The Ohio State University

***MythBusters:* An Introduction to Applied Interdisciplinary Research Methods**

Autumn Semester 20XX

ARTSCI 1137.XX (1 credit hour)

Professor: Lorraine S. Wallace, PhD

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Course Time and Location: TBD

Office Hours: By appointment

Course Description:

Throughout our daily lives, we regularly encounter interesting situations that spark our interest and curiosity. For example, have you ever considered questions such as (1) is yawning is contagious, (2) are men are better at following maps than women, (3) can you eat a spoonful of cinnamon without drinking water, or (4) does footwear choice affect driving performance? Common questions such as these have been explored and tested on the long-running *MythBusters* (http://www.discovery.com/tv-shows/mythbusters/) television series. Throughout the seminar, we will watch and critique select *MythBuster* clips to enable us to delve deeply into how studies or experiments are designed and executed to reliably answer real-world situations encountered in everyday life. Using *MythBuster* clips as a foundation, we will critically and comprehensively explore key ingredients in scientific study design, including: (1) proposing a solid and measurable research question, (2) developing sound experimental methodology, (3) meticulous observation and measurement, (4) designing data analysis plans, (5) interpretation and reporting of generated findings, (6) identification of study strengths and limitations, and (6) planning and delivering a dissemination plan. This seminar is geared towards students in all fields of study.

Course Objectives:

1. To introduce students to the key ingredients in scientific inquiry and study design.

2. To provide students an opportunity to devise a research question and design a scientific study to address a real-world question of interest.

3. To enable students to understand the benefits of synthesizing multiple disciplinary perspectives.

4. To provide students an opportunity to develop their oral presentation skills.

Course Website:

Students are required to make regular use of Carmen (https://carmen.osu.edu) during this seminar. The Carmen site contains assignments, readings, content links, and more. Students are responsible for all material contained in Carmen, unless specific material is listed as optional.

Course Evaluation:

Class Participation:
Regular attendance and active participation in discussions are a must to be successful in the course. Poor class attendance (missing more than one class) will negatively impact your overall class participation grade.
(20% of total course grade)

Written Assignments and Hands-on Experiments:
Throughout the semester, students will individually complete three (3) short (≈3-page, double-spaced pages) written assignments based upon *MythBusters* clips viewed in class:
Week 4: *Pop Rocks and Soda* clip
Week 6: *Phone Book Friction* clip
Week 9: *Flu Fiction* clip
As outlined below on the course schedule, unlike other weekly meetings, we will not be discussing the clips viewed during weeks 4, 6, and 9. Instead, we will watch clips and then students will be asked to reflect upon the content of the experiment or "myth." For each experiment or "myth," students will describe (1) the research question tested, (2) strengths and weaknesses of the methodology employed to address the research question, and (3) how the experiment or "myth" could have been tested using some other type of methodology.
(30% of total course grade [each assignment is worth 10% of total course grade])

Final Group Project:
Working in small groups (approximately 3 students), students will write a 5-page, double-spaced research proposal addressing a scientific myth that they would like to test. The proposal will describe: (1) a well-defined and measurable research question, (2) the experimental methodology to be employed (e.g., data collection, randomization, measurement), (3) data analysis plans, (4) anticipated results, and (5) an overview of study strengths and limitations. Small groups are encouraged to meet with the instructor and submit a rough draft for feedback prior to the due date. The proposal will draw upon all of concepts presented throughout the seminar.
(30% of total course grade)

Final Group Project Oral Presentation:
Each small group of students will present the scientific myth they would like to test to the class. Presentations will be approximately 12 minutes (8 minutes for presentation and 4 minutes for class discussion).
(10% of total course grade)

Peer Evaluations of Final Group Project Oral Presentations:
Using a rubric distributed in class, each student will provide constructive feedback/peer evaluations for 4 groups of students.
(10% of total course grade)

Grading Scale:

A	93-100
A-	90-92
B+	87-89
B	83-86
B-	80-82
C+	77-79
C	73-76
C-	70-72
D+	67-69
D	60-66
E	0-59

You are expected to be a good academic citizen. Come to class on time and be prepared for class when it begins. If you arrive more than 15 minutes late, you will not earn attendance/participation points for that day. Courtesy needs to be maintained in the classroom at all times. Respect your classmates and instructor. Show your respect for each other by waiting until the class is over to have private conversations. Wait until class is dismissed to pack up or leave the classroom.

Use of electronic devices (laptop computers, tablets, smartphones, etc.) in class for any purpose except directly related to academics is prohibited. Any violations of the policy will result in an automatic deduction of 2 percentage points from the student's final grade.

Course Schedule:

Week #	Topic(s)/Activity(ies)
1	• Seminar introduction and syllabus review • What is science? What is a myth? • Viewing and discussion of *Cell Phone Driving versus Drunk Driving* *MythBusters* clip
2	• The nature of evidence • Asking questions and finding answers • Viewing and discussion of *Shaving Cream Shenanigans* *MythBusters* clip
3	• Developing measurable research questions • Viewing and discussion of *Solid Mercury Explosion* *MythBusters* clip
4	• The science of measurement and observation • Viewing of *Pop Rocks and Soda* *MythBusters* clip
5	• Designing a study to answer the research question • Viewing and discussion of *Party Balloon Pile Up* *MythBusters* clip

6	• Statistics and significance • Viewing of *Phone Book Friction* *MythBusters* clip
7	• Probabilities and error • Viewing and discussion of *Cockroach Survival* *MythBusters* clip
8	• Interpreting research findings • Viewing and discussion of *Swimming in Syrup* *MythBusters* clip
9	• Identifying study strengths and weaknesses • Viewing of *Flu Fiction* *MythBusters* clip
10	• Disseminating study findings • Viewing and discussion of *Mattress Mayhem* *MythBusters* clip
11	• The process and importance of scientific peer review • Viewing and discussion of *Drain Disaster* *MythBusters* clip
12	• Pseudoscience • Viewing and discussion of *Penny Drop* *MythBusters* clip
13	• Science and the public • Viewing and discussion of *Great Gas Conspiracy* *MythBusters* clip
14	• Final Group Project Oral Presentations
15	• Final Group Project Oral Presentations

*** All clips, to be viewed in class, are part of *MythBusters* 10th Anniversary Collection.**

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/.

Disability Services Statements:

Students with disabilities (including mental health, chronic or temporary medical conditions) that have been certified by the Office of Student Life Disability Services will be appropriately accommodated and should inform the instructor as soon as possible of their needs. The Office of Student Life Disability Services is located in 098 Baker Hall, 113 W. 12th Avenue; telephone 614- 292-3307, slds@osu.edu; slds.osu.edu