacists

- planned harmonization of higher education in Southeast Asia,

❑ objective of increasing the international competitiveness of ASEAN higher education.

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Pharmacy education needs to:

- react to and anticipate professional and social change

- renew its mission and update its learning objectives

- Kris Olds (2016)

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Objectives of Research:

- Examines the process of curriculum review and redevelopment used in the:

❑ Faculty of Pharmacy of the University of Santo. Tomas

- Provides the application of evidence-based principles in the:

❑ systematic investigation of curriculum effectiveness.

- Gathers data and information

❑ view to propose a five-year Bachelor of Science in Pharmacy program reflecting an outcomes-based approach to curriculum development.

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Statement of the Problem

Main problem

•How can the proposed Pharmacy curriculum be made functional in order to produce Professional Pharmacists who are responsive to the needs of individuals, families and communities in today's society?

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Research sought to answer the following questions:

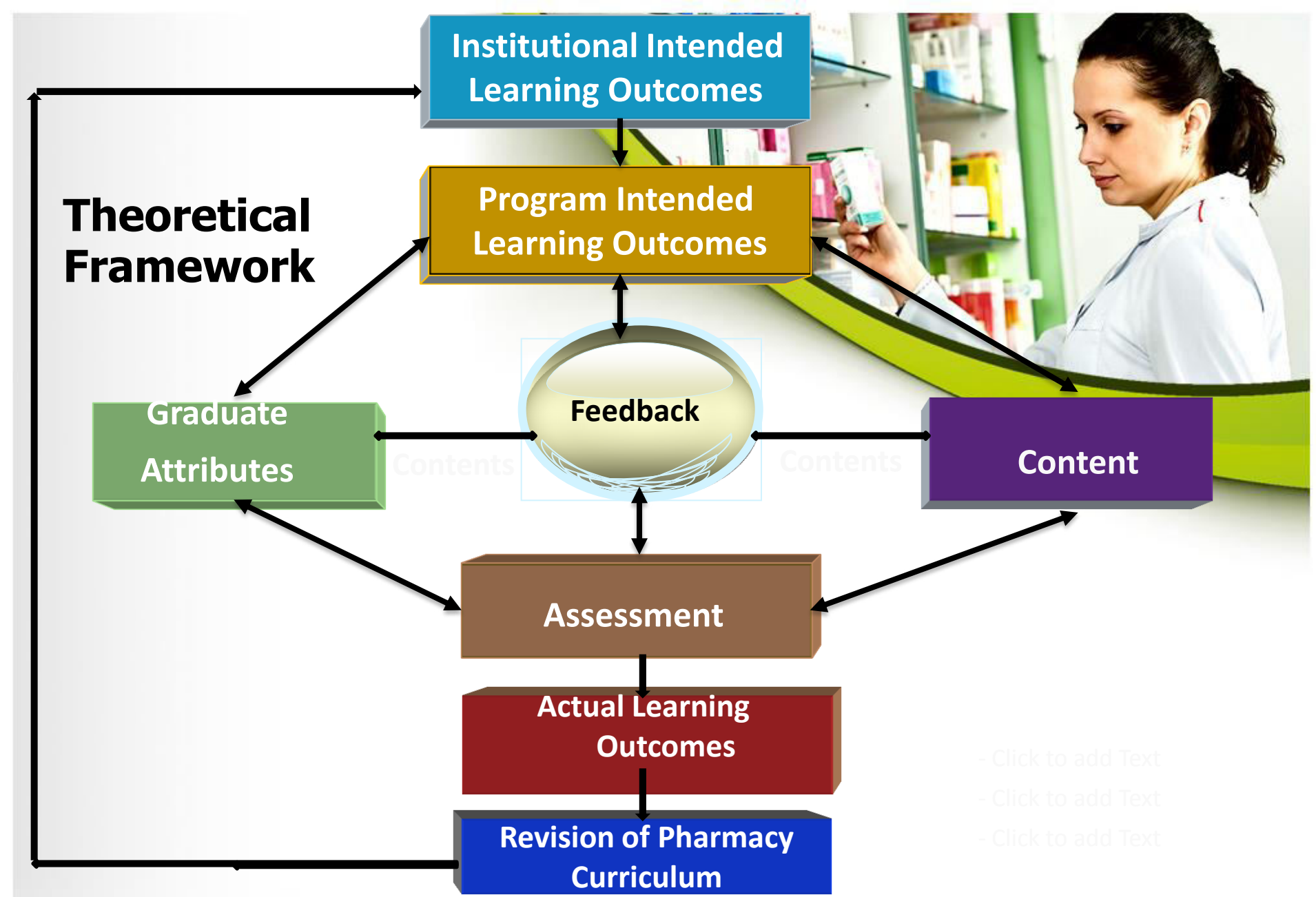
- What are the perceptions on the Program Intended Learning outcomes (PILO) of the current B.S. Pharmacy Curriculum by the Dean, Department Chairperson, Faculty Members, Alumni and the graduating Pharmacy students?
- What graduate attribute/s in the present curriculum need enhancement, modification, and addition?

How can the proposed Pharmacy curriculum be made functional in order to produce Professional Pharmacists who are responsive to the needs of individuals, families and communities in today's society?

Research sought to answer the following questions:

- What are the strengths, weaknesses, opportunities, and threats of the present curriculum of the Bachelor of Science in Pharmacy Program?
- What is the status of the present B.S. Pharmacy Curriculum?
- What revisions in the curriculum may be proposed to the Bachelor of Science in Pharmacy Program?

Theoretical Framework



Curriculum Planning Model Illustrating Outcomes-Based Approach to Pharmacy Curriculum Development

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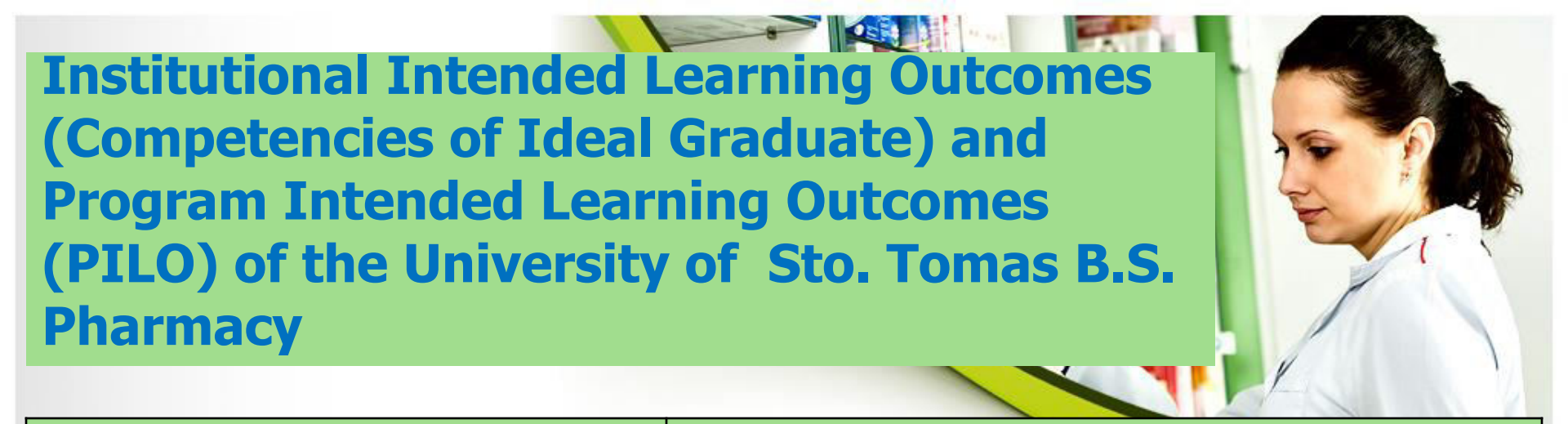
Institutional Intended Learning Outcomes (IILO/Competencies of Ideal Graduate) and Program Intended Learning Outcomes (PILO) of the University of Sto. Tomas B.S. Pharmacy

Institutional Intended Learning Outcomes (Competencies of Ideal Graduate)	Program Intended Learning Outcomes (PILO)
Academic Excellence	Demonstrate creative application of concepts and methods of pharmacy practice geared towards the advancement of various fields of Pharmacy.
Leadership and Teamwork	Assume leadership roles as appropriate to the work profession and society effectively and harmoniously as members of healthcare teams.
Critical Thinking, Research and Problem Solving Skills	Demonstrate critical application of principles, theories and processes in pharmacy using logical and systematic methods to provide practical solutions to real life professional situations.

Institutional Intended Learning Outcomes (Competencies of Ideal Graduate) and Program Intended Learning Outcomes (PILO) of the University of Sto. Tomas B.S. Pharmacy

Institutional Intended Learning Outcomes (Competencies of Ideal Graduate)	Program Intended Learning Outcomes (PILO)
Productivity and Accountability	Generate insights and new knowledge in pharmacy that will contribute to nation-building and sustainable development through drug designs and development for the prevention, diagnosis, mitigation and treatment of diseases of man and animals
Social and Ethical Responsibility	Exhibit Catholic values and moral principles reflective of the Thomasian identity as health care professionals in the formation of humanely progressive and healthy society.

Institutional Intended Learning Outcomes (Competencies of Ideal Graduate) and Program Intended Learning Outcomes (PILO) of the University of Sto. Tomas B.S. Pharmacy



Institutional Intended Learning Outcomes (Competencies of Ideal Graduate)	Program Intended Learning Outcomes (PILO)
Communication and Relational Skills	Apply effective communication competencies through interpersonal skills and utilize information technology responsibly as an effective tool in exploring and expressing ideas individually and collaboratively, and in maintaining therapeutic relationships by providing drug and health related information.
Global Engagement	Collaborates with people of various faces from diverse cultural backgrounds and intensify Thomasian values to address global challenges.

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Graduate attributes /Graduates' broader range of competencies

Twenty first (21st) Century skills or attributes that are required of graduates of the Department of Pharmacy

critical thinking	creativity
decision-making	communication
life and career	collaboration
problem-solving skills	information and communications technology
communication skills	information literacy
personal and social responsibility	citizenship.

Significance of the Study

Dean & Department Chair
Develop a more in-depth assessment of the content of the Pharmacy program
Justifiable basis for the appropriation of funds
Awareness of the need to look into the viability of the curriculum
Faculty
Improvement of teaching methods/strategies toward development of: - more effective skills & knowledge
Students
Develop correct perspective -working knowledge of role, tasks, duties & responsibilities - professional values expected of pharmacists
Pharmaceutical sectors
Graduates will be highly skilled and competitive

Research Design & Methodology

- Research design
  - ❑ Quantitative to triangulation method

- Instrument for data gathering
  - ❑ Multi-aspect questionnaires for data gathering.
  - ❑ Informal random and open-ended questions

- Evaluated and approved
  - ❑ Ethics and Review Board of the UST Faculty of Pharmacy

Research Design & Methodology

- Study focused on the:

❑ current four (4) year curriculum of B.S. Pharmacy program of University of Santo. Tomas.

- Time frame of the study

❑ School Year 2015-2016.

Population and Study Sampling

301 Respondents

- 2 Pharmacy Administrators: Dean & Chairperson
- 22 Pharmacy Faculty Members
- 257 Graduating Pharmacy Students
- 20 UST Pharmacy Alumni: 3 Community 4 Hospital 8 Industry 5 FDA

- ❑ Received copies - Participant's Information and Informed Consent and Consent Forms
- ❑ Participation - on a voluntary basis

The study consists of four parts:

- Quantitative analyses on the **program intended learning outcomes and course content** - assessment of the Dean, the Department Chairperson, the Faculty Members, the Alumni representing the various pharmaceutical areas

- Quantitative analyses on the **program intended outcomes and course content**
  - assessment of the **learning activities** of the graduating student

- Qualitative and quantitative analyses of the **open-ended questions** on the:
  - graduate attributes, coherence of the current curriculum, Pharmacy courses, internship, elective clerkships, strengths, weaknesses, problems, opportunities and threats of the present curriculum.

- **Enhancement or development and revisions** to be adopted in the the proposed B.S. Pharmacy program.

Statistical Treatment and Analysis of Data

- Qualitative Interpretation of Assessment on the PILO of the current B.S. Pharmacy Curriculum by the Stakeholders
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  - Likert-type scales

Overall and individual PILO component mean scores of the assessment

Given by each respondent and the different groups were computed and Interpreted as:

- 4.00 – 3.01: High Significance
- 3.00 – 2.01: Moderate Significance
- 2.00 – 1.00: Low Significance

Statistical Treatment and Analysis of Data

Data gathered were properly organized for statistical treatment, using:

- **Kendall's tau b test** - determine differences on perspective of each group as well as student section cluster
- **SPSS version 7.0** - utilized for all statistical treatments and analyses of PILO
- **Percentage** - determine frequencies of given variables; and
- **Ranking** - relates to frequency, determines the relative importance of given variables in the rank.

RESULTS & INTERPRETATION

STUDENT LEARNING NEEDS

Assessment of Student Learning Needs (Competencies)/Components of Program Intended Learning Outcomes (PILO)

Results

Assessment of Components of PILO by the Students Based From the Learning Activities

Program Intended Learning Outcomes	Mean	Standard Deviation	Interpretation
1.Academic Excellence	3.14	0.38	Moderate to High Significance
2.Leadership & Teamwork	3.53	0.44	**High Significance**
3. Critical Thinking	3.25	0.42	Moderate to High Significance
4.Productivity & Accountability	3.25	0.41	Moderate to High Significance
5. Social & Ethical Responsibility	3.58	0.40	**High Significance**
6. Communication & Relational Skills	3.35	0.39	Moderate to High Significance
7. Global Engagement	3.12	0.54	Moderate to High Significance
Students' Overall Rating	**3.35**	**0.33**	**High Significance**

Assessment of Components of PILO by the Students Based From the Learning Activities

Existing curriculum:

- **greatly contributed**

  - in achieving the components of the Program Intended Learning Outcomes (PILO) to the B.S. Pharmacy graduating students

- **appropriate enhancement with rating of moderate to high significance**:

Academic Excellence

Critical Thinking

Productivity and Accountability

Communications & Relational Skills

Global Engagement

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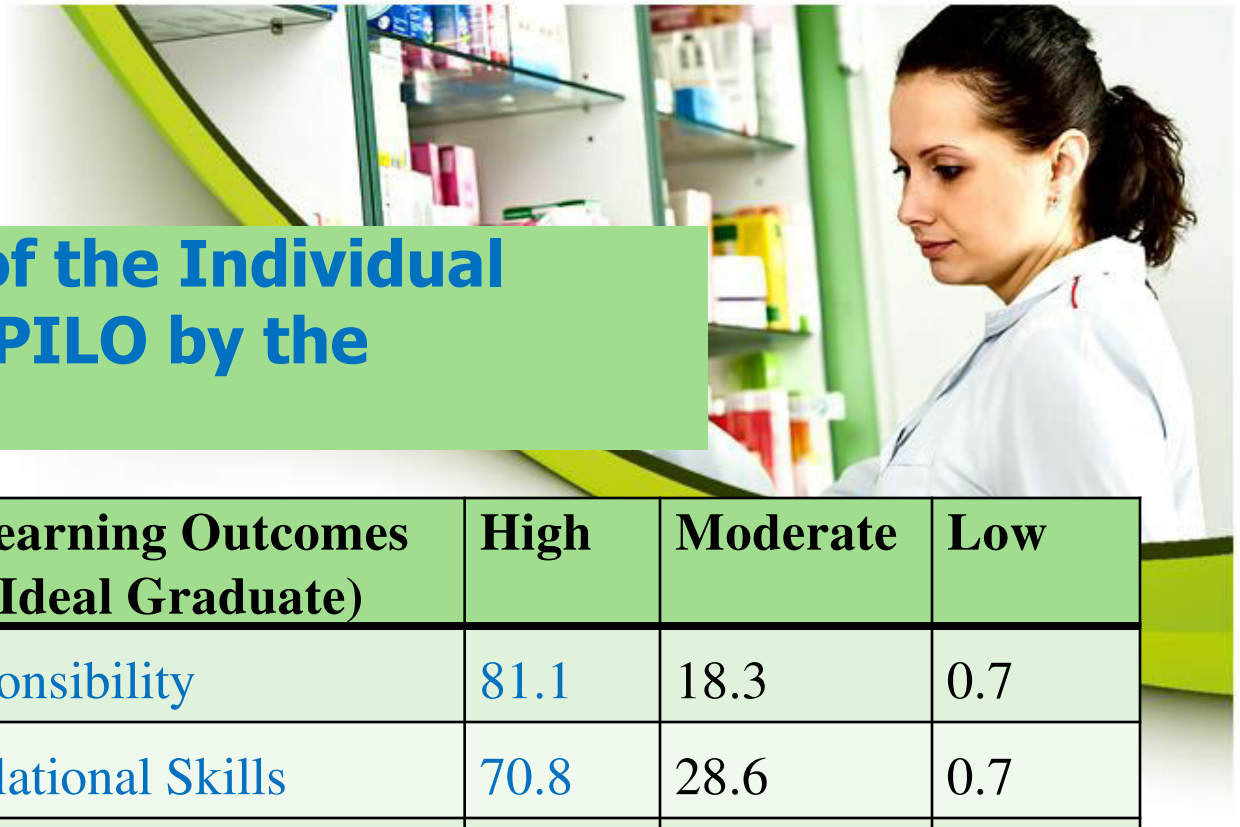
Results

Comparison of Assessment Given by Stakeholders on the Contribution of the Curriculum to the Overall Achievement of PILO

Significance	Students		Administrator		Faculty		Alumni		Total	
	n	%	n	%	n	%	n	%	n	%
High	206	*80.2*	2	*100.0*	22	*100.0*	14	*70.0*	**244**	***81.1***
Moderate	51	*19.8*	0	*0.0*	0	*0.0*	6	*30.0*	**57**	***18.9***
Low	0	*0.0*	0	*0.0*	0	*0.0*	0	*0.0*	**0**	***0.0***
Total	257	*626.8*	2	*100.0*	22	*100.0*	20	*100.0*	**301**	***100.0***



In-depth Analysis of the Individual Assessment of the PILO by the Stakeholders

Program Intended Learning Outcomes (Competencies of an Ideal Graduate)	High	Moderate	Low
Social & Ethical Responsibility	81.1	18.3	0.7
Communication & Relational Skills	70.8	28.6	0.7
Leadership & Teamwork	69.8	29.2	1.0
Productivity & Accountability	60.8	38.9	0.3
Critical Thinking, Research and Problem Solving	54.8	44.2	1.0
Academic Excellence	52.5	46.8	0.7
Global Engagement	46.5	48.8	4.7

Individual Assessment of the PILO by the Stakeholders

- **Existing curriculum**

✓Significant contribution in achieving the competencies of PILO

- **Greater enhancement should be provided to these three competencies of PILO with moderate to high significance rating:**

✓ Critical Thinking, Research and Problem Solving Skills

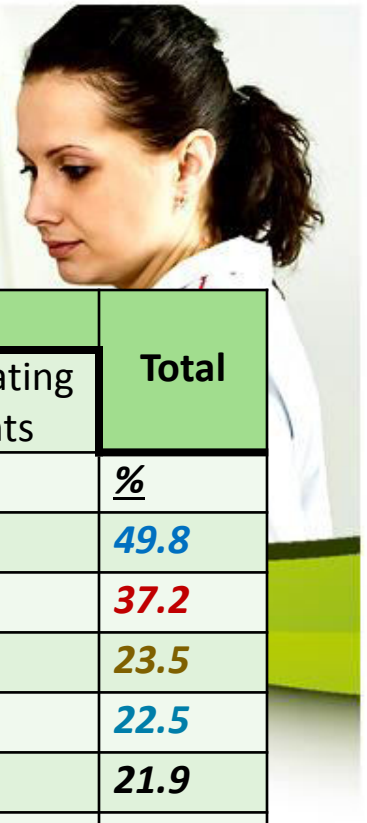
✓ Academic Excellence

✓ Global Engagement.

LEARNING ACTIVITIES

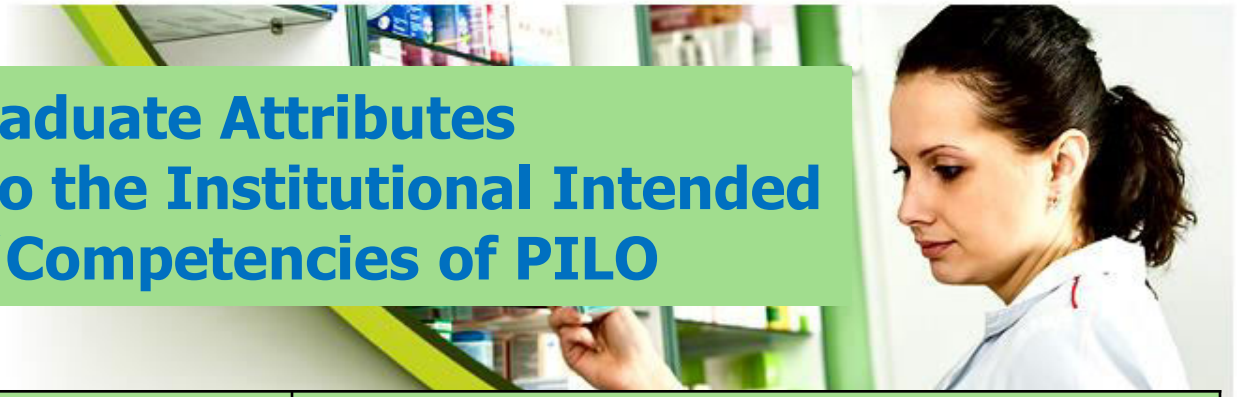
Assessment on Learning Activities/Graduate Attributes (21st Century Skills) Requiring Enhancement

Comparison & Overall Assessment given by Stakeholders on Graduate Attributes (21st Century Skills) Requiring Enhancement



Graduate Attributes	Respondents				Total
	Administrators	Faculty	Alumni	Graduating Students	
	%	%	%	%	%
a. Critical Thinking	*50.0*	*63.4*	*55.0*	*48.2*	***49.8***
b. Decision-Making	*50.0*	*54.5*	*45.0*	*35.0*	***37.2***
c. Problem-Solving	*50.0*	*59.0*	*45.0*	*18.6*	***23.5***
d. Communication	*50.0*	*68.2*	*45.0*	*16.7*	***22.5***
e. Life & Career	*50.0*	*22.7*	*40.0*	*20.2*	***21.9***
f. Personal & Social Responsiblity	*100.0*	*54.5*	*25.0*	*17.1*	***20.9***
g. Collaboration	*50.0*	*31.8*	*35.0*	*15.9*	***18.6***
h. Creativity	*50.0*	*31.8*	*20.0*	*16.7*	***18.2***
i. Information & Communications Technology	*50.0*	*22.7*	*35.0*	*11.6*	***14.2***
j. Information Literacy	*50.0*	*22.7*	*20.0*	*7.4*	***9.6***
k. Citizenship	*100.0*	22.7	*5.0*	*3.5*	**6.0**
Overall rating					***22.0***

Integration of the Graduate Attributes (21st century skills) to the Institutional Intended Learning Outcomes/Competencies of PILO



Competencies of PILO	Graduate Attributes (21st century skills)
Academic Excellence	Foundation of Pharmacy Courses, Decision-Making, Learning, Creativity, Problem-Solving
Leadership and Teamwork	citizenship, life & career, collaboration
Critical Thinking, Research and Problem Solving Skills	Critical thinking, creativity, problem-solving, decision making, research
Productivity and Accountability	communication & collaboration, life-long learning, research
Social and Ethical Responsibility	personal & social responsibility
Communication and Relational Skills	collaboration, information literacy, ICT, communication
Global Engagement	research, collaboration, communication

Integration of the Graduate Attributes (21st century skills) to the Institutional Intended Learning Outcomes/ Competencies of PILO

- **Assessment of the PILO**
  - consistent with the results on the evaluation of the graduate attributes (21st century skills).
- **Competencies of PILO that require greater and appropriate enrichment in the Pharmacy Curriculum:**

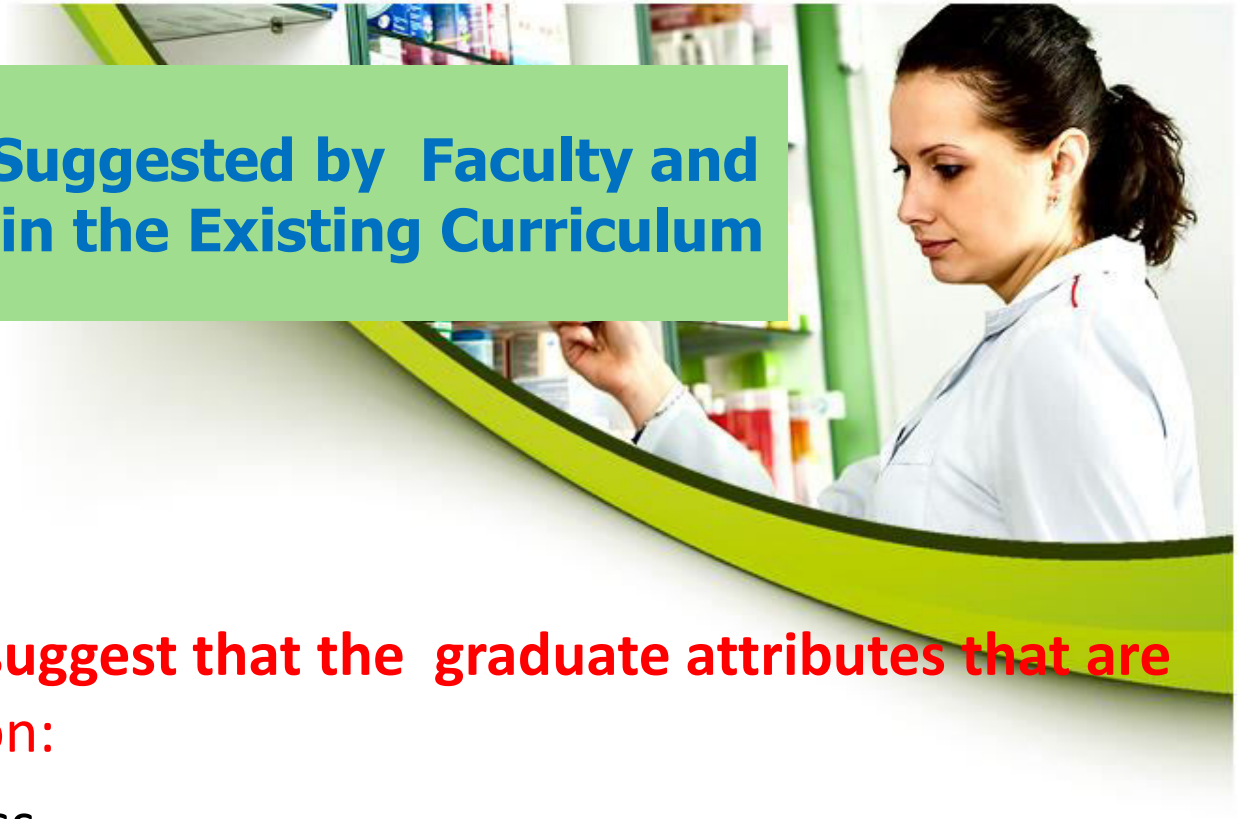
✓ Critical Thinking, Research and Problem Solving Skills

✓ Academic Excellence

✓ Communication and Relational Skills

✓ Global Engagement

Graduate Attributes Suggested by Faculty and Alumni for Inclusion in the Existing Curriculum



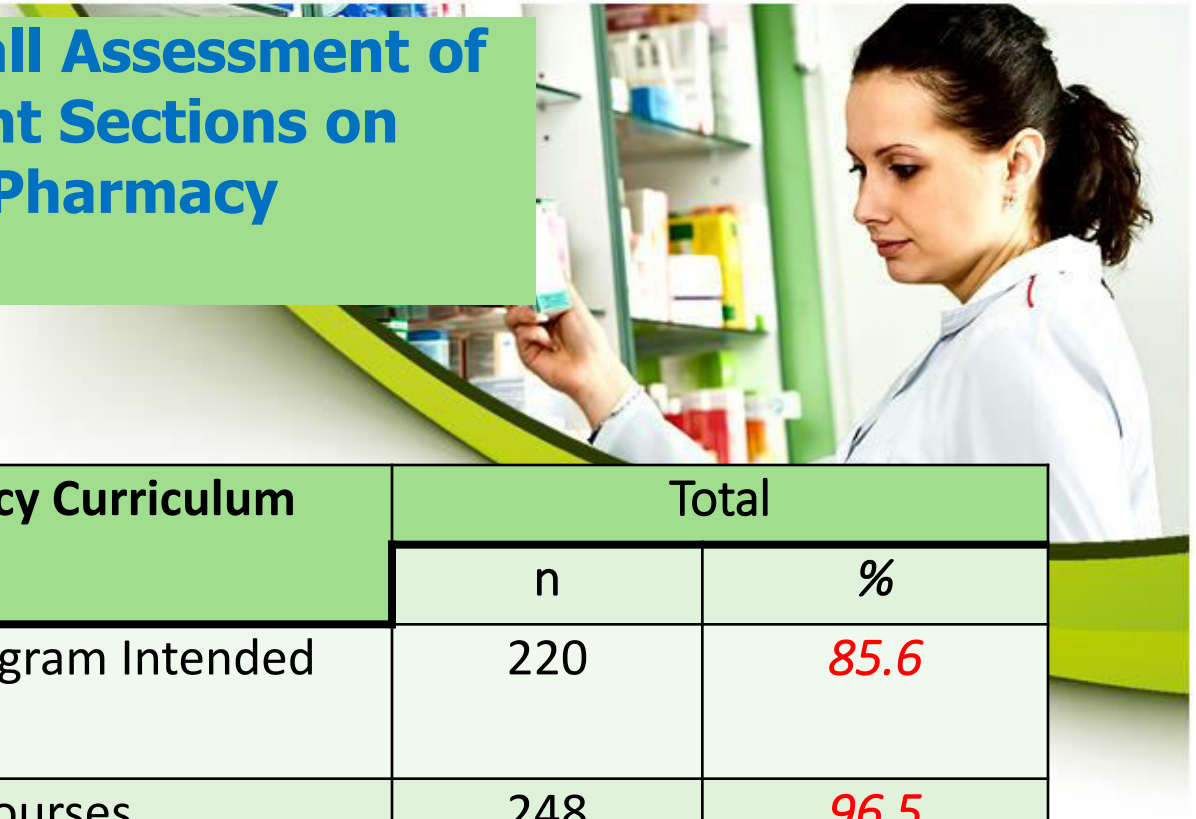
FEEDBACK

- **Faculty and Alumni suggest that the graduate attributes that are essential** for inclusion:
  - research-orientedness
  - life-long learning
  - operational excellence
  - customer service skills
  - work ethics and values
  - advocates of environment

COURSE CONTENT

Assessment on Coherence of Existing Pharmacy Curriculum

Comparison and Overall Assessment of Students from Different Sections on Coherence of Current Pharmacy Curriculum



Coherence of Current Pharmacy Curriculum	Total	
	n	%
a. Course-alignment to the Program Intended Learning Outcomes	220	*85.6*
b. Pre-requisite/co-requisite courses appropriately placed	248	*96.5*
c. Preparation for each new course taken because of previous knowledge acquired	237	*92.2*
d. Course-sequence appropriateness	219	*85.2*
e. Course-integration	238	*92.6*
Overall rating	232.4	*90.4*

Assessment of Students from Different Sections on Coherence of Current Pharmacy Curriculum

Results affirmed:

- Course-alignment to the PILO
- Pre-requisite/co-requisite courses are appropriately placed
- Preparedness of students for each new course taken because of previous knowledge acquired
- Course-sequence appropriateness
- Proper course integration

Significant comments or suggestions given by the students on the coherence of the present Pharmacy curriculum

More time will be allotted for Pharmacology
Toxicology course should come before the thesis preparation;
Transfer some courses from 3rd year 2nd term to 3rd year 1st term like Pharmacognosy and to update its activities
Course Audit should have its own time, separated from the regular terms;
Enhance distribution of courses in each term; some terms are too loaded due to particular majors compiled;
Courses must be integrated and more focused to what is really needed in the profession;
Some terms are too loaded due to particular majors compiled;
Four (4) years Pharmacy Curriculum must be five (5) or six (6) years
Curriculum be aligned into actual Philippine practice

Overall Assessment given by the Administrators, Faculty Members and Alumni on the Coherence of Current Curriculum

Coherence of Current Pharmacy Curriculum	Total	
	n	%
A. Course-alignment to the Program Intended Learning Outcomes	39	88.6
B. Course-sequence appropriateness	33	75.0
C. Course-integration	37	84.1
D. Pre-requisite/co-requisite courses appropriately placed	37	84.1
E. Number of units fitted for each professional course		
1.Number of units per professional lecture courses only	33	75.0
2. Number of units per professional lecture with laboratory	32	72.7
F. Total number of units for the courses suitable for each semester per year level	32	72.7

Assessment given by the Administrators, Faculty Members and Alumni on the Coherence of Current Pharmacy Curriculum

Results revealed:

- Course-alignment to the PILO
- Course-sequence appropriateness
- Proper course integration
- Pre-requisite/co-requisite courses are appropriately placed
- Amenable to the number of units per professional lecture courses only, number of units per professional lecture with laboratory and total number of units for the courses are suitable for each semester per year level

Comments/suggestions given by the Faculty and Alumni of the different components on the Coherence of Pharmacy Curriculum.

Course-alignment, course-sequence & course-integration

Courses are to be aligned with the Pharmacy practice and are not limited with academic settings.
Greater concentration or weight should be given to the major and professional courses, including clinical trials and research
Grouping of the courses should be undertaken
Goals and objectives (PILO) must be aligned with the learning activities given to students
Provisions for actual practice and learning experiences in the community, hospital, clinical, and manufacturing pharmacies during the last term of the fourth year.
Development of more soft skills and leadership skills and management related courses.
Drug delivery systems course offering aside from Dosage Forms and the separation of Philippine Medicinal Plants from Pharmacognosy
Student development on multifaceted expertise and a grasp of interrelationships in the real world that brings together diverse disciplines in a comprehensive manner

Comments/suggestions given by the Faculty and Alumni of the Different Components on the Coherence of Pharmacy Curriculum

Number of units per professional lecture courses and number of units per professional lecture with laboratory and total number of units for each semester per year level
Increase the number of units for Research and Thesis Writing 1.
Give maximum units requirement for a specific program - to develop needed learning competencies of the students and achieve threshold standards.
Give due focus on laboratory skills of the students - to increase their competence and national and global competitiveness
Review the number of units between the lecture and laboratory - the students learn more from their laboratory experience and the weight or impact of the laboratory units should likewise be appropriately reflected.
Curriculum must be aligned to other countries' curriculum – to become globally competitive.
Assess total number of units for the academic load and the allocation of the number of units per term for each year level
Fourth (4th) year level should be focused on course audit - due to its intensity & comprehensive nature

Comments/suggestions given by the Faculty and Alumni of the Different Components on the Coherence of Pharmacy Curriculum

From the remarks or comments given:

- **Changes or modifications** on the:
  - courses, distribution of schedules, time, learning activities and the academic load in the current curriculum.
- **Students should be exposed and involved** in:
  - actual learning experiences.
- **Courses should include:**
  - actual practice of Pharmacy and are not limited to the acquisition of theories
- **Curriculum has to be:**
  - aligned to other countries' curriculum.

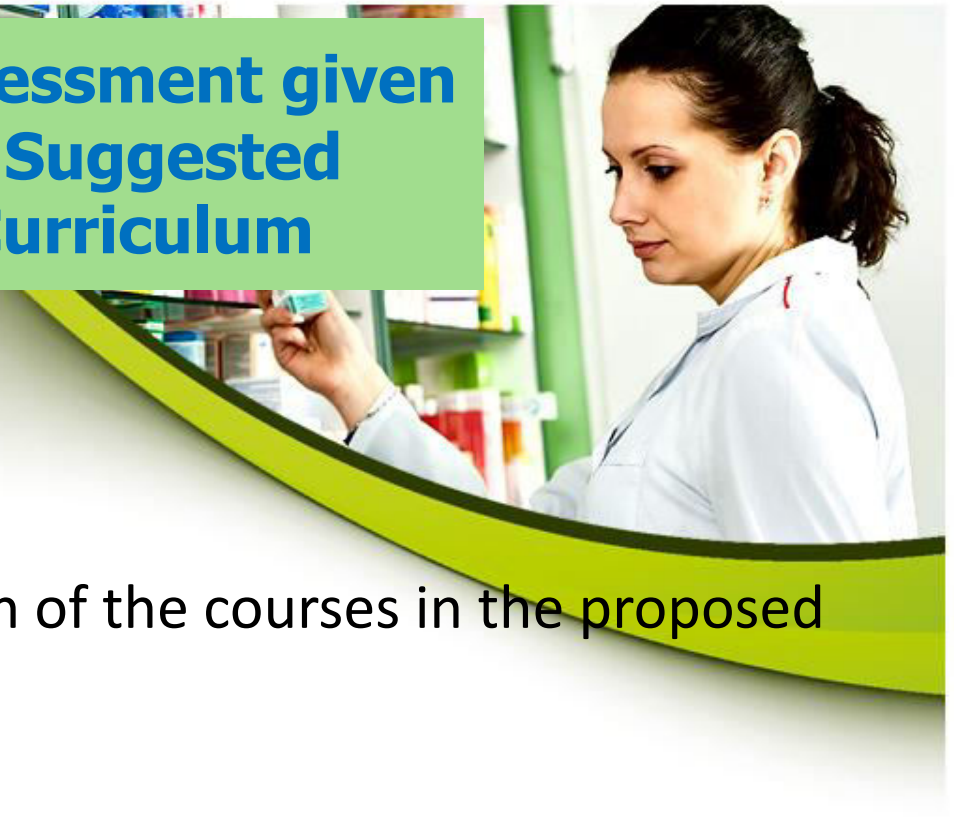
COURSE CONTENT

Assessment on Courses Suggested to be added in the Current Curriculum

Comparison and Overall Assessment given by Stakeholders on Courses Suggested to be added in the Current Curriculum

Courses Suggested	Respondents				Total
	Administrators	Faculty	Alumni	Graduating Students	
	%	%	%	%	%
Pharmacotherapeutics	50.0	59.1	50.0	97.2	**91.0**
Integrative Medicine (Complementary & Alternative Medicine)	50.0	50.0	35.0	96.5	**88.7**
Drug Delivery Systems	50.0	50.0	40.0	94.2	**87.0**
Drug Discovery & Development	50.0	45.5	50.0	91.4	**85.0**
Cosmetic Product Formulation	100.0	54.5	35.0	86.8	**81.1**
Pharmacoepidemiology	0.0	45.5	10.0	82.3	**74.8**
Regulatory Pharmacy	50.0	77.3	75.0	73.9	**74.1**
Pharmacoeconomics	0.0	45.5	30.0	77.4	**71.4**
Immunology & Hematology	0.0	40.9	20.0	77.8	**70.8**
Pharmacy Business Management (with Accounting)	50.0	77.3	55.0	64.6	**64.8**

Comparison and Overall Assessment given by Stakeholders on Courses Suggested to be added in the Current Curriculum



- **Results implied**

- Stakeholders favored the addition of the courses in the proposed Pharmacy Curriculum

Other Courses Suggested for Inclusion

Students
Molecular Biology, Biotechnology, Entrepreneurship and Oncology; to separate Physiology from Human Anatomy and Microbiology from Parasitology.
Administrator
Foreign language courses.
Alumni
In-depth course on CGMP and standards used by the national regulatory agency.
Faculty
Physical Chemistry, Radiopharmacy, Drug modelling through computer application, Ethnopharmacology, Social Pharmacy, Parenteral Therapy, and Zoology.

Suggestions on the Removal/Modification of Course Offerings

Suggestions on the Removal or Modification of Course Offerings

Students
Separation of Human Physiology and Pathophysiology from Human Anatomy
Transfer of some courses from third year second term to third year first term, such as Pharmacognosy, which includes updating of its activities
Course Audit to be given on separate time
More student involvement, patient exposure, actual learning experiences, and concrete and interactive learning outcomes.
Actual cases should also be provided
Clerkship should also be included under clinical courses.

Suggestions on the Removal or Modification of Course Offerings

Alumni
Pharmacognosy units need to be increased.
Pharmacognosy, **Plant Chem and other pharmaceutical chemistry** courses need to be simplified
Pharmacy Business Management and Regulatory Pharmacy must also taught
Curriculum must have some sort of **specialization on the field** (I.e. on different clinical field, industrial/manufacturing)

Suggestions on the Removal or Modification of Course Offerings

Faculty Members
Modification or improvement of Pharmacy Informatics; Organic Medicinals Laboratory, and Pharmacognosy, Clinical Pharmacy, Anatomy, Physiology and Dispensing.
Botany must be more pharmaceutical in approach
Separation of Pharmacognosy and Plant Chemistry from Philippine Medicinal Plants, the combination of Pharmaceutical Jurisprudence and Healthcare Ethics
Alignment of the current curriculum with clinical practice, which includes further specialization on the field.
Add more related courses
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Assessment on Extent of Pharmacy Internship

Overall Assessment given by Administrators, Faculty and Alumni on Extent of Pharmacy Internship

Respondents						Overall Rating	
Administrators		Faculty		Alumni			
n	%	n	%	n	%	n	%
0	*0%*	6	*27%*	4	*20%*	10	***22.7%***

Overall Assessment given by Administrators, Faculty and Alumni on Extent of Pharmacy Internship

Results imply:

- Disapproval of the administrators, faculty, and the alumni of the
  - increase on the number of hours of Pharmacy Internship.
- Suggestions/recommendations of some respondents who affirmed the lengthening of the Pharmacy Internship:

➢ According to the new law: 960 hours internship will be increased to 1200 hours

❖ Students will be more immersed at real life situations

➢ lessen didactic sessions and lengthen clerkship hours.

- Faculty suggests that if the Curriculum will be increased to five (5) years
  - the whole 5th year should be dedicated to the internship program

Overall Assessment given by Administrators, Faculty and Alumni on Extent of Pharmacy Internship

FEEDBACK

For greater exposure and experience to realities of work:

- need to prolong the duration for the three (3) areas of Pharmacy Internship such as:
  - Community Pharmacy, Hospital Pharmacy, and Pharmaceutical Industry.

Two (2) new areas of Pharmacy Internship will be added:

- Institutional Internship and Social and Administrative Internship
  - provide students with an intense practice on the different fields of Pharmacy and simulation of the actual Pharmacy practice

Assessment on the Suggested Elective Clerkships in the Pharmacy Curriculum

Comparison and Overall Assessment given by Stakeholders on the Suggested Elective Clerkships in the Pharmacy Curriculum

Elective Clerkships	Participants				Total
	Administrators	Faculty	Alumni	Graduating Students	
	%	%	%	%	%
Infectious Disease	*0.0*	*36.4*	*25.0*	*96.1*	*96.1*
Research	*0.0*	*40.9*	*45.0*	*94.2*	*94.2*
Outpatient Practice	*0.0*	*36.4*	*25.0*	*94.6*	*94.6*
International	*0.0*	*31.8*	*20%*	*94.6*	*94.6*
Geriatrics	*0.0*	*22.7*	*10.0*	*94.6*	*94.6*
Administration	*0.0*	*54.5*	*25.0*	*88.7*	*88.7*
g. Academic	*0.0*	*13.6*	*10.0*	*91.4*	*91.4*

Comparison and Overall Assessment given by Stakeholders on the Suggested Elective Clerkships in the Pharmacy Curriculum

- **Mean high ratings**
  - due to the scores given by the **students** to all the Elective Clerkship.
  - specify the **approval of the students** to integrate elective clerkships in the current curriculum**.**
- **Responses of the Alumni, Administrators and Alumni** are
  - **homogenous.**
  - gave low ratings which signify their **disapproval** of incorporating elective clerkships in the curriculum.

Comparison and Overall Assessment given by Stakeholders on the Suggested Elective Clerkships in the Pharmacy Curriculum

Feedback

With the suggestion of some stakeholders that:

- **students must be able to:**
  - develop multi-faceted expertise
  - grasp the importance of interrelationship in the real world that will bring together diverse disciplines in a comprehensive manner;
- **alignment of the current curriculum** with the prescribed curriculum of other countries

➢ elective clerkships will be integrated in the Pharmacy Curriculum.

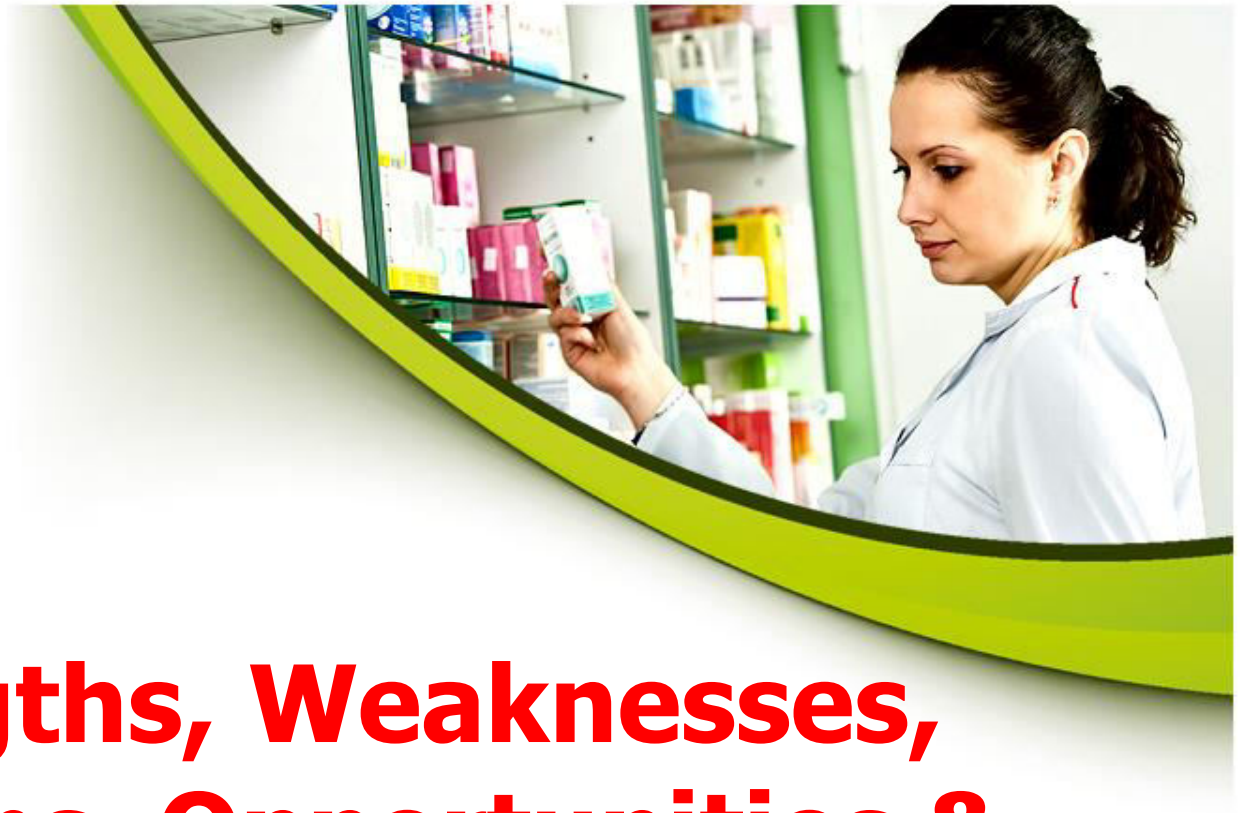
Concern/s on the Courses/Work Handled in Relation to Day-to-Day Teaching/Working Responsibilities

Concern/s on the Courses/Work Handled in Relation to Day-to Day Teaching/Working Responsibilities

Administrator
Insufficient number of hours to cover the scope of the courses,
Need for students': participation higher retention application of the lessons learned in various practical settings.

Concern/s on the Courses/Work Handled in Relation to day-to day Teaching/Working Responsibilities

Faculty conveyed the need to address the following:
Practical application and relevance of the scope of the courses; uniformity of lessons taught including teaching techniques; and extent and relevance of information to be covered
Poor communicative skills of the students, and provisions for intense practice in the different fields of Pharmacy amongst students, and time distribution of topics/activities to maximize learning outcomes.
Students' academic load should be: - reviewed - should include avenues and activities to ensure their wholistic development
Consultations and updating with the alumni should be further maximized to: - identify courses that need emphasis and - decongest course offerings that can be repetitive and unnecessary.
Instruments/equipment for laboratories/research are expensive.
Didactic style teaching should be lessened. Teachers' roles should not be limited to lecturers but instead must be viewed as lecturers who motivate students to work independently.



Strengths, Weaknesses, Problems, Opportunities & Threats of the B.S. Pharmacy Program

Strengths of the Present Curriculum of the Bachelor of Science in Pharmacy Program

Updated in terms of pre-requisites and course order/offering.

Teaching and learning are outcomes-based

- ❖encouraging independence by giving the students ample opportunity for research and other related academic pursuits
- ❖ help in the development /refining of critical thinking skills.

Utilization of laboratories enhances the skills of the students.

- ❖fully equipped with the knowledge needed for a “generalist pharmacist”
- ❖graduates become globally competitive.

Weaknesses of the present curriculum of the Bachelor of Science in Pharmacy Program

Scarcities of real life scenarios to prepare students for actual practice. The existing curriculum

Lacks the following:

- ❖time to fully accomplish all activities and academic responsibilities,
- ❖laboratory equipment,
- ❖research-orientedness,
- ❖venue for application of learned concepts and principles and collaboration with other schools of pharmacy nationwide; likewise, with healthcare professionals and patients.

Though it has a solid foundation, it is somehow left behind comparing it to other universities outside the country

Problems of the present curriculum of the Bachelor of Science in Pharmacy Program

Alumni
The need to align it with international standards so that students will not have a hard time if they choose to work abroad
Curriculum as too compressed, the class size as overpopulated, and that some courses as outdated.
Need to incorporate current practice and standards for both national and international Pharmacy.

Problems of the present curriculum of the Bachelor of Science in Pharmacy Program

Faculty
Lack of grants/funds.
Internship is conducted every summer; however, the internship course is offered only on the succeeding semester after the actual internship.
Lack of actual application of knowledge and availability of equipment.
The need for specialization among graduates to be globally competitive.
Need for more social and administrative outputs.
Problems with internship regarding institution partnership need to be addressed

Opportunities of the present curriculum of the Bachelor of Science in Pharmacy Program

Offers:

- career opportunities in the different fields of Pharmacy in the Philippines;
- international and local collaborations;
- collaborative research (local or international) with in the agencies as part of student/faculty mobility program;
- new batch of faculty members with new/creative ideas; and
- internationalization that fosters free exchange of technology and information.

Threats of the present curriculum of the Bachelor of Science in Pharmacy Program

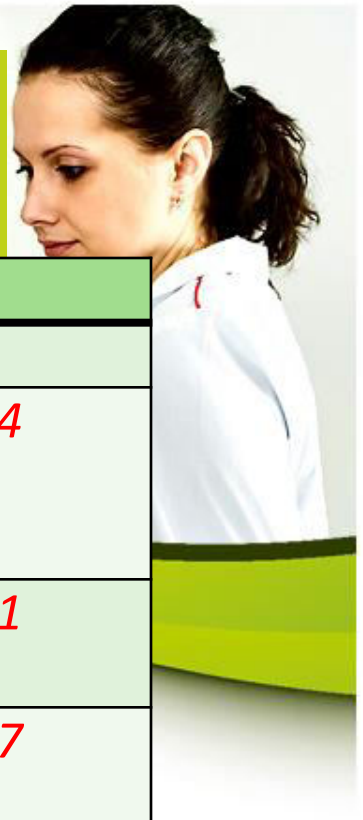
Updated curriculum of pharmacy profession based on international standards – must always be aligned with UST curriculum;
“Other options” and “schedule” for professionals with relevant expertise will be a major barrier to be solved;
Curriculum serves as a stepping stone of students to go abroad since applicability to local setting is evident;
Impact of K-12, new Pharmacy Bill, new curriculum that will be released by CHED, innovations in the healthcare system, new trends in professional practice, healthcare demands;

Threats of the present curriculum of the Bachelor of Science in Pharmacy Program

Challenges of globalization;
Other universities' offering the same specialization and strength in social action with a more extensive curriculum;
New batch of faculty members with curve in terms of content mastery and teaching strategies, and drug testing and assay in industry might be given to chemists, consequently it is necessary to strengthen skills and the Pharmacy Law.

Assessment on Proposed Revisions in the Current Curriculum

Overall Assessment of Students on Proposed Revisions in the Current Curriculum



Proposed Revisions	Total	
	n	%
a. Instructional resources (facilities, equipment, instrument & lab.)	253	*98.4*
b. Updated textbooks & references	252	*98.1*
c. Innovative methodologies of instruction	251	*97.7*
d. More linkages (community, hospital, manufacturing, schools – local & international)	251	*97.7*
e. Exposure to realities of work (practicum & electives)	249	*96.9*
f. Research & extension activities	246	*95.7*

Other Revisions Suggested by the Students

Collaboration with international universities;
Training of students in the real world (aside from internship);
Wider and better choices for sites of internships;
Provisions for genuine support for students, which include support for their thesis research, giving them access to laboratories and equipment, providing them hands on training during courses (eg. Clinical Pharmacy) and more effort in securing global linkages.
The curriculum must be made aligned with the actual Philippine practice rather than producing workers to work abroad.
To offer a five-Year Curriculum of Bachelor of Science Pharmacy Program

Proposed Revisions in the Current Curriculum

Assessment and feedback:

- **The improvements proposed by the students are consistent to:**
  - weaknesses of the current curriculum,
  - problems of the current curriculum and
  - concerns of the **Administrators** and Faculty Members on the courses handled in relation to their day-to-day teaching.

Revisions to Pharmacy Curriculum

Three (3) major areas of revision in the Pharmacy Curriculum concluded as needed:

- introduce students to the
  - **professional practice of Pharmacy at the onset of their Pharmacy education**,
- provide opportunities for students to
  - **practice what they learn in real-life environments,** and
- integrate related courses to
  - **reduce duplication of materials and increase relevance between courses** .

Revisions to Pharmacy Curriculum

Pharmacy curricula consulted:

- various parts of the world, including the United States, United Kingdom, Canada, Australia, and ASEAN countries were examined.
- new guidelines, policies and standards of CHED for the B.S. Pharmacy program

Revisions to Pharmacy Curriculum

The major and professional courses in the four-year curriculum of BS Pharmacy Degree Program:

- retained with some modifications.

- From the feedback and suggestions given by the stakeholders,
  - some of the courses are transferred in the first year, second year and third year with the proposed five-year curriculum

- integrate new related courses

Modified professional courses

Integration of related new courses in the proposed Pharmacy Curriculum

Modified Professional Courses in the Existing Pharmacy Curriculum for the Proposed Five-Year BS Pharmacy Curriculum

Four -Year BS Pharmacy Curriculum	Five -Year BS Pharmacy Curriculum
Human Anatomy, Physiology & Pathophysiology	**Human Anatomy is separated** from Human Physiology and Pathophysiology;
Principles of Pharmacy Administration & Management I	**Changed to** Introduction to Pharmaceutical Management and Leadership
Pharmaceutical Microbiology & Parasitology	**Changed to** Pharmaceutical Microbiology & **Immunology**
Pharmaceutical Biochemistry	Pharmaceutical Biochemistry **and Molecular Biology**
Dispensing & Medication Counseling	**Reorganinized into three (3):** A.Basic Dispensing (Dispensing Process, Reading & Interpreting the Prescription and Other Medicine Orders) B.Dispensing & Medication Safety C. Patient Medication Counseling
Clinical Toxicology	**Integration of Clinical Drug Abuse** with Toxicology
Pharmaceutical Dosage Forms	**Restructured into:** A. Basic Pharmaceutical Dosage Forms B. Drug Delivery Systems C. Drug Discovery and Development D. Cosmetic Product Formulation

New courses to be Included in the Existing Pharmacy Curriculum for the Proposed Five Year BS Pharmacy Curriculum

Basic Dispensing (Dispensing Process, Reading and Interpreting the Prescription and Other Medicine Orders)
Integrative Medicine (Complementary and Alternative Medicine),
Drug Delivery Systems
Drug Discovery and Development
Cosmetic Product Formulation
Pharmacotherapy
Regulatory Pharmacy
Pharmacoepidemiology
Pharmacoeconomics
Pharmacy Business Management (with Accounting).

PROPOSED FIVE-YEAR B.S. PHARMACY DEGREE PROGRAM

FOUR – YEAR CURRICULUM LEADING TO THE DEGREE OF BACHELOR OF SCIENCE IN PHARMACY School Year 2010 - 2018

FIRST YEAR	First Term			
Subject Number	**Subject Description**	**Lec. Hrs.**	**Lab. Hrs.**	**Total Units**
ENG 1	Introduction to College English	3	0	3
FIL 101	Komunikasyong sa Akademikong Pilipino	3	0	3
PSY 1	General Psychology	3	0	3
MATH 101	College Algebra	3	0	3
PHAR. 1	Introduction to Pharmacy	3	0	3
BOT. 102A	Pharmaceutical Botany with Taxonomy	3	6	5
CHEM 100	General Inorganic Chemistry	3	6	5
THY 1	Contextualized Salvation History	(3)	0	(3)
P.E. 1	Physical Education I	2		2
NSTP 1	National Service Training Program	(1.5)		(1.5)
	Total			27
	Total			27

Bachelor of Science in Pharmacy Degree Program Reflecting an Outcomes-based Approach to Curriculum Development

Course Title	Term 1
	Units
Year 1	
Introduction to Pharmacy/Perspective in Pharmacy	3
Pharmaceutical Botany with Taxonomy with Lab.	5
Chemistry & Pharmacy of Inorganic Medicinals with Qualitative Chemistry with Lab.	5
Introduction to Pharmaceutical Care (Concept of Health Care System)	3
Common Core Courses***	9
Subtotal	**25**

FOUR – YEAR CURRICULUM LEADING TO THE DEGREE OF BACHELOR OF SCIENCE IN PHARMACY School Year 2010 - 2018

FIRST YEAR	Second Term			
Subject Number	Subject Description	Lec. Hrs.	Lab. Hrs.	Total Units
ENG 2	Reading & Thinking Skills for Academic Study	3	0	3
FIL. 102	Pagbasa at Pagsulat Tungo sa Pananaliksik	3	0	3
PHL 2	Logic	3	0	3
RC	Rizal Course	3	0	3
PHARCHM 1	Chemistry & Pharmacy of Inorganic Medicinals with Qualitative Chemistry	3	6	5
PHARCARE 1	General Concept of the Health Care System	3	0	3
PHAR 2	Pharmaceutical Calculations	3	0	3
THY 2	Church & Sacraments	(3)	0	(3)
P.E. 2	Physical Education	2		2
NSTP 2	National Service Training Program	(1.5)		(1.5)
	Total			**25**

Bachelor of Science in Pharmacy Degree Program Reflecting an Outcomes-based Approach to Curriculum Development

Course Title	Term 2
	Units
Year 1	
Pharmaceutical Calculations	3
Human Anatomy with Lab*	5
Pharmaceutical Organic Chemistry with Lab.	5
Introduction to Pharmaceutical Management & Leadership	3
Internship I: Community Pharmacy	2
Common Core Courses***	9
Subtotal	**27**
Special Term: Community Pharmacy Internship	300 hours

Bachelor of Science in Pharmacy Degree Program Reflecting an Outcomes-based Approach to Curriculum Development

***** Candidates are required to successfully complete six General Education Core/ General Education Courses (GPS CHED, 2016)**

Foreign Language,
Theology
Social Sciences & Philosophy

Math, Science & Technology
Purposive Communication
Psychology

FOUR – YEAR CURRICULUM LEADING TO THE DEGREE OF BACHELOR OF SCIENCE IN PHARMACY School Year 2010 - 2018

SECOND YEAR	First Term			
Subject Number	**Subject Description**	**Lec. Hrs.**	**Lab. Hrs.**	**Total Units**
BIOSCI 3	Human Anatomy, Physiology & Pathophysiology	3	6	5
CHEM 200	Organic Chemistry	3	6	5
HETAR	Health Economics with Taxation & Agrarian Reform	3	0	3
COMP 103	Introduction to Computer with Applications	1	4	3
PHAR 3	Pharmaceutical Dosage Forms	3	6	5
PHL 5	Christian Ethics	3	0	3
INTERN 1	Internship I	1	2	2
P.E. 3	Physical Education III	2		2
	Total			**28**

Bachelor of Science in Pharmacy Degree Program Reflecting an Outcomes-based Approach to Curriculum Development

Course Title	Term 1
	Units
Year 2	
Basic Dispensing (Dispensing Process, Reading & Interpreting the Prescription and Other Medicine Orders) with Lab	4
Human Physiology& **Pathophysiology** with Lab.	5
Pharmaceutical Analysis 1 with Lab. (Quantitative Chemistry 1)	4
Pharmaceutical Marketing & Entrepreneurship ++++	3
Pharmaceutical Biochemistry **and Molecular Biology** with Lab.	5
Pharmacy Informatics with Lab.	3
Subtotal	**24**

FOUR – YEAR CURRICULUM LEADING TO THE DEGREE OF BACHELOR OF SCIENCE IN PHARMACY School Year 2010 - 2018

SECOND YEAR	Second Semester			
Subject Number	**Subject Description**	**Lec. Hrs.**	**Lab. Hrs.**	**Total Units**
PHYS 201	General Physics	4	3	5
PH-MCR-PRS	Pharmaceutical Microbiology & Parasitology	3	6	5
MATH 600	Biostatistics	2	2	3
PHAR 5	Hospital Pharmacy	2	2	3
PH-BIOCHEM	Pharmaceutical Biochemistry	3	6	5
SCL 3	The Social Teaching of the Church	3	0	3
P.E. 4	Physical Education IV	2	0	2
	Total			**26**

Bachelor of Science in Pharmacy Degree Program Reflecting an Outcomes-based Approach to Curriculum Development

Course Title	Term 2
	Units
Year 2	
Pharmaceutical Dosage Forms with Lab.	4
Pharmacy & Chemistry of Organic Medicinals with Lab.	4
Pharmacognosy, with PMP & Plant Chemistry with Lab.	5
Pharmaceutical Microbiology & **Immunology** with Lab	5
Hospital Pharmacy with Interprofessional Approach	3
Internship II: Hospital Pharmacy	2
Subtotal	**23**
Special Term: Hospital Pharmacy Internship	300 hours

FOUR – YEAR CURRICULUM LEADING TO THE DEGREE OF BACHELOR OF SCIENCE IN PHARMACY School Year 2010 - 2018

THIRD YEAR	First Semester			
Subject Number	**Subject Description**	**Lec. Hrs.**	**Lab. Hrs.**	**Total Units**
PHL 4	Philosophy of Man	3	0	3
SA	Socio Anthropology	3	0	3
Lit 102A	Philippine Literatures	3	0	3
PHAR 4	Physical Pharmacy	3	3	4
PHBS 1	Biopharmaceutics & Pharmacokinetics	3	0	3
PHARCHM 2	Pharmacy & Chemistry of Organic Medicinals	3	3	4
PHARCARE 2	Public Health	3	0	3
INTERN 2	Internship II: Hospital Pharmacy	1	2	2
	Total			**25**

Bachelor of Science in Pharmacy Degree Program Reflecting an Outcomes-based Approach to Curriculum Development

Course Title	Term 1
	Units
Year 3	
Integrative Medicine (Complementary & Alternative Medicine)	2
Drug Delivery Systems*	3
Pharmaceutical Analysis 2/Physical Pharmacy with Lab. (Instrumental Methods of Analysis)	4
Public Health Pharmacy	3
Drug Discovery & Development*	2
Pharmaceutical Manufacturing & CGMP (including validation) with lab.	5
Pharmacology 1 & Therapeutics	4
Subtotal	**23**

FOUR – YEAR CURRICULUM LEADING TO THE DEGREE OF BACHELOR OF SCIENCE IN PHARMACY
School Year 2010 - 2018

THIRD YEAR	Second Term			
Subject Number	**Subject Description**	**Lec. Hrs.**	**Lab. Hrs.**	**Total Units**
ENG 3	Academic Writing Skills	3	0	3
PHBS 3	Pharmacognosy with PMP & Plant Chemistry	3	6	5
PHARCHM 3	Quality Control 1	3	6	5
PHBS 2A	Pharmacology 1 & Therapeutics	4	0	4
PHAR 6	Pharmaceutical Manufacturing	3	6	5
PHARCARE 3	Communication & Interpersonal Skills	3	0	3
RTW 1	Research & Thesis Writing 1	1	0	1
	Total			**26**

Bachelor of Science in Pharmacy Degree Program Reflecting an Outcomes-based Approach to Curriculum Development

Course Title	Term 2
	Units
Year 3	
Cosmetic Product Formulation with Lab.*	4
Pharmacotherapy 1*	4
Dispensing & **Medication Safety** with Lab.	4
Pharmacy Business Management **(with Accounting)***	2
Pharmacology II & Therapeutics with Lab.	5
Biopharmaceutics & Pharmacokinetics	3
Internship III: Manufacturing Pharmacy	2
Subtotal	**24**
Special Term: Industrial Pharmacy Internship	300 hours

FOUR – YEAR CURRICULUM LEADING TO THE DEGREE OF BACHELOR OF SCIENCE IN PHARMACY
School Year 2010 - 2018

FOURTH YEAR	First Term			
Subject Number	**Subject Description**	**Lec. Hrs.**	**Lab. Hrs.**	**Total Units**
PH-INFO	Pharmacy Informatics	2	2	3
PHBS 2B	Pharmacology II & Therapeutics	3	3	4
PHARCHM 4	Drug Testing & Assay with Instrumentation	3	3	4
PHAR 11	Principles of Pharmacy Administration & Management I	3	0	3
PHARCARE 4	Dispensing & Medication Counseling	3	3	4
SCL 9	Marriage & Family	3	0	3
RTW 2	Research & Thesis Writing II	1	6	3
INTERN 3	Internship III: Manufacturing Pharmacy	1	2	2
	Total			**26**

Bachelor of Science in Pharmacy Degree Program Reflecting an Outcomes-based Approach to Curriculum Development

Course Title	Term 1
	Units
Year 4	
Pharmacotherapy 2*	4
Patient Medication Counseling*	3
Drug Testing & Assay with Instrumentation with Lab.	4
Pharmaceutical Toxicology & **Drug Abuse**	3
Clinical Pharmacy (Assessment with Monitoring) with Lab.	4
Research Methods & Thesis Writing 1	1
Pharmaceutical Statistics with Lab.	3
Academic Writing Skills/Technical Writing (Core)	3
Subtotal	**25**

FOUR – YEAR CURRICULUM LEADING TO THE DEGREE OF BACHELOR OF SCIENCE IN PHARMACY School Year 2010 - 2018

FOURTH YEAR	Second Term			
Subject Number	**Subject Description**	**Lec. Hrs.**	**Lab. Hrs.**	**Total Units**
PHARCHM 5	Clinical Toxicology	3	0	3
PHARCARE 5	Clinical Pharmacy	3	3	4
PHAR 12	Pharmaceutical Marketing & Entrepreneurship	3	0	3
PHARJUR	Pharmaceutical Jurisprudence & Ethics	3	0	3
HETHICS	Health Care Ethics	3	0	3
PHISTCONS	Philippine History & Constitution	3	0	3
	Course Audit	5	0	5
	Total			**24**

Bachelor of Science in Pharmacy Degree Program Reflecting an Outcomes-based Approach to Curriculum Development

Course Title	Term 2
	Units
Year 4	
Pharmaceutical Jurisprudence & Ethics	3
Pharmacotherapy 3*	4
Regulatory Pharmacy*	3
Drugs & Disease Management (Health Technology Assessments & Health Policy)	2
Introduction to Pharmacoepidemiology*	3
Research & Thesis Writing II with Lab.	3
Healthcare Ethics (Core)	3
Pharmacoeconomics *	3
Internship IV: Institutional and Social and Administrative Internship	2
Subtotal	**26**
Special Term: Institutional Internship Social & Administrative Internship	 120 hours 180 hours

Bachelor of Science in Pharmacy Degree Program Reflecting an Outcomes-based Approach to Curriculum Development

Course Title	Term 1 Units
Year 5	
Area of Concentration: Pharmacy Clerkship (500 hours) choice of: Community Pharmacy Clerkship Hospital Pharmacy Clerkship Industrial Pharmacy Clerkship	**(500 hours)**
And choice of one elective clerkship in: Clinical Pharmacy Clerkship: Infectious Diseases Clinical Pharmacy Clerkship: Pediatric Clinical Pharmacy: Outpatient Practice Clinical Pharmacy: Geriatrics Hospital Pharmacy Experience in International Country Social Pharmacy: Administration Institutional: Academic/Research	(300 hours)

Pharmacy Internship for:

➢ **more student involvement, patient exposure, actual learning experiences, and concrete learning outcomes** therefore:

❖increased from **200 hours to 300 hours** for Community, Hospital, and Industrial Pharmacy.

❖added internship in **Institutional for 120 hours and Social and Administrative for 180 hours.**

- **In the fifth year**

First term

- Students will **practice in their chosen area of concentration/specialization** (from **360 hours is increased to 500 hours**) in accredited establishments, such as community, hospital, and the industry.

- **clerkship in real life scenarios is included as an elective**
  - to prepare students in actual practice.
  - students may select one elective clerkship either in the practice of:

- **Clinical Pharmacy** such as: a) infectious diseases, b) pediatric c)outpatientpractice, and d) geriatrics;
- **Hospital Pharmacy** in an International Country;
- **Social Pharmacy** on administrative training; and
- **Institutional** either in the nursing home/rehabilitation center/drug abuse center/family planning clinic/penal institution/athletic facility.

Bachelor of Science in Pharmacy Degree Program Reflecting an Outcomes-based Approach to Curriculum Development

Course Title	Term 2 Units
Year 5	
Course Audit	5
Total Units	**202**

In Conclusion:

- **In the fifth year**

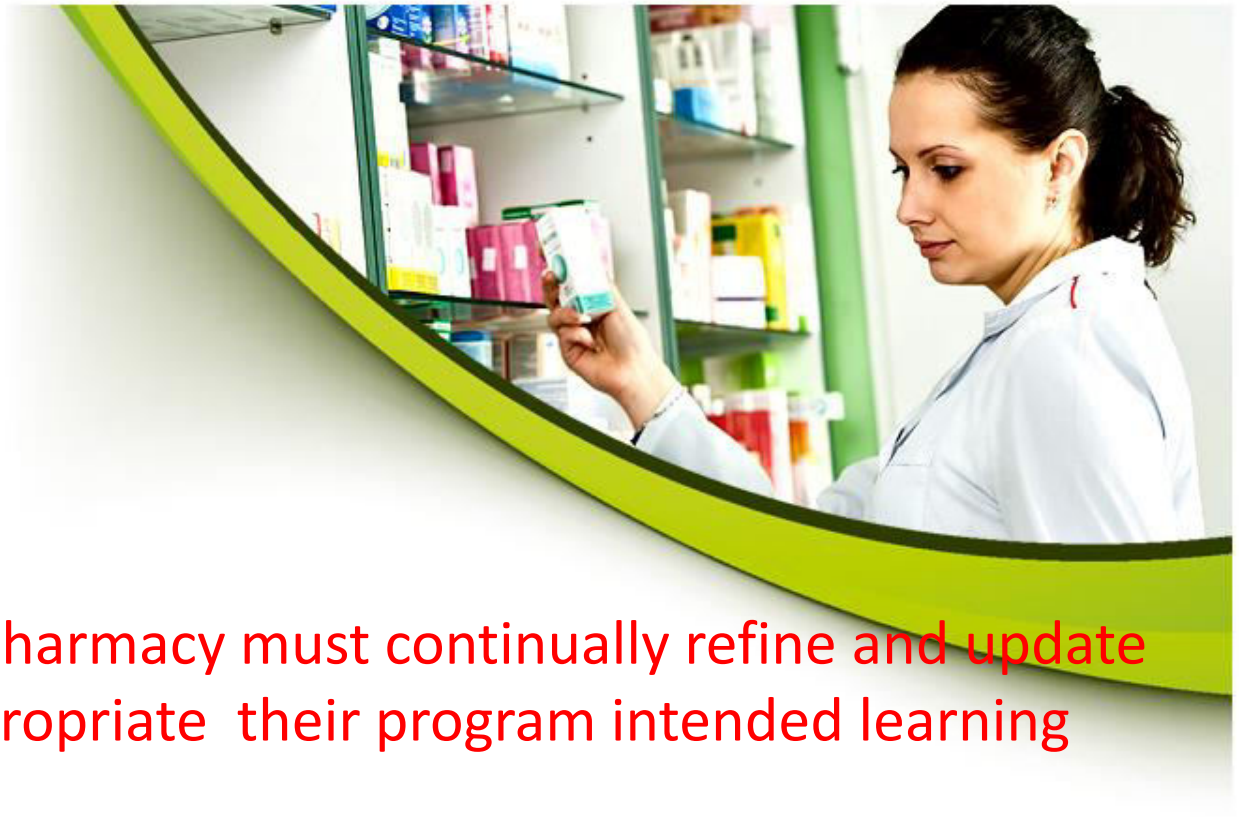
  Second term, students:

➢ will focus on **course audit** in preparation for the Pharmacy Licensure Examination.

Conclusions

- Three (3) major areas of revision in the Pharmacy Curriculum were concluded as needed:
- (1) introduce students to the professional practice of pharmacy at the onset of their Pharmacy education,
- (2) provide opportunities for students to practice what they learn in real-life environments, and
- (3) integrate related courses to reduce duplication of materials and increase relevance between subjects.[2]

Conclusions



- UST Department of Pharmacy must continually refine and update as deemed to be appropriate their program intended learning outcomes to:

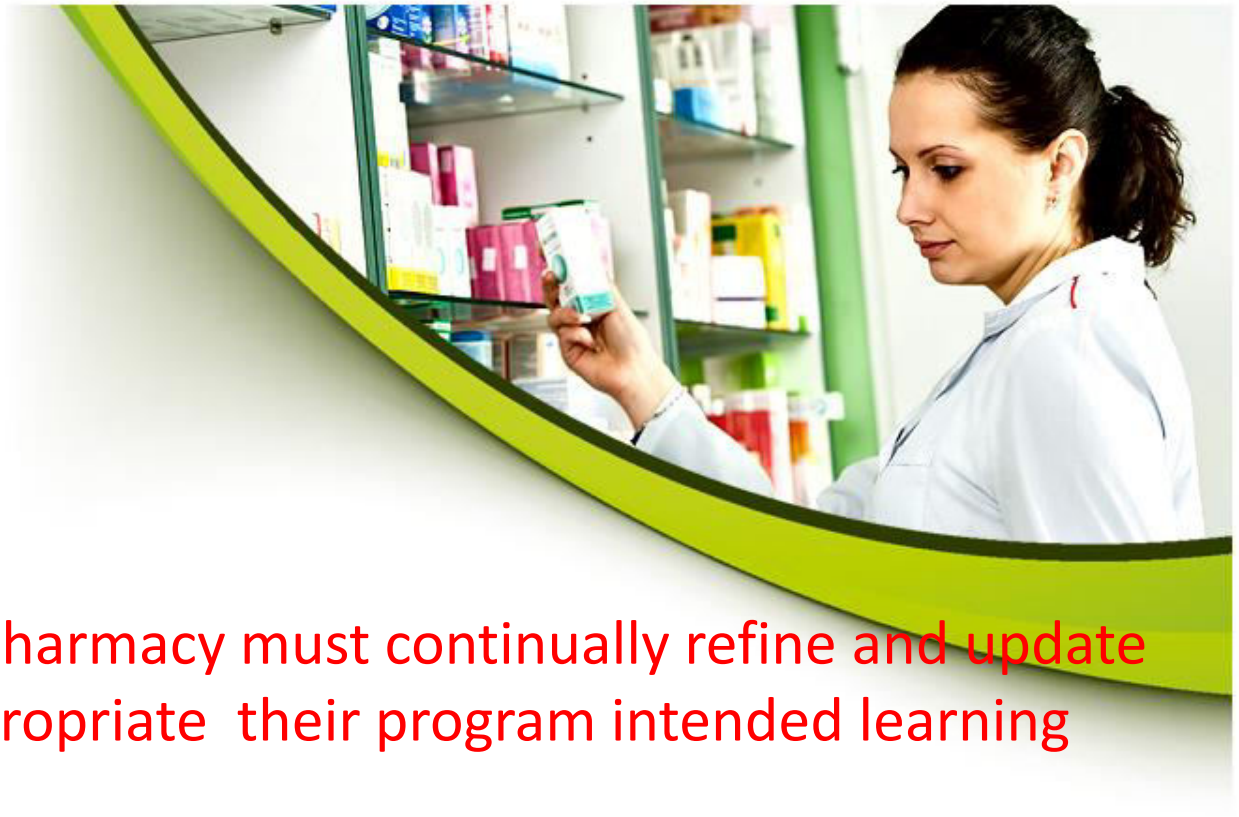
➢ reflect state-of-the-art practice,

➢ develop a variety of educational experiences,

➢ assist students in maximally achieving these outcomes, and

➢ obtain and use valid, reliable, assessment data to make necessary changes in the curriculum.

Conclusions



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➢ reflect state-of-the-art practice,

➢ develop a variety of educational experiences,

➢ assist students in maximally achieving these outcomes, and

➢ obtain and use valid, reliable, assessment data to make necessary changes in the curriculum.

Conclusions

- The University of Santo Tomas B.S. Pharmacy Program has been granted Level IV Reaccreditation Status for five years (**April 2014 to April 2019)** and awarded the Center of Excellence by CHED.

➢ Nevertheless, the assessment and feedback identified the needs or gaps in the current curriculum of the existing four-year B.S. Pharmacy Program.

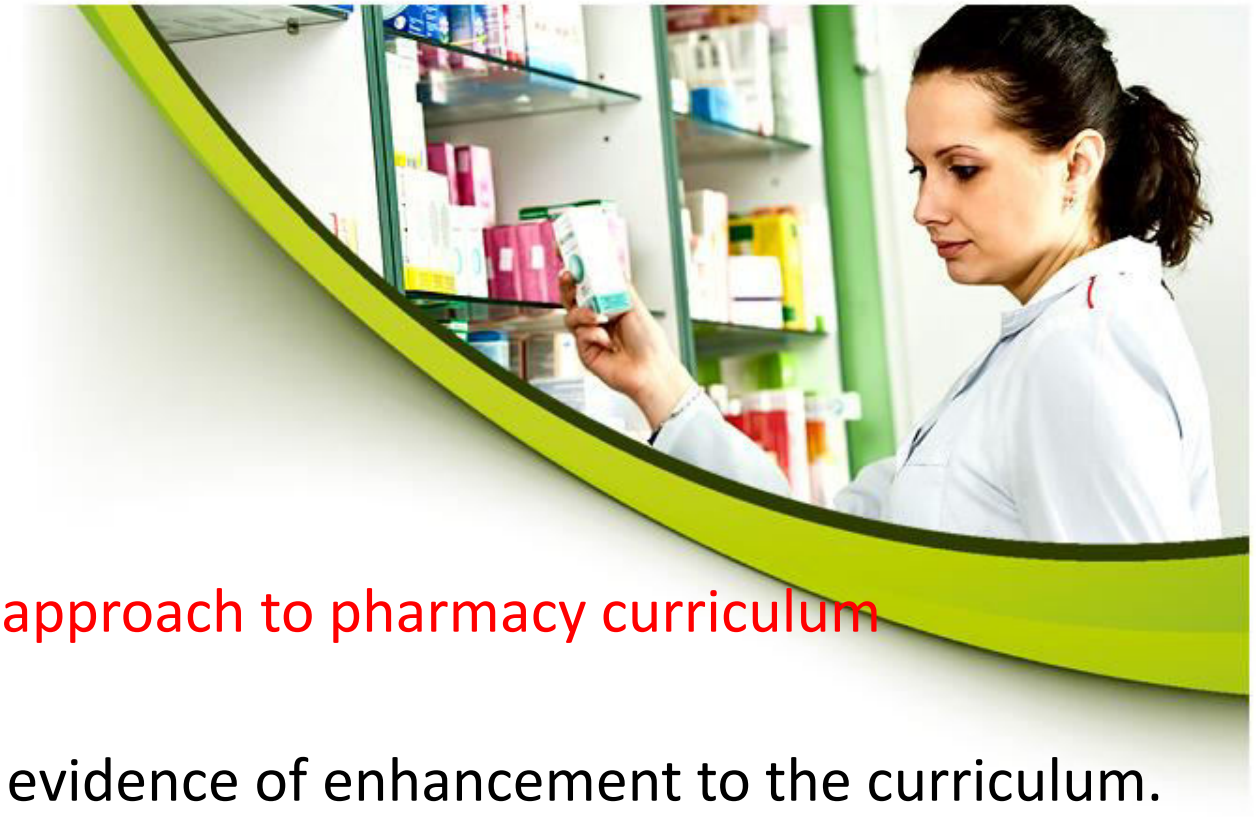
Conclusions

- Pharmacy Alumni of various Pharmacy sectors, professional pharmaceutical associations, accrediting agencies (PACUCOA), PRC, CHED and school linkages (local and international)

➢ can fulfill an important role by assisting the Department of Pharmacy Administrators and Faculty Members in their efforts to improve:

- student learning,
- program outcomes, and
- modification or revision of the curriculum.

Conclusions



- An outcomes-based approach to pharmacy curriculum development

➢ provided convincing evidence of enhancement to the curriculum. Such an approach should be considered when implementing or revising pharmacy curriculum.

Mabalos!!!