Biochemistry and Biotechnology MS

The Biochemistry and Biotechnology Program offers three types of Master of Science degrees.

Non-Thesis

One is a 30-credit-hour non-thesis option suitable for those with laboratory research experience or for others, such as educators, who do not require research experience.

Thesis

The second option includes laboratory-based research under the supervision of one of the program faculty members, leading to a written thesis. All students admitted to the graduate program are considered to be in the non-thesis program. They may transfer into the thesis program after they have been accepted as a thesis student by one of the faculty.

Professional Science

The third is a 32-credit-hour Professional Science emphasis area that includes a strong business component for students who are interested in learning more about the business aspects of companies. This track may not be appropriate for students who are interested in pursuing a PhD or working primarily as laboratory scientists. For more information go to the Professional Science program page.

Admission Requirements

Applicants to the M.S. program must submit a completed application and personal data forms, and transcripts of all previous postsecondary academic work. Submission of Graduate Record Examination scores and letters of recommendation, although not required, will be considered. Admission as a regular graduate student requires graduation from an accredited college with a minimum grade point overall and in biology and chemistry courses of 3.0 (where A=4.0). Students will generally be expected to have completed a major in biology, chemistry, biochemistry or biotechnology. In addition to the Graduate School admission requirements, applicants should have completed undergraduate courses in biochemistry, organic chemistry, cell biology, and genetics. Applicants may be asked to make up any deficiencies in these areas as a condition of enrollment.

All international applicants, except those from countries where English is the primary language, must show English proficiency by submitting according to UMSL's International Student and Scholar Services requirements.

Degree Requirements

Both the thesis and non-thesis options require a total of 30 graduate credit hours, of which at least half must be at the 5000-level or above. A maximum of 12 credit hours of Graduate Research (BIOL 6905 or CHEM 6905) may be applied toward the thesis option and a maximum of 5 credit hours toward the non-thesis option. Students must have a 3.0 GPA in non-research courses.

Required Courses		
CHEM 5722	Advanced Graduate Biochemistry	3
CHEM 5774	Bioinformatics	3
or BIOL 5436	Advanced Applied Bioinformatics	
BIOL 6615	Advanced Biotechnology Laboratory II	4
BIOL 6602	Advanced Molecular Biology	3
or BIOL 6608	Advanced Synthetic Biology	
or BIOL 6632	Advanced Nucleic Acid Structure and Function	
or BIOL 6642	Advanced Plant Biology and Biotechnology	
BIOL 6889	Graduate Seminar	2
Elective Courses		**15**
CHEM 4733	Biochemistry Laboratory	
CHEM 5302	Foundations of Physical Chemistry	
CHEM 5772	Advanced Physical Biochemistry	
CHEM 5694	Special Topics in Organic Chemistry (when relevant)	
CHEM 5774	Bioinformatics	
CHEM 5794	Special Topics in Biochemistry	
CHEM 6787	Problem Seminar in Biochemistry [1]	
CHEM 6905	Graduate Research in Chemistry	
BIOL 4122	Biostatistics	
BIOL 4842	Immunobiology	
BIOL 5012	Advanced Genetics	
BIOL 5069	Topics in Cellular and Molecular Biology [1]	
BIOL 5099	Biology Colloquium [1]	
BIOL 5436	Advanced Applied Bioinformatics	
BIOL 6608	Advanced Synthetic Biology	
BIOL 6442	Advanced Developmental Biology	
BIOL 6550	Advanced Bacterial Pathogenesis	
BIOL 6602	Advanced Molecular Biology	
BIOL 6622	Advanced Cellular Basis of Disease	
BIOL 6632	Advanced Nucleic Acid Structure and Function	
BIOL 6642	Advanced Plant Biology and Biotechnology	
BIOL 6652	Advanced Virology	
BIOL 6699	Graduate Internship in Biotechnology	
BIOL 6889	Graduate Seminar (when relevant)	
BIOL 6905	Graduate Research in Biology	
BIOL 6920	Advanced Topics in Biology (when relevant)	
Total Hours		**30**

1 Maximum of 3 credit hours between BIOL 5069, BIOL 5099, and CHEM 6787.