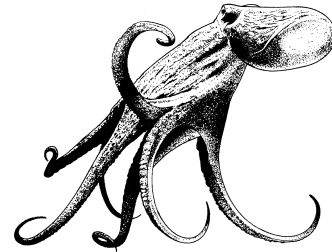


**Introduction to Experimental Design and Statistics**  
**BI 399**

Instructor: Brian Bingham  
Meeting time: M-F 9-5  
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**Course Objectives:** An introduction to experimental design and statistics. This course is designed for juniors and seniors in the biological sciences who want to become more conversant with experimental design and the use of appropriate statistical tests. It will cover data analysis and tests commonly used in biological science. Topics will include descriptive statistics, hypothesis testing, analysis of variance, correlation, regression and experimental design. Course will emphasize practical approaches to real data using the rich marine environment of the Oregon coast.

Materials Needed:

- There is no text. We will use articles from the primary literature and class notes. You may want to have access to a good statistics reference book. I recommend the following, but any introductory statistical book will do:

Quinn, G.P. and M.J. Keough (2002). *Experimental Design and Data Analysis for Biologists*. Cambridge Univ. Press, Cambridge.

Sokal, R.R. and F.J. Rohlf (1995). *Biometry*. W.H. Freeman, N.Y.

Zar, J.H. (1999). *Biostatistical Analysis*. Prentice-Hall, Englewood Cliffs, N.J.

Evaluation of Work:

Midterm exam:	100
Final exam:	100
Homework assignments (8 @ 10 points each)	80
<u>Literature presentations (2 @ 5 each)</u>	<u>10</u>
Total:	290

## Introduction to Experimental Design and Statistics: BI 399

	<u>Date</u>	<u>Discussion Topic</u>
Aug	20 AM	What is (are?) statistics?
	PM	Populations: Parameters and pitfalls
	21 AM <sup>*1</sup>	Comparing samples? Try a <i>t</i>
	PM	Dealing with paired samples
	22 AM <sup>*2</sup>	What can we assume about assumptions?
	PM	Clean glassware, big samples and other keys to power
	23 AM <sup>*3</sup>	t-test = 1-way ANOVA
	PM	Comparing multiple groups: Pairwise comparisons
	24 AM <sup>*4</sup>	Testing more than one factor with ANOVA
	PM	<b>Midcourse Exam</b>
	27 AM	ANOVA, ANOVA again
	PM	“Pseudoreplication” produces “pseudostatistics”
	28 AM <sup>*5</sup>	Correlation: What is it and what can it tell us?
	PM	Regression analysis for prediction
	29 AM <sup>*6</sup>	Regression analysis for explanation
	PM	Regression for dummies (dummy variables that is)
30 AM <sup>*7</sup>	Goodness-of-fit, contingency tables	
PM	What can I do with complex data?	
31 AM <sup>*8</sup>	Review	
PM	<b>Final Exam</b>	

**\*Homework assignment due**