MATH AND COMPUTING

The ability to understand and apply statistical and computational reasoning is essential in our society. It is a critical component of liberal arts education at DePaul University. Regardless of a student's field of study or career after graduation, exposure to the methods and tools of statistical reasoning and computational reasoning is important for life-long learning.

Math and Computing Domain courses are particularly relevant to achieving the goals stated in 3.1.B. of DePaul's 2024 strategic plan, to "ensure that all graduates demonstrate core competencies and transferable skills (e.g., cultural agility; technological, information, and data literacy; computational thinking; critical and systems thinking; effective communication; and ethical and moral reasoning)."

To adequately prepare our students in statistical and computational reasoning skills, the Math and Computing domain offers two categories of courses: Computational Reasoning (CR) and Statistical Reasoning (SR).

Learning Outcomes

Computational Reasoning

Students will be able to:

- Apply computational thinking skills to analyze and design solutions to problems or to express a creative concept.
- Develop, express, trace, and analyze algorithms.
- Apply fundamental concepts of programming in implementing algorithms.
- Create original artifacts using computational tools and techniques.
- Apply computational tools to transform and manipulate data.
- Explain the potential harms and benefits of computing in a number of contexts.

Statistical Reasoning

Students will be able to:

- Recognize and explain statistically based results from real data (either primary or secondary) and evaluate whether reported conclusions reasonably follow from the study and analysis conducted.
- Use statistical software to produce and interpret graphical displays and statistical summaries.
- Recognize and explain the roles of variability and randomness in interpreting data and drawing conclusions.
- Explain common ethical issues associated with sound statistical practice, including those associated with research design, and their impact on statistical decision-making.
- Measure the strength of association between variables and identify possible effects of confounding or interacting variables on the interpretation of the association.
- Apply basic ideas of statistical inference, including confidence intervals or hypothesis testing, in a variety of settings.

QR and MCD Waiver

Depending on a student's program of study, they may need to take MAT 120 QUANTITATIVE REASONING. Readiness for MAT 120 is determined by the math placement test taken online after admission. Students may need to take developmental coursework prior to MAT 120. Students who complete MAT 120 and both a Computational Reasoning course and a Statistical Reasoning course in the Math and Computing Learning Domain take one less Learning Domain course. Students may not apply the course reduction to any Domain where only one course is required, and cannot be applied to the Scientific Inquiry Learning Domain. The MAT 120 requirement may be waived by passing a dedicated proficiency exam or it may be fulfilled by credit for advanced math coursework earned in-residence at DePaul (MAT 135, MAT 136, MAT 147, MAT 148, MAT 149, MAT 150, MAT 151, MAT 152, MAT 155, MAT 156, MAT 160, MAT 161, MAT 162, MAT 170, MAT 171, MAT 172, or equivalent) or earned externally either as transfer credit from another college/university or as test credit through AP, CLEP, IB, or International A and A/S Level exams. Calculus course(s) may be used to fulfill any of the three QR/MCD requirements.

Courses

Below please find examples of courses offered for Math and Computing credit. For information on current offerings, please consult Campus Connection.

Computational Reasoning (CR)

Course	Title	Quarter Hours
GEO 241	GEOGRAPHIC INFORMATION SYSTEMS I: DIGITAL MAPPING	4
IT 123	INTRODUCTION TO COMPUTATIONAL REASONING	4
PSC 201	GEOGRAPHIC INFORMATION SYSTEMS	4

Statistical Reasoning (SR)

Course	Title	Quarter Hours
CMNS 282	STATISTICS IN HUMAN COMMUNICATION	4
GEO 391	STATISTICAL DATA ANALYSIS FOR GIS	4
IT 223	DATA ANALYSIS	4
MAT 137	BUSINESS STATISTICS	4
MAT 348	APPLIED STATISTICAL METHODS	4
PSC 205	STATISTICS FOR THE SOCIAL SCIENCES	4
SOC 279	INTRO STATS FOR THE SOCIAL SCIENCES	4