



IUPUI

SCHOOL OF INFORMATICS AND COMPUTING

LIS S201

Introduction to Data Studies

BS in Applied Data and Information Science Program

Section No.: 27495

Credit Hours: 3

Canvas Course Site: <https://iu.instructure.com/courses/2098595>

Instructor: Dr. Angela P. Murillo, Ph.D., Assistant Professor, School of Informatics and Computing

Office Hours: By Appointment

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Website: <https://soic.iupui.edu/people/angela-murillo/>

Prerequisites: None

COURSE DESCRIPTION

This class introduces digital literacies, focusing on data and information literacy in the media, civic engagement, business, informatics, and data science. Students explore the production of data, their roles as data creators and consumers, and the effects of data practices on society. Students apply their acquired skills in real-world situations.

EXTENDED COURSE DESCRIPTION

This course emphasizes the value of data in society and provides students the opportunity to learn basic data concepts and skills. Students will gain an understanding of key factors for data studies including data sources, data ethics, data policy, data evaluation, data manipulation, and data visualization. Additionally, students will gain valuable hands-on experience working with data.

This course is a required course for the Applied Information Science Minor/Certificate and Applied Data and Information Science Major curriculum.

TEXTBOOK

- Herzog, D. (2015). Data literacy: A user's guide. SAGE Publications: Los Angeles, CA, available online via Canvas through IU eText
- Additional readings as assigned

TECHNOLOGIES

Hardware

A reliable computer running Windows, Mac OS, or Linux operating system. Please visit <http://informatics.iupui.edu/technology/laptop> for information on the Laptop Initiative for Informatics majors. For PC users, you need to have the most recent version of Firefox or Chrome. For Mac users, you need to have the most recent version of Safari, Firefox, or Chrome.

To successfully complete this course, students must:

- Have adequate computing skills, including but not limited to the use of Microsoft Office suite or equivalent to process, save, and retrieve documents.
- Learn how to submit your assignments using Canvas.

Software

You have three sources for software: IUware, IUanyWare, Office 365

- IUware allows students, faculty, and staff to download software at no charge. See What is IUware? (<https://kb.iu.edu/d/agze>)
- IUanyWare uses a web browser or mobile app to run certain IU-licensed software applications without your needing to install them on your device. See What is IUanyWare (<https://kb.iu.edu/d/bbbr>)
- Office 365 (<https://uits.iu.edu/initiatives/microsoft-365>) is a subscription-based service free to all IU currently enrolled students that provides multiple options for accessing the newest versions of Microsoft Office. See About Microsoft Office 365 at IU (<https://kb.iu.edu/d/bexq>)
- For more details, see: About software at IU (<https://kb.iu.edu/d/aclo>)

Canvas works best in the most recent version of Edge, Chrome, Firefox, or Safari browsers. Canvas does not support Internet Explorer.

STUDENT LEARNING OUTCOMES

Upon completion of this course, students will	RBT	<u>PLUS</u>	PLO	Assessment
1. Recognize that data can have value and play a key role in society by providing opportunities to grow knowledge, innovate, and influence.	2	P2.1 P2.3 P4.3 P4.4	A1, A2, A3, A4, E1	Assignments Discussion Paper Quizzes Final Project
2. Identify and evaluate various sources and types of data.	2	P2.1, P2.3	A1, A3, A4	Assignments Discussion Final Project
3. Analyze datasets in context to determine the reliability of the information, including potential bias in data collection or representation.	3	P2.3, P3.2 P4.4	A3, C4	Assignments Final Project
4. Understand the ethical guidelines and implications for using, managing, and communicating data.	2	P4.3 P4.4	A2, D2, E1	Assignments Paper Final Project

5. Examine results produced in data analysis using data visualizations that are suitable for their purpose and targeted audience.	3	P2.1, P2.3, P3.2	B1, B4 E1	Assignments Final Project
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*[RBT: Revised Bloom's Taxonomy](#): 1. Remembering, 2. Understanding, 3. Applying, 4. Analyzing, 5. Evaluating, 6. Creating

PROFILES OF LEARNING FOR UNDERGRADUATE SUCCESS (PLUS):

P2.1 **Problem Solver** – Think critically

P2.3 **Problem Solver** – Analyzes, synthesizes, and evaluates

P3.2 **Innovator** – Creates/designs

P4.3 **Community Contributor** – Behaves ethically

P4.4 **Community Contributor** – Anticipates consequences

PROGRAM LEARNING OUTCOME COMPETENCY AREA

A1: Data Literacy - Distinguish between data, information, and knowledge.

A2: Data Literacy - Analyze the value and key role data plays in society in providing opportunities to expand knowledge, to innovate, and to influence.

A3: Data Literacy - Analyze datasets in context to determine data veracity including bias in data collection or representation.

A4: Data Literacy - Assess values with respect to the use of data technologies.

B1: Data Science - Organize, visualize, and analyze large, complex datasets using descriptive statistics and graphs to make decisions.

B4: Data Science - Conceptualize and design effective visualizations for a variety of data types and analytical tasks.

C4: Information Science - Understand the characteristics of various data types generated and used by a variety of disciplines, subdisciplines, research communities, and government organizations.

D1: Data Ethics - Understand the relation between data, ethics, and society.

E1: Other Topics - Design, conduct, and write up results of research.

TEACHING AND LEARNING METHODS

Active learning (AL), project-based learning (PBL), and asynchronous use of Canvas.

TOPICS

Structurally, this course covers sixteen weeks. Fourteen of those weeks included substantive content; three weeks account for the intro to the course, Thanksgiving Break, and finals week. Each module iteratively builds on those that came before it.

Each week begins on Monday at 12:00 AM and ends on the following Sunday at 11:59 PM. Most assignments are due Sunday at 11:59 PM, except for the Final Exam.

Week 1: Introduction to the Course

Week 2: Intro to Data Foundations

Week 3: Data Basics

Week 4:	Finding Data
Week 5:	Requesting and evaluating data
Week 6:	Data integrity checks
Week 7:	Data manipulation
Week 8:	Introduction to data ethics
Week 9:	Data ethics, Part 2
Week 10:	Data journalism, Part 1
Week 11:	Data journalism, Part 2
Week 12:	Summary Statistics
Week 13:	Introduction to Visualization
Week 14:	Thanksgiving Break
Week 15:	Visualization Part 2
Week 16:	Final Project Preparation
Finals Week:	Final Project Due

ASSESSMENTS

Each student should not only read the assigned material but also arrive at a competent understanding of it prior to assessment. These measures will be used to assess student-learning outcomes:

Introductory Homework (2.5): The introductory course module includes several assessments to help you get orientated to the course.

Quizzes (17.5%): Quizzes are collectively worth 17.5% percent of your total grade. The quizzes help assess your understanding of the concepts and provide you with opportunities to practice. Structurally, the quizzes are administered via Canvas. Questions will include simple true/false, multiple-choice, matching, and short essays.

Online Discussion Participation (7.5%): You will explore topics and readings throughout the semester through an online discussion forum. You are expected to participate in the discussion forum by offering ideas, including your thoughts and from sources outside of the class readings, and interacting with your classmates. To participate in the online discussion, I will provide a prompt and/or question of what should be discussed.

Assignments (45%): Throughout the course, assignments will provide you the opportunity to engage more deeply with data through either hands-on learning or other types of exploration. Criteria and submission details for these assignments are provided in Canvas.

- Assignment 1: Exploring Data Source
- Assignment 2: Data Integrity Check
- Assignment 3: Data Manipulation

- Assignment 4: Data Journalism Case Analysis
- Assignment 5: Summary Statistics and Number Comparison
- Assignment 6: Visualization Practice

Data Ethics Paper (12.5%): You will research and write a short paper examining data ethics. Details will be provided throughout the semester.

Final Project: Visualization Presentations & Paper (15%): For the final project, you will demonstrate your ability to find, explore, inspect, clean, manipulate, analyze, and visualize data. You will present your data through both a presentation and a paper and include a critical analysis of the technical pros and cons of the data and visualizations you choose and describe the questions and story you are trying to tell with your data and visualizations.

GRADING

Introductory Homework (2.5%)

Quizzes (17.5%)

Online Discussion Participation (7.5%)

Assignments (45%)

Data Ethics Paper (12.5%)

Final Project: Visualization Presentation and Paper (15%)

EXPECTATIONS, GUIDELINES, AND POLICIES

Attendance:

The course will be taught entirely online including web-based readings and resources, threaded discussions, plus online presentations and activities. This course assumes that students can work independently. There are no required face-to-face meetings. There are no required synchronous online meetings. However, students are encouraged to e-mail or arrange an online chat with the instructor at any time.

A basic requirement of this course is that you will participate in all class meetings, whether online or face-to-face, and conscientiously complete all required course activities and assignments. Students are expected to complete the assignments, quizzes, and projects on time, which is your attendance.

Incomplete:

The instructor may assign an [incomplete](#) (I) grade only if at least 75% of the required coursework has been completed at passing quality and holding you to previously established time limits would result in unjust hardship to you. All unfinished work must be completed by the date set by the instructor. Left unchanged, an incomplete automatically becomes an F after one year.

Deliverables:

You are responsible for completing each deliverable (e.g., assignment, quiz) by its deadline and submitting it by the specified method. Deadlines are outlined in the syllabus or in

supplementary documents accessible through Canvas. Should you miss a class, you are still responsible for completing the deliverable and for finding out what was covered in class, including any new or modified deliverable.

In fairness to the instructor and students who completed their work on time:

Late assignments will have 5% per day deducted up to six days late.

- After six days, an assignment will be accepted, marked with 70% deducted and any additional deduction based on the assignment criteria.
- Instructors have the discretion to provide exceptions based on special circumstances, such as illness or emergency.
- If you have difficulties completing assignments, please communicate with your instructor (at least 8 hours before the assignment is due, or, more preferably, as soon as you know you will be late completing the assignment) to create a timeline and plan for assignment completion.

Grading Scale:

A+	97–100%	Professional level work, showing highest level of achievement
A	93–96.99%	Extraordinarily high achievement, quality of work; shows command of the subject matter
A–	90–92.99%	Excellent and thorough knowledge of the subject matter
B+	87–89.99%	Above average understanding of material and quality of work
B	83–86.99%	Mastery and fulfillment of all course requirements; good, acceptable work
B–	80–82.99%	Satisfactory quality of work
C+	77–79.99%	Modestly acceptable performance and quality of work
C	73–76.99%	Minimally acceptable performance and quality of work
C–	70–72.99%	Unacceptable work (Core course must be repeated for credit)
D+	67–69.99%	Unacceptable work (Course must be repeated for credit)
D	63–66.99%	Unacceptable work
D–	60–62.99%	Unacceptable work
F	Below 60	Unacceptable work

No credits are granted for a grade below C.

CODE OF CONDUCT

All students should aspire to the highest standards of academic integrity. Using another student's work on an assignment, cheating on a test, not quoting or citing references correctly, or any other form of dishonesty or plagiarism shall result in a grade of zero on the item and possibly an F in the course. Incidences of academic misconduct shall be referred to the Department Chair and repeated violations shall result in dismissal from the program.

All students are responsible for reading, understanding, and applying the *Code of Student Rights, Responsibilities and Conduct* and in particular the section on academic misconduct. Refer to *The Code > Responsibilities > Academic Misconduct*. <https://studentcode.iu.edu/>

All students must also successfully complete the Indiana University Department of Education “How to Recognize Plagiarism” Tutorial and Test. You must document the difference between your writing and that of others. Use quotation marks in addition to a citation, page number, and reference whenever writing someone else’s words (e.g., following the *Publication Manual of the American Psychological Association*). To detect plagiarism instructors apply a range of methods, including Turnitin.com.

Academic Misconduct:

1. **Cheating:** Cheating is an attempt to use or provide unauthorized assistance, materials, information, or study aids in any form and in any academic exercise or environment.
 - a. A student must not use external assistance on any “in-class” or “take-home” examination, unless the instructor specifically has authorized external assistance. This prohibition includes, but is not limited to, the use of tutors, books, notes, calculators, computers, and wireless communication devices.
 - b. A student must not use another person as a substitute in the taking of an examination or quiz, nor allow other persons to conduct research or to prepare work, without advanced authorization from the instructor to whom the work is being submitted.
 - c. A student must not use materials from a commercial term paper company, files of papers prepared by other persons, or submit documents found on the Internet.
 - d. A student must not collaborate with other persons on a particular project and submit a copy of a written report that is represented explicitly or implicitly as the student’s individual work.
 - e. A student must not use any unauthorized assistance in a laboratory, at a computer terminal, or on fieldwork.
 - f. A student must not steal examinations or other course materials, including but not limited to, physical copies and photographic or electronic images.
 - g. A student must not submit substantial portions of the same academic work for credit or honors more than once without permission of the instructor or program to whom the work is being submitted.
 - h. A student must not, without authorization, alter a grade or score in any way, nor alter answers on a returned exam or assignment for credit.
2. **Fabrication:** A student must not falsify or invent any information or data in an academic exercise including, but not limited to, records or reports, laboratory results, and citation to the sources of information.
3. **Plagiarism:** Plagiarism is defined as presenting someone else’s work, including the work of other students, as one’s own. Any ideas or materials taken from another source for either written or oral use must be fully acknowledged.
 - a. A student must not adopt or reproduce ideas, opinions, theories, formulas, graphics, or pictures of another person without acknowledgment.
 - b. A student must give credit to the originality of others and acknowledge indebtedness whenever:
 1. directly quoting another person’s actual words, whether oral or written;
 2. using another person’s ideas, opinions, or theories;
 3. paraphrasing the words, ideas, opinions, or theories of others, whether oral or written;

4. borrowing facts, statistics, or illustrative material; or
 5. offering materials assembled or collected by others in the form of projects or collections without acknowledgment
4. **Interference:** A student must not steal, change, destroy, or impede another student's work, nor should the student unjustly attempt, through a bribe, a promise of favors or threats, to affect any student's grade or the evaluation of academic performance. Impeding another student's work includes, but is not limited to, the theft, defacement, or mutilation of resources to deprive others of the information they contain.
 5. **Violation of Course Rules:** A student must not violate course rules established by a department, the course syllabus, verbal or written instructions, or the course materials that are rationally related to the content of the course or to the enhancement of the learning process in the course.
 6. **Facilitating Academic Dishonesty:** A student must not intentionally or knowingly help or attempt to help another student to commit an act of academic misconduct, nor allow another student to use his or her work or resources to commit an act of misconduct.

CAMPUS POLICIES

1. **Administrative withdrawal (undergraduate only):** Students must participate in all class discussions and conscientiously complete all required course activities and/or assignments. If a student is unable to attend, participate in, or complete an assignment on time, the student must inform the instructor. If a student misses more than half of the required activities within the first 25% of the course without contacting the instructor, the student may be administratively withdrawn from this course. Administrative withdrawal may have academic, financial, and financial aid implications. Administrative withdrawal occurs after the full refund period, and a student who has been administratively withdrawn is ineligible for a tuition refund. <https://studentcentral.iupui.edu/register/administrative-withdrawal.html>
2. **Counseling and Psychological Services (CAPS):** Students seeking counseling or other psychological services should contact the [CAPS office](mailto:capsindy@iupui.edu) at 274-2548 or capsindy@iupui.edu.
3. **Course policies:** Several campus policies governing IUPUI courses may be found at the following [link: http://registrar.iupui.edu/course_policies.html](http://registrar.iupui.edu/course_policies.html)
4. **Disabilities policy:** All qualified students enrolled in this course are entitled to reasonable accommodations for a disability. Notify the instructor during the first week of class of accommodations needed. Students requiring accommodations register with Adaptive Educational Services (AES) and complete the appropriate forms from AES before receiving accommodations. The AES office is located at UC 100, Taylor Hall (Email: aes@iupui.edu, Tel. 317 274-3241). For more information visit <http://aes.iupui.edu>. For ADA resources visit <https://accessibility.iu.edu/ada/>. For ADA policies visit <https://policies.iu.edu/policies/ua-02-americans-disability-act/>.
5. **Education and Title VI:** IUPUI nurtures and promotes “a campus climate that seeks, values, and cultivates diversity in all of its forms and that provides conditions necessary for all campus community members to feel welcomed, supported, included, and valued” (IUPUI Strategic Initiative 9). IUPUI prohibits “discrimination against anyone for reasons of race, color, religion, national origin, sex, sexual orientation, marital

status, age, disability, or veteran status” (Office of Equal Opportunity). Title VI of the Civil Rights Act of 1964 protects people from discrimination based on race, color, or national origin in programs or activities that receive Federal financial assistance. Programs and activities that receive ED funds must operate in a nondiscriminatory manner, including admissions, recruitment, financial aid, academic programs, student treatment and services, counseling and guidance, discipline, classroom assignment, grading, vocational education, recreation, physical education, athletics, housing, and employment, if it affects those who are intended to benefit from the Federal funds.

<http://www2.ed.gov/about/offices/list/ocr/docs/hq43e4.html>

6. **Emergency preparedness:** Know what to do in an emergency to be protected and to protect others. For more information, visit the emergency management website at <http://protect.iu.edu/emergency>.
7. **No class attendance without enrollment:** Only those who are officially enrolled in this course may attend class unless enrolled as an auditor or making up an incomplete by prior arrangement with the instructor. This policy does not apply to those assisting a student with a documented disability, serving in an instructional role, or administrative personnel. <https://facultystaffcentral.iupui.edu/enrollment/index.html> Children may *not* attend class with their parents, guardians, or childcare providers.
8. **Religious holidays:** IUPUI respects the right of all students to observe their religious holidays and will make reasonable accommodation, upon request, for such observances. Students seeking accommodation for religious observances must submit a [request form](#) to the course instructor by the end of the second week of the semester. For information visit.
9. **Sexual misconduct:** One of the instructor’s responsibilities is to create a safe learning environment. IU does not tolerate sexual harassment or violence, which are prohibited under Title IX and the [sexual misconduct policy](#). The university can help students subjected to sexual misconduct. To seek help, obtain information and resources, or speak to someone confidentially, visit <https://stopsexualviolence.iu.edu/>. Federal regulations and University policy require the instructor to convey promptly any information about potential sexual misconduct to IUPUI’s Deputy Title IX Coordinator or IU’s Title IX Coordinator to ensure appropriate measures are taken and resources are offered. To protect a student’s privacy all involved will only share information with those who need to know to ensure the university can respond and assist.
10. **Student advocate:** The Student Advocate assists students with personal, financial, and academic issues. The Student Advocate is in the Campus Center, Suite 350, and may also be contacted at 317 274-4431 or studvoc@iupui.edu. For more information visit <http://studentaffairs.iupui.edu/advocate>.

SCHOOL POLICIES AND GUIDELINES

1. **Civility:** To maintain an effective and inclusive learning environment, it is important to be an attentive and respectful participant in lectures, discussions, groupwork, and other classroom exercises. Thus, unnecessary disruptions should be avoided, such as ringing cell phones, engagement in private conversations, and other unrelated activities. Cell phones, media players, or any noisy devices should be turned off during a class. Texting, web surfing, and posting to social media are generally not permitted. Laptop use may be permitted if it is used for taking notes or conducting class activities.

Students should check with the instructor about permissible devices in class. Profanity or derogatory comments about the instructor, fellow students, invited speakers or other classroom visitors, or any members of the campus community shall not be tolerated. A violation of this rule shall result in a warning and, if the offense continues, possible disciplinary action.

2. **Communication:** For classroom-based courses, the instructor or teaching assistant should respond to emails by the end of the next class or, for online courses, within two Indiana University working days, which excludes weekends and holidays. The instructor should provide weekly office hours or accept appointments for face-to-face, telephone, or teleconferenced meetings, and announce periods of extended absence in advance.
3. **Course evaluations:** Course evaluations provide vital information for improving the quality of courses and programs. Students are urged to complete one course and instructor evaluation for each section in which they are enrolled at the School of Informatics and Computing with the following exceptions: (a) The student has withdrawn from the course; (b) fewer than five students are enrolled in the section (in which case maintaining anonymity is difficult); and (c) the section is a laboratory that must be taken with a course having a different section number. Course evaluations are completed at <https://soic.iupui.edu/app/course-eval/>. Course evaluations are typically open from the eleventh week. Course evaluations are anonymous, which means that no one can view the name of the student completing the evaluation. In addition, no one can view the evaluation itself until after the instructor has submitted the final grades. In small sections, demographic information should be left blank, if it could be used to identify the student.
4. **Email:** Indiana University uses the student's IU email account as an official means of communication, and students should check it daily. Although the student may have IU email forwarded to an outside email account, the student should email faculty and staff from the student's IU email account.
5. **Right to revise:** The instructor reserves the right to make changes to this syllabus as necessary and, in such an event, will notify students of the changes immediately.

MISSION STATEMENT

The Mission of IUPUI is to provide for its constituent's excellence in

- Teaching and Learning;
- Research, Scholarship, and Creative Activity; and
- Civic Engagement.

With each of these core activities characterized by

- Collaboration within and across disciplines and with the community;
- A commitment to ensuring diversity; and
- Pursuit of best practices.

IUPUI's mission is derived from and aligned with the principal components—Communities of Learning, Responsibilities of Excellence, Accountability and Best Practices—of Indiana University's Strategic Directions Charter.

STATEMENT OF VALUES

IUPUI values the commitment of students to learning; of faculty to the highest standards of teaching, scholarship, and service; and of staff to the highest standards of service. IUPUI recognizes students as partners in learning. IUPUI values the opportunities afforded by its location in Indiana's capital city and is committed to serving the needs of its community. Thus, IUPUI students, faculty, and staff are involved in the community, both to provide educational programs and patient care and to apply learning to community needs through service. As a leader in fostering collaborative relationships, IUPUI values collegiality, cooperation, creativity, innovation, and entrepreneurship as well as honesty, integrity, and support for open inquiry and dissemination of findings. IUPUI is committed to the personal and professional development of its students, faculty, and staff and to continuous improvement of its programs and services.