1.0 CALENDAR DESCRIPTION
This course covers most statistical procedures used in experimental research. Data analysis will be conducted using SPSS for Windows. Topics covered include the $t$-test, various forms of analysis of variance, bivariate correlation, simple and multiple regression, factor analysis, and multivariate analysis of variance to name a few. Students will become familiar with reporting research findings and writing a result section for a scientific manuscript.

Prerequisites: At least one undergraduate statistics course and entry into Medical Biophysics graduate program.

2.0 COURSE INFORMATION
Instructor: Yves Bureau PhD

Office: E5-136, 268 Grosvenor (St Joseph’s hospital)

Phone Number: 646-6000 ext 65739

Office Hours: By appointment

Time and Location(s) of Lecture(s):

Lecture: Wednesday 7:00-10:00pm at Somerville House - Rm. 3355
Directions to SH, Rm 3355: http://www.classfind.com/western/room/SV3355

3.0 TEXTBOOK (optional but highly recommended)


4.0 COURSE OBJECTIVES and LEARNING OUTCOMES

This course introduces students to the use of inferential statistical software. Emphasis is placed on the use of SPSS for WINDOWS on microcomputers. A license for SPSS may be purchased from the computer store at UWO for approximately $125.00 as a stand-alone program or you can access it via UWO online.

The major portion of the lectures deals with the rationale and application of various statistical procedures. Lectures focus on selected univariate and multivariate
There are no laboratories. There will be assignments that will help the student familiarize themselves with SPSS and the statistical procedures.

Learning outcomes include:
- Students will be able to perform a wide variety of statistical tests using their own datasets and SPSS.
- Students will deeply understand Type I and Type II error and how to adjust for small sample sizes.
- Students will have a deep understanding of the meaning of correlations and regressions including logistic regression and how to properly perform them using SPSS.
- Students will be expert in performing single independent variable analysis of variance and single independent variable repeated measures designs.
- Students will understand the need for and the role of posthoc analysis for all statistical designs and the role of completely randomized factorial designs and ANCOVA/MANOVA.
- Students will learn Split plot factorial designs/ Posthoc Analysis.
- Students will learn how and when to use Chi-Square or similar techniques.
- Students will be involved in a discussion and demonstration of non-parametric tests.
- Students will be introduced to Sample size analysis and power calculations.

5.0 EVALUATION

(30%) There will be three assignments which will help the students familiarize themselves with SPSS and the course material.

(70%) There will be one three day take home exam in which the students will have to answer questions by analyzing a series of databases.

6.0 TEST AND EXAMINATION SCHEDULE

No pre-exam tests. The exam will be scheduled by class consensus.
7.0 LECTURE SCHEDULE (This is tentative. Subject to change.)

LECTURE (This is a guideline only and can change without warning in order to fulfill the needs of the class)

<table>
<thead>
<tr>
<th>Date</th>
<th>Major Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Jan 11</td>
<td>Introduction. What are statistics? How should we think about them.</td>
</tr>
<tr>
<td></td>
<td><strong>Assignment 1 given.</strong></td>
</tr>
<tr>
<td>3. Jan 25</td>
<td>Monte Carlo Methods (Type I and Type II error).</td>
</tr>
<tr>
<td>4. Jan 27</td>
<td>Correlation and Regression.</td>
</tr>
<tr>
<td></td>
<td><strong>Assignment 1 due.</strong></td>
</tr>
<tr>
<td>5. Feb 1</td>
<td>Multiple Correlation and Regression.</td>
</tr>
<tr>
<td></td>
<td><strong>Assignment 2 given.</strong></td>
</tr>
<tr>
<td>6. Feb 8</td>
<td>Single independent variable analysis of variance. Single independent variable</td>
</tr>
<tr>
<td></td>
<td>repeated measures designs. Posthoc analysis for these designs.</td>
</tr>
<tr>
<td>7. Feb 15</td>
<td>Completely randomized factorial designs and ANCOVA. Split plot factorial</td>
</tr>
<tr>
<td></td>
<td>designs/Posthoc Analysis.</td>
</tr>
</tbody>
</table>

**Note:** Week of February 20th no class (Conference week).

|           | **Assignment 2 due.**                                                        |
|           | **Assignment 3 given.**                                                      |
| 9. Mar 8  | Factor Analysis. Chi-Square or other relevant techniques. Discussion and    |
|           | demonstration of non-parametric tests.                                       |
| 10. Mar 15 | Logistic Regression (given time), Sample size analysis.                      |
| 12. Mar 29 | Miscellaneous tests presented.                                              |
|           | **Assignment 3 due.**                                                        |
| 13. Apr 5 | Review.                                                                      |

Exam to be scheduled in consensus with students
8. Other Considerations

Statement on Academic Offences
Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_grad.pdf.

Attendance Policy:
All classes are mandatory, unless otherwise stated. Any student who, in the opinion of the course co-ordinator is absent too frequently from class or laboratory periods in any course, will receive a failing grade after due warning has been given in writing from the course co-ordinator and Graduate Chair.

Cheating and Plagiarism Policy:
Students are encouraged to work together, but each student must take total responsibility for his/her submitted work. Students must write their laboratory reports and final projects in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. University policy states that cheating, including plagiarism, is a scholastic offence. The commission of a scholastic offence is attended by academic penalties which might include expulsion from the program. If a student is caught cheating, there will be no second warning.

All written reports and projects may be subject to submission for textual similarity review to commercial plagiarism detection software under license to the University for the detection of plagiarism. All reports will be included as source documents on the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between the University of Western Ontario and Turnitin.com (http://www.turnitin.com).

Use of Electronic Devices Policy:
No electronic devices (e.g., cell phones, MP3 players) may be used during lectures or examinations unless otherwise stated. The use of non-programmable calculators is permitted during examinations; programmable calculators are prohibited during examinations.

OWL Internet/Bulletin Board Policy:
It is the student’s responsibility to read the course website posted on Western’s on-line learning management system, OWL (https://owl.uwo.ca/portal). This includes the course bulletin board and all information and/or assignments posted about the course. If the student fails to act on information that has been posted on the course site and does so without a legitimate explanation (i.e., those covered under the illness/compassionate form), then there are NO grounds for an appeal.

Request for Assignments Extensions:
Students are advised to inform the course co-ordinator as soon as possible regarding an
extension for assignment submissions due to medical reasons or other compassionate reasons. Extensions will only be granted by the course co-ordinators at their discretion.

**Absence Due to Medical Illness:**
Students must familiarize themselves with the Policy on Accommodation for Medical Illness: [https://studentservices.uwo.ca/secure/index.cfm](https://studentservices.uwo.ca/secure/index.cfm)
If you are unable to meet a course requirement due to illness or other serious or compassionate circumstances, you must provide valid medical or other supporting documentation to the course co-ordinator immediately. It is the student’s responsibility to make alternative arrangements with the co-ordinator to complete missing course requirements.

A student requiring academic accommodation due to illness, should use the Student Medical Certificate: [http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf) when visiting an off-campus medical facility or request a Record's Release Form for visits to Student Health Services.

The form is available at: [http://www.health.uwo.ca/services/students/policies.html](http://www.health.uwo.ca/services/students/policies.html). The release form will allow the course co-ordinator to confirm with Student Health Services that a student’s absence from regular attendance or inability to meet scheduled course commitments is due to medical reasons. The nature of the illness will not be divulged by Student Health Services.

**Graduate Students’ Mental Health and Physical Wellness:**
As part of a successful graduate student experience at Western, students are encouraged to make their health and wellness a priority. Western provides several on campus health-related services to help you achieve optimum health and engage in healthy living while pursuing your graduate degree. For example, to support physical activity, all students, as part of their registration, receive membership in Western’s Campus Recreation Centre: [http://www.uwo.ca/campus_life/athletics.html](http://www.uwo.ca/campus_life/athletics.html)

All facets of extracurricular campus life in which graduate students can participate are available on this URL: [http://www.uwo.ca/campus_life/arts_culture.html](http://www.uwo.ca/campus_life/arts_culture.html)

Information regarding health and wellness-related services available to students may be found at [http://www.health.uwo.ca](http://www.health.uwo.ca). Students seeking help regarding mental health concerns are advised to speak to someone in whom they feel comfortable confiding, such as their graduate supervisor, their program director (Graduate Chair), or other relevant administrators in their unit. Campus mental health resources may be found at: [http://www.health.uwo.ca/mental_health/resources.html](http://www.health.uwo.ca/mental_health/resources.html)

**Accessibility to the Course and Course Materials:**
Please contact the course co-ordinator if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 for any specific question regarding an accommodation.