



# Course Outline

Course Name: Applied Statistics (TSTA 301)

Academic Period: 2024 - 2025

Faculty:

Faculty Availability:

Associate Dean:

Mike Wells  
mike.wells@humber.ca

Schedule Type Code:

## Land Acknowledgement

Humber College is located within the traditional and treaty lands of the Mississaugas of the Credit. Known as Adoobiigok [A-doe-bee-goke], the “Place of the Alders” in Michi Saagiig [Mi-Chee Saw-Geeg] language, the region is uniquely situated along Humber River Watershed, which historically provided an integral connection for Anishinaabe [Ah-nish-nah-bay], Haudenosaunee [Hoeden-no-shownee], and Wendat [Wine-Dot] peoples between the Ontario Lakeshore and the Lake Simcoe/Georgian Bay regions. Now home to people of numerous nations, Adoobiigok continues to provide a vital source of interconnection for all.

## Equity, Diversity and Inclusion Statement

Humber College and the University of Guelph-Humber (Humber) are leaders in providing a learning, working and living environment that recognizes and values equity, diversity and inclusion in all its programs and services. Humber commits to reflect the diversity of the communities the College serves. Students, faculty, support and administrative staff feel a sense of belonging and have opportunities to be their authentic selves.

Faculty or Department	Faculty of Liberal Arts & Sciences
Course Name:	Applied Statistics (TSTA 301)
Pre-Requisites	( <a href="#">TMTH 202</a> OR <a href="#">TMTH 204</a> OR <a href="#">TMTH 205</a> OR TMTH 220)
Co-Requisites	none
Equates	none
Restrictions	none
Credit Value	3
Total Course Hours	42


Developed By:

Prepared By:

Approved by:  
  
Mike Wells

## Humber Learning Outcomes (HLOs) in this course.

The HLOs are a cross-institutional learning outcomes strategy aimed at equipping Humber graduates with the employability skills, mindsets, and values they need to succeed in the future of work. To explore all the HLOs, please consult the [Humber Learning Outcomes framework](#).

-  Critical Thinking
-  Communication
-  Digital Fluency
-  Strategic Problem-Solving

## Course Description

Topics of study include the language of probability and statistics; measures of centre, variability, and position; visualization through pie and bar charts, ogives, and histograms; calculating probabilities using conditional probability, Multiplication and Addition Rules, and contingency tables; discrete and continuous distributions; Central Limit Theorem; confidence intervals; hypothesis testing for population means; correlation and regression analysis; and statistical process control.

## Course Rationale

The course provides an introduction to statistical theory and techniques with direct applications to established industrial practices of quality assurance and process control.

## Course Learning Method(s)

- Lecture
- Online

## Learning Outcomes

- Calculate various standard measures of location, central tendency, and variability for descriptive and inferential statistics.
- Use software to construct charts, tables, and other graphics to interpret and analyze data.
- Solve probability problems by applying various probability rules.
- Evaluate probabilities using discrete and continuous probability distributions.
- Apply the Central Limit Theorem to calculate probabilities involving sample means.
- Construct confidence intervals using the standard normal and t-distributions to provide an interval estimate for a population mean.
- Carry out one-sample and two dependent-sample hypothesis testing on population means to make a decision relative to the context of the problem.
- Conduct correlation and regression analyses for modelling and prediction.
- Create control charts to determine whether a process or attribute is under statistical control.

## Assessment Weighting

Assessment	Weight
Labs, quizzes, assignments, projects, presentations, etc.	30%
Midterm Exam	35%

Assessment	Weight
Final Exam	35%
<b>Total</b>	<b>100%</b>

## Modules of Study

Module	Course Learning Outcomes	Resources	Assessments
Descriptive Statistics	<ul style="list-style-type: none"> <li>Calculate various standard measures of location, central tendency, and variability for descriptive and inferential statistics.</li> <li>Use software to construct charts, tables, and other graphics to interpret and analyze data.</li> </ul>	Chapter 1: Sections 1.1-1.3  Chapter 2: Sections 2.1-2.8	<ul style="list-style-type: none"> <li>Midterm Exam</li> <li>Labs, quizzes, assignments, projects, presentations, etc.</li> </ul>
Introduction to Probability	<ul style="list-style-type: none"> <li>Solve probability problems by applying various probability rules.</li> </ul>	Chapter 3: Sections 3.1-3.5	<ul style="list-style-type: none"> <li>Midterm Exam</li> <li>Labs, quizzes, assignments, projects, presentations, etc.</li> </ul>
Discrete Probability Distributions	<ul style="list-style-type: none"> <li>Evaluate probabilities using discrete and continuous probability distributions.</li> </ul>	Chapter 4: Sections 4.1-4.3, 4.6	<ul style="list-style-type: none"> <li>Midterm Exam</li> <li>Labs, quizzes, assignments, projects, presentations, etc.</li> </ul>
Continuous Probability Distributions	<ul style="list-style-type: none"> <li>Evaluate probabilities using discrete and continuous probability distributions.</li> </ul>	Chapter 5: Sections 5.1-5.3  Chapter 6: Sections 6.1-6.2	<ul style="list-style-type: none"> <li>Midterm Exam</li> <li>Final Exam</li> <li>Labs, quizzes, assignments, projects, presentations, etc.</li> </ul>
Sampling Distribution of the Sample Mean	<ul style="list-style-type: none"> <li>Evaluate probabilities using discrete and continuous probability distributions.</li> <li>Apply the Central Limit Theorem to calculate probabilities involving sample means.</li> </ul>	Chapter 7: Sections 7.1-7.3	<ul style="list-style-type: none"> <li>Final Exam</li> <li>Labs, quizzes, assignments, projects, presentations, etc.</li> </ul>
Interval Estimates	<ul style="list-style-type: none"> <li>Construct confidence intervals using the standard normal and t-distributions to provide an interval estimate for a population mean.</li> </ul>	Chapter 8: Sections 8.1-8.2	<ul style="list-style-type: none"> <li>Final Exam</li> <li>Labs, quizzes, assignments, projects, presentations, etc.</li> </ul>

Module	Course Learning Outcomes	Resources	Assessments
Hypothesis Testing For Population Means	<ul style="list-style-type: none"><li>Carry out one-sample and two dependent-sample hypothesis testing on population means to make a decision relative to the context of the problem.</li></ul>	Chapter 9: Sections 9.1-9.5  Chapter 10: Section 10.4	<ul style="list-style-type: none"><li>Final Exam</li><li>Labs, quizzes, assignments, projects, presentations, etc.</li></ul>
Correlation and Regression	<ul style="list-style-type: none"><li>Conduct correlation and regression analyses for modelling and prediction.</li></ul>	Chapter 12: Sections 12.1-12.3, 12.5	<ul style="list-style-type: none"><li>Final Exam</li><li>Labs, quizzes, assignments, projects, presentations, etc.</li></ul>
Control Charts for Attributes and Variables	<ul style="list-style-type: none"><li>Create control charts to determine whether a process or attribute is under statistical control.</li></ul>	Class notes and handouts	<ul style="list-style-type: none"><li>Final Exam</li><li>Labs, quizzes, assignments, projects, presentations, etc.</li></ul>

## Required Resources

<a href="#">Illowsky, B., &amp; Dean, S. (2022). <i>Introductory Statistics</i>. Openstax: Rice University.</a>
All students enrolled in the course, including online, are required to write the tests and exams in person on campus.

## Additional Tools and Equipment

- Scientific Calculator
- Microsoft Excel

## Essential Skills

Section	Skills	Measurement	Details
Communication	<ul style="list-style-type: none"><li>Reading</li><li>Writing</li><li>Speaking</li><li>Listening</li><li>Presenting</li></ul>	Teach and measure	<ul style="list-style-type: none"><li>Class and lab instruction</li><li>Class interactions and evaluation of lab work and assessments</li></ul>
Numeracy	<ul style="list-style-type: none"><li>Understanding and applying mathematical concepts and reasoning</li><li>Analyzing and using numerical data</li><li>Conceptualizing</li></ul>	Teach and measure	<ul style="list-style-type: none"><li>Class and lab instruction</li><li>Class interactions and evaluation of lab work and assessments</li></ul>

Section	Skills	Measurement	Details
Critical Thinking and Problem-Solving	<ul style="list-style-type: none"> <li>Analysing</li> <li>Synthesizing</li> <li>Evaluating</li> <li>Decision-Making</li> </ul>	Teach and measure	<ul style="list-style-type: none"> <li>Class and lab instruction</li> <li>Class interactions and evaluation of lab work and assessments</li> </ul>
Information Management	<ul style="list-style-type: none"> <li>Gathering and managing information</li> <li>Selecting and using appropriate tools and technology for a task or project</li> <li>Computer literacy</li> <li>Internet skills</li> </ul>	Teach and measure	<ul style="list-style-type: none"> <li>Class and lab instruction</li> <li>Class interactions and evaluation of lab work and assessments</li> </ul>

## Prior Learning Assessment & Recognition (PLAR)

Prior Learning Assessment and Recognition (PLAR) is the formal evaluation and credit-granting process whereby candidates may obtain credits for prior learning. Prior learning includes the knowledge competencies and skills acquired, in both formal and informal ways, outside of post-secondary education. Candidates may have their knowledge, skills and competencies evaluated against the learning outcomes as defined in the course outline. Please review the [Assessment Methods Glossary](#) for more information on the Learning Portfolio assessment methods identified below.

The method(s) that are used to assess prior learning for this course may include:

- Challenge Exam (results recorded as a % grade and added to student's CGPA)

Please contact the Program Coordinator for more details.

## Academic Regulations

It is the student's responsibility to be aware of the College Academic Regulations. The Academic Regulations apply to all applicants to Humber and all current students enrolled in any program or course offered by Humber, in any location. Information about academic appeals is found in the [Academic Regulations](#).

## Anti-Discrimination Statement

At Humber College, all forms of discrimination and harassment are prohibited. Students and employees have the right to study, live and work in an environment that is free from discrimination and harassment. If you need assistance on concerns related to discrimination and harassment, please contact the [Centre for Human Rights, Equity and Inclusion](#) or the [Office of Student Conduct](#).

## Accessible Learning Services

Humber strives to create a welcoming environment for all students where equity, diversity and inclusion are paramount. Accessible Learning Services facilitates equal access for students with disabilities by coordinating academic accommodations and services. Staff in Accessible Learning Services are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations. If you require academic accommodations, contact:

[Accessible Learning Services](#)

North Campus: (416) 675-6622 X5090

Lakeshore Campus: (416) 675-6622 X3331

## Academic Integrity

Academic integrity is essentially honesty in all academic endeavors. Academic integrity requires that students avoid all forms of academic misconduct or dishonesty, including plagiarism, cheating on tests or exams or any misrepresentation of academic accomplishment.

## Disclaimer

While every effort is made by the professor/faculty to cover all material listed in the outline, the order, content, and/or evaluation may change in the event of special circumstances (e.g. time constraints due to inclement weather, sickness, college closure, technology/equipment problems or changes, etc.). In any such case, students will be given appropriate notification in writing, with approval from the Dean (or designate) of the School.

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