

**De La Salle University  
College of Science**

**DEPARTMENT OF CHEMISTRY  
GRADUATE CATALOGUE**

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*Revision date: August 2022*

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## DE LA SALLE UNIVERSITY

### ***Preamble***

De La Salle University in Manila the Philippines is an internationally recognized Catholic university established by the Brothers of the Christian Schools in 1911. Inspired by the charism of St John Baptist de La Salle, the University community, together and by association, provides quality human and Christian education by teaching minds, touching hearts and transforming lives.

### **Vision-Mission**

A leading learner-centered and research university, bridging faith and scholarship, attuned to a sustainable Earth, and in the service of society, especially the poor and marginalized.

### **Core Values**

#### *Faith (religio)*

DLSU is committed to nurturing a community of distinguished and morally upright scholars that harmonizes faith and life with contemporary knowledge in order to generate and propagate new knowledge for human development and social transformation.

#### *Service (mores)*

DLSU is committed to being a resource for Church and Nation and being socially responsible in building a just, peaceful, stable and progressive Filipino nation.

#### *Communion (cultura)*

DLSU is committed to building a community of leaders, competent professionals, scholars, researchers and entrepreneurs, who will participate actively in improving the quality of life in Philippine society within the perspective of Christian ideals and values.

## Expected Lasallian Graduate Attributes (ELGAs)

The Expected Lasallian Graduate Attributes (ELGAs) focus on the knowledge, skills and attributes that graduates should acquire and demonstrate in their course of studies and internships as evidence of accomplishing the school's vision-mission. These ELGAs also reflected the graduate's capacity for lifelong learning and transfer of knowledge in the workplace.

Expected Lasallian Graduate Attributes (ELGAs)	Desired Learning Results That Demonstrates Higher Order Thinking Skills ( <i>deep understanding</i> ) - A Lasallian who:
<b>Critical and Creative Thinker</b>	<ul style="list-style-type: none"> <li>➤ Generates ideas, designs, systems or information with resourcefulness, imagination, insight, originality, aesthetic judgment, enterprise and a risk-taking approach to meet current and emerging needs of society</li> <li>➤ Responds to multiple experiences and ideas about the world and communicates personal and religious meaning through various modes and media</li> <li>➤ Uses innovative methods and technologies to solve problems, make decisions and envisage hopeful futures</li> <li>➤ Constructs and applies knowledge, concepts theories and generations to make meaning and communicate clear and coherent ideas and concept as much as possible aligned with Christian principles</li> </ul>
<b>Effective Communicator</b>	<ul style="list-style-type: none"> <li>➤ Communicates effectively and confidently in a range of contexts and for many different audiences</li> <li>➤ Listens actively to the intent and spirit of others' words and respond appropriately verbally and non-verbally</li> <li>➤ Composes and comprehends a range of written, spoken and visual text to convey information that is meaningful to society and the Church</li> <li>➤ Explores ideas critically and expresses them clearly for a variety of purposes</li> <li>➤ Uses individual and group performances to explore and express ideas, thoughts, feelings, values and understandings</li> </ul>
<b>Reflective Lifelong Learner</b>	<ul style="list-style-type: none"> <li>➤ Critically reflects on problems and issues to shape ideas and solutions that contribute to a better understanding of the wider world of the Church</li> <li>➤ Critically evaluates and reflects on their assumptions and values</li> </ul>

	<ul style="list-style-type: none"> <li>➤ Plans, organizes, manages and evaluates own thinking, performance, behavioral and well being</li> <li>➤ Reflects on the significance of God and/or religious experience for themselves and others</li> <li>➤ Develops awareness of the spiritual nature and religious significance of life</li> </ul>
<b>Service-Driven Citizen</b>	<ul style="list-style-type: none"> <li>➤ Creates products and performances that achieve their purpose and are appropriate for their intended audience</li> <li>➤ Develops and incorporates Christian leadership skills to contribute positively to the accomplishment of team goals through collaborative processes</li> <li>➤ Develops and practices effective interpersonal skills in order to relate to others in peaceful, tolerant compassionate and non-discriminatory ways</li> <li>➤ Nourishes relationships with God, self, others and the environment with compassion, sensitivity respect, integrity and empathy</li> <li>➤ Evaluates their moral sensitivities and sense of responsibility through participation in a range of learning contexts</li> </ul>



## **COLLEGE OF SCIENCE**

### ***Overview***

The thrust of the College of Science is to develop an academic community of whole persons who are intellectually, socially, spiritually responsive to the needs of nation and of the Filipinos, using the instrument of science. These values are manifested in the different science disciplines through its various programs and services. The role of Science and Technology, is emphasized in the curricular offerings with research and development as a necessary input.

### ***Vision - Mission***

The College of Science is committed to the development of a community of competent scientists, harnessing their knowledge, skills, values and expertise towards being a resource for the Nation and Church especially in the service of the poor.

### ***Philosophy***

Advances in Science and Technology are a necessary drive and support toward economic development. A sustainable progress thus requires a pool of competent scientists who are excellent researchers and educators, and are truly practicing Christians committed to value of respect for humanity.

### ***Goals***

1. Enhance capability to offer world class science and mathematics instruction and research through:
  - a. a significant increase in the number of PhD Degree holders by hiring and by supporting the professional development of faculty members,
  - b. the acquisition of more advanced equipment/instruments,
  - c. the formation of research teams/ groups that will optimize research capability and increase research outputs/publications,
  - d. the training of junior faculty and graduate/undergraduate students as research assistants, and
  - e. the fostering of linkages with academic and research institutions abroad.

2. Increase the pool of skilled human resources for scientific, industrial, business, and environmental establishments by offering more courses that are responsive to the current needs of Philippine society and the Asia-Pacific Region.
3. Hire more faculty members who are experts in the identified fields of specialization; and offering more training programs which emphasize skills development.

## DEPARTMENT OF CHEMISTRY

### Vision

The Department of Chemistry envisions itself to be among the premier departments in the discipline, holding a position of strength in teaching and research in the scientific community, and providing relevant resources towards national development.

### Mission

The Department of Chemistry is committed to promote scholarship, learning, and responsible practice of Chemistry.

### Goals

The Department aims to:

1. Provide excellent teaching and dynamically updated programs in Chemistry;
2. Promote vigorous research;
3. Develop students into graduates imbued with Christian values, concerned with the sustainability of the environment, and equipped with lifelong abilities to provide service and leadership in the scientific community and in society in general;
4. Support the professional and psychosocial development of the faculty and co-academic personnel;
5. Nurture and environment conducive to learning and research;
6. Adhere to ethical standards of scholarship and professionalism and to live the Christian faith.

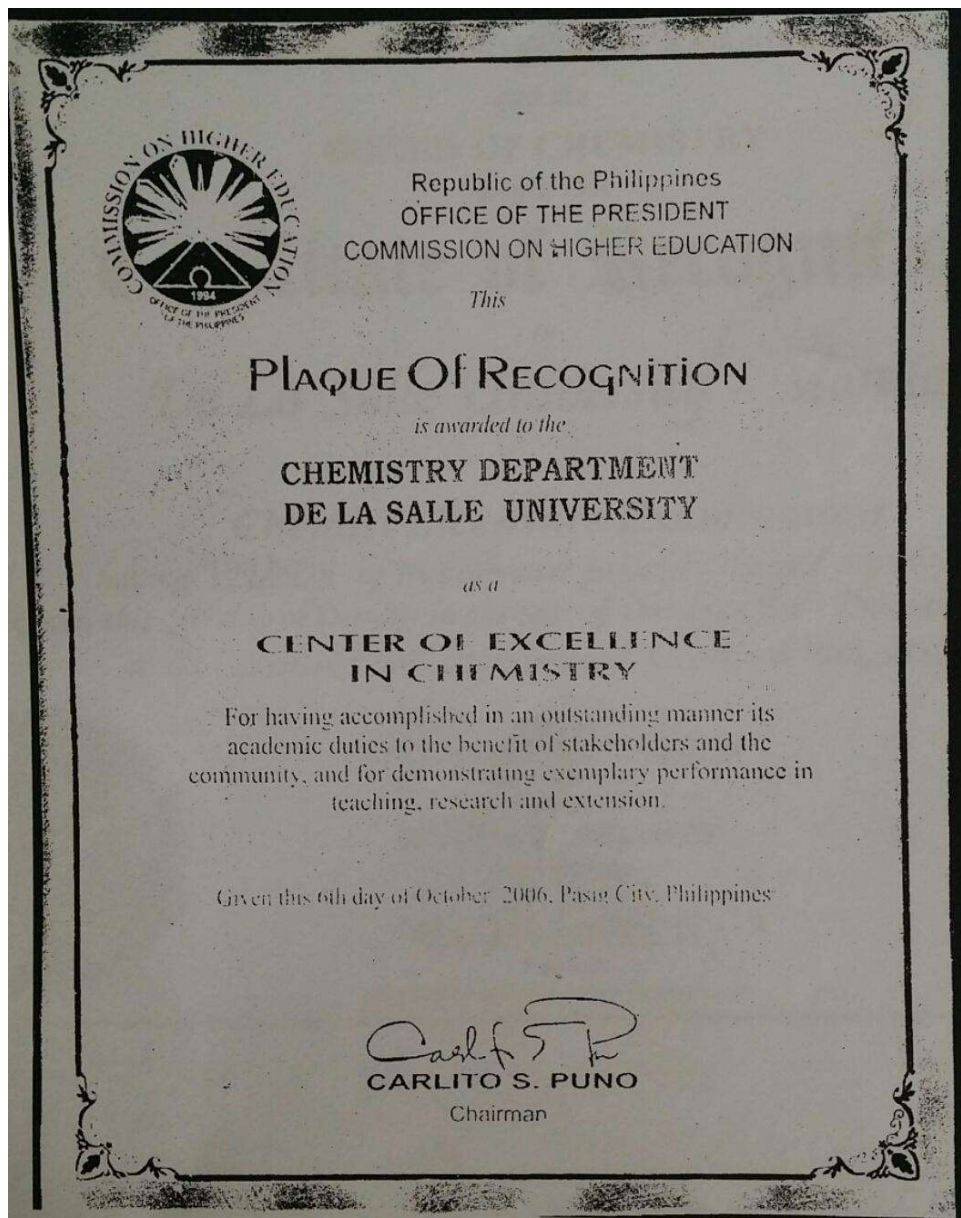
### Awards and Recognitions

The Department of Chemistry is recognized by the Commission on Higher Education as a *Center of Excellence in Chemistry*. Its undergraduate programs were evaluated under the ASEAN University Network Quality Assurance Assessment at Programme Level in 2010.

The Department of Chemistry is home to chemists and researchers that are known both internationally and locally. It boasts of faculty members who have been recognized by the University as outstanding researchers, as well as by national and international institutions such as The Royal Society of Chemistry, Third World Academy of Sciences, the National Research Council of the Philippines, and the National Academy of Science and Technology.



PLAQUE OF RECOGNITION AS CHED CENTER OF EXCELLENCE



CERTIFICATE OF REGISTRATION FROM THE PROFESSIONAL REGULATION  
COMMISSION



RESEARCH AWARDS



**Most Productive in Research  
Science and Technology**

**AY 2013-2014**

**FIRST PLACE**  
*is awarded to*

**Chemistry Department**

*On this 29<sup>th</sup> day of September 2014*

**This entitles the department to PhP25,000 additional workshop budget**

**Br. Dennis M. Magbanua FSC**  
OIC President and Chancellor



# **Most Productive in Research**

**AY 2012-2013**

**SECOND PLACE**

*is awarded to*

## **Chemistry Department**

*On this 1<sup>st</sup> day of October 2013*

This entitles the department to PhP20,000 additional workshop budget.

A handwritten signature in green ink, likely of Br. Ricardo P. Laguda FSC.

Br. Ricardo P. Laguda FSC  
President and Chancellor



*Best in Research*

**AY 2011-2012**

**SECOND PLACE**

is awarded to

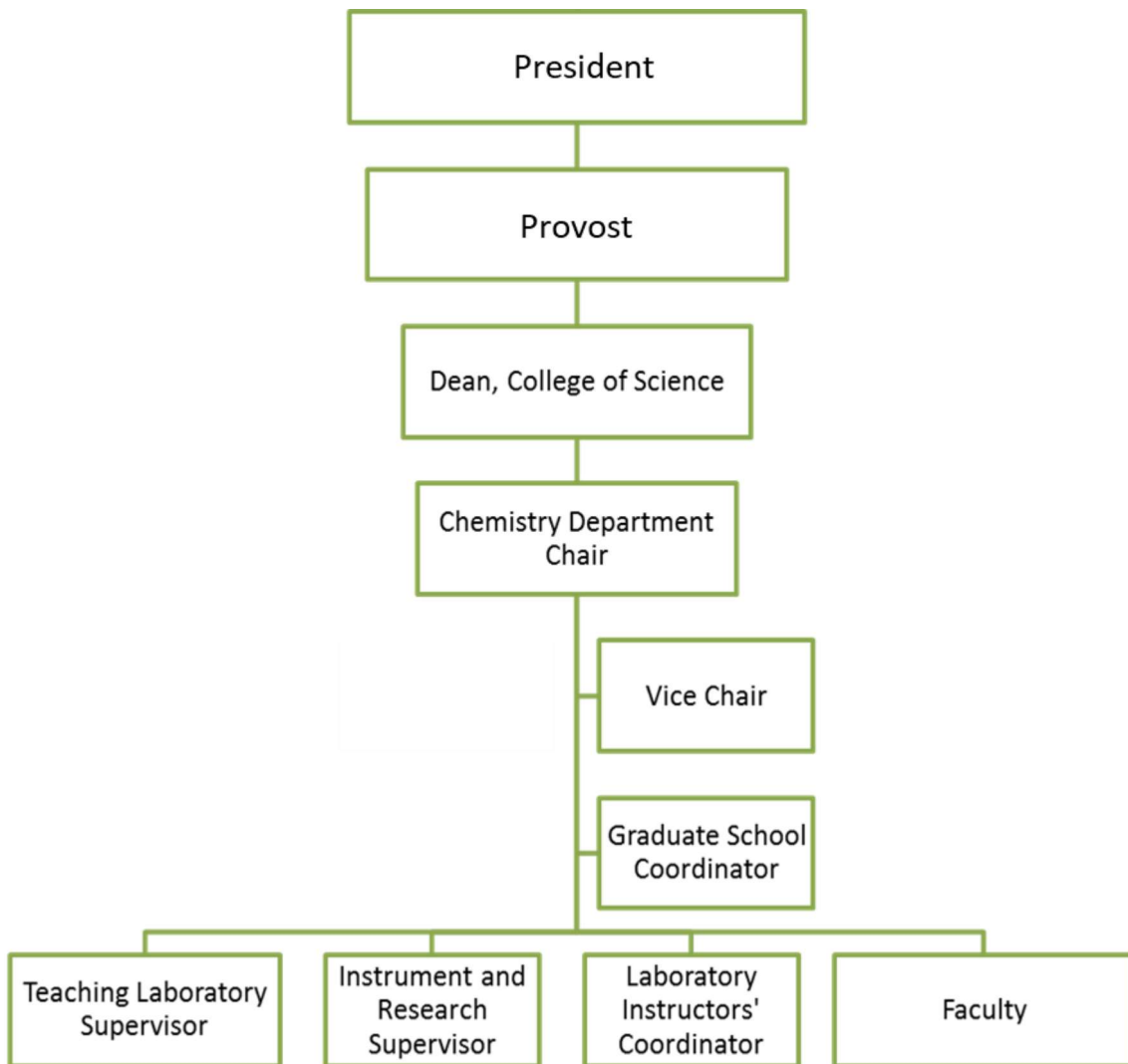
**Chemistry Department**

*On this 5<sup>th</sup> day of October 2012*

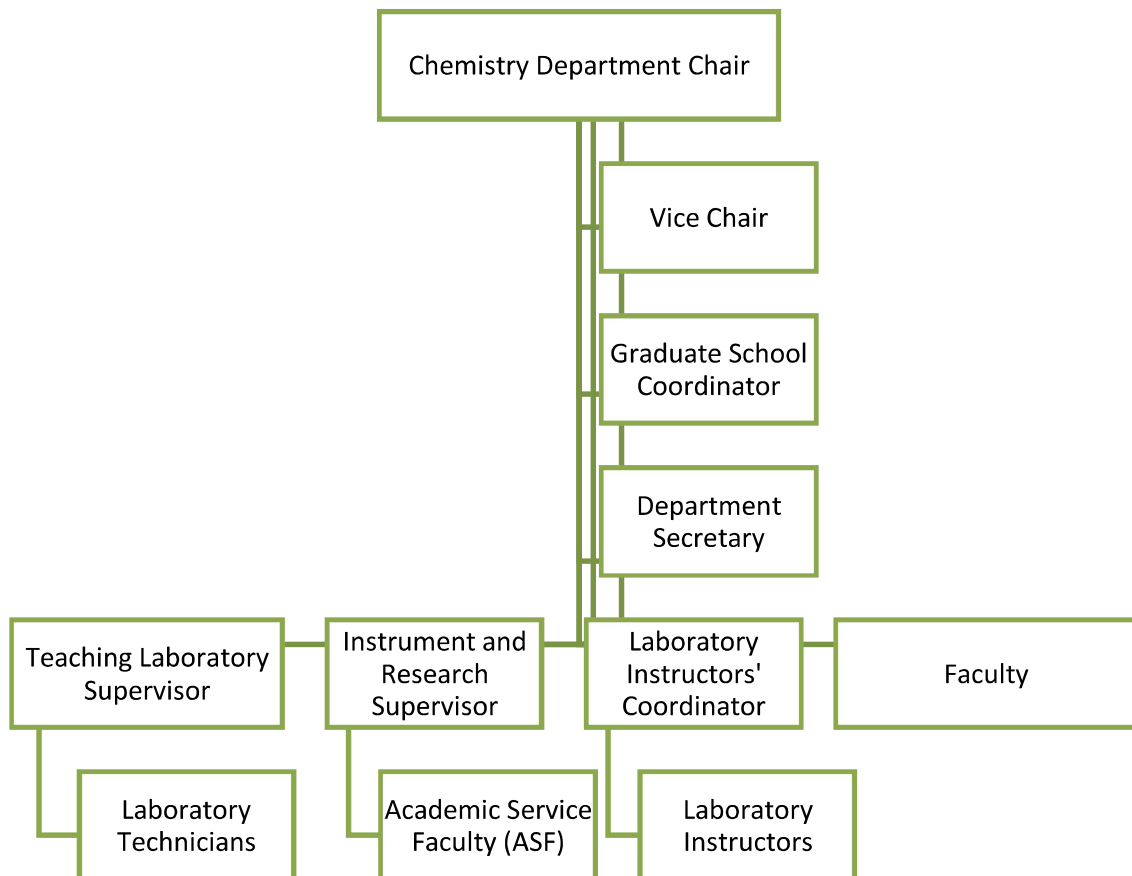
This entitles the department to Php20,000 additional workshop budget.

BR. RICARDO P. LAGUDA FSC  
President and Chancellor

**UNIVERSITY ORGANIZATIONAL CHART**  
2021-2022



**DEPARTMENT OF CHEMISTRY  
ORGANIZATIONAL CHART  
2021-2022**



## ROSTER OF FULL-TIME FACULTY MEMBERS

**Dr. Gerardo C. Janairo**

*Distinguished Full Professor and University Fellow*

D.Sc. Chemistry

Eberhard-Karls-Universität zu Tübingen, Federal Republic of Germany

Specialization: Organic Synthesis, Carbohydrate Chemistry

**Dr. Drexel H. Camacho**

*Full Professor 5 and University Fellow*

Ph.D. Chemistry

Tohoku University, Japan

Specialization: Polymers and Biopolymers, Organometallic Synthesis

**Dr. Glenn V. Alea**

*Full Professor 4*

Ph.D. Chemistry

De La Salle University-Manila, Philippines

Specialization: Organic Synthesis

**Dr. Aldrin P. Bonto**

*Associate Professor 1*

Ph.D. Chemistry

De La Salle University

Specialization: Postharvest Chemistry, Ultrasonication of Starch-based Food

**Dr. Searle Aichelle S. Duay**

*Assistant Professor 4*

Ph.D. Chemistry

University of Connecticut, United States of America

Specialization: Antimicrobial Peptides, Peptide-membrane Interactions, Molecular Dynamics

**Dr. Rafael A. Espiritu**

*Full Professor 1*

Ph.D. Chemistry

Osaka University, Japan

Specialization: Membrane Biophysics, Regulated Cell Death

**Dr. Francisco C. Franco, Jr.**

*Full Professor 3*

Ph.D. Chemistry

Osaka University, Japan

Specialization: Molecular Systems Design, Materials Chemistry

**Dr. Joel Garcia**

*Full Professor 3*

Ph.D. Chemistry

Wayne State University, United States of America

Specialization: Molecular Imaging, Lanthanide & Nanochemistry, Sensor Development



**Dr. Vincent Antonio S. Ng**

*Full Professor 1*

Ph.D. Chemistry

Osaka University, Japan

Specialization: Membrane Biochemistry and Biophysics, Food Chemistry

**Dr. David P. Penaloza, Jr.**

*Full Professor 5*

Ph.D. Chemistry

University of Connecticut, United States of America

Specialization: Polymer Chemistry, Colloids, and Surface Science

**Dr. Derrick Ethelbert C. Yu**

*Full Professor 5*

Ph.D. Chemistry

Hokkaido University, Japan

Specialization: Materials Science

**Dr. Lorenzo DV Alba**

*Associate Professor 2*

Ph.D. Chemistry Double Degree

De La Salle University-Manila, Philippines and

Osaka University, Japan

Specialization: Bioinorganic Chemistry

**Dr. Mariafe N. Calingacion**

*Associate Professor 5*

Ph.D. Chemistry

Wageningen University, The Netherlands

Specialization: Food Chemistry, Pesticide Toxicology, Plant Metabolomics, Systems Biology

**Dr. Lourdes P. Guidote**

*Associate Professor 3*

Ph.D. Chemistry

The University of Tokyo, Japan

Specialization: Inorganic Synthesis

**Dr. Jamie Raul O. Janairo**

*Associate Professor 4*

Ph.D. Chemistry

De La Salle University-Manila, Philippines

Specialization: Natural Products Chemistry

**Dr. Faith Marie G. Laguna**

*Associate Professor 2*

Ph.D. Chemistry

De La Salle University-Manila, Philippines

Specialization: Organic Synthesis, Drug Discovery

**Dr. Nancy Lazaro-Llanos**

*Associate Professor 7*

Ph.D. Chemistry

Ohio University, United States of America

Specialization: Biological Membranes, Peptide Chemistry

**Dr. Stephani Joy Y. Macalino**  
*Associate Professor 3*  
Ph.D. Chemistry  
Ehwa Womans University, South Korea  
Specialization: Biochemistry, Pharmaceutical Sciences

**Dr. Raymond S. Malabed**  
*Associate Professor 5*  
Ph.D. Chemistry  
Osaka University, Japan  
Specialization: Membrane Biochemistry and Biophysics, Food Chemistry

**Dr. Hilbert D. Magpantay**  
*Associate Professor 1*  
Ph.D. Chemistry  
De La Salle University, Phillippines  
Specialization: Natural Products Chemistry

**Dr. Eric Camilo R. Punzalan**  
*Associate Professor 4*  
Ph.D. Chemistry  
University of Connecticut, United States of America  
Specialization: Organometallic Synthesis, Environmental Chemistry

**Dr. Julita C. Robles**  
*Associate Professor 4*  
Ph.D. Chemistry  
De La Salle University-Manila, Phillippines  
Specialization: Inorganic Chemistry, X-ray crystallography

**Dr. Rodolfo E. Sumayao, Jr.**  
*Associate Professor 5*  
Ph.D. Chemistry  
University College Dublin, Ireland  
Specialization: Redox Biochemistry and Signaling, Translational Medicine, Biomarker Discovery

**Dr. Emmanuel V. Garcia**  
*Assistant Professor 5*  
Ph.D. Chemistry  
De La Salle University-Manila, Phillippines  
Specialization: Food and Bioanalytical Chemistry, Coffee Chemistry


**Dr. Marissa G. Noel**  
*Senior Lecturer*  
Ph.D. Chemistry  
Ateneo de Manila University, Phillippines  
Specialization: Food Chemistry, Plant Tissue Culture

## **GRADUATE DEGREE PROGRAMS**

- Master of Science in Chemistry (MS-CHEM), including the DLSU-CPU CHED Offshore MS Chemistry program
- Doctor of Philosophy in Chemistry (PHD-CHY)
- Doctor of Philosophy in Chemistry (Straight Program, PHDSCHY)

MASTER OF SCIENCE IN CHEMISTRY

CHED Permit

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

GOVERNMENT RECOGNITION  
No. 120, s. 1983      **39254**

By virtue of the authority in me vested by Act 2706, as amended by Commonwealth Act 180, I, Onofre D. Corpuz, Minister of Education and Culture do hereby grant, effective June 14, 1983, to the **DE LA SALLE UNIVERSITY**  
2401 Taft Ave., Manila

**GOVERNMENT RECOGNITION**  
for the  
**GRADUATE COURSE IN CHEMISTRY**  
Leading to the degree of Master of Science in Chemistry  
(M.S.)


It is provided, however, that the Minister of Education and Culture reserves the right to satisfy himself, either personally or through accredited representatives, of the fact that the instruction and the conditions affecting instruction in this course, comply with all the requirements of the Ministry of Education and Culture.


In the case of failure on the part of the above-named school to observe and maintain any of the required standards of the Ministry of Education and Culture affecting the course herein approved, the authority hereby granted may be revoked and cancelled, the records of the students who have actually attended the said course may be taken over and kept in the files of the Ministry of Education and Culture, and the guaranty bond submitted by the said school declared forfeited in accordance with the provisions of Section 8 of Act 2706.

It is stipulated, moreover, that the authority hereby granted does not extend to any branch of the said school, whether located in the same municipality or city, or in other municipalities or cities, nor to any other course, grade, or curriculum year.

The foregoing Recognition supersedes and cancels all previous records of Government approval affecting the course or separate parts of the course herein recognized.

Given at the City of Manila, Philippines, this 14th day of September, Nineteen Hundred and Eighty-three

Recommended by:  
  
ANTONIO G. DUPLAO  
Director of Higher Education

  
ONOFRE D. CORPUZ  
Minister of Education and Culture

(Not valid without  
Ministry seal)

cc : NIESS Regional Office



Republic of the Philippines  
Office of the President  
**COMMISSION ON HIGHER EDUCATION**  
NATIONAL CAPITAL REGION

June 18, 2004



**Mr. Edwin P. Santiago**  
Registrar  
De La Salle University System  
2401 Taft Ave.  
Manila

Dear Mr. Santiago:

This is to acknowledge receipt, contents noted and made as a matter of record the offering of the following programs effective School Year 2004-2005 with the information that by virtue of CHED Memorandum Order No. 32, s.2001, your institution was granted autonomous status and one of the benefits to be enjoyed is the privilege to offer a new course/program in the undergraduate/graduate level/s without securing permit/authority from the CHED:

1. Master in Biology
2. Master in Chemistry
3. Master in Mathematics
4. Master in Physics
5. Master in History
6. Master in Political Science
7. Master in Psychology
8. Master in Sociology
9. Master in Economics

Please be reminded that in operating the said programs, your institution should ensure that all the minimum requirements prescribed by CHED are complied with.

Very truly yours,

  
**AMELIA A. BIGLETE**  
Director IV

<http://www.ched.gov.ph>

6th Floor, Pacific Corporate Center, 131 West Avenue, Quezon City  
Tel. Nos. 373-5561/52/53 Telefax: 373-5562 E-mail: [chednrc@info.com.ph](mailto:chednrc@info.com.ph)



Republic of the Philippines  
OFFICE OF THE PRESIDENT  
**COMMISSION ON HIGHER EDUCATION**  
June 25, 2015

**Bro. Raymundo B. Suplido, FSC**  
President  
De La Salle University (DLSU)  
2401 Taft Ave., Malate,  
Manila

**Dear Bro. Suplido:**

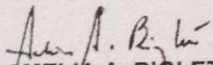
This has reference to your communication regarding your proposal to offer an Off-base/Off-campus program for the following Host Delivering Higher Education Institutions under the CHED Science and Engineering Graduate Scholarship (SEGS):

1. Mariano Marcos State University – Ph.D. in Mathematics
2. Central Philippine University – M.Sc. in Chemistry, Ph.D. in Biology and Ph.D. in Mechanical Engineering
3. Saint Louis University – M.Sc. in Civil Engineering

Please be informed that based on the recommendation of the Technical Working Group (TWG) for the Science and Engineering Graduate Scholarship during its meeting held on June 25, 2015 at CHED Diliman, Quezon City, since DLSU is a CHED Delivering Higher Education Institution under the SEGS for the said programs, your institution can offer Off-base/Off-campus program which can take effect Academic Year 2015-2016.

For your information and guidance.

Very truly yours,

  
**AMELIA A. BISLETE**  
Director IV, Office of Programs and  
Standards Development (OPSD)

# MASTER OF SCIENCE IN CHEMISTRY

## Program Specification

1. Awarding Institution – **De La Salle University**
2. College/School – **College of Science**
3. Name of Final Award – **Master of Science in Chemistry**
4. Program Title – **Master of Science in Chemistry**
5. **Program Overview**

The Master of Science in Chemistry program aims to provide students with an extensive grounding in chemical concepts and training in chemical techniques at the graduate level, to update them on recent developments in chemistry, and to encourage independent experimental work.

### 6. Expected Learning Outcomes of the Program (PO)

#### **ELGA 1: Creative and Critical Thinker**

- PO1: Demonstrate broad and coherent knowledge of pertinent areas of chemistry related to their field of interest.
- PO2: Exhibit an in-depth understanding of the underlying principles and applications of the various instrumentation, techniques and/or software critical to their research projects.
- PO3: Properly collect, analyze, assess, and evaluate the data gathered in their experiments to make logical, reasonable, and valid scientific arguments.

#### **ELGA2: Effective Communicator**

- PO4: Effectively communicate the fundamental aspects of their field of interest as well as their research ideas and experimental results, both in oral and written form,

#### **ELGA3: Reflective Life-long Learner**

- PO5: Work efficiently in a highly dynamic, multi-cultural and interdisciplinary environment
- PO6: Acquire sufficient skills and competencies needed to embark on a professional career or further graduate studies

#### **ELGA4: Service-driven Citizen**

- PO7: Always conduct themselves ethically and responsibly in the pursuit of their scientific and professional objective

## 7.0 Program Structure

### 7.1. Course Requirements

Core/Major Courses	18 units
Cognate/Elective Courses	9 units
Graduate Seminar	3 units
Directed Research	0 Unit
Thesis	6 units
Comprehensive Examination	0 unit
<b>Total</b>	<b>36 units</b>

### 7.2. Major Courses

CHM603M	Structural Concepts in Inorganic Chemistry
CHM621M	Advanced Analytical Techniques in Chemistry Lecture
CHM622M	Advanced Analytical Techniques in Chemistry Laboratory
CHM643M	Organic Reactions and Mechanisms
CHM644M	Organic Reactions Laboratory
CHM662M	Advanced Physical Chemistry
CHM683M	Advanced Biochemistry

### 7.3. Electives

Depending on the thesis topic, field of specialization, or interest, a student chooses the corresponding elective subjects offered during a specific term. The elective subjects to be offered will depend on the availability of the appropriate faculty as well on whether the subject has been offered recently. The Department will ensure that these subjects will be as varied as possible.

### 7.4. Comprehensive Examinations

Students can take the written comprehensive examination (WCE) after successfully passing ALL core/major courses. These exams will be in Analytical Chemistry, Organic Chemistry, Physical Chemistry, Inorganic Chemistry, and Biochemistry.

### 7.5. Thesis

Enrollment in thesis is required for proposal and final defense and can only be done once a student (A) passes four out of five comprehensive examinations including the choice of area of specialization of the student and (B) obtains an average passing mark in the comprehensive exams, and a passing grade in the area of specialization.

### 7.6. Publication Requirement



Earning the Master's degree requires the publication of at least one paper from the master's thesis project in a reputable refereed journal. The published paper or the submitted manuscript along with a copy of the acceptance for publication from the editor of the journal must be appended to the final copy of the thesis.

## 8. Admission requirements

- 8.1. Compliance with the admission requirements of the University
- 8.2. A BS Chemistry graduate who has taken at least 34 units of chemistry, 5 units of physics, and 5 units of calculus. Admission of applicants from allied fields is subject to the approval of the Chemistry Graduate Committee. These students may also be required to take refresher and/or bridging courses.
- 8.3. Satisfactory test results on the entrance examination administered by the Admissions Office as well as pass the proficiency exam in the five areas of Chemistry namely Organic Chemistry, Inorganic Chemistry, Analytical Chemistry, Physical Chemistry, and Biochemistry.

## 9. Transfer Credits

A maximum of 6 Units of lecture core courses earned from an accredited and recognized HEI may be credited/transferred provided the grades are not lower than 2.5. Masteral thesis units may not be transferred.

## 10. Retention and Residency

- 10.1. The minimum credit grade in all courses is 2.0. A student must re-enroll a course if a grade lower than 2.0 is obtained. (DLSU Student Handbook 2015-18, page 123, section 19.6.2)
- 10.2. The student becomes ineligible for the program if he / she incurs two (2) grades of "0.0" (DLSU Student Handbook 2015-18, page 127, section 19.15)
- 10.2. As mandated by CHED a student should be enrolled in the MS Chemistry program for a minimum of one year to a maximum of **8 years**. An extension of a maximum of 3 years may be allowed provided the student enrolls in one 3- unit penalty course for every year of extension.
- 10.3. For transferees or shiftees: the student must have enrolled in the program for at least a year to graduate from the program.
- 10.4. Students who are not enrolled in any course must apply for residency.

## 11. Flow Chart

### Year 1

Term 1	Term 2	Term 3
Fundamentals of Research and Seminar (CHM900M, 3 units) Advanced Analytical Chemistry ( CHM621M, 3 units) Advanced Analytical Chemistry Laboratory ( CHM622M, 1 unit) Elective 1 (3 units) (Advanced Technical Reading and Writing 1 ENG501M, 3 units)*	Advanced Physical Chemistry (CHM662M, 3 units) Organic Reactions and Mechanism (CHM643M, 3 units) Elective 2 (3 units) (Directed Research with laboratory, CHM902M, 0 unit) (Advanced Technical Reading and Writing 2 ENG502M, 3 units)*	Structural Concepts in Inorganic Chemistry (CHM603M, 3 Units) Organic Reactions Laboratory (CHM644M, 2 Units) Advanced Biochemistry (CHM683M, 3 units) Elective 3 (3 units)
Total Units: 10 (+ 3)	Total Units: 9 (+ 3)	Total Units: 11

### Year 2

Term 1	Term 2	Term 3
Comprehensive Examination (0 Unit)	Chemistry Thesis 1 (CHM876M, 6 Units) Thesis proposal Defense	Chemistry Thesis 2 (CHM877M, 0 Unit)
Total Units: 0	Total Units: 6	Total Units: 0

### Year 3

Term 1	Term 2	Term 3
Chemistry Thesis 3 (CHM878M, 0 Units) Thesis Final defense		
Total Units: 0		

N.B. This flowchart is ideal for full-time students entering the program on the 1st term of the academic year without the need for any bridging and/or refresher courses. The evaluation of the essay component of the entrance exam results determines whether or not a student will be required to take the remedial English courses ENG501M and ENG502M.

## 12. Teaching, Learning, and Assessment Strategies

Lecture and laboratory classes in this program are held regularly, every week, during the trimester. Furthermore, seminars and research presentation of faculty members, students and/or experts from outside the University are also scheduled and details are disseminated ahead of time. These seminars

are given so that the graduate students remain up-to-date with current advances in the chemical sciences and allied fields.

Student learning activities both in the lecture and laboratory classes are designed for adult learners and maximize the learning opportunity. These activities include, but not limited to, presentation of recent journal articles, problem sets and group discussions, and the design of own experimental methods to address a particular problem. Tools for assessment employed by the faculty include examinations, written reports, oral presentations, and discussion during seminars and presentations.

Before a student is allowed to enroll in his/her thesis course, he/she must first pass the written comprehensive examination (WCE) in the chosen four of the five areas of Chemistry, namely, Analytical Chemistry, Organic Chemistry, Physical Chemistry, Inorganic Chemistry, and Biochemistry. (Kindly refer to the WCE policies in the latter part of this catalogue)

For the master's thesis, the students are exposed early on in their program regarding the expertise and research interests of each faculty member to help them in their decision of choosing the right thesis adviser. As soon as the student and the corresponding faculty have agreed, the student can start working on his/her original research project under the adviser's expert supervision and guidance

### 13. Date the program specification was revised: April 19, 2022

### 14. Curriculum Map

Category	Courses		ELGA 1			ELGA 2	ELGA 3		ELGA 4
			PO1	PO2	PO3	PO4	PO5	PO6	PO7
Bridging Courses	CHM526M	Analytical Chemistry Bridging Course	✓	✓		✓		✓	✓
	CHM546M	Organic Chemistry Bridging Course	✓	✓		✓		✓	✓
	CHM562M	Physical Chemistry Bridging Course	✓	✓		✓		✓	✓
Remedial English Courses	ENG501M	Advanced Technical Reading and Writing 1				✓		✓	
	ENG502M	Advanced Technical Reading and Writing 2				✓		✓	
Research Courses	CHM902M	Directed Research with Laboratory	✓	✓	✓	✓	✓	✓	✓
	CHM876M to CHM884M	Chemistry Thesis 1 to 9	✓	✓	✓	✓	✓	✓	✓
	CHM621M	Advanced Analytical Techniques in Chemistry Lecture	✓	✓		✓		✓	✓
Core Courses	CHM622M	Advanced Analytical Techniques in Chemistry Laboratory	✓	✓	✓	✓	✓	✓	✓

	CHM683M	Advanced Biochemistry	✓	✓		✓	✓	✓	✓
	CHM662M	Advanced Physical Chemistry	✓	✓		✓	✓	✓	✓
	CHM643M	Organic Reactions and Mechanisms	✓	✓		✓	✓	✓	✓
	CHM644M	Organic Reactions and Laboratory	✓	✓	✓	✓	✓	✓	✓
	CHM603M	Structural Concepts in Inorganic Chemistry	✓	✓		✓	✓	✓	✓
Graduate Seminar	CHM900M	Fundamentals of Research and Seminar	✓	✓		✓	✓	✓	✓
	CHM782M	Advanced Techniques in Biochemistry Laboratory	✓	✓	✓	✓	✓	✓	✓
	CHM785M	Biological Membranes/Molecular Basis of Selected Diseases	✓	✓		✓	✓	✓	✓
	CHM809M	Carbohydrate Chemistry	✓	✓		✓	✓	✓	✓
	CHM779M	Chemical Crystallography 1	✓	✓		✓	✓	✓	✓
	CHM763M	Chemical Kinetics	✓	✓		✓	✓	✓	✓
	CHM761M	Chemical Thermodynamics	✓	✓		✓	✓	✓	✓
	CHM723M	Chromatographic Methods Lecture	✓	✓		✓	✓	✓	✓
	CHM724M	Chromatographic Methods Laboratory	✓	✓	✓	✓	✓	✓	✓
	CHM703M	Coordination Chemistry	✓	✓		✓	✓	✓	✓
	CHM751M	Environmental Chemistry	✓	✓		✓	✓	✓	✓
	CHM783M	Enzymology	✓	✓		✓	✓	✓	✓
	CHM787M	Food and Plant Biochemistry	✓	✓		✓	✓	✓	✓
	CHM893M	Heterocyclic Chemistry	✓	✓		✓	✓	✓	✓
	CHM701M	Inorganic Synthesis	✓	✓		✓	✓	✓	✓
	CHM702M	Inorganic Synthesis Laboratory	✓	✓	✓	✓	✓	✓	✓
	CHM891M	Lipid Chemistry	✓	✓		✓	✓	✓	✓
	CHM755M	Materials Science 1	✓	✓		✓	✓	✓	✓
	CHM805M	Medicinal Chemistry	✓	✓		✓	✓	✓	✓
	CHM780M	Metabolomics	✓	✓		✓	✓	✓	✓
	CHM781M	Molecular Biochemistry	✓	✓		✓	✓	✓	✓
	CHM747M	Natural Products Chemistry	✓	✓		✓	✓	✓	✓
	CHM741M	Organic Synthesis Lecture	✓	✓		✓	✓	✓	✓
	CHM789M	Physical Biochemistry	✓	✓		✓	✓	✓	✓
	CHM705M	Physical Inorganic Chemistry	✓	✓		✓	✓	✓	✓

CHM808M	Polymer Chemistry	✓	✓		✓	✓	✓	✓
CHM661M	Quantum Chemistry 1	✓	✓		✓	✓	✓	✓
CHM792M	Regulated Cell Death: Mechanisms and Functions	✓	✓		✓	✓	✓	✓
CHM743M	Spectroscopic Methods in Organic Chemistry	✓	✓		✓	✓	✓	✓
CHM745M	Stereochemistry	✓	✓		✓	✓	✓	✓
CHM813M	Special Topics in Analytical Chemistry	✓	✓		✓	✓	✓	✓
CHM814M	Special Topics in Analytical Chemistry 2	✓	✓		✓	✓	✓	✓
CHM819M	Special Topics in Biochemistry	✓	✓		✓	✓	✓	✓
CHM811M	Special Topics in Inorganic Chemistry	✓	✓		✓	✓	✓	✓
CHM756M	Special Topics in Materials Science	✓	✓		✓	✓	✓	✓
CHM815M	Special Topics in Organic Chemistry	✓	✓		✓	✓	✓	✓
CHM816M	Special Topics in Organic Chemistry 2	✓	✓		✓	✓	✓	✓
CHM817M	Special Topics in Physical Chemistry	✓	✓		✓	✓	✓	✓

DOCTOR OF PHILOSOPHY IN CHEMISTRY

CHED Permit

Republika ng Pilipinas  
KAGAWARAN NG EDUKASYON, KULTURA AT ISPORTS  
Pambansang Pinarangal Bahayon  
Munim St., North EDSA, Quezon City

GOVERNMENT PERMIT (NCR)  
No. C-286, Series 1994



Pursuant to the provisions of Act No. 2706, as amended, and Batas Pambansa Bilang 232 (Education Act of 1962), the **DE LA SALLE UNIVERSITY**  
Taft Ave., Manila

is hereby granted authority to operate the

**POSTGRADUATE COURSE IN CHEMISTRY**  
leading to the degree of Doctor of Philosophy  
in Chemistry

for the school year **1994-1995**.

This permit shall be subject to revocation anytime the school fails to maintain the standards required for this course and to faithfully abide by the laws, the rules and regulations, and the requirements of the Department of Education, Culture and Sports governing the operation of authorized private school courses. The school authorities are to inform the Department of Education, Culture and Sports of any plan or action regarding closure or phasing out of the course or any change (s) in the prescribed requirements.

Furthermore, this permit does not extend to any branch of the school.

Given at Quezon City, this **25th** of **May** Nineteen Hundred and Ninety **Four**.

For the Secretary of Education,  
Culture and Sports:

*Nilo L. Rosas*  
**NILO L. ROSAS**  
Director IV

Recommended by:

(Not Valid Without DECS-NCR Seal  
or With Government Approval)  
**ET/PS Ciraso**

*10/18  
6/11/94  
CC*

# DOCTOR OF PHILOSOPHY IN CHEMISTRY

## Program Specification

1. Awarding Institution – **De La Salle University**
2. College/School – **College of Science**
3. Name of Final Award – **Doctor of Philosophy in Chemistry**
4. Program Title – **Doctor of Philosophy in Chemistry**
5. **Program Overview**

The Doctor of Philosophy in Chemistry Degree at De La Salle University is designed to provide advanced study and research in Chemistry. The program was initially offered in consortium with the University of the Philippines in Diliman and Ateneo de Manila University. The Ph. D. degree in Chemistry is earned by those able to demonstrate breadth and depth of knowledge of the facts and theories of chemistry and the ability to conduct independent chemical research as evidenced by the acceptance of a doctoral dissertation.

### 6. Expected Learning Outcomes of the Program (PO)

#### **ELGA 1: Creative and Critical Thinker**

- PO1: Demonstrate advanced knowledge of chemistry necessary to understand and critically evaluate current research in their field of interest.
- PO2: Exhibit an in-depth understanding of the underlying principles and applications of the various instrumentation, techniques and/or software critical to their research projects.
- PO3: Properly collect, analyze, assess, and evaluate the data gathered in their experiments to make logical, reasonable, and valid scientific arguments.

#### **ELGA2: Effective Communicator**

- PO4: Effectively communicate the fundamental aspects of their field of interest as well as their research ideas and experimental results, both in oral and written form, particularly by publication in highly respected international peer-reviewed journals

#### **ELGA3: Reflective Life-long Learner**

- PO5: Work efficiently in a highly dynamic, multi-cultural and interdisciplinary environment.
- PO6: Identify new research possibilities, develop, and conduct independent research towards the realization of these opportunities with the goal of contributing new and original knowledge related to their field of interest.

#### **ELGA4: Service-driven Citizen**

- PO7: Always conduct themselves ethically and responsibly in the pursuit of their scientific and professional objective

## 7. Program Structure

### 7.1. Course Requirements

Cognate/Elective Courses	15 units
Graduate Seminar	3 units
Directed Research	0 Unit
Focused Studies	6 units
Dissertation	12 units
Comprehensive Examination	0 unit
Candidacy Examination	0 unit
<b>Total</b>	<b>36 units</b>

### 7.2. Proficiency Exams

Upon acceptance to the program, a student will take proficiency exams in subject areas to be determined by the department admissions committee. Bridging course(s) may be required depending on the results of the exams.

### 7.3. Electives

Depending on the thesis topic, field of specialization, or interest, a student chooses the corresponding elective subjects offered during a specific term. The elective subjects to be offered will depend on the availability of the appropriate faculty as well on whether the course has been offered recently. The Department will ensure that these offerings will be as varied as possible and will address student research interest requirements.

### 7.4. Graduate Seminars

Students take three (3) seminar courses, each corresponding to one unit, over a 3-term schedule, i.e. one seminar class per term. The seminar topics will be chosen and approved by the student's graduate committee. At least one of the seminars will be in another area outside of the dissertation topic. Students are required to deliver an informative analysis and evaluation of a journal article. The seminar presentation will be open to the public. Students are also required to attend at least three (3) other seminars inside or outside of the University. In addition, he/she is required to attend the seminars given by other Chemistry graduate students.

### 7.5. Progress Reports

The student must write an annual progress report after every completion of three terms. This will be submitted to the dissertation adviser or the student's graduate committee if the adviser has not been chosen yet.

### 7.6. Comprehensive Examinations

Students can take the comprehensive exam upon successful completion of all elective and seminar courses. The exam will be on special topics chosen by the student's graduate committee. These will be within the student's field of specialization and may be based on the elective courses taken.



### **7.7. Candidacy Examination**

Candidacy examination is a research proposal on a topic not related to the student's field of specialization. It will be defended before a panel of three (3) members including the dissertation adviser, and is open to the public. The candidacy examination can be taken at the option of the student after all electives and seminars are completed (term 5 for full-time students).

### **7.8. Dissertation**

Enrollment in dissertation is required for proposal and final defense. This can be enrolled after passing the comprehensive examination. The dissertation will be publicly defended before a panel of five members, at least one of which is a content and method specialist from outside the university.

### **7.9. Publication Requirement**

Earning the degree requires the publication of at least one paper from the dissertation project in an internationally/nationally indexed journal. The published paper, or the submitted manuscript along with a copy of the acceptance for publication from the editor of the journal must be appended to the final copy of the dissertation.

## **8. Admission requirements**

- 8.1. Compliance with the admission requirements of the University
- 8.2. Evaluation of credentials by the department. PhD students must have completed at least three units each of all five graduate level core courses on Analytical Chemistry, Organic Chemistry, Physical Chemistry, Inorganic Chemistry, and Biochemistry.

## **9. Retention and Residency**

- 9.1. The student will be dismissed from the program if he / she incurs two (2) grades of "0.0" (DLSU Student Handbook 2012-15, page 136, section 4.15)
- 9.2. As mandated by CHED a student should be enrolled in the PhD Chemistry program for a minimum of one year to a maximum of **10 years**. An extension of a maximum of 5 years may be allowed provided the student enrolls in one 3- unit penalty course for every year of extension.
- 9.3. Students who are not enrolled in any course must apply for residency.

## 10. Flowchart

### Year 1

Term 1	Term 2	Term 3
Elective 1 (3 units)  Elective 2 (3 units)  Seminar 1 (CHM931D, 1 unit) (Refresher courses as needed)  (Advanced Technical Reading and Writing 1 ENG501M, 3 units)*	Elective 3 (3 units)  Elective 4 (3 units)  Seminar 2 (CHM932D, 1 unit) (Directed Research without laboratory, CHM901D, 0 unit) (Advanced Technical Reading and Writing 1 ENG502M, 3 units)*	Elective 5 (3 Units)  Seminar 3 (CHM933D, 1 Unit) (Directed Research with laboratory, CHM902D, 0 unit)
Total Units: 7 (+ 3)	Total Units: 7 (+ 3)	Total Units: 4

### Year 2

Term 1	Term 2	Term 3
Comprehensive Examination (0 Unit)	Focused Studies (CHM951D, 3 units)  (Candidacy Examination)*	Focused Studies (CHM952D, 3 units)  (Candidacy Examination)
Total Units: 0	Total Units: 3	Total Units: 3

### Year 3

Term 1	Term 2	Term 3
Chemistry Dissertation (CHM971D, 12 Units)  Dissertation Proposal Defense  (Candidacy Examination)	Chemistry Dissertation (CHM972D, 0 unit)  (Candidacy Examination)	Chemistry Dissertation (CHM973D, 0 unit)  Dissertation Final Defense  (Candidacy Examination)
Total Units: 12	Total Units: 0	Total Units: 0

N.B. This flowchart is ideal for full-time students entering the program on the 1st term of the academic year without the need for any bridging and/or refresher courses. The evaluation of the essay component of the entrance exam results determines whether or not a student will be required to take the remedial English courses ENG501M and ENG502M.

\*The Candidacy Examination can be taken at the option of the student beginning Term 5.

### 11. Teaching, Learning, and Assessment Strategies

Lecture classes in this program are held regularly, every week, during the trimester. Furthermore, seminars and research presentation of faculty members, students and/or experts from outside the University are also scheduled and details are disseminated ahead of time. These seminars are given so that the graduate students remain up to date with current advances in the chemical sciences and allied fields.

Student learning activities are designed for adult learners and maximize the learning opportunity. These activities include, but not limited to, presentation of recent journal articles, problem sets and group discussions, and the design of own experimental methods to address a particular problem. Tools for assessment employed by the faculty include examinations, written reports, oral presentations, and discussion during seminars and presentations.

Before a student is allowed to enroll in his/her thesis course, he/she must first pass the written (WCE) comprehensive examination. (Kindly refer to the WCE policies in the latter part of this catalogue).

For the dissertation, the students are exposed early on in their program regarding the expertise and research interests of each faculty member to help them in their decision of choosing the right thesis adviser. As soon as the student and the corresponding faculty have agreed, the student can start working on his/her original research project under the adviser's expert supervision and guidance.

### 12. Date the program specification was revised: April 19, 2022

### 13. Curriculum Map

Category	Courses		ELGA 1			ELG A 2	ELGA 3		ELG A 4
			P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7
Remedial English Courses	ENG501M	Advanced Technical Reading and Writing 1				✓		✓	
	ENG502M	Advanced Technical Reading and Writing 2				✓		✓	
Research Courses	CHM932D	Directed Research with Laboratory	✓	✓	✓	✓	✓	✓	✓
	CHM951D and CHM952D	Focused Studies 1 and 2	✓	✓	✓	✓	✓	✓	✓
	CHM971D to CHM979D	Chemistry Dissertation 1 to 9	✓	✓	✓	✓	✓	✓	✓
Bridging Courses	CHM621D	Advanced Analytical Techniques in Chemistry Lecture	✓	✓		✓		✓	✓
	CHM622D	Advanced Analytical Techniques in Chemistry Laboratory	✓	✓	✓	✓	✓	✓	✓
	CHM683D	Advanced Biochemistry	✓	✓		✓	✓	✓	✓
	CHM662D	Advanced Physical Chemistry	✓	✓		✓	✓	✓	✓

	CHM643D	Organic Reactions and Mechanisms	✓	✓		✓	✓	✓	✓
	CHM644D	Organic Reactions and Laboratory	✓	✓	✓	✓	✓	✓	✓
	CHM603D	Structural Concepts in Inorganic Chemistry	✓	✓		✓	✓	✓	✓
Graduate Seminar	CHM931D to CHM933D	Seminars 1 to 3	✓	✓		✓	✓	✓	✓
	CHM782D	Advanced Techniques in Biochemistry Laboratory	✓	✓	✓	✓	✓	✓	✓
	CHM785D	Biological Membranes/Molecular Basis of Selected Diseases	✓	✓		✓	✓	✓	✓
	CHM809D	Carbohydrate Chemistry	✓	✓		✓	✓	✓	✓
	CHM779D	Chemical Crystallography 1	✓	✓		✓	✓	✓	✓
	CHM763D	Chemical Kinetics	✓	✓		✓	✓	✓	✓
	CHM761D	Chemical Thermodynamics	✓	✓		✓	✓	✓	✓
	CHM723D	Chromatographic Methods Lecture	✓	✓		✓	✓	✓	✓
	CHM724D	Chromatographic Methods Laboratory	✓	✓	✓	✓	✓	✓	✓
	CHM703D	Coordination Chemistry	✓	✓		✓	✓	✓	✓
	CHM751D	Environmental Chemistry	✓	✓		✓	✓	✓	✓
	CHM783D	Enzymology	✓	✓		✓	✓	✓	✓
	CHM787D	Food and Plant Biochemistry	✓	✓		✓	✓	✓	✓
	CHM893D	Heterocyclic Chemistry	✓	✓		✓	✓	✓	✓
	CHM701D	Inorganic Synthesis	✓	✓		✓	✓	✓	✓
	CHM702D	Inorganic Synthesis Laboratory	✓	✓	✓	✓	✓	✓	✓
	CHM891D	Lipid Chemistry	✓	✓		✓	✓	✓	✓
	CHM755D	Materials Science 1	✓	✓		✓	✓	✓	✓
	CHM805D	Medicinal Chemistry	✓	✓		✓	✓	✓	✓
	CHM780D	Metabolomics	✓	✓		✓	✓	✓	✓
	CHM781D	Molecular Biochemistry	✓	✓		✓	✓	✓	✓
	CHM747D	Natural Products Chemistry	✓	✓		✓	✓	✓	✓
	CHM741D	Organic Synthesis Lecture	✓	✓		✓	✓	✓	✓
	CHM789D	Physical Biochemistry	✓	✓		✓	✓	✓	✓
	CHM705D	Physical Inorganic Chemistry	✓	✓		✓	✓	✓	✓
	CHM808D	Polymer Chemistry	✓	✓		✓	✓	✓	✓
	CHM661D	Quantum Chemistry 1	✓	✓		✓	✓	✓	✓
	CHM792D	Regulated Cell Death: Mechanisms and Functions	✓	✓		✓	✓	✓	✓
	CHM743D	Spectroscopic Methods in Organic Chemistry	✓	✓		✓	✓	✓	✓
	CHM745D	Stereochemistry	✓	✓		✓	✓	✓	✓
	CHM813D	Special Topics in Analytical Chemistry	✓	✓		✓	✓	✓	✓
	CHM814D	Special Topics in Analytical Chemistry 2	✓	✓		✓	✓	✓	✓
	CHM819D	Special Topics in Biochemistry	✓	✓		✓	✓	✓	✓
	CHM811D	Special Topics in Inorganic Chemistry	✓	✓		✓	✓	✓	✓
	CHM756D	Special Topics in Materials Science	✓	✓		✓	✓	✓	✓
	CHM815D	Special Topics in Organic Chemistry	✓	✓		✓	✓	✓	✓

	CHM816D	Special Topics in Organic Chemistry 2	✓	✓		✓	✓	✓	✓
	CHM817D	Special Topics in Physical Chemistry	✓	✓		✓	✓	✓	✓

#### 14. Additional New Courses

##### Focused Studies 1 CHM951D

Focused studies narrow the identified research area to a well-defined topic by allowing the student to explore current issues and concerns specific to the area. Consultative and self-paced study of literature in relevant fields determined to best answer research questions will help identify suitable methods and necessary information. A seminar presentation is required at the end of this course.

##### Focused Studies 2 CHM952D

Following Directed Research and Focused Studies, the student is expected to write a clear proposal of the dissertation research project and a persuasive, professional grant application.

DOCTOR OF PHILOSOPHY IN CHEMISTRY (STRAIGHT PROGRAM)

CHED Permit



Republic of the Philippines  
Office of the President  
**COMMISSION ON HIGHER EDUCATION**  
NATIONAL CAPITAL REGION

May 28, 2015

**Br. Ricardo P. Laguda, FSC**  
President  
De La Salle University  
2401 Taft Ave.  
Manila



**Dear Br. Laguda:**

This is to transmit to you the herein communication of Dr. Amelia A. Biglete, Director IV, Office of Programs and Standards Development (OPSD), Commission on Higher Education, acknowledging receipt, contents noted and made as a matter of record the documents submitted regarding your offering of **Doctor of Philosophy in Chemistry (Straight Program)** effective for **Academic Year 2015-2016**.

Please be reminded that the CHED minimum requirements as embodied in the existing policies, standards and guidelines (PSG) for the said degree program are fully complied with.

For your information and guidance.

Very truly yours,

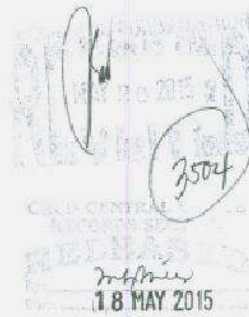
  
**LEONIDA S. CALAGUI, Ph.D., CESO III**  
Director IV

cc: Dr. Amelia A. Biglete  
Director IV, OPSD

E18



Republic of the Philippines  
OFFICE OF THE PRESIDENT  
**COMMISSION ON HIGHER EDUCATION**



2<sup>nd</sup> Indorsement  
May 14, 2015

Respectfully forwarded to **Dr. Leonida S. Calagui**, Director IV, CHED National Capital Region, C.P. Garcia Avenue, Diliman, Quezon City, the herein reply of the Office of Programs and Standards Development, regarding the intention of **De La Salle University**, Taft Avenue, Manila, to offer **Doctor of Philosophy in Chemistry (Straight Program)** effective Academic Year 2015-2016, using its benefit as an autonomous institution.

Please inform the concerned institution that this Office acknowledges receipt, contents noted, and made as a matter of record the documents submitted by the institution, with the information that by virtue of CHED Memorandum Order No. 44, s. 2008 and Memorandum from the Chairperson dated July 30, 2013, one of the privileges of an institution granted autonomous status is to offer new course(s)/program(s) in the undergraduate and at graduate level, in their areas of expertise as indicated by their accreditation status, without securing permit/authority from CHED except in disciplines that are under moratorium.

Furthermore, the institution should be reminded to ensure that the CHED minimum requirements as embodied in the existing policies, standards and guidelines (PSGs) for the particular degree program are fully complied with.

  
**AMELIA A. BIGLETE**  
Director IV, Office of Programs and Standards Development (OPSD)

# DOCTOR OF PHILOSOPHY IN CHEMISTRY (Straight Program)

## Program Specification

- |                         |  |
|-------------------------|--|
| 1. Awarding Institution | De La Salle University                               |
| 2. College/School       | College of Science                                   |
| 3. Name of Final Award  | Doctor of Philosophy in Chemistry                    |
| 4. Program Title        | Doctor of Philosophy in Chemistry (Straight Program) |
| 5. Program Overview     |  |

The Straight Doctor of Philosophy in Chemistry Degree at De La Salle University is designed to provide advanced study and research in Chemistry that adheres to the standards provided by the Commission on Higher Education (CHED). The straight program is intended for applicants with high aptitude for chemistry and who have demonstrated outstanding research capabilities backed up by research experience.

### OBJECTIVES OF THE PROGRAM

To raise the standard of chemistry research and capabilities in the Philippines to levels comparable to, if not better than, international standards.

To develop and increase competent manpower for the academe, research and industry

### 6. Expected Learning Outcomes of the Program (PO)

#### *ELGA 1: Creative and Critical Thinker*

- PO1: Demonstrate advanced knowledge of chemistry necessary to understand and critically evaluate current research in their field of interest.
- PO2: Exhibit an in-depth understanding of the underlying principles and applications of the various instrumentation, techniques and/or software critical to their research projects.
- PO3: Properly collect, analyse, assess, and evaluate the data gathered in their experiments to make logical, reasonable, and valid scientific arguments.

#### *ELGA2: Effective Communicator*

- PO4: Effectively communicate the fundamental aspects of their field of interest as well as their research ideas and experimental results, both in oral and written form, particularly by publication in highly-respected international peer-reviewed journals

#### *ELGA3: Reflective Life-long Learner*

- PO5: Work efficiently in a highly dynamic, multi-cultural and interdisciplinary environment
- PO6: Identify new research possibilities, develop, and conduct independent research towards the realization of these opportunities with the goal of contributing new and original knowledge related to their field of interest



*ELGA4: Service-driven Citizen*

PO7: Always conduct themselves ethically and responsibly in the pursuit of their scientific and professional objective

## 7. Program Structure

### **Course Requirements**

Core/Major courses	15 units
Cognate/Elective Courses	15 units
Graduate Seminar	6 units
Directed Research	0 unit
Preparation PhD Proposal	0 unit
Dissertation	12 units
Qualifying Examination	0 unit
Comprehensive Examinations	0 unit
Candidacy Examination	0 unit
<b>Total</b>	<b>48 units</b>

This program is designed for highly qualified students possessing a BS Chemistry degree, although students currently in the MS program may be accepted subject to meeting certain requirements.

### ***Major Courses***

CHM603D	Structural Concepts in Inorganic Chemistry
CHM621P	Advanced Analytical Techniques in Chemistry Lecture
CHM643D	Organic Reactions and Mechanisms
CHM662D	Advanced Physical Chemistry
CHM683D	Advanced Biochemistry

### ***Electives***

Depending on the thesis topic, field of specialization, or interest, a student chooses the corresponding elective subjects offered during a specific term. The elective subjects to be offered will depend on the availability of the appropriate faculty as well on whether the subject has been offered recently. The Department will ensure that these subjects will be as varied as possible.

### ***Graduate Seminar***

Students take six (6) seminar courses, each corresponding to one unit. A maximum of two (2) seminar courses may be taken per term. These courses must be enrolled with different faculty members, i.e. different specializations, and must cover the five major areas of Chemistry. Students are required to deliver a journal presentation, which is open to the public, and attend other seminars inside or outside of the University. In addition, he/she is required to attend the seminars given by other Chemistry graduate students.

### ***Qualifying Examinations***

These examinations cover the five (5) major fields of Chemistry: Analytical Chemistry, Organic Chemistry, Physical Chemistry, Inorganic Chemistry, and Biochemistry. BS Chemistry entrants can take these after successfully completing all core courses. These exams are comparable to the MS-level comprehensive examinations.

### ***Comprehensive Examinations***

Students can take these exams upon successful completion of all elective and seminar courses. There will be three (3) written exams on special topics within the student's field of specialization and one (1) oral exam on the student's main specialization.

#### ***Candidacy Examination***

This may only be enrolled upon passing all four comprehensive examinations. Candidacy examination is a research proposal on a topic not related to the student's field of specialization and defended before a panel of three (3) members. This is open to the public.

#### ***Dissertation***

Enrollment in dissertation is required for proposal and final defense. This can be enrolled after passing all four comprehensive examinations, but the dissertation can only be defended after passing the candidacy examination.

### 8. Admission requirements

#### *BS Entrants (Straight Program)*

1. Compliance with the admission requirements of the University;
2. Exemplary record in BS Chemistry or allied field and preferably have research experience;
3. Have completed 60 units of chemistry courses and obtained an average grade in chemistry not lower than 87%;
4. Satisfactory test results on the entrance examination administered by the Admissions Office as well as pass the proficiency exam in the five areas of Chemistry namely Organic Chemistry, Inorganic Chemistry, Analytical Chemistry, Physical Chemistry, and Biochemistry.
5. Be a full time student.

#### *MS Entrants (Ladder Program)*

1. A student from the DLSU MS Chemistry Program may be upgraded to the Straight PhD Program if
  - a. he/she has passed the comprehensive examination in all required fields but has not defended an MS Chemistry thesis and
  - b. his/her CGPA in MS Chemistry courses is not lower than 3.0.
2. An MS Chemistry student who has not taken the comprehensive examination but has completed all courses in the DLSU MS Chemistry Program may also be upgraded to the straight PhD Chemistry Program provided that
  - a. he/she passes the qualifying examination for the straight PhD Program in five fields of chemistry and
  - b. his/her CGPA in MS Chemistry courses is not lower than 3.0
3. An applicant who finished a Master in Chemistry (Non-Thesis / NTMChem) degree may be accepted into the straight PHD program if
  - a. he/she has exceptional academic record and/or research experience; he/she is required to take the proficiency exams in all 5 fields (BS level).
  - b. he/she passes the CGPC assessment. The Chemistry Graduate Program Committee should also evaluate the academic records of an applicant whose exceptional qualification may not be covered in the "Guidelines and Policies for the Straight PhD Chemistry Program".

## 9. Flow Chart

**BS Entrants**

<b>Year 1</b>		
<b>Term 1</b>	<b>Term 2</b>	<b>Term 3</b>
Remedial English		
Advanced Analytical Chemistry (Core Course, 3 Units)	Advanced Physical Chemistry (Core Course, 3 Units)	Advanced Inorganic Chemistry ( Core Course , (3 Units)
Advanced Biochemistry (Core course, 3 Units)	Advanced Organic Chemistry (Core course , 3 Units)	Elective 3 (3 Units)
Elective 1 (3 Units) Seminar 1 (1 Unit)	Elective 2 (3 Units)	Elective 4 (3 Units)
Proposal Preparation (0 Unit)	Seminar 2 (1 Unit)	Seminar 3 (1 Unit)
	Directed Research 1 (0 Unit)	Directed Research 2 (0 Unit)
TOTAL: 10 Units	TOTAL: 10 Units	TOTAL: 10 Units
<b>Year 2</b>		
<b>Term 1</b>	<b>Term 2</b>	<b>Term 3</b>
Elective 5 (3 Units)	Seminar 5 (1 Unit)	Directed Research 5 (0 Unit)
Seminar 4 (1 Unit)	Seminar 6 (1 Unit)	Comprehensive Examination (0 Unit)
Qualifying Examination (0 Unit)	Directed Research 4 (0 Unit)	
Directed Research 3 (0 Unit)		
TOTAL: 4 Units	TOTAL: 2 Unit	TOTAL: 0 Unit
<b>Year 3</b>		
<b>Term 1</b>	<b>Term 2</b>	<b>Term 3</b>
Dissertation 1 (12 Units)	Dissertation 2 (0 Unit)	Dissertation 3 (0 Unit)
		Candidacy Examination (0 Unit)
		Final Oral Defense (0 Unit)
TOTAL: 12 Units	TOTAL: 0 Units	TOTAL: 0 Unit

**MS Entrants**

<b>Year 1</b>		
<b>Term 1</b>	<b>Term 2</b>	<b>Term 3</b>
Remedial English		
Elective 1 (3 Units)	Elective 3 (3 Units)	Elective 5 (3 Units)
Elective 2 (3 Units)	Elective 4 (3 Units)	Seminar 5 (1 Unit)
Seminar 1 (1 Unit)	Seminar 3 (1 Unit)	Seminar 6 (1 Unit)
Seminar 2 (1 Unit)	Seminar 4 (1 Unit)	Directed Research 3 (0 Unit)
Proposal Preparation (0 Unit)	Directed Research 2 (0 Unit)	
Directed Research 1 (0 Unit)		
TOTAL: 7 Units	TOTAL: 7 Units	TOTAL: 5 Units
<b>Year 2</b>		
<b>Term 1</b>	<b>Term 2</b>	<b>Term 3</b>
Directed Research 4 (0 Unit)	Dissertation 1 (12 Units)	Dissertation 2 (0 Units)
Comprehensive Examination (0 Unit)		
TOTAL: 4 Units	TOTAL: 0 Unit	TOTAL: 12 Unit
<b>Year 3</b>		
<b>Term 1</b>		
Dissertation 3 (0 Unit)		
Candidacy Exam		
Final Oral Defense (0 Unit)		
TOTAL: 0 Unit		

## 10. Teaching, Learning, and Assessment Strategies

Lecture classes in this program are held regularly, every week, during the trimester. Furthermore, seminars and research presentation of faculty members, students and/or experts from outside the University are also scheduled and details are disseminated ahead of time. These seminars are given so that the graduate students remain up-to-date with current advances in the chemical sciences and allied fields.

Student learning activities are designed for adult learners and maximize the learning opportunity. These activities include, but not limited to, presentation of recent journal articles, problem sets and group discussions, and the design of own experimental methods to address a particular problem. Tools for assessment employed by the faculty include examinations, written reports, oral presentations, and discussion during seminars and presentations.

Before a student is allowed to enroll in his/her thesis course, he/she must first pass the written (WCE) and oral (OCE) comprehensive examinations. (Kindly refer to the WCE and OCE policies in the latter part of this catalogue). In addition, he/she must pass the candidacy examination prior to defending his/her dissertation.

For the dissertation, the students are exposed early on in their program regarding the expertise and research interests of each faculty member to help them in their decision of choosing the right thesis adviser. As soon as the student and the corresponding faculty have agreed, the student can start working on his/her original research project under the adviser's expert supervision and guidance. As a final requirement and testament to the quality of research done, the student is required to have his/her research accepted for publication in a peer-reviewed journal.

11. Date the program specification was written or revised: August 19, 2015

**Curriculum Map: PHD-CHY (Straight Program)**

CATEGORY	SUBJECT		ELGA 1			ELGA 2	ELGA 3		ELGA 4
			PO 1	PO 2	PO 3	PO4	PO 5	PO 6	PO7
Remedial English Course	ENG501M	Advanced Technical Reading and Writing 1				*		*	
	ENG502M	Advanced Technical Reading and Writing 2				*		*	*
Research Courses	CHM901P	Directed Research without Laboratory	*	*		*	*	*	*
	CHM902D	Directed Research with Laboratory	*	*	*	*	*	*	*
	CHM971D to CHM985D	Chemistry Thesis 1 to 12	*	*	*	*	*	*	*
Core Courses	CHM621P	Advanced Analytical Techniques in Chemistry Lecture	*	*		*		*	*
	CHM683D	Advanced Biochemistry	*	*		*	*	*	*
	CHM662D	Advanced Physical Chemistry	*	*		*	*	*	*
	CHM643M	Organic Reactions and Mechanisms	*	*		*	*	*	*
	CHM644D	Organic Reactions Laboratory	*	*	*	*	*	*	*
	CHM603D	Structural Concepts in Inorganic Chemistry	*	*		*	*	*	*
Graduate Seminar	CHM931D to CHM936D	Seminar 1 to 6	*	*		*	*	*	*
Electives	CHM745D	Advanced Physical Organic Chemistry	*	*		*	*	*	*
	CHM622D	Advanced Analytical Techniques in Chemistry Laboratory	*	*	*	*	*	*	*
	CHM782D	Advanced Techniques in Biochemistry Laboratory	*	*	*	*	*	*	*
	CHM785D	Biological Membranes/Molecular Basis of Selected Diseases	*	*		*	*	*	*
	CHM779D	Chemical Crystallography 1	*	*		*	*	*	*
	CHM763D	Chemical Kinetics	*	*		*	*	*	*
	CHM761D	Chemical Thermodynamics	*	*		*	*	*	*
	CHM809D	Chemistry of Carbohydrates	*	*		*	*	*	*
	CHM893D	Chemistry of Heterocycles	*	*		*	*	*	*
	CHM891D	Chemistry of Lipids	*	*		*	*	*	*
	CHM747D	Chemistry of Natural Products	*	*		*	*	*	*
	CHM723D	Chromatographic Methods Lecture	*	*		*	*	*	*
	CHM724D	Chromatographic Methods Laboratory	*	*	*	*	*	*	*
	CHM703D	Coordination Chemistry	*	*		*	*	*	*
	CHM751D	Environmental Chemistry	*	*		*	*	*	*
	CHM783D	Enzymology	*	*		*	*	*	*
	CHM787D	Food and Plant Biochemistry	*	*		*	*	*	*
	CHM701D	Inorganic Synthesis	*	*		*	*	*	*
	CHM702D	Inorganic Synthesis Laboratory	*	*	*	*	*	*	*
	CHM755D	Materials Science 1	*	*		*	*	*	*
	CHM805D	Medicinal Chemistry	*	*		*	*	*	*
	CHM781D	Molecular Biochemistry	*	*		*	*	*	*
CHM741D	Organic Synthesis Lecture	*	*		*	*	*	*	
CHM789D	Physical Biochemistry	*	*		*	*	*	*	
CHM807D	Polymer Chemistry	*	*		*	*	*	*	

CATEGORY	SUBJECT	ELGA 1			ELGA 2	ELGA 3		ELGA 4
		PO 1	PO 2	PO 3	PO4	PO 5	PO 6	PO7
	CHM705D	Physical Inorganic Chemistry	*	*		*	*	*
	CHM743D	Spectroscopic Methods in Organic Chemistry	*	*		*	*	*
	CHM745D	Stereochemistry	*	*		*	*	*
	CHM721D	Special Topics in Analytical Chemistry	*	*		*	*	*
	CHM813D	Special Topics in Analytical Chemistry	*	*		*	*	*
	CHM814D	Special Topics in Analytical Chemistry 2	*	*		*	*	*
	CHM819D	Special Topics in Biochemistry	*	*		*	*	*
	CHM811D	Special Topics in Inorganic Chemistry	*	*		*	*	*
	CHM756D	Special Topics in Materials Science	*	*		*	*	*
	CHM815D	Special Topics in Organic Chemistry	*	*		*	*	*
	CHM816D	Special Topics in Organic Chemistry 2	*	*		*	*	*
	CHM817D	Special Topics in Physical Chemistry	*	*		*	*	*
	CHM661D	Quantum Chemistry 1	*	*		*	*	*
	CHM662D	Quantum Chemistry 2	*	*		*	*	*

## **COURSE DESCRIPTIONS**



Master of Science in Chemistry  
*MS-CHEM*  
**Course Descriptions**

**BRIDGING COURSES** (*only for the DLSU-CPU CHED Offshore Program*)

**Analytical Chemistry Bridging Course (CHM526M)**

**0 unit**

This course will introduce the major aspects of chemical analysis. Topics to be taken up include principles and applications of titrimetric analyses in acid-base, precipitation and complexation reactions. This course will also cover basic principles of spectroscopy.

**Physical Chemistry Bridging Course (CHM562M)**

**0 unit**

This is a course devoted to a study of the laws of thermodynamics, kinetics, and their applications to simple systems.

**Organic Chemistry Bridging Course (CHM546M)**

**0 unit**

This subject deals with the basic principles needed to understand the chemistry of organic compounds. It will cover topics based on the concept of functional groups and discuss the structure, nomenclature, preparation and properties of different compound classes with emphasis on alkanes, alkenes, alkynes, alkyl halides, alcohols, ethers, aromatic and carbonyl compounds.

**REMEDIAL ENGLISH COURSES**

**Advanced Technical Reading and Writing 1 (ENG501M)**

**3 units**

The first part of an intensive English academic reading and writing course, focuses on the review of basic reading and writing skills and their application in the preparation of short academic papers such as definitions and descriptions, and non-prose forms. It emphasizes the mastery of active reading strategies, the effective use of rhetorical and organizational features of academic writing, and proper documentation.

**Advanced Technical Reading and Writing 2 (ENG502M)**

**3 units**

The second part of the intensive English academic reading and writing course, focuses on the writing of data commentary and the various parts of a research report, with emphasis on the different rhetorical moves and the linguistic features that realize these moves. The course continues to emphasize the observance of integrity in writing and research.

**RESEARCH COURSES**

**Directed Research with Laboratory (CHM902M)**

**0 unit**

Development of an original research problem through laboratory experimentation under the supervision of an adviser. The course is designed for student who wish to start laboratory research work but are not yet eligible to enroll in the thesis course.

**Chemistry Thesis 1 to 9 (CHM876M – CHM884M)****6 units**

Conduct of an original research under the supervision of a thesis mentor.

**CORE COURSES****Advanced Analytical Techniques in Chemistry Lecture (CHM621M)****3 units**

A course dealing with the principles and instrumentation in spectroscopy, chromatography, mass spectrometry, hyphenated techniques, thermal analytic methods, and voltammetry.

**Advanced Analytical Techniques in Chemistry Laboratory (CHM622M)****1 unit**

A laboratory course covering instrumental analytical applications of absorption and emission spectroscopy, chromatography, and voltammetric methods in determining important physicochemical data.

**Advanced Biochemistry (CHM683M)****3 units**

A study of the structure and function of biomolecules, biochemical pathways, and signal transduction.

**Advanced Physical Chemistry (CHM662M)****3 units**

This lecture course will review fundamental concepts of physical chemistry including basic quantum chemistry and spectroscopy. The rest of the course will be devoted to calculations of thermodynamic parameters as well as computational techniques in physical chemistry and their application to the interpretation of experimental data.

**Organic Reactions and Mechanisms (CHM643M)****3 units**

An intensive review of selected organic chemical reactions and mechanisms emphasizing the experimental approach.

**Organic Reactions Laboratory (CHM644M)****2 units**

A laboratory course covering the application of concepts and theories discussed in organic synthesis lecture. Techniques such as monitoring of reactions, proper handling of toxic and air sensitive compounds, and determining correct reaction set-up are also included.

**Structural Concepts in Inorganic Chemistry (CHM603M)****3 units**

A course dealing with atomic theory, structure and symmetry, bonding theories, acid-base chemistries and chemical forces in inorganic compounds. Coordination compounds, organometallics, cage/cluster compounds, and bio-organic systems are likewise presented from the viewpoint of their structure and bonding.

**Fundamentals of Research and Seminar (CHM900M)****3 units**

A course aimed at guiding the student in choosing a research problem for a master's thesis. Surveys on the use of chemical literature, including databases and computer-aided searching, are presented. The

student is required to submit a proposal of his or her thesis research at the end of the course, as well as to present a seminar on a current topic of chemical interest.

## **ELECTIVE COURSES**

### **Advanced Physical Organic Chemistry (CHM745M)**

**3 units**

A course emphasizing the application of physical chemistry in the study of structure and reactivity of organic compounds as well as organic reaction mechanisms.

### **Advanced Techniques in Biochemistry Laboratory (CHM782M)**

**1 unit**

This course deals with the theory and application of modern biochemical techniques and instrumentation. Topics covered include the use chromatographic and electrophoretic techniques, and spectroscopy in the separation, characterization, analysis, and structural elucidation of biomolecules.

### **Biological Membranes/Molecular Basis of Selected Diseases (CHM785M)**

**3 units**

*Part I focuses on the molecular principles to explain the structure, function, dynamics and bioenergetics of biological membranes. Part II deals with the molecular basis of selected diseases and drug therapy.*

### **Chemical Crystallography 1 (CHM779M)**

**3 units**

An introduction to x-ray diffraction processes of single crystals. The course includes crystallographic symmetry, x-ray principles, diffraction processes and collection and interpretation of x-ray data.

### **Chemical Kinetics (CHM763M)**

**3 units**

A course dealing with the study of rates of chemical reactions, their description, interpretations, and mechanisms. The course includes the principal theories of unimolecular and bimolecular processes, chain reactions, absolute reaction rate theory and its applications to chemical systems. Selected topics, such as heterogeneous kinetics, isotopic effects, flow systems, fast reaction techniques, may be covered.

### **Chemical Thermodynamics (CHM761M)**

An extended study of principles of the thermodynamic laws and their application to chemical and related systems, real and ideal. The principles and applications of statistical thermodynamics are introduced.  
3 units

### **Chemistry of Carbohydrates (CHM809M)**

**3 units**

A study of the chemistry of carbohydrates from a predominantly structural and mechanistic approach. Carbohydrate metabolism will also be discussed.

### **Chemistry of Heterocycles (CHM893M)**

**3 units**

A study of systematic heterocyclic chemistry with emphasis on 5- and 6- membered systems. Comparison with carbocyclic systems will be included.

**Chemistry of Lipids (CHM891M)****3 units**

A study of the chemistry of lipids, the relationships between structure and function. Lipid metabolism will also be discussed.

**Chemistry of Natural Products (CHM747M)****3 units**

The study of structures and biogenesis of the different groups of secondary metabolites. It also includes spectroscopic methods applied to structure elucidation of secondary metabolites, the experimental techniques in detection, extraction and isolation of secondary metabolites, a discussion of the research directions in the chemistry of natural products research, and inorganic aspects of natural products.

**Chromatographic Methods Lecture (CHM723M)****2 units**

A study of the principles, instrumentation, application, and qualitative as well as quantitative interpretation of the physico-chemical data of liquid chromatographic methods (SLC, HPLC, IEC, GPC) and gas chromatographic methods (GSC, GLC). New methods such as supercritical fluid chromatography may also be included.

**Chromatographic Methods Laboratory (CHM724M)****1 unit**

A laboratory course on separation of mixtures by liquid and gas chromatographic methods.

**Coordination Chemistry (CHM703M)****3 units**

A course covering the structure and bonding of coordination compounds, their reactivities and mechanisms. Spectral, magnetic, and crystallographic data are used in the characterization of these compounds.

**Environmental Chemistry (CHM751M)****3 units**

A course dealing with the fundamentals of dynamic equilibria processes in the environment sources as well as the study on the nature and chemistry of pollutants, monitoring, and control of environmental pollution in air, land and water.

**Enzymology (CHM783M)****3 units**

A course in biochemistry which discusses enzyme classification and nomenclature, 3-dimensional structure of enzymes, mechanics of catalysis and enzyme-substrate interaction.

**Food and Plant Biochemistry (CHM787M)****3 units**

Part 1 is a brief introduction to the biochemistry of foods of plant origin. The course is designed to give students a basic understanding of the biochemical components of plant foods and the changes that occur during the processing of specific food types.

Part 2 of the course aims to present an overview of plant biochemistry to include discussions of photosynthesis, carbohydrate metabolism, nitrogen fixation, reduction and assimilation.

**Inorganic Synthesis (CHM701M)****2 units**

A course dealing with the analysis, strategy, and planning involved in the synthesis of inorganic compounds, particularly coordination compounds.

**Inorganic Synthesis Laboratory (CHM702M)****2 units**

This course includes laboratory experiments on the synthesis of inorganic compounds such as metal carbonyls, transition metal complexes, and metallocenes. Techniques of monitoring the reaction, proper handling of sensitive materials, determining correct reaction set-ups, as well as characterization of inorganic products are emphasized.

Co-requisite : CHM701D

**Materials Science 1 (CHM755M)****3 units**

A course on the fundamentals of the chemistry and physics of solids, as well as actual materials applications such as synthesis techniques, structural design and characterizations, and functional (electronic, magnetic, optical) physical properties.

**Medicinal Chemistry (CHM805M)****3 units**

The study of structure, synthesis, mechanism of action and biosynthesis of medicinal agents such as cardiovascular agents, central nervous system stimulants and depressants, anesthetics, antiallergenics, analgesics, and hormones.

**Molecular Biochemistry (CHM781M)****3 units**

A study of the mechanisms of the chemical transformations in biological systems. The biochemical bases of some pathological conditions are also discussed.

**Organic Synthesis Lecture (CHM741M)****3 units**

A course dealing with the analysis, strategy, and planning of multi-step organic synthesis, including the application of protecting groups and metal catalysts, the choice of proper reagents, and reaction conditions.

**Physical Biochemistry (CHM789M)****3 units**

Covers qualitative and quantitative tests and molecular modeling of carbohydrates, lipids, proteins and nucleic acids.

**Polymer Chemistry (CHM807M)****3 units**

This course tackles topics on the physicochemical properties of polymers which include the molecular weight, morphology, bulk, solubility, elasticity and thermal transitions. It also looks into the mechanisms and kinetics of polymerization process as well as copolymerization.

**Physical Inorganic Chemistry (CHM705M)****3 units**

General principles of spectroscopic analysis and characterization of inorganic compounds. Group Theory is utilized.

**Spectroscopic Methods in Organic Chemistry (CHM743M)**

**3 units**

A course dealing with the application of spectroscopic techniques (UV-Vis, IR, MS, and NMR) in the structure elucidation of organic compounds. Two dimensional NMR techniques are emphasized.

**Stereochemistry (CHM745M)**

**3 units**

A course on control elements in organic synthesis. Topics include regioselectivity, stereoselectivity, asymmetric induction/catalysis, and Woodward-Hoffman rules.

**Regulated Cell Death: Mechanisms and Functions (CHM792M)**

**3 units**

This elective course will introduce to the students the known regulated cell death pathways, its mechanism/s, molecular control/s, and function/s. This will also include a discussion of the most recent advances in this field, as well as some experimental techniques used in investigating these pathways.

**Special Topics in Analytical Chemistry (CHM721M)**

**3 units**

This course deals with the theory and applications of chromatography and electrochemistry, the quantitative interpretation of data and methods development.

**Special Topics in Analytical Chemistry (CHM813M)**

**3 units**

Lectures on current trends and developments in analytical chemistry.

**Special Topics in Analytical Chemistry 2 (CHM814M)**

**3 units**

A study of principles of chemical analysis with emphasis on current trends in the field of analytical chemistry.

**Special Topics in Biochemistry (CHM819M)**

**3 units**

Lectures on current trends and developments in biochemistry.

**Special Topics in Inorganic Chemistry (CHM811M)**

**3 units**

Lectures on current trends and developments in inorganic chemistry

**Special Topics in Materials Science (CHM756M)**

**3 units**

Lectures on current trends and developments in materials science.

**Special Topics in Organic Chemistry (CHM815D)**

**3 units**

A study of special areas of organic chemistry featuring current advances and trends.

**Special Topics in Organic Chemistry 2 (CHM816M)**

**3 units**

A study of special areas of organic chemistry featuring current advances and trends.

**Special Topics in Physical Chemistry (CHM817M)**

**3 units**

Lectures on current trends and developments in physical chemistry

**Quantum Chemistry 1 (CHM661M)****3 units**

A study of the postulates of quantum mechanics as applied to simple systems and hydrogen-like systems. The course includes group theory and discussions of selected approximation methods for many electron systems.

**RESIDENCY****COS8500**

This is enrolled when the student is not enrolled in any course but continues to enjoy the privileges of a bonafide graduate student allowing him/her to use the university library, enjoy medical and dental services, among others.



Doctor of Philosophy in Chemistry  
*PHD-CHY*  
**Course Descriptions**

**REMEDIAL ENGLISH COURSES**

**Advanced Technical Reading and Writing 1 (ENG501M)**

**3 units**

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**Advanced Technical Reading and Writing 2 (ENG502M)**

**3 units**

The second part of the intensive English academic reading and writing course, focuses on the writing of data commentary and the various parts of a research report, with emphasis on the different rhetorical moves and the linguistic features that realize these moves. The course continues to emphasize the observance of integrity in writing and research.

**RESEARCH COURSES**

**Directed Research without Laboratory (CHM901P)**

**0 unit**

The development of an original problem under the supervision of an adviser. The course is designed for students who are not yet eligible to enroll in the thesis course but who wish to start working in their research problem which does not entail laboratory work.

**Directed Research with Laboratory (CHM902D)**

**0 unit**

Development of an original research problem through laboratory experimentation under the supervision of an adviser. The course is designed for student who wish to start laboratory research work but are not yet eligible to enroll in the thesis course.

**Chemistry Dissertation (CHM971D – CHM985D)**

**12 units**

Conduct of an original research under the supervision of a dissertation mentor.

**SEMINAR**

**Seminar 1- 4 (CHM931D-934D)**

**1 unit**

**ELECTIVE COURSES**

**Advanced Physical Organic Chemistry (CHM745D)**

**3 units**

A course emphasizing the application of physical chemistry in the study of structure and reactivity of organic compounds as well as organic reaction mechanisms.

**Advanced Analytical Techniques in Chemistry Laboratory (CHM622D)**

**1 unit**

A laboratory course covering instrumental analytical applications of absorption and emission spectroscopy, chromatography, and voltammetric methods in determining important physicochemical data.

**Advanced Analytical Techniques in Chemistry Lecture (CHM621D)**

**3 units**

A course dealing with the principles and instrumentation in spectroscopy, chromatography, mass spectrometry, hyphenated techniques, thermal analytic methods, and voltammetry.

**Advanced Biochemistry (CHM683D)**

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A study of the structure and function of biomolecules, biochemical pathways, and signal transduction.

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**Biological Membranes/Molecular Basis of Selected Diseases (CHM785D)**

**3 units**

*Part I focuses on the molecular principles to explain the structure, function, dynamics and bioenergetics of biological membranes. Part II deals with the molecular basis of selected diseases and drug therapy.*

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**3 units**

An introduction to x-ray diffraction processes of single crystals. The course includes crystallographic symmetry, x-ray principles, diffraction processes and collection and interpretation of x-ray data.

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**Chemical Thermodynamics (CHM761D)**

An extended study of principles of the thermodynamic laws and their application to chemical and related systems, real and ideal. The principles and applications of statistical thermodynamics are introduced.

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**Chromatographic Methods Lecture (CHM723D)****2 units**

A study of the principles, instrumentation, application, and qualitative as well as quantitative interpretation of the physico-chemical data of liquid chromatographic methods (SLC, HPLC, IEC, GPC) and gas chromatographic methods (GSC, GLC). New methods such as supercritical fluid chromatography may also be included.

**Chromatographic Methods Laboratory (CHM724D)****1 unit**

A laboratory course on separation of mixtures by liquid and gas chromatographic methods.

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**Molecular Biochemistry (CHM781D)****3 units**

A study of the mechanisms of the chemical transformations in biological systems. The biochemical bases of some pathological conditions are also discussed.

**Organic Reactions Laboratory (CHM644D)****2 units**

A laboratory course covering the application of concepts and theories discussed in organic synthesis lecture. Techniques such as monitoring of reactions, proper handling of toxic and air sensitive compounds, and determining correct reaction set-up are also included.

**Organic Reactions and Mechanisms (CHM643D)****3 units**

An intensive review of selected organic chemical reactions and mechanisms emphasizing the experimental approach.

**Organic Synthesis Lecture (CHM741D)****3 units**

A course dealing with the analysis, strategy, and planning of multi-step organic synthesis, including the application of protecting groups and metal catalysts, the choice of proper reagents, and reaction conditions.

**Physical Biochemistry (CHM789D)****3 units**

Covers qualitative and quantitative tests and molecular modeling of carbohydrates, lipids, proteins and nucleic acids.

**Polymer Chemistry (CHM807P)****3 units**

This course tackles topics on the physicochemical properties of polymers which include the molecular weight, morphology, bulk, solubility, elasticity and thermal transitions. It also looks into the mechanisms and kinetics of polymerization process as well as copolymerization.

**Physical Inorganic Chemistry (CHM705D)****3 units**

General principles of spectroscopic analysis and characterization of inorganic compounds. Group Theory is utilized.

**Quantum Chemistry 1 (CHM661D)****3 units**

A study of the postulates of quantum mechanics as applied to simple systems and hydrogen-like systems. The course includes group theory and discussions of selected approximation methods for many electron systems.

**Quantum Chemistry 2 (CHM765D)****3 units**

A course dealing with approximation methods for chemical systems and a study of time dependent processes.

**Spectroscopic Methods in Organic Chemistry (CHM743D)****3 units**

A course dealing with the application of spectroscopic techniques (UV-Vis, IR, MS, and NMR) in the structure elucidation of organic compounds. Two dimensional NMR techniques are emphasized.

**Regulated Cell Death: Mechanisms and Functions (CHM792D)**

3 units

This elective course will introduce to the students the known regulated cell death pathways, its mechanism/s, molecular control/s, and function/s. This will also include a discussion of the most recent advances in this field, as well as some experimental techniques used in investigating these pathways.

**Special Topics in Analytical Chemistry (CHM721D)**

3 units

This course deals with the theory and applications of chromatography and electrochemistry, the quantitative interpretation of data and methods development.

**Special Topics in Analytical Chemistry (CHM813D)**

3 units

Lectures on current trends and developments in analytical chemistry.

**Special Topics in Analytical Chemistry 2 (CHM814D)**

3 units

A study of principles of chemical analysis with emphasis on current trends in the field of analytical chemistry.

**Special Topics in Biochemistry (CHM819D)**

3 units

Lectures on current trends and developments in biochemistry.

**Special Topics in Inorganic Chemistry (CHM811D)**

3 units

Lectures on current trends and developments in inorganic chemistry

**Special Topics in Materials Science (CHM756D)**

3 units

Lectures on current trends and developments in materials science.

**Special Topics in Organic Chemistry (CHM815D)**

3 units

A study of special areas of organic chemistry featuring current advances and trends.

**Special Topics in Organic Chemistry 2 (CHM816D)**

3 units

A study of special areas of organic chemistry featuring current advances and trends.

**Special Topics in Physical Chemistry (CHM817D)**

3 units

Lectures on current trends and developments in physical chemistry

**Stereochemistry (CHM745D)**

3 units

A course on control elements in organic synthesis. Topics include regioselectivity, stereoselectivity, asymmetric induction/catalysis, and Woodward-Hoffman rules.

**Structural Concepts in Inorganic Chemistry (CHM603D)**

3 units

A course dealing with atomic theory, structure and symmetry, bonding theories, acid-base chemistries and chemical forces in inorganic compounds. Coordination compounds, organometallics, cage/cluster compounds, and bio-organic systems are likewise presented from the viewpoint of their structure and bonding.

## **RESIDENCY**

### **COS8500**

This is enrolled when the student is not enrolled in any course but continues to enjoy the privileges of a bonafide graduate student allowing him/her to use the university library, enjoy medical and dental services, among others.

Doctor of Philosophy in Chemistry (Straight Program)

*PHD-CHY*

**Course Descriptions**

**REMEDIAL ENGLISH COURSES**

**Advanced Technical Reading and Writing 1 (ENG501M)**

**3 units**

The first part of an intensive English academic reading and writing course, focuses on the review of basic reading and writing skills and their application in the preparation of short academic papers such as definitions and descriptions, and non-prose forms. It emphasizes the mastery of active reading strategies, the effective use of rhetorical and organizational features of academic writing, and proper documentation.

**Advanced Technical Reading and Writing 2 (ENG502M)**

**3 units**

The second part of the intensive English academic reading and writing course, focuses on the writing of data commentary and the various parts of a research report, with emphasis on the different rhetorical moves and the linguistic features that realize these moves. The course continues to emphasize the observance of integrity in writing and research.

**RESEARCH COURSES**

**Directed Research without Laboratory (CHM901P)**

**0 unit**

The development of an original problem under the supervision of an adviser. The course is designed for students who are not yet eligible to enroll in the thesis course but who wish to start working in their research problem which does not entail laboratory work.

**Directed Research with Laboratory (CHM902D)**

**0 unit**

Development of an original research problem through laboratory experimentation under the supervision of an adviser. The course is designed for students who wish to start laboratory research work but are not yet eligible to enroll in the thesis course.

**Chemistry Dissertation (CHM971D – CHM985D)**

**12 units**

Conduct of an original research under the supervision of a dissertation mentor.

**SEMINAR COURSES**

Seminar 1-6 (CHM931D - 936D)

**CORE COURSES**

**Advanced Analytical Techniques in Chemistry Lecture (CHM621P)**

**3 units**

A course dealing with the principles and instrumentation in spectroscopy, chromatography, mass spectrometry, hyphenated techniques, thermal analytic methods, and voltammetry.



**Advanced Biochemistry (CHM683D)****3 units**

A study of the structure and function of biomolecules, biochemical pathways, and signal transduction.

**Advanced Physical Chemistry (CHM662D)****3 units**

This lecture course will review fundamental concepts of physical chemistry including basic quantum chemistry and spectroscopy. The rest of the course will be devoted to calculations of thermodynamic parameters as well as computational techniques in physical chemistry and their application to the interpretation of experimental data.

**Organic Reactions and Mechanisms (CHM643D)****3 units**

An intensive review of selected organic chemical reactions and mechanisms emphasizing the experimental approach.

**Structural Concepts in Inorganic Chemistry (CHM603D)****3 units**

A course dealing with atomic theory, structure and symmetry, bonding theories, acid-base chemistries and chemical forces in inorganic compounds. Coordination compounds, organometallics, cage/cluster compounds, and bio-organic systems are likewise presented from the viewpoint of their structure and bonding.

**ELECTIVE COURSES****Advanced Physical Organic Chemistry (CHM745D)****3 units**

A course emphasizing the application of physical chemistry in the study of structure and reactivity of organic compounds as well as organic reaction mechanisms.

**Advanced Analytical Techniques in Chemistry Laboratory (CHM622D)****1 unit**

A laboratory course covering instrumental analytical applications of absorption and emission spectroscopy, chromatography, and voltammetric methods in determining important physicochemical data.

**Advanced Techniques in Biochemistry Laboratory (CHM782D)****1 unit**

This course deals with the theory and application of modern biochemical techniques and instrumentation. Topics covered include the use chromatographic and electrophoretic techniques, and spectroscopy in the separation, characterization, analysis, and structural elucidation of biomolecules.

**Biological Membranes/Molecular Basis of Selected Diseases (CHM785D)****3 units**

*Part I focuses on the molecular principles to explain the structure, function, dynamics and bioenergetics of biological membranes. Part II deals with the molecular basis of selected diseases and drug therapy.*

**Chemical Crystallography 1 (CHM779D)****3 units**

An introduction to x-ray diffraction processes of single crystals. The course includes crystallographic symmetry, x-ray principles, diffraction processes and collection and interpretation of x-ray data.

**Chemical Kinetics (CHM763D)****3 units**

A course dealing with the study of rates of chemical reactions, their description, interpretations, and mechanisms. The course includes the principal theories of unimolecular and bimolecular processes, chain reactions, absolute reaction rate theory and its applications to chemical systems. Selected topics, such as heterogeneous kinetics, isotopic effects, flow systems, fast reaction techniques, may be covered.

**Chemical Thermodynamics (CHM761D)**

An extended study of principles of the thermodynamic laws and their application to chemical and related systems, real and ideal. The principles and applications of statistical thermodynamics are introduced.

**3 units****Chemistry of Carbohydrates (CHM809D)****3 units**

A study of the chemistry of carbohydrates from a predominantly structural and mechanistic approach. Carbohydrate metabolism will also be discussed.

**Chemistry of Heterocycles (CHM893D)****3 units**

A study of systematic heterocyclic chemistry with emphasis on 5- and 6- membered systems. Comparison with carbocyclic systems will be included.

**Chemistry of Lipids (CHM891D)****3 units**

A study of the chemistry of lipids, the relationships between structure and function. Lipid metabolism will also be discussed.

**Chemistry of Natural Products (CHM747D)****3 units**

The study of structures and biogenesis of the different groups of secondary metabolites. It also includes spectroscopic methods applied to structure elucidation of secondary metabolites, the experimental techniques in detection, extraction and isolation of secondary metabolites, a discussion of the research directions in the chemistry of natural products research, and inorganic aspects of natural products.

**Chromatographic Methods Lecture (CHM723D)****2 units**

A study of the principles, instrumentation, application, and qualitative as well as quantitative interpretation of the physico-chemical data of liquid chromatographic methods (SLC, HPLC, IEC, GPC) and gas chromatographic methods (GSC, GLC). New methods such as supercritical fluid chromatography may also be included.

**Chromatographic Methods Laboratory (CHM724D)****1 unit**

A laboratory course on separation of mixtures by liquid and gas chromatographic methods.

**Coordination Chemistry (CHM703D)****3 units**

A course covering the structure and bonding of coordination compounds, their reactivities and mechanisms. Spectral, magnetic, and crystallographic data are used in the characterization of these compounds.

**Environmental Chemistry (CHM751D)****3 units**

A course dealing with the fundamentals of dynamic equilibria processes in the environment sources as well as the study on the nature and chemistry of pollutants, monitoring, and control of environmental pollution in air, land and water.

**Enzymology (CHM783D)****3 units**

A course in biochemistry which discusses enzyme classification and nomenclature, 3-dimensional structure of enzymes, mechanics of catalysis and enzyme-substrate interaction.

**Food and Plant Biochemistry (CHM787D)****3 units**

Part 1 is a brief introduction to the biochemistry of foods of plant origin. The course is designed to give students a basic understanding of the biochemical components of plant foods and the changes that occur during the processing of specific food types.

Part 2 of the course aims to present an overview of plant biochemistry to include discussions of photosynthesis, carbohydrate metabolism, nitrogen fixation, reduction and assimilation.

**Inorganic Synthesis (CHM701D)****2 units**

A course dealing with the analysis, strategy, and planning involved in the synthesis of inorganic compounds, particularly coordination compounds.

**Inorganic Synthesis Laboratory (CHM702D)****2 units**

This course includes laboratory experiments on the synthesis of inorganic compounds such as metal carbonyls, transition metal complexes, and metalloarenes. Techniques of monitoring the reaction, proper handling of sensitive materials, determining correct reaction set-ups, as well as characterization of inorganic products are emphasized.

Co-requisite : CHM701D

**Materials Science 1 (CHM755D)****3 units**

A course on the fundamentals of the chemistry and physics of solids, as well as actual materials applications such as synthesis techniques, structural design and characterizations, and functional (electronic, magnetic, optical) physical properties.

**Medicinal Chemistry (CHM805D)****3 units**

The study of structure, synthesis, mechanism of action and biosynthesis of medicinal agents such as cardiovascular agents, central nervous system stimulants and depressants, anesthetics, antiallergenics, analgesics, and hormones.

**Molecular Biochemistry (CHM781D)****3 units**

A study of the mechanisms of the chemical transformations in biological systems. The biochemical bases of some pathological conditions are also discussed.

**Organic Reactions Laboratory (CHM644D)****2 units**

A laboratory course covering the application of concepts and theories discussed in organic synthesis lecture. Techniques such as monitoring of reactions, proper handling of toxic and air sensitive compounds, and determining correct reaction set-up are also included.

**Organic Synthesis Lecture (CHM741D)****3 units**

A course dealing with the analysis, strategy, and planning of multi-step organic synthesis, including the application of protecting groups and metal catalysts, the choice of proper reagents, and reaction conditions.

**Physical Biochemistry (CHM789D)****3 units**

Covers qualitative and quantitative tests and molecular modeling of carbohydrates, lipids, proteins and nucleic acids.

**Polymer Chemistry (CHM807P)****3 units**

This course tackles topics on the physicochemical properties of polymers which include the molecular weight, morphology, bulk, solubility, elasticity and thermal transitions. It also looks into the mechanisms and kinetics of polymerization process as well as copolymerization.

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A course dealing with the application of spectroscopic techniques (UV-Vis, IR, MS, and NMR) in the structure elucidation of organic compounds. Two dimensional NMR techniques are emphasized.

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A course dealing with approximation methods for chemical systems and a study of time dependent processes.

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This elective course will introduce to the students the known regulated cell death pathways, its mechanism/s, molecular control/s, and function/s. This will also include a discussion of the most recent advances in this field, as well as some experimental techniques used in investigating these pathways.

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This course deals with the theory and applications of chromatography and electrochemistry, the quantitative interpretation of data and methods development.

**Special Topics in Analytical Chemistry (CHM813D)****3 units**

Lectures on current trends and developments in analytical chemistry.

**Special Topics in Analytical Chemistry 2 (CHM814D)****3 units**

A study of principles of chemical analysis with emphasis on current trends in the field of analytical chemistry.

**Special Topics in Biochemistry (CHM819D)****3 units**

Lectures on current trends and developments in biochemistry.

**Special Topics in Inorganic Chemistry (CHM811D)****3 units**

Lectures on current trends and developments in inorganic chemistry

**Special Topics in Materials Science (CHM756D)****3 units**

Lectures on current trends and developments in materials science.

**Special Topics in Organic Chemistry (CHM815D)****3 units**

A study of special areas of organic chemistry featuring current advances and trends.

**Special Topics in Organic Chemistry 2 (CHM816D)****3 units**

A study of special areas of organic chemistry featuring current advances and trends.

**Special Topics in Physical Chemistry (CHM817D)**

**3 units**

Lectures on current trends and developments in physical chemistry

## **RESIDENCY**

### **COS8500**

This is enrolled when the student is not enrolled in any course but continues to enjoy the privileges of a bonafide graduate student allowing him/her to use the university library, enjoy medical and dental services, among others.

# **CHEMISTRY GRADUATE SCHOOL GUIDELINES AND POLICIES**



## CHEMISTRY GRADUATE SCHOOL GUIDELINES AND POLICIES FOR THE MS CHEMISTRY PROGRAM

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### 1. ENTRY REQUIREMENTS

- 1.1. The applicant must comply with all the graduate school admission requirements of DLSU.
- 1.2. He/she must be a BS Chemistry graduate who has taken a minimum of 34 Units of chemistry courses, 5 Units of Calculus and 5 Units of Physics (minimum requirements listed below). Admission of applicants who graduated in related fields is subject to the approval of the Chemistry Graduate Committee (CGC). Graduates from related fields may be required to take bridging and/or refresher courses.
  - General Chemistry 10 Units (Lec & Lab)
  - Inorganic Chemistry 3 Units (Lec& Lab)
  - Organic Chemistry 5 Units (Lec & Lab)
  - Analytical Chemistry 5 Units (Lec)
  - Physical chemistry 5 Units (Lec & Lab)
  - Chemical instrumentation 3 Units (Lec)
  - Biochemistry 3 Units (Lec)
  - General Physics (5 Units)
  - Integral and Differential Calculus (5 Units)
  - Chemistry or Science Thesis & Practicum(6 Units)
- 1.3. The applicant must pass the entrance examination given by the admissions office as well as the proficiency examination in five areas of Chemistry.
- 1.4. The Proficiency Examination
  - 1.4.1 He / She must pass the proficiency examination in all 5 fields (60% passing): Inorganic Chemistry, Organic Chemistry, Analytical Chemistry, Physical Chemistry, and Biochemistry.
  - 1.4.2 The Chemistry Graduate Program Coordinator (CGPC), in consultation with the Chemistry Graduate Committee (CGC), will evaluate the applicant's academic records and proficiency examination results to determine if he/she may be admitted as a regular MS student or on probation.

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<sup>1</sup> The Chemistry Graduate Committee (CGC) is composed of all chemistry faculty members teaching graduate courses except those who are enrolled in the graduate program  
<sup>2</sup> Allied fields: Biochemistry, Pharmaceutical, Agricultural Chemistry, Molecular Biology/Biotechnology, Environmental Science, Food Science, Geochemistry, and Chemical Engineering

### 2. PROGRAM REQUIREMENTS

Advance Academic Writing <sup>3</sup>	(6 units)
Core/Major Courses	18 units
Cognate/Elective Courses	9 units
Graduate Seminar	3 units
Directed Research	0 Unit
Thesis	6 units
Comprehensive Examination	0 unit
<b>Total</b>	<b>36 units</b>

<sup>3</sup>Advanced Academic Writing is a remedial English course for graduate students based on the admission examination result. The student may be exempted from taking the both remedial courses. Alternatively, A student advised to take these remedial classes may be exempted from taking the second remedial course.

#### CORE COURSES

Structural Concepts in Inorganic Chemistry	3 units
Advanced Analytical Techniques in Chemistry Lecture	3 units
Advanced Analytical Techniques in Chemistry Laboratory	1 unit
Organic Reactions and Mechanisms	3 units
Organic Reactions Laboratory	2 units
Quantum Chemistry I	3 units
<u>Advanced Biochemistry</u>	<u>3 units</u>
<b>TOTAL</b>	<b>18 Units</b>

- 2.1. Core courses (18 Units) include: Structural Concepts in Inorganic Chemistry (CHM603M), Advanced Analytical Techniques in Chemistry Lecture (CHM621M), Advanced Analytical Techniques in Chemistry Laboratory (CHM622M), Organic Reactions and Mechanisms (CHM643M), Organic Reactions Laboratory (CHM644M), Quantum Chemistry 1 (CHM661M), and Advanced Biochemistry (CHM683M).
- 2.2. Elective courses are preferably in the student's field of specialization. New courses may be opened according to the expertise and availability of a faculty member. Special classes may be opened for elective courses.

#### 3. TRANSFER CREDITS

A maximum of 6 Units of lecture core courses earned from an accredited and recognized HEI may be credited or transferred provided the grade is not lower than 2.5. Masteral thesis units may not be transferred.

#### 4. RETENTION AND RESIDENCY

1. The student will be dismissed from the program if he/she incurs two (2) grades of “0.0”
2. An average of 2.0 from the grades obtained for every 3 – term period with no grade lower than 2.0 has to be maintained to stay in the MSChemistry program.
3. As mandated by CHED a student should be enrolled in the MS Chemistry program for a minimum of one year to a maximum of 5 years. An extension of a maximum of 3 years may be allowed provided the student enrolls in one 3 - unit penalty course for every year of extension.
4. For transferees or shiftees: the student must have enrolled in the program for at least a year to graduate from the program.
5. Students who are not enrolled in any course must apply for residency.

## 5. RESEARCH

- 5.1. Ethics in research: the HEI, the thesis mentor and the students must
  - 5.1.1. practice integrity of research at all times.
  - 5.1.2. maintain a safe and secure working environment.
  - 5.1.3. establish ownership of research results before the project commences.

### 5.2. Change in thesis mentor

This is highly discouraged. If this cannot be avoided the following should be observed. The student must seek the advice of the department’s graduate coordinator. The student and the graduate coordinator must then talk to the thesis mentor.

- 5.2.1. If a Settlement has been reached
  - Once the mentor and the graduate coordinator come up with an agreement they must present this to the Chemistry Graduate Committee (CGC) and the Department Chair.
  - If there are sensitive issues involved and agreed upon they must be presented in written form and witnessed by the Chemistry Graduate Program Coordinator (CGPC) and the Department Chair.
- 5.2.2. If no settlement has been reached the case will be elevated to the Chemistry Graduate Committee (CGC). The following points may be considered:
  - Who owns the research project?
  - Can the student retain the research problem or not?
  - Is monetary compensation required, e.g. has the research owner been committed to finish the project? Has money been spent by one party so that it has to be carried on to completion?
  - Has the new mentor supervised a similar project before? Can the project owner entrust the student to a new mentor?
  - Will the student defend a new proposal?
  - Will the proposed change extend the student’s time to finish the work?
  - Is the student on scholarship? What are the implications of the proposed changes to the student’s scholarship provisions?

The CGC must reach a decision regarding the change in thesis mentor not later than one month after the first meeting. Elevation of the case to the Dean's office is highly discouraged.

- 5.3. Intellectual Property  
Every member of a research group is expected to comply with the provisions of the Student Handbook, Appendix O, on Intellectual Property.
- 5.4. Directed Research
  - 5.4.1 The MS Chemistry graduate student may start working on a research project as indicated in his/her program of study by enrolling in Directed Research. Students are encouraged to enroll in Directed Research as early in their program as possible.
  - 5.4.2 Directed Research will be offered every term. The course carries zero (0) unit; however, the student will be asked to pay for three laboratory units. The student may enroll in this course for an unlimited number of times until he/she becomes eligible to enroll in Thesis.
  - 5.4.3 A student enrolled in Directed Research or Thesis is required to present proof of his/her enrollment in this course before he/she is allowed to work in the laboratory.
  - 5.4.4 Each research student must pass the *Safety and Risk Assessment* before he / she is allowed to work in the laboratory.
- 5.5. The Proposal Defense
  - 5.5.1 Three panelists or examiners to include one external member must sit in a proposal defense. The Reader will serve as chair of the Panel of Examiners.
  - 5.5.2 The student must submit to the Chemistry Graduate Program Coordinator (CGPC) the following at least 3 weeks before the intended defense date
    - a) a copy of the manuscript (3 copies)
    - b) the target date of defense,
    - c) the names of the reader and panel members, and
    - d) the contact numbers of the intended reader and panel members
  - 5.5.3 The CGPC will invite the prospective Reader stipulating his/her duties and responsibilities (CGP Form 01A1).
  - 5.5.4 The prospective Reader may indicate his/her willingness to examine the paper by returning the *conforme* form (CGP Form 01B1) to the CGPC.
  - 5.5.5 The Reader is given a copy of the proposal at least 3 weeks before the intended date of defense. He / She is also given a copy of the Examination Report (CGP Form 01C1). The Reader returns the accomplished proposal examination report (CGP Form 01C1) to the coordinator at most a week after receipt of the manuscript.
  - 5.5.6 The CGPC invites the prospective panel members (CGP Form 01A2); the panel members return to CGPC the *conforme* form (CGP Form 01B2) before a copy of the manuscript is given to them; each Panel Member returns the Proposal Examination

- Report (CGP Form 01C2) at most a week after receipt of the manuscript. The Oral Proposal Defense schedule is then finalized.
- 5.5.7 After the defense, the defense panel chair should submit the consolidated comments from the panel of examiners to the CGPC, the student's mentor, the student and all members of the panel.
- 5.6. Final Oral Defense
- 5.6.1 The three proposal panelists must preferably sit in the final oral defense. The Reader remains as chair of the Defense Panel. Only one member of the panel may be absent during the oral defense on the condition that he / she submits the examination report (Parts 1 and 2).
- 5.6.2 The procedure followed will be the same as the proposal defense: the CGPC invites the reader (CGP Form 02A1); the reader returns the *conforme* form (CGP Form 02B1).
- 5.6.3 The student submits a copy of the manuscript to the Reader at least 3 weeks before the intended date of defense. The Reader is expected to return the examination report (CGP Form 02C1) to the CGPC within 1 week after receipt of the manuscript. The reader's report is relayed to the student's mentor. The reader's comment should also express the student's readiness to defend his / her work.
- 5.6.4 The CGPC will invite the panelists stipulating their duties and responsibilities (CGP Form 02A2). Each prospective panelist indicates his/her willingness to examine the paper for the final oral defense by returning the *conforme* form (CGP Form 02B2).
- 5.6.5 The panelists are provided with copies of the thesis manuscript for examination and the evaluation form (CGP Form 02C2 Part 1). Results of the panel evaluation should be given to the Reader at most 4 days before the scheduled final defense.
- 5.6.6 The Panel Chair must provide the CGPC with a copy of the consolidated examiners' report (Part 1) prior to the oral defense. The CGPC relays the result to the Student's mentor. They in turn discuss it with the student prior to the student's final oral defense.
- 5.6.7 After the defense, the defense panel chair should submit the consolidated comments from the panel of examiners to the CGPC, the student's mentor, the student and all members of the panel.
- 5.6.8 The student must submit a laboratory clearance to the CGPC before the final oral defense.

## 6. SEMINAR AND RESEARCH COURSE

- 6.1 The objectives of the graduate research and seminar are: to train the student to carry out independent search of the literature, to expose the student to various areas of Chemistry, and to train him/her in the written and oral delivery of a technical paper.
- 6.2 The course includes delivery of a seminar and research proposal, attendance in departmental and external seminars, submission of a research proposal, among others.

## **7 COMPREHENSIVE EXAMINATION**

- 7.1. The student must pass the written comprehensive examination in five fields.
- 7.2. If the student fails the re-take examination, he/she must enroll in a refresher course before he/she can take it the third time.
- 7.3. Two or more faculty members will prepare the comprehensive examination for every field. A generic section will be opened as team-taught course.
- 7.4. A student may take the comprehensive examination up to 3 times only. Failing in any area of the written comprehensive examinations three (3) times will render the student ineligible to continue in the program.

## **8. GRADES**

- 8.1 The minimum grade with credit is 2.0.
- 8.2 A grade of Audit (A) is given for courses taken for personal enrichment as well as those enrolled for comprehensive exam re-take. A student taking Directed Research is also given a grade of Audit. A student taking Thesis is given a grade of 9.9 until he/she completes all requirements.
- 8.3 Grades for penalty courses for re-admission should not be lower than 2.0.
- 8.4 Incomplete grade is discouraged for all graduate courses.
- 8.5 The deadlines for submission of final grades and the grade consultation schedule follow that of the undergraduates. The department secretary will arrange the grade consultation schedule.

## **9. GRADUATION REQUIREMENTS**

- 9.1 The student must submit a hard copy of the thesis, a poster, and a published article in a reputable Science Journal to the Chemistry Graduate Program Coordinator (CGPC). Alternatively, a letter acknowledging submission of article from the journal editor may be submitted in place of the published article.
- 9.2 Registrar's requirements: 5 electronic copies (2 for the department and 3 for the Registrar's office), Signed Thesis Approval Sheet, Defense Panel Report and a Panel Chair report, regarding satisfactory revisions.

## **10. FUNCTION OF THE CHEMISTRY GRADUATE COMMITTEE (CGC)**

- 10.1 Formulate policies and guidelines to manage the program
- 10.2 Implement the program
- 10.3 Review and monitor the program regularly



## CHEMISTRY GRADUATE SCHOOL GUIDELINES AND POLICIES FOR THE PhD CHEMISTRY PROGRAM

Approved by:

- (1) Chemistry Department (06 August 2010)
- (2) Council of Chairs (17 August 2010)
- (3) College Council (14 January 2011)
- (4) Revisions approved by Chemistry Graduate Committee (24 October 2014)

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### 1. ENTRY REQUIREMENTS: PhD CHEMISTRY PROGRAM

- 2.1. The applicant must comply with all the graduate school admission requirements of DLSU
- 2.2. He / She must be a BS Chemistry graduate who has taken a minimum of 48 units of Chemistry, 6 units of Calculus and 3 units of Physics. Admission of applicants who graduated in related fields is subject to the approval of the Chemistry Graduate Committee. Graduates from related fields may be required to take bridging and/or refresher courses.
- 2.3. He / She must be a graduate of MS Chemistry or allied field<sup>2</sup> and have completed 18 units of the following core courses:

#### CORE COURSES

Advanced Inorganic Chemistry	3
Advanced Analytical Chemistry (lecture)	3
Advanced Analytical Chemistry (laboratory)	1
Advanced Organic Chemistry (lecture)	3
Advanced Organic Chemistry (laboratory)	2
Advanced Physical Chemistry	3
Advanced Biochemistry	3

- 2.4. He / She must pass the qualifying (Proficiency) examination in five fields (70% passing): Inorganic Chemistry, Organic Chemistry, Analytical Chemistry, Physical Chemistry and Biochemistry.
- 2.5. The Chemistry Graduate Program Coordinator (CGPC), in consultation with the Chemistry Graduate Committee evaluates the applicant's academic records and proficiency examination results to determine if he/she may be admitted to the PhD Chemistry program as a regular student or on probation. The committee may recommend bridging or refresher courses as needed.
- 2.6. Transfer of Credits:  
A maximum of 6 units of lecture courses earned from an accredited and CHED recognized HEI may be credited/transferred provided the grade is not lower than 2.5. PhD thesis / dissertation units may not be transferred.

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<sup>1</sup> The Chemistry Graduate Committee is composed of all faculty members teaching graduate courses except those who are enrolled in the graduate program

<sup>2</sup> Allied fields: Biochemistry, Pharmaceutical, Agricultural, Molecular Biology/Biotechnology, Environmental Science, Food Science, and Chemical Engineering

### 3. PROGRAM REQUIREMENTS



Course Work	12 units
Graduate Seminar	4 units
Directed Research	0 unit
PhD Seminar (Candidacy Exam)	0 unit
Comprehensive Exam (3 written exam and 1 oral exam)	0 unit
Proposal Defense	0 unit
Dissertation	12 units
<i>Total</i>	<i>28 units</i>

Course Work (12 units) may be any graduate course in the student's field of specialization. New courses may be opened according to the expertise and availability of a faculty member. Special classes may be opened for elective courses.

### 3. RETENTION AND RESIDENCY

- 3.1. The student will be dismissed from the program if he / she incurs two (2) grades of "0.0".
- 3.2. An average of 2.5 from the grades obtained for every 3 – term period with no grade lower than 2.5 has to be maintained to stay in the PhD program.
- 3.3. The minimum residency for PhD is 3 years and maximum is 7 years. The residency may be extended for a maximum period of 5 years but the student must enroll in one 3-unit penalty course for every year of extension.
- 3.4. Shiftees must be in the program for a minimum of 2 years to graduate from the program.

### 4. RESEARCH/DISSERTATION

- 4.1. Ethics in research: the HEI, the dissertation mentor and the students must
  - 4.1.1 practice integrity of research at all times;
  - 4.1.2 maintain a safe and secure working environment;
  - 4.1.3 establish ownership of research results before the project commences.
- 4.2. Change in dissertation mentor
 

This is highly discouraged. If this cannot be avoided the following should be observed.

  - 4.2.1 The student must seek the advice of his / her Chemistry Graduate Advisory Committee (CGAC). The student and the Chair of his / her CGAC must then talk to the dissertation mentor. Once they come up with an agreement they must present this to the chemistry

graduate program coordinator (CGPC) and the Department Chair. If there are sensitive issues involved and agreed upon they must be presented in written form and witnessed by the CGPC and the Department Chair.

4.2.2 If no settlement has been reached the case will be elevated to the CGPC and the Department chair. The following points may be considered:

- Who owns the research project?
- Can the student retain the research problem or not?
- Is monetary compensation required, e.g. has the research owner been committed to finish the project? Has money been spent by one party so that it has to be carried on to completion?
- Has the new mentor supervised a similar project before? Can the project owner entrust the student to a new mentor?
- Will the student defend a new proposal?
- Will the proposed change extend the student's time to finish the work?
- Is the student on scholarship? What are the implications of the proposed changes for the student's scholarship provisions?

#### 4.3. Intellectual Property

Every member of a research group is expected to comply with the provisions of the student handbook, Appendix O, on Intellectual Property.

#### 4.4. Directed Research

- 4.4.1 A PhD Chemistry graduate student may start working on his/her research project as indicated in his/her program of study by enrolling in Directed Research. Students are encouraged to enroll in Directed Research as early in their program as possible.
- 4.4.2 Directed Research will be offered every term. The course carries zero (0) unit; however, the student will be asked to pay for three laboratory units. The student may enroll in this course for an unlimited number of times until he/she becomes eligible to enroll in dissertation.
- 4.4.3 A student enrolled in Directed Research or Dissertation is required to present proof of his/her enrollment in this course before he/she is allowed to work in the laboratory.
- 4.4.4 Each research student must pass the *Safety and Risk Assessment* before he / she is allowed to work in the laboratory.

#### 4.5. The Proposal Defense

- 4.5.1 Five dissertation panelists or examiners to include at most two external members must sit in a proposal defense. The Reader will serve as chair of the Panel of Examiners.
- 4.5.2 The chemistry graduate program coordinator (CGPC) will invite the prospective Reader stipulating his / her duties and responsibilities (CGP FORM 01A1).
- 4.5.3 The prospective Reader may indicate his/her willingness to examine the paper by returning Form (CGP FORM 01B1) to the CGPC.
- 4.5.4 The student submits a copy of the proposal to the Reader at least 3 weeks before the intended date of defense.

- 4.5.5 The Reader returns the Proposal examination report (CGP FORM 01C1) to the coordinator at most a week upon receipt of the manuscript
- 4.5.6 The CGPC invites the prospective panel members (CGP FORM 01A2); the panel members return to CGPC the *conforme* form (CGP FORM 01B2) before a copy of the manuscript is given; the Panel Member returns the Proposal Examination Report (CGP FORM 01C2) at most a week upon receipt of the manuscript. The Oral Proposal Defense schedule is then finalized
- 4.5.7 After the defense, the defense panel chair should submit the consolidated comments from the panel of examiners to the CGPC, the student's mentor, the student and all members of the panel.
- 4.6. Final Oral Defense
- 4.6.1 The five dissertation proposal panelists must preferably sit in the final oral defense. The Reader remains as chair of the Defense Panel.
- 4.6.2 The procedure followed will be the same as the proposal defense: the CGPC invites the reader (CGP Form 02A1); the reader returns the *conforme* form (CGP Form 02B1); and examines the manuscript
- 4.6.3 The student submits a copy of the manuscript to the Reader at least 4 weeks before the intended date of defense. The Reader is expected to return his/her comments (CGP FORM 02C1) to the CGPC within 1 to 2 weeks. The report is relayed to the student's mentor and the advisory board. The comment should also express the student's readiness to defend his work.
- 4.6.4 The CGPC will invite the panelists stipulating their duties and responsibilities (CGP FORM 02A2). Each prospective panelist indicates his/her willingness to examine the paper for the final oral defense by returning the *conforme* form (CGP FORM 02B2)
- 4.6.5 The panelists are provided with copies of the thesis manuscript for examination and the evaluation form (CGP FORM 02C2 Part 1). Results of the panel evaluation should be given to the Reader at most 4 days before the scheduled final defense.
- 4.6.6 The Panel Chair must provide the CGPC with a copy of the consolidated examiners' report prior to the defense. The CGP Coordinator relays the result to the Student's mentor and the advisory board. They in turn discuss it with the student prior to the student's final oral defense.
- 4.6.7 The student must submit a laboratory clearance to the CGPC before the final oral defense.
- 4.6.8 After the defense, the defense panel chair should submit the consolidated comments from the panel of examiners to the CGPC, the student's mentor, the student and all members of the panel.

## 5. SEMINAR

- 5.1. The objectives of the graduate seminars are: to train the student to carry out independent search of the literature, to expose the student to various areas of Chemistry, and to train him/her in the oral delivery of a technical paper.
- 5.2. Students must enroll in a maximum of 1 seminar per term. The seminar topics must cover 4 out of 5 fields of chemistry.
- 5.3. The course requirements are the following:
- 5.3.1. presentation of a seminar on topic approved by the faculty in charge anytime between the 2<sup>nd</sup> to the 12<sup>th</sup> week of the term.

- 5.3.2. printed copy of the seminar to be presented to the department (faculty in charge, at least three days before the presentation). The manuscript must follow the prescribed Chemistry journal format.
- 5.3.3. attendance in a minimum of 3 seminars within DLSU or outside DLSU as approved by the faculty in charge
- 5.3.4. attendance in all seminars presented by other graduate students and those organized or sponsored by the chemistry department
- 5.3.5. a seminar notebook where he/she lists and summarizes the dates, speakers, and contents of the seminars attended.
- 5.4. Seminar courses should be rotated among graduate faculty members, *i.e.* students should enroll in seminar courses with different faculty members (different fields) and not just his/her intended thesis adviser.
- 5.5. Grading is numerical and 30% of the grade will come from the assessment of the faculty members who attended the presentation.
- 5.6. The seminar is a formal event which is open to the public. A student presenter must have a minimum number of attendees at the seminar (at least 4 faculty members, including the seminar instructor, and 6 students) to receive credit for his/her presentation.
- 5.7. Students giving the seminar must make all the necessary arrangements, *e.g.* invitations, logistics, *etc.*

## 6. COMPREHENSIVE EXAMINATION

- 6.1. Of the four examinations, three are written exams on special topics assigned by the chemistry graduate advisory committee. The topics should be within the student's field of specialization (e.g. journal article, seminar topic). The fourth is an oral examination on the student's main field (organic, analytical, inorganic or physical chemistry). A panel of three (3) faculty members will sit as examiners.
- 6.2. The College and university policies on retake of comprehensive examinations will be followed.
- 6.3. A generic section for team-teaching will be created to facilitate the payment of fees for the examiners.

## 7. GRADES

- 7.1. The minimum grade with credit is 2.5.
- 7.2. Courses taken for personal enrichment including courses enrolled for comprehensive exam re-take are given a grade of AUDIT. Students taking Directed Research are also given a grade of AUDIT. Those taking Thesis/Dissertation are given a grade of 9.9 until the student completes all requirements.
- 7.3. Grades for penalty courses for re-admission should not be lower than 2.5
- 7.4. No incomplete grade is given for all graduate courses.
- 7.5. The deadline for submission of final grades and the grade consultation schedule follow that of the undergraduates. The department secretary will arrange the grade consultation schedule.

## 8. CANDIDACY EXAMINATION

- 8.1. The student must pass all of the four comprehensive examinations before taking the candidacy examination.
- 8.2. The candidacy examination must be passed before the final oral dissertation defense.

8.3. The candidacy examination is a research proposal presentation on a topic not related to the student's area of specialization. The CGPC must assign a minimum of three panelists, including the student's dissertation adviser, to examine the proposal and the student's ability to conduct independent and original study in any field of chemistry.

## **9. GRADUATION REQUIREMENTS**

9.1.1. The student must submit a hard copy of the dissertation, a poster, and a published article in a reputable Science Journal to the department. Alternatively, a Letter of Acceptance may be submitted in place of the published article.

9.1.2. Registrar's requirements: 5 electronic copies (2 for the department and 3 for the Registrar's office), Signed Dissertation Approval Sheet with complete signatures, Defense Panel Report and a Panel Chair report regarding satisfactory revisions.

## **10. GENERAL POLICIES**

10.1. Annual progress report

10.1.1. The student is required to submit a progress report at the end of every academic year. The report must include the following: grades, important milestones during the year, conformity with target schedules, research dissemination activities, and other achievements or activities done during the year.

10.1.2. The CGPC in consultation with the chair of the student's CGAC shall evaluate the report and assess it as very satisfactory, satisfactory, or unsatisfactory.

10.2. Functions of the Chemistry Graduate Committee

10.2.1. Formulate policies and guidelines to manage the program

10.2.2. Implement the program

10.2.3. Review and monitor the program regularly

10.3. Chemistry Graduate Advisory Committee (CGAC)

11.3.1. Sit with the student to prepare his/her program of study and submits this to Chemistry Graduate Program Coordinator. The study program must identify important achievements, markers and deadlines. The program of study may be amended upon consultation with the student's CGAC thru the chair and with the CGPC.

11.3.2. Work with CGPC to assess the annual report evaluation of the student

11.3.3. Attend to academic and non-academic concerns of the student

## CHEMISTRY GRADUATE SCHOOL GUIDELINES AND POLICIES FOR THE STRAIGHT PHD CHEMISTRY PROGRAM

Approved by the Chemistry Department on 21 February 2014 and by the COS Council of Chairs on 28 August 2014

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### 1. ENTRY REQUIREMENTS: STRAIGHT PHD PROGRAM

1.1 *The applicant must comply with all the graduate school admission requirements of DLSU*

1.2. *He/She must demonstrate high aptitude in chemistry and must have a productive chemistry research experience*  
Excellent record may be assessed from applicant's aptitude in chemistry (previous grades, previous degrees, GRE or other national/international test scores, recommendations, etc.) and Research aptitude as indicated by letters of reference, prior research experience, publications demonstrated laboratory skills, and capacity for critical analysis and creative work

1.3. *He/She must have completed 60 units of chemistry courses which should include the following minimum requirements:*

- General Chemistry 10 Units (Lec & Lab)
- Inorganic Chemistry 3 Units (Lec & Lab)
- Organic Chemistry 5 Units (Lec & Lab)
- Analytical Chemistry 5 Units (Lec)
- Physical chemistry 5 Units (Lec & Lab)
- Chemical Instrumentation 3 Units (Lec)
- Integral and Differential Calculus (6 Units)
- General Physics (3 Units)
- Chemistry or Science Thesis 6 Units)

1.4. *The Proficiency Examination*

1.4.1 He /She must pass the proficiency examination in all 5 fields (70% passing): Inorganic Chemistry (INOCHE3 level), Organic Chemistry (ORGCHE1 & ORGCHE2), Analytical Chemistry (INSMETH level), Physical Chemistry (PYSICHE1 level), Biochemistry (BIOCHE1 and 2 level).

1.4.2 The Chemistry Graduate Program Coordinator (CGPC), in consultation with the Chemistry Graduate Program Committee, will evaluate the applicant's academic records and proficiency examination results to determine if the applicant may be admitted to the MS or Straight PhD Chemistry Program.

1.5. Students in the DLSU MS Chemistry Program may opt to be upgraded to the straight PHD program on the following conditions:

1.5.1 He/She must have completed the program course work with a CGPA not lower than 3.0 and must have passed the comprehensive examination.

1.5.2 If course work was completed but the comprehensive examination has not been taken yet, his/her CGPA in MS courses must not be lower than 3.0 and he/she must pass all fields in the straight PhD qualifying examination.

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- 1.6. An applicant who finished a Master in Chemistry (Non-Thesis) (NTMChem) degree may be accepted into the straight PHD program if
- 1.6.1 He /She has exceptional academic records and/or research experience; he/she is required to take the proficiency exams in all 5 fields (BS level).
  - 1.6.2 He /She passes the CGPC assessment. CGPC should also assess the academic records of an applicant whose exceptional qualification may not be covered in this “Guidelines and Policies”.

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<sup>1</sup> The Chemistry Graduate Committee is composed of all chemistry faculty members teaching graduate courses except those who are enrolled in the graduate program

<sup>2</sup> Allied fields: Biochemistry, Pharmaceutical, Agricultural Chemistry, Molecular Biology/Biotechnology, Environmental Science, Food Science, Geochemistry, and Chemical Engineering

## 2. PROGRAM REQUIREMENTS

REQUIREMENTS	UNITS
Core courses/Major Courses	15 (3 units each)
Elective Courses	15
Preparation for PHD Proposal	0
Proposal Defense	0
Graduate Seminar	6
Directed Research	0
Qualifying Examination (5 fields)	0
Comprehensive Examination (Oral and Written)	0
PHD Seminar/Candidacy	0
PHD Dissertation Defense	12
TOTAL	<b>48</b>

- 2.1. Core courses (15 Units) include: Structural Concepts in Inorganic Chemistry (CHM603D), Organic Reactions and Mechanisms (CHM643D), Advanced Analytical Techniques in Chemistry (CHM621P), Advanced Physical Chemistry (CHM662M), and Advanced Biochemistry (CHM683D)
  - 2.2. Elective courses are preferably in the student’s field of specialization. New courses may be opened according to the expertise and availability of a faculty member. Special classes may be opened for elective courses.
- ### 3. RETENTION AND RESIDENCY
- 3.1 The student will be dismissed from the program if he/she incurs two (2) grades of “0.0”.
  - 3.2 An average of 2.5 from the grades obtained for every 3 – term period with no grade lower than 2.5 has to be maintained to stay in the straight PhD program

- 3.3 The minimum residency for PhD is 3 years and maximum is 7 years. The residency may be extended for a maximum period of 5 years but the student must enroll in one 3-unit penalty course for every year of extension
- 3.4 Shiftfees should be in the program for a minimum of 2 years to graduate from the program

#### 4. RESEARCH/DISSERTATION

- 4.1. Ethics in research: the HEI, the dissertation mentor and the students must
- 4.1.1 promote integrity of research at all times;
  - 4.1.2 provide a safe and secure working environment;
  - 4.1.3 establish ownership of research results before the project commences.
- 4.2. Change in dissertation mentor: This is highly discouraged. If this cannot be avoided the following should be observed:
- 4.2.1 The student must seek the advice of his Chemistry Graduate Advisory Committee (CGAC). The student and the Chair of his CGAC must then talk to the dissertation mentor. Once they come up with an agreement they must present this to the CGPC and the Department Chair. If there are sensitive issues involved and agreed upon they must be presented in written form and witnessed by the CGPC and the Department Chair.
- 4.2.2 If no settlement has been reached the case will be elevated to the CGPC and the Department chair. The following points may be considered:
- Who owns the research project?
  - Can the student retain the research problem or not?
  - Is monetary compensation required, e.g. has the research owner been committed to finish the project? Has money been spent by one party so that it has to be carried on to completion?
  - Has the new mentor supervised a similar project before? Can the project owner entrust the student to a new mentor?
  - Will the student defend a new proposal?
  - Will the proposed change extend the student's time to finish the work?
  - Is the student on scholarship? What are the implications of the proposed changes for the student's scholarship provisions?
- 4.3. Intellectual Property  
Every member of a research group is expected to comply with the provisions of the student handbook, Appendix O, on Intellectual Property.
- 4.4. Directed Research
- 4.4.1 A straight PHD Chemistry graduate student may start working on his research project as indicated in his/her program of study by enrolling in Directed Research.



- 4.4.2 Directed Research will be offered every term. The course carries zero (0) unit; however, the student will be asked to pay for three laboratory units. The student may enroll in this course for an unlimited number of times until he/she becomes eligible to enroll in dissertation.
- 4.4.3 A student enrolled in Directed Research or Dissertation is required to present proof of his/her enrollment in this course before he/she is allowed to work in the laboratory.
- 4.5. The Proposal Defense
- 4.5.1 Five dissertation panelists or examiners to include at most two external members must sit in a proposal defense. The Reader will serve as chair of the Panel of Examiners.
- 4.5.2 The CGPC will invite the prospective Reader stipulating his/her duties and responsibilities (CGP FORM 01A1).
- 4.5.3 The prospective Reader may indicate his/her willingness to examine the paper by returning Form (CGP FORM 01B1) to the CGPC.
- 4.5.4 The student submits a copy of the proposal to the Reader at least 3 weeks before the intended date of defense.
- 4.5.5 The Reader returns the Proposal examination report (CGP FORM 01C1) to the coordinator at most a week upon receipt of the manuscript.
- 4.5.6 The CGPC invites the prospective panel members (CGP FORM 01A2); the panel members return to CGPC the *conforme* form (CGP FORM 01B2) before a copy of the manuscript is given; the Panel Member returns the Proposal Examination Report (CGP FORM 01C2) at most a week upon receipt of the manuscript. The Oral Proposal Defense schedule is then finalized.
- 4.5.7 After the defense, the defense panel chair should submit the consolidated comments from the panel examiners to the CGPC, the student's mentor, the student and all members of the panel.
- 4.6. Final Oral Defense
- 4.6.1 The five dissertation proposal panelists must preferably sit in the final oral defense. The Reader remains as chair of the Defense Panel.
- 4.6.2 The procedure followed will be the same as the proposal defense: the CGPC invites the reader (CGP FORM 02A1); the reader returns the *conforme* form (CGP FORM 02B1); and examines the manuscript.
- 4.6.3 The student submits a copy of the manuscript to the Reader at least 4 weeks before the intended date of defense. The Reader is expected to return his/her comments (CGP FORM 02C1) to the CGP coordinator within 1 to 2 weeks. The report is relayed to the student's mentor and the advisory board. The comment should also express the student's readiness to defend his work.
- 4.6.4 The CGPC will invite the panelists stipulating their duties and responsibilities (CGP FORM 02A2). Each prospective panelist indicates his/her willingness to examine the paper for the final oral defense by returning the *conforme* form (CGP FORM 02B2).
- 4.6.5 The panelists are provided with copies of the thesis manuscript for examination and the evaluation form (CGP FORM 02C2 Part 1). Results of the panel evaluation should be given to the Reader at most 4 days before the scheduled final defense.
- 4.6.6 The Panel Chair must provide the CGPC with a copy of the consolidated examiners' report prior to the defense. The CGPC relays the result to the Student's mentor and the advisory board. They in turn discuss it with the student prior to the student's final oral defense.
- 4.6.7 The student must submit a laboratory clearance to the CGPC before the final oral defense.

## **5. SEMINAR**

- 5.1 The objectives of the graduate seminars are: to train the student to carry out independent search of the literature, to expose the student to various areas of Chemistry, and to train him/her in the oral delivery of a technical paper.
- 5.2 The student may enroll in a maximum of 2 seminars per term and each seminar course must be rotated among the graduate faculty members. The seminar topics must cover the 5 fields of chemistry and the sixth field to be decided by the CGAC of the student.
- 5.3 The course includes delivery of a seminar, attendance in departmental and external seminars, among others.
- 5.4 Grading is numerical and 30% of the grade will come from the assessment of the faculty members who attended the presentation.

## **6. ANNUAL PROGRESS REPORT**

The student is required to submit a progress report at the end of every academic year. The report must include the following: grades, important milestones during the year, conformity with previously prepared time table /deadlines and other activities done during the year.

The CGPC in consultation with the chair of CGAC shall evaluate the report and assess as it very satisfactory, satisfactory, marginal or unsatisfactory.

## **7. COMPREHENSIVE EXAMINATION**

- 7.1. Of the four examinations, three are written exams on special topics within the student's field of specialization assigned by the Chemistry Graduate Advisory Committee (CGAC). One written exam will be paper-based the other two will be on any topic assigned by CGAC. The fourth examination is an oral examination on the student's field of specialization. A panel of three (3) faculty members, which includes the thesis Mentor, will sit as examiners.
- 7.2. The college and university policies on re - take of comprehensive examinations will be followed.
- 7.3. A generic section for team-teaching will be created to facilitate the payment of fees for the examiners.

## **8. GRADES**

- 8.1. The minimum grade with credit is 2.5.
- 8.2 Courses taken for personal enrichment including courses enrolled for comprehensive exam re-take are given a grade of AUDIT. Students taking Directed Research are also given a grade of AUDIT. Those taking Thesis/Dissertation are given a grade of 9.9 until the student completes all requirements.
- 8.3 Grades for penalty courses for re-admission should not be lower than 2.5
- 8.4 No incomplete grade is given for all graduate courses.

8.5 The deadline for submission of final grades and the grade consultation schedule follow that of the undergraduates. The department secretary will arrange the grade consultation schedule.

## **9. CANDIDACY EXAMINATION**

- 9.1. The student must pass all of the four comprehensive examinations before taking the candidacy examination.
- 9.2. The candidacy examination must be passed before the final oral dissertation defense.
- 9.3. The candidacy examination is a research proposal presentation on a topic not related to the student's area of specialization. The CGPC must assign a minimum of three panelists, including the student's dissertation adviser, to examine the proposal and the student's knowledge of the subject matter.

## **10. GRADUATION REQUIREMENTS**

- 10.1 The student must submit a hard copy of the dissertation, a poster, and a published article in a reputable Science Journal to the department. Alternatively, a Letter of Acceptance may be submitted in place of the published article.
- 10.2 Registrar's requirements: 5 electronic copies (2 for the department and 3 for the Registrar's office), Signed Dissertation Approval Sheet with complete signatures, Defense Panel Report and a Panel Chair report regarding satisfactory revisions.

## **11. GENERAL POLICIES**

### **11.1. Annual progress report**

The student is required to submit a progress report at the end of every academic year. The report must include the following: grades, important milestones during the year, conformity with target schedules, research dissemination activities, and other achievements or activities done during the year. The CGPC in consultation with the chair of the student's CGAC shall evaluate the report and assess it as very satisfactory, satisfactory, or unsatisfactory.

### **11.2. Functions of Chemistry Graduate Program Committee**

- 11.2.1 Formulate policies and guidelines to manage the program
- 11.2.2 Implement the program
- 11.2.3 Review and monitor the program regularly

### **11.3. Chemistry Graduate Advisory Committee (CGAC)**

- 11.3.1 Sits with the student to prepare his/her program of study and submits this to CGPC. The study program must identify important achievements, markers and deadlines. The program of study may be amended upon consultation with the student's CGAC thru the Chair and with the CGPC.

- 11.3.2 Works with the CGPC to assess the annual report evaluation of the student.
- 11.3.3 Attends to academic and non-academic concerns of the student.

*09 June 2015*

# **CHEMISTRY GRADUATE SCHOOL FORMS**

## **PROPOSAL DEFENSE**

### **STEP 1**

The Candidate submits to CGPC (Chemistry Graduate Program Coordinator) the following

1. The manuscript of the Proposal
2. The target date for Defense
3. The names of the reader and panel members
4. Contact numbers of the reader, panel members and of the student

### **STEP 2**

The CGPC invites the Reader (CGP Form 01A1) to examine the manuscript and return the “Conforme” form (CGP Form 01B1) to the coordinator. A copy of the manuscript is then given to the Reader.

### **STEP 3**

The reader returns to CGPC the Proposal Examination Report (CGP Form 01C1) a week after receipt of the manuscript. CGPC relays the examination results to the Thesis Mentor and the Advisory Committee.

### **STEP 4**

The CGPC invites the members of the defense panel (CGP Form 01A2); panel members returns the conforme form (CGP Form 01B2) to CGPC; copy of the manuscript is given to each panel member.

### **STEP 5**

The Reader and the Panel Members are informed of the final date of proposal defense

### **STEP 6**

After the defense, the reader submits the recommendations and corrections to the Student, the Thesis Mentor and the Graduate Program coordinator.

## FINAL ORAL DEFENSE

### STEP 1

The Candidate submits to CGPC (Chemistry Graduate Program Coordinator) the following

1. The manuscript of the thesis
2. The target date for Defense
3. The names of the reader and panel members
4. Contact numbers of the reader, panel members and of the student

### STEP 2

The CGPC invites the Reader (CGP Form 02A1) to examine the manuscript and return the “Conforme” form (CGP Form 02B1) to the coordinator. A copy of the manuscript is then given to the Reader.

### STEP 3

The reader returns to CGPC the Final Thesis Defense Examination Report Part 1(CGP Form 02C1) two weeks after receipt of the manuscript. CGPC relays the reader’s examination results to the Thesis Mentor and the Advisory Committee, if any.

### STEP 4

The CGPC invites members of the defense panel (CGP Form 02A2); panel members return the conforme form (CGP Form 02B2) to CGPC; copy of the manuscript is given to each panel member.

### STEP 5

The Panel Members return the Final Thesis Defense Examination Report Part 1(CGP Form 02C1) at most 10 days after receipt of the manuscript. The consolidated examination result provided by the Reader is relayed by the CGP Coordinator to the Thesis Mentor and the student’s Advisory Committee.

### STEP 6

The Reader and the Panel Members are informed of the final date of the Final Oral defense. An Invitation to the Public must be posted at least 4 days before the final Oral Defense

### STEP 7

The Student submits a laboratory clearance to the CGP coordinator before the defense

### STEP 8

The Panel Members submit the Final Oral Defense Evaluation form (CGP for 02C1; Part 2) to the Reader.

After the defense, the reader submits the recommendations and corrections to the Student, the Thesis Mentor and the Graduate Program coordinator.

### STEP 9

The reader gives the go signal to the revised manuscript by affixing his signature in the Approval sheet.

### STEP 10

The Adviser and the Department Chair sign the Approval sheet subject to submission of publication and other requirements



## DE LA SALLE UNIVERSITY

### PROPOSAL DEFENSE TRACKING FORM

#### STEP 1

\_\_\_\_\_  
(Signature)

The Candidate submits to CGPC (Chemistry Graduate Program Coordinator) the following

1. The manuscript of the Proposal
2. The target date for Defense
3. The names of the reader and panel members
4. Contact numbers of the reader, panel members and of the student

#### STEP 2

\_\_\_\_\_  
(Signature)

The CGPC invites the Reader (CGP Form 01A1) to examine the manuscript and return the "Conforme" form (CGP Form 01B1) to the coordinator. A copy of the manuscript is then given to the Reader.

#### STEP 3

\_\_\_\_\_  
(Signature)

The reader returns to CGPC the Proposal Examination Report (CGP Form 01C1) a week after receipt of the manuscript. CGPC relays the examination results to the Thesis Mentor and the Advisory Committee.

#### STEP 4

\_\_\_\_\_  
(Signature)

The CGPC invites the members of the defense panel (CGP Form 01A2); panel members return the conforme form (CGP Form 01B2) to CGPC; copy of the manuscript is given to each panel member.

#### STEP 5

\_\_\_\_\_  
(Signature)

The Reader and the Panel Members are informed of the final date of proposal defense

#### STEP 6

\_\_\_\_\_  
(Signature)

After the defense, the reader submits the consolidated comments, recommendations and corrections to the student, the thesis mentor, graduate program coordinator and the panel members





# DE LA SALLE UNIVERSITY

## FINAL ORAL DEFENSE TRACKING FORM

### STEP 1

CGPC'S Signature: \_\_\_\_\_ DATE \_\_\_\_\_

The Candidate submits to CGPC (Chemistry Graduate Program Coordinator) the following

1. The manuscript of the thesis
2. The target date for Defense
3. The names of the reader and panel members
4. Contact numbers of the reader, panel members and of the student

### STEP 2

READER'S Signature: \_\_\_\_\_ DATE \_\_\_\_\_

The CGPC invites the Reader (CGP Form 02A1) to examine the manuscript and return the "Conforme" form (CGP Form 02B1) to the coordinator. A copy of the manuscript is then given to the Reader.

### STEP 3

CGPC'S Signature: \_\_\_\_\_ DATE \_\_\_\_\_

The reader returns to CGPC the Final Thesis Defense Examination Report Part I (CGP Form 02C1) one week after receipt of the manuscript. CGPC relays the reader's examination results to the Thesis Mentor and the Advisory Committee, if any.

### STEP 4

P. MEMBER'S Signature: \_\_\_\_\_ DATE \_\_\_\_\_

The CGPC invites members of the defense panel (CGP Form 02A2); panel members return the conforme form (CGP Form 02B2) to CGPC; copy of the manuscript is given to each panel member.

### STEP 5

CGPC'S Signature: \_\_\_\_\_ DATE \_\_\_\_\_

The Panel Members return the Final Thesis Defense Examination Report Part I (CGP Form 02C1) at most one week after receipt of the manuscript. The consolidated examination result provided by the Reader is relayed by the CGP Coordinator to the Thesis Mentor and the student's Advisory Committee.

### STEP 6

STUDENT'S Signature: \_\_\_\_\_ DATE \_\_\_\_\_

The Reader and the Panel Members are informed of the final date of the Final Oral defense. An Invitation to the Public must be posted at least 4 days before the final Oral Defense

### STEP 7

SECRETARY'S Signature: \_\_\_\_\_ DATE \_\_\_\_\_

The Student submits a laboratory clearance to the CGP coordinator before the defense

### STEP 8

MENTOR'S Signature: \_\_\_\_\_ DATE \_\_\_\_\_

The reader consolidates his comments and corrections with those of the other panel members and discuss it the thesis mentor before the final oral defense

### STEP 9

CGPC'S Signature: \_\_\_\_\_ DATE \_\_\_\_\_

After the defense, the Panel Members submit the Final Oral Defense Evaluation form (CGP for 02C1; Part 2) to the Reader. He then submits the consolidated comments, recommendations and corrections to the student, the thesis mentor, graduate program coordinator and the panel members.



DE LA SALLE UNIVERSITY  
Proposal Defense Invitation for Reader-Panel Chair  
CGP FORM 01A1

CHEMISTRY DEPARTMENT  
College of Science

Date \_\_\_\_\_

TO: \_\_\_\_\_  
Thesis Proposal Reader and Panel Chair

FR: \_\_\_\_\_  
Chemistry Graduate Coordinator

FOR: \_\_\_\_\_ (Name of Student)  
M. S. (or PhD) Chemistry Candidate

May I invite you to be the thesis proposal defense Reader and Panel Chair of the aforementioned candidate. As directed, you will be provided with a copy of the thesis proposal entitled "\_\_\_\_\_".

As reader you are expected to accomplish the following:

1. Accomplish the Examination Report (CGP Form 01C1) and return to the CGC coordinator **one week** after receipt of the manuscript. The readiness of the student to defend his thesis based on sufficiency of content, presentation and interpretation of results.
2. Provide the panel members, the student, the student's mentor and the CGC coordinator with duly signed consolidated recommendations of all the panel members.

If you agree to examine the proposal and return the examination result within one week after receipt of the manuscript please sign the "Conforme" form (CGP Form 01C) and return it to the Chemistry Graduate Program Coordinator on or before \_\_\_\_\_.

The compensation for the proposal examination is \_\_\_\_\_. This invitation also assumes that you will remain as Reader and Chair of the panel in the final oral defense of the student.

The defense has been tentatively scheduled from \_\_\_\_\_ on \_\_\_\_\_ at the \_\_\_\_\_, De La Salle University.

Noted by:

\_\_\_\_\_  
Chair, Chemistry Dept.

\_\_\_\_\_  
Vice-Dean, College of Science

CC: \_\_\_\_\_, Adviser



DE LA SALLE UNIVERSITY  
Proposal Defense Invitation for Panel Members  
CGP FORM 01A2

Chemistry Department  
College of Science

\_\_\_\_\_  
(Date)

TO: \_\_\_\_\_  
Thesis Proposal Panel Member

FR: \_\_\_\_\_  
Chemistry Graduate Coordinator

FOR: (Name of Student)  
M. S. (or PhD) Chemistry Candidate

May I invite you to be the thesis proposal defense External Panel Member of the aforementioned candidate. As directed, the candidate will provide you with a copy of his thesis proposal entitled "\_\_\_\_\_."

As panel member you are expected to accomplish and return the Examination Report (CGP form 02C1A) to the CGC coordinator one week after receipt of the manuscript. The Examination Report will be consolidated by the reader before the actual defense

If you agree to examine the proposal and return the examination result within one week after receipt of the proposal please sign the "conforme" form (CGP Form 01C2) and return the form to the Chemistry Graduate Program Coordinator, on or before \_\_\_\_\_.

The compensation for the proposal examination is \_\_\_\_\_. This invitation also assumes that you will remain as Reader and Chair of the panel of examiner in the final oral defense of the student

The defense has been tentatively scheduled from \_\_\_\_\_ on \_\_\_\_\_, at the \_\_\_\_\_, De La Salle University.

Noted by:

\_\_\_\_\_  
Chair, Chemistry Dept.

\_\_\_\_\_  
Vice-Dean, College of Science

cc: \_\_\_\_\_, Adviser



DE LA SALLE UNIVERSITY  
Reader's Conforme Letter for Proposal Defense  
(CGP FORM 01B1)

CHEMISTRY DEPARTMENT  
College of Science

\_\_\_\_\_(Date)\_\_\_\_\_

TO: \_\_\_\_\_  
Chemistry Graduate Program Coordinator

FR: \_\_\_\_\_  
Proposal Defense Reader-Panel Chair

FOR: \_\_\_\_\_  
(Name of Student)  
M. S. (or PhD) Chemistry Candidate

Dear \_\_\_\_\_:

I agree to examine the research proposal paper of \_\_\_\_\_ and return the Examination Report (CGP Form 01C1) on or before \_\_\_\_\_. I am also expected to consolidate the corrections and Recommendations of the Panel members after the defense. I understand that the defense has been tentatively scheduled from \_\_\_\_\_ on \_\_\_\_\_ at the \_\_\_\_\_, De La Salle University.

SIGNED:

\_\_\_\_\_  
Reader-Panel Chair



DE LA SALLE UNIVERSITY  
Panel Member's Conforme Letter for Proposal Defense  
(CGP FORM 01B2)

**Chemistry Department**  
College of Science

\_\_\_\_\_  
(Date)

TO: \_\_\_\_\_  
Chemistry Graduate Program Coordinator

FR: \_\_\_\_\_  
Proposal Defense Panel Member

FOR: \_\_\_\_\_  
(Name of Student)  
M. S. (or PhD) Chemistry Candidate

Sir/Madame:

I agree to examine the research proposal paper of \_\_\_\_\_ and return the Examination Report (CGP Form 01C2) on or before \_\_\_\_\_. I understand that the defense has been tentatively scheduled from \_\_\_\_\_ on \_\_\_\_\_, at the \_\_\_\_\_, De La Salle University.

SIGNED:

\_\_\_\_\_  
Internal/External Panel Member

READER'S THESIS/DISSERTATION PROPOSAL EXAMINATION REPORT  
CGP FORM 01C1

NAME OF CANDIDATE \_\_\_\_\_

This Thesis Examiner's Report of Two Parts:

**PART 1: RESEARCH QUALITY AND THESIS PRESENTATION**

**PART 2: RECOMMENDATION**

**PART I RESEARCH QUALITY AND THESIS PRESENTATION**

Perfect Score	15
<b>1. Formulation of general and specific objectives</b> Are the objectives congruent with the research problem? Were they formulated well? Do these objectives require technical capabilities and competencies in the MS/PhD level? Please specify the points that may require further elaboration and clarification during the defense and subsequent thesis corrections.	
COMMENTS:	

Perfect Score	35
<b>2. Literature Review</b> Is the literature review a critical evaluation/analysis of the recent trend and important publications? Does it culminate in an exposition of the gaps in the current state of knowledge of the field of research? Please comment on whether the research objectives are designed to fill in those gaps. Please specify the points that may require further elaboration and clarification during the defense and subsequent thesis corrections.	
COMMENTS:	

Perfect Score		35
<b>3. Research Design and Methodology</b> Is the approach to solving the problem logical and doable? Are the tools to be employed suitable and adequate to solve the research problem/objectives? Are the experimental set-up and procedure safe; are the necessary precautions identified? Please specify the points that may require further elaboration and clarification during the defense and subsequent thesis corrections.		
COMMENTS:		
Perfect Score		15
<b>4. Rigor of thesis as MS/PhD thesis</b> Please comment on the substantiality and complexity of the candidate's work with respect to the requirements of MS/Ph.D. In your judgment, does the thesis demonstrate sufficient effort, original contribution in knowledge and comprehension of the research topic? Please specify the points that may require further elaboration and clarification during the defense and subsequent thesis corrections.		
COMMENTS:		
TOTAL SCORE		
GENERAL COMMENTS		





PANEL MEMBER'S THESIS/DISSERTATION PROPOSAL EXAMINATION REPORT  
CGP FORM 01C2  
(Adapted from Multimedia University)

NAME OF CANDIDATE \_\_\_\_\_

This Thesis Examiner's Report of Two Parts:

**PART 1: RESEARCH QUALITY AND THESIS PRESENTATION**

**PART 2: RECOMMENDATION**

**PART I RESEARCH QUALITY AND THESIS PRESENTATION**

Perfect Score	15
<b>1. Formulation of general and specific objectives</b> Are the objectives congruent with the research problem? Were they formulated well? Do these objectives require technical capabilities and competencies in the MS/PhD level? Please specify the points that may require further elaboration and clarification during the defense and subsequent thesis corrections.	
COMMENTS:	
Perfect Score	30
<b>2. Literature Review</b> Is the literature review a critical evaluation/analysis of the recent trend and important publications? Does it culminate in an exposition of the gaps in the current state of knowledge of the field of research? Please comment on whether the research objectives are designed to fill in those gaps. Please specify the points that may require further elaboration and clarification during the defense and subsequent thesis corrections.	
COMMENTS:	
Perfect Score	10
<b>3. Identification of Research Gap</b> Was the literature review comprehensive and carefully analyzed to justify the research gap? Please specify the points that may require further elaboration and clarification during the defense and subsequent thesis correction	
COMMENTS:	

<b>Perfect Score</b>	<b>30</b>
<b>4. Research Design and Methodology</b> Is the approach to solving the problem logical and doable? Are the tools to be employed suitable and adequate to solve the research problem/objectives? Are the experimental set-up and procedure safe; are the necessary precautions identified? Please specify the points that may require further elaboration and clarification during the defense and subsequent thesis corrections.	
<b>COMMENTS:</b>	
<b>Perfect Score</b>	<b>15</b>
<b>5. Rigor of thesis as MS/PhD thesis</b> Please comment on the substantiality and complexity of the candidate's work with respect to the requirements of MS/Ph.D. In your judgment, does the thesis demonstrate sufficient effort, original contribution in knowledge and comprehension of the research topic? Please specify the points that may require further elaboration and clarification during the defense and subsequent thesis corrections.	
<b>COMMENTS:</b>	
<b>TOTAL SCORE</b>	
<b>GENERAL COMMENTS</b>	





DE LA SALLE UNIVERSITY  
Final Oral Defense Invitation for Reader-Panel Chair  
(CGP FORM 02A1)

Chemistry Department  
College of Science

\_\_\_\_\_  
(Date)

TO: \_\_\_\_\_  
Reader and Chair, Final Oral Defense

FR: \_\_\_\_\_  
Chemistry Graduate Program Coordinator

FOR: \_\_\_\_\_  
(Name of Student)  
M.S. (or PhD) Chemistry Candidate

May I invite you to be the thesis proposal defense Reader and Panel Chair of the aforementioned candidate. As directed, you will be provided with a copy of the thesis proposal entitled "\_\_\_\_\_."

As reader you are expected to accomplish the following:

1. Accomplish the Examination Report (CGP Form 02C1A) and return it to the CGC coordinator **one week after receipt of the manuscript**. The readiness of the student to defend his thesis based on sufficiency of content, presentation and interpretation of results.
2. Provide the panel members and the CGC coordinator with consolidated recommendations at least 2 days before the final oral defense schedule and,
3. After the final oral defense, provide the panel members, student, student's mentor and the CGC coordinator with consolidated corrections and recommendations duly signed by the panel members

If you agree to examine the proposal and return the examination result within one week after receipt of the manuscript please sign the "Conforme" form (CGP Form 01C) and return it to the Chemistry Graduate Program Coordinator on or before \_\_\_\_\_.

The compensation for the proposal examination is \_\_\_\_\_. This invitation also assumes that you will remain as Reader and Chair of the panel in the final oral defense of the student. The defense has been tentatively scheduled from \_\_\_\_\_ on \_\_\_\_\_ at the \_\_\_\_\_, De La Salle University.

Noted by:

\_\_\_\_\_  
Chair, Chemistry Dept.

\_\_\_\_\_  
Vice-Dean, College of Science

CC: \_\_\_\_\_, Adviser



DE LA SALLE UNIVERSITY  
Final Oral Defense Invitation for Panel Members  
CGP FORM 02A2

CHEMISTRY DEPARTMENT  
College of Science

\_\_\_\_\_  
(Date)

TO: \_\_\_\_\_  
Panel Member, Final Oral Defense

FR: \_\_\_\_\_  
Chemistry Graduate Program Coordinator

FOR: \_\_\_\_\_  
(Name of Student)  
M.S. (or PhD) Chemistry Candidate

May I invite you to be a panel member of the aforementioned candidate. The coordinator through the candidate will provide you with a copy of his thesis/dissertation entitled "\_\_\_\_\_".

As panel member you are expected to accomplish the Examination Report (CGP Form 02C1A) and return it to the CGC coordinator one week after receipt of the manuscript. Your presence is also required during the actual defense.

The compensation for each internal (or external) panel member is \_\_\_\_\_.

The defense has been tentatively scheduled from \_\_\_\_\_ on \_\_\_\_\_ at the \_\_\_\_\_, De La Salle University.

Noted by:

\_\_\_\_\_  
Chair, Chemistry Dept.

\_\_\_\_\_  
Vice-Dean, College of Science

cc: \_\_\_\_\_, Adviser



DE LA SALLE UNIVERSITY  
Panel Member's Conformance Letter for Final Oral Defense  
(CGP FORM 02B2)

**Chemistry Department**  
College of Science

\_\_\_\_\_  
(Date)

TO: \_\_\_\_\_  
Chemistry Graduate Program Coordinator

FR: \_\_\_\_\_  
Panel Member, Final Oral Defense

FOR: \_\_\_\_\_  
(Name of Student)  
M.S. (or PhD) Chemistry candidate

Sir/Madame:

I agree to examine the manuscript for the final oral defense of \_\_\_\_\_ and return the Examination Report (Part 1) one week after receipt of the manuscript. I also agree to accomplish the Examination Report (Part 2) after the defense.

I understand my physical presence is required during the defense and that the defense has been tentatively scheduled from \_\_\_\_\_ on \_\_\_\_\_ at the \_\_\_\_\_, De La Salle University

SIGNED:

\_\_\_\_\_  
Panel Member

**READER'S FINAL THESIS DEFENSE EVALUATION FORM (PART 1)**  
CGP FORM 02C1

NAME OF CANDIDATE \_\_\_\_\_

THE THESIS WRITE UP (65%)		
	Maximum Score	Actual Score
<b>A. THE ABSTRACT</b>		
1	5	
It includes a concise description of the study, the statement of the problem, methods and procedures, results and their implications		
<b>B. THE INTRODUCTION AND THE PROBLEM</b>		
	10	
1		
The introduction gives the background of the study, a clear statement of the problem, the objectives of the study		
2		
The statement of the problem is clear and concise; the problem is clearly delimited		
3		
The objectives are designed to fill in the gaps highlighted in Literature study		
4		
The problem is relevant and is suitable for graduate study research		
5		
The significance of the study is attributed to definite impacts of the new knowledge generated to society e.g. specific advantage of new technology, use of new knowledge generated, application of new sets of facts to understand certain fields of science		
<b>C. LITERATURE STUDY</b>		
	15	
1		
The topic is introduced by a brief description of the content of the review, how the review is organized and the strategy used for literature search		
2		
The review was integrated into a cohesive picture of body of knowledge to highlight and justify the research gap addressed in the study		
3		
The relationship of the study to previous studies is clearly defined		
<b>D. RESEARCH DESIGN (5%)</b>		
	5	
1		
The approach on how the problem will be addressed is well designed		
2		
Collaboration with other people or research laboratories is briefly described and identified;		
3		
New methodologies are distinguished from routine procedures		
4		
Instruments/ equipment including software programs are properly identified		
5		
The ability to design and execute research plan has been demonstrated		
<b>E. EXPERIMENTAL DATA (10%)</b>		
	10	
1		
Data generation procedures are reliable and logical.		
2		
The reason for the deviation from the original data collection procedure is articulated clearly		
3		
Inclusion of discrepant and nonconforming data are properly treated and explained		
4		
The data collection process is systematic and sufficient to solve the problem.		
<b>F. INTERPRETATION AND DISCUSSION OF RESULTS (15%)</b>		
	15	
1		
Data are interpreted correctly and applied appropriately		
2		
Separate interpretation of data lead to a unified and coherent research result		
3		
The research results are consistent with the goals and objectives of the study		
4		
The data were analyzed, interpreted and discussed to give an unambiguous conclusion		
<b>H. SUMMARIES, CONCLUSION AND RECOMMENDATION (5%)</b>		
	5	
1		
Conclusions are logically and intelligently drawn from literature review and experimental results		
2		
The proposed objectives were achieved		

**COMMENTS (THE WRITE UP):** Please state the candidate's original contribution, and comment on the significance of this contribution as new knowledge (theory, methodology, applications, etc.) to the field of research and the possibility of publication. Kindly specify the points that may require further elaboration and clarification during the defense and subsequent thesis corrections.

**ERRATA:**

Please highlight the errors that have to be corrected, preferably in a separate sheet in the format shown below

Page No.	Line No.	Error	should read as
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Please use extra paper if needed.

**ASSESSMENT:**

- The proponent may present the final oral defense
- The proponents is not ready to defend the dissertation

**SIGNATURE OF READER:** \_\_\_\_\_

**NOTE:** The readiness of the student to defend his thesis is based on sufficiency of content, presentation and interpretation of results.



**READER'S FINAL THESIS DEFENSE EVALUATION FORM (PART 2)**  
CGP FORM 02C1

<b>THE ORAL DEFENSE (25%)</b>			
		Maximum Score	Actual Score
<b>I. MASTERY OF SUBJECT MATTER (20%)</b>		20	
1	Answers to questions were clear, straight to the point and full of insights		
2	Chemical principles are easily recalled to explain findings in the research work		
3	The student is very knowledgeable of every detail of his work and the work of other researchers working on the same field of study		
<b>II. COMMAND OF THE LANGUAGE (5%)</b>		5	
1	Voice is loud enough		
2	Speaking is coherent, clear and understandable		
<b>J. STAGE PRESENCE (5%)</b>		5	
1	Questions were all answered with confidence		
2	Keeps eye contact with audience; commands attention		

<b>THE THESIS IN GENERAL (10%)</b>			
<b>K. IMPACT OF RESEARCH (10%)</b>		10	
1	The thesis topic and output is very timely		
2	The work will make a very important contribution to the field		
3	The work covered is substantial		
4	Some aspect of the work is complex but tackled elegantly		
		<b>TOTAL</b>	
		(Write up and Oral defense)	

**OVERALL PERFORMANCE RATING SCALE:**

Excellent	Very Good	Acceptable	Marginally acceptable	Poor (Failed)
94-100	87-93	80 - 86	73 -79	72 or lower

**COMMENTS:** Please comment on the substantiality and complexity of the candidate's work)

**COMMENTS (ORAL DEFENSE)** Please comment on the delivery and preparedness of the student

**GENERAL COMMENTS**

Please provide any other comments you feel are important to the evaluation of this thesis, especially the suitability of the thesis title to the content of the thesis, whether the abstract captures the essence of the thesis and whether the organization of the thesis is appropriate.

**ERRATA:**

Please highlight the errors that have to be corrected, preferably in a separate sheet in the format shown below

Page No.	Line No.	Error	should read as
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Please use extra paper if needed.

**ASSESSMENT:**

- Passed with Minor Revisions
- Passed with major Revisions
- Failed

**PANEL MEMBER'S FINAL THESIS DEFENSE EVALUATION FORM (PART 1)**  
CGP FORM 02C2

NAME OF CANDIDATE \_\_\_\_\_

<b>THE THESIS WRITE UP (65%)</b>		Maximum Score	Actual Score
<b>A. THE ABSTRACT</b>		5	
1	It includes a concise description of the study, the statement of the problem, methods and procedures, results and their implications		
<b>B. THE INTRODUCTION AND THE PROBLEM</b>		10	
1	The introduction gives the background of the study, a clear statement of the problem, the objectives of the study		
2	The statement of the problem is clear and concise; the problem is clearly delimited		
3	The objectives are designed to fill in the gaps highlighted in Literature study		
4	The problem is relevant and is suitable for graduate study research		
5	The significance of the study is attributed to definite impacts of the new knowledge generated to society e.g. specific advantage of new technology, use of new knowledge generated, application of new sets of facts to understand certain fields of science		
<b>C. LITERATURE STUDY</b>		15	
1	The topic is introduced by a brief description of the content of the review, how the review is organized and the strategy used for literature search		
2	The review was integrated into a cohesive picture of body of knowledge to highlight and justify the research gap addressed in the study		
3	The relationship of the study to previous studies is clearly defined		
<b>D. RESEARCH DESIGN (5%)</b>		5	
1	The approach on how the problem will be addressed is well designed		
2	Collaboration with other people or research laboratories is briefly described and identified.		
3	New methodologies are distinguished from routine procedures		
4	Instruments/ equipment including software programs are properly identified		
5	The ability to design and execute research plan has been demonstrated		
<b>E. EXPERIMENTAL DATA (10%)</b>		10	
1	Data generation procedures are reliable and logical.		
2	The reason for the deviation from the original data collection procedure is articulated clearly		
3	Inclusion of discrepant and nonconforming data are properly treated and explained		
4	The data collection process is systematic and sufficient to solve the problem.		
<b>F. INTERPRETATION AND DISCUSSION OF RESULTS (15%)</b>		15	
1	Data are interpreted correctly and applied appropriately		
2	Separate interpretation of data lead to a unified and coherent research result		
3	The research results are consistent with the goals and objectives of the study		
4	The data were analyzed, interpreted and discussed to give an unambiguous conclusion		
<b>H. SUMMARIES, CONCLUSION AND RECOMMENDATION (5%)</b>		5	
1	Conclusions are logically and intelligently drawn from literature review and experimental results		
2	The proposed objectives were achieved		

**COMMENTS (THE WRITE UP):** Please state the following:

1. candidate's original contribution, and comment on the significance of this contribution as new knowledge (theory, methodology, applications, etc.) to the field of research and the possibility of publication.
2. part of the thesis that need to be re-written or re-evaluated as well as extra experiments that need to be done before the defense

**ERRATA:**

Please highlight the errors that have to be corrected, preferably in a separate sheet in the format shown below

Page No.	Line No.	Error	should read as
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Please use extra paper if needed.

**ASSESSMENT:**

The proponent need some major revisions

The proponent need some minor revisions

SIGNATURE OF PANEL MEMBER \_\_\_\_\_

**PANEL MEMBER'S FINAL THESIS DEFENSE EVALUATION FORM (PART 2)**  
CGP FORM 02C2

<b>THE ORAL DEFENSE (25%)</b>		
	<b>Maximum Score</b>	<b>Actual Score</b>
<b>I. MASTERY OF SUBJECT MATTER (20%)</b>		20
1	Answers to questions were clear, straight to the point and full of insights	
2	Chemical principles are easily recalled to explain findings in the research work	
3	The student is very knowledgeable of every detail of his work and the work of other researchers working on the same field of study	
<b>I. COMMAND OF THE LANGUAGE (5%)</b>		5
1	Voice is loud enough	
2	Speaking is coherent, clear and understandable	
<b>J. STAGE PRESENCE (5%)</b>		5
1	Questions were all answered with confidence	
2	Keeps eye contact with audience; commands attention	
<b>THE THESIS IN GENERAL (10%)</b>		
<b>K. IMPACT OF RESEARCH (10%)</b>		10
1	The thesis topic and output is very timely	
2	The work will make a very important contribution to the field	
3	The work covered is substantial	
4	Some aspect of the work is complex but tackled elegantly	
		<b>TOTAL</b> (Write up and Oral defense)

**OVERALL PERFORMANCE RATING SCALE:**

5	4	3	2	1
Excellent	Very Good	Acceptable	Marginally acceptable	Poor (Failed)
94-100	87-93	80 - 86	73 - 79	72 or lower

**COMMENTS:** Please comment on the substantiality and complexity of the candidate's work. Please comment also on the delivery and preparedness of the student

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**READER'S COMMENTS (ORAL DEFENSE):** Please comment on items you feel are important to the evaluation of this thesis, especially the suitability of the thesis title to the content of the thesis, whether the abstract captures the essence of the thesis and whether the organization of the thesis is appropriate.

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**ASSESSMENT:**

- Passed with Minor Revisions
- Passed with major Revisions
- Failed

**ERRATA:**

Please highlight the errors that have to be corrected, preferably in a separate sheet in the format shown below

Page No.	Line No.	Error	should read as
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Please use extra paper if needed.