

# CHEMICAL PHYSICS / MASTER OF SCIENCE

## Overview

The Master of Science in Chemical Physics is designed to offer a multifaceted approach in preparing graduates for careers in higher education, industry, professional management, government, and other agencies associated with chemistry or physics. This program incorporates the moral and ethical dimensions of decision-making and interpersonal relations in all coursework. The program will ensure that students, in their roles as leaders in this critical field, understand the importance of integrity, fairness, and respect for diverse cultural traditions. Courses are taught in a sixteen-week format and are scheduled so that students can take least two or three courses each semester, including two in the summer.

## Time Limitation for Completing the Program

A student must complete all graduation requirements within seven years from completion of the first graduate course taken at Lewis University. Students remain under the requirements of the catalog in effect at the time of matriculation unless they discontinue attendance for two consecutive years or more, in which case they will follow the catalog in effect upon their return.

## Graduation Requirements

The Master of Science in Chemical Physics curriculum consists of a total of 30 credit hours. Within these 30 credits are a required Core of 12 hours, Skills and Research requirements of nine hours (including a thesis of six hours), and Electives of nine hours. To graduate from the program, the student must complete 30 hours of credit and maintain a 3.0 GPA.

## Comprehensive Examination

There is no comprehensive examination in this program.

## Thesis Option

### Culminating Experience: The Thesis

In order to fulfill the requirement of a culminating experience, the student must write and submit an acceptable thesis. Acceptable research methods which fulfill the thesis option include quantitative, qualitative, experimental, quasi-experimental, and case study approaches. The thesis must demonstrate a knowledge of chemical physics in depth and breadth appropriate for an applicant to a doctoral program.

## Non-Thesis Option

### Culminating Experience: Capstone Experience

In order to fulfill the requirement of a culminating experience, the student must conduct a Capstone Experience, write a Capstone paper, and give a Capstone presentation, unless some other method of dissemination is approved by the Capstone advisor and the Graduate Program Director. The Capstone Experience may be a one to two semester research project or it may be some other kind of approved high impact experience like a significant community service or outreach project, an interdisciplinary project, or an approved internship.

## Requirements Degree Requirements

Degree Offered: Master of Science

Total Credit Hours: 30

## Thesis Option

Code	Title	Hours
<b>Core Courses</b>		
Select four of the following:		12
CHEM 50100	Chemical Thermodynamics	
CHEM 60100	Kinetics and Reaction Mechanisms	
CHEM 60500	Applied Spectroscopy	
PHYS 54100	Quantum Mechanics	
PHYS 54200	Condensed Matter Physics	
<b>Skills and Research</b>		
CHEM 59600	Introduction to Research	1
or PHYS 59600 Introduction to Research		
CHEM 69800	Masters Thesis	6
or PHYS 69800 Masters Thesis		
Select two of the following:		2
CHEM 59700	Applied Data Analysis and Visualization in the Physical Sciences	
or PHYS 597 Applied Data Analysis and Visualization in the Physical Sciences		
CHEM 59800	Topical Seminar in Experimental Techniques	
or PHYS 59800 Topical Seminar in Experimental Techniques		
CHEM 69600	Graduate Seminar	
or PHYS 696 Graduate Seminar		
<b>Electives</b>		
Any 50000- or 60000-level Chemistry or Physics courses not used to fill a Core or Skills requirement may be used to fulfill the Electives requirement. <sup>1</sup>		9
<b>Total Hours</b>		<b>30</b>

<sup>1</sup> CHEM 68000-Level Special Topics, PHYS 68000-Level Special Topics, CHEM 68500 Readings in Chemistry, and PHYS 68500 Readings in Physics may be repeated for credit for different topics. Up to six hours of graduate coursework in other related disciplines may be chosen with the approval of Advisor and Graduate Program Director.

## Non-Thesis Option

Concentration: CPNT

Code	Title	Hours
<b>Core Courses</b>		
Select four of the following:		12
CHEM 50100	Chemical Thermodynamics	
CHEM 60100	Kinetics and Reaction Mechanisms	
CHEM 60500	Applied Spectroscopy	
PHYS 54100	Quantum Mechanics	
PHYS 54200	Condensed Matter Physics	
<b>Skills and Research</b>		

CHEM 59600 Introduction to Research or PHYS 59600 Introduction to Research	1
CHEM 69500 Graduate Capstone <sup>1</sup> or PHYS 69500 Graduate Capstone	3
Select two of the following:	2
CHEM 59700 Applied Data Analysis and Visualization in the Physical Sciences or PHYS 597 Applied Data Analysis and Visualization in the Physical Sciences	
CHEM 59800 Topical Seminar in Experimental Techniques or PHYS 59800 Topical Seminar in Experimental Techniques	
CHEM 69600 Graduate Seminar or PHYS 696 Graduate Seminar	
<b>Electives</b>	
Any 50000- or 60000-level Chemistry or Physics courses not used to fill a Core or Skills requirement may be used to fulfill the Electives requirement. <sup>2</sup>	12
<b>Total Hours</b>	<b>30</b>

<sup>1</sup> A student who starts in the thesis track and switches to the non-thesis track may substitute up to two credit hours of CHEM 69800 Masters Thesis or PHYS 69800 Masters Thesis for CHEM 69500 Graduate Capstone or PHYS 69500 Graduate Capstone.

<sup>2</sup> CHEM 68000-Level Special Topics, PHYS 68000-Level Special Topics, CHEM 68500 Readings in Chemistry, and PHYS 68500 Readings in Physics may be repeated for credit for different topics. Up to six hours of graduate coursework in other related disciplines may be chosen with the approval of Advisor and Graduate Program Director.

## Additional Admission Requirements

### Full Admission

All candidates for admission must possess a bachelor's degree in Chemistry or Physics or Chemical Physics from a regionally-accredited institution of higher education or in a major in a related field. Individuals who have completed a bachelor's degree in an unrelated area but have work experience in chemical industries may also apply. The applicant's overall undergraduate GPA must be 3.0 or higher on a 4.0 scale. In special cases, the GPA may be calculated on the most recent 60 semester hours of coursework.

Additionally, applicants must submit:

1. A completed application, accompanied by a nonrefundable application fee.
2. Academic transcripts from each institution of higher education attended.
3. A one-to-two page personal statement describing the applicant's background and how the degree relates to the applicant's career goals.
4. Three letters of recommendation attesting to the applicant's likely success in the program.

Completed application materials will be reviewed by the Graduate Council of the College of Aviation, Science, and Technology. The Council has the final say in graduate admissions. After Graduate Council review, the applicant will be informed in writing of its decision.

## Provisional Admission

Under certain circumstances, students who do not meet the GPA requirement (GPA below 3.0, but above 2.5) for full admission may request to be admitted to the program on a provisional basis. Provisionally-admitted students must complete the first 9 semester hours of graduate study with a GPA of 3.0 or higher. After 9 hours of completed coursework, a provisionally-accepted student's application will be reviewed again for full admission. This decision will be made by the Graduate Program Director in consultation with the Graduate Council of the College of Aviation, Science, and Technology.

## Student-at-Large

A student-at-large is not a degree candidate. In order to be admitted as a student-at-large, the applicant must submit official documentation of a baccalaureate degree from an accredited institution of higher education and complete a modified application form. The decision to admit an at-large student to graduate courses belongs to the Graduate Program Director, whose decision is based on an evaluation of the applicant's undergraduate coursework and possibly an interview. However, should the student decide to apply for full admission status at a later time, but within 5 years of course completion, only a maximum of 9 semester hours of graduate coursework completed as a student-at-large can be applied toward an advanced degree and only courses with grades of B or better will count toward the degree.

## Transfer of Graduate Credit

1. A maximum of 6 semester hours of graduate level work earned at a regionally-accredited institution of higher education will be accepted toward a Master of Science degree in Chemical Physics. Only courses in which the student received a grade of B or higher will transfer to Lewis University. Prior coursework should be current and must have been completed within the last five years.
2. All transfer credits must be documented and approved before full admission into the program will be granted. In approving a request to transfer credit from another institution, the Graduate Program Director may, at their discretion, require that the student pass a proficiency examination for the corresponding Lewis University course.
3. Courses from outside the United States will be considered if they are evaluated as graduate level by the Office of Admission or the Commission on Accreditation of the American Council on Education.
4. Credit for prior learning is not awarded for graduate courses.

## International Students

International students are required to meet all the admission requirements for full or provisional admission and also the admission requirements specified in the General Information section of this Catalog entitled "Entering International Students (<https://catalog.lewisu.edu/graduate/general-information/admission-policies/>)."