**Course Syllabus**

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| **2025 CNU International Summer Session** |

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| **Course Title** | | | Basic Statistics | | | | | | | | | | | | | | | | | | |
| **Course Type** | | | In-class | | | | | | | | **Credits**  **(hours)** | | | 3 (45 hours) | | | | | | | |
| **Department** | | | Statistics | | | | | | | | **Professor** | | | Sohee Kang | | | | | | | |
| **Classification**  **(year in school)** | | | N/A | | | | | | | | **Course Code** | | | CLT0933 | | | | | | | |
| **Class room** | | | Natural Science 1 - 124 | | | | | | | | **E-mail** | | | Sohee.kang@utoronto.ca | | | | | | | |
| **Prerequisite(s)** | | | No prerequisites | | | | | | | | | | | | | | | | | | |
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| **Course objectives** | | | This course guides students through the process of conducting statistical investigations, encompassing data collection, data exploration, statistical inference, and drawing meaningful conclusions. | | | | | | | | | | | | | | | | | | |
| **Course Summary** | | | Statistics is the science of collecting, organizing, and interpreting data. In science, society, and everyday life, data helps us better understand the world and make informed decisions, while statistical methods distinguish meaningful insights from noise.  This course introduces key techniques in statistical work, with an emphasis on concepts and practical applications. It is designed to help students develop a solid understanding of how statistics can be applied in their respective fields.  Our ultimate goal is to derive meaningful insights from data, covering the entire process from data collection to analysis and drawing informed conclusions.  **Course Learning Outcomes**  On successful completion of the course, students will be able to:   * Understand, interpret, and conduct descriptive statistical analysis * Interpret regression analysis results * Understand basic concepts in probability theory and the characteristics of random variables * Understand and perform statistical inference based on interval estimation and hypothesis testing | | | | | | | | | | | | | | | | | | |
| **Teaching Methods** | | | **Teaching Methods** | | | | | | | | | | | | | | | | | | |
| Lecture | Presentation/Discussion | | | | Problem Based Learning | | | | Project Based Learning | Flipped Learning | | | Experiment/ Practices | | | | Others  (Describe) | |
|  | Presentation | | | | Bi-weekly quizzes with peers | | | |  |  | | | Bi-weekly data labs with peers | | | |  | |
| **Experiential Learning**:  Data lab (4 data labs) will be conducted at the end of lectures: graphical and numerical methods to describe the variables, scatter plots, and regression, simulation-based demonstration of sampling distributions, and one sample t-test. Students will write an appropriate analysis report using CMU's Integrated Statistics Learning Environment (ISLE)  (<https://www.stat.cmu.edu/isle/data_explorers.html>).  **Problem-based Learning**:  **Two-stage Quizzes** will be conducted at the end of lectures, comprising a 20-minute of individual quiz and a 20-minute group quiz. This was a simple way to introduce collaborative learning and formative assessment. The marking scheme allocated 60% for the individual quiz and 40% for the group quiz. Students are more intensely engaged with the material during quiz and they receive immediate feedback from their peers to correct the misunderstanding. The two-stage quiz contributed to reducing the stress and anxiety of quiz for students. | | | | | | | | | | | | | | | | | | |
| **Grading** | | | Mid-Term | Final | | Individual Tasks | | | Team Projects | | | Class participation | | | Attendance | | Others  (Describe) | | | | **Total** |
| **30%** | **40%** | |  | | | **Two stage quizzes and data labs**  **25%** | | |  | | | **5%** | |  | | | | **100%** |
| \* Please note **that if students do better in the final exam, then the midterm weight will be replaced by the final (final take up 70% instead of 40%)** since the final exam covers all learning materials.  ※ Pursuant Section 28 of the Guidelines on Class Management, grading methods can be adjusted for the physically impaired.  ※ Under Section 29 of the University Regulations on Academic Affairs, a student automatically fails a course in case of failure to attend more than 3/4 classes. (More than four(4) times absence) | | | | | | | | | | | | | | | | | | |
| **Accommodations for Handicapped** | | | - Visually impaired: provision of course related materials in audio, note taking helper, permission to record the lecture  - Audibly impaired: provision of course related materials in visual, note taking helper, permission to have e-learning lectures in sign language or shorthand  - Physically or mentally challenged: provision of course related materials, note taking helper, permission to record the lecture   * Any other requests that are considered necessary: provision of assisted   ingress and egress to the classrooms and other supports | | | | | | | | | | | | | | | | | | |
| **Textbooks & References** | | | | | | | | | | | | | | | | | | | | | |
| Category | Title | | | | Author | | | | | | | Publisher | | | | | | | Year of publication | | |
| Main textbook | **STATS-Data and Models** | | | | De Veaux, Velleman, and Bock | | | | | | | Pearson | | | | | | | 2016 | | |
| Others | **Introduction to Statistical Investigations** | | | | Nathan Tintle et al | | | | | | | Wiley | | | | | | | 2016 | | |
| Reference | Introductory Statistics with R by Peter Dalggard, Springer, 2008 | | | | | | | | | | | | | | | | | | | | |
| **Daily Course Schedule** | | | | | | | | | | | | | | | |
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| **Day**  **(3hurs)** | **Lecture Topic** | **Hours per day** | **Method of Instruction** | **Class Materials & Assignments** |
| 1 | Introduction to Statistical investigation and introduction to ISLE Interface | 3 | Power point presentation | ISLE statistical tools demonstration |
| 2 | Describing and summarizing Categorical Data and Quantitative Data | 3 | Power point presentation | Data Lab 1 |
| 3 | Comparing Distributions, SD as ruler and normal model | 3 | Power point presentation | Two-stage Quiz 1 |
| 4 | Scatter plots and Correlation | 3 | Power point presentation |  |
| 5 | Linear Regression | 3 | Power point presentation | Data Lab 2 |
| 6 | Regression Wisdom and understanding randomness | 3 | Power point presentation | Two-stage Quiz 2 |
| 7 | Randomness to probability Probability Rules | 3 | Power point presentation | Two-stage Quiz 3 |
| 8 | **Midterm Exam** | 3 |  |  |
| 9 | Random Variables | 3 | Power point presentation |  |
| 10 | Sampling distributions and confidence intervals for proportion | 3 | Power point presentation | Two-stage Quiz 4 |
| 11 | Testing hypotheses about proportion  More about Tests | 3 | Power point presentation | Data Lab 3 |
| 12 | Inference about Means | 3 | Power point presentation | Two-stage Quiz 5 |
| 13 | Comparing Means | 3 | Power point presentation | Data Lab 4 |
| 14 | Comparing Two Proportions | 3 | Power point presentation |  |
| 15 | **Final Exam** | 3 |  |  |