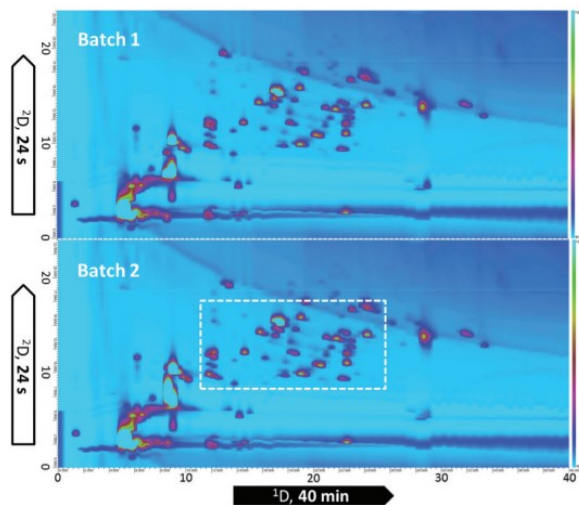
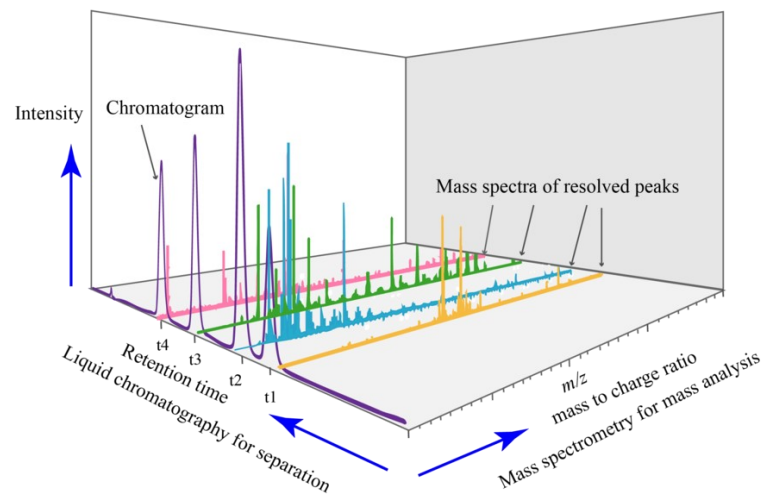


New Graduate Certificate Programs in Chemistry at UNL



Bioanalytical
Chemistry



Chromatography &
Analytical Separations

Overview of Graduate Certificate Programs at UNL

- Graduate certificate programs are designed for post-baccalaureate, graduate, or post-graduate students.
- These programs typically requires at least 12-15 credit hours of work past the bachelor's degree, but no more than 20 hours.
- After completing the prescribed set of coursework, students receive a graduate certificate rather than a degree. Completion of the certificate is indicated on the UNL graduate transcript.
- Graduate certificate programs may function independently of degree programs. Hours earned in certificate programs may be applied to a degree program.
- There are currently 48 Graduate Certificate programs at UNL, including two new ones created in the Chemistry Program

Graduate Certificate Program 1

- Bioanalytical Chemistry -

Bioanalytical Chemistry Graduate Certificate Program



<https://www.unl.edu/gradstudies/academics/programs/BIOA-GCER>

Bioanalytical chemistry and the chemical analysis of biological samples are important areas in modern biological and biochemical research and in industries that either produce or test biochemicals.

This certificate program will meet a need for professionals who have expertise and training in bioanalytical chemistry and who can readily apply such techniques to new areas of research, chemical analysis, or product development as related to humans, animals, plants, and microorganisms.

The overall training and learning goals of this certificate program are:

- To provide students with a solid foundational basis on applications of bioanalytical chemistry.
- To provide a framework by which students can gain the knowledge and expertise needed to apply bioanalytical chemistry to fields and uses of importance in industry, modern chemical/biomedical research, and biochemical analysis.

Graduate Certificate Program 2

– Chromatography & Analytical Separations -

Chromatography and Analytical Separations Graduate Certificate Program

The logo for the University of Nebraska Lincoln, featuring the text "UNIVERSITY OF Nebraska Lincoln" in a serif font, with "Nebraska" in a larger, bold font and "UNIVERSITY OF" and "Lincoln" in smaller fonts above and below it respectively.

<https://www.unl.edu/gradstudies/academics/programs/CHRM-GCER>

Chromatography and related analytical separations are important tools in many fields of chemical and biochemical research and in industries that either produce or test chemicals.

This certificate program will meet a need for professionals who have expertise and training in these methods and who can readily apply such techniques to new areas of research, chemical analysis, or product development.

The overall training and learning goals of this certificate program are:

- Provide students with a solid foundational basis on the theory and applications of chromatography and related analytical separation methods
- Provide a framework by which students can gain the knowledge and expertise needed to apply chromatography and related analytical separation methods to fields and uses of importance in industry, modern chemical/biochemical research, and chemical analysis.

General Certificate Requirements

Graduate certificate programs are based on coursework only and do not have a research component. There is no comprehensive/oral exam requirement.

Major Admission Requirements

B.S. or B.A. in Chemistry or related discipline (e.g., Biochemistry, Chemical Engineering, Food Science and Technology, Biological Systems Engineering, Environmental Analysis) **or** equivalent industrial nonacademic experience

Standard application requirements: Prior transcripts, CV/resume and names of references

Other application requirements: Personal statement of 250-500 words that describes the applicant's background, as related to the topic of this certificate program, and the reasons for their interest in this program

Admission Deadlines

Applications are accepted year-round, but students formally enter the program in August or January.

Programs officially became active in Fall 2022. Two students are already admitted or in the final stages of being admitted. Several others have indicated plans to apply.

Expected Advantages of New Graduate Certificate Programs

- Platforms for aiding in further training of skilled STEM workers for local/regional industries or laboratories and students in other departments
- Recruiting tool for attracting new MS and PhD graduate students into Chemistry program
- Means for increasing competitiveness of participating graduate students in the job market
- Way of increasing enrollment in a variety of Chemistry graduate courses (analytical, chemical biology/synthetic chemistry, physical chemistry) with existing resources.
- Side benefit includes use as part of Broader Impact statements and in justifications for major equipment requests in proposals to NSF or other funding agencies

Certificate Program Curriculum

- Each of the two new certificate has a total of 18 credits of graduate courses
- There are 12 credits of core courses and 6 credits of elective courses

Example: Core Courses – Bioanalytical Chemistry Certificate

Courses	Certificate cr hrs
<i>Required – Core Courses</i>	12
CHEM 821 – Analytical Chemistry or CHEM 824 – Applied Problems in Analytical Chemistry	3
CHEM 835 – Chemical Biology	3
Two of the following (3 cr hrs each) CHEM 825D – Mass Spectrometry CHEM 825G – Chromatographic Separations CHEM 825K – Introduction to Nuclear Magnetic Resonance CHEM 991A – Special Topics in Analytical Chemistry: Biosensors	6

- All of the core courses are in Chemistry and are offered on a regular basis (once per year for 821, 824 and 835)

Example: Elective Courses – Bioanalytical Chemistry Certificate

<i>Electives</i> (6 credit hours from among the following)	6 (selected from list below)
CHEM 825E – Data Handling	2
CHEM 991E – Special Topics in Organic Chemistry – Introduction to Computational Chemistry	3
CHEM 936 – Molecular Biology Methods	2-3
CHEM 871 – Physical Chemistry	4
CBIO 842 – Integrating Quantitative and Computational Biology into Life Sciences Research	3
BIOC 837 – Research Techniques in Biochemistry	4
CHEM 823 – Analytical Chemistry Laboratory	2
CHEM 898 – Special Topics (non-thesis research)	1-2
CHEM 991A – Special Topics in Analytical Chemistry (other than Biosensors)	3
CHEM 825D, 825G, 825K, or 991A-Biosensors if not counted within core requirements	3

- Each of the above listings is an existing courses that is offered on a regular basis
- Each of the departments in this list of courses (Biochemistry - BIOC, Complex Biosystems - CBIO) have indicated their support and willingness to participate during the formation of these certificate programs

Core Courses – Chromatography & Analytical Separations Certificate

Courses:	Credit hours within proposed Certificate
<i>Required – Core Courses</i>	12
CHEM 821 – Analytical Chemistry or CHEM 824 – Problems in Analytical Chemistry	3
CHEM 825G – Chromatographic Separations	3
CHEM 991A – Special Topics in Analytical Chemistry: Advanced Separation Methods	1
CHEM 825D – Mass Spectrometry	3
CHEM 825A – Ionic Equilibria or CHEM 825E – Data Handling	2

- These courses are also existing courses in Chemistry that are offered on a regular basis (once per year for 821 and 824)
- This program differs from the Bioanalytical Certificate in providing students working in either bioanalysis or other fields, such as environmental science, drug testing and development, materials research, etc.

Elective Courses – Chromatography & Analytical Separations Certificate

<i>Electives</i> (6 credit hours from among the following)	6 (selected from list below)
CHEM 898 – Non-thesis research	1-2
CHEM 823 – Analytical Chemistry Laboratory	2
CHEM 835 – Chemical Biology	3
CHEM 982 – Thermodynamics	3
CHEM 984 – Kinetics	2
CHEM 991E – Special Topics in Organic Chemistry – Introduction to Computational Chemistry	3
BIOC 837 – Research Techniques in Biochemistry	4
CHME 873 – Biochemical Engineering	3
CHME 874 – Advanced Biochemical Engineering	3

- Each of the above listings is an existing courses that is offered on a regular basis
- Each of the departments in this list of courses (Biochemistry - BIOC, Chemical and Biomolecular Engineering - CHME) have indicated their support and willingness to participate during the formation of these certificate programs

Admission and Enrollment: Admission/enrollment in a graduate certificate program occurs independently of graduate (MS and PhD) programs.¹ The Certificate Advisory Committee makes decisions on student admission.

Relationship to Graduate Degrees: Students may pursue a graduate certificate and graduate degree simultaneously. Certificate courses taken at the University of Nebraska may count toward a graduate degree, but courses taken/applied toward a previously awarded graduate degree/certificate cannot be counted toward a future graduate certificate.

Courses completed at institutions other than the University of Nebraska cannot count toward a graduate certificate.¹

Other Items: No financial support/stipend (e.g., RA or TA) is offered to students through a graduate certificate program.

No visa support is offered by the University of Nebraska for international students applying only to a graduate certificate program.

There is no required time frame for completion of a graduate certificate.

For students pursuing more than one certificate, a maximum of 3 credit hours may be shared; shared credits cannot count toward more than two certificates.¹

General Management of Certificate Programs

Certificate Director: Dr. David S. Hage, Chemistry Dept., UNL

Support Staff: Rezarta Selmani, Chemistry Dept., UNL

Certificate Advisory Committees

Bioanalytical Chemistry Certificate:

David Hage (Chair), Rebecca Lai, Robert Powers

Chromatography and Analytical Separations Certificate:

David Hage (Chair), James Checco, Patrick Dussault

Additional Departmental Assistance

Chemistry Admissions Committee:

Stephen Morin (Chair); Rezarta Selmani (Staff – Recruiting/Communications)

Chemistry Graduate Committee:

Rebecca Lai (Chair); Rezarta Selmani (Staff – Graduate Program)