

FACT

Job growth for chemists is anticipated to be 10 percent in Illinois from 2012 to 2022. This is a higher growth rate than the national average.

National Data Source:

Bureau of Labor Statistics, Office of Occupational Statistics and Employment Projections.

State Data Source: Illinois Department of Employment Security, Economic Information and Analysis Division and Illinois Wage Information.

Developing Scientists

Analytical chemists make qualitative and quantitative determinations about structure, composition, and nature of materials by identifying and measuring their components. They develop analytical techniques, study relationships and interactions, and identify the presence and concentration of chemical pollutants.

Outstanding Preparation

As a student in the M.S. in Analytical Chemistry program, you receive valuable hands-on experience with state-of-the-art instrumentation, procedures, and computer analysis. You will learn to recognize the importance of future biotechnology and the analytical techniques that will be needed to support it. You will have an opportunity to choose between a thesis, project, or internship option. Graduates work as analytical chemists in laboratories specializing in the application of wet chemical and instrumental procedures in problem solving, and in the pharmaceutical industry. You are also prepared to pursue a Ph.D. in the various chemistry disciplines.

Superior Faculty

You will work with highly qualified and engaged faculty. Faculty research interests include photochemistry, spectrochemistry, trace analysis of organic pesticides, chromatography and gas chromatography/mass spectrometry, electro-chemistry, analysis of metals in the environment, water analysis, biochemistry, computational chemistry, equations of state, bio-organic chemistry, organometallic chemistry, and catalysis.

For more information:

Dr. Joong-Won Shin
Assistant Professor of Chemistry and Faculty Advisor
708.235.2835
jshin@govst.edu



Required Preparation

Before admission, applicants should have completed the following course work with a grade of "B" or better in each course: at least four hours of analytical chemistry with lab (CHEM-3233, CHEM-3234); eight hours of physical chemistry with lab (CHEM-3641, CHEM-3642, CHEM-3643, CHEM-3644); eight hours of organic chemistry with lab (CHEM-3531, CHEM-3532, CHEM-3533, CHEM-3534); three hours of biochemistry (CHEM-4331); three hours of advanced inorganic chemistry (CHEM-4443); three hours of statistical methods (STAT-4219/STAT-6219); three hours of computer science; and one hour of chemical literature (equivalent to CHEM-4155). Students lacking one or more of these courses or having less than a "C" in a course may be admitted to the program. However, they will have to complete or repeat the appropriate course(s) at Governors State University. All students are conditionally admitted until course review is completed and placement exam requirements are satisfied.

Placement Exams

All conditionally admitted students enrolled in the M.S. Analytical Chemistry program will be required to take placement exams in organic chemistry, physical chemistry, analytical chemistry, inorganic chemistry, and biochemistry. These multiple choice exams were developed by the American Chemical Society to assess entering graduate students and cover the course content in the various fields of chemistry at the undergraduate level. Students who show a deficiency in these areas will be required to take and earn a minimum grade of B in the respective undergraduate course(s): Organic Chemistry Lecture and Laboratory I and II (CHEM-3531, CHEM-3532, CHEM-3533, CHEM-3534); physical chemistry: Physical Chemistry Lecture and Laboratory I & II (CHEM-3641, CHEM-3642, CHEM-3643, CHEM-3644); analytical chemistry: Analytical Chemistry Lecture and Laboratory (CHEM 3233, CHEM 3234);

and either inorganic chemistry: Advanced Inorganic Chemistry (CHEM-4443) or biochemistry: Biochemistry (CHEM-4331). The deficiency courses should be taken within the five terms of initial registration. Students who do not receive the grades of "B" in the deficiency courses within the prescribed time may be dropped from the program. The new students who have earned a bachelor's degree in chemistry and who have received the grades of "B" or better in organic chemistry, physical chemistry, analytical chemistry, inorganic chemistry, and biochemistry may opt to not participate in the respective exam(s).

Thesis/Project/Internship Option

As part of this degree program, students must choose between a thesis, project, or internship option.

In the thesis option, students develop a thesis proposal usually related to a faculty member's research, carry out a formal research study under the supervision of the faculty member and a degree committee, prepare a final manuscript, and make a presentation in CHEM - 8997 Research Presentation in Chemistry (1). The thesis option would be appropriate for students who have focused research interests or who intend to pursue doctoral study.

In the project option, students develop a master's project proposal, complete a master's project in conjunction with a faculty member, and prepare a final report. The project student makes a presentation of the relevant literature in CHEM - 8997 Research Presentation in Chemistry (1).

In the chemistry literature project option, students identify a chemistry project related to the one or more courses of the master's

degree study in analytical chemistry, do an in depth current literature inquiry, and prepare a final report with discussions including their own conclusions including future developments. The minimum time for the research project is one term. The chemistry literature project students make a presentation of the relevant literature in Research Presentation in Chemistry (1).

In the internship option, students identify an CHEM - 8997 internship sponsor, complete an internship application and proposal, and, once accepted, complete the internship under the joint guidance of the site supervisor and GSU faculty sponsor. A final written report and presentation in CHEM - 8997 Research Presentation in Chemistry (1) is required.

Degree Requirements

Students must meet all university requirements for a master's degree.

Required Courses (13 Hours)

CHEM - 6443 Inorganic Spectroscopy (2)
CHEM - 6444 Inorganic Spectroscopy Laboratory (1)
CHEM - 6544 Organic Spectroscopy Laboratory (1)
CHEM - 6543 Organic Spectroscopy (2)
CHEM - 6733 Chromatography (3)
CHEM - 6734 Chromatography Laboratory (1)
CHEM - 8157 Methods Development (3)

Chemistry Selectives (10 to 15 Hours)

CHEM - 6333 Analytical Biochemistry (2)
CHEM - 6334 Analytical Biochemistry Lab (1)
CHEM - 6752 Practical Chemistry Instruction (1)
CHEM - 8733 Mass Spectrometry (3)
CHEM - 8734 Mass Spectrometry Laboratory (1)
CHEM - 8753 Electrochemistry (3)
CHEM - 8754 Electrochemistry Laboratory (1)
CHEM - 8763 NMR Spectroscopy (3)
CHEM - 8764 NMR Spectroscopy Laboratory (1)

Advanced Selectives (4 to 9 Hours)

Select at least 4 hours from the following courses:

BIOL - 6641 Toxicology (3)
CHEM - 6552 Chem Software (1)
CHEM - 7537 Adv. Organic Chemistry (3)
CHEM - 7557 Chemistry of Biomolecules (3)
CHEM - 7667 Photochemistry (3)
CHEM - 8057 Special Topics: Chemistry (3)

NOTE:

Other graduate-level science courses as approved by the academic advisor. Students may not take more than one credit hour towards CHEM-5035 Chemistry Workshop.

Thesis/Project/Internship Option (4 – 7 Hours)

Students in the thesis option take 7 hours from this section, and select a minimum of 16 hours from Chemistry Selectives and Advanced Selectives above.

All other students take 4 hours from this section and select a minimum of 19 hours from Chemistry Selectives and Advanced Selectives above.

CHEM - 8930 Grad Chem Lit Project (1-3)
CHEM - 8950 Grad Research Project (1-3)
CHEM - 8959 Grad Thesis Lit Search (1)
OR
CHEM - 8960 Graduate Thesis Project (1-5)
CHEM - 8997 Research Pres. in Chem (1)
OR
CHEM - 8940 Internship (1-4)
CHEM - 8997 Research Pres in Chem (1)

Total - 36 Hours

