STATISTICS/APPLIED STATISTICS (BS/MS)

CURRICULUM

AP Credit Policies (https://catalog.luc.edu/undergraduate/arts-sciences/mathematics-statistics/#policytext)

Code  Title                                    Hours
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BS Requirements
MATH 161  Calculus I                           4
MATH 162  Calculus II                          4
MATH 263  Multivariable Calculus              4
MATH 212  Linear Algebra                       3
STAT 203  Introduction to Probability & Statistics 3
or STAT 335  Introduction to Biostatistics      3
STAT 303  SAS Programming & Applied Statistics 3
STAT 304  Introduction to Probability          3
STAT 305  Introduction to Mathematical Statistics 3
STAT 307  Statistical Design & Analysis of Experiments (capstone) 3
STAT 308  Applied Regression Analysis           3

Science Requirement
Select two of the following:                     6
ANTH 101  Human Origins                        
BIOL 101  General Biology I                    
BIOL 102  General Biology II                   
CHEM 160  Chemical Structure and Properties     
CHEM 180  Chemical Reactivity I                
ENVS 101  The Scientific Basis of Environmental Issues 
PHYS 121  College Physics I Lec/Dis             
PHYS 122  College Physics II Lec/Dis            

Electives
Select three of the following:                    9
STAT 306  Intro to Stochastic Processes         
STAT 310  Categorical Data Analysis            
STAT 311  Applied Survival Analysis            
STAT 321  Computational Aspects of Modeling and Simulation 
STAT 336  Advanced Biostatistics                
STAT 337  Quantitative Methods in Bioinformatics 
STAT 338  Predictive Analytics                 
STAT 351  Nonparametric Statistical Methods     
STAT 370  Data Science Consulting               
STAT 388  Topics                               

MS Requirements
STAT 401  Introduction to Applied Statistics Using R 1
STAT 403  SAS Program & Applied Statistics       3
STAT 404  Probability & Statistics I             3
STAT 405  Probability & Statistics II            3
STAT 407  Statistical Design                     3
STAT 408  Applied Regression Analysis            3

Select Four (4) Elective Courses                  12
STAT 495  Statistical Consulting Capstone        2

Total Hours 78

The BS degree has waivers for both Quantitative and Scientific core.

Specializations
Our flexible program allows students to focus on their interests by choosing a specialization. Possibilities include:

<table>
<thead>
<tr>
<th>Specialization</th>
<th>Description</th>
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<tbody>
<tr>
<td>Biostatistics</td>
<td>The Biostatistics specialization covers non- and pre-clinical statistical methods, bioassay, statistical genetics, clinical trials, and bioinformatics.</td>
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<tr>
<td>Environmental</td>
<td>The Environmental Statistics specialization addresses Geographic Information Systems (GIS), spatial statistics, and environmetrics.</td>
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<tr>
<td>General Applied</td>
<td>The specialization in General Applied Statistics includes non-medical applications such as actuarial, commercial, data-mining, industrial, marketing, and national defense.</td>
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<tr>
<td>Predictive</td>
<td>The Predictive Modeling specialization focuses on big data analytics and modeling.</td>
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Predictive Analytics/Modeling

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).

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 Bachelor's/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 4.
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.