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 331	
9:15-10:15		Office Hours		Office Hours	Office Hours
10:15-11:15		Math 331		Office Hours	Office Hours
11:15-12:15					Math 331
12:15-1:15					
1:15-2:15	Math 231		Math 231	Math 231	
2:15-3:45	Office Hours		Office Hours		
3:45-5:00	Math 333		Math 333		

COURSE INFORMATION

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

Labs: **NH22:** Mondays at 9:15, Wednesday and Thursday at 2:15
NH123: Thursdays at 9:15, 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: dates: There will be six assignments, due at the beginning of class on the following

Assignment #1: Due on Tuesday January 19
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 2
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 16
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 9
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 23
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 6
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 18 to 22
Lab #2: The week of February 1 to 5
Lab #3: The week of February 15 to 19
Lab #4: The week of March 8 to 12
Lab #5: The week of March 22 to 26
Lab #6: The week of April 5 to 9

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

Quiz #1	Tuesday January 12
Quiz #2	Tuesday January 26
Test #1:	Tuesday February 9
Quiz #3	Tuesday February 23
Test #2:	Tuesday March 16
Quiz #4	Tuesday March 30

Final Exam: 9:00am on Thursday April 15

Course Evaluation:

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