

Course Information

EDUC 263B: Curriculum and Instruction in Mathematics (4 units)

Fall 2024

Tuesdays, 3:15 pm - 6 pm

CERAS 302

Primary Instructor: Dr. Jo Boaler (she/her pronouns)

You may call me “Jo” in writing and when we talk.

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Office Hours by appointment (email me to set up a time)

Teaching Assistant: Marti Lane (they/them pronouns)

Feel free to call me “Marti” in writing and when we talk.

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Course Overview/Goals

This is the second of a 3-course sequence focused on mathematics teaching and learning designed to create an opportunity for sustained learning and professional growth. This quarter, we will examine two crucial and closely connected aspects of classroom instruction: planning lessons and assessing student learning. To do so, we will:

- Discuss approaches to the “backward design” of curricula in which educators begin their planning with a vision of the understandings they want their students to achieve and the dimensions of performance that would demonstrate those understandings. We will explore and map important understandings in secondary mathematics and the misconceptions often held by students.
- Consider different forms of assessment – formative and summative - noting the importance of designing assessments that match our instructional goals: assessing understanding in multiple ways, offering rationale for each design and goal, and integrating assessment and instruction. We will also examine dimensions of mathematics instruction teachers must consider as they prepare lessons: informal assessment, participation structures, selection and implementation of tasks, and the role of the teacher in the lesson. There will be a joint focus throughout the course on research and practice. Journals and other assignments will encourage you to learn from course readings and classroom placements through informed reflection.
- Explore problem-solving as a teaching approach. Before you can develop in students the skills to solve mathematical problems, you need to know yourself as a problem solver, and you need to know particular processes involved in problem-solving. Throughout the quarter, we will inspect and work on a set of mathematical tasks to help us accomplish both goals.
- Engage in tasks in class, using a variety of formats: individual, pairs, groups, and whole class. We will delve deep enough into the tasks to illustrate an important aspect of problem-solving, but you may need to continue pondering and working on the extensions outside of class. In addition to reflecting on your own mathematical experience with each task, we will systematically consider the mathematics likely to surface, the background skills needed to access the tasks, and the range of approaches students are likely to take.

Course Materials

Technology: All course details and materials will be posted on our Canvas course site. You will need to have access to a device that connects to the internet so that you can access email and Canvas. Students should bring their STEP-provided iPad or another device to each class session.

Readings: All course readings will be posted electronically to Canvas at the beginning of the quarter, so students have the choice to print them free of charge in CERAS if desired.

Coursework and Grading

We expect you to come to class having completed the reading and assignments due for that day and to be prepared to participate in class discussions and activities. This means that you have a clear idea of the main points; you may have formulated some questions; and/or you have noted any related issues that the reading or topic raised for you. On some days we may ask you to respond to the article and engage with your peers in the discussion section of Canvas.

Regarding participation, we are looking for you to contribute to small and whole group discussions in class and online discussions. Whether you are more talkative or more introverted in nature, we expect that you make concerted efforts to both listen and contribute, monitoring your level of sharing, and making space for others to join in. We recognize that you may have more to say about one topic over another, but across the 9 classes, we should have heard your thoughts and ideas in both small and whole group discussions and online. This will help your learning as well as the learning of the group.

Your participation depends upon your timeliness in attendance. If for any reason, you will miss or be late to class, please email the instructors ahead of time.

Throughout the quarter, you will be required to complete several assignments (see Assignment details on Canvas), conduct readings (see Course Schedule), and complete daily tasks, which will be described during class. Our expectation is that everyone will receive an A grade. If your work – including the quality of your participation and major assignments – is not at that standard we will discuss ways to improve it.

Major Assignments

Your assignments for this quarter are:

What:	When:	Where:	Details:
Norms Assignment	Monday, September 23 by 10 pm	Upload to Canvas	3000 words
Assessment for Learning (Part 1)	Monday, October 28 by 10 pm	Upload to Canvas	<i>Refer to Canvas</i>
Assessment for Learning (Part 2)	Monday, December 9 by 10 pm	Upload to Canvas	<i>Refer to Canvas</i>

Course Schedule

Subject to change, based on student feedback and input!

Date	Readings for Class
9/24	Session 1: Classroom Culture and Sociomathematical Norms
	Kazemi, E. (1998). Research into practice: Discourse that promotes conceptual understanding. <i>Teaching Children Mathematics</i> , 4(7), 410-414.
10/1	Session 2: Assessment for Learning
	Boaler, J. (2016). Assessment for a growth mindset. In <i>Mathematical mindsets: Unleashing students' potential through creative math, inspiring messages and innovative teaching</i> (pp. 141-169). John Wiley & Sons.
10/8	Session 3: Building Self-Aware Students Through Assessment
	Boaler, J., Dance, K., & Woodbury, E. (2018). From performance to learning: Assessing to encourage growth mindsets. <i>youcubed</i> , Stanford University, 1-18. Suurtamm, C., & Arden, A. (2017). Using assessment to enhance mathematics teaching and learning. In D. A. Spangler & J. J. Wanko (Eds.), <i>Enhancing classroom practice with research behind principles to action</i> (pp. 141-152). NCTM.
10/15	Session 4: High School Mathematics Pathways and Data Science
	Daro, P., & Asturias, H. (2019). Branching out: Designing high school math pathways for equity. <i>Just Equations</i> , 1-28.
10/22	Session 5: Technology and Literacy
	TBD
10/29	Session 6: Teaching Through Big Ideas and Connections
	Chapter 2: Teaching for equity and engagement. <i>California Mathematics Framework</i> .
11/05	No Class - Democracy Day
11/12	Session 7: Mathematical Tasks - Systems of Equations (CODAP/Desmos)
	Boaler, J. (2016). Rich mathematical tasks. In <i>Mathematical mindsets: Unleashing students' potential through creative math, inspiring messages and innovative teaching</i> , 57-91. John Wiley & Sons. Chapter 5.
11/19	Session 8: Math-ish - Classroom Ideas
	Boaler, J. (2024). GEMS Proposal - Extract.
11/26	No Class - Thanksgiving Break
12/3	Session 9: Culturally Relevant Pedagogy and Equitable Mathematics Learning
	Ladson-Billings, G. (2014). Culturally relevant pedagogy 2.0: a.k.a. the remix. <i>Harvard Educational Review</i> , 84(1), 74-84. Wager, A. A., Pietz, B., & Klehr, M. (2017). Providing access to equitable mathematics learning. In D. A. Spangler & J. J. Wanko (Eds.), <i>Enhancing classroom practice with research behind principles to action</i> (pp. 99-112). NCTM.
12/10	Session 10: Final Questions and End of Quarter Gathering
	none

Course Policies

Submitting to Canvas

All assignments should be digitally submitted to Canvas as a single file, unless otherwise specified by the instructors. You may choose to submit a word document or a link to a [shared google document](#). Be sure to change the permissions to “anyone in Stanford University with the link [can comment](#)” on google docs before submission in order to avoid a late penalty. All feedback will be provided digitally within your submitted documents in Canvas.

Please save all files using the following naming convention:

Lastname_Assignment

For example: Lane_Norms Assignment

Deadlines and Late Submissions

Assignment deadlines are listed in the course schedule, along with estimated times of completion, to enable you to effectively plan and balance your academic work and other commitments. Despite the best planning, however, we know that life happens! So:

- Please contact us in advance if you have any concerns about completing major assignments on time. Extensions may be granted by your instructors, if requested.
- Late work that is submitted without an extension may be subject to a grade penalty.
- As with all of your work in C&I this year, you may revise and resubmit any written assignment for a higher grade.
- Do your best to complete readings such that you can be an active participant in the next class session! If the reading is longer or more academic in nature, find the most salient parts or pieces that stand out to you.

The Honor Code

All Stanford students are expected to follow the Stanford Honor Code and Fundamental Standard, as noted in the STEP Handbook and Stanford Student Guide. Please review [Stanford's Honor Code](#), [these recommendations](#) from the Office of Community Standards, and [documentation and citation resources](#) from the Hume Center for Writing and Speaking.

Academic Accommodations

Stanford is committed to providing equal educational opportunities for disabled students. Disabled students are a valued and essential part of the Stanford community. We welcome you to our class.

If you experience a disability, please register with the Office of Accessible Education (OAE). Professional staff will evaluate your needs, support appropriate and reasonable accommodations, and prepare an Academic Accommodation Letter for faculty. To get started, or to re-initiate services, please visit oea.stanford.edu.

If you already have an Academic Accommodation Letter, we invite you to share your letter with us. Academic Accommodation Letters should be shared at the earliest possible opportunity so we may partner with you and OAE to identify any barriers to access and inclusion that might be encountered in your experience of this course.

Learning Resources

Your peers and instructors are valuable sources of learning, and we hope you will make the most of our time together! In addition, Stanford has a wealth of resources for graduate students, from group study halls to well-being coaches to professional development offerings. Which of the resources below will you explore?

- [Writing tutors](#) from the Hume Center for Writing and Speaking, to get additional feedback on your teaching portfolio materials
- [English as a Second Language \(ESL\) courses](#) for international graduate students
- [Pedagogy workshops and programs](#) from the Center for Teaching and Learning (CTL), to continue your teaching development
- [IDEAL Pedagogy](#) self-paced course, learning community, and/or syllabus consultation from CTL, to continue developing inclusive pedagogy practices
- [Peer Academic Coaching](#) from CTL, to help with time management and other work strategies
- [Study Halls](#) from CTL, to work in quiet companionship with other students
- [Grad Grow](#) from the Office of the Vice Provost for Graduate Education, to develop key professional competencies, including in teaching and mentorship
- [Well-being coaches](#) from Vaden, to receive holistic support and guidance