

I. MATTERS APPROVED BY THE BOARD (cont'd)

...

B. Academic Matters (cont'd)

....

3. Institution of the following Doctor of Philosophy by Research Programs in UP Los Baños:

- a. Ph.D. by Research (Agricultural Chemistry)
- b. Ph.D. by Research (Biochemistry)
- c. Ph.D. by Research (Wildlife Science)

Board Action: APPROVED

4. Institution of the Master of Science in Human Movement Science, UP Mindanao

Board Action: APPROVED

5. Institution of the Bachelor of Science in Data Science, UP Mindanao

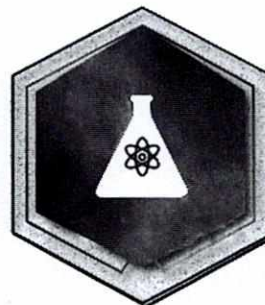
Board Action: APPROVED

6. Institution of the Doctor in Sustainability Program, UP Open University

Board Action: APPROVED

7. Recommendations of the University Registrars Task Force on the Harmonization of Academic Policies and Procedures

Board Action: APPROVED



**CURRICULAR PROPOSAL FOR THE
INSTITUTION OF**

**DOCTOR OF PHILOSOPHY
BY RESEARCH
(BIOCHEMISTRY)**

**INSTITUTE OF CHEMISTRY
COLLEGE OF ARTS AND SCIENCES
UNIVERSITY OF THE PHILIPPINES LOS BAÑOS**

Action of the Board of Regents
at its 1374th Meeting on APR 03 2023

APPROVAL


ROBERTO M.J. LARA

**Secretary of the University
and of the Board of Regents**

OVPAAC-CURR Form 2.0
University of the Philippines
PROPOSAL FOR NEW ACADEMIC PROGRAMS

Approval
ROBERTO M.J. LARA
Secretary of the University
and of the Board of Regents
Action of the Board of Regents
at its 1374th Meeting on APR 9 2023

Title of program: Doctor of Philosophy by Research (Biochemistry)

☐ Type of program: ☐ undergraduate ☐ MS/MA ☒ PhD

Proponent (Department, College, CU): Institute of Chemistry, College of Arts and Sciences, UPLB

Total no. of years: 3 years

Total no. of units: 15

I. Academic Merit (should answer the required competencies of graduates)

Introduction

In the University of the Philippines Charter of 2008 or RA 9500, UP as the national university shall serve its purpose as a leading public and secular institution of higher learning, as a research, a graduate, a public service and a regional and global university. The University is expected to provide excellent education and training in various disciplines, professions and academic fields to produce leaders, scholars and experts that would contribute to society.

The Institute of Chemistry of the College of Arts and Sciences, University of the Philippines Los Baños in accordance with UP's mandate proposes the Doctor of Philosophy by Research (Biochemistry) program to provide high quality training through research to future leaders and experts in the field of Biochemistry.

The Doctor of Philosophy by Research (Biochemistry) program aims to train students to develop intellectual and technical capabilities for independent research in the field of Biochemistry. The graduates are expected to use the skills gained from the program to produce basic and applied research that are directly or indirectly related to the Biochemistry and Chemistry fields to address problems and issues affecting society. The graduates are expected to accomplish these in their capacities as academics, as heads or personnel of government or private research institutes, universities, and industrial companies. The program also aims to develop and strengthen personal values in the students including the sense of responsibility, accuracy, prudence, and honesty. The proposed program also aims to produce graduates with excellent oral and written communication skills that are essential in their future roles as leaders, teachers, researchers and policy makers in the dissemination of information to the academic and scientific community, to the industry and to the public.

The proposed Doctor of Philosophy by Research (Biochemistry) would use an interdisciplinary approach since biochemistry as a field combines various fields such as chemistry, biology, physics, genetics, molecular biology, engineering, biotechnology, food science, toxicology, material science, biomedical sciences, computer and data science, animal and plant sciences and related fields. The Doctor of Philosophy by Research (Biochemistry) student is expected to acquire and to adapt important skills and competencies from several disciplines through self-directed learning during the research process. The student should also stay up-to-date with recent developments in the field and in the allied fields, and with societal issues. Being informed should inspire and motivate the student to propose solutions through research. The Institute of Chemistry through its offering of the

Doctor of Philosophy by Research (Biochemistry) program expects benefits for the advancements in the biochemistry field, benefits for the Institute, for the University, for the future students and their families, and for the Philippine and global society.

The Institute of Chemistry already has an existing regular PhD in Biochemistry program. This PhD by Research provides an alternative mode of delivery of our program. This will not be a duplicate of UP Manila's PhD program since UPLB has unique research areas that a PhD by Research (Biochemistry) can work on.

II. Brief description of the program

1. Program Outcomes (POs)

The proposed Doctor of Philosophy by Research (Biochemistry) program aims to produce a graduate who:

Common to all doctorate programs

- has the ability to demonstrate knowledge and skills at the most advanced level at the frontier of a field;
- possesses independent and original thinking skills needed for complex multidisciplinary research resulting in the creation of new methods or practices;
- can apply knowledge and skills in highly advanced contexts, and in the development and testing of new theories and new solutions to resolve complex and abstract issues;
- can make authoritative and expert judgment in the management of research or organization;
- can perform significant responsibility in extending professional knowledge and practice, and in the creation of new ideas or processes;

Specific to the Doctor of Philosophy by Research (Biochemistry) Program

- can implement novel basic research that could expand the knowledge in the molecular basis of life processes;
- can conduct novel applied research that could provide strategic, practical and socially-relevant solutions to problems related to the influence of matter and chemical reactions in life processes, and in allied fields such as the environment, health sciences and medicine; and
- can contribute as an innovative, ethical, knowledge-based, systematic, and practical individual in the fields where biochemistry is applied, such as in the academe and in the industry, in the public and in the private sectors.

2. Program structure

The proposed Doctor of Philosophy by Research (Biochemistry) has the following courses:

Course	Units*
Graduate Seminar in Biochemistry	3
Dissertation	12
TOTAL	15

Please see Appendix A for the schematic diagram showing the progression of the course.

Action of the Board of Regents
at its 1379th Meeting on APR 03 2023
APPROVAL
ROBERTO M.J. LARA
Secretary of the University
and of the Board of Regents

Program Outcomes A graduate of the Doctor of Philosophy by Research (Biochemistry) Program	Institutional Outcomes of U.P. as the National University#									
	A	B	C	D	E	F	G	H	I	J
Common to all doctorate programs										
a) has the ability to demonstrate knowledge and skills at the most advanced level at the frontier of a field	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
b) possesses independent and original thinking skills needed for complex multidisciplinary research resulting in the creation of new methods or practices	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
c) can apply knowledge and skills in highly advanced contexts, and in the development and testing of new theories and new solutions to resolve complex and abstract issues	✓	✓	✓	✓	✓	✓	✓	✓		✓
d) can make authoritative and expert judgment in the management of research or organization	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
e) can perform significant responsibility in extending professional knowledge and practice, and in the creation of new ideas or processes	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Specific to the Doctor of Philosophy by Research (Biochemistry)										
f) can implement original basic research that could expand the knowledge in the molecular basis of life processes;	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
g) can conduct original applied research that could provide strategic, practical and socially-relevant solutions to problems related to the influence of matter and chemical reactions in life processes in chemistry and allied fields such as the environment,	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Action of the Board of Regents at its 127th Meeting on APR 03 2023

APPROVAL

ROBERTO M.J. LARA

Secretary of the University and of the Board of Regents

APPROVAL
[Signature]
ROBERTO M.J. LARA

**Secretary of the University
and of the Board of Regents**

health and medicine, agriculture;
and

h) can contribute as an innovative,
ethical, knowledge-based,
systematic, and practical
individual in the fields where
biochemistry is applied such as
in the academe, and industry, in
public and in the private sectors.

✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
---	---	---	---	---	---	---	---	---	---	---	---

INSTITUTIONAL OUTCOMES OF U.P. AS THE NATIONAL UNIVERSITY

I. The ideal graduate of U.P. as the National University is:

- A. a scholar dedicated to the search for truth and knowledge;
- B. an expert and leader who pursues excellence and innovation towards inclusive growth and development;
- C. an active contributor in the dissemination and application of knowledge;
- D. a lifelong learner who adapts to the rapidly changing global environment;
- E. a person imbued with the *Pahinungod Spirit*, engaged in community, public and volunteer service;
- F. a responsible citizen with a deep sense of intercultural understanding and ethical responsibility; and
- G. an advocate with abiding respect for freedom, democracy, human rights, and gender equity.

II. The University's desired impact on society are:

- H. strong research-based governance and responsive public policies in pursuit of social progress and transformation;
- I. enhanced national identity and consciousness that serve as inspiration to other peoples; and
- J. an empowered nation, enjoying human, environmental and economic security, contributing to regional and global sustainability

Curriculum Map

COURSES	PROGRAM OUTCOMES							
	a	b	c	d	e	f	g	h
CHEM 400, Doctoral Dissertation (Thesis Research)	R	R	D	D	R	D	D	D
CHEM 399, Graduate Seminar in Biochemistry (Ph.D.)	D	D	D	D	D	D	D	D

I: INTRODUCED — The student gets introduced to concepts/principles.
R: REINFORCED (or Practiced) — The student practices the competencies with supervision.
D: DEMONSTRATED — The student practices competencies across different settings with minimal supervision.

3. Program requirements

3.1. Admission into the PhD by Research (Biochemistry) Program

Section 1. Admission Requirements

Article 1. An applicant for admission to graduate work for the degree of Doctor of Philosophy (Ph.D.) by research must

- a) be a holder of a Master of Science (MS) degree in Chemistry, Agricultural Chemistry, or Biochemistry from a recognized institution provided that the core course requirements of the UPLB-IC MS degree programs or their equivalents have been complied with;
- b) have a general weighted average GWA of 1.75 or better in the master's degree;
- c) have at least i) three (3) years of relevant experience in research as project leader or co-project leader, or ii) 5 years of relevant experience in research as study or co-study leader, or iii) 5 years of relevant experience beyond MS degree. For cases (i) and (ii) a certification by his/her home institution/funding agency is required, while for case (iii) a certification by the project/study leader of the potential of the applicant to be a project/study leader is needed; and
- d) have one (1) publication in an indexed journal (Web of Science or Scopus) with the applicant as the first/lead/sole author within the last 5 years. This output should be beyond the MS degree.

Article 2. A. duly accomplished application form must be submitted to the UPLB Graduate School together with the following documents:

- a. original and photocopy of the official transcript of academic records, in English language with no remarks and with an explanation of the grading system used, from tertiary and graduate institutions attended;
- b. photocopy of bachelor's and master's diplomas;
- c. certification from a competent authority that the applicant has at least three (3) years of satisfactory research experience;
- d. reprints or copies of the applicant's research outputs;
- e. research proposal (1,500 to 3,000 words) that shall include the title, rationale, objectives, framework, methodology, and references of the proposed study;
- f. for international students, certification from the Office of the University Registrar (or equivalent) of the previous university attended that the medium of instruction is English (if applicable), or results of the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) or its equivalent (acceptable score will be based on GS Policies);
- g. application fee, to be paid by bank transfer or postal money order; and
- h. sealed letters of reference from two former professors, superiors, or colleagues and a letter of reference from the applicant's former master's degree adviser.

Action of the Board of Regents
at its 374th Meeting on APR 03 2023

APPROVAL

ROBERTO M.J. LARA

Secretary of the University
and of the Board of Regents

Section 2. Evaluation for Admission

Article 1. The Evaluation Committee from the Institute of Chemistry's Graduate Admissions and Curriculum Committee composed of a chair and three (3) graduate faculty members shall assess the potential of an applicant as a PhD by research student. Three of the members will be permanent while the fourth member will be chosen based on the research interest of the applicant.

Article 2. The Evaluation Committee shall conduct the interview, assessment examination, and defense of the research proposal of the applicant. The assessment examination will be both written and oral.

Article 3. Acceptance will be based on the overall performance of the applicant and requires that the applicant must receive no more than one negative vote from the Evaluation Committee.

The Institute of Chemistry Director on behalf of the Evaluation Committee will endorse to the Dean of the Graduate School (GS) applicants who are favorably evaluated for acceptance into the Program, indicating any additional conditions (such as recommendations for non-credit course work) and identifying the potential advisers for each student.

Section 3. Notice of Admission

Article 1. A letter of admission will be sent out to a student who is favorably endorsed for admission to the Program and will be informed of this assessment as well as the names and contact details of potential advisers.

Section 4. Registration

The student shall be allowed to register only upon presentation of the letter of admission from the Dean of the Graduate School to the Office of the University Registrar.

Section 5. Deferment of admission

Deferment of admission for a period of not exceeding one year may be granted upon written request. A student unable to register within one year of admission will have to reapply for admission.

Section 6. Residency and Time Limit

Article 1. A student is in residence when he/she is registered for dissertation work on campus, or work *in absentia* with due approval in advance by his/her Advisory Committee.

Article 2. A minimum period of three (3) but not more than five (5) years is required for residency.

Article 3. Transfer/Shifting. Policies on transfer/shifting, and other rules and regulations are specified in the UPLB Graduate School Manual.

Article 4. After 5 years, the residency can be extended upon recommendation of the Advisory Committee, consistent with the provision in Chap. 10, Sec. 19, Art. 5 of the UPLB Graduate School Policies, Rules and Regulations (2010).

Action of the Board of Regents
at its 1374th Meeting on APR 03 2023

APPROVAL

ROBERTO M.J. LARA

Secretary of the University
and of the Board of Regents

APPROVAL

ROBERTO M.J. LARA

Page 8

Secretary of the University
and of the Board of Regents

Section 7. Advisory Committee

Article 1. In the first semester of residence, the student, in consultation with the Chair/Director of the major department/institute and after interviewing prospective advisers from among the Institute's faculty, shall select his/her major adviser who shall also be the chair of the student's Advisory Committee. The student, together with his/her major adviser, shall form the committee, which shall be composed of five (5) members, including the adviser, with the major and related areas represented.

Article 2. The Chair of the Advisory Committee shall convene the committee not later than one month after the approval of its composition by the Dean of the Graduate School. The student shall discuss with his/her Advisory Committee the details of the dissertation proposal including the place of work and its mechanics of monitoring, facilities needed, time required to accomplish the work, and the budget. During his/ her first semester, the student shall also discuss the required seminar presentations in relation to the dissertation research with the Advisory Committee.

Article 3. The student shall discuss with his/her Advisory Committee for the approval of portions of the dissertation, which are ready for presentation in a seminar, and to be written and submitted for publication.

Section 8. Work in Absentia

The provisions of Chapter 10, Section 16, Articles 1 and 2 of the UPLB Graduate School Policies, Rules and Regulations (2010). shall also apply to the PhD by Research program.

Section 9. Final Examination Panel

The provisions of Chapter 10, Section 15, Articles 2-9 of the UPLB Graduate School Policies, Rules and Regulations (2010) shall also apply to the PhD by Research program.

Section 10. Final Examination

Article 1. The Final Examination panel shall be composed of the student's Advisory Committee and two (2) external reviewers to be appointed by the Dean of the Graduate School from among three (3) nominees of the department/institute. The process of external review shall be consistent with Chap. 10, Sec. 15, Art. 2-9 of the UPLB Policies, Rules and Regulation. In addition, the doctoral dissertation outline as well as the manuscript will be externally reviewed to ensure quality. The student shall be given, by his/her Final Examination panel, an oral examination which will be opened to the public. The Graduate School shall publicize the schedule and place of the oral examination.

The Final Examination is an oral examination where the student presents and defends his/her doctoral dissertation. The application for a permit for Final Examination presentation must be made no later than one month before the proposed schedule. A draft of the dissertation is a requirement for the permit application. The presentation should be scheduled no later than the last day of classes for the semester.

All members of the Final Examination Panel (members of the Advisory Committee plus Chair of the Thesis Examining Panel) should be in attendance in person or by electronic communication on the scheduled date of the presentation. The examination is open to the public.

Article 2. To pass the examination, the student must receive no more than one negative vote from the Advisory Committee.

Article 3. A student who fails the examination may be given a re-examination not earlier than one month but not later than one year after the first examination only upon unanimous approval of his/her Advisory Committee. Failure to pass the re-examination shall disqualify the student from earning the degree.

Article 4. A student who passes the Final Examination shall be given a numerical grade by his/her adviser in consultation with the members of the Advisory Committee. This grade reflects the whole work done during the program to include the publications emanating from the research work and the results of the final examination.

Section 11. Requirements for Graduation. Students of the Program will be subject to the rules and regulations of the University. Any breach of these rules will be dealt with in accordance with the administrative and academic policies, guidelines, rules, and regulations concerning student conduct and discipline.

Article 1. Seminar. The student must register three (3) units of seminar (CHEM 399) (1 unit per semester), and present a seminar as a requirement for each enrollment. At least two of the seminar topics to be presented must be about the dissertation of the student. The student shall not be allowed to continue the program if he/she will not be able to give a satisfactory performance in his/her first seminar presentation.

Article 2. Confirmation of Candidacy. Within the first year of residency, the student must submit to the GS dean a research proposal and a program of study (if applicable) and duly approved by all members of the Advisory Committee. A presentation of the research proposal may be required by the Advisory Committee prior to approval. The whole or parts of the approved research proposal may also be presented in the seminar course (CHEM 399).

With the approval of the research proposal (and program of study) by the GS Dean, the candidacy in the program is confirmed. The student is allowed to enroll the appropriate number of units for the dissertation (CHEM 400) course in each semester, following the program of study.

Article 3. Dissertation. The student must register a total of twelve (12) units of the dissertation (CHEM 400) course. The enrollment may be as increments of three (3) units until all twelve units had been earned upon completion and submission of the dissertation and a numerical grade had been given. For each enrolment, the student must demonstrate significant progress on the dissertation work to warrant a grade of satisfactory (S). If a student fails to show satisfactory progress, the student will be assessed with a grade of Unsatisfactory (U) and must re-enroll the enrolled number of units of the dissertation course.

Article 4. Before the student can be awarded the degree, at least three (3) articles from his/her dissertation work with him/her as the lead (first) or sole author should be published. The first page or the title page of the published articles shall be appended to the manuscript.

Article 5. Three (3) printed copies and one (1) electronic copy (in PDF and MS Word file) of the dissertation manuscript duly approved by the Advisory Committee members must be submitted to the Graduate School.

Action of the Board of Regents
at its 127th Meeting on

APPROVAL

ROBERTO M.J. LARA

Secretary of the University
and of the Board of Regents

APR 03 2023

4. Course institution/addition

Course Institution:

4.1. Course number: **CHEM 399**

4.1.1. Course title: **Graduate Seminar in Biochemistry (Ph.D.)**

4.1.2. Course description:

4.1.3. Course credit: **1 unit**

4.1.4. Course prerequisite: **COI***

4.1.5. Semester Offered: **1, 2**

4.1.6. Course Stipulation: may be taken more than once

4.1.7. Justification: This course aims to develop the scientific communications skills of the graduate students. This course is mandatory for all Doctor of Philosophy graduate students to provide opportunities to conduct a seminar based on scientific literature, basic and recent developments in their fields of interests, and experimental results from their respective research projects and/or dissertations. The discussions should involve current research efforts that utilize advanced methods and the application of chemical principles and tools to further broaden understanding of science and chemistry as well as emerging areas in chemistry and/or biochemistry. Students are encouraged to highlight new findings that involve multidisciplinary research resulting from chemistry and other disciplines such as biology, agriculture, biotechnology, material science, environmental science and engineering science.

4.1.8. Attachments: **(Appendix B.1)**

Course addition (already existing under the regular PhD in Biochemistry program):

4.2. Course number: **CHEM 400**

4.3. Course title: **Dissertation**

4.4. Course credit: **12 units**

4.5. Course prerequisite: **COI***

4.6. Semester offered: **1,2,M**

4.7. Course stipulation: can be taken using the following scheme: 3-3-3-3 or 4-4-4

*COI: for the faculty-in-charge assess the readiness of the student to pursue the next units of research.



5. Curriculum

A minimum period of three (3) but not more than five (5) years is required for residency.

Sample program/timeline 1

Course title	Course description	Units	Prerequisite
First year 1st semester			
CHEM 399*	Graduate Seminar	1	COI
CHEM 400**	Doctoral Dissertation	3	COI
First year 2nd semester			
CHEM 400**	Doctoral Dissertation	3	COI
Second year 1st semester			
CHEM 399*	Graduate Seminar	1	COI

CHEM 400**	Doctoral Dissertation	3	COI
Second year 2nd semester			
CHEM 400**	Doctoral Dissertation	3	COI
Third year 1st semester			
CHEM 399*	Graduate Seminar	1	COI
CHEM 400**	Doctoral Dissertation	(1)	COI
Third year 2nd semester			
CHEM 400**	Doctoral Dissertation	(1)	COI
TOTAL UNITS		15	

* For institution

**For doctoral dissertation, after the 3-3-3-3 units, the student is allowed to enroll 1 unit per term up to a maximum of six (6) terms, following the GS Policy on Enrollment of Dissertation.

6. Faculty profile

6.1. Academic qualifications

6.1.1. Faculty of Department proposing program

Name	Degree	Rank	Status	Specialization	Courses to teach in the new program
Abrera, Annabelle T.	<i>Dr. nat. techn.</i>	Associate Professor	Permanent	Physical Chemistry	CHEM 399, CHEM 400
Aguila, Mae Joanne B.	PhD	Associate Professor	Permanent	Inorganic Chemistry	CHEM 399, CHEM 400
Aldemita, Ma. Desiree B.	<i>Dr. nat. techn.</i>	Associate Professor	Permanent	Biochemistry	CHEM 399, CHEM 400 (can serve only as member of the Advisory Committee)
Arreola, Sheryl Lozel B.	<i>Dr. nat. techn.</i>	Associate Professor	Permanent	Food Biotechnology	CHEM 399, CHEM 400
Completo, Gladys Cherisse J.	PhD	Professor	Permanent	Chemistry (Organic)	CHEM 399, CHEM 400
Hizon-Fradejas, Amelia B.	PhD	Assistant Professor	Permanent	Analytical Chemistry	CHEM 399, CHEM 400
Lacsamana, Marivic S.	PhD	Professor	Permanent	Biochemistry	CHEM 399, CHEM 400

Action of the Board of Regents at its 137th Meeting on APR 03 2023

APPROVAL

ROBERTO M. LARA

Secretary of the University and of the Board of Regents

521	Manalo, Cervinia V.	PhD	Assistant Professor	Temporary	Analytical Chemistry	CHEM 399,
522						
523						
524	Manalo, Marlon N.	PhD	Associate Professor	Permanent	Chemistry (Physical Organic)	CHEM 399, CHEM 400
525						
526						
527	Nacario, Ruel C.	PhD	Professor	Permanent	Chemistry (Organic)	CHEM 399, CHEM 400
528						
529						
530	Recuenco, Mariam C.	PhD	Associate Professor	Permanent	Chemistry (Biochemistry)	CHEM 399, CHEM 400
531						
532						
533						
534	Torio, Mary Ann O.	PhD	Professor	Permanent	Biochemistry	CHEM 399, CHEM 400
535						
536						

6.2. Research Activities

Name of Faculty	Research Activities	Title of publications (last 3 years) See Appendix C
Abrera, Annabelle T.	Chemical kinetics Chemical profiling of bee products (venom, propolis, etc.) Computational chemistry	Action of the Board of Regents at its 137th Meeting on APPROVAL <i>[Signature]</i> ROBERTO M.J. LARA Secretary of the University and of the Board of Regents APR 03 2023
Aguila, Mae Joanne B.	Catalysis for Biomass Valorization, Environmental Remediation, Organic Transformation Biopolymer adsorbents for CO ₂ Cr ³⁺ and its effects on glucose metabolism Alternative reaction media Computational Chemistry	
Aldemita, Ma. Desiree B.	Analysis of hive products derived from honey bees and stingless bees	
Arreola, Sheryl Lozel B.	Utilization of microbial enzymes for food and feed applications Development and validation of analytical methods	
Completo, Gladys Cherisse J.	Synthesis of inhibitors of glycosyltransferases involved in the formation of the mycobacterial cell wall (Medicinal Chemistry) Mass analysis of conjugated glycans, human milk oligosaccharides, and	

571
572
573
574
575
576
577
578
579
580
581
582
583
584
585
586
587
588
589
590
591
592
593
594
595
596
597
598
599
600
601
602
603
604
605
606
607
608
609
610
611
612
613
614
615
616
617
618
619
620

	animal milk oligosaccharides and glycoproteins Functional Food Development Glycomics and Gylcoproteomics of established mammalian cancer cells	
Hizon-Fradejas, Amelia B.	Environmental Chemistry - Microplastics in the environment - Environmental water & sediment analysis - Ecological restoration research - Green Chemistry Chemical Toxicology -Toxicity testing Bee Program - Analysis of bee products	
Lacsamana, Marivic S.	Proteins (Lectins, Enzymes, Phycocyanin) - Isolation, Purification, Characterization and Applications; Bioadsorbents/Enzyme Immobilization; Nanotechnology; Cd ion remediation; Chemical Education	
Manalo, Cervinia V.	Environmental chemistry Chemical oceanography Water and wastewater quality analyses Biofouling determination and treatment in polyamide reverse osmosis membranes Carbon recycling systems using heterotrophic microalgae, thraustochytrids	
Manalo, Marlon N.	Quantum mechanical modeling Screening of bioactivity by molecular docking Physical chemistry Computational chemistry	
Nacario, Ruel C	Organic Synthesis and Medicinal Chemistry (Drug Discovery) Natural Products Gycoproteomics and Glycomics of Cancer Cells	
Recuenco, Mariam C.	Protein-stabilized nanoparticles as sensors	

Action of the Board of Regents
at its 1374th Meeting on APR 03 2023
APPROVAL

ROBERTO M.J. LARA
Secretary of the University
and of the Board of Regents

	Phytochemical content and antioxidant activities of plant foods Protein purification and characterization Protein-ligand interactions (<i>in-silico</i>)	Action of the Board of Regents at its <u>1379th</u> Meeting on <u>APR 03 2023</u> APPROVAL ROBERTO M. J. LARA Secretary of the University and of the Board of Regents
Torio, Mary Ann O.	Bioactive Peptides, Protein Engineering, Proteomics and Functional Food	

See Appendix C

III. Needs Assessment (should show the competitive advantage of the program)

A needs assessment survey was conducted from April 4-16, 2022 to evaluate the needs and interest of prospective students in the proposed programs of **Doctor of Philosophy by Research (Biochemistry)** and **Doctor of Philosophy by Research (Agricultural Chemistry)** to be offered by the Institute of Chemistry, University of the Philippines Los Baños.

Sex and age profiles of respondents

There were 24 respondents to the survey, 10 (41.7%) females and 14 (58.3%) males with ages ranging from early 20's to late 40's. More than 60% of the respondents constitute the age ranges of 26-35.

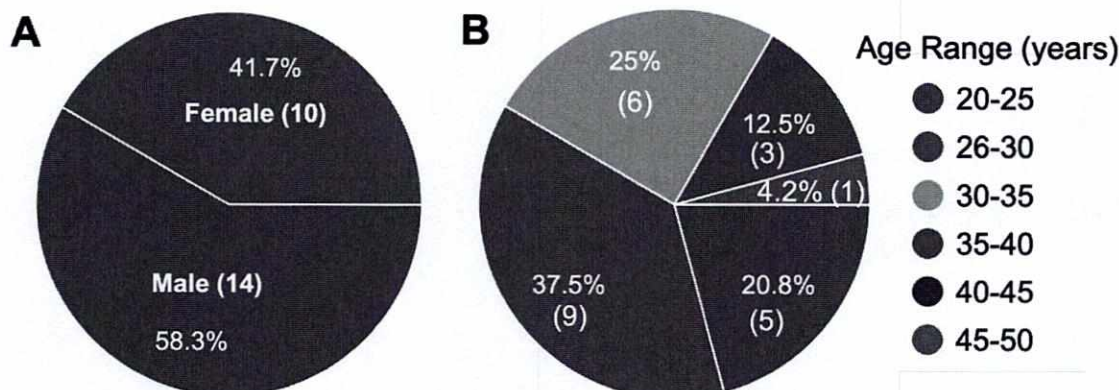


Figure 1. Sex (A) and age (B) profiles of the respondents in the needs assessment survey for the proposed programs of Doctor of Philosophy by Research (Biochemistry) and Doctor of Philosophy by Research (Agricultural Chemistry) to be offered by the Institute of Chemistry, University of the Philippines Los Baños.

Educational background and specialization profiles of respondents

Figure 2 shows that 13 of 24 respondents (54.2%) are currently enrolled in a Master's program, and a total of 11 (55.8%) already have a Master's degree. Based on these responses, the Doctor of Philosophy by Research programs of IC have 11 potential applicants if the programs are to be offered by the next academic year.

From the fields or specialization, 22 (91.7%) are currently enrolled or had graduated from a chemistry-related field.

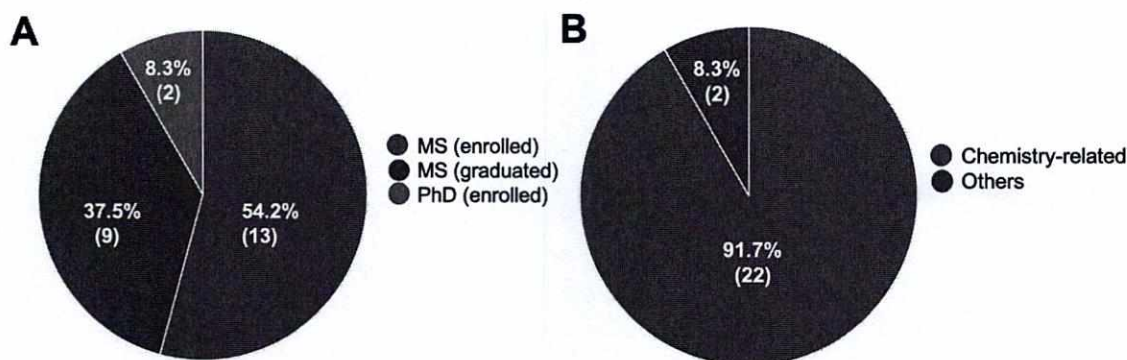


Figure 2. Educational background (A) and specialization (B) profiles of the respondents in the needs assessment survey for the proposed programs of Doctor of Philosophy by Research (Biochemistry) and Doctor of Philosophy by Research (Agricultural Chemistry) to be offered by the Institute of Chemistry, University of the Philippines Los Baños.

Employment, industry sectors, and work roles of the respondents

Table 1 shows the profiles for employment status, industry sectors, and work roles of the respondents. More than 95% (23) of the 24 respondents are currently employed. Nineteen (19, 79.2%) are working in government institutions while 4 (16.6%) work in the private sector. From the population of respondents, 12 (50%) are employed as faculty/instructor/lecturer/teaching staff in their respective institutions, 6 (25%) work as research associates/assistants/specialists. Those who work in the private sectors have the following roles: as an animal nutritionist, quality assurance officer, laboratory analyst/chemist, pollution control officer.

Based on these responses, a total of 9 (37.5%) respondents who had higher ranks in the teaching and research fields may potentially qualify in the proposed programs.

Table 1. Employment, industry sectors, and work roles of the respondents

Questions/Responses	Frequency	Percent
Action of the Board of Regents at its 137th Meeting on <u>APR 03 2023</u> APPROVAL ROBERTO M.J. LARA Secretary of the University and of the Board of Regents		
1. Employment status		
Employed	23	95.8
Not employed	1	4.2
Total	24	100
2. Sector where currently employed		
Government	19	79.2
Private	4	16.6
Not applicable	1	4.2

Total	24	100
3. Current role in organization		
Faculty/Instructor/ Lecturer/Teaching Staff	12	50.0
Research Associate/ Research Assistant/ Research Specialist	6	25.0
Quality Assurance/ Laboratory Analyst/ Chemist/ Laboratory Manager	4	16.6
Animal Nutritionist	1	4.2
Not applicable	1	4.2
Total	24	100

Research and publication experiences of respondents

When asked if their current work roles involved research management and/or implementation, 15 of 24 respondents or 62.5% responded in the affirmative (Table 2). From these sets, 12 had three or more years of professional research experience. With regards to experience in publishing research results, 6 respondents had one publication each, while 6 had two or more papers published. In terms of authorship, 2 respondents indicated being principal investigators in their projects, 1 had sole authorship, 5 as first authors, and 9 had been corresponding authors.

Based on the publication requirements of sole and first authorship, 6 (25%) of the respondents may possibly qualify if they apply to the programs for the First semester 2022-2023.

Table 2. Research and publication experiences of respondents

Questions/Responses	Frequency (Total Respondents = 24)	Percent
1. Does work involve research management and/or implementation?		
Yes	15	62.5
No	9	37.5
Total	24	100
2. Number of years of professional research experience		
0 Years	9	37.5
1-2 Years	3	12.5
3-5 Years	6	25.0
More than 5 Years	6	25.0
Total	24	100
3. Publication experience: Number of publications beyond Master's degree programs or those produced independently		

0	ROBERTO M. J. LARA	12	50.0
1	Secretary of the University	6	25.0
2	and of the Board of Regents	3	12.5
3-5		2	8.4
6-9		1	4.2
Total		24	100

4. Previous role(s) as author in published articles

Sole author	1	4.2
First author	5	20.8
Corresponding author	9	37.5
Principal investigator	2	8.4
Co-author	2	8.4
Not applicable	12	50.0

Interests in the Doctor of Philosophy by Research (Biochemistry) and/or Doctor of Philosophy by Research (Agricultural Chemistry) programs of the Institute of Chemistry, UPLB

Table 3 shows the respondents' interest in the proposed Doctor of Philosophy by Research programs. Four respondents of 24 (16.7%) indicated interest in the regular Doctor of Philosophy programs of the Institute, while 7 (29.2%) indicated interest in the proposed Doctor of Philosophy by Research programs. This may suggest a higher degree of interest in the Doctor of Philosophy by Research programs compared to the regular or by coursework programs of the Institute.

Three (3) respondents indicated interest in applying to the Doctor of Philosophy by Research programs in the next two years, between the First Semester 2022-2023 and First Semester 2023-2024. On the other hand, four (4) respondents indicated interest in applying to the Doctor of Philosophy by Research programs between the First Semester 2024-2025 and First Semester 2025-2026.

Table 3. Interest in the Doctor of Philosophy by Research (Biochemistry) and/or Doctor of Philosophy by Research (Agricultural Chemistry) programs of the Institute of Chemistry, UPLB

Questions/Responses	Frequency (Total Respondents = 24)	Percent
1. Interest in the Doctor of Philosophy (REGULAR/COURSEWORK) in Biochemistry and/or Doctor of Philosophy in Agricultural Chemistry of IC, UPLB		
Yes	4	16.7
No	9	37.5
Maybe	11	45.8
Total	24	100
2. Interest in the Doctor of Philosophy by Research (Biochemistry) and/or Doctor of Philosophy by Research (Agricultural Chemistry) of IC, UPLB		
Yes	7	29.2
No	6	25.0
Maybe	11	45.8

Total	24	100
--------------	----	-----

3. When do you plan to apply for the Doctor of Philosophy by Research (Biochemistry) and/or Doctor of Philosophy by Research (Agricultural Chemistry) of IC, UPLB?

1 st Semester 2022-2023	1	4.2
2 nd Semester 2022-2023	1	4.2
1 st Semester 2023-2024	1	4.2
2 nd Semester 2023-2024	0	0
1 st Semester 2024-2025	2	8.4
2 nd Semester 2024-2025	0	0
1 st Semester 2025-2026	2	8.4
2 nd Semester 2025-2026	0	0
Not applying/ not applicable	17	70.8
Total	24	100

The survey also asked for the fields and research interests of the prospective students (Table 4). The respondents indicated highest interests in Biochemistry (9, 37.5%), and Agricultural Chemistry (4, 16.7%). Other fields of interest include Material Science, Agricultural Sciences and Environmental Science.

When the participants were asked about what they thought was a realistic publication requirement for the programs, 11 (45.8%) indicated that having one (1) first author publication accepted, and having two (2) more manuscripts (non-first author) accepted, as realistic. Eight (8) respondents (33.3%) replied that having one (1) first author publication accepted, and two (2) more first author manuscripts for submission, may be realistic.

Table 4. Survey on the fields and research interests of prospective students, and opinions on publication requirements of proposed programs of Doctor of Philosophy by Research (Biochemistry) and/or Doctor of Philosophy by Research (Agricultural Chemistry)

Questions/Responses	Frequency (Total Respondents = 24)	Percent
1. Fields and research interests if applying for the Doctor of Philosophy by Research programs		
Biochemistry	9	37.5
Agricultural Chemistry	4	16.7
Material Science	4	16.7
Agricultural Sciences (plant, animal, crop protection, soil, etc)	3	12.5
Environmental Science	3	12.5
Biology	1	4.2
2. The proposed Doctor of Philosophy by Research programs would take three years and would require a number of publications for graduation. Which do you think would be a realistic minimum number of required publications to graduate from the program?		

APPROVAL
[Signature]
ROBERTO M. LARA

**Secretary of the University
and of the Board of Regents**

1 first author publication accepted, and 2 more manuscripts (non-first author) accepted	11	45.8
1 first author publication accepted, and 2 more first author manuscripts for submission	8	33.3
2 first author publications accepted, and 1 more manuscript (non-first author) accepted	2	8.4
2 first author publications accepted, and 1 more manuscript (non-first author) for submission	2	8.4
3 first author publications accepted	1	4.2
Total	24	100

When asked about their motivations for applying to the Doctor of Philosophy by Research programs, participants indicated professional development (95.8%), promotion (54.2%) and higher potential income (50%) as the top three motivations or reasons (Table 5). More than 60% of the participants are considering scholarships to finance their studies, while others indicated possibly employing research grants (16.7%) and self-funding (12.5%).

The needs assessment survey also asked for the possible reasons for not choosing to apply to the Doctor of Philosophy by Research programs of the Institute of Chemistry (Table 5, item 3). More than 79% of the respondents indicated that they may be interested in pursuing the degrees elsewhere. About 66% of the respondents are also considering possible limitations in research funding and scholarships. Fifty percent of the participants also indicated that topics and potential advisers for topics of interest may be limited. One participant noted that projects may be too ambitious for the Institute's actual logistical capabilities and facilities.

Table 5. Motivations and possible limitations to pursuing the degrees of Doctor of Philosophy by Research (Biochemistry) and/or Doctor of Philosophy by Research (Agricultural Chemistry) to be offered by the Institute of Chemistry

Questions/Responses	Frequency (Total Respondents = 24)	Percent
1. Motivations in pursuing a degree in Doctor of Philosophy in Biochemistry or Doctor of Philosophy in Agricultural Chemistry of IC, UPLB		
Professional development	23	95.8
Promotion	13	54.2
Higher potential income/salary	12	50.0
Availability of scholarships	9	37.5
Proximity	7	29.2
Requirement for tenure	5	20.8
Opportunity for study leave	5	20.8

Research funding opportunities		4.2
Not applicable	1	4.2

2. How would you finance your studies if you apply to the Doctor of Philosophy by Research programs of IC, UPLB?

Scholarships/sponsorships	15	62.5
Research grants	4	16.7
Self-funding	3	12.5
Not applicable/no definite plans	2	8.4
Total	24	100

3. Possible reasons for NOT choosing IC, UPLB to pursue a degree in Doctor of Philosophy by Research (Biochemistry) or Doctor of Philosophy by Research (Agricultural Chemistry)

Interest in trainings elsewhere or abroad	19	79.2
Limited research funding	12	50.0
Limited scholarships available	4	16.7
Limited research topics/problems	6	25.0
Few faculty/staff on desired topic	6	25.0
Too ambitious topics for the Institute's actual logistic capabilities/facilities	1	4.2

Summary of the needs assessment survey

This needs assessment survey was able to provide data on the interest of prospective students in pursuing the Doctor of Philosophy programs of the Institute of Chemistry. The Doctor of Philosophy by Research programs may be more attractive to prospective students due to the similarities to the programs abroad where the work is focused on producing research and publishing. Since there is no more coursework, the students could focus on self-directed learning and mastering research techniques and a particular topic of interest. These research-based programs may produce more research outputs for the students, for the faculty, for the Institute and for the University. Potential benefits may include more visibility and impact of the research and researchers.

Based on the responses, the Institute may receive about 1-2 applications per year, which may be similar to the usual applications in the regular (by coursework) Doctor of Philosophy programs of the Institute. However, prospective students may consider applying elsewhere due to concerns in research funding, scholarships, facilities, available research problems and teaching staff. Therefore, the Institute and the University must be reflective and proactive in coming up with measures to address these concerns.

Potential research funding and scholarship opportunities

With regards to financing the studies of prospective students, a number of scholarship programs from the government, such as from the Commission of Higher Education (CHED), Department of Science and Technology (DOST) and from the Department of Agriculture-Bureau of Agricultural Research (DA-BAR) are available. Non-government research institutions and agencies such as the Southeast Asian Regional Council for Graduate Study and Research in Agriculture (SEARCA) and the International Rice Research Institute (IRRI) may also have available scholarships and may provide prospective research partners for prospective students. Partnerships and collaborations with universities and researchers

abroad, and also with industries and private companies may also offer opportunities for short-term research and exchange. These may address the gaps in funding and facilities. Research funding for students who are currently employed in the University may be availed from the OVPA- and OVCRE- administered research grants. The Institute must also be proactive in addressing the gaps in resources and facilities. Currently, the Institute faculty are actively seeking research funding and networks with alumni, industry and university partners.

Potential employment options

The Doctor of Philosophy by Research program in Biochemistry have the potential to produce high quality graduates that could become leaders, teachers, researchers and policy makers in various sectors of the society. The government has a number of agencies where graduates can find employment. Examples include the DOST's sectoral planning councils, service institutes and advisory bodies, the Department of Health's Research Institute for Tropical Medicine and Virology Institute, Department of Agriculture's service institutes, and State Universities and Colleges. Private and non-governmental organizations may also employ graduates of the programs. The prospective graduates of the program may also find employment in universities, research institutes and industries abroad. Some may take on leadership roles such as establishing their own businesses, heading companies and government agencies, or running for public office.

Sources of potential enrollees to the programs

The proposed programs may have potential enrollees/applicants from those having Master of Science (MS) degrees from the University of the Philippines System, from other state universities and colleges, from private universities offering Master of Science in Chemistry and other related programs (e.g Ateneo de Manila University, De La Salle University, University of Sto. Tomas). In addition, qualified applicants may come from those who are currently employed in government and private agencies whose work involves research management and/or implementation. Foreign students are also potential students to the program.

IV. Budget and effect on resources

(Needs should consider the carrying capacity of the institution – Dept., College, CU. It should also reflect recurring budgets when the program is implemented.)

1. Budget allocation

Particulars	No. of Existing*	Year	Actual needs	Additional requirement	Total cost (attach details and computation as Appendix D)
1.1. Faculty items	12	Y1	0	0	
		Y2		0	
		Y3		0	

Action of the Board of Regents
at its 1374th Meeting on APR 03 2023

APPROVAL

ROBERTO M. J. LARA

Secretary of the University
and of the Office of Regents

1011	Sub-total for faculty					
1012	1.2. Capital outlay		Y1	1		3,000,000
1013	Laboratory spaces		Y2	1		
1014	And Offices for		Y3	1		
1015	Graduate Students					
1016						
1017	Sub-total for capital outlay					3,000, 000
1018	1.3. Equipment (specify)	Various	Y1			16,500,000
1019		equipment	Y2			5,700,000
1020		and	Y3			3,400,000
1021		instruments				
1022		(See				
1023		Appendix				
1024		D)				
1025	Sub-total for equipment**					25,600,000
1026	1.4. Additional personnel					
1027	1.4.1. Office staff		Y1			
1028	1.4.2. Laboratory staff		Y2	1		450,000
1029	1.4.3. others		Y3			
1030	Sub-total for additional					450,000
1031	personnel					
1032	1.5. Library and other	Various	Y1			
1033	teaching materials**	software	Y2			
1034		licenses and	Y3			
1035		subscription				
1036		s				
1037	Sub-total for library and					
1038	other materials					
1039	1.6 Additional MOOE	Travel,	Y1			150,000
1040		office	Y2			150,000
1041		supplies,	Y3			150,000
1042		cleaning				
1043		supplies,				
1044		laboratory				
1045		supplies				
1046	Sub-total for additional					450,000
1047	MOOE					
1048	TOTAL BUDGET					PHP
1049	(recurring expenditure)					29,500,000.00
1050						
1051	V. Projected income					
1052	Particulars	Projected no. of students		Projected income		
1053	1. Student enrolment	Y1	2	Y1	18,000	
1054		Y2	4	Y2	36,000	
1055		Y3**	6	Y3	54,000	
1056	Sub-total for student		12		Php 108,000	
1057						
1058						
1059						
1060						

Action of the Board of Regents
at its 137th Meeting on

APPROVAL

APR 13 2023

ROBERTO M.J. LARA

Secretary of the University
and of the Board of Regents

FILE COPY

2. Other income sources (describe activity, e.g., research, and indicate whether it is a yearly activity, etc. write none if there are no other sources)	100,000 grant award x 2 students Research publications incentives (e.g. IPA Institutional Award) x 2 students x 2 publications (All authors form the Institute of Chemistry)	200,000 60,000
Sub-total for other income sources		260,000
TOTAL		368,000.00

Action of the Board of Regents
at its 1379th Meeting on APR 03 2023

APPROVAL

 ROBERTO M.J. LARA

Secretary of the University
and of the Board of Regents

Appendix A

Schematic diagram showing the progression of courses

Sample progression/ timeline

<i>First Year</i>		<i>Second Year</i>		<i>Third Year</i>	
<i>First Semester</i>	<i>Second Semester</i>	<i>First Semester</i>	<i>Second Semester</i>	<i>First Semester</i>	<i>Second Semester</i>
CHEM 399	CHEM 400	CHEM 399	CHEM 400	CHEM 399	CHEM 400
CHEM 400		CHEM 400		CHEM 400	

Sample Topics for Biochemistry dissertation

1. The construction of carbon recycling systems using heterotrophic microorganisms cultivated on food and beverage-processed waste and wastewater for the production of alternative fish/poultry feed/ingredient that are rich in polyunsaturated fatty acids. This will use techniques in microbiology in the culture of microorganisms and chemical techniques in the analysis of the wastewater, biomass and fatty acids. The metabolic pathways used by the microorganisms and the molecular aspects of enzyme mechanisms can be investigated by biochemists. Molecular biology can provide aspects of proteomics and metabolomics and roles of gene expression in the microorganisms.
2. Studies on the use of different biotechnological approaches for the production of prebiotics by hydrolases from probiotic lactic acid bacteria and characterization of the products. These will require expertise in microbiology, biotechnology and biochemistry.
3. Studies on protein expression and purification for the elucidation of protein structure and function. These will involve the use of techniques in traditional biochemistry and molecular biology as well as techniques in microbiology and cell biology. Biophysical techniques may be employed for protein structure and function analysis to include various spectroscopic techniques. Computational chemistry can be used for molecular docking and molecular dynamics studies. The research problems could focus on issues affecting agriculture, forestry, health and medicine, and environment.
4. Screening and profiling of secondary metabolites from local species of bacteria, fungi, animals or plants. Research problems under this theme can arise from the need to search for novel compounds that can be used for various purposes, e.g. medicine, industrial and commercial uses. The research would require expertise in biodiversity studies in order to select candidate sources. High throughput methods in metabolomics such as NMR spectroscopy and mass spectrometry are needed for the screening. Biochemistry would deal with the metabolic pathways, and enzyme mechanisms to produce the metabolites. Organic chemistry deals with

1109 aspects of organic synthesis and reaction mechanisms. Physical and computational chemistry for
1120 aspects of energetics, thermodynamics, and molecular dynamics.
1121
1122 5. Studies on the use and optimization of deep eutectic solvents in the isolation of biomolecules
1123 (proteins, carbohydrates, lipids and nucleic acids). This combines the application of inorganic
1124 chemistry and biochemistry. It can involve the search for environmentally friendly and less
1125 hazardous solvents. The techniques would include advanced spectroscopic techniques to
1126 analyse the properties of the solvents and biomolecules, and their interactions. Computational
1127 chemistry and physical chemistry approaches can also contribute to modeling and simulations,
1128 and to aspects regarding energetics and thermodynamics.



1129
1130
1131
1132
1133
1134
1135
1136
1137
1138
1139
1140
1141
1142
1143
1144
1145
1146
1147
1148
1149
1150
1151
1152
1153
1154
1155
1156
1157
1158
1159
1160
1161
1162
1163
1164
1165
1166
1167
1168



Action of the 1379th Meeting on
APPROVAL
ROBERTO M.J. LARA
Secretary of the University
and of the Board of Regents

APR 03 2023

Page 26

**PROPOSAL FOR THE INSTITUTION OF CHEM 399
GRADUATE SEMINAR**

I. IDENTIFYING AND DESCRIPTIVE INFORMATION

A. Course Catalogue Description

1. Course Number: CHEM 399
2. Course Title: Graduate Seminar in Biochemistry (Ph.D.)
3. Course Description:
4. Prerequisite: COI*
5. Semester Offered: 1,2
6. Course Credit: 1 unit (can be taken more than once)
7. Number of Hours: 1 (class)
8. Course Goal: This course provides opportunities for students to develop and demonstrate their skills in the critical study of literature and data, in the effective oral and written communication of data and ideas, and in their participation and engagement in scientific fora and discussions.

Course objectives:

- a. To discuss a research topic of current interest in biochemistry in the form of a public seminar
- b. To present his/her research findings in scientific meetings and answer questions with depth and clarity

B. Rationale

This course aims to develop the scientific communications skills of the graduate students. This course is mandatory for all Doctor of Philosophy graduate students to provide opportunities to conduct a seminar based on scientific literature, basic and recent developments in their fields of interests, and experimental results from their respective research projects and/or dissertations. The discussions should involve current research efforts that utilize advanced methods and the application of chemical principles and tools to further broaden understanding of science and chemistry as well as emerging areas in chemistry and/or biochemistry. Students are encouraged to highlight new findings that involve multidisciplinary research resulting from chemistry and other disciplines such as biology, agriculture, biotechnology, material science, environmental science and engineering science.

*COI: for the faculty-in-charge assess the readiness of the student to pursue the next units of research.

Appendix C

Faculty	Publications (2019-Current)
Abrera, Annabelle T. Action of the Board of Regents at its <u>1379th</u> Meeting on <u>Apr 03</u> 2023 APPROVAL  ROBERTO M.J. LARA Secretary of the University and of the Board of Regents	Abrera A, Castrosanto M, Hermocilla JA, Manalo M. (2022). Molecular Docking of Ecdysone Agonists and Limonoid Components of Calamondin Seeds to Tobacco Budworm Ecdysone Receptor. KIMIKA 33 (1), 9-19 - Castrosanto MA, Abrera AT, Manalo MN, Ghosh A. 2022. In silico evaluation of binding of phytochemicals from bayati (<i>Anamirta cocculus</i> Linn) to the glutathione-s-transferase of Asian Corn Borer (<i>Ostrinia furnacalis</i> Guenée). Journal of Biomolecular Structure and Dynamics, 1-7 - Medina, EER, Abrera, AT, Manalo, MN. (2020). Isolation and characterization of bioactive compounds from seeds of Ipil-ipil (<i>Leucaena leucocephala</i>) and its antifeedant activity against the third instar of common cutworm (<i>Spodoptera litura</i>). Philippine Agricultural Scientist, 103(3), 201-206 Abrera, AT, Chang, H, Kracher, D, Ludwig, R, Haltrich, D. (2020). Characterization (electrochemical and kinetic properties) of pyranose oxidase variants for bioelectrocatalytic applications. Biochimica Biophysica Acta (BBA)-Proteins and Proteomics, 1868(2), 140335 Abrera, AT, Sützl, L, Haltrich, D. (2020). Pyranose oxidase: a versatile sugar oxidoreductase for bioelectrochemical applications. Bioelectrochemistry, 132, 107409
Aldemita, Ma. Desiree B.	Belina-Aldemita MD, Fraberger V, Schreiner M, Domig KJ, D'Amico S. (2020). Safety aspects of stingless bee pot-pollen from the Philippines. Die Bodenkultur: Journal of Land Management, Food and Environment, 71(2), 87-100. Belina-Aldemita MD, Schreiner M, D'Amico S. (2020). Characterization of phenolic compounds and antioxidative potential of pot-pollen produced by stingless bees (<i>Tetragonula biroi</i> Friese) from the Philippines. Journal of Food Biochemistry, 44, e13102. Belina-Aldemita MD, Oppen C, Schreiner M, D'Amico S. (2019). Nutritional composition of pot-pollen produced by stingless bees (<i>Tetragonula biroi</i> Friese) from the Philippines. Journal of Food

	Composition and Analysis, 82, 103215.
Arreola, Sheryl Lozel B.	1. Fornoles CADR, Delmo NV, Traje AMM, Arreola SLB, Hizon-Fradejas AB. 2020. Optimization and Kinetics of Bioadsorption of Aqueous Potassium Permanganate in Charred Cacao Shells. <i>KIMIKA</i> 31 (2), 80-90 2. Mangao AM, Arreola SLB, San Gabriel EV, Salamanes KC. 2020. Aqueous extract from leaves of <i>Ludwigia hyssopifolia</i> (G. Don) Exell as potential bioherbicide. <i>Journal of the Science of Food and Agriculture</i> 100 (3), 1185-1194
Aguila, Mae Joanne B.	1. Marquez KP, Arizala CVD, Soriano VJ, Barron JMG, Florece AEA, Caday JHB, Calibo JAS, Aguila MJB, Razal RA, Migo VP. 2021. Recycled Polyethylene Terephthalate as Reinforcement Additive of Asphalt Mixture for Pavement Application. <i>Philippine Journal of Science</i>, 150(3), 1063-1070. 2. Magsino AJA, Carlos CJT, Torio MAO, Villar TDC, Rodriguez MS, Aguila MJB. 2020. Removal of Coomassie Brilliant Blue R-250 Using Iron Oxide-Graphene Oxide Composite via Fenton-like Reaction. <i>Philippine Journal of Science</i>, 149(4), 1083-1094. 3. Tinio, JCP, Rayos Jr. AL, Aguila MJB, Salamanes KC. 2019. Bioherbicidal Activity of <i>Medenilla</i> Lindl. Leaf Extract <i>Phillip. Agric. Scientist</i>, 102(3), 270-275. 4. Rosales JH, Yaptenco KF, Aguila MJB, Armstrong PR. 2019. Rapid Differentiation of Commercially-Available Soy Sauces using Near-Infrared Spectroscopy. <i>Philippine Journal of Agricultural and Biosystems Engineering</i> 15(2), 3-12.
Completo, Gladys Cherisse J.	1. Quizon C, Alvarez MR, Moreno P, Delica K, Basingan Jr M, Deniega F, Abogado R, Padolina ID, Heralde III F, Completo GC, Nacario R. Antioxidant and Anticancer Activities of <i>Manilkara zapota</i> and <i>Lansium domesticum</i> Leaves Coupled with Metabolomics analysis using Molecular Networking", <i>Vietnam Journal of Chemistry</i>, 2022, Accepted for publication.

Action of the Board of Regents
at its 1379th Meeting on APR 03 2023
APPROVAL

ROBERTO M.J. LARA
Secretary of the University
and of the Board of Regents

1319
1320
1321
1322
1323
1324
1325
1326
1327
1328
1329
1330
1331
1332
1333
1334
1335
1336
1337
1338
1339
1340
1341
1342
1343
1344
1345
1346
1347
1348
1349
1350
1351
1352
1353
1354
1355
1356
1357
1358
1359
1360
1361
1362
1363
1364
1365
1366
1367
1368



2. Quizon C, Alvarez MR, Moreno P, Delica K, Basingan Jr M, Deniega F, Abogado R, Padolina ID, Heralde III F, **Completo GC**, Nacario R. Effect of drying method on the anticancer activity and metabolite profile of Mango (*Mangifera indica*) leaf extracts as revealed using LC-MS/MS metabolomics", *Vietnam Journal of Chemistry*, **2022**, Accepted for publication.
3. Alvarez MRS, Grijaldo SB, Nacario, RC, Rabajante JF, Heralde FM, Lebrilla CB, **Completo GCJ**. 2021. In silico-based discovery of inhibitors against glycosylation proteins dysregulated in cancer. *Journal of Biomolecular Structure and Dynamics*, 1-13.
<https://doi.org/10.1080/07391102.2021.2022534>
4. Albaladejo ASB, **Completo GCJ**, Nacario RC, Navarro BRR, Lebrilla CB. 2021. Rapid-Throughput Analysis of Human Milk Oligosaccharides from Filipino Breastmilk. *Kimika*, 32(2), 11-25. Retrieved from
<https://kimika.pfcs.org.ph/index.php/kimika/article/view/340>
5. Castrosanto M, Alvarez MR, Salamanes K, Nacario, R, **Completo, GC**. 2021. Barnyard Grass [*Echinochloa Crus-Galli* (L.) Beauv] Leaves Extract Against Tomato Pests. *Philippine Journal of the Science of Food and Agriculture* 2021 May 9, <https://doi.org/10.1002/jsfa.11298>.
6. Ortiz CL, **Completo GC**, Nacario RC, Nellas RB. 2019. Potential Inhibitors of Galactofuranosyltransferase 2 (GlfT2): Molecular Docking, 3D-QSAR, and *In Silico* ADMETox Studies, *Scientific Reports* 2019, 9(1), 1-28.

Hizon-Fradejas, Amelia B.

1. Ferreras JM, Clemencia MCM, **Hizon-Fradejas A**, Uy LY and Torio MA, 2021. Isolation, purification and characterization of proteins in "señorita" banana (*Musa acuminata* (AAA)'Señorita') pulp with bioactive peptides exhibiting antihypertensive and antioxidant activities. *Applied Sciences*, 11(5), p.2190.
2. Fornoles CAD, Delmo NV, Traje AMM, Arreola SLB, **Hizon-Fradejas AB** and Marquez KP. 2020. Optimization and Kinetics of Bioadsorption of Aqueous Potassium Permanganate in Charred Cacao Shells. *KIMIKA*, 31(2), pp.80-90.

1369
1370
1371
1372
1373
1374
1375
1376
1377
1378
1379
1380
1381
1382
1383
1384
1385
1386
1387
1388
1389
1390
1391
1392
1393
1394
1395
1396
1397
1398
1399
1400
1401
1402
1403
1404
1405
1406
1407
1408
1409
1410
1411
1412
1413
1414
1415
1416
1417
1418

Lacsamana, Marivic S.

Action of the Board of Regents
at its 1379th Meeting on APR 03 2023

APPROVAL

ROBERTO M.J. LARA

Secretary of the University
and of the Board of Regents

3. **Hizon-Fradejas AB**, Dela Torre LDG, Alvarez PLJ, Belina-Aldemita M, Micor JRL, Angelia MRN, Barrion-Dupo ALA and Cervancia CR, 2019. Antioxidant and physico-chemical properties and botanical origin of Pollen collected by Apis cerana Frabricius from selected apiaries in Laguna and Batangas provinces (Philippines). *The Philippine Entomologist*, 33(1).

1. Villaverde EC, **Lacsamana MS**, Navarro RC, Cardenas LB, Estacio MAC. 2022. Evaluation of the ameliorative effect of the Philippine native blueberry *Vaccinium myrtoides* (Blume) Miq. fruit extract against cyclophosphamide-induced hepatotoxicity in mice. *Journal of Nature Studies* 20(2): 61-74. Online ISSN: 2244-5226.
2. Macale A, **Lacsamana M**, Quimbo MA, Centeno E. 2021. Enhancing the performance of students in chemistry through flipped classroom with peer instruction teaching strategy. *LUMAT: International Journal on Math, Science and Technology Education*, 9(1), pp.717-747.
3. Sinad KVG, Peralta MM, Sabularse VC, **Lacsamana MS**. 2021. Immobilization of Phycocyanin in a Rice Hull Nanosilica/Calcium-Alginate Bead System for Cadmium Ion Remediation. *Philippine Journal of Science*, 150(3), pp.951-962.
4. Alomia RLM, Sabularse VC, **Lacsamana MS**, Razal RA, Hernandez HP. 2020. Preparation and Characterization of an Amino-functionalized α -Cellulose from Pineapple [*Ananas comosus* (L.) Merr.] Crown Leaves. *Philippine Journal of Science*, 149(2), pp.325-333.
5. Upadhyay SK, Torio MAO, **Lacsamana MS**, Diaz MGQ, Angelia MRN, Sucgang AT, UY LYC. 2021. Introduction of the Hypocholesterolemic Peptide, LPYPR, to the Major Storage Protein of Mung Bean [*Vigna radiata* (L.) Wilczek] through Site-directed Mutagenesis. *International Food Research Journal* 28(3): 527 – 537.
6. Magalona ML, Peralta MM, **Lacsamana MS**, Sabularse VC, Pelegrina AB, De Guzman CC.

1419
1420
1421
1422
1423
1424
1425
1426
1427
1428
1429
1430
1431
1432
1433
1434
1435
1436
1437
1438
1439
1440
1441
1442
1443
1444
1445
1446
1447
1448
1449
1450
1451
1452
1453
1454
1455
1456
1457
1458
1459
1460
1461
1462
1463
1464
1465
1466
1467
1468

	2019. Analysis of Inorganic Arsenic (As (III) and Total As) and Some Physicochemical Parameters in Groundwater Samples from Selected Areas in Bulacan, Batangas, and Laguna, Philippines. <i>KIMIKA</i> , 30(2), pp.28-38.
Manalo, Cervinia V.	1. Manalo CV, Ohno M, Nishimoto S, Okuda T, Nakai S. and Nishijima W. 2019. Long-term pilot plant study using direct chlorination for biofouling control of a chlorine-resistant polyamide reverse osmosis membrane. <i>Desalination and Water Treatment</i>, 138: 57-67. 2. Manalo CV and Nishijima W. 2019. Chapter 18: Biofouling detection on reverse osmosis membranes in <i>Recent Advances in Water and Wastewater Treatment Technologies</i>. (Eds) Thanh B.X., Chiemchaisri C., Fujioka T., Varjani S. Springer Publishing Company. pp: 379-402.
Manalo, Marlon N.	1. Abrera A, Castrosanto M, Hermocilla JA, Manalo M. (2022). Molecular Docking of Ecdysone Agonists and Limonoid Components of Calamondin Seeds to Tobacco Budworm Ecdysone Receptor. <i>KIMIKA</i> 33 (1), 9-19 2. Castrosanto MA, Abrera AT, Manalo MN, Ghosh A. 2022. In silico evaluation of binding of phytochemicals from bayati (<i>Anamirta cocculus</i> Linn) to the glutathione-s-transferase of Asian Corn Borer (<i>Ostrinia furnacalis</i> Guenée). <i>Journal of Biomolecular Structure and Dynamics</i>, 1-7 3. Mangussad D, Sucgang AT, Clemencia MCM, Manalo M, Uy LY, Torio MA. 2021. Isolation and Characterization of the Total Protein in 'Lakatan' Banana (<i>Musa acuminata</i> Colla) with Bioactive Peptides Exhibiting Antioxidative and Antihypertensive Activities. <i>Philippine Agricultural Scientist</i> 104 (3), 268-277 4. Medina, EER, Abrera, AT, Manalo, MN. (2020). Isolation and characterization of bioactive compounds from seeds of Ipil-ipil (<i>Leucaena leucocephala</i>) and its antifeedant activity against the third instar of common cutworm (<i>Spodoptera litura</i>). <i>Philippine Agricultural Scientist</i>, 103(3), 201-206

Action of the Board of Regents
at its 1374th Meeting on APR 03 2023

APPROVAL

ROBERTO M.J. LARA

Secretary of the University
and of the Board of Regents

1469
1470
1471
1472
1473
1474
1475
1476
1477
1478
1479
1480
1481
1482
1483
1484
1485
1486
1487
1488
1489
1490
1491
1492
1493
1494
1495
1496
1497
1498
1499
1500
1501
1502
1503
1504
1505
1506
1507
1508
1509
1510
1511
1512
1513
1514
1515
1516
1517
1518
1519

	5. San Gabriel EV, Matanguihan DAP, Perico PDR, Micor JRL, Manalo MN, Polintan EA, Dupo ALB and Cervancia CR. (2019). Physico-chemical properties of beeswax from four different honey bee (<i>Apis</i>) species. <i>Philippine Entomologist</i>. 33(1): 1-10
Nacario, Ruel C.	1. Quizon C, Alvarez MR, Moreno P, Delica K, Basingan Jr M, Deniega F, Abogado R, Padolina ID, Heralde III F, Completo GC, Nacario R. Antioxidant and Anticancer Activities of <i>Manilkara zapota</i> and <i>Lansium domesticum</i> Leaves Coupled with Metabolomics analysis using Molecular Networking", <i>Vietnam Journal of Chemistry</i>, 2022, Accepted for publication. 2. Quizon C, Alvarez MR, Moreno P, Delica K, Basingan Jr M, Deniega F, Abogado R, Padolina ID, Heralde III F, Completo GC, Nacario R. Effect of drying method on the anticancer activity and metabolite profile of Mango (<i>Mangifera indica</i>) leaf extracts as revealed using LC-MS/MS metabolomics", <i>Vietnam Journal of Chemistry</i>, 2022, Accepted for publication. 3. Alvarez MRS, Grijaldo SB, Nacario, RC, Rabajante JF, Heralde FM, Lebrilla CB, Completo GCJ. 2021. In silico-based discovery of inhibitors against glycosylation proteins dysregulated in cancer. <i>Journal of Biomolecular Structure and Dynamics</i>, 1-13. https://doi.org/10.1080/07391102.2021.2022534 4. Albaladejo ASB, Completo GCJ, Nacario RC, Navarro BRR, Lebrilla CB. 2021. Rapid-Throughput Analysis of Human Milk Oligosaccharides from Filipino Breastmilk. <i>Kimika</i>, 32(2), 11-25. Retrieved from https://kimika.pfcs.org.ph/index.php/kimika/article/view/340 5. Castrosanto M, Alvarez MR, Salamanes K, Nacario, R, Completo, GC. 2021. Barnyard Grass [<i>Echinochloa Crus-Galli</i> (L.) Beauv] Leaves Extract Against Tomato Pests. <i>Philippine Journal of the Science of Food and Agriculture</i> 2021 May 9, https://doi.org/10.1002/jsfa.11298. 6. Asejo AB, Moreno PG, Billones J, Nacario R, Heralde III FM. 2020. Preliminary characterization and in silico studies on the alpha amylase

Action of the Board of Regents
at its 1379th Meeting on APR 03 20234.

APPROVAL


ROBERT M. J. LARA
Secretary of the University
and of the Board of Regents

1520
1521
1522
1523
1524
1525
1526
1527
1528
1539
1530
1531
1532
1533
1534
1535
1536
1537
1538
1539
1540
1541
1542
1543
1544
1545
1546
1547
1548
1549
1550
1551
1552
1553
1554
1555
1556
1557
1558
1559
1560
1561
1562
1563
1564
1565
1566
1567
1568
1569
1570

	inhibitors from <i>Momordica charantia</i> AMP-06 methanolic leaf extract, <i>Philippine Journal of Biology and Molecular Biology</i> 2020, Vol. I, No. 1, 61-70. doi: 10.5555/pjbm.b.ph.2020.01.01.61 7. Ortiz CL, Completo GC, Nacario RC, Nellas RB. 2019. Potential Inhibitors of Galactofuranosyltransferase 2 (GlfT2): Molecular Docking, 3D-QSAR, and <i>In Silico</i> ADMETox Studies, <i>Scientific Reports</i> 2019, 9(1), 1-28.
Recuenco, Mariam C. Action of the Board of Regents at its <u>1379th</u> Meeting on <u>APR 03 2023</u> APPROVAL  ROBERTO M.J. LARA Secretary of the University and of the Board of Regents	1. Recuenco MC, Alejo KG. 2019. "Laboratory-scale Preparation of Potentially Inexpensive Low- and Middle-range Protein Molecular Weight Markers for SDS-PAGE." <i>Philippine Journal of Science</i> Volume 148 Number 2, 379-390 (June 2019). 2. Bernardo AKM, Talavera MTM, Atienza LM, Recuenco MC, Gordoncillo NP. 2020. Factors associated with folate deficiency among Filipino women of child-bearing age. <i>Malaysian Journal of Nutrition</i> 26(2):229-243. 3. Medina MAP, Uy LYC, Manuel MCM, Recuenco MC, Torio MAO. 2020. Hypocholesterolemic activity of mungbean 8Sα globulin engineering with lactostatin. <i>Philippine Journal of Crop Science (PJCS)</i>, 45 (2):13-26 (August 2020). 4. Recuenco MC, De Luna JRP, Magallano NG., Salamanes KC. 2020. Phytochemical screening, total phenolics, antioxidant and antibacterial activities of selected Philippine indigenous fruits. <i>Philippine Journal of Science</i>, 149: (3-a): 697-706, October 2020. 5. Maranan KRA, Bueno CM, Adiova CB, Recuenco MC. 2021. Effect of increasing levels of eggshell powder on the production performance, carcass characteristics, and bone properties of broiler chicken. <i>Philipp J Vet Anim Sci</i> 2021 47(2):1-15. 6. Amano M, Recuenco MC, Hashimoto K, Shibata H. 2022. Synthesis and photocatalytic activity of hexagonal plate-like shaped Au nanoparticles/ZnO composite particles under visible-light irradiation/ <i>Journal of Oleo Science</i>. doi: 10.5650/jos.ess22014
Torio, Mary Ann O.	1. Bravo RKD, Angelia MRN, Uy LYC, Garcia RN and Torio MAO. 2022. Isolation, purification and characterization of the antibacterial, antihypertensive and antioxidative properties of the

1571
1572
1573
1574
1575
1576
1577
1578
1579
1580
1581
1582
1583
1584
1585
1586
1587
1588
1589
1590
1591
1592
1593
1594
1595
1596
1597
1598
1599
1600
1601
1602
1603
1604
1605
1606
1607
1608
1609
1610
1611
1612
1613
1614
1615
1616
1617
1618
1619
1620

Action of the Board of Regents
at its 1379th Meeting on APR 03 2023
APPROVAL

ROBERTO M.J. LARA
Secretary of the University
and of the Board of Regents

bioactive peptides in the purified and proteolyzed major storage protein of pigeon pea (*Cajanus cajan*) seeds. *Food Chemistry: Molecular Sciences*, 4, p.100062.

2. Ferreras JM, Clemencia MCM, Hizon-Fradejas A, Uy LY and **Torio MA**, 2021. Isolation, purification and characterization of proteins in "señorita" banana (*Musa acuminata* (AAA)'Señorita') pulp with bioactive peptides exhibiting antihypertensive and antioxidant activities. *Applied Sciences*, 11(5), p.2190.
3. Angeles JGC, Villanueva JC, Uy LYC, Mercado SMQ, Tsuchiya MCL, Lado JP, Angelia MRN, Bercansil-Clemencia MCM, Estacio MAC and **Torio MAO**. 2021. Legumes as functional food for cardiovascular disease. *Applied Sciences*, 11(12), p.5475.
4. Mangussad D, Sucgang AT, Clemencia MCM, Manalo M, Uy LY, **Torio MA**. 2021. Isolation and Characterization of the Total Protein in 'Lakatan' Banana (*Musa acuminata* Colla) with Bioactive Peptides Exhibiting Antioxidative and Antihypertensive Activities. *Philippine Agricultural Scientist* 104 (3), 268-277
5. Crieta BRA, Tuaño APP, **Torio MAO**, Villanueva JC, Gaban PJV and Castillo-Israel KAT. 2021. In vitro lipid-lowering properties of the fruits of two bignay [*Antidesma bunius* (L.) Spreng] cultivars as affected by maturity stage and thermal processing. *Food Chemistry: Molecular Sciences*, 2, p.100020.
6. Magsino AJA, Carlos CJT, **Torio MAO**, Villar TDC, Rodriguez MS, Aguila MJB. 2020. Removal of Coomassie Brilliant Blue R-250 Using Iron Oxide-Graphene Oxide Composite via Fenton-like Reaction. *Philippine Journal of Science*, 149(4), 1083-1094.
7. Medina MAP, Uy LYC, Manuel MCM, Recuenco MC, **Torio MAO**. 2020. Hypocholesterolemic activity of mungbean 8Sα globulin engineering with lactostatin. *Philippine Journal of Crop Science (PJCS)*, 45 (2):13-26 (August 2020).
8. Gamis M, Uy LY, Laurena A, Hurtada W and **Torio MA**, 2020. Protein Engineering of Mung Bean (*Vigna radiata* (L.) Wilczek) 8Sα Globulin with

1621
1622
1623
1624
1625
1626
1627
1628
1629
1630
1631
1632
1633
1634
1635
1636
1637
1638
1639
1640
1641
1642
1643
1644
1645
1646
1647
1648
1649
1650
1651
1652
1653
1654
1655
1656
1657
1658
1659
1660
1661
1662
1663
1664
1665
1666
1667
1668
1669
1670

	Lactostatin. <i>Applied Sciences</i>, 10(24), p.8787. 9. Lado JP, Arellano B.Z, Osio CAL, Tendero BJ, de la Vina CB, Torio MAO, Laude RP and Diaz MGQ, 2019. Early differential expression of galactomannan biosynthesis genes in 'Makapuno' coconut (<i>Cocos nucifera</i> L.) revealed by the de novo assembly and analysis of endosperm transcriptome. <i>Philipp Agricul Sci</i>, 102, pp.6-24.
--	--



**Appendix D****Budget Allotment for Equipment****List of Equipment for the Offering of Doctor of Philosophy by Research (Biochemistry) of the Institute of Chemistry, UPLB***

Type and Basic Specifications	Estimated price (PHP)	Justification	Priority
-20C BioFreezer	500,000	for storage of temperature-sensitive biological samples and reagents	Y1
-80C BioFreezer	2,000,000	for storage of temperature-sensitive biological samples and reagents	Y1
High Performance Liquid Chromatograph with accessories (with quaternary pump, degassing unit, Evaporative Light Scattering Detector, column oven, complete PC system, C18 column, amino column, hydrophilic interaction liquid chromatography column, porous graphitized carbon column, guard column, filtration system with vacuum pump)	10,000,000	for the analysis of biomolecules, purification and separation of components of a liquid mixture	Y1
Micropipettors and accessories (4 sets)	400,000	for dispensing measured volumes of liquids	Y1
Shaking water bath	800,000	for the mixing of reaction systems, bacterial and cell cultures, staining and washing procedures in a temperature-controlled environment	Y1
UV-Visible Spectrophotometer and accessories (190-1100 nm range, wavelength scanning, LED screen, minimum interface, different measurement modes)	800,000	for qualitative and quantitative analysis of biomolecules in UV-Visible region	Y1
Water purification system	2,000,000	for high quality purification of water for use in reactions, buffer preparations, and for cleaning purposes	Y1
Total for Year 1	16,500,000		
Autoclave pressure steam sterilizer	100,000	for sterilization of samples	Y2

1722	Automatic ice making machine	200,000	for production of ice for the temporary storage of biological samples and maintenance of cold conditions for reactions	Y2
1723				
1724				
1725				
1726				
1727	Differential Scanning Calorimeter (DSC)	2,000,000	for characterization of proteins and other biomolecules	Y2
1728				
1729				
1730	Freeze-dryer	1,500,000	for the dehydration of various samples	Y2
1731				
1732				
1733	Horizontal Electrophoresis system with power supply for nucleic acids	200,000	for resolution of PCR products, and DNA and RNA separations	Y2
1734				
1735				
1736	Incubator (2)	200,000	for incubation or breeding of microorganisms under certain conditions	Y2
1737				
1738				
1739				
1740	Laminar flow hood	300,000	for the preparation and to prevent contamination biological samples	Y2
1741				
1742				
1743	Multimeter (pH and electrical conductivity) (2)	200,000	for the measurement of pH and electrical conductivity	Y2
1744				
1745	Polymerase Chain Reaction (PCR) apparatus	700,000	for amplification of DNA segments	Y2
1746				
1747	Vertical Electrophoresis system with power supply for proteins	300,000	for separation of proteins	Y2
1748				
1749				
1750	Total for Year 2	5,700,000		
1751				
1752	Analytical balance	200,000	for weighing of samples	Y3
1753	Microplate shaker/ incubator	200,000	for mixing tissue samples, cell lysis, incubation of reactions, and extraction of nucleic acids and proteins	Y3
1754				
1755				
1756				
1757	Multi-vortex mixer (2)	100,000	for mixing of laboratory samples	Y3
1758				
1759				
1760	Orbital shaker	200,000	for the mixing of reaction systems, bacterial and cell cultures, staining and washing procedures	Y3
1761				
1762				
1763				
1764	Refrigerated microcentrifuge (500-20,000 rpm of higher, digital, with rotors which accommodate 1.5 mL to 2 mL volume, temperature range -20 to 4 deg C, benchtop)	1,500,000	for separation of temperature-sensitive heterogenous samples	Y3
1765				
1766				
1767				
1768				
1769				
1770	Tip sonicator set	300,000	for cell lysis	Y3

Action of the Board of Regents APR 03 2023
at its 1379th Meeting on

APPROVAL

ROBERTO M.J. LARA

**Secretary of the University
and of the Board of Regents**

1771	Ultrasonic bath sonicator (2)	400,000	for solubilizing, dissolving, digesting, dispersing, emulsifying, homogenizing and mixing of samples	Y3
1772				
1773				
1774				
1775	Viscometer	500,000	for measurement of viscosity and flow properties of fluids	Y3
1776				
1777				
1778				
1779	Total for Year 3	3,400,000		
1780				
1781	Total	25,600,000		
1782				

*List of prescribed equipment is based on this CHED Memo

<https://ched.gov.ph/wp-content/uploads/2017/10/CMO-No.18-s2007.pdf>

Appendix E: Benchmarking

	Benchmarking - PhD Biochemistry			
	UPLB By coursework	UP Manila	PhD by Research UPLB	Other PhD Biochemistry
Objectives	Training to become qualified to teach biochemistry in the undergraduate and graduate levels, research in biochemistry and biotechnology, agriculture and forestry	Encourage development of biochemistry in the Philippines, highly trained biochemists, contribute to development of new knowledge	Training to develop intellectual and technical capabilities for independent research in the field of biochemistry, produce basic and applied research, dissemination of scientific information, Play leadership roles in organization	UST none DLSU – PhD Chemistry by coursework Univ San Carlos – PhD Chemistry PhD Chemistry Ateneo

Action of the Board of Regents at its 127th Meeting on APR 03 2023

APPROVAL

ROBERTO M. J. LARA

Secretary of the University and of the Board of Regents

Requirements	MS biochem, chem, agchem	MS Chem /biochem or equivalent	MS biochem, chem, agchem, with research and publication experience	
Program	By coursework Total 38 units 15 units major 9 units cognate 12 dissertation 2 units seminar	By coursework Total 45 units 12 units cognate 18 units core courses At least 27 units – courses (9 from other related areas outside department) 15 units - dissertation	By Research Total 15 Units Graduate seminar 3 units (3X1 unit) Dissertation 12 units (4X 3 units)	
Research themes	Biochemistry, chemistry, agriculture, forestry, computational chemistry, biotechnology	Biochemistry, genetics, nutrition, industrial, strong association with the medical field	Biochemistry, chemistry, agriculture, forestry, computational chemistry, biotechnology	
Faculty	12 – from various fields including biochemistry, organic chemistry, inorganic chemistry and physical chemistry	16 fields – biochemistry, molecular biology and biotechnology, bioinformatics, genetics, cell biology, microbiology, medicine, health policy, genomics		

Action of the Board of Regents
at its 1374th Meeting on APR 03 2023
APPROVAL
ROBERTO M.J. LARA
Secretary of the University
and of the Board of Regents