Term Information

Effective Term   Spring 2014

General Information

Course Bulletin Listing/Subject Area   Evol, Ecology & Organismal Bio
Fiscal Unit/Academic Org   Evolution, Ecology & Org Bio - D0390
College/Academic Group   Arts and Sciences
Level/Career   Graduate
Course Number/Catalog   8896.19
Course Title   EEOB Grad Seminar: Current topics in quantitative methods
Transcript Abbreviation   G Sem: Quant Meth
Course Description   Current topics in quantitative methods as related to evolution, ecology, and organismal biology
Semester Credit Hours/Units   Variable: Min 1 Max 2

Offering Information

Length Of Course   14 Week, 7 Week
Flexibly Scheduled Course   Never
Does any section of this course have a distance No
education component?
Grading Basis   Satisfactory/Unsatisfactory
Repeatable   Yes
Allow Multiple Enrollments in Term   Yes
Max Credit Hours/Units Allowed   20
Max Completions Allowed   10
Course Components   Seminar
Grade Roster Component   Seminar
Credit Available by Exam   No
Admission Condition Course   No
Off Campus   Never
Campus of Offering   Columbus

Prerequisites and Exclusions

Prerequisites/Corequisites   Grad standing, or permission of instructor
Exclusions

Cross-Listings

Cross-Listings

Subject/CIP Code

Subject/CIP Code   26.0701
Subsidy Level   Doctoral Course
Intended Rank   Masters, Doctoral

Requirement/Elective Designation

Required for this unit's degrees, majors, and/or minors
The course is an elective (for this or other units) or is a service course for other units

Course Details

Course goals or learning objectives/outcomes

- Learn to use R for the management, description, analysis and visualisation of ecological data.
- Learn best principles of data exploration, analysis and visualisation.

Content Topic List

- Introduction to and tour of R
- Subsets and data management
- Useful functions
- Basic and advanced graphics
- Classic tests, linear regression, ANOVA, generalized linear models
- Writing functions
- If, for, while, repeat
- Random sampling and numbers
- Mixed effects models
- Phylogenetic comparative methods
- Community ordination
- Spatial point pattern analysis

Attachments

- 8896.19 syllabus-2013-09-11.docx: Syllabus

  (Syllabus. Owner: Lanno,Roman P.)

Comments

- This syllabus should take care of the issues *(by Lanno,Roman P. on 09/16/2013 09:26 PM)*
- -Many links are dead in syllabus.

  -Please provide necessary elements in syllabus (see list of bolded items on p. 13

  http://asccas.osu.edu/files/ASC_CurrAssess_Operations_Manual.pdf): academic misconduct, disability services *(by Vankeerbergen,Bernadette Chantal on 09/11/2013 11:36 AM)*

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Lanno,Roman P.	08/31/2013 12:54 PM	Submitted for Approval
Approved	Lanno,Roman P.	08/31/2013 12:58 PM	Unit Approval
Approved	Hadad,Christopher Martin	09/02/2013 02:41 PM	College Approval
Revision Requested	Vankeerbergen,Bernadette Chantal	09/11/2013 11:37 AM	ASCCAO Approval
Submitted	Lanno,Roman P.	09/16/2013 09:27 PM	Submitted for Approval
Approved	Lanno,Roman P.	09/16/2013 09:28 PM	Unit Approval
Approved	Hadad,Christopher Martin	09/17/2013 07:41 AM	College Approval
Pending Approval	Hanlin,Deborah Kay Hogle,Danielle Nicole Jenkins,Mary Ellen Bigler Nolen,Dawn Vankeerbergen,Bernadette Chantal	09/17/2013 07:41 AM	ASCCAO Approval

Quantitative Methods in R

Logistics

Instructor: Simon A. Queenborough

Location: Aronoff

Office Hours:

Required: A computer running R 3.0.0 and Rstudio with wi-fi internet access.

Objectives

1. Learn to use R for the management, description, analysis and visualisation of ecological data.

2. Learn best principles of data exploration, analysis and visualisation.

Recommended Course Book

This book is not required but good for complete novices, as it describes in detail things like moving data from spreadsheets to text files to R.

Beckerman, AP & Petchey, OL *Getting Started with R* website Amazon

Assignments, Examinations & Grades

This seminar is graded as Satisfactory/Unsatisfactory. Grades will be based on completion of in-class exercises.

There will be optional mid-terms and final tests for those inclined.

Course Schedule

Why R? Introduction and overview of R

First, read this New York Times article. Then, watch these online videos, Parts 1, 2, 3 and 4.

Next... Install R on to your laptop! (go to www.r-project.org, and follow links through to your OS).

And get ready for some gRRRReat fun!

Guided introduction to R and basic ideas

Class 1. Introduction to R

Class 2. Tour of R

Class 3. First R session, guided

Class 4. Subsets and Data Management
Exercises 1 | data:

Exercises 2 | data:

Exploring and Visualising Data

Class 5. Useful Functions (apply etc).
Exercises 5 | data:

Class 6. Basic Graphics
The Visual Display of Quantitative Information

Exercises 6 | data:

Class 7. Advanced Graphics
Exercises 7 | data:

More graphics resources:

Statistical Analysis of Data
A Protocol for Data Exploration to Avoid Common Mistakes

Class 8. Classical Tests

Class 9. Linear Regression

Class 10. ANOVA

Class 11. Generalized Linear Models

Advanced Statistics & Programming in R

Class 12. Writing Functions
Exercises 12 | data:

Class 13. If, For, While, Repeat
Exercises 13 | answers

Class 14. Random Sampling & Numbers
Exercises 14 | answers

Specialised Topics in R

Class 15. Mixed Effects Models
data: seedling, fruit | Bolker article

Class 16. Phylogenetic Comparative Methods
data: geospiza, tree

Class 17. Community Ordination
data: veg, site | John2007

Class 18. Spatial Point Pattern Analysis
Spatstat handbook

Resources

Programming
Code Academy - " Learn to code. Codecademy is the easiest way to learn how to code. It's interactive, fun, and you can do it with your friends"

Software Carpentry "Our mission is to help scientists be more productive by teaching them basic computing skills"

online programming R resources

Braun W.J., Murdoch D.J. A First Course in Statistical Programming with R Phil Spector Data Manipulation with R

Peter Hurd

text editors
a list of GUIs for Windows, Mac and Linux. We will be using RStudio on this course.

books
Ben Bolker Ecological Models and Data in R

Mick Crawley The R Book

Venables & Ripley Modern Applied Statistics in S-Plus

Andrew Gelman & Jennifer Hill Data Analysis Using Regression and Multilevel/Hierarchical Models

Alain Zuur et al A Beginner's Guide to R

graphics

Edward Tufte: The Visual Display of Quantitative Information, Envisioning Information, Beautiful Evidence

Murrell R Graphics

Bill Cleveland The Elements of Graphing Data, Visualizing Data

R Graph Gallery

Gallery of Data Visualisation

dot plots

simple graphs

ggplot2

websites

R project

R help

R wiki

R Introduccion (en linea, ingles)

Ecology and Epidemiology in R

Burns stats

StatsRus

spreadsheets

spreadsheet addiction

why does Excel suck so much?

blogs

Andrew Gelman blog

Methods in Ecology and Evolution Journal

badscience.net

General Issues & Conduct

Academic misconduct

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct http://studentlife.osu.edu/csc/.

Accessibility

Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Avenue; telephone 292-3307, TDD 292-0901; http://www.ods.ohio-state.edu/.