

A Seven-Course Classroom: Different Uses of a Flexible Classroom Space

Background

- **Studio classrooms:** Students sit in small groups at fixed tables instead of in front-facing rows [1-6].
- **Conflicting evidence:** Teaching lecture-based classes in studio classrooms...
 - Encourages instructors to adopt more student-centered pedagogy [7-11].
 - Has negative effects on student learning outcomes [10].
- **Flexible classroom:** Easily reconfigured between front-facing rows (like a typical lecture hall) and small groups (like a studio classroom).
 - Effects on faculty teaching and student learning have not been rigorously examined [6,11-13].

New Flexible Classroom Spaces at U-M

133 Chrysler Center ← Classrooms renovated Fall 2016 → 224 Gorguze Family Laboratory

224 GFL has two spaces:

- 46-seat **main classroom** with 8 monitors **This poster**
- 16-seat secondary room with 4 monitors

84	Capacity	48
9	Monitors	8

- Movable whiteboards
- Front whiteboard
- Movable furniture

Research Questions

1. How do flexible classroom spaces afford *responsive teaching*?
2. How does room layout influence students' perceptions of activities?
3. How do lecture-based courses, active learning courses, discussion sections, and co-curricular activities co-exist in the same space? **This poster**

Class	Instructors	Student Enrollment	Class Level	Pedagogy
1. Introduction to Circuits	A	41	Lower	Lecture/Active learning
2. Introduction to Engineering (IOE lecture section)	B & C	41	First-year	Lecture
3. Capstone Design (BME)	D & E	39	Upper	Mostly active learning
4. Introduction to Materials	F	46	All	Mostly active learning
5. Engineering Mentorship and Leadership	G & H	26	Upper	Mostly active learning
6. Technical Communications	E & J	10	Upper	Mostly active learning
7. Introduction to Engineering (NAME discussion section)	J	20	Lower	Mostly active learning

Findings: Arrangement of Furniture

Four different layouts in first three weeks

Front-Facing Rows

5 pseudo-rows, each with 9 students and with center aisle

Small Group Layout 1 (SG1)

8 groups, each with 2 tables, 6 students, 1 monitor

Small Group Layout 2 (SG2)

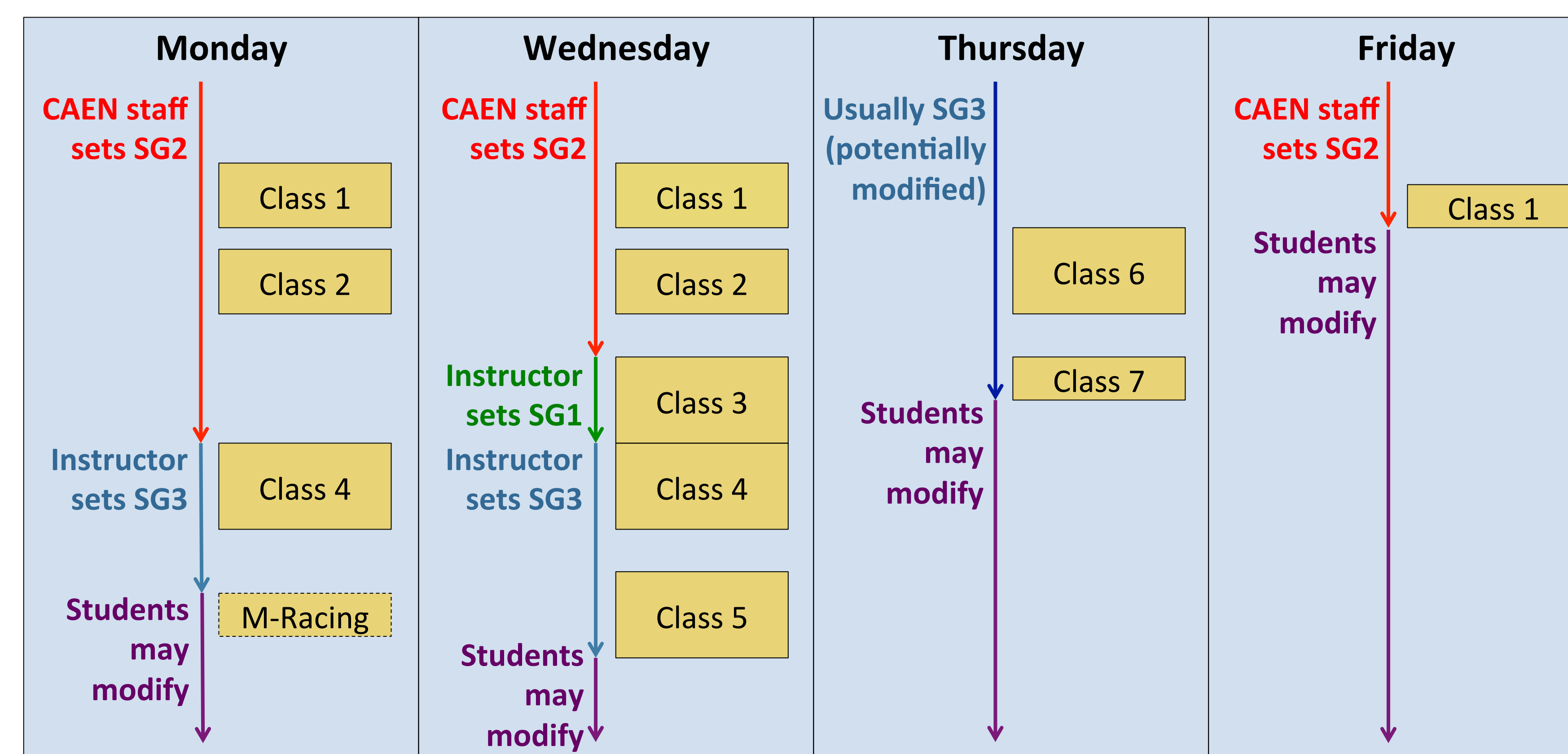
Similar to SG1, with one table moved to middle of room

Small Group Layout 3 (SG3)

9 groups, each with 1 table, 5-6 students, 1 whiteboard

Key: Instructor station Table

Three instructors set the layout for their class—and sometimes for following classes



- Class 2 used **SG2** layout set by Class 1. Both classes used mostly lecture, but Class 1 used more active learning. Rearrangement would be difficult.
- Class 3 used **SG1**, moving 1 table from **SG2**.
- Classes 5, 6, and 7 used **SG3** layout set by Class 4. All four courses used mostly active learning. Rearrangement would be easy.

Findings: Use of Technology

Instructor uses monitors to project slides All classes 1, 2, 3, 4, 5, 6, 7		
Classes 3, 6	Classes 4, 5	Class 7
Students use monitors for group activities	Students use whiteboards for group activities	Instructor uses whiteboards for in-class discussions

Future Work

- Room updates to create a "front of the room" space:
 - Relocated monitor, larger white board, new location for front screen
- Future research questions:
 - How is the room used after-hours?
 - Why do instructors use specific classroom configurations and technology?
 - Does the classroom flexibility encourage instructors to try new things?

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