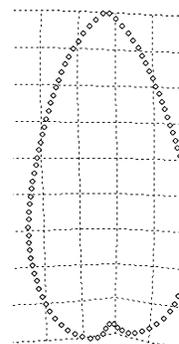


BIOL 240 — Biometry (4 credits)

Alexey Shipunov

Spring 2016



SYLLABUS

Class Dates : January to May 2016

Course Description :

Course will cover introductory statistic concepts in a form designed specifically for biology majors, its goal is to strengthen Biology and Chemistry 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 software 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

Office Hours : Mondays and Wednesdays, 1 pm to 3 pm.

Phone : 858-3116

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

Lectures : Mondays and Wednesdays, 11:35 am to 12:50 am, Moore 213

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

Web site : http://ashipunov.info/shipunov/school/biol_330/

Laboratories : Thursdays, 9 am to 12 pm, 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 themselves but instructor's help is provided. Finally, on exams students work independently. 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: a **minimum** of one letter grade will be deducted from the grade for academic dishonesty / plagiarism.

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):

| | | |
|------------|---------------|---|
| Week 1 | Jan 13 | Data and data processing; no lab |
| Week 2 | Jan 20 | Basics of computer literacy, R basics; Lab 1 |
| Week 3 | Jan 25, 27 | How to process the data; Lab 2 |
| Week 4 | Feb 1, 3 | R graphics; Lab 3 |
| " | | 1st exam: Feb 8 |
| Weeks 5, 6 | Feb 10, 17 | Types of data; Labs 4 and 5 |
| Week 7 | Feb 22, 24 | One-dimensional data, descriptive statistics; Lab 6 |
| Week 8 | Feb 29, Mar 2 | Hypotheses testing; Lab 7 |
| " | | 2nd exam: Mar 7 |
| Week 9 | Mar 9 | Two samples; no lab |
| | | <i>Week 10: Spring break</i> |
| Week 11 | Mar 21, 23 | Two samples; no lab |
| Week 12 | Mar 30 | Two samples; Lab 8 |
| Week 13 | Apr 4, 6 | Contingency tables; Lab 9 |
| " | | 3rd exam: Apr 11 |
| Week 14 | Apr 13 | Correlation; regression; Lab 10 |
| Week 15 | Apr 18, 20 | ANCOVA; ANOVA; Lab 11 |
| Week 16 | Apr 25, 27 | Data mining; no lab |
| Week 17 | May 2, 4 | Data mining; Lab 12 |
| Week 18 | | 4th exam: Tuesday May 10, 12:00 pm |