MATHEMATICAL SCIENCES (BS)

The Department of Mathematical Sciences offers courses in pure and applied mathematics to help students reach a wide variety of intellectual, academic, and career goals.

Many students come to the department to obtain the mathematical background needed to be successful in programs in the natural sciences, computer science, social sciences, and business. Such students may choose to supplement their major in their home department by obtaining a minor in mathematics.

Other students come to the department seeking a program leading to an undergraduate or graduate degree in one of the mathematical sciences. Undergraduate students majoring in mathematical sciences may choose one of seven areas of concentration:

- Actuarial Science
- Applied and Computational Mathematics
- Financial Mathematics
- Pure Mathematics
- Quantitative Analysis and Operations Research
- Statistics
- In consultation with a mathematics faculty advisor, undergraduate students may also create an individualized program of courses leading to a degree in mathematical sciences.

A thesis option is available to mathematics majors who wish to pursue an extended independent project related to a theoretical or applied focus of the program. Students would work under the guidance of a faculty mentor. At least 4 credits must be completed over one or two quarters prior to the thesis submission. Interested students are strongly encouraged to enroll in MAT 390 during their junior year.

Program Requirements	Quarter Hours
Liberal Studies Requirements	80
Major Requirements	32-36
Major Concentration Requirements	24-28
Open Electives	48-56
Total hours required	**192**

Learning Outcomes

Students will be able to:

- Construct valid logical arguments and analyze the reasoning of others.
- Implement a variety of mathematical structures to model and analyze complex problems.
- Apply general mathematical theory to solve problems in mathematics and in the sciences.
- Communicate mathematical ideas clearly, in verbal and visual form, by using appropriate mathematical terminology and notation.

College Core Requirements

Modern Language Requirements

Students who intend to graduate with the Bachelor of Arts (BA) degree will be required to demonstrate competence in a modern language equivalent to the proficiency attained from one year of college-level language study. Such competence may be demonstrated in one of several ways:

- completing the last course in the fourth-year high school sequence of any language
- completing the last course in the first-year college sequence of any language
- completing a college course beyond the first-year level in any language
- achieving a satisfactory score on any of the Modern Language placement examinations administered at DePaul
- achieving a satisfactory rating in a proficiency examination accepted by DePaul
- achieving a score of 3 or higher on the Advance Placement (AP) test for any language
- achieving a score of 5 or higher in the Language B assessment from a Standard or Higher Level International Baccalaureate (IB) program
- achieving a satisfactory score on the CLEP examination

Please note: Modern Languages courses with an E-designation are taught in English and may not be applied to the Modern Language Requirement.

For further information regarding satisfactory scores and possible credit from the DePaul placement, AP, CLEP, or IB examinations, please contact Student Records.

Students who complete an Inter-College Transfer (ICT) to the College of Science and Health will abide by the College of Science and Health Modern Language Requirement in place on the effective date of the ICT.

BA students who meet College requirements and wish to pursue further work in the language may elect the “Modern Language Option” of the Liberal Studies Program. While Bachelor of Science (BS) students are not required to demonstrate competency in a modern language, the “Modern Language Option” is available to them for language study at any level. Modern Languages courses with an E-designation are taught in English and may not be applied to the Modern Language Option.

Major Declaration Requirements

All students in the College are required to declare a major field prior to beginning their junior year. After researching College programs, the student should declare a major field by visiting Campus Connection and using the Declarations and Inter-College Transfer tool. The student will then be assigned a faculty advisor or staff advisor in the department or program and should make an appointment to see that advisor at his or her earliest convenience.

To change major fields, or to declare a minor or concentration, the student must use the Declarations and Inter-College Transfer tool described above. However, for the purpose of exploring the possibility of changing a major field, the student should consult an academic advisor in the College or an academic advisor in the Office for Academic Advising Support.

Liberal Studies Requirements

Honors program requirements can be found in the individual Colleges & Schools section of the University Catalog. Select the appropriate college or school, followed by Undergraduate Academics and scroll down.

First Year Program		Hours
Chicago Quarter		
LSP 110 or LSP 111	DISCOVER CHICAGO or EXPLORE CHICAGO	4
Focal Point		
LSP 112	FOCAL POINT SEMINAR	4
Writing		
WRD 103	COMPOSITION AND RHETORIC I [1]	4
WRD 104	COMPOSITION AND RHETORIC II [1]	4
Quantitative Reasoning		
Not Required		
Sophomore Year		
Race, Power, and Resistance		
LSP 200	SEMINAR ON RACE, POWER, AND RESISTANCE	4
Junior Year		
Experiential Learning		
Required		4
Senior Year		
Capstone		
MAT 398	SENIOR CAPSTONE SEMINAR [1,2]	4

1 Students must earn a C- or better in this course.

2 Students with a primary major in Mathematics are required to complete the Capstone offered by the Mathematics department. Students double majoring or pursuing dual degrees with the primary major or primary degree in Mathematics are required to complete the Capstone offered by the Mathematics department. Mathematics students in the University Honors Program shall take the University Honors Capstone. They are not expected to take both the Honors Capstone and the primary major or primary degree Capstone.

Learning Domains

Arts and Literature (AL) (https://catalog.depaul.edu/undergraduate-core/liberal-studies-program/liberal-studies-learning-domains/arts-and-literature/)

- 3 Courses Required

Historical Inquiry (HI) (https://catalog.depaul.edu/undergraduate-core/liberal-studies-program/liberal-studies-learning-domains/historical-inquiry/)

- 2 Courses Required

Math and Computing (MC) (https://catalog.depaul.edu/undergraduate-core/liberal-studies-program/liberal-studies-learning-domains/math-and-computing/)

- Not Required

Philosophical Inquiry (PI) (https://catalog.depaul.edu/undergraduate-core/liberal-studies-program/liberal-studies-learning-domains/philosophical-inquiry/)

- 2 Courses Required

Religious Dimensions (RD) (https://catalog.depaul.edu/undergraduate-core/liberal-studies-program/liberal-studies-learning-domains/religious-dimensions/)

- 2 Courses Required

Scientific Inquiry (SI) (https://catalog.depaul.edu/undergraduate-core/liberal-studies-program/liberal-studies-learning-domains/scientific-inquiry/)

- 1 Lab Course Required

Social, Cultural, and Behavioral Inquiry (SCBI) (https://catalog.depaul.edu/undergraduate-core/liberal-studies-program/liberal-studies-learning-domains/social-cultural-and-behavioral-inquiry/)

- 3 Courses Required

Notes

Courses offered in the student's primary major cannot be taken to fulfill LSP Domain requirements. If students double major, LSP Domain courses may double count for both LSP credit and the second major. Students who choose to take an experiential learning course offered by the major may count it either as a general elective or the Experiential Learning requirement.

In meeting learning domain requirements, no more than one course that is outside the student's major and is cross-listed with a course within the student's major, can be applied to count for LSP domain credit. This policy does not apply to those who are pursuing a double major or earning BFA or BM degrees.

Major Requirements

Course Requirements

Common Core

Course	Title	Quarter Hours
Select one of the following three-course Calculus sequences:		12-18
Sequence One		
MAT 150	CALCULUS I	
MAT 151	CALCULUS II	
MAT 152	CALCULUS III	
Sequence Two		
MAT 147	CALCULUS WITH INTEGRATED PRECALCULUS I	
MAT 148	CALCULUS WITH INTEGRATED PRECALCULUS II	
MAT 149	CALCULUS WITH INTEGRATED PRECALCULUS III	
Sequence Three		
MAT 160	CALCULUS FOR MATHEMATICS AND SCIENCE MAJORS I	
MAT 161	CALCULUS FOR MATHEMATICS AND SCIENCE MAJORS II	
MAT 162	CALCULUS FOR MATHEMATICS AND SCIENCE MAJORS III	
Sequence Four		
MAT 170	CALCULUS FOR LIFE SCIENCES I	
MAT 171	CALCULUS FOR LIFE SCIENCES II	
Select one of the following:		

MAT 149	CALCULUS WITH INTEGRATED PRECALCULUS III	
MAT 152	CALCULUS III	
MAT 162	CALCULUS FOR MATHEMATICS AND SCIENCE MAJORS III	
Sequence Five [1]		
MAT 155	SUMMER CALCULUS I	
MAT 156	SUMMER CALCULUS II	
MAT 260	MULTIVARIABLE CALCULUS I	4
MAT 261	MULTIVARIABLE CALCULUS II	4
MAT 262	LINEAR ALGEBRA	4
MAT 215	INTRODUCTION TO MATHEMATICAL REASONING	4
or MAT 140 & MAT 141	DISCRETE MATHEMATICS I and DISCRETE MATHEMATICS II	
CSC 241	INTRODUCTION TO COMPUTER SCIENCE I (or a more advanced course in any programming language)	4
MAT 398	SENIOR CAPSTONE SEMINAR (Liberal Studies Program Capstone)	4
Select four courses from any of the following:		16
Natural Sciences		
Computer Sciences:		
All CSC courses may apply		
Data Science:		
All DSC courses may apply		
Game Development:		
GAM 244	GAME DEVELOPMENT I	
GAM 245	GAME DEVELOPMENT II	
GAM 350	PHYSICS FOR GAME DEVELOPERS	
GAM 353	TOOL PROGRAMMING FOR GAME DEVELOPMENT	
GAM 368 through GAM 391 [2]		
GAM 394 through GAM 398 [3]		
Information Technology:		
IT 223	DATA ANALYSIS	
IT 278	COMMUNITY-BASED TECHNOLOGY PROJECTS	
IT 231 through IT 240		
IT 263	APPLIED NETWORKS AND SECURITY	
IT 313 through IT 373		
IT topics courses may only be accepted with advanced approval from the chair		
Software Engineering:		
All SE courses may apply		
Select one of the following:		
GEO 241	GEOGRAPHIC INFORMATION SYSTEMS I: DIGITAL MAPPING	
GEO 243	EARTH OBSERVATION	
GEO 345	PROGRAMMING IN PYTHON FOR GIS	
Data Analysis Requirement, which can be satisfied via one of the following:		
AP Statistics credit (score of 3 or better)		
An applied statistics or data analysis course from this list: MAT 137, MAT 242, MAT 341 MAT 348, IT 223, PSY 240, BIO 206, ENV 260, SOC 279, MAT 353, HON 180. Other data analysis courses may satisfy the requirement with departmental approval. Note that this course may be taken as one of the four Natural or Computer Science courses required for the BS, as part of the major, or as an open elective.		
The following concentration areas will automatically satisfy the data analysis requirement: Actuarial Science, Financial Math, Quantitative Analysis and Operations Research, and Statistics.		

1 This Calculus sequence is offered only during the summer, in two 6-credit hour courses. Students successfully completing MAT 131, MAT 147, MAT 150 or MAT 160 should enroll in MAT 155; students who successfully complete MAT 148, MAT 151 or MAT 161 should enroll in MAT 156. Students who successfully complete MAT 155 may enroll in either MAT 151 or MAT 156.

2 Except CSC 382.

3 Courses may only be accepted with advanced approval from the chair.

Concentration Requirements

Students must also complete the requirements from one of the following concentrations: Pure Mathematics; Statistics; Actuarial Science; Financial Mathematics; Quantitative Analysis and Operations Research; Applied and Computational Mathematics; or Individualized.

If the student chooses to declare more than one Mathematical Sciences concentration, then the student must complete the requirements for each concentration, and take at least three additional 300-level courses overall. For example, a student earning two concentrations would have taken at least nine 300-level courses, and a student earning three concentrations would have taken at least twelve 300-level courses.

Students are advised to talk with their advisor before double majoring, because some major combinations are prohibited. No more than 50% of the credits that apply to one major may be drawn from another major.

Concentrations, tracks and specializations provide focus to the major. In addition to any college core requirements, liberal studies requirements and major requirements, students are required to choose one of the following:

- Actuarial Science Concentration, Mathematical Sciences (BS) (https://catalog.depaul.edu/programs/mathematical-sciences-bs/actuarial-science-concentration-mathematical-sciences-bs/)
- Applied and Computational Mathematics Concentration, Mathematical Sciences (BS) (https://catalog.depaul.edu/programs/mathematical-sciences-bs/applied-computational-mathematics-concentration-mathematical-sciences-bs/)
- Financial Mathematics Concentration, Mathematical Sciences (BS) (https://catalog.depaul.edu/programs/mathematical-sciences-bs/financial-mathematics-concentration-mathematical-sciences-bs/)
- Individualized Concentration, Mathematical Sciences (BS) (https://catalog.depaul.edu/programs/mathematical-sciences-bs/individualized-concentration-mathematical-sciences-bs/)
- Pure Mathematics Concentration, Mathematical Sciences (BS) (https://catalog.depaul.edu/programs/mathematical-sciences-bs/pure-mathematics-concentration-mathematical-sciences-bs/)

- Quantitative Analysis and Operations Research Concentration, Mathematical Sciences (BS) (https://catalog.depaul.edu/programs/mathematical-sciences-bs/quantitative-analysis-operations-research-concentration-mathematical-sciences-bs/)
- Statistics Concentration, Mathematical Sciences (BS) (https://catalog.depaul.edu/programs/mathematical-sciences-bs/statistics-concentration-mathematical-sciences-bs/)