Программа онлайн курса:

Программирование в R / Programming in R

Название высшего учебного заведения, разработавшего сайт	University Johns Hopkins
Наименование онлайн-платформы	Coursera
Даты изучения онлайн-курса	1 раз в неделю
Время	58 часов
Формат изучения дисциплины Ссылка на онлайн-курс	https://www.coursera.org/learn/r-programming

I. ЦЕЛЬ, РЕЗУЛЬТАТЫ ОСВОЕНИЯ КУРСА

Working curriculum of the university in the training direction 38.04.05 "Business-Informatics", training level - Master, 1st course, approved in 2018

Purpose:

- program in R and use for efficient data analysis;

- install and configure the software required for the statistical programming environment.

Results of the course:
- Collect detailed information using R profiler
- Configure statistical programming software
- Make use of R loop functions and debugging tools
- Understand critical programming language concepts

II. СОДЕРЖАНИЕ УЧЕБНОЙ ДИСЦИПЛИНЫ
CONTENT OF THE DISCIPLINE

In this course you will learn how to program in R and how to use R for effective data analysis. You will learn how to install and configure software necessary for a statistical programming environment and describe generic programming language concepts as they are implemented in a high-level statistical language. The course covers practical issues in statistical computing which includes programming in R, reading data into R, accessing R packages, writing R functions, debugging, profiling R code, and organizing and commenting R code. Topics in statistical data analysis will provide working examples.

Unit 1: Background, Getting Started, and Nuts & Bolts

This unit covers the basics to get you started up with R. The Background Materials lesson contains information about course mechanics and some videos on installing R. The Week 1 videos cover the history of R and S, go over the basic data types in R, and describe the functions for reading and writing data. I recommend that you watch the videos in the listed order, but watching the videos out of order isn't going to ruin the story

Unit 2: Programming with R

Welcome to Unit 2 of R Programming. This week, we take the gloves off, and the lectures cover key topics like control structures and functions.

We also introduce the first programming assignment for the course, which is due at the end of the week.

Unit 3: Loop Functions and Debugging

We have now entered the third week of R Programming, which also marks the halfway point. The lectures this week cover loop functions and the debugging tools in R. These aspects of R make R useful for both interactive work and writing longer code, and so they are commonly used in practice

Unit 4: Simulation & Profiling

This unit covers how to simulate data in R, which serves as the basis for doing simulation studies. We also cover the profiler in R which lets you collect detailed information on how your R functions are running and to identify bottlenecks that can be addressed. The profiler is a key tool in helping you optimize your programs. Finally, we cover the str function, which I personally believe is the most useful function in R

III.ОЦЕНИВАНИЕ
THE FORMATION ORDER OF GRADES FOR THE DISCIPLINE

Unit 1:Background, Getting Started, and Nuts & Bolts
- 1 practical task (40min)

Unit 2: Programming with R
- 2 practical task (20min)

Unit 3: Loop Functions and Debugging
- 1 practical task (10 min)

Unit4: Simulation & Profiling
- 2 practical task (20min)

Forms and Types of control

The course is based on a rather complicated method of grading.

Final score consists of:
- score for current work during the classes – O1;
- final exam presentation – O2.

Final score O looks as follow:

O=0,6*O1+0,4*O2.

The rounding method of the cumulative score of final control is made according to the rules of rounding arithmetic.

IV. LITERATURE

4.1 Core textbooks:

Richard Cotton Learning R. Published by O'Reilly Media, Inc., 1005 Gravenstein Highway North, Sebastopol, CA 95472 http://kek.ksu.ru/EOS/DataMining/1449357105_LearR.pdf

8.2 Additional supporting articles and conference papers:

1. Peter Dalgaard Introductory Statistics with R. Department of Biostatistics University of Copenhagen Denmark. 2008. 2nd Ed., 363 pp. (Springer Texts in Statistics) Hardcover http://www.academia.dk/BiologiskAntropologi/Epidemiologi/PDF/Introductory_Statistics_with_R__2nd_ed.pdf

2. Люк Д. A User's Guide to Network Analysis in R Springer, 2016, p. 248
3. Джеймс Г., Уиттон Д., Хасти Т., Тибширани Р. An Introduction to Statistical Learning with Application in R. Springer, 2016, p.456,

V.   РЕСУРСЫ

4. Link to resources**: https://www.coursera.org/learn/r-programming**
5. R programming Wikibook https://en.wikibooks.org/wiki/R_Programming
6. Books related to R https://www.r-project.org/doc/bib/R-books.html

VI.   УЧЕБНЫЕ ПОСОБИЯ И ОБЗОРНЫЕ УПРАЖНЕНИЯ

Every course on Coursera is taught by top instructors from the world's best universities and educational institutions. Courses include recorded video lectures, auto-graded and peer-reviewed assignments, and community discussion forums.

VII.   ТЕХНИЧЕСКИЕ ТРЕБОВАНИЯ

This course is delivered completely online. Have access to a computer or mobile device that supports the Internet and have constant access to the Internet to view or download the necessary course resources, as well as to conduct any automatic course assessments.

ABSTRACT

R is free software designed for statistical computing. Today R is more popular than SQL, it is actively used in commercial organizations, research and universities.

This online course gives an introduction to R to build up graphing, simulating and computing skills to enable one to see theoretical and statistical models in economics in a unified way. The great advantage of R is that it is free, extremely flexible and extensible. The online course addresses the specific needs of economists, and helps them move up the R learning curve. It uses data that can be downloaded from the internet, and which is also available in different R packages. With some treatment of basic econometrics, the book discusses quantitative economics broadly and simply, looking at models in the light of data.