

BIOLOGY/BIOINFORMATICS (BS/MS)

Accelerated Bachelor's/Master's programs (ABM) provide significant cost savings to students interested in accelerating their path to an advanced degree. An ABM allows full-time students to complete both an undergraduate and graduate degree within just five years, equating to a lower overall cost than completing both programs separately. The **Bioinformatics ABM programs** include coursework in *Biology, Chemistry, Computer Science, and Statistics* as well as hands-on *research experience*. Students typically apply during the spring semester of their Junior year (*Applicants must be at least a Junior based on credit hours and >1 year from completing the BS degree*).

Two ABM programs are available:

- For students majoring in **Biology BS - Bioinformatics MS** (*BIOL BS/BIOI MS*) [**This page!**]
- For students majoring in **Bioinformatics BS/MS** (*BIOI BS/BIOI MS*) [Please follow this link (<https://catalog.luc.edu/undergraduate/accelerated-bachelors-masters-program/bioinformatics-bsms/>)]

The one-year MS component of each program is offered as one of two tracks:

- Thesis track** (research-based) for students interested in academic research and advanced degree programs, such as a Ph.D.
- Non-thesis track** (internship-based) for students who aim to enter the workforce in an industrial setting, such as Biotech and Pharma

Related Programs

Major

- Bioinformatics (BS) (<https://catalog.luc.edu/undergraduate/arts-sciences/bioinformatics/bioinformatics-bs/>)

Master's

- Biology (MS) (<https://catalog.luc.edu/graduate-professional/graduate-school/arts-sciences/biology/biology-ms/>)

Combined

- Bioinformatics (BS/MS) (<https://catalog.luc.edu/undergraduate/accelerated-bachelors-masters-program/bioinformatics-bsms/>)

Curriculum

An ABM allows full-time students to complete an undergraduate AND graduate degree within five years. This is possible because students take Graduate-level courses during their senior year, which earns them Graduate-level credit. Graduate-level credit hours taken during the undergraduate program and then applied toward graduate program requirements will be referred to as Shared Credits. Up to 15 Graduate-level credit hours can be taken during senior year, and a minimum of 15 Graduate-level credit hours will be taken during the MS year.

Rules for taking MS courses in senior year:

- A maximum of 15 Graduate-level credit hours can be taken during the undergraduate program.

- Included in these 15 credit hours may be up to three designated courses that may count as Shared Credits for the BS and the MS degree (formerly known as double dipping). Designated courses are listed at the bottom of this curriculum. Three courses for recommended Shared Credits are included in the course list.
- Graduate-level credit hours taken during senior year that are not Shared Credits will count toward the MS degree only.

The following courses are required for the Accelerated Biology BS/ Bioinformatics MS degrees (BIOL-BS/BIOI-MS). Two tracks are offered: a thesis track and a non-thesis track. While most fundamental Bioinformatics MS courses are required for both tracks, some track-specific Graduate-level courses are listed under the respective thesis track and non-thesis track headers. Please note that prerequisites for Bioinformatics MS courses may not be required for the Biology BS degree. However, they must be completed for MS-required courses.

Code	Title	Hours
Biology Courses Required		
BIOL 101	General Biology I	3
BIOL 111	General Biology I Lab	1
BIOL 102	General Biology II	3
BIOL 112	General Biology II Lab	1
BIOL 251	Cell Biology	3
BIOL 265	Ecology	3
BIOL 282	Genetics	3
BIOL 283	Genetics Laboratory	1
Biology Elective Courses		
BIOL 388	Bioinformatics	3
CHEM 361	Principles of Biochemistry	3
STAT 335	Introduction to Biostatistics	3
STAT 437	Quantitative Bioinformatics (BS+MS credit)	3
Select 6 credits of Bioinformatics Electives for Shared Credits (BS +MS credits)		6
Biology Courses: Electives (p. 2) (1+ credit) ¹		1-4
Biology Laboratory Required		
Select one additional required laboratory component (p. 3) (1+ credit)		1
Chemistry Courses Required		
CHEM 160	Chemical Structure and Properties	3
or CHEM 101	General Chemistry A Lecture/Discussion	
or CHEM 105	Chemical Principles	
CHEM 161	Chemical Structure and Properties Laboratory	1
or CHEM 105	Chemical Principles	
or CHEM 111	General Chemistry Lab A	
CHEM 180	Chemical Reactivity I	3
or CHEM 221	Organic Chemistry I Lec/Disc	
or CHEM 223	Organic Chemistry A Lec/Disc	
CHEM 181	Chemical Reactivity I Lab	1
or CHEM 221	Organic Chemistry I Lec/Disc	
or CHEM 225	Organic Chemistry Lab A	
CHEM 240	Chemical Reactivity II	3
or CHEM 222	Organic Chemistry II Lec/Disc	
or CHEM 224	Organic Chemistry B Lec/Disc	
CHEM 241	Chemical Reactivity II Laboratory	1

or CHEM 222	Organic Chemistry II Lec/Disc	
or CHEM 226	Organic Chemistry Lab B	
CHEM 260	Quantitative Methods in Chemistry	3
or CHEM 102	General Chemistry B Lecture/Discussion	
or CHEM 106	Basic Inorganic Chemistry	
CHEM 261	Quantitative Methods in Chemistry Laboratory	1
or CHEM 106	Basic Inorganic Chemistry	
or CHEM 112	General Chemistry Lab B	
Math Courses Required		
MATH 131	Applied Calculus I	3
or MATH 161	Calculus I	
MATH 132	Applied Calculus II	3
or MATH 162	Calculus II	
Physics Courses Required		
PHYS 111	College Physics I Lec / Dis	3
or PHYS 121	College Physics I with Calculus Lecture/Discussion	
or PHYS 125	General Physics I Lec/Dis	
PHYS 111L	College Physics Laboratory I	1
PHYS 112	College Physics II Lec/Disc	3
or PHYS 122	College Physics II with Calculus Lecture/Discussion	
or PHYS 126	General Physics II Lec/Dis	
PHYS 112L	College Physics Lab II	1
MS Bioinformatics Fundamental Courses (both tracks)		
BIOL 500	Advanced Bioinformatics	3
BIOL 501	Bioinformatics Seminar	1
BIOL 565	Exploring Proteins (Fall only)	3
or CHEM 465	Special Topics in Biochemistry	
COMP 483	Computational Biology (Spring only)	4
Thesis track specific courses		13
UNIV 370	Responsible Conduct in Research and Scholarship	
BIOL 494	Bioinformatics Research Design	
BIOL 499	Bioinformatics Research	
BIOL 595	Thesis Supervision	
+ 2 Bioinformatics Electives		
Non-thesis track specific courses		13
BIOL 498	Bioinformatics Internship	
+ 5 Bioinformatics Electives		
Total Hours		105-108

Note: The required courses within the major also satisfy the following University Core Curriculum (<https://catalog.luc.edu/undergraduate/university-requirements/university-core/>) requirements: scientific literacy (6 credits) and quantitative analysis (3 credits).

Biology Electives

Code	Title	Hours
Biology		
Any BIOL 200-Level Course ³		
Any BIOL 300-Level Course ³		
BIOL 2TRN Biology 200-Level Transfer		
BIOL 3TRN Biology 300-Level Transfer		
Anthropology		

ANTH 246 / BIOL 246	Ancient Human-Animal Interactions	3
ANTH 280 / BIOL 280	Evolution of Human Disease	3
ANTH 281 / BIOL 281	Evolution of the Human Diet	3
ANTH 325 / BIOL 325	Primatology-Behavior & Ecology	3
ANTH 326 / BIOL 326	Human Osteology Lec/Lab	4
ANTH 327 / BIOL 378	Dental Anthropology	3
ANTH 346 / BIOL 346	Biology of Women	3
ANTH 359 / BIOL 359	Paleopathology	3
Chemistry		
CHEM 361 / BIOL 366	Principles of Biochemistry	3
Computer Science		
COMP 381 / BIOL 388	Bioinformatics	3
Environmental Science		
ENVS 215 / BIOL 215	Ornithology	3
ENVS 267 / BIOL 347	Bird Conservation and Ecology	3
ENVS 319 / BIOL 329		3
ENVS 340 / BIOL 340	Natural History of Belize	3
ENVS 345 / BIOL 349	Conservation and Sustainability of Neotropical Ecosystems	3
ENVS 369 / BIOL 348	Field Ornithology	3
Neuroscience		
NEUR 101	Introduction to Neuroscience ⁴	3
NEUR 300 / BIOL 303	Seminar in Neuroscience	1
NEUR 301 / BIOL 373	Laboratory in Neuroscience I	4
NEUR 302	Laboratory in Neuroscience II	3
Physics		
PHYS 371	Biophysics	3
Psychology		
PSYC 240 / BIOL 240	Psychology-Biology of Perception ⁴	3
PSYC 311 / BIOL 313	Lab in Psychobiology	3
PSYC 382 / BIOL 284	Behavioral and Cognitive Neuroscience	3
PSYC 388 / BIOL 373	Laboratory in Neuroscience I	4
Statistics		
STAT 310 / BIOL 310	Categorical Data Analysis	3

STAT 335 / BIOL 335	Introduction to Biostatistics	3
STAT 336 / BIOL 336	Advanced Biostatistics	3
STAT 337 / BIOL 337	Quantitative Methods in Bioinformatics	3

³ If not already taken as a required course.

⁴ Either BIOL 240/PSYC 240 Psychology-Biology of Perception OR NEUR 101 Introduction to Neuroscience (but NOT both) count as Biology Electives.

Lab Requirements

Code	Title	Hours
100-Level Labs		
Both of the following courses are required:		
BIOL 111	General Biology I Lab	1
BIOL 112	General Biology II Lab	1
200-Level Labs		
The following course is required:		
BIOL 283	Genetics Laboratory	1
Biology Elective Labs		
Choose at least one of the following courses:		
BIOL 205	Plant Biology Lec/Lab	4
BIOL 210	Laboratory Techniques	2
BIOL 242	Anatomy and Physiology I	4
BIOL 243	Anatomy and Physiology II	4
BIOL 252	Cell Biology Laboratory	1
BIOL 266	Ecology Laboratory	1
BIOL 302	General Microbiology Lec/Lab	4
BIOL 313 / PSYC 311	Lab in Psychobiology	3
BIOL 315	Introductory Immunology Lec/Lab	4
BIOL 316	Limnology Lec/Lab	4
BIOL 323	Comparative Anatomy Lec/Lab	4
BIOL 326 / ANTH 326	Human Osteology Lec/Lab	4
BIOL 327	Wetland Ecology	4
BIOL 340 / ENVS 340	Natural History of Belize	3
BIOL 341	Histology Lec/Lab	4
BIOL 342	Human Anatomy	4
BIOL 349 / ENVS 345	Conservation and Sustainability of Neotropical Ecosystems	3
BIOL 355	Parasitology Lec/Lab	4
BIOL 360	Field Biology	3
BIOL 363	Entomology Lec/Lab	4
BIOL 366L	Cell Physiology & Biochemistry Lab	3
BIOL 367	Bioimaging	4
BIOL 368	Plant Ecology Lec/Lab	4
BIOL 370	Ichthyology Lec/Lab	4
BIOL 373 / NEUR 301 / PSYC 388	Laboratory in Neuroscience I	4

BIOL 375	Aquatic Insects Lecture & Laboratory	4
BIOL 385	Prin Electron Microscopy Lec/Lab	4
BIOL 390	Molecular Biology Laboratory	4
BIOL 395	Special Topics in Biology (if designated as a laboratory course)	3
BIOL 395L	Special Topics Laboratory	1-4
BIOL 396	Research ⁵	3
BIOL 398	Internship in Biology ⁵	1-3
NEUR 302	Laboratory in Neuroscience II	3

⁵ Either BIOL 396 Research OR BIOL 398 Internship in Biology (but NOT both) count as Biology Electives.

Designated Courses that may count for Shared Credits for the BS and MS degrees:

Up to three of the listed courses may be taken at the graduate level during senior year and count as Shared Credits towards the BS and MS degrees.

Code	Title	Hours
BIOL 495	Special Topics (Genomics - Spring only)	3
BIOL 495	Special Topics (Metagenomics - Fall only)	3
BIOL 565	Exploring Proteins (Fall only)	3
CHEM 465	Special Topics in Biochemistry (Proteomics - odd years, Spring only)	3
COMP 453	Database Programming	3
COMP 479	Machine Learning (Fall only)	3
COMP 483	Computational Biology	4
STAT 437	Quantitative Bioinformatics	3

List of MS Bioinformatics Electives

Code	Title	Hours
Biology		
BIOL 402	Microbiology	3
BIOL 482	Advanced Molec Genetics	3
BIOL 495	Special Topics (Genomics - Spring only)	3
BIOL 495	Special Topics (Metagenomics - Fall only)	3
BIOL 495	Special Topics (Scientific Logic and Critical Thinking)	3
BIOL 495	Special Topics in Bioinformatics (Human Genetics)	3
Chemistry		
CHEM 425	Special Topics in Organic Chemistry (Medicinal Chemistry)	3
CHEM 435	Special Topics in Physical Chemistry (Computational Biochemistry)	3
CHEM 455	Special Topics in Analytical Chemistry (Introduction to Spectroscopy)	3
CHEM 465	Special Topics in Biochemistry (Enzymology)	3
CHEM 465	Special Topics in Biochemistry (Plant Biochemistry)	3
CHEM 465	Special Topics in Biochemistry (Protein Crystallography)	3
Computer Science		
COMP 406	Data Mining	3
COMP 413	Intermediate Object-Oriented Development	3

COMP 439	Distributed Systems	3
COMP 453	Database Programming	3
COMP 460	Algorithms & Complexity	3
COMP 471	Theory of Programming Languages	3
COMP 479	Machine Learning	3
COMP 486	Computational Neuroscience	3
Statistics		
STAT 406	Stochastic Processes	3
STAT 407	Statistical Design	3
STAT 408	Applied Regression Analysis	3
STAT 410	Categorical Data Analysis	3
STAT 436	Topics in Biostatistics	3

Suggested Sequence of Courses

The sequence of courses below is meant to be used as a suggested path for completing coursework. An individual student's completion of requirements depends on course offerings in a given term as well as the start term for a major or graduate study. Students should consult their advisor(s) for assistance with course selection.

These sample course schedules exemplify how students may complete their Bioinformatics major (BS), University Core Requirements, and MS in Bioinformatics within five years of study. The first is an example for the Non-thesis track, and the second for the thesis track:

Sample Schedule Biology BS/Bioinformatics MS Non-thesis Track

Course	Title	Hours
Year 1		
Fall		
BIOL 101	General Biology I	3
BIOL 111	General Biology I Lab	1
CHEM 160	Chemical Structure and Properties	3
CHEM 161	Chemical Structure and Properties Laboratory	1
MATH 131	Applied Calculus I	3
CORE: College Writing Seminar		3
Hours		14
Spring		
BIOL 102	General Biology II	3
BIOL 112	General Biology II Lab	1
CHEM 180	Chemical Reactivity I	3
CHEM 181	Chemical Reactivity I Lab	1
MATH 132	Applied Calculus II	3
CORE: Theology and Religious Studies Tier 1		3
CORE: Philosophical Knowledge Tier 1		3
Hours		17
Year 2		
Fall		
BIOL 282	Genetics	3
BIOL 283	Genetics Laboratory	1
CHEM 260	Quantitative Methods in Chemistry	3
CHEM 261	Quantitative Methods in Chemistry Laboratory	1
CAS Elective (CS course recommended)		3
CORE: Historical Knowledge Tier 1		3

CORE: Artistic Knowledge and Experience		3
Hours		17
Spring		
BIOL 251	Cell Biology	3
CHEM 224	Organic Chemistry B Lec/Disc	3
CHEM 226	Organic Chemistry Lab B	1
CORE: Historical Knowledge Tier 2		3
CORE: Literary Knowledge Tier 1		3
CORE: Theology and Religious Studies Tier 2		3
Hours		16
Year 3		
Fall		
BIOL Elective Lab		1
BIOL 388	Bioinformatics ¹	3
PHYS 111	College Physics I Lec / Dis	3
PHYS 111L	College Physics Laboratory I	1
CAS Elective ⁴		3
CAS Language Requirement 1		3
CORE: Philosophical Knowledge Tier 2		3
Hours		17
Spring		
BIOL 265	Ecology	3
CHEM 361	Principles of Biochemistry ¹	3
BIOL Elective Lab		1
STAT 335	Introduction to Biostatistics ¹	3
PHYS 112	College Physics II Lec/Disc	3
PHYS 112L	College Physics Lab II	1
CAS Language Requirement 2		3
Apply for B.S./M.S Program		
Hours		17
Year 4		
Fall		
BIOL Elective: Bioinformatics Elective ²		3
CAS Elective ⁵		3
CORE: Literary Knowledge Tier 2		3
CORE: Societal & Cultural Knowledge Tier 1		3
CORE: Ethics		3
Hours		15
Spring		
STAT 437	Quantitative Bioinformatics ²	3
BIOL Elective: Bioinformatics Elective ²		3
Bioinformatics Elective ³		3
CORE: Societal & Cultural Knowledge Tier 2		3
Hours		12
Year 5		
Fall		
BIOL 500	Advanced Bioinformatics ³	3
BIOL 565	Exploring Proteins ³	3
Bioinformatics Elective ³		3
Hours		9
Spring		
BIOL 498	Bioinformatics Internship ³	1

BIOL 501	Bioinformatics Seminar ³	1
COMP 483	Computational Biology ³	4
Bioinformatics Elective ³		3
Hours		9
Total Hours		143

¹ This course is required to meet the GPA requirements for admission into the Bioinformatics ABM program.

² Courses which could be applied towards both the B.S. and M.S. degrees.

³ Required of the M.S. degree, totaling 30 credit hours

⁴ Computer Science course, COMP 215 Object Oriented Programming with Mathematics, recommended.

⁵ Computer Science course, COMP 231 Data Structures & Algorithms for Informatics, recommended

Sample Schedule Biology BS/Bioinformatics MS Thesis Track

Course	Title	Hours
Year 1		
Fall		
BIOL 101	General Biology I	3
BIOL 111	General Biology I Lab	1
CHEM 160	Chemical Structure and Properties	3
CHEM 161	Chemical Structure and Properties Laboratory	1
MATH 131	Applied Calculus I	3
CORE: College Writing Seminar		3
Hours		14
Spring		
BIOL 102	General Biology II	3
BIOL 112	General Biology II Lab	1
CHEM 180	Chemical Reactivity I	3
CHEM 181	Chemical Reactivity I Lab	1
MATH 132	Applied Calculus II	3
CORE: Theology and Religious Studies Tier 1		3
CORE: Philosophical Knowledge Tier 1		3
Hours		17
Year 2		
Fall		
BIOL 282	Genetics	3
BIOL 283	Genetics Laboratory	1
CHEM 240	Chemical Reactivity II	3
CHEM 241	Chemical Reactivity II Laboratory	1
CORE: Historical Knowledge Tier 1		3
CORE: Artistic Knowledge and Experience		3
CAS Elective (CS course recommended)		3
Hours		17
Spring		
BIOL 251	Cell Biology	3
CHEM 260	Quantitative Methods in Chemistry	3
CHEM 261	Quantitative Methods in Chemistry Laboratory	1
CORE: Historical Knowledge Tier 2		3
CORE: Literary Knowledge Tier 1		3

CORE: Theology and Religious Studies Tier 2		3
Hours		16
Year 3		
Fall		
BIOL Elective Lab		1
BIOL 388	Bioinformatics ¹	3
PHYS 111	College Physics I Lec / Dis	3
PHYS 111L	College Physics Laboratory I	1
CAS Elective ⁴		3
CAS Language Requirement 1		3
CORE: Philosophical Knowledge Tier 2		3
Hours		17
Spring		
CHEM 361	Principles of Biochemistry ¹	3
BIOL Elective Lab		1
STAT 335	Introduction to Biostatistics ¹	3
PHYS 112	College Physics II Lec/Disc	3
PHYS 112L	College Physics Lab II	1
CAS Language Requirement 2		3
Apply for B.S./M.S. Program		
Hours		14
Year 4		
Fall		
UNIV 370	Responsible Conduct in Research and Scholarship ²	0
BIOL 494	Bioinformatics Research Design ²	1
BIOL Elective: Bioinformatics BIOL Elective ³		3
CAS Elective ⁵		3
CORE: Literary Knowledge Tier 2		3
CORE: Societal & Cultural Knowledge Tier 1		3
CORE: Ethics		3
Hours		16
Spring		
BIOL 265	Ecology	3
BIOL 501	Bioinformatics Seminar ²	1
STAT 437	Quantitative Bioinformatics ³	3
BIOL Elective: Bioinformatics BIOL Elective ³		3
CORE: Societal & Cultural Knowledge Tier 2		3
Hours		13
Year 5		
Fall		
BIOL 500	Advanced Bioinformatics ²	3
BIOL 565	Exploring Proteins ²	3
BIOL 499	Bioinformatics Research ²	4
Hours		10
Spring		
COMP 483	Computational Biology ²	4
BIOL 499	Bioinformatics Research ²	4
BIOL 595	Thesis Supervision ²	1
Hours		9
Total Hours		143

- ¹ This course is required to meet the GPA requirements for admission into the Bioinformatics ABM program.
- ² Courses required of the M.S. degree, totaling 30 credit hours.
- ³ Courses which could be applied towards both the B.S. and M.S. degrees
- ⁴ Computer Science course, COMP 215 Object Oriented Programming with Mathematics, recommended.
- ⁵ Computer Science course, COMP 231 Data Structures & Algorithms for Informatics, recommended.

TRANSFERRING CREDIT

Transfer students seeking the BS in Biology degree must take a minimum of 20 credit hours in Biology courses at Loyola. No more than 18 credit hours from another institution may be applied to the BS in Biology degree program.

COURSE REPEAT RULE

Effective with the spring 2009 semester, students are allowed only TWO attempts to pass Biology courses with a C- or better grade. The two attempts includes withdrawals (W).

The procedure for securing approval for a repeat: Students must come to the Biology Department, fill out a permission to register form, and obtain signatures of both the faculty instructor, and the Biology Chairperson or Assistant-Chairperson. A copy of this form is then submitted to the student's academic advisor to secure final permission for the repeat. After a second attempt to pass a Biology course, it is at the discretion of the Biology Chairperson or Assistant-Chairperson whether the student may repeat the course.

Guidelines for Accelerated Bachelor's/Master's Programs

Terms

- Accelerated Bachelor's/Master's programs: In this type of program, students share limited credits between their undergraduate and graduate degrees to facilitate completion of both degrees.
- Shared credits: Graduate level credit hours taken during the undergraduate program and then applied towards graduate program requirements will be referred to as shared credits.

Admission Requirements

Accelerated Bachelor's/Master's programs are designed to enhance opportunities for advanced training for Loyola's undergraduates. Admission to these programs must be competitive and will depend upon a positive review of credentials by the program's admissions committee. Accordingly, the admission requirements for these programs may be higher than those required if the master's degree were pursued entirely after the receipt of a bachelor's degree. That is, programs may choose to have more stringent admissions requirements in addition to those minimal requirements below.

Requirements:

- Declared appropriate undergraduate major,
- By the time students begin taking graduate courses as an undergraduate, the student has completed approximately 90 credit hours, or the credit hours required in a program that is accredited by a specialty organization,¹

- A minimum cumulative GPA for coursework at Loyola that is at or above the program-specific requirements, a minimum major GPA that is at or above the program-specific requirements, and/or appropriate designated coursework for evaluation of student readiness in their discipline.²

Students not eligible for the Accelerated Bachelor's/Master's program (e.g., students who have not declared the appropriate undergraduate major) may apply to the master's program through the regular admissions process. Students enrolled in an Accelerated Bachelor's/Master's program who choose not to continue to the master's degree program upon completion of the bachelor's degree will face no consequences.³

Ideally, a student will apply for admission (or confirm interest in proceeding towards the graduate degree in opt-out programs) as they approach 90 credit hours. Programs are encouraged to begin advising students early in their major so that they are aware of the program and, if interested, can complete their bachelor's degree requirements in a way that facilitates completion of the program. Once admitted as an undergraduate, Program Directors should ensure that students are enrolled using the plan code associated with the Accelerated Bachelor's/Master's program. Using the plan code associated with the Accelerated Bachelor's/Master's program will ensure that students may be easily identified as they move through the program. Students will not officially matriculate into the master's degree program and be labeled as a graduate student by the university, with accompanying changes to tuition and Financial Aid (see below), until the undergraduate degree has been awarded. Once admitted to the graduate program, students must meet the academic standing requirements of their graduate program as they complete the program curriculum.

- ¹ Programs that have specialized accreditation will adhere to the admissions criteria provided by, or approved by, their specialized accreditors.
- ² The program will identify appropriate indicators of student readiness for graduate coursework (e.g., high-level performance in 300 level courses). Recognizing differences between how majors are designed, we do not specify a blanket requirement.
- ³ If students choose not to enroll in the Accelerated Bachelor's/Master's program, they still must complete all of the standard requirements associated with the undergraduate degree (e.g., a capstone).

For more information on Admissions requirements, visit here (<https://gpm.luc.edu/portal/admission/?tab=home>).

Curriculum

Level and progression of courses. The Accelerated Bachelor's/Master's programs are designed to be competitive and attractive to our most capable students. Students admitted to Accelerated Bachelor's/Master's programs should be capable of meeting graduate level learning outcomes. Following guidance from the Higher Learning Commission, only courses taken at the 400 level or higher (including 300/400 level courses taken at the 400 level) will count toward the graduate program.^{1,2}

Up to 50% of the total graduate level credit hours, required in the graduate program, may come from 300/400 level courses where the student is enrolled in the 400 level of the course. Further, at least 50% of the credit hours for the graduate program must come from courses that are designed for and restricted to graduate students who have been admitted to a graduate program at Loyola (e.g., enrolled in plan code that indicates the Accelerated Bachelor's/Master's program, typically ending with the letter "D").³

In general, graduate level coursework should not be taken prior to admission into the Accelerated Bachelor's/Master's program. Exceptions may be granted for professional programs where curriculum for the Accelerated Bachelor's/Master's program is designed to begin earlier. On the recommendation of the program's Graduate Director, students may take one of their graduate level courses before they are admitted to the Accelerated Bachelors/Master's program if they have advanced abilities in their discipline and course offerings warrant such an exception.⁴ Undergraduate degree requirements outside of the major are in no way impacted by admission to an Accelerated Bachelor's/Master's program.⁵

Shared credits. Undergraduate courses (i.e., courses offered at the 300 level or below) cannot be counted as shared credits nor count towards the master's degree. Up to 50% of the total graduate level credit hours, required in the graduate program, may be counted in meeting both the undergraduate and graduate degree requirements. Of those shared credits, students in an Accelerated Bachelor's/Master's program should begin their graduate program with the standard introductory course(s) for the program whenever possible. So that students may progress through the Accelerated Bachelor's/Master's program in a timely manner, undergraduate programs are encouraged to design their curriculum such that a student can complete some required graduate credit hours while completing the undergraduate degree. For instance, some of the graduate curriculum should also satisfy electives for the undergraduate major.

The program's Graduate Director will designate credit hours to be shared through the advising form and master's degree conferral review process. Shared credit hours will not be marked on the undergraduate record as having a special status in the undergraduate program. They will be included in the student's undergraduate earned hours and GPA. Graduate credit hours taken during the undergraduate program will not be included in the graduate GPA calculation.

¹ If students wish to transfer credits from another university to Loyola University Chicago, the program's Graduate director will review the relevant syllabus(es) to determine whether it meets the criteria for a 400 level course or higher.

² Programs with specialized accreditation requirements that allow programs to offer graduate curriculum to undergraduate students will conform to those specialized accreditation requirements.

³ In rare cases, the Graduate Director may authorize enrollment in a 400-level course for a highly qualified and highly motivated undergraduate, ensuring that the undergraduate's exceptional participation in the graduate class will not diminish in any way the experience of the graduate students regularly enrolled.

⁴ For example, if a particular course is only offered once every 2-3 years, and a student has demonstrated the necessary ability to be successful, the Graduate Director may allow a student to take a graduate level course to be shared prior to the student being formally admitted to the graduate program. See, also, footnote 3.

⁵ Students should not, for example, attempt to negotiate themselves out of a writing intensive requirement on the basis of admission to a graduate program.

Graduation

Degrees are awarded sequentially. All details of undergraduate commencement are handled in the ordinary way as for all students in the School/College/Institute. Once in the graduate program, students abide by the graduation deadlines set forth by the graduate program. Students in these programs must be continuously enrolled from undergraduate to graduate degree program unless given explicit permission by their program for a gap year or approved leave of absence. In offering the

option of an Accelerated Bachelor's/Master's program, the university is making possible the acceleration of a student's graduate degree completion. It should be understood that students may not request deferral of their matriculation into the Master's degree program. If students would like to delay their graduate studies after earning the undergraduate degree, they may apply for admission to the traditional master's degree program. Any application of graduate credit earned while in the undergraduate program is subject to the policies of the graduate degree granting school.

Learning Outcomes

At the completion of the Biology BS / Bioinformatics MS program:

- Students will demonstrate developing mastery of the following Vision and Change core concepts and their related principals: evolution (the diversity of life-forms that have evolved over time through mutations, selection and genetic change; structure and function (the basic units of biological structures that define the functions of all living things); information flow, exchange and storage (the influence of genetics on the control of the growth and behavior of organisms); pathways and transformations of energy and matter (the ways in which chemical transformation pathways and the laws of thermodynamics govern the growth and change of biological systems); and systems (the ways in which living things are interconnected and interact with one another).
- Students will be able to retrieve, synthesize, and critically evaluate scientific literature.
- Students will be able to communicate (orally and in writing) results and interpretation of scientific research.
- Students will be able to design and implement experiments that test predictive hypotheses, analyze data, report results, and interpret the significance of these experiments.
- Students will gain fundamental skills that will help you be an inquisitive scientist: a solid foundation in biological, computational, chemical, and statistical concepts and theory; the capacity to employ statistical and computational methods to investigate and solve problems within the life sciences; and the ability to conduct bioinformatics study in industry and/or the research environment.