American University of Central Asia

Software Engineering Program

Spring 2016

Syllabus - Programming R: Software for Statistical Computing, COM 211, ID 3863

Instructor		**Email**	**Office Hours**	**Phone**	**Office**
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Course ID	**Course Credits**	**Semester**	**Day and Time**	**Room**	**Lang.**
3863	6	Spring	Tu: 10.50-12.05 Th: 10.50-12.05	NC 233	English

I. Course Description

This course is an introduction to R, a powerful and flexible statistical language and environment that also provides more flexible graphics capabilities than other popular statistical packages. The course will introduce students to the basics of using R for statistical programming, computation, graphics, and modeling. We will start with a basic introduction to the R language, reading and writing data, and graphics. We then discuss writing functions in R and tips on programming in R.

Finally, the latter part of the course will focus on using R to fit some important types of statistical models, including linear regression. Our goal is to get students up and running with R such that they can use R in their research and are in a good position to expand their knowledge of R on their own.

Students Learning Objectives:

After taking the course, students will be able to

- use R for statistical programming, computation, graphics, and modeling,
- write functions and use R in an efficient way,
- fit some basic types of statistical models
- use R in their own research,
- be able to expand their knowledge of R on their own.

II. Course Policies

a. Students are expected to BE ON TIME for classes. If instructor marked the student absent in case that the student is late for the class, he is considered to be absent for the whole class, unless excused by instructor.

b. ATTENDANCE. Class attendance is required. If the student misses the class with an excuse, he shall provide necessary documents to prove it within a week after he/she missed a class. If the requirements mentioned above are not observed, student's absence is considered to be unexcused. If a student missed over 15 classes, he/she will not be attested for the course.

c. WRITTEN ASSIGNMENTS must be submitted to instructor by the deadline. The student may submit assignment late: at the latest by the next day after the deadline before 5 pm, in that case 1 point will be deducted from the final grade for the work (e.g., if your grade is "A" for the work, after deduction, your grade will be "B"). ***This rule applies to any student who was aware or should have been aware of an assignment and the deadline no matter whether he was sick or had any other excuse on the date of a deadline***.

d. The student has to follow ACADEMIC HONESTY code. All types of cheating (plagiarism etc) **are strictly prohibited**. If a student fails to observe this requirement, instructor may give from an "F" for the work up to an "F" for the whole course depending on the type of assignment and other circumstances.

IV. Assessment

a. Grading will be based on following components:

Grades will be based on a total of 100 points, coming from**:**

Quiz 1	The lecturer will announce day and time	10 points
Midterm Exam	The lecturer will announce day and time	25 points
Quiz 2	The lecturer will announce day and time	10 points
Individual assignment	The lecturer will announce day and time	10 points
Final Exam	The lecturer will announce day and time	30 points
Home works	Every class	15 points

b. Grading scale:

The total grade of the student is as follows:

0 ≤ F ≤ 40 < D ≤ 45 < C- ≤ 50 < C ≤60 < C+ ≤65< B- ≤70 < B ≤ 80 < B+ ≤ 85< A- ≤ 90 < A≤100

Make-up Exams and Quizzes

- If the reason for missing the midterm exam is valid, the student's final exam will be worth up to 55 points.
- If the reason for missing a quiz is valid, the quiz can be taken at another time and will be worth 5 points.
- If the reason for missing the Final Exam is valid, the student can apply for the grade of "I".
- If a student misses both exams, he/she will not be attested for the course.
- If the reason for missing any exam or quiz is not valid, then the grade 0 will be given for the missing exam or quiz.

Cell phones

Using cell phones during quizzes and exams prohibited.

V. Miscellaneous (as needed or desired)

Prerequisites: Introduction to contemporary mathematics I

VI. Textbooks and References

1. Alain F. Zuur, Elena N. Ieno, Erik H.W.G. Meesters Beginner's Guide to R - Springer, 2009.
2. Allerhand M. Tiny Handbook of R - SpringerBriefs in Statistics, 2011
3. Baayen R. Analyzing Linguistic Data - A Practical Introduction to Statistics using R , 2008.
4. Gardener M. Beginning R - The Statistical Programming Language , 2012.
5. Jim Albert, Maria Rizzo R by Example, 2012.
6. Matloff N. Art of R Programming - A Tour of Statistical Software Design , 2011.

VII. Software

R is available for free from http://cran.r-project.org/ for UNIX/Linux, Windows, and Mac. It is also available in the IT microlabs.

R studio is available for free from https://www.rstudio.com/products/rstudio/download/ for UNIX/Linux, Windows, and Mac. It is also available in the IT microlabs.

VIII. Tentative Academic Calendar

Week 1-4.

Introduction to the R language. Obtaining and managing R. Objects - types of objects, classes, creating and accessing objects. Arithmetic and matrix operations. Simple functions. Project organization and getting data into R.

Week 5-7.

The R environment. Importing Data. Objects in R Packages and subsetting data. The graphics subsystem.

Week 8-11.

Descriptive statistics and graphics. Summary statistics for a single group. Graphical display of distributions. Summary statistics by groups. Graphics for grouped data. Tables. Graphical display of tables.

Week 12-15.

One- and two-sample tests. Regression and correlation. Linear models. Analysis of Variance.