QUANTITATIVE REASONING AND TECHNOLOGICAL LITERACY

The purpose of the Quantitative Reasoning and Technological Literacy (QRTL) at DePaul University is to help DePaul students to become confident and critical users of quantitative information of all kinds.

The program addresses the growing need for quantitative and computer literacy in response to the enormous expansion in the use of quantitative methods and information in the social and physical sciences as well as civic life. The use and misuse of quantitative information in public policy and scientific issues are particularly emphasized; students are taught to recognize the limitations of the quantitative methods as well as the insights they provide. Students learn by working with data sets from many different disciplines, such as psychology, environmental science, economics, finance, sociology, history. Students write critiques of quantitative arguments, gather data and present arguments of their own. The course is taught by instructors from many disciplines; psychology, communication, geography, history, mathematics and computer science. QRTL provides a solid foundation upon which subsequent courses in the disciplines and the Liberal Studies Program can and must necessarily build.

In the first year, students begin a two-course sequence comprised of the following courses:

<table>
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<tr>
<th>Course</th>
<th>Title</th>
<th>Quarter Hours</th>
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<tr>
<td>LSP 120</td>
<td>QUANTITATIVE REASONING &amp; TECHNOLOGICAL LITERACY I</td>
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<td>LSP 121</td>
<td>QUANTITATIVE REASONING AND TECHNOLOGICAL LITERACY II</td>
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Some students may be required to take preparatory math classes before being eligible to enroll in QRTL courses, while other students may have one or both QRTL courses met by AP scores, transfer credit, or proficiency tests. Majors that require calculus do not require QRTL.

QRTL Waiver

Readiness for LSP 120 is determined by the math placement test taken online after admission. Students may need to take developmental coursework prior to LSP 120. The LSP 120 requirement may be waived by credit already earned for advanced math coursework or by passing a dedicated proficiency exam. Students who complete both LSP 120 and LSP 121 take one less Learning Domain course. Students may not apply the course reduction to any Domain where only one course is required, and if taken within the SI Domain, the reduction cannot be applied to the SI Lab or SWK requirement.

Learning Outcomes

Students will be able to:

- Make estimations.
- Use proportional reasoning.
- Use percent change.
- Use information conveyed as data, graphs, and chart.
- Draw inferences from data.
- Aggregate data with pivot tables.
- Recognize disaggregation as a factor in interpreting data.
- Formulate applied problems mathematically, seek patterns, and draw conclusion.
- Recognize interactions in complex systems.
- Use linear, exponential, and simulation models.
- Recognize the impact of different rates of growth.
- Make and interpret frequency distributions.
- Summarize data with measures of center and dispersion.
- Measure and interpret the association between variables.
- Recognize the difference between correlation and causation.
- Solve applied problems involving the normal distribution and z-scores.
- Recognize that seemingly improbably coincidences are not uncommon.
- Evaluate risk from available evidence.
- Calculate basic common probabilities.
- Use sequential, logical thinking
  - Develop algorithms to solve problems.
  - Use Boolean conditionals and repetition to create simple computer programs.
- Make algebraic calculations within a spreadsheet using cell addresses and formulas.
  - Format the layout of a spreadsheet.
  - Use statistical, logical, and financial.
  - Use and create macros to automate repetitious tasks.
- Make appropriate and effective graphs to communicate and visualize quantitative information.
  - Enter data into a pre-existing database
  - Import data from a text file or spreadsheet file into a database.
  - Filter records based on a single parameter and on multiple parameter.
  - Sort records with multiple sort keys.
  - Formulate and conduct queries.
  - Generate a report from a database.
  - Recognize the difference between a flat file and a relational database.
  - Create a relational database using two or more tables.
  - Construct a query for a relational database using two or more tables.
  - Construct a query for a relational database using joins.
  - Design and implement forms for data entry.
- Import data from a spreadsheet or database into a statistics package.
  - Use graphical tools in a statistical package to make specialized statistics plots such as box plots and normal probability plots.
  - Calculate descriptive summary statistics using a statistical package.
- Construct the concept of algorithm through experimentation and reflection on everyday activities.
  - Articulate an accurate definition of an algorithm
  - Recognize algorithms fitting the definition.
  - Construct the notion of a control structure and a repetition structure.
• Acquire the ability to trace simple programs listings using control and repetition structures.
• Use control and repetition structures to write simple computer programs to affect a task.
• Analyze and discuss the impact of information technology on society and their own lives.
• Discuss the implications of the fact that information and decision making are increasingly quantitative.
• Critically assess the sources, importance and factual accuracy of digital information.