EDS 411A: MEDS Capstone
Course Syllabus (Winter 2021)

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**EDS 411A Description:** The goal of EDS 411A is to facilitate student learning, work and progress on their MEDS Capstone project through lessons, activities, supervised and unsupervised project work, and peer review and feedback. Additionally, EDS 411A provides opportunities for professional and career development (e.g. presentation skills, writing and editing, client relations, team science, panel discussions, and conflict resolution).

Throughout the course, students will build on skills they have learned in prior MEDS courses to implement them in a real-world data science project, including:

- **Prepare professional documentation for a data science project** through the Design and Implementation Plan, and Technical Documentation
- **Practice project management and reproducible workflows** using tools and strategies learned in MEDS courses, establishing clear expectations for group roles and participation, and with frequent updates within and across groups
- **Continue to build real-world skills for data science projects** through continued collaborative work in git, data analyses and statistics, data visualization and communication, and more
- **Implement professional skills for data science careers** including code and documentation peer review, team and client relations, scheduling and organizing tools & strategies, and conflict resolution & communication
A major goal of 411A is to facilitate and support student work on their Design and Implementation Plan (due to faculty advisors on the last day of Winter Quarter). See Capstone Guidelines for more information.

Each group’s Design and Implementation Plan must include the following components (10 pages of writing maximum, all graphics and figures in appendices):

a. Title Page
b. Executive Summary (not to exceed one page)
c. Problem Statement and Objectives
d. Solution Design
   i. Approach and Methods
   ii. Data Management Plan
   iii. Proposed Software or Tools
e. Products and Deliverables
f. Testing Plan
g. Documentation Plan
h. Timeline and Milestones
i. Team Management Plan
j. Budget and Budget Justification
k. References

Note: EDS 411A meets for 4 hr/wk. The expected total project contribution of each group is 30 - 40 hours / wk (~10 - 12 hr / group member). Most work done on MEDS Capstone projects will be outside of EDS 411A. This course exists to provide opportunities for co-learning and sharing between groups, and designated time for learning & practicing skills that are important across all projects. Additional work & progress on Capstone projects should be expected based on weekly discussions with the faculty advisor and/or clients.

**Project management:** Each week, individual students will submit a checklist of tasks they will contribute to that week (e.g. as a checklist in a GitHub issue), and provide updates on tasks they worked on the previous week (e.g. by responding to a GitHub issue they submitted the previous week). The exercise of creating a clearly defined and carefully scoped task list for the week is a valuable practice for project management, staying on track based on the project timeline, and to ensure that all team members have a clear understanding of what is being worked on, when.
Course prerequisites (official): None

Required textbook / reader: None (readings will be assigned and posted)

Bring to class: All students should bring all materials and devices needed for work on their capstone project to class every day. Students should also bring a notebook and pens/pencils to each session.

Course materials: Materials are accessed through the course website.

Course communication: Course communication will be through Slack workspace and website.

Assignments: EDS 411 is a practicum-style course that prioritizes work and progress on MEDS Capstone projects, combined with short lectures, guest visits, and activities to reinforce data science, project management, and professional skills throughout. Course requirements will be related to Capstone milestones, and will be assessed based on frequent in-class presentations, and group and individual self-assessments throughout the quarter.

Assessment and grading:

Grades will be based on three components:
1. Course participation and contributions (70%)
2. Biweekly group presentations / updates (20%)
3. Individual weekly task checklist & response (10%)

Access and accommodations: Please submit requests for accommodations often and early. It is never too late to apply for DSP accommodations. If you have any kind of disability, whether apparent or non-apparent, learning, emotional, physical, or cognitive you may be eligible to use formal accessibility services on campus. To arrange class-related accommodations, please contact DSP. DSP will initiate communication about accommodations with faculty. By making a plan through DSP, appropriate accommodations can be implemented without disclosing your specific condition or diagnosis to course instructors.
**Code of Conduct:** All course participants (instructor, guests, students) are expected to adhere to the Bren School and UCSB Codes of Conduct.

### Tentative topics / activities:

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<thead>
<tr>
<th>Wk</th>
<th>Lesson</th>
<th>Activities</th>
<th>Relevant reading / docs</th>
<th>Capstone Progress</th>
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</table>
| 1  | Course introduction and capstone requirements, roles overview, expectations. The “Getting help order of operations” for MEDS Capstones. | 3 minute flash talks (project introduction)  
Blank poster brainstorms: Making a plan for team project management & present to the group  
Write 1-paragraph summary for Bren website  
Finance management: (Bridget Mastopiero) | [What is the team data science process?](https://www.example.com/what-is-the-team-data-science-process)  
[Writing good GitHub issues](https://www.example.com/writing-good-github-issues) | Team management plan in progress, define roles and set expectations for communication / map out a workflow w/ expected tools.  
Add roles to Googlesheet, share with Emily & Satie.  
Brainstorm project timeline.  
**First meeting with both faculty advisors** |
| 2  | Client and supervisor relations: considerations & communication strategies | Panel discussion:  
**Awareness of tools & expertise:** Making a product that is robust and sustainable, given the tools & skills your client can work with.  
**Communicating with clients** to get what you need for forward progress  
Solution design brainstorm: approaches, software & tools.  
**Meeting with faculty advisor and client (if applicable)** |
<p>| 3  | Data science project documentation | Activity: Review data documentation and data management plan examples | <a href="https://www.example.com/data-documentation-intro">Data documentation intro from Illinois Library</a> | Outline &amp; start populating a data management and project documentation plan for your project. |</p>
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<th>4</th>
<th>Testing - Brainstorming &amp; designing how to test your work &amp; deliverables</th>
<th>Group pairing &amp; testing brainstorm. How can we break this? How would we test for that? Panel on the importance of testing things (“Flash failures” - flash talks on failing by MEDS faculty, and what they would have done differently, followed by happy hour)</th>
<th>See considerations <a href="#">here</a>, especially re: data engineering practices.</th>
<th>Continued work on Design &amp; Implementation Plan (focus on Testing)</th>
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<td>5</td>
<td>Building trust and dealing with conflicts in teams to keep a project moving forward</td>
<td>Panel discussion on conflict resolution: panelists TBD (possibly 2nd year MESMs?)</td>
<td>Hadley Wickham’s aggregated resources on blameless postmortems</td>
<td>Documentation plan drafted &amp; presented. Drafted solution design / approach. Revisit and share project timeline.</td>
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<td>Mid-quarter check-in &amp; peer feedback</td>
<td>All groups present (~7 min)</td>
<td>N/A</td>
<td>Complete &amp; submit first draft of Design &amp; Implementation plan</td>
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<td>Project storytelling &amp; presentation skills (Part 1)</td>
<td>Practice: Outlining a story, presenting your project</td>
<td>TBD</td>
<td>Start putting together a presentation on your project (skeleton for faculty review) Compile Design &amp;</td>
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<td>Implementation Plan components</td>
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<td>Revise Design &amp; Implementation plan</td>
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<td>Faculty reviews</td>
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<td>Final revision and submission: Design &amp; Implementation plan</td>
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