McGill University
Department of Sociology
Sociology 622 – Event History Analysis
Fall 2019

Professor: Céline Le Bourdais
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Office: Peterson Hall Room 314
Phone: 514-398-6840
Office Hours: Tuesday 14:00 – 16:00 and by appointment
Seminar / Lab: Peterson Hall Room 310
Time: Tuesday, 8:35 – 11:25

Required text:

Other Material:
Online articles noted in Syllabus, lectures and exercises on myCourses.

General description and objectives:
This course is designed to introduce students to the practical application and interpretation of event history analysis (also known as survival analysis and hazard/risk analysis) in the social sciences. Event history analysis refers to a set of statistical methods used to analyze change from one state to another in longitudinal data that are able to explicitly model time dependence and the effects of independent variables on the timing and likelihood of the transition. Social life is replete with such transitions: examples on individual level include such things as marriage, births, divorce, entry into the labor market and entry into college.

The course will cover the basics of the method and data structure, and implementation using the software package STATA. Substantive topics will include parametric, semi-parametric and non-parametric models, as well as extensions to the analysis of multiple events and dealing with unobserved heterogeneity (frailty). Each topic will be explored through a combination of substantive examples, mathematical formulation, and practical application using STATA.

Students will become familiar with the logic of longitudinal analyses, and of event history analysis in particular. They will become comfortable with the evaluation and critique of empirical research employing event history analysis and will become competent in the application of standard and advanced methods of this type of analysis.

Evaluation:
Learning statistical analyses requires constant reading and practice. Consequently, first there will be both laboratory exercises and homework assignments. These are designed to give you experience with the materials and methods covered in the readings and during the lecture and
discussion portions of the seminar. The second component of the evaluation will be in the form of a proposal for a research project using either Statistics Canada 2011 General Social Survey or another survey tailored to your project. The third component will be the completion of the research project itself.

**Homework Assignments:** There will be four (4) homework assignments, which will be worth 15% a piece. Dates of distribution and collection are noted below in the tentative calendar of dates.

**Project Proposal:** The project proposal will identify a research question and ancillary hypotheses involving a theoretical/substantive problem that can be addressed through event history analysis, and include a brief literature review (at least three journal articles that use event history analysis concerning their topic, or one similar enough substantively or methodologically to inform their research). The project proposal is due on **November 5** and is worth **10%**.

**Research Project:** The research project should take the form of a journal article and contains: 1) an introduction to the problem; 2) a brief literature review; 3) a statement of the aims of the analysis; 4) a description of the data source to be used, and construction of data analysed (generated variables, analytic sample selection); 5) a results section that will begin with simple life table description and then proceed with event history analysis; and 6) a discussion/conclusion. Students should also note explicitly limitations of their analyses in this section. The paper is due **December 6** and is worth **30%**. On the last day of class (November 26), students will be invited to present their research (a short 15-minute presentation).

**Disability and illness policies:**

Individuals with university recognised disabilities will be afforded special considerations in the setting of examination times and venues and depending on the type of disability may be given extra time to complete the required work. Assignments and/or projects that are late due to illness will not be accepted without an authoritative third-party excuse and explanation. Examinations will not be re-scheduled without the same considerations.

**Health and Wellness Resources at McGill:**

Student well-being is a priority for the University. All of our health and wellness resources have been integrated into a single Student Wellness Hub, your one-stop shop for everything related to your physical and mental health. If you need to access services or get more information, visit the Virtual Hub at mcgill.ca/wellness-hub or drop by the Brown Student Services Building (downtown) or Centennial Centre (Macdonald campus). Within your faculty, you can also connect with your Local Wellness Advisor (to make an appointment, visit mcgill.ca/lwa).

**Academic Integrity:**

*McGill University values academic integrity. Therefore all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures (see [www.mcgill.ca/integrity](http://www.mcgill.ca/integrity) for more information).*
Right to submit in English or French written work that is to be graded:

_In accord with McGill University’s Charter of Students’ Rights, students in this course have the right to submit in English or in French any written work that is to be graded._

**Course Outline & Schedule**

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<thead>
<tr>
<th>Week 1</th>
<th>September 3</th>
<th>Introduction: Longitudinal Data and Analysis. Stata and Data Sets</th>
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<tbody>
<tr>
<td>Week 2</td>
<td>September 10</td>
<td>Basic Concepts in Survival Analysis: Event, Timing, Spell, Censoring and Truncation</td>
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<td>Week 3</td>
<td>September 17</td>
<td>Life Tables and Survivor Functions</td>
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<td>Week 4</td>
<td>September 24</td>
<td>Maximum Likelihood Estimation and Parametric Models</td>
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<td>Week 5</td>
<td>October 1</td>
<td>Parametric Models Continued: Changing Hazards with Time in Exponential Models; Piecewise Exponential Model</td>
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<td>Week 6</td>
<td>October 8</td>
<td>Discrete Time Models</td>
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<td>Week 7</td>
<td>October 15</td>
<td>Semi-parametric (Proportional Hazard) Models</td>
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<td>Week 8</td>
<td>October 22</td>
<td>Time Varying Covariates and Interactions: Exponential and PH Models</td>
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<td>Week 9</td>
<td>October 29</td>
<td>Non-Proportionality, Stratification and Interaction</td>
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<td>Week 10</td>
<td>November 5</td>
<td>Specification/Model Selection/Residual Analysis</td>
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<td>Week 11</td>
<td>November 12</td>
<td>Competing Risks</td>
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<td>Week 12</td>
<td>November 19</td>
<td>Frailty and Repeated Events</td>
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<td>Week 13</td>
<td>November 26</td>
<td>Special Topics/Review. Presentation of students’ research.</td>
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**Calendar of Exercises and Papers**

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<tr>
<th>Exercise 1</th>
<th>Distributed</th>
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<tr>
<td>Exercise 2</td>
<td>September 17</td>
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<tr>
<td>PROJECT PROPOSAL</td>
<td>October 29</td>
<td>November 12</td>
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<th>Project Proposal</th>
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<tr>
<td>Research Project</td>
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<td>December 6</td>
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Schedule and Readings

1. **Introduction** (September 3)
   
   Longitudinal data and analysis. Presentation of class data sets.
   
   **Introduction to Stata**: Basic Commands, Help, [UCLA guide to STATA](http://www.ucla.edu/)

2. **Basic Concepts in Survival Analysis: Event, Timing, Spell, Censoring and Truncation** (September 10)
   
   Cleves et al., Chapters 1 & 4, Chapter 6 for lab
   

3. **Life Tables and Survivor Functions** (September 17)
   
   Cleves et al., Chapters 2 & 8
   
   Proulx, Christine. 2014. “The Provision of Unpaid Care over the Life Course – Changes across Cohorts and Genders”. Pp. 27-42 in *Juggling Spheres of Life: The Provision of Unpaid Care over the Life Course and Its Impact on Men’s and Women’s Employment Trajectories*. McGill University, Department of Sociology, Ph.D. thesis. (available on [eScholarship@McGill](http://escholarship@mcgill))

4. **Maximum Likelihood Estimation and Parametric Models** (September 24)
   
   Cleves et al., Chapters 12-13
   

5. **Parametric Models Continued: Changing Hazards with Time in Exponential Models; Piecewise Exponential Model** (October 1)
   
   

6. **Discrete Time Models** (October 8)
   
   

7. **Semi-parametric (Proportional Hazard) Models** (October 15)
   
   Cleves et al., Chapters 9.1-9.2, 10.1-10.2
   

8. **Time Varying Covariates: Exponential and PH Models** (October 22)
   
   Cleves et al., Chapter 10.5

9. Non-Proportionality, Stratification and Interaction (October 29)
   Cleves et al., 9.3, 10.4, 11.1

10. Specification/ Residual Analysis/ Weights (November 5)
    Cleves et al., Chapter 11.2
    Other reading TBA

11. Competing Risks (November 12)
    Cleves et al., Chapter 17

12. Repeated Events and Data Construction (November 19) – Invited lecturer: Ana Fostik (Statistics Canada)
    Cleves et al., Chapters 9.4, 15.1

13. Special Topics/Review; Students’ presentation (November 26)