DSC 450 Data Science Independent Study

Individual work on special topics in data science

Marcus Birkenkrahe

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1 General Course Information

- Meeting Times: **by appointment only**
- Meeting place: Derby Science Building room 210 or online
- Professor: Marcus Birkenkrahe
- Professor's Office: Derby Science Building 210
- Phone: (870) 307-7254 (office) / (501) 422-4725 (private)
- Office hours: by appointment
- Textbook: N/A

2 Objectives

The Data Science Independent Study aims to:

1. Deepen Understanding: Enhance students' grasp of key data science concepts, techniques, and tools.
2. Application: Enable practical application of data science theories to real-world challenges.
3. Research Proficiency: Develop research and problem-solving skills using diverse data sources and methodologies.
4. Advanced Tool Mastery: Foster proficiency in leading data science software and programming languages.

5. Critical Thinking: Promote the evaluation of complex datasets and models with a critical mindset.

6. Ethical Considerations: Emphasize responsible and ethical data usage, ensuring privacy and fairness.

7. Collaboration: Encourage cross-disciplinary collaboration, integrating insights from multiple perspectives.

8. Continuous Learning: Inculcate a habit of staying updated with evolving data science trends and technologies.

9. Project Management: Enhance abilities in initiating, executing, and presenting independent projects.

10. Communication: Develop skills in effectively communicating data-driven insights to diverse audiences.

This study encourages holistic data science exploration, promoting both technical expertise and broader interdisciplinary connections.

3 Target audience

This course is tailored for advanced students and professionals with foundational knowledge in data science, statistics, or a related field. Ideal participants are those eager to dive deeper into specialized data topics, undertake independent research, and apply theoretical concepts to real-world problems. The course will especially benefit those aiming for careers as data scientists, data analysts, or roles requiring rigorous data-driven decision-making. Prior experience with programming languages such as Python or R is beneficial but not mandatory, as the emphasis is on exploration, critical thinking, and application.

4 Student Learning Outcomes

Upon completion, students will:

1. Demonstrate advanced proficiency in key data science techniques and tools.

2. Apply data science concepts to solve real-world challenges.

3. Exhibit rigorous research and problem-solving abilities.
4. Critically evaluate and interpret complex datasets and models.
5. Adhere to ethical standards in data analysis and interpretation.
6. Collaborate effectively across disciplines, integrating diverse insights.
7. Stay abreast of current trends and technologies in data science.
8. Manage and execute data-driven projects from initiation to presentation.
9. Communicate data insights articulately to varied audiences.

5 Course requirements

Students must possess:

- Foundational knowledge in data science or statistics.
- Familiarity with a programming language (preferably Python or R).
- A commitment to a semester-long research project.
- Regular attendance in consultation sessions.
- Engagement in peer reviews.
- Completion of ethical data usage training.
- Final project presentation.

6 Grading system

You should be able to see your current grade at any time using the Canvas gradebook for the course. To pass, you need 60%.

DESCRIPTION	IMPACT
Final report	50%
Final presentation	25%
Participation	25%

7 Learning Management System (LMS)

We will use Canvas and GitHub in this course.

8 Schedule and session content

For **important dates**, see the academic Calendar at: catalog.lyon.edu.

Independent research does not follow a particular schedule but it is instead aligned with the researchers' schedule and (if applicable) deadlines for journal submissions or conferences.

9 Standard and course policies

- **Standard Lyon College Policies** are incorporated into this syllabus and can be found at: lyon.edu/standard-course-policies.