BioStatistics – Fall 2017
(BioSci 465)

Instructor: Dr. Peter Dunn
Lapham 497 (south wing)
ph: 229-2253
e-mail: pdunn@uwm.edu

Lecture times: Tues, Thurs 1100-1215 (PM) in Chemistry 180 <- May change
Office hours: Please email or talk to me for an appointment.

Course topics: Introductory statistics with application to biology. Includes descriptive
statistics, hypothesis testing, t-tests, ANOVA, regression, and Chi-
square.

Required Textbook: The Analysis of Biological Data by Whitlock & Schluter
Last year the book sold for $100 from an independent publisher, but they got bought
by MacMillan (which then raised the price!). So I would advise you to get a used
copy, which is available online for much less. You can also rent a copy ($35 on
Amazon.com) or share one with a friend if you want to reduce your costs.

Optional extra credit: Extra-credit is primarily completed using TopHat (tophat.com),
a student response system that works through phones or mobile devices. You will
need to register your mobile phone or laptop with TopHat to answer questions in
class. I will use your TopHat responses for part of your extra credit (see below - up to
10% of your grade). The questions asked in class will be similar to the exam
questions (some will be very similar!), so this will give you practice for the exams.
These questions will not be given outside of class, so you need to come to class to
see what type of questions will be on the exams.

You will need to register online at https://tophat.com/ as a student and pay the fees
there, if you have not registered for another class at UWM that uses TopHat (e.g.,
Genetics, or Birds of Wisconsin). The current advertised fees are $24 for the term,
$36 for a year, and $72 lifetime.

The tophat site has instructions on how to use the system. You will need to bring to
class a mobile device (cell-phone, tablet, or laptop) to be able to answer the
TopHat quizzes. Don't forget to charge your battery. A text message from an older
cell phone can also be used to answer the questions (see the TopHat site for details).
Use UWM-WiFi to connect your laptop or mobile device when answering TopHat
quizzes in class, the UWMPublic connection is known to log out and cause failure to
upload your answers.
Homework problems and examples in lecture (TopHat questions) will generally come from the textbook, so you need a copy of the textbook. You will do better in this class if you study the textbook! Exams will be based on material in lecture, textbook, and homework.

Class format

Course material will be delivered via lecture and class discussion. Lecture slides will be available on the course Desire2Learn site (http://D2L.uwm.edu). The site will have some of my lecture slides in Powerpoint or PDF format. I suggest you print them out and bring them to class so you can write down notes during lecture.

IMPORTANT: This class requires regular participation. You will NOT be successful if you miss classes and try to learn the material simply by reading the lecture slides. DO NOT make this mistake.

If you miss class, find out what you have missed from your classmates or check the D2L site for announcements. This is your responsibility. Do not email me asking what you missed, or if “there is anything important for the test”!

Six (6) homework assignments (48% of total grade; 8% each) will be given over the course of the semester. Homework assignments will include computation as well as questions about comprehension of various methods. It is expected that homework will be completed individually. Homework is assigned on Thursday and due before class on the following Thursday. All homework is submitted through the D2L site, either as a quiz or upload. One or two homework assignments will require the use of statistical software, either R or JMP, which will be explained in class. R is free for downloading from www.r-project.org. JMP is not free, but UWM has a site license, so you can also get it for free from the UWM Software Store.

Two examinations (40% of total grade) will be administered during the semester. The second exam will be administered on the last day of class. Exams will consist of approximately 35-45 questions. The exams will be multiple choice and include definitions, decision-making and problem-solving. There is relatively little number-crunching in the course. Exams will be non-cumulative, but will rely upon understanding material covered earlier in the semester. During exams some computation will be required; however, all necessary formulae and statistical tables will be provided. Calculators may be used, but other electronic equipment that include calculators may not (laptops, cell phones, pda’s, etc). All exams will be collected and kept in the instructor’s office. Students may view their own previously completed exams and quizzes in the instructor’s office, but may not keep them.

Two in-class exercises (12% of grade; 6% each).- You will have two in class assignments that will involve problem-solving. These will be submitted through D2L similar to the homework.
**Extra-Credit** --- TopHat Questions & Computer Exercises in R or JMP (10%). If your grade is low in other areas (Exams and Homework), then this will boost your grade (I will not use it to lower your grade!). It is available to everyone; if you want to do it that's fine (think of it as "insurance"). Most of the extra-credit will be graded based on responses using TopHat (8 pts total).

A few extra-credit exercises using computer software will be submitted using D2L (worth 1% each). There will be 2-4 questions per lecture using TopHat (starting during the second week of lecture), and these will be graded based on attendance (60%) and correct answers to the questions (40%). Several of the TopHat questions in lecture will also be used in the exams, so this will help you study for the exams – if you come to lecture (these questions and the correct answers will not be posted on D2L).

**Evaluation:** Grades will be based on the **two exams, two in-class exercises and 6 homework assignments**. However, any points from Extra Credit, up to a maximum of 10 points will be **ADDED** to your grade from the exams and homework. So it cannot hurt your grade to do some of the extra credit, but it will be based on the entire semester, so you have to attend class and answer questions consistently to get the full 10 points.

Graduate students will be required to make a 15 min presentation to the class on a topic of interest (chosen after consulting the instructor). Grades will be allocated in the following manner:

- **Undergraduates:** homework 48% (8 pts each), Exam I 20%, Exam II 20%, in-class exercises (12%)
- **Graduate students:** homework 28%, Exam I 20%, Exam II 20%, in-class exercises (12%), class presentation 20%

Letter grades will be assigned based on the final total points listed below.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>92 – 100%</td>
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<tr>
<td>A-</td>
<td>89 – 91%</td>
</tr>
<tr>
<td>B+</td>
<td>86 – 88%</td>
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<tr>
<td>B</td>
<td>82 – 85%</td>
</tr>
<tr>
<td>B-</td>
<td>79 – 81%</td>
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<tr>
<td>C</td>
<td>76 – 78%</td>
</tr>
<tr>
<td>C-</td>
<td>71 – 75%</td>
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<tr>
<td>D+</td>
<td>65 – 67%</td>
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<tr>
<td>D</td>
<td>61 – 64%</td>
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<tr>
<td>D-</td>
<td>56 – 60%</td>
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<tr>
<td>F</td>
<td>0 - 55%</td>
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**Need for Special Accommodation**
* Students who require note-taking or test-taking accommodations in order to meet any of the requirements of this course, please contact me as soon as possible to make suitable arrangements.
**Dates of Lecture Topics and Homework are subject to change.**
Dates for the two in-class exercises will be announced one week in advance

<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Lecture topic</th>
<th>chapter</th>
<th>Homework</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6, 8 Sep</td>
<td>Introduction, Descriptive Statistics, using R &amp; JMP</td>
<td>1-5</td>
<td>1. Types of data &amp; Descriptive stats (due before class on 15 Sep)</td>
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<tr>
<td>2</td>
<td>13, 15 Sep</td>
<td>Probability, Hypothesis testing</td>
<td>6,7,8,9</td>
<td>2. Frequencies (due before class on 22 Sep)</td>
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<tr>
<td>3</td>
<td>20, 22 Sep</td>
<td>Analysis of Frequencies; Normal Distribution</td>
<td>10</td>
<td></td>
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<tr>
<td>4</td>
<td>27, 29 Sep</td>
<td>Confidence intervals, One &amp; Two sample tests</td>
<td>11,12,13</td>
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<td></td>
<td>3 Oct</td>
<td>Last day to Withdraw without 'W' and to get a partial refund</td>
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<tr>
<td>5</td>
<td>4, 6 Oct</td>
<td>Review, <strong>EXAM I (6 Oct)</strong></td>
<td></td>
<td>3. Sampling distr &amp; hypoth. Testing (due before class on 4 Oct)</td>
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<td>7</td>
<td>18, 20 Oct</td>
<td><strong>Intro to ANOVA, Types of ANOVA</strong></td>
<td>18</td>
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<tr>
<td>8</td>
<td>28 Oct</td>
<td>Last day to Withdraw from class (with a W and no refund)</td>
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<td></td>
<td>25, 27 Oct</td>
<td>Two Factor ANOVA</td>
<td>17</td>
<td>5. ANOVA (due before class on 3 Nov)</td>
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<tr>
<td>9</td>
<td>1, 3 Nov</td>
<td><strong>Intro to Regression</strong></td>
<td>16</td>
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<td>10</td>
<td>8, 10 Nov</td>
<td>Correlation</td>
<td></td>
<td>6. Regression (due before class on 17 Nov)</td>
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<td>11</td>
<td>15, 17 Nov</td>
<td>Multiple regression, The big picture</td>
<td></td>
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<tr>
<td>12</td>
<td>22, 24 Nov</td>
<td><strong>No class this week, Tues or Thurs. (Thanksgiving)</strong></td>
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<tr>
<td>13</td>
<td>29 Nov</td>
<td>Graduate Student Presentations</td>
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<td>14</td>
<td>1, 6 Dec</td>
<td>Review, <strong>Exam II (6 Dec)</strong></td>
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<td></td>
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<td><strong>There is NO Final Exam in this course</strong></td>
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Some University Guidelines of Interest

**Academic Misconduct**
The university has a responsibility to promote academic honesty and integrity and to develop procedures to deal effectively with instances of academic dishonesty. Students are responsible for the honest completion and representation of their work, for the appropriate citation of sources, and for respect of others' academic endeavors. A more detailed description of Student Academic Disciplinary Procedures may be found in Regents Policy Statements, UWS Chapter 14 and UWM Faculty Document #1686.

**Complaint Procedures**
Students may direct complaints to the head of the academic unit or department in which the complaint occurs. If the complaint allegedly violates a specific university policy, it may be directed to the head of the department or academic unit in which the complaint occurred or to the appropriate university office responsible for enforcing the policy.

**Grade Appeal Procedures**
A student may appeal a grade on the grounds that it is based on a capricious or arbitrary decision of the course instructor. Such an appeal shall follow the established procedures adopted by the department, college, or school in which the course resides. These procedures are available in writing from the respective department chairperson or the Academic Dean of the College/School. A more detailed description of the grade Appeal Policy may be found in UWM Selected Academic and Administrative Policies, Policy #S-28 and UWM Faculty Document #1243.

**Sexual Harassment**
Sexual harassment is reprehensible and will not be tolerated by the University. It subverts the mission of the University and threatens the careers, educational experience, and well being of students, faculty, and staff. The University will not tolerate behavior between or among members of the University community which creates an unacceptable working environment.

**Using Desire2Learn (D2L):**

1. Call up your Web browser (e.g., Firefox), and go to the following Web address: D2L.uwm.edu. Note that there is no "www". This will bring up the Desire2Learn Welcome screen. You will see a location to enter your Username and Password.

2. Your Username is your Alpha/Panthermail (ePanther) username (the same username as your campus email), without the "@uwm.edu" part. Either hit the Tab key on your keyboard, or use the mouse to click in the box next to Password. Your password is your ePanther password. Once you have typed in your password, then please hit Login.

3. You should then see a My Home screen. You will see on the screen a list of My Milwaukee Courses. There is a + next to the phrase Spring_15; click on the + sign. You will then see a + next to the name of any department in which you are enrolled in a course that uses D2L, for example, + L&S-Biological Sciences. Click on that +. Finally, you will see a course title underlined in blue. That is a hot link: click on it and you will enter your course Home Page.
4. Once you are on the **My Home** screen, you will see links on the left side of your screen that allow you to **change** your ePanther password or **forward** your ePanther email to your preferred private email address.

5. If you have any difficulty getting on the course Web site, please close down your Web browser completely and open it up again, then try logging on again using the instructions above. If you do not know your ePanther username or password, please get help as indicated below.

    **What to do if you have problems with Desire2Learn (D2L)**

If you have problems with your login (e.g., you forgot your password, or if you just can't get on) or if you run into any other typical Desire2Learn difficulties, help is available 24 hours a day, 7 days a week. You may do one of the following:

- Send an email to **help@uwm.edu**
- Pick up a phone and call (414) 229-4040 in Metro Milwaukee (or just 4040 on a UWM campus phone)
- Go to Bolton 225 (this lab is not open all day or on weekends – check for specific hours)
- If you are calling from off campus but within Wisconsin or the USA, call 1-877-381-3459.