

Spring 2016

DEPARTMENT: Educational Studies, Leadership, and Counseling

COURSE PREFIX: HDL

COURSE NUMBER: 631

CREDIT HOURS: 3

I. TITLE:

Educational Data Management Techniques

II. COURSE DESCRIPTION AND PREREQUISITE(S):

A study of educational data management techniques using the R programming environment for statistical computing and graphics.

Prerequisite(s): None

III. COURSE OBJECTIVES:

Upon successful completion of this class, the student will be able to

- A. manipulate missing values in educational datasets;
- B. understand data type conversions in educational datasets;
- C. create and record variables in educational datasets;
- D. sort, merge, and subset educational datasets;
- E. select and drop variables in educational datasets;
- F. understand mathematical, statistical, and character functions;
- G. write one's own functions to accomplish educational data management tasks; and
- H. examine and reflect ways to aggregate and reshape educational data.

IV. CONTENT OUTLINE:

- A. Variables management in R
- B. Missing values
- C. Data type conversions
- D. Data sorting and merge
- E. Subsetting datasets
- F. Mathematical, statistical, and character functions
- G. Looping and conditional execution
- H. User-written functions
- I. Ways to aggregate and reshape data

V. INSTRUCTIONAL ACTIVITIES:

This course utilizes the web platform or course management system at Murray State University. Students need their Murray State University ID and Password to log in. The course instructor will communicate with students via a variety of interactive tools including discussions, announcements, and email. Students in this course are required to log in the course management system regularly (at least once a week) to access the course content, to participate in class discussions or chats, and to complete course assignments.

Student learning requirements:

Email Account: An email account is mandatory for this course. Throughout the semester, course-related information will be distributed to the student's Murray State University email address (RacerMail). Students are expected to check their RacerMail regularly (at least once a week for course updates). Please note: Email is used primarily as a tool of communication in this course. All assignments in this course must be submitted to Canvas (Detailed "How to submit" instructions will be provided for each assignment).

Internet Access: Students in this course are required to have access to high-speed internet and a computer in order to have a successful experience in this online course. This course is not appropriate for a student who has no or limited (such as dial-up) internet access.

File storage: Students in the course are required to have a file storage/retrieval media (such as a computer hard disk, USB flash drive, memory card, or CD-RW) for the purpose of saving students' own work completed in this course. Students in this course are required to make backups regularly to safeguard their own data.

Software: Students in this course are required to have access to the latest version of the following software in order to complete this course: Web browser (such as Firefox®, Internet Explorer®), R®, RStudio®, Adobe Reader®, CutePDF Writer®,

Microsoft Word®, Microsoft Excel®, and Microsoft PowerPoint® software. Students need to follow the directions to download the free R®, RStudio®, and CutePDF Writer® software programs and install them in their own computers.

Hardware: Students in this course are required to have (or have access to) a working personal computer to install and run the free R software. Instructions on how to install R software will be provided. In addition, students in the course are required to have access to a digital camera. Students may be expected to take photos of the artifacts they created for this course and to upload photos (in jpg file format) to Canvas.

VI. FIELD, CLINICAL, AND/OR LABORATORY EXPERIENCES:

The student's professional workplace acts as the laboratory to explore course issues.

VII. TEXT(S) AND RESOURCES:

Kabacoff, R. I. (2011). *R in action: Data analysis and graphics with R*. Shelter Island, NY: Manning.

Other course reading materials will be provided by the instructor.

VIII. EVALUATION AND GRADING PROCEDURES:

Students are expected to submit their work no later than the due date. **Assignments turned in after the due date will result in a deduction of 50 percent of the assignment points per day the assignment is late.** Even though an assignment turned in two days after the due date will result in a grade of zero, students are still required to complete the assignment. Failure to complete all the assignments and learning tasks before the last day of class will result in a letter grade of "incomplete." A student seeking to have an "incomplete" course grade changed must follow the established university regulation and policy. The grading system is as follows:

Course Project	30%
Homework/ Discussion assignments	70%
Total:	100%
A = 90 – 100%	
B = 80 – 89%	
C = 70 – 79%	
D = 60 – 69%	
E = below 60%	

Course Project (CP)

In this course activity, students are expected to identify an appropriate dataset in the public domain which can be used to address a relevant and meaningful workplace or real-world problem. Students will manage and analyze his or her identified dataset using R for statistical computing and graphics. The CP is divided into three smaller steps. Students will complete this project step by step under the guidance of the course instructor. In the first step, students need to identify and select an appropriate dataset in the public domain. In the second step, students need to complete basic data management tasks using R. In the third step, students are expected to complete advanced data management tasks using R. Students are expected to write an 8-page project report.

Homework/ Discussion (HD) assignments

Students are expected to respond to specific questions about content from the textbooks and to actively participate in class/group discussions. There will be 10 homework/ discussion assignments for a total of up to 70% of the course grade.

IX. ATTENDANCE POLICY:

Students are expected to adhere to the MSU Attendance Policy outlined in the current MSU Bulletins.

There will be no required face-to-face meetings for this web course. However, students will be expected to make weekly progress online.

X. ACADEMIC HONESTY POLICY:

Murray State University takes seriously its moral and educational obligation to maintain high standards of academic honesty and ethical behavior. Instructors are expected to evaluate students' academic achievements accurately, as well as ascertain that work submitted by students is authentic and the result of their own efforts, and consistent with established academic standards. Students are obligated to respect and abide by the basic standards of personal and professional integrity.

Violations of Academic Honesty include:

Cheating - Intentionally using or attempting to use unauthorized information such as books, notes, study aids, or other electronic, online, or digital devices in any academic exercise; as well as unauthorized communication of information by any means to or from others during any academic exercise.

Fabrication and Falsification - Intentional alteration or invention of any information or citation in an academic exercise. Falsification involves changing information whereas fabrication involves inventing or counterfeiting information.

Multiple Submissions - The submission of substantial portions of the same academic work, including oral reports, for credit more than once without authorization from the instructor.

Plagiarism - Intentionally or knowingly representing the words, ideas, creative work, or data of someone else as one's own in any academic exercise, without due and proper acknowledgement.

Instructors should outline their expectations that may go beyond the scope of this policy at the beginning of each course and identify such expectations and restrictions in the course syllabus. When an instructor receives evidence, either directly or indirectly, of academic dishonesty, he or she should investigate the instance. The faculty member should then take appropriate disciplinary action.

Disciplinary action may include, but is not limited to the following:

- 1) Requiring the student(s) to repeat the exercise or do additional related exercise(s).
- 2) Lowering the grade or failing the student(s) on the particular exercise(s) involved.
- 3) Lowering the grade or failing the student(s) in the course.

If the disciplinary action results in the awarding of a grade of E in the course, the student(s) may not drop the course.

Faculty reserve the right to invalidate any exercise or other evaluative measures if substantial evidence exists that the integrity of the exercise has been compromised. Faculty also reserve the right to document in the course syllabi further academic honesty policy elements related to the individual disciplines.

A student may appeal the decision of the faculty member with the department chair in writing within five working days. Note: If, at any point in this process, the student alleges that actions have taken place that may be in violation of the Murray State University Non-Discrimination Statement, this process must be suspended and the matter be directed to the Office of Institutional Diversity, Equity and Access. Any appeal will be forwarded to the appropriate university committee as determined by the Provost.

XI. NON-DISCRIMINATION POLICY AND STUDENTS WITH DISABILITIES:

Policy Statement

Murray State University endorses the intent of all federal and state laws created to prohibit discrimination. Murray State University does not discriminate on the basis of race, color, national origin, gender, sexual orientation, religion, age, veteran status, or disability in employment, admissions, or the provision of services and provides, upon request, reasonable accommodation including auxiliary aids and services necessary to afford individuals with disabilities equal access to participate in all programs and activities. For more information, contact the Executive Director of Institutional Diversity, Equity and Access, 103 Wells Hall, (270) 809-3155 (voice), (270) 809-3361 (TDD).

Students with Disabilities

Students requiring special assistance due to a disability should visit the Office of Student Disability Services immediately for assistance with accommodations. For more information, students should contact the Office of Student Disability Services, 423 Wells Hall, Murray, KY 42071. 270-809-2018 (voice) 270-809-5889(TDD).

XII. OTHER REQUIRED DEPARTMENTAL OR COLLEGIATE COMMITTEE INFORMATION

DISPOSITIONS OF A MURRAY STATE UNIVERSITY COLLEGE OF EDUCATION AND HUMAN SERVICES GRADUATE

1. Inclusive – Is an advocate for an inclusive community of people with varied characteristics, ideas, and worldviews.
2. Responsible – Considers consequences and makes decisions in a rational and thoughtful manner for the welfare of others; acts with integrity to pursue an objective with thoroughness and consistency.
3. Enthusiastic – Is eager and passionately interested in tasks that relate to beliefs about education.
4. Caring – Demonstrates regard for the learning and wellbeing of every student.
5. Confident – Exhibits certainty about possessing the ability, judgment, and internal resources needed to succeed as a teacher.
6. Ethical – Conforms to accepted professional standards of conduct by making decisions based on standards and principles established by the education profession.
7. Leadership – Is an ethical change agent who acts to inspire classrooms, schools, districts, and communities

The instructor reserves the right to modify the format of this course as circumstances demand.