

## Course Outline - CHL 5228H Y

### **STATISTICAL METHODS FOR GENETICS & GENOMICS - RESEARCH SEMINAR AND JOURNAL CLUB 2017-2018**

#### **TIME and PLACE:**

**Fall term** 10am – 12noon Friday (Health Sciences Room 614)

**Winter term** 10am - 12noon Friday (Health Sciences Room TBA)

Seminar: 1 hour; Small Group Discussion: 1 hour.

<http://www.dlsph.utoronto.ca/students/current-students/timetables/>

#### **Co-INSTRUCTORS:**

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## **A. COURSE OVERVIEW**

### **Goals and Objectives:**

To obtain basic understanding of current developments in statistical genetic/genomic methods and current analytic issues in genetic epidemiology.

To become cognizant of sources of methodology literature for the design and analysis of investigations in statistical genetics, statistical genomics, and genetic epidemiology.

To develop critical evaluation skills for underlying theory and/or applications of current study designs and statistical analysis methods.

To develop skills in communication and presentation in an inter-disciplinary setting.

**Audience:** PhD Graduate students in Biostatistics, Epidemiology or Statistics

**Pre-requisites:** Biostatistics/Statistics coursework at the graduate level and instructor permission

**Co-requisites:** Fundamentals of Genetic Epidemiology, CHL5430H Fall Term  
<http://www.dlsph.utoronto.ca/course/fundamentals-of-genetic-epidemiology/>

Fundamentals of Statistical Genetics, STA2080H Winter Term  
<http://www.utstat.toronto.edu/sun/funstatgene-index.html>

### **Special features about course delivery:**

One hour Research Seminar/Journal Club session, held 2-3 times per month, September through April with faculty participation.  
Seminar sessions will be followed by one hour small-group discussion for registered students and other participants, with faculty discussion leaders

Co-ordinated with the monthly International Speaker Seminar Series (ISSS) organized as part of the STAGE Training Program in Advanced Genetic Epidemiology.

<http://www.stage.utoronto.ca/home/iss>

ISSS held Friday at 12 noon followed by Informal post seminar Q&A with guest speaker. Light refreshments served.

**Class size for discussion:** 4-8 trainees (PhD students and post-doctoral fellows).

### **Faculty Discussion leaders:**

Shelley Bull, Dalla Lana School of Public Health & Lunenfeld-Tanenbaum Research Institute

Andrew Paterson, Dalla Lana School of Public Health & SickKids Research Institute

### **Academic deadlines:**

Deadline for scheduling student presentations: 1 December 2017.

Deadline to submit a one page paper outline: no later than 16 February, 2018.

Due date for the Final paper: 6 April 2018.

## **B. ASSIGNMENTS AND EVALUATION**

Students are expected to:

- (1) attend Friday journal club sessions and seminars, including ISSS
- (2) present in one journal club session, and
- (3) submit a short paper.

Pass/Fail according to

Participation in Seminars and Discussion Groups  
Presentation (Late Fall 2017 or Winter term 2018)  
Final paper (due April 6, 2018)

*A pass is required in all three components*

### **Some guidelines for the paper**

Final paper is due April 6, 2018.

Please set up a meeting with course faculty to formulate the research question that you want to consider in the paper, and discuss how to address it.

Submit a one page outline no later than February 16, 2018.

Formatting and Length:

Any standard journal style is acceptable, see for example guidelines for authors in *Genetic Epidemiology*, *Statistics in Medicine*, *Amer J of Human Genetics*.

Please submit with 12 pt font, and 1.5 line spacing.

Length of 10-15 (max) manuscript pages, excluding references, tables and figures.

### **C. STATISTICAL SOFTWARE**

No special requirements.

### **D. STANDARD NOTICES**

#### **Plagiarism**

The Code of Behaviour on Academic Matters (University of Toronto Governing Council Secretariat, 1991) reads:

*“ It shall be an offence for a student knowingly:*

- *to represent as one's own any idea or expression of an idea or work of another in any academic examination or term test or in connection with any other form of academic work, i.e. to commit plagiarism;*
- *to submit, without the knowledge and approval of the instructor to whom it is submitted, any academic work for which credit has previously been obtained or is being sought in another course or program of study in the University or elsewhere;*
- *to submit any academic work containing a purported statement of fact or reference to a source which has been concocted;” (B.1.d-f)*

#### **Academic deadlines and policy on late assignments**

Deadline for scheduling student presentations: 1 December 2017.

Deadline to submit a one page paper outline: no later than 16 February 2018.

Due date for the Final paper: 6 April 2018.

## E. DETAILED SEMINAR AND EVALUATION SCHEDULE (subject to revision)

- September 22      10 am – IGES Reports / Organization for Journal Club  
11 am – First Class for CHL Course Participants
- September 29      10 am – Statistical & Computational Methods  
Topic: Virtual ChIP-seq: Predicting transcription factor binding by learning from the transcriptome  
Abstract: <https://goo.gl/jzZ4h5>  
Presenter: Mehran Karimzadeh, Michael Hoffman, MedBiophysics &PMH
- October 6            12 noon – STAGE International Speaker Seminar  
Cristen Willer, University of Michigan  
<http://www.stage.utoronto.ca/home/iss>  
  
Topic: Insights into Human Health & Cardiometabolic Disease Using Large-Scale Genomics
- October 13          10 am – Journal Club  
Reading: An Expanded View of Complex Traits: From Polygenic to Omnigenic, Boyle, Li & Pritchard (2017)  
Presenter: Andrew Paterson, SickKids  
<http://www.sciencedirect.com.myaccess.library.utoronto.ca/science/article/pii/S0092867417306293>
- October 20          No Seminar \* ASHG October 17-21, Orlando \*
- October 27          10 am – Reports from ASHG Meeting
- November 3          12 noon – STAGE International Speaker Seminar  
Matthew Stephens, University of Chicago  
<http://www.stage.utoronto.ca/home/iss>
- November 10        10 am – Seminar/Journal Club
- November 17        10 am – Statistical & Computational Methods  
Topic: Statistical Analysis of Imaging Genetics Data  
Presenter: Dehan Kong, Statistical Sciences
- November 24        10 am – Seminar/Journal Club
- December 1          12 noon – STAGE International Speaker Seminar  
Michael Nalls, National Institute of Health  
<http://www.stage.utoronto.ca/home/iss>
- \* last week of classes Nov 27 – Dec 1 \*  
\* deadline to schedule course presentation Dec 1 \*
- December 15        10 am – Statistical & Computational Methods  
Topic: X-chromosome Association on Microbiome Data  
Presenters: Osvaldo Espin-Garcia, Wei Xu, Biostatistics & PMH

\*\*\*\*\* 2018 \*\*\*\*\*

- January 12 10 am – Seminar/Journal Club  
\* first week of classes Jan 8-12
- January 19 10 am – Statistical & Computational Methods  
Topic: A Novel Bayesian Approach for Region-Based Analysis of Next Generation Sequencing Data  
Presenters: Laurent Briollais, Amelia Xu, Biostatistics & LTRI
- January 26 10 am – Seminar/Journal Club
- February 2 12 noon – STAGE International Speaker Seminar  
<http://www.stage.utoronto.ca/home/iss>
- February 9 10 am – Seminar/Journal Club
- February 16 10 am – Statistical & Computational Methods  
Topic: Zero-inflated methods for microbiome data  
Presenter: Qiang Sun, Statistical Sciences
- \* Feb 16 deadline to submit paper outline \*
- February 23 No seminar – Reading Week \* Feb 26 final date to drop course \*
- March 2 12 noon – STAGE International Speaker Seminar  
<http://www.stage.utoronto.ca/home/iss>
- March 9 10 am – Seminar/Journal Club
- March 16 10 am – Statistical & Computational Methods \* winter break \*
- March 23 10 am – Seminar/Journal Club
- March 30 No Seminar – Good Friday Holiday
- April 6 12 noon – STAGE International Speaker Seminar  
Nilanjan Chatterjee, Johns Hopkins University  
<http://www.stage.utoronto.ca/home/iss>

April 2-6 \*\* Last week of classes

April 6 \*\* Due date for final student papers

**Seminars continue through April-May 2017:**

- April 13 10 am – Seminar/Journal Club
- April 20 10 am – Statistical & Computational Methods  
Topic: BOSS: Best Ordered Subset Analysis  
Presenters: Emery Gossens, Lei Sun, Statistics
- April 27 10 am – Seminar/Journal Club

May 4 12 noon – STAGE International Speaker Seminar  
Gilean McVean, University of Oxford  
<http://www.stage.utoronto.ca/home/iss>

May 11 10 am – Seminar/Journal Club  
May 18 *No Seminar - Victoria Day Weekend*  
May 25 10 am - Seminar/Journal Club

June 1 12 noon – STAGE International Speaker Seminar  
Carl Langefeld, Wake Forest University  
<http://www.stage.utoronto.ca/home/iss>

\* Statistical Society of Canada, June 3 - 6, Montreal \*

\* Canadian Human & Statistical Genetics Meeting, June 10 - 13, Harrison Hot Springs, BC \*