St. Francis Xavier University
Department of Mathematics, Computing and Information Systems
Math/Biology 331 - Statistical Methods/Biostatistics

Instructor: Aaron Childs
Office: Basement, Nicholson Annex 20
Phone: 867-5402
E-mail: achilds@juliet.stfx.ca
Web Site: http://www.stfx.ca/people/achilds/welcome.html
Office Hours:

	Monday	Tuesday	Wednesday	Thursday	Friday
8:15-9:15	Math 433			Math 331	
9:15-10:15	Office Hours	Office Hours	Office Hours	Office Hours	Office Hours
10:15-11:15	Office Hours	Math 331	Math 433	Office Hours	Office Hours
11:15-12:15				Math 433	Math 331
12:15-1:15					
1:15-2:15	Math 231		Math 231	Math 231	
2:15-3:15	Office Hours	Math 372	Office Hours		
3:15-4:15		Math 372			
4:15-4:45		Math 372			

COURSE INFORMATION

Lectures: NH 21, Tuesdays 10:15, Thursdays 8:15, and Fridays 11:15

Labs: Xavier Hall 126, Monday at 9:15 and 1:15, Wednesday at 2:15, Thursday at 9:15 and 10:15 and 2:15 on the weeks given below

Optional Reference Book: *Fundamentals of Biostatistics*, Fourth Edition by Bernard Rosner. Duxbury Press

Calculators: Any calculator can be used on the tests and exam.

Formula Sheet: Some formulas will be given on the tests and exam.

Assignments: There will be six assignments, due at the beginning of class on the following dates:

Assignment #1: Due on Tuesday January 20
Topics: Chapter 9 - Multisample Inference, Analysis of Variance
- Review of the Two-Sample t-Test
- One-way Analysis of Variance
- Pairwise comparisons - Bonferroni T-tests

Assignment #2: Due on Tuesday February 3
Topics: More Experimental Design

- Review of the Paired Samples t-Test
- Randomized complete block design
- Checking the assumptions: residual analysis

Assignment #3: Due on Tuesday February 17
Topics: Chapter 10 - Hypothesis Testing for Categorical Data

- Review of Two sample test for binomial proportions
- Chi-Square test, and Fisher's Exact Test
- Chi-Square Goodness of Fit Test
- $R \times C$ Contingency Tables: $R \times C$ test for independence, $R \times C$ test for homogeneity.
- Confounding and Simpson's Paradox

Assignment #4: Tuesday March 10
Topics: Chapter 12 - Nonparametric Methods

- Nonparametric alternatives to the one-sample t-test: Sign test for the Median, and Wilcoxon Signed-Rank Test
- The nonparametric two-sample t-test and paired comparison design: Wilcoxon Rank-Sum Test and Wilcoxon Signed Rank Test for Paired Observations
- Nonparametric one-way ANOVA: Kruskal-Wallis Test
- Nonparametric alternative to the Randomized Block Design: Freidman Test

Assignment #5: Tuesday March 24
Topics: Chapter 11 - Simple Linear Regression and Correlation

- Fitting Regression Lines - The Method of Least Squares
- Inferences About Parameters from Regression Lines
- Prediction Intervals and Confidence Intervals
- Assessing the Goodness of Fit of Regression Lines
- Residual Analysis - Checking for Normality
- The Correlation Coefficient
- Coefficient of Determination

Assignment #6: Tuesday April 7
Topics: More Chapter 11 - Multiple Regression

- Multiple Regression - Interval Estimation, Hypothesis Testing, Prediction and Confidence Intervals on a Predicted Response, Testing a Subset of Predictor Variables
- Use of Indicator or "Dummy" Variables
- Confounding and Interaction in Regression
- Polynomial Regression

Labs: There will be six labs, to be held the week of:

Lab #1: The week of January 19 to 23
Lab #2: The week of February 2 to 6
Lab #3: The week of February 16 to 20
Lab #4: The week of March 9 to 13
Lab #5: The week of March 23 to 27
Lab #6: The week of April 6 to 10

Tests and Final Exam: The tests and exam will be on the following dates:

Quiz #1	Tuesday January 13
Quiz #2	Tuesday January 27
Test #1:	Tuesday February 10
Quiz #3	Tuesday March 3
Test #2:	Tuesday March 17
Quiz #4	Tuesday March 31

Final Exam: To be determined

Course Evaluation:

Assignments:	10%
Labs:	10%
Test 1:	15%
Test 2:	15%
Quizzes:	10%
Final Exam:	40%