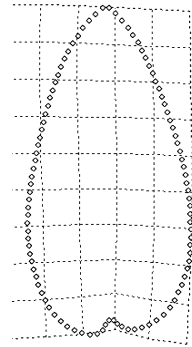


# BIOL 240 — Biometry (4 credits)

Alexey Shipunov

Spring 2018



## SYLLABUS

**Class Dates** : January to May 2018

### Course Description :

Course will cover introductory statistic concepts in a form designed specifically for biology majors, its goal is to strengthen Biology students with statistical knowledge and abilities. It is a practical, software-based examination of the concepts of sampling, hypotheses testing (non-parametric and parametric), descriptive statistics, contingency, correlation, analysis of variation, linear models and basic multivariate techniques. Only biological, real-world data will be used. Course will concentrate on underlying principles, applicability and practical use of methods covered. R statistical environment will be used as a main tool.

The course relies on the computer literacy: file system and basic file operations, basic text operations, spreadsheets, vector and raster graphics, Internet file formats and protocols.

**Instructor** : Dr. Alexey Shipunov

**Office** : Moore 229 and University greenhouse

**Office Hours** : Fridays, from 1 pm till late.

**Phone** : 858-3116

**E-mail** : alexey.shipunov@minotstateu.edu, this is the preferable way of communication.

**Lectures** : Mondays and Wednesdays, 3 pm to 4:15 pm, Moore 213

**Textbook** : Shipunov A., and many others. Visual statistics. Use R! [Electronic book, continuously updated].

**Web site** : [http://ashipunov.info/shipunov/school/biol\\_240/](http://ashipunov.info/shipunov/school/biol_240/)

**Laboratories** : Thursdays, 10 am to 12:50 am, Moore 213

### Grading :

The class is strictly practical. “Lectures” are not lectures but **seminars** where every student works under the guidance. Sometimes, the seminar will end with a short quiz. On **labs**, students work independently but instructor’s help is provided. Finally, on **exams** students work by themselves, without human help. Typically, lab and exam results are accepted via email.

**Four** exams are given. Missed exams count zero points. There is a possibility for **one make-up** exam. *Receiving zero points for more than one laboratory or for more than one exam results in a failed course.* However, there are five legitimate reasons for absence: (1) emergency situations, (2) attested medical conditions, (3) military duty, (4) participation in MSU sports events, and (5) dependent sick leave. In all these cases, the absence must be announced via e-mail **in advance**.

Points are distributed as follows (grading points may vary):

**Seminar quizzes** :  $\approx 10$  points (1–3 points per question)

**Four exams** :  $\leq 400$  points (assuming 100 points per exam)

**Laboratories** :  $\leq 240$  points (20 points per Lab  $\times$  12 labs)

**Letter Grades** :  $A \geq 90\%$ ,  $B \geq 80\%$ ,  $C \geq 70\%$ ,  $D \geq 60\%$ ,  $F < 60\%$ .

**Academic Honesty** : Honesty and integrity are central to academic life at Minot State University. Cheating may affect the student in accordance with the grading policy.

**Disability Needs** : In coordination with Disability Support services, reasonable accommodations will be provided for qualified students with disabilities. Please contact the instructor during the first week of class to make arrangements. Additional information is available from MSU Disability Support Services.

**Minot State University interpersonal abuse statement (Title IX)** : Minot State University strives to create a campus community free from interpersonal abuse including sexual misconduct. In working to achieve this intent, Minot State University commits to: taking action to stop sexual misconduct; taking action to remedy its effects by providing advocacy, support and appropriate referral services for recipients of the behavior; taking action to prevent recurrences; educating individuals and promoting discussions on interpersonal abuse and violence; and conducting impartial investigation of all reports/notices of sexual misconduct through fair, equitable and prompt procedures. Investigations will be independent of and separate from law enforcement investigations of criminal activity.

**Tentative Course Schedule** (subject to change, only exam dates are fixed!):

Week 1	Data and data processing
Week 2	Basics of computer literacy, R basics; Lab 1
Week 3	How to process the data; Lab 2
Week 4	R graphics; Lab 3
Week 5	Types of data; Lab 4
1st exam: Feb 5	
Week 6	One-dimensional data, descriptive statistics; Lab 5
Week 7	One-dimensional data, descriptive statistics; Lab 6
Week 8	Hypotheses testing; Lab 7
2nd exam: Mar 1	
<i>Week 10: Spring break</i>	
Week 11	Two samples; Lab 8
Week 12	ANOVA; <i>no lab</i>
Week 13	Contingency tables; Lab 9
3rd exam: Apr 9	
Week 14	Correlation; regression; <i>no lab</i>
Week 15	ANCOVA; Lab 10
Week 16	Data mining; Lab 11
Week 17	Data mining; Lab 12
4th exam: May 10, 2 pm	

*Please note that the schedule is a subject to change. Only exam dates are fixed.*