



**HDFS 59000: Regression**

**CRN: 11043 Credits: 4**

**Course location:** Lectures on Tuesdays and Thursdays 9:00-10:15am in Smith Hall 201;

Labs on Fridays 9:30-10:20am in Stanley Coulter Hall G046

\*\*\* All lectures and labs will be recorded and posted to Brightspace \*\*\*

\*\*\* In the event we need to meet virtually during our scheduled class time \*\*\*

If connecting via internet: <https://purdue.webex.com/join/duncan99>

If connecting via phone: 855-282-6330 with access code: 645 047 509

**Brightspace page:** <https://purdue.brightspace.com/d2l/home/464087>

**Professor:** Robert Duncan, Ph.D. (he/him/his)  
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Student hours: by appointment

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Student hours: by appointment

**Course Description:**

This course has two primary goals:

- 1) Provide students with foundational knowledge related to linear regression statistical analyses

- 2) Provide students with the opportunity to practice writing, interpreting, and presenting regression analyses for the purposes of dissemination

Two lectures per week will be focused on the key concepts and ideas of linear regression, and one lab session per week will be used to facilitate understanding of Stata as relevant to regression models. Code for using R will also be provided whenever possible. The objective of this course is to help students gain a familiarity and understanding of linear regression that will translate into their own research success. If done successfully, linear regression models can be the primary analyses that lead to publications, theses defenses, and conference presentations. Additionally, more advanced statistical analyses often build on the foundational knowledge of linear regression. It is highly encouraged to attend (or view recordings of) all lectures and labs.

### **Course Guidelines:**

- You are responsible for attending all lectures and labs, please let the course instructor know as soon as possible if you are going to miss for any reason.
  - Because of the COVID-19 pandemic, all lectures and labs will be video recorded and put onto Brightspace. If you have to miss class for any reason, you are still responsible for watching the course videos at your earliest convenience.
- You are responsible for completing all readings prior to the class for which it is assigned.
- Labs, and corresponding assignments, will be given on Fridays and they will be due the following Friday by the end of the day (midnight).
  - Each day late will result in a 10% reduction in grade
- The paper assignment should be submitted through Brightspace by the end of the day they are due (midnight).

- Each day late will result in a 10% reduction in grade
- Make/keep a copy of anything you submit

**Required Text:**

Acock, A. C. (2018). A Gentle Introduction to Stata (6<sup>th</sup> Edition). Stata Press.

ISBN-13: 978-1-59718-269-0

Other readings will be assigned periodically throughout the semester and posted to Brightspace.

**Brightspace:**

Access the course via Purdue's Brightspace learning management system. Begin with the Start Here tab, which describes how the course Brightspace is organized. It is strongly suggested that you explore and become familiar not only with the site navigation but with content and resources available for this course. See the Student Services widget on the campus homepage for resources such as Technology Help, Academic Help, Campus Resources, and Protect Purdue.

**Learning Outcomes:**

1. Gain a foundational knowledge related to linear regression statistical analyses (including multiple regression, mediation, and moderation).
  - Methods of Evaluation: Exams
2. Demonstrate the ability to do statistical analyses related to regression modeling in Stata.
  - Methods of Evaluation: Lab assignments
3. Independently apply course knowledge on regression to your research ideas/interests.
  - Methods of Evaluation: Paper presentation and assignment

**Grading:**

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Labs: Throughout the semester, there will be 8 individual lab assignments.

Each assignment is worth 2.5% of your final grade. The assignments are exercises that correspond to the topic of instruction for the given week. You will be given one week to complete an assignment. You may work in groups but should submit your own version. 20%

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Research Paper: Students will conduct an empirical analysis on a topic of their choosing from an available dataset (either publicly available or one that you work with as a graduate student). The paper (double-spaced & in APA format) will include an introduction (~1-2 page), method (~1-2 pages), analytic plan (~1 page), results (~1-2 pages), and discussion section (~1 page). The paper must also include at least three tables (e.g., descriptive statistics, correlation matrix, regression results). 35%

- Students will do a 5-10 minute presentation on their proposed analyses during week 9 (March 7<sup>th</sup>-11<sup>th</sup>), which will be 10% of your final grade.
- The paper will be due Friday of week 16 (April 29<sup>th</sup>) and will be 25% of your final grade.

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Exams: There will be three exams (15% each). Material will be based on lectures, readings, and assignments. They will primarily be free response, focused on interpretation of regression output and models. 45%

- Exams will be in person
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**Course Grading System:**

A	94-100%	B-	80-83.99%	D+	67-69.99%
A-	90-93.99%	C+	77-79.99%	D	64-66.99%
B+	87-89.99%	C	74-76.99%	D-	60-63.99%
B	84-86.99%	C-	70-73.99%	F	<60%

**Student's Responsibilities:**

- Be present, keep up to date with the course, and have assignments completed.
- Read all assigned materials BEFORE class and be prepared to discuss in class.
- Everyone brings unique experiences to the classroom. Please be respectful about the opinions and questions of others.
- Be an active learner! Ask questions! This is the best way for you and others in the class to learn. If you have a question about a particular statistical concept, it is likely that someone else has the same question.
- Routinely devote approximately 4–6 hours to course materials and assignments outside of the classroom.
- Please communicate with me in person about any concerns you may be having about the class. I cannot assist you in achieving a positive learning experience if I do not know you are struggling with the class or its contents and/or assignments. I sincerely want you to succeed!

**Course Philosophy and Participation:**

Graduate education is largely a self-directed approach to learning. Your success depends upon your commitment to understanding statistical concepts and using Stata. You should understand the importance of quantitative methods in answering research questions. This course affords the opportunity for you to gain skills that will greatly increase your success in research. Please be willing to listen, share insights, ask questions, and participate in class discussion and activities. In addition, I encourage you to work in groups to discuss issues and think critically about issues and assignments. Much can be learned through brainstorming and thoughtful interaction.

**Nondiscrimination Statement:**

Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual

to strive to reach his or her potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life. A hyperlink to Purdue's full Nondiscrimination Policy Statement is included in our course Brightspace under University Policies, and can be found at [http://www.purdue.edu/purdue/ea\\_eou\\_statement.html](http://www.purdue.edu/purdue/ea_eou_statement.html).

**Attendance:**

Students are expected to attend all classes in-person unless they are ill or otherwise unable to attend class. If they feel ill, have any symptoms associated with COVID-19, or suspect they have been exposed to the virus, students should stay home and contact the Protect Purdue Health Center (496-INFO).

In the current context of COVID-19, in-person attendance will not be a factor in the final grades. However, timely completion of alternative assessments can certainly be part of the final grade. Students need to inform the instructor of any conflict that can be anticipated and will affect the timely submission of an assignment or the ability to take an exam.

Classroom engagement is extremely important and associated with your overall success in the course. The importance and value of course engagement and ways in which you can engage with the course content even if you are in quarantine or isolation, will be discussed at the beginning of the semester. Student survey data from Fall 2020 emphasized students' views of in-person course opportunities as critical to their learning, engagement with faculty/TAs, and ability to interact with peers.

Only the instructor can excuse a student from a course requirement or responsibility. When conflicts can be anticipated, such as for many University-sponsored activities and religious observations, the student should inform the instructor of the situation as far in advance as possible. For unanticipated or emergency conflicts, when

advance notification to an instructor is not possible, the student should contact the instructor/instructional team as soon as possible by email, through Brightspace, or by phone. In cases of bereavement, quarantine, or isolation, the student or the student's representative should contact the Office of the Dean of Students via email or phone at 765-494-1747. Our course Brightspace includes a link to the Dean of Students under 'Campus Resources.'

If you must quarantine or isolate at any point in time during the semester, please reach out to me via email so that we can communicate about how you can continue to learn remotely. Work with the Protect Purdue Health Center (PPHC) to get documentation and support, including access to an Academic Case Manager who can provide you with general guidelines/resources around communicating with your instructors, be available for academic support, and offer suggestions for how to be successful when learning remotely. Your Academic Case Manager can be reached at [acmq@purdue.edu](mailto:acmq@purdue.edu). Importantly, if you find yourself too sick to progress in the course, notify your academic case manager and notify me via email or Brightspace. We will make arrangements based on your particular situation.

**Late Policy:**

All assignments should be completed by the due date and time. For each day late, a 10% reduction in grade will be imposed. Assignments more than a week late will not be accepted.

**One Week Resolution Policy:**

Any assignments that need to be made up and any discrepancies with grades all need to be brought to the attention of the instructor within one week of the missed assignment or the posting of the disputed grade. After one week passes, the instructor will no longer entertain requests for makeup assignments or grade adjustments. Furthermore, students with questions about their grades must see the instructor before the final exam.



**Cell Phones/Texting/Email/Etc.:**

Please be considerate of others by turning off cell phones prior to class. If you have a special need that makes it necessary to leave your phone on, please see the instructor before class. During class please refrain from communication outside of the classroom through the use of text messages, email, social media, etc. Please also refrain from multitasking, such as browsing the web, during class/lab.

**Academic Integrity:**

Academic integrity is one of the highest values that Purdue University holds. Individuals are encouraged to alert university officials to potential breaches of this value by either emailing [integrity@purdue.edu](mailto:integrity@purdue.edu) or by calling 765-494-8778. While information may be submitted anonymously, the more information is submitted the greater the opportunity for the university to investigate the concern. More details are available on our course Brightspace table of contents, under University Policies.

Link to Information Regarding Academic Integrity:

<http://www.purdue.edu/odos/osrr/academic-integrity/index.html>

Link to Information Regarding Student Conduct:

[http://www.purdue.edu/studentregulations/student\\_conduct/index.html](http://www.purdue.edu/studentregulations/student_conduct/index.html)

**Accessibility:**

Purdue University strives to make learning experiences as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, you are welcome to let me know so that we can discuss options. You are also encouraged to contact the Disability Resource Center at: [drc@purdue.edu](mailto:drc@purdue.edu) or by phone: 765-494-1247.

**Special Accommodations:**

Students seeking special accommodation(s) in this course are expected to inform the instructor of their individual situations at the start of the semester. Depending on the circumstances, written documentation may be necessary in order to provide the student

with additional means. Special accommodations include, but are not limited to, academic support, medical needs, athletic contests, etc.

**Mental Health/Wellness Statement:**

**If you find yourself beginning to feel some stress, anxiety and/or feeling slightly overwhelmed, try WellTrack.** Sign in and find information and tools at your fingertips, available to you at any time.

**If you need support and information about options and resources,** please contact or see the Office of the Dean of Students. Call 765-494-1747. Hours of operation are M-F, 8 am- 5 pm.

**If you find yourself struggling to find a healthy balance between academics, social life, stress, etc.** sign up for free one-on-one virtual or in-person sessions with a Purdue Wellness Coach at RecWell. Student coaches can help you navigate through barriers and challenges toward your goals throughout the semester. Sign up is completely free and can be done on BoilerConnect. If you have any questions, please contact Purdue Wellness at evans240@purdue.edu.

**If you're struggling and need mental health services:** Purdue University is committed to advancing the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of mental health support, services are available. For help, such individuals should contact Counseling and Psychological Services (CAPS) at 765-494-6995 during and after hours, on weekends and holidays, or by going to the CAPS office on the second floor of the Purdue University Student Health Center (PUSH) during business hours.

**Americans with Disabilities Act (ADA):**

It is the policy of Purdue University to accommodate and welcome students with disabilities. In compliance with the American with Disabilities Act (ADA) all qualified students enrolled in the course are entitled to “reasonable accommodations”. It is the student’s responsibility to inform the instructor of any special needs.

**Emergency Preparation:**

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor's control. Relevant changes to this course will be posted onto the course website or can be obtained by contacting the instructors or TAs via email or phone. You are expected to read your @purdue.edu email on a frequent basis

**Protect Purdue:**

**The Protect Purdue Plan, which includes the Protect Purdue Pledge, is campus policy and as such all members of the Purdue community must comply with the required health and safety guidelines. Required behaviors in this class include: staying home and contacting the Protect Purdue Health Center (496-INFO) if you feel ill or know you have been exposed to the virus, properly wearing a mask in classrooms and campus building, at all times (e.g., mask covers nose and mouth, no eating/drinking in the classroom), disinfecting desk/workspace before and after use, maintaining appropriate social distancing with peers and instructors (including when entering/exiting classrooms), refraining from moving furniture, avoiding shared use of personal items, maintaining robust hygiene (e.g., handwashing, disposal of tissues) prior to, during and after class, and following all safety directions from the instructor.**

**Students who are not engaging in these behaviors (e.g., wearing a mask) will be offered the opportunity to comply. If non-compliance continues, possible results include instructors asking the student to leave class and instructors dismissing the whole class. Students who do not comply with the required health behaviors are violating the University Code of Conduct and will be reported to the Dean of Students Office with sanctions ranging from educational requirements to dismissal from the university.**

**Any student who has substantial reason to believe that another person in a campus room (e.g., classroom) is threatening the safety of others by not complying (e.g., not properly wearing a mask) may leave the room without consequence. The student is encouraged to report the behavior to and discuss the next steps with their instructor. Students also have the option of reporting the behavior to the Office of the Student Rights and Responsibilities. See also Purdue University Bill of Student Rights.**

This is a **tentative** schedule, and therefore, all topics, readings, and assignments are subject to change. You are responsible for any changes made by the course instructor.

**Jan. 3 – Academic Year Faculty/Staff First Day**

**Jan. 10 – Classes Begin**

**Jan. 17 – Martin Luther King Jr. Day (no classes)**

**March 14-19 – Spring Vacation**

**April 30 – Classes End**

**May 2-7 – Final Exams**

**May 7 – Semester Ends**

**May 10 – Grades Due**

Week 1	Jan 10-14	Discuss research interests; review of correlation; rationale for linear regression models	Acock pgs. 193-210	
Week 2	Jan 17-21	Correlations; underlying statistics of linear regression	Acock pgs. 210-218	
Week 3	Jan 24-28	Bivariate regression; assumptions	Nguyen et al., 2016	Lab 1 due Jan. 28

Week 4	Jan 31-Feb 4	Multiple regression	Acock pgs. 275-299	Lab 2 due Feb. 4
Week 5	Feb 7-11	Multiple regression with dummy variables	Acock pgs. 299-309 Morrisey & Vinopal, 2018	Lab 3 due Feb. 11
Week 6	Feb 14-18	Power and types of error	Podcast on p-values and Ioannidis, 2005	Exam 1 on Feb. 17
Week 7	Feb 21-25	Introduction to SEM; Mediation models	Acock pgs. 417-432	Lab 4 due Feb. 25
Week 8	Feb 28-March 4	Mediation models; Cross-Lagged Panel Models	Acock pgs. 440-446 MacKinnon et al., 2000	Lab 5 due March 4
Week 9	March 7-11	Student presentations on proposed paper analyses		Paper Presentation
Week 10	March 14-18	Spring Vacation!		
Week 11	March 21-25	Moderation/interaction models	Acock pgs. 309-335	

Week 12	March 28-April 1	Moderation/interaction models	Almeida et al., 2009	Lab 6 due April 1
Week 13	April 4-8	Moderation/interaction models	Leve et al., 2009	Lab 7 due April 8
Week 14	April 11-15	Logistic regression	Acock pgs. 339-364	Exam 2 on April 12
Week 15	April 18-22	Logistic regression	Sheldrick et al., 2017 Acock pgs. 364-378	Lab 8 due April 22
Week 16	April 25-29	Spillover; Reflections; Review for final		Final Paper due April 29
Week 17	May 2-6	Finals Week		Cumulative Final Exam