Engaging With Each Other

- Introduce yourself to those at your table
- Take 2 minutes to explain your primary research interest in layman’s terms to one another (3MT style!)
- The best instructors should be able to engage with everyone
It Starts With You!

- Make good first impressions
- Communicating expectations and fairness
- Develop your teaching persona
- Comfort and personality
- Enthusiasm for subject matter
### Difficult Topic
Friction on incline planes

### What I am currently doing
- A lab without an incline on friction the week before
- A lecture deriving the equations
- Worksheets in class and online homework with varying difficulty and topic

Spend a few minutes filling out the first two boxes yourself and discuss with your table. Look for similarities between what you are all doing.
Targeting Your Audience

- Who is taking your class?
  - What can we learn about our students ahead of time?
  - MyFSU has student rosters
  - What job do they want in the future?
Knowing Your Students: Student Rosters

Step 1: myFSU “Faculty & Staff”

Step 2: “Teaching” → “My Courses”
Knowing Your Students: Student Rosters

Step 3: “Class Roster” on Faculty Center
Knowing Your Students: Student Rosters

Step 4: Get to know your students!

<table>
<thead>
<tr>
<th>Enrolled Status</th>
<th>Grade 1</th>
<th>Grade 2</th>
<th>Units</th>
<th>Program and Plan</th>
<th>Level</th>
<th>1st Attn Process Status</th>
<th>1st Day Submit Deadline</th>
<th>Attendance Submitted</th>
<th>Last Date Added</th>
<th>Last Enrollment Time Stamp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DKD</td>
<td>DKD</td>
<td>3.00</td>
<td>Bachelor's in Music - Instrumental Music Ed - BM</td>
<td>Sophomore</td>
<td>Present</td>
<td>01/09/2018 8:39:59PM</td>
<td>06/09/2018 01:05:55 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>DKD</td>
<td>DKD</td>
<td>3.00</td>
<td>Bachelor's in Music - Music - Undecided</td>
<td>Sophomore</td>
<td>Present</td>
<td>01/09/2018 8:39:59PM</td>
<td>10/16/2017 03:19:21 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>DKD</td>
<td>DKD</td>
<td>3.00</td>
<td>Bachelor's in Music - Music Therapy - BM</td>
<td>Junior</td>
<td>Present</td>
<td>01/09/2018 8:39:59PM</td>
<td>10/17/2017 06:00:48 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>DKD</td>
<td>DKD</td>
<td>3.00</td>
<td>Bachelor's in Music - Instrumental Music Ed - BM</td>
<td>Sophomore</td>
<td>Present</td>
<td>01/08/2018 8:39:59PM</td>
<td>01/08/2018 08:28:14 AM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>DKD</td>
<td>DKD</td>
<td>3.00</td>
<td>Bachelor's in Music - Music Therapy - BM</td>
<td>Freshman</td>
<td>Present</td>
<td>01/08/2018 8:39:59PM</td>
<td>01/08/2018 08:22:05 AM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>DKD</td>
<td>DKD</td>
<td>3.00</td>
<td>Bachelor's in Music - Music Therapy - BM</td>
<td>Sophomore</td>
<td>Present</td>
<td>01/08/2018 8:39:59PM</td>
<td>01/08/2018 08:19:13 AM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>DKD</td>
<td>DKD</td>
<td>3.00</td>
<td>Bachelor's in Music - Music Therapy - BM</td>
<td>Junior</td>
<td>Present</td>
<td>01/08/2018 8:39:59PM</td>
<td>10/16/2017 08:00:41 AM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>DKD</td>
<td>DKD</td>
<td>3.00</td>
<td>Bachelor's in Music - Music Therapy - BM</td>
<td>Sophomore</td>
<td>Present</td>
<td>01/08/2018 8:39:59PM</td>
<td>10/16/2017 07:54:32 AM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>DKD</td>
<td>DKD</td>
<td>3.00</td>
<td>Bachelor's in Music - Music Therapy - BM</td>
<td>Sophomore</td>
<td>Present</td>
<td>01/08/2018 8:39:59PM</td>
<td>10/16/2017 08:50:47 AM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>DKD</td>
<td>DKD</td>
<td>3.00</td>
<td>Bachelor's in Music - Music Therapy - BM</td>
<td>Junior</td>
<td>Present</td>
<td>01/08/2018 8:39:59PM</td>
<td>10/16/2017 09:34:20 AM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>DKD</td>
<td>DKD</td>
<td>3.00</td>
<td>Bachelor's in Music - Music Therapy - BM</td>
<td>Sophomore</td>
<td>Present</td>
<td>01/08/2018 8:39:59PM</td>
<td>10/16/2017 09:34:20 AM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>DKD</td>
<td>DKD</td>
<td>3.00</td>
<td>Bachelor's in Music - Music Therapy - BM</td>
<td>Sophomore</td>
<td>Present</td>
<td>01/08/2018 8:39:59PM</td>
<td>03/08/2018 08:20:27 AM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>DKD</td>
<td>DKD</td>
<td>3.00</td>
<td>Bachelor's in Music - Music Therapy - BM</td>
<td>Sophomore</td>
<td>Present</td>
<td>01/08/2018 8:39:59PM</td>
<td>10/16/2017 10:52:20 AM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>DKD</td>
<td>DKD</td>
<td>3.00</td>
<td>Bachelor's in Music - Music Therapy - BM</td>
<td>Sophomore</td>
<td>Present</td>
<td>01/08/2018 8:39:59PM</td>
<td>07/04:92 AM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>DKD</td>
<td>DKD</td>
<td>3.00</td>
<td>Bachelor's in Music - Music Therapy - BM</td>
<td>Junior</td>
<td>Present</td>
<td>01/08/2018 8:39:59PM</td>
<td>10/16/2017 01:11:34 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>DKD</td>
<td>DKD</td>
<td>3.00</td>
<td>Bachelor's in Music - Music Therapy - BM</td>
<td>Freshman</td>
<td>Present</td>
<td>01/08/2018 8:39:59PM</td>
<td>01/08/2018 20:59:59PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>DKD</td>
<td>DKD</td>
<td>3.00</td>
<td>Bachelor's in Music - Music Therapy - BM</td>
<td>Sophomore</td>
<td>Present</td>
<td>01/08/2018 8:39:59PM</td>
<td>01/08/2018 20:59:59PM</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Tailoring Material

- Make content relatable
- Topics aren’t in a bubble
- Set learning goals for a class period
- Build them up for the next assignment
Spend a few minutes filling out the next two boxes. Think of precise learning goals for class session(s).

**WHO ARE MY STUDENTS?**
- Engineering, physics and other science majors
- First year or second year
- Prerequisites: Calculus 1, Trigonometry, Algebra
- Class is required for major for most students

**WHAT ARE MY LEARNING GOALS FOR THE LESSON**
- Build on previous understanding of friction and:
- Be able to find forces in tilted coordinate system
- Be able to use Newton’s Laws to find equilibrium
- Be able to use Newton’s Laws to find acceleration
Collaboration

- Group work
- Small discussions
- Size: four or fewer people
- Tailoring assignments to be group focused
- Bringing it back to the entire class
- Prepare for careers
Technology

- Integrating technology into your class
- Using technology correctly
- Online homework
  - Companion sites/links/resources with textbooks
- Social media
Feedback

- From students:
  - End of semester or SPOT evaluations
  - Reading your classroom and gradebook
  - DoodlePoll for what’s working and what’s not

- From you:
  - Grading and comments
  - Expectation vs. reality
  - Being flexible with your class
Spend a few minutes thinking about what specifically isn’t working in your class and identify what topics we discussed can help you. Also get food, drink, take a break or talk to your table/us!

**SUBOPTIMAL TEACHING PRACTICES**
- Overloading my students with too many topics too quickly
- Not building up material in a logical way
- Not sticking to my learning goals

**NEW IDEAS I CAN TRY IN MY CLASS**
- Building up by making the topic an entire week instead of just one class period
- Focusing on just one topic in the activities and homework
- Better connect my topic to previous friction activities
How We SCALE-UP Our FSU Physics Classes

Student Centered Active Learning Environment with Upside-down Pedagogies
Engagement Techniques in a SCALE-UP Classroom

- Instructor Interactions
- Tailoring Material
- Technology
- Collaboration
- Feedback
Checking Our Work: Normalized Learning Gains

- Force Concept Inventory
- Pre- and post-tests
- Offer small amount of extra credit to incentivize students to take tests seriously
- Normalized Learning Gain = \( \frac{\text{New Score} - \text{Past Score}}{\text{Max Points} - \text{Past Score}} \)
Semester by Semester Results

Traditional Lecture Based Physics Course

MOOC - Massive Open Online Course

IE - Interactive Engagement

Individual Semesters for FSU
Worksheet Part 4

CONCRETE LESSON I CAN IMPLEMENT
Day 1: No incline
Worksheet: Use Newton’s Laws to find static condition
Use friction coefficient and masses from last week’s lab
Calculate acceleration for various masses we could test
Do this experiment in the lab and check for agreement

CONCRETE LESSON I CAN IMPLEMENT
Day 2: Incline
Worksheet: Use Newton’s Laws to find static condition
Use Day 1 results for various incline angles
Calculate static conditions and accelerations for masses
Do this experiment in the lab for various angles

Put everything together to create a lesson plan for your subject using the techniques learned today! Talk with each other and with us about interesting ideas.
The SCALE-UP Project: A Student-Centered Active Learning Environment for Undergraduate Programs. Robert J. Beichner, North Carolina State University, Raleigh, NC

Force Concept Inventory. David Hestenes, Malcolm Wells and Greg Swackhamer

Interactive-engagement versus traditional methods: A six-thousand-student survey of mechanics test data for introductory physics courses. Richard Hake

Learning in an introductory physics MOOC: All cohorts learn equally, including an on-campus class. Kimberly F Colvin, John Champaign, Alwina Liu, Qian Zhou, Colin Fredericks, David E Pritchard