# TAPDP WORKSHOP SCHEDULE

**ENGINEERING GROUP**

**TAPDP 2012**

<table>
<thead>
<tr>
<th>PFs:</th>
<th>School:</th>
<th>Dept.:</th>
<th>Draft #:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weiwei Chen</td>
<td>HSSOE</td>
<td>EECS</td>
<td>2</td>
</tr>
<tr>
<td>Sarah Hernandez</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## DAY 1: TUESDAY, SEPTEMBER 25, 2012

<table>
<thead>
<tr>
<th>Workshop #</th>
<th>Start:</th>
<th>End:</th>
<th>Total Time:</th>
<th>Workshop Title:</th>
<th>Location:</th>
<th>Program Objective:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8:15</td>
<td>8:55</td>
<td></td>
<td>TAs Check-in</td>
<td>PSCB, SSL</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>9:00</td>
<td>9:30</td>
<td>30min</td>
<td>Welcome and Buy-in</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>9:30</td>
<td>10:10</td>
<td>40min</td>
<td>First day of class</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>10:10</td>
<td>10:20</td>
<td>10min</td>
<td>Energizer</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>10:20</td>
<td>11:00</td>
<td>40min</td>
<td>TA Roles and Responsibilities</td>
<td></td>
<td>2, 12</td>
</tr>
<tr>
<td></td>
<td>11:00</td>
<td>11:15</td>
<td>15 MIN.</td>
<td>BREAK</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>11:15</td>
<td>12:15</td>
<td>60min</td>
<td>Learning Styles and UCI Students</td>
<td></td>
<td>3, 4</td>
</tr>
<tr>
<td></td>
<td>12:15</td>
<td>1:00</td>
<td>45 min.</td>
<td>LUNCH</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>1:00</td>
<td>1:45</td>
<td>45min</td>
<td>Active Learning</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>1:45</td>
<td>2:25</td>
<td>40min</td>
<td>Problem solving skills</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>2:25</td>
<td>2:35</td>
<td>10min</td>
<td>Energizer</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>2:35</td>
<td>3:15</td>
<td>40min</td>
<td>Grading</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>3:15</td>
<td>3:30</td>
<td>15 min.</td>
<td>BREAK</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>3:30</td>
<td>4:40</td>
<td>70min</td>
<td>Lead discussion sessions and hold office hours</td>
<td></td>
<td>3, 4, 5, 6, 9</td>
</tr>
<tr>
<td>9</td>
<td>4:40</td>
<td>5:00</td>
<td>20min</td>
<td>Closure/Assignment</td>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>
### DAY 2: WEDNESDAY, SEPTEMBER 26, 2012:

<table>
<thead>
<tr>
<th>Workshop#:</th>
<th>New:</th>
<th>Start:</th>
<th>End:</th>
<th>Total Time:</th>
<th>Workshop Title:</th>
<th>Location:</th>
<th>Program Objective:</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td></td>
<td>9:00</td>
<td>10:30</td>
<td>90min</td>
<td>Micro-teaching</td>
<td></td>
<td>4,5,6,11</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10:30</td>
<td>10:45</td>
<td>15 min.</td>
<td>BREAK</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>10:45</td>
<td>12:00</td>
<td>75min</td>
<td>EEE tools and campus resources</td>
<td></td>
<td>8,10</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>12:00</td>
<td>12:30</td>
<td>30min</td>
<td>Wrap-up</td>
<td></td>
<td>11,12</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>12:30</td>
<td>1:00</td>
<td>30 min.</td>
<td>TA Union</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

**Follow-Up Fall Workshops**

*N.B.:* You (PFs) are allowed to deviate from the kinds of workshops and the times of workshops. This agenda is a model for you. The only requirements are that they meet the general TAPDP goals and they must keep the break and lunch times the same as above.

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**When you submit your drafts, you should also submit your overall schedule as the cover sheet. Use this form as your template—just fill in the times and names of your own workshops.**
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WORKSHOP01 “Welcome and Buy-in”

| NAMES: | Weiwei Chen |
| DEPARTMENT(S) THAT THIS WORKSHOP IS AIMED AT: | Henry Samueli School of Engineering |

**TOPIC:**
Welcome and Buy-in

**ABSTRACT:** If you were a new PF looking for a workshop on the above topic, what kind of a description of this workshop would help you to get a good sense of what this workshop entails?

This workshop will give a brief introduction of the 1.5 day TAPDP workshop to the TAs, including the workshop schedule, the purpose of this training, and the facilitators of the workshops. The TAs will have the chance to ask questions if they have any.

**LEARNING OUTCOMES:** What should the TAs be able to do & know by the end of this workshop? Note that TAs wbat = TAs will be able to... (Suggestion: Try to have only 1-3 outcomes.)

| TAs wbat... | Meet their TAPDP facilitators |
| TAs wbat... | Explain the importance of teaching |
| TAs wbat... | Identify the schedule of TAPDP and address their concerns about TAPDP |

**STEPS TOWARD TAs ACHIEVING LEARNING OUTCOME # 1:** What will the TAs do to help them to achieve the learning outcome, above? (Suggestion: you can have as many steps along the way as you feel appropriate.)

| TAs will... | Meet their PF, Weiwei and Sarah, as the facilitators of the 1.5 day TAPDP training |

**STEPS TOWARD TAs ACHIEVING LEARNING OUTCOME # 2:** What will the TAs do to help them to achieve the learning outcome, above? (Suggestion: you can have as many steps along the way as you feel appropriate.)

| TAs will... | Read an article from NY times regarding a publication in the journal Science about how teaching improves research of graduate students. |
| TAs will... | Be able to figure out how their own research and benefit from practice teaching |

**STEPS TOWARD TAs ACHIEVING LEARNING OUTCOME # 1:** What will the TAs do to help them to achieve the learning outcome, above? (Suggestion: you can have as many steps along the way as you feel appropriate.)

| TAs will... | Write down one of their concerns about being a TA |
| TAs will... | Write down one thing they wish to learn from TAPDP |
**TAas will...**

Be able to ask the PFs about their concerns

---

**RESEARCH SUPPORTING THIS WORKSHOP:** What research has been done in this area? List two articles that (preferably) offer research-backed conclusions about best practices in this area. At least one of the articles should have some disciplinary commonality with your TA group(s).

**Article One (w/ summary)**


The paper shows that the STEM students who both taught and conducted research demonstrate significantly greater improvement in their abilities to generate testable hypotheses and design valid experiments. Teaching experience can contribute substantially to the improvement of essential research skills.

**Article Two (w/ summary)**


The paper shows that only half of the TAs in the study have received formal TA training. Findings also suggested that TA training and supervision are helpful in building TA self-efficacy toward teaching. With respect to supervisory style, TAs preferred a collegial style of interaction with their course supervisors. TAs found workshops or courses on college teaching as the preferred modality for their training, and most favored building skills in organizing their course materials, evaluating student learning, handling multicultural issues, and dealing with ethical issues in teaching.

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**SUPPLIES NEEDED:**

<table>
<thead>
<tr>
<th>QUANTITY:</th>
<th>ITEM NAME:</th>
<th>COLOR/SPECIFICS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>#TAs * 1.2</td>
<td>Index cards</td>
<td>white</td>
</tr>
<tr>
<td>#TAs + 2 (Weiwei, Sarah) +2 (backup)</td>
<td>Name tags</td>
<td></td>
</tr>
<tr>
<td>#TAs + 2</td>
<td>Printed copies of the “Teaching Aids Research Skills of Grad Students, Study Says” from NY Times article</td>
<td>Yellow</td>
</tr>
<tr>
<td>#TAs + 2</td>
<td>Printed copies/e-copy of the “Graduate Students’ Teaching Experiences Improve Their Methodological Research Skills” from</td>
<td>White</td>
</tr>
</tbody>
</table>
Science

5 Pens (maybe)
3~4 Poster paper for TAPDP Schedule
#TAs / 8 Table labels and holders

Mask tape

**ROOM CONFIGURATION:** (Describe/show how the room will be set up. The set up below is just a sample to be moved as you like.)

Students sit around the tables and face toward the podium and screen.
TAPDP schedule post on the wall.
(Assume that we will use EH2430)

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**PREPARATION:** (What needs to be done by you in advance?)
1. Poster of the TAPDP schedule with brief workshop descriptions
2. Create the online student name list for random picking

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**WORKSHOP SCHEDULE:** Indicate when each portion of the workshop will begin and end.

<table>
<thead>
<tr>
<th></th>
<th>BEGIN TIME</th>
<th>END TIME</th>
<th>TOTAL TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Welcome and introduction</td>
<td>5min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Buy-in</td>
<td></td>
<td>10min</td>
<td></td>
</tr>
<tr>
<td>3. TAPDP schedule overview and concern cards</td>
<td>15min</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL TIME FOR WORKSHOP:</strong></td>
<td></td>
<td></td>
<td><strong>30 min</strong></td>
</tr>
</tbody>
</table>

---

**WORKSHOP SEGMENTS:** (Break down each part of the workshop:)

<table>
<thead>
<tr>
<th>PART #1:</th>
<th>BEGIN TIME</th>
<th>END TIME</th>
<th>TOTAL TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Welcome and Introduction</td>
<td></td>
<td></td>
<td>5min</td>
</tr>
</tbody>
</table>

---

**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

Good morning, everyone. Please take a seat and I’d like to request everyone wear your nametag for the next one and half days. It would be really helpful for us to know and remember your name. If you would prefer being called in the name that is not the one on
your nametag, please feel free to write down your preferred name on the nametag.

[Wait for the TAs to be settled in]

Welcome to UCI and welcome to School of Engineering. My name is Weiwei Chen, and this is Sarah Hernandez. We will be hosting the TAPDP training over the next day and a half. Before we start, are there any concerns or comments or questions?
[Wait for the TAs to ask questions]

The training we will have here today and tomorrow is called TAPDP. We will hear this acronym very often in these two days. Here, TAPDP stands for Teaching Assistant Professional Development Program. The TAPDP training is co-sponsored by the Division of Undergraduate Education and the Graduate Division, and implemented by a group of wonderful people from the TLTC. TLTC is the Teaching, Learning and Technology Center whose purpose is to improve teaching here in UCI. The TLTC hosts various workshops with the focus of pedagogies through the whole academic year.

Does anyone know what pedagogy means?

[Give some candies or chocolate bars if someone has the correct answer. Pedagogy means the study and science of ways and methods of teaching.]

The TLTC also offers 1-on-1 confidential consultations on teaching. One of the major programs of the TLTC is TAPDP, the program we are having here now. TAPDP is a specialized program aimed at preparing TAs for their instructional careers here at UCI and afterwards.

TAPDP is usually held during the orientation week of each fall quarter. Today, there are about twenty TAPDP groups for different departments and schools having this training on the campus. Each TAPDP group is run by the Pedagogical Fellows or PFs. Sarah and I are your pedagogical fellows here for the school of engineering.

Let me first introduce myself to you. As I stated earlier, my name is Weiwei Chen. I am a Ph.D. student in the department of Electrical Engineering and Computer Science. I am working with Prof. Rainer Dömer on embedded system design methodology. I was born and grew up in Shanghai, China, and came to the U.S. for my doctorate degree five years ago. I have been TAing for five quarters here and will TA again in the coming fall and winter quarter. I applied for the pedagogical fellowship last year. I am very honored to be selected and received extensive training in many aspects of pedagogy to prepare myself for the scholarship of teaching as well as hosting this TA training workshop. It was a pleasure to meet everyone here and I am looking forward to working with all of you in the following one and half days.

Standing here with me this morning is my friend and co-Pedagogical Fellow, Sarah Hernandez. I will allow her to introduce herself formally now.

[Allow Sarah to introduce herself]

**PART#2:**

<table>
<thead>
<tr>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Buy-in</td>
<td></td>
<td>10min</td>
</tr>
</tbody>
</table>

Copyright 2012 Weiwei Chen, UC Irvine
**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.
Now you know a little bit about Sarah and me and TAPDP. You may now be wondering what should we expect from this training program. Here are some things that may give you a brief idea about TAPDP:

1. There will be a series of discipline-specific and interactive workshops in TAPDP to prepare you to become a TA. (We will discuss about the detailed TAPDP schedule in the next part of this workshop. TAPDP is a relaxed environment; we are not giving out grades or reporting back to your advisors. This is a place that you can feel comfortable asking questions, practicing your teaching and developing new teaching strategies.)

2. Each of you will be involved in various learning activities throughout TAPDP, which you can incorporate into your own teaching in the future. (The design of TAPDP has a strong bias towards experiential, learning-centered, and active learning. This bias is based on Social Constructivist epistemology. We have some short readings on the TLTC’s website about this underlying theory for you to refer to.)

3. You will gain a lot of team working experience and develop a community with your cohort of the other new TAs.

I’m sure everyone here intends to do a good job at teaching, but it may ranker lower or higher on your priority list depending on why you came to grad school. It is normal to believe that as graduate students we shall focus on our research. Teaching can consume a lot of our precious time and is a diversion from research. However, this feeling is not always correct. If we take a close look at what we are doing for teaching and what we need for research, we can find a lot of common things these two scholarships share. Practicing one can actually strengthen the other.

First of all, teaching is a great way to practice communication. As graduate students, no matter in science or engineering, you will frequently be asked to reason your research approaches, present your research findings, and work with the others. All of these require great communication skills.

Second, teaching provides deeper and more thorough understandings on the course subjects. According to my own experience, I figure out that I need to dig into more details about the course material if I have to teach them. It happens all the time that I find something I’ve never thought about when I learned the same subject as a student. Moreover, what is essential to teaching is an awareness of how others perceive the world, which is something we hope to address over the next few days. This broad view and open mindedness is often what creates the scientific and technical breakthroughs that will advance your careers. And finally, when you apply for jobs in the future an understanding and awareness of these issues will raise your credibility in the job market.

I myself believe that training and striving to be a good TA is very compatible with your development as a researcher. I am not only speaking of my own experience but will also show you some scientific research results to prove this.

There is an article in last year’s journal *Science* that addresses the issues of the importance of teaching. The article is called “*Graduate Student’s Teaching experiences improve their methodological research skills*” (2011) and was cited in a NY Times Article, which you have in
front of you.

[Hand out the article, maybe ask someone to read it out loud, use “popcorn reading” among groups.

Or randomly pick the students to read by using the random name picker

http://www.barryfunenglish.com/enter/toolsRandomStudent.php

http://www.superteachertools.com

[Popcorn Reading - students use this strategy to stay engaged and alert while reading out loud. One person reads and when he/she is ready for the next person says "popcorn." The next person takes up where the first student left off and says "popcorn" when he/she is ready for the next person to read again.]

"Graduate students in the "hard” sciences who teach in addition to engaging in research greatly improve their research skills compared with graduate students who undertook research alone, according to a new study.

The study, published last week in the journal Science, found that “teaching experience can contribute substantially to the improvement of essential research skills.”

After following 95 graduate students for a year, they found that those who taught were able to write far better research proposals, based on a set of criteria including having testable hypotheses, methodology, experimental design and data analysis.

The report suggests that researchers may come to view “teaching experience as a value-added component of graduate research training,” rather than as a diversion from valuable research time.

Researchers also said it pointed to complaints that academics in the hard sciences often lack teaching skills, and that including teaching as part of graduate studies may better prepare future researchers for teaching.”

Here, as what graduate students will do, I show you the scientific reference to support my statement of how teaching can help to improve research. I hope this can provide you a new angle to look at teaching and maybe appreciate it more now.

TAPDP is probably the only formal training you will get as a TA and possibly as a future teaching faculty. It is meant to prepare you ahead of time for what you will encounter as a TA. A little time spent now will save you a lot of time over the following years since you will learn to be more effective and confident in your teaching through TAPDP.

<table>
<thead>
<tr>
<th>PART #3:</th>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Schedule review and concern cards</td>
<td></td>
<td></td>
<td>15min</td>
</tr>
</tbody>
</table>

Copyright 2012 Weiwei Chen, UC Irvine
NARRATIVE: Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

Now let talk a little bit about what we will do in the following one and half day. As a way of introducing the TAPDP schedule, I would like to ask each of you write down one of your biggest concerns about being a TA on the index card. I will give you one minute to write down your concern and then I will collect them.

[Let the TAs to write down their concerns. Collect the index card and put them in a bowl / bag. Add “not clear on the schedule post” in case that the TA does not know which workshop will address the concern.]

Ok now let’s take a look at our schedule. Today after this introductory workshop we will have:

• First Day in Class
• TA Roles and Responsibilities
• Learning style and UCI student demography
• Active Learning
• Problem solving skills
• Grading
• Lead a discussion session and office hours

For tomorrow we will have:

• Microteaching
• EEE tools and campus resources
• Wrap Up
• TA Union

Okay, I now have all your ideas in this bowl. We have posted the detailed workshop schedule of TAPDP with some brief descriptions on the wall, and I have all your concerns in this bowl. Now we are going to go around the room, draw a card from the bowl and tape it on the schedule where you think we will address that concern.

[Pass the bowl around and the TAs move, read the schedule and tape their cards]

As you can see, we will address most of your concerns in TAPDP. You may still have some other concerns that may not be covered in TAPDP. I would like to let you know that you can always to turn to TLTC for help or write to Sarah and me anytime.

Alright, are there any further questions or comments?

So this concludes our very first workshop! The learning outcome we have achieved in this workshop are: 1) you met Sarah and me. 2) you can explain the importance of teaching. 3) you get know to the purpose of TAPDP and have a review of the schedule. You have your first take-away teaching technique you can use. That is the “index card writing”. You can ask the students to quickly write down their concern / muddiest point in your class on the index card. It is a good way for you to get an idea about what are your
students’ concerns or how do they learn in the class. Any questions or comments? Beside this workshop, we will have another ten exciting workshops to sharpen our teaching skills. We need to be very punctual due to this intense schedule. Please show up on time in the morning, and come back from breaks and lunch at the scheduled time. With your help we are going to have a great TAPDP!
WORKSHOP02 “First Day of Class”

**NAME(S):** Weiwei Chen

**DEPARTMENT(S) THAT THIS WORKSHOP IS AIMED AT:**
Henry Samueli School of Engineering

**TOPIC:**
First Day of Class

**ABSTRACT:** If you were a new PF looking for a workshop on the above topic, what kind of a description of this workshop would help you to get a good sense of what this workshop entails?

The TAs will get to know each other and get prepared for their first day in class (discussion/lab).

**LEARNING OUTCOMES:** What should the TAs be able to do & know by the end of this workshop? Note that TAs wbat = TAs will be able to… (Suggestion: Try to have only 1-3 outcomes.)

<table>
<thead>
<tr>
<th>TAs wbat…</th>
<th>Get to know each other and build a community of peers</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAs wbat…</td>
<td>Identify the students’ expectations in the first day of class</td>
</tr>
<tr>
<td>TAs wbat…</td>
<td>Identify what to prepare before the first day of class and what to do on the first day of class</td>
</tr>
</tbody>
</table>

**STEPS TOWARD TAs ACHIEVING LEARNING OUTCOME # 1:** What will the TAs do to help them to achieve the learning outcome, above? (Suggestion: you can have as many steps along the way as you feel appropriate.)

<table>
<thead>
<tr>
<th>TAs will…</th>
<th>Get to know each other in the icebreaker activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAs will…</td>
<td>Learn some icebreaker activities for their first day of class</td>
</tr>
</tbody>
</table>

**STEPS TOWARD TAs ACHIEVING LEARNING OUTCOME # 2:** What will the TAs do to help them to achieve the learning outcome, above? (Suggestion: you can have as many steps along the way as you feel appropriate.)

<table>
<thead>
<tr>
<th>TAs will…</th>
<th>Brainstorm in groups for what do students expect on the first day of class</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAs will…</td>
<td>Debrief together for what they can do to meet the student’s expectation on the first day of class.</td>
</tr>
</tbody>
</table>

**STEPS TOWARD TAs ACHIEVING LEARNING OUTCOME # 3:** What will the TAs do to help them to achieve the learning outcome, above? (Suggestion: you can have as many steps along the way as you feel appropriate.)

<table>
<thead>
<tr>
<th>TAs will…</th>
<th>Work on a minute paper to address the three important tasks of the first day</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAs will…</td>
<td>Share their opinions with their neighbors in think-pair-share activity</td>
</tr>
<tr>
<td>TAs will…</td>
<td>Debrief together for what they can do to accomplish the three important</td>
</tr>
</tbody>
</table>
RESEARCH SUPPORTING THIS WORKSHOP: What research has been done in this area? List two articles that (preferably) offer research-backed conclusions about best practices in this area. At least one of the articles should have some disciplinary commonality with your TA groups(s).

**Article One**  
This book is a collection of fun and simple educational icebreaker activities that get students excited and engaged from the very first minute of class. These activities are great to use with students at all levels, and many of the activities include variations and modifications for different groups. Research has shown that the use of icebreakers increases student motivation by creating an emotional connection between the student and school. In as little as five minutes, a creative icebreaker can engage students' brains, encourage critical thinking, and much more.

**Article Two**  
The first day of class sets the tone for the rest of the term. It is natural for both students and instructors to feel anticipation, excitement, anxiety, and uncertainty. To pique students' interest and anticipation, convey your enthusiasm for the material and stimulate students' curiosity about topics that will be covered during the term. To reduce students' anxiety and uncertainty, try to create a relaxed, open classroom environment conducive to inquiry and participation, and let students know what you will expect from them and what they can expect from you and the course. The suggestions provided by this book, intended to help to get the class off to a good start, address the three important tasks of the first day: handling administrative matters, creating an open friendly classroom environment, and setting course expectations and standards.

http://teaching.berkeley.edu/bgd/firstday.html  
(Linking to this book chapter from other websites is permissible. However, the contents of this chapter may not be copied, printed, or distributed in hard copy form without permission.)

**SUPPLIES NEEDED:**

<table>
<thead>
<tr>
<th>QUANTITY</th>
<th>ITEM NAME</th>
<th>COLOR/SPECIFICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Pens</td>
<td>Blue/black</td>
</tr>
<tr>
<td></td>
<td>(if some TAs forget to bring their own)</td>
<td></td>
</tr>
</tbody>
</table>

**ROOM CONFIGURATION:** (Describe/show how the room will be set up. The set up below is just a sample to be moved as you like.)

Students sit around the tables and face toward the podium and screen. Assume that we will use EH2430 screen
**PREPARATION:** (What needs to be done by you in advance?)

1. Slides for the workshop (with animation)
2. Print the minute paper
3. Prepare for the icebreaker questions

---

**WORKSHOP SCHEDULE:** Indicate when each portion of the workshop will begin and end.

<table>
<thead>
<tr>
<th></th>
<th>BEGIN TIME</th>
<th>END TIME</th>
<th>TOTAL TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Introduction to the workshop</td>
<td>3min</td>
<td>3min</td>
<td>3min</td>
</tr>
<tr>
<td>2. Icebreaker</td>
<td>10min</td>
<td>10min</td>
<td>10min</td>
</tr>
<tr>
<td>3. Brainstorm for what do students expect on the first day of class?</td>
<td>5min</td>
<td>5min</td>
<td>5min</td>
</tr>
<tr>
<td>4. Group debriefing</td>
<td>5min</td>
<td>5min</td>
<td>5min</td>
</tr>
<tr>
<td>5. Think-pair-share: three important tasks of the first day</td>
<td>8min</td>
<td>8min</td>
<td>8min</td>
</tr>
<tr>
<td>6. Group debriefing</td>
<td>7min</td>
<td>7min</td>
<td>7min</td>
</tr>
<tr>
<td>7. Closing</td>
<td>2min</td>
<td>2min</td>
<td>2min</td>
</tr>
</tbody>
</table>

**TOTAL TIME FOR WORKSHOP:** 40 min

---

**WORKSHOP SEGMENTS:** (Break down each part of the workshop:)

<table>
<thead>
<tr>
<th>PART #1:</th>
<th>BEGIN TIME</th>
<th>END TIME</th>
<th>TOTAL TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Introduction to the workshop</td>
<td></td>
<td>3min</td>
<td>3min</td>
</tr>
</tbody>
</table>

---

**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you'll say, what you'll do, and how you'll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

The topic for this workshop is “First day in Class”. As the TA here in UCI, our in class teaching is usually for discussion sessions or lab sessions. Many TAs will be very nervous before their first day in class as I did when I started TA in 2008 for EECS10, a lower-lever introductory programming course. I was worried about no knowing what to say since the students may not attend the lecture yet. I was also not sure about how to interact with new college students since I had very little TA experience. Moreover, since I didn't have
discussion sessions when I was in college, I did not have any idea what I was supposed to do in the class. So this workshop is designed to help you get prepared for your first day in class.

There are three learning objectives for this workshop:

1. TAs will be able to know each other and build a community of peers
2. TAs will be able to identify the students’ expectations in the first day of class
3. TAs will be able to identify what to prepare before the first day of class and what to do on the first day of class

Anyone has questions?

<table>
<thead>
<tr>
<th>PART#2:</th>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Icebreaker</td>
<td></td>
<td></td>
<td>10min</td>
</tr>
</tbody>
</table>

**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

First, let us have an icebreaker activity to kick off this workshop. You already know Sarah and me. We also want you to get to know each other as fellow graduate students and TAs. You can also use this activity on your first day of class to make your students get familiar with each other.

The icebreaker we will do is called “sort and mingle”. This activity will require us to move a little bit, so please stand up and put your chairs inward. I will ask you a question and provide some choices. The “sorting” is that I would like to have all the TAs who have the choice to form a group and move to the designated corner.

Here is the first question.

1. Have you TAed before? Yes, please go to corner A; No, please go to corner B.
   [TAs start moving around]
   Okay, now we have two groups. Let’s do the “mingle” part. I want each of you find one TA in your group whom you don’t know, and introduce yourselves to each other. Tell your partner your name, major and which class do you expect to TA in the future.

2. Let’s do this again. This time, let us think about our biggest fear about TAing is (1) there is going to be a lot of work/takes away from research, go to corner A. (2) I don’t know what the heck to do, go to corner B, or (3) TAing a class where I know nothing about the subject, please go to corner C.
   [TAs start moving around]
   Now please find one TA whom you don’t know in your group and introduce yourselves to each other. Tell your partner your name, major and your research interests.

3. Okay, now the third question, given a choice, I would spend my day * at Disneyland * on the Beach * Hiking in the Mountains * Spend my day reading a good book
   TAs, please introduce yourselves to one of the members in your group and tell me where did you do your undergraduate study, e.g. a public research extensive school, a
private teaching-centered college, etc.?

Contingency plan:

1. If there is more time, ask more questions like:

   Would you rather sky-dive, scuba-dive, read a book about both the library, or watch a documentary about both at home.

   Speak one language * Speak two languages * Speak more than two languages

   Have never left this continent * Have visited another continent * Have visited two other continents * Have visited more than two other continents

2. If running out of time, cut one question.

Lets go back to our seats. I think all of you now make friends with at least three other TAs. This icebreaker activity helps us to know more about the others by the “sorting” process. It also gives us opportunities to talk with each other so that we can feel more comfortable sitting here together. Icebreaker activity is also something you can do on your first day of class. Here is a handout for different icebreakers you can try in the classroom.

Any questions?

<table>
<thead>
<tr>
<th>PART #3:</th>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Brainstorm for what do students expect on the first day of class?</td>
<td></td>
<td></td>
<td>5min</td>
</tr>
<tr>
<td>4. Group Debriefing</td>
<td></td>
<td></td>
<td>5min</td>
</tr>
</tbody>
</table>

**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

Since we are friends now, let us do some teamwork. In this part of the workshop, I will ask you to form a group of three first.

[TAs form groups. If there are 1~2 TAs cannot find a group, ask them to join the other groups to form a group of 4.]

Please work as a group and answer this question: **What do students expect on the first day of class?** Write down your answers as a group on the flipchart paper / whiteboard. Just image if you were the student, what would you like to know in the first class. I will give you 5 minutes to discuss and write down your thoughts. Now, please go!

[While the TAs are working together, the PF can walk around to answer any questions and encourage TAs to talk and word as a group.]
Okay, now let us see what do you think that the students may expect on the first day of class:

1. Course (discussion, lab) syllabus / topics
2. Let out early
3. Workload
4. Course assessment
5. Grading policy
6. Attendance policy
7. Reading requirements
8. Contact information: email, office hour / location / work phone
9. Who are you (TA)?

[PF asks the TAs for their answers and write them on the whiteboard. PF can give comments accordingly.]

Very good. Now we have a better picture about what the students may expect on the first day of class. Most of the items here will very likely be on the course syllabus. I think it would be a good idea to go over the syllabus with your students, especially for those things that relate to the discussion or lab sessions, and those tasks you will be in charge of, e.g. homework, contact information, email policy, etc. We will have a session for some details for TA syllabus in one of the afternoon workshops.

<table>
<thead>
<tr>
<th>PART #4:</th>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
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</thead>
<tbody>
<tr>
<td>5. Think-pair-share: three important tasks of the first day</td>
<td></td>
<td></td>
<td>8min</td>
</tr>
<tr>
<td>6. Group debriefing</td>
<td></td>
<td></td>
<td>7min</td>
</tr>
</tbody>
</table>

**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

Now we come to the last part of this workshop. Let us take a look at the detailed things that we can do or want to do in the first day of class.

In Barbara Gross Davis’s book, “Tools for Teaching” (Jossey-Bass Publishers: San Francisco, 1993), it is mentioned that there are three important tasks we need to address in our first class. The three tasks are listed in the paper that I am now handing out to you. I will give you 4 minutes to come up with 2 things that you think you can do for each task. This time, please work on your own.

[PFs Hand out the minute paper. While the TAs are working on the minute paper, PF can make some comments or suggestions if the TAs have no clue about the questions, e.g:}
Some of the student expectations are about course administrations. What would you do to cover those things?

What can you do to know more about your students?

What kind of tone would you like to set for your class?

4 minutes is up. Now, I want each of you to share your answers with one of your neighbor and discuss if anything else you can do to address each task.

[PF bring the TAs back as a big group]

Okay, now any good ideas for addressing the three important tasks?

What can we do to ”Take care of Administrative tasks”?

[ Possible answers:

• Write the course name and number on the board
• Take attendance
• Mention department course policies
• Explain the procedure for the course’s sections
• Review any prerequisites for the course
• Define your expectation for the student participation
• Tell students about campus policies and academic honesty
• Discuss syllabus
• Invite students to attend your office hours

• **Visit the classroom the day before your first class.**
  *Where the classroom is? Any equipment I can use? Do I need to bring my own laptop? Whiteboard or chalkboard? … Figure out the classroom configuration first!!*

]

What can we do to “Creating a Positive Classroom Environment”?

[ Introduce yourself

• Setup the tone on the first day of class, e.g. “strict on policies but will be supportive”.
• Use icebreaker to make students get to know each other
• Begin to learn student’s names: photographs, student fill introduction cards, name tags, seating chart, self-introductions.
• Give students an opportunity to meet each other
• Encourage team working.

]

What can we do to “Set course Expectations and Standards”?
• Discuss the objectives of the course
• Ask students to list the goals they hope to achieve by taking the course.
• Describe how you propose to spend class time.
• Give your students ideas about how to study and prepare for class.
• If appropriate, give a brief diagnostic pretest.
• Ask students to do a group exercise.
• Work through a problem or piece of material that illustrates the course content.
• Give an assignment for the next class session.
• Ask students to write their reactions to the first day.

<table>
<thead>
<tr>
<th>PART #4:</th>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Closing</td>
<td></td>
<td></td>
<td>2min</td>
</tr>
</tbody>
</table>

**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

What we just did is called the “think-pair-share” activity. We consider the questions alone first, and then share our thoughts with our peers. This is a great way to motivate students and promote higher-level thinking. We will introduce you more learning activities that you can use in the workshop “active learning” this afternoon.

As the conclusion of this workshop, we first had an icebreaker activity to get familiar with each other; then we brainstormed in groups to identify what will our students expect on the first day of class; and finally we did the “think-pair-share” activity to figure out the detailed things we can do in our first class.

There is a handout about other icebreakers you could try, and the link to the summary about David’s book in the TLTC thumb drive. If you need more handy material to design your first class, I strongly recommend you take a look at them.

Any questions, concerns or comments?
First Day in Class: Icebreakers

Other questions can be used for “dog person, cat person”:
1. If you had to choose one drink: (1) water, (2) beer or wine, or (3) give me something hard.
2. If I could be doing anything right now it would be: (1) lying on a tropical beach with a drink in hand, (2) sleeping in the comfiest bed ever, (3) engaging in a physical outdoor activity.
3. My vehicle of choice: (1) Classic American muscle car 68 Mustang, (2) I need space for my toys and friends with Toyota 4runner, or (3) give me luxury with a Lexus.
4. My biggest fear about TAing is (1) there is going to be a lot of work/takes away from research, (2) I don't know what the hell to do, or (3) TAing a class where I know nothing about the subject.
5. I have participated in (1) 5 or 10K, (2) in a half marathon or adventure obstacle run, or (3) marathon or greater.
6. Speak one language * Speak two languages * Speak more than two languages
7. I dream in Black and White * Color * Don't know
8. I am Right handed * Left handed
9. Have never left this continent * Have visited another continent * Have visited two other continents * Have visited more than two other continents
10. Would describe myself as... Religious * Spiritual * Neither * Prefer to keep such things to myself
11. Learn best by... Reading * Listening * Seeing * Doing
12. My favorite meal of the day is... Breakfast * Lunch * Dinner * Dessert
13. Growing up, I was surrounded by people who were.... Generally the same races/ethnicities as I am * Generally of different races/ethnicities than I am * Prefer to keep such things to myself
14. Of the following list, I am most afraid of... Spiders * Heights * Snakes * Enclosed spaces
15. I sleep on my Back * Side * Stomach * All of the Above
16. I have... Never broken a bone * Broken one bone * Broken more than one bone
17. Given a choice, I would... Spend my day at Disneyland * the Beach *Hiking in the Mountains * Spend my day reading a good book
18. I met my best friend... In childhood * In high school * In College * After college

Two Truths and a Lie:
Each group member shares two things about themselves that are true and one thing that is a lie. The rest of the group tries to guess which is the untrue statement.

Ask Me about:
Each person gets a regular size post-it note. They should write a keyword response to a prompt such as, “Something that you know a lot about?” “Something about summer break?” “An interesting hobby?” After everyone has an idea, the group informally mingles around and asks each other about the topic. This is a great conversation starter. “Ask Me About ...” can be part of the nametag.
First Day in Class: Getting To Know Your Students
Brainstorm Notes: What do students expect on the first day of class?
First Day in Class: Minute Paper
In Barbara Gross Davis’s book, “Tools for Teaching” (Jossey-Bass Publishers: San Francisco, 1993), it is mentioned that there are three important tasks we need to address in our first class. Please write down at least 2 things you think you can do to for each of the following tasks.

1. What would you do to “Take care of Administrative tasks”?

2. What would you do to “Creating a Positive Classroom Environment”?

3. What would you do to “Set course Expectations and Standards”?

[The online book chapter can be reached from http://oed.berkeley.edu/bgd/firstday.html]
### Energizer 1 “Balloon Tossing and Sorting”

<table>
<thead>
<tr>
<th>NAMES:</th>
<th>Weiwei Chen</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEPARTMENT(S) THAT THIS WORKSHOP IS AIMED AT:</td>
<td>Henry Samueli School of Engineering</td>
</tr>
<tr>
<td>TOPIC:</td>
<td>Energizer 1</td>
</tr>
<tr>
<td>ABSTRACT:</td>
<td>If you were a new PF looking for a workshop on the above topic, what kind of a description of this workshop would help you to get a good sense of what this workshop entails? The TAs will play a Balloon Tossing and Sorting activity to relax and keep awake in the intensive TAPDP training.</td>
</tr>
<tr>
<td>LEARNING OUTCOMES:</td>
<td>What should the TAs be able to do &amp; know by the end of this workshop? Note that TAs wbat = TAs will be able to… (Suggestion: Try to have only 1-3 outcomes.)</td>
</tr>
<tr>
<td>TAs wbat...</td>
<td>Relax and have some fun</td>
</tr>
<tr>
<td>STEPS TOWARD TAs ACHIEVING LEARNING OUTCOME # 1:</td>
<td>What will the TAs do to help them to achieve the learning outcome, above? (Suggestion: you can have as many steps along the way as you feel appropriate.)</td>
</tr>
<tr>
<td>TAs will...</td>
<td>Play a Balloon Tossing and Sorting game</td>
</tr>
<tr>
<td>RESEARCH SUPPORTING THIS WORKSHOP:</td>
<td>What research has been done in this area? List two articles that (preferably) offer research-backed conclusions about best practices in this area. At least one of the articles should have some disciplinary commonality with your TA groups(s).</td>
</tr>
<tr>
<td>Article One (w/ summary)</td>
<td>No Research Needed</td>
</tr>
<tr>
<td>SUPPLIES NEEDED:</td>
<td></td>
</tr>
<tr>
<td>QUANTITY:</td>
<td>ITEM NAME: Right number of Balloons in different colors</td>
</tr>
<tr>
<td>Yellow, Blue, Red, Green, Orange, Purple, ... #TAs + 4</td>
<td>COLOR/SPECIFICS: Whistle</td>
</tr>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ROOM CONFIGURATION:</td>
<td>(Describe/show how the room will be set up. The set up below is just a sample to be moved as you like.)</td>
</tr>
</tbody>
</table>
Desks can be in any configuration. We just need some room around the tables so that the TAs will have the room to stand in groups. Assume that we will use EH2430

PREPARATION: (What needs to be done by you in advance?)

1. Get Balloons!

WORKSHOP SCHEDULE: Indicate when each portion of the workshop will begin and end.

<table>
<thead>
<tr>
<th>PART #1:</th>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
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</thead>
<tbody>
<tr>
<td>1. Balloon Tossing and Sorting</td>
<td></td>
<td></td>
<td>10min</td>
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</table>

TOTAL TIME FOR WORKSHOP: 10 min

WORKSHOP SEGMENTS: (Break down each part of the workshop:)

<table>
<thead>
<tr>
<th>PART #1:</th>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Balloon Tossing and Sorting</td>
<td></td>
<td></td>
<td>10min</td>
</tr>
</tbody>
</table>

NARRATIVE: Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

Okay, you look a little bit tired. So before we continue to next workshop, let’s play something to energize us.

Let’s all stand up! We are going to play a quick energizing game called the Balloon Toss and Sort!!!
The point is to get you energized and ready for the next workshop (then you have a break for coffee!).

Everyone try to move the desks inward and stand in a circle around the room. Pass this bag around and everyone take a balloon from the bag. First we are going to blow up our balloons.

[blow up balloons]

Good! Now you see there are a few colors. The goal of the game is to get all the same colors to the same side/corner of the room, this might seem easy, but there is a catch. We are not going to pre-designate which color goes to which corner, and you must remain silent while playing AND you have to keep the balloons in the air at all times.

No grabbing or passing!

For each balloon you drop on the floor inside the circle, one person has to leave the circle! It's kind of like wacky volleyball! So on three we will all toss up our balloons into the air and try to sort them... 1... 2... 3....

Notes:
If time is allowed, let the TAs regroup themselves into groups with balloons of different colors.
Let them introduce themselves to their fellow TAs that they have not had the chance to talk with.
WORKSHOP03 “TA Roles and Responsibilities”

**NAME:** Weiwei Chen  
**DEPARTMENT(S) THAT THIS WORKSHOP IS AIMED AT:** Henry Samueli School of Engineering

**TOPIC:**  
TA Roles and Responsibilities

**ABSTRACT:** If you were a new PF looking for a workshop on the above topic, what kind of a description of this workshop would help you to get a good sense of what this workshop entails?

This workshop will inform the TAs about their roles and responsibilities, foster team working spirit, and introduce some TLTC services by playing the jeopardy game as a class. (Adapted from “TA Roles and Responsibilities” by Sarah Hernandez, TAPDP 2011)

**LEARNING OUTCOMES:** What should the TAs be able to do & know by the end of this workshop? Note that TAs wbat = TAs will be able to...  
(Suggestion: Try to have only 1-3 outcomes.)

- **TAs wbat...** Describe 1~2 TA responsibilities and duties  
- **TAs wbat...** List 1~2 services that TLTC is providing  
- **TAs wbat...** Work in teams and practice speaking briefly in front of the class

**STEPS TOWARD TAs ACHIEVING LEARNING OUTCOME # 1:** What will the TAs do to help them to achieve the learning outcome, above? (Suggestion: you can have as many steps along the way as you feel appropriate.)

- **TAs will...** Play a revised jeopardy game in teams  
- **TAs will...** Play as the “coxswain” at least once to write down the answer to one question regarding TA roles and responsibilities.  
- **TAs will...** Play as the “speaker” to briefly describe their team’s answer in the classroom

**STEPS TOWARD TAs ACHIEVING LEARNING OUTCOME # 2:** What will the TAs do to help them to achieve the learning outcome, above? (Suggestion: you can have as many steps along the way as you feel appropriate.)

- **TAs will...** Watch the TLTC welcome video clip  
- **TAs will...** Find the answer to the “Final Jeopardy” question about the services that are provided by TLTC.  
- **TAs will...** Play as the “coxswain” at least once to write down the answer to one question regarding TA roles and responsibilities.

**STEPS TOWARD TAs ACHIEVING LEARNING OUTCOME # 3:** What will the TAs do to help them to achieve the learning outcome, above? (Suggestion: you can have as many
steps along the way as you feel appropriate.)

<table>
<thead>
<tr>
<th>TAs will...</th>
<th>Play a revised jeopardy game in teams</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAs will...</td>
<td>Play as the “speaker” to briefly describe their team’s answer in the classroom</td>
</tr>
</tbody>
</table>

**RESEARCH SUPPORTING THIS WORKSHOP:** What research has been done in this area? List two articles that (preferably) offer research-backed conclusions about best practices in this area. At least one of the articles should have some disciplinary commonality with your TA group(s).

**Article One (w/ summary)**
This book is designed for college faculty, staff, and administrators who train and supervise teaching assistants (TAs). It presents a collection of papers with information on designing, implementing, and improving TA training programs.

**Article Two (w/ summary)**
This paper examines the results of a study comparing the performance of students in a high school chemistry course who created homemade PowerPoint games as a test review with the students who used a traditional study guide on two separate unit tests. Students scored significantly higher on one of the two unit tests; however, there was no difference in performance between students who created games multiple times. This was the first time a significant difference has been reported when using homemade PowerPoint games.

**SUPPLIES NEEDED:**

<table>
<thead>
<tr>
<th>QUANTITY:</th>
<th>ITEM NAME:</th>
<th>COLOR/SPECIFICS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Very cool prize for the winning team</td>
<td>Thumb drives with the TLTC logo</td>
</tr>
<tr>
<td>Ceiling(#TAs / y) + 1</td>
<td>Flipchart paper / Whiteboards</td>
<td></td>
</tr>
<tr>
<td>Ceiling(#TAs / y)</td>
<td>Markers</td>
<td></td>
</tr>
<tr>
<td>Ceiling(#TAs / y)</td>
<td>Bell rings</td>
<td></td>
</tr>
<tr>
<td>Ceiling(#TAs / y)</td>
<td>Table label holder</td>
<td></td>
</tr>
<tr>
<td>Ceiling(#TAs / y)</td>
<td>Table labels (colorful index card or numbers)</td>
<td></td>
</tr>
</tbody>
</table>
**ROOM CONFIGURATION:** (Describe/show how the room will be set up. The set up below is just a sample to be moved as you like.)

Divide room into even teams. Let each team sit in the same row.

<table>
<thead>
<tr>
<th>Podium</th>
<th>screen</th>
</tr>
</thead>
</table>

“Coxswain Seat”

Answer is written by the ‘Coxswain’s Seat’ and passed to the ‘Speaker’, student by student, then the ‘Speaker’ reads when called on. Shift both the “Coxswain” and “speaker” seats every 1~2 questions.

### PREPARATION:
(What needs to be done by you in advance?)

1. Make sure the Jeopardy game PowerPoint works
2. Write down the possible answers for each question on index cards (w color). It will be helpful for me to find the answer quickly in the classroom.
3. Ask Chris if he has the TLTC welcome video with higher resolutions
4. Prepare PowerPoint slides for the workshop
5. Get familiar with the comment for each question
6. Set the tables
7. 
8. 

### WORKSHOP SCHEDULE:
Indicate when each portion of the workshop will begin and end.

<table>
<thead>
<tr>
<th>Portion of Workshop</th>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Introduction to TA Duties</td>
<td>2min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Introduction to the Jeopardy Game</td>
<td>3min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Play the Jeopardy Game</td>
<td>30min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Summarize TA roles and responsibilities</td>
<td>5min</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL TIME FOR WORKSHOP:** 40 min
WORKSHOP SEGMENTS: (Break down each part of the workshop:)

<table>
<thead>
<tr>
<th>PART #1:</th>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to TA Duties</td>
<td></td>
<td></td>
<td>2min</td>
</tr>
</tbody>
</table>

NARRATIVE: Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

We have known each other a little bit and had some ideas about what to do on our first day in class. Now, we are going to have our next workshop to discuss more details about our TA job. The topic of this workshop is “TA roles and responsibilities”.
When I started my first TAship in my second year here, I had very little idea about my duties and responsibilities. I am an international student and never had TAs in my undergraduate years. So I had no models that I can learn from. I guess some of you may have the same experience like me. How many of you never had TAs for your undergraduate courses? Show of hands. How many of you had TAs in your classes? How many of you have worked as TAs in the past?
[TAs may have very different backgrounds. It is time to see the diversity.]
Well, we seem to have very different experience about the TAship here. In this workshop, we will discuss TA roles and responsibilities here in UCI. We hope that in the next 40 minutes, we can give you a general picture about the professional responsibilities of the TAship. By the end of this workshop, you will be able to:
1. Describe 1~2 TA responsibilities and duties here in UCI
2. Participate in a classroom game which you can use in your own class for effective teaching
3. List 1~2 services that TLTC is providing so that you can use to improve your teaching

<table>
<thead>
<tr>
<th>PART#2:</th>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to the Jeopardy Game</td>
<td></td>
<td></td>
<td>3min</td>
</tr>
</tbody>
</table>

NARRATIVE: Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

So we are going to play a game in this workshop. First, who is familiar with the jeopardy game?
[I guess most of them are familiar with jeopardy]
It’s great that most of us are familiar with this game. But it is okay that you’ve never heard about it. The rules of the game are very easy. We will play this game in groups to answer questions. We will have questions in four categories, and in each category we have questions with different points. The first team to find out the answer of the question will get the right to present their answer to the class. If the answer is right, the team will get the points of the question; if the answer is wrong, the team will lose the points for the question. So as a team, you need to be fast but also sure that you know the right answer. After we finish all the questions, the team with the highest points will be the winner.
Since today we are sitting in this classroom, here is how we are going to play...

We are going to play as a rowing team. Each column of seats is one team. The person in the last seat is the “Coxswain Seat”. The person in the “Coxswain Seat” is the one in charge. He/she has to write the answer to the posted question on a sheet of paper and passes it to the student in the front seat, the “Speaker”, via each student seated between as the crew. The crews don't need to handle any technical situations but just using your strength to pass the paper. Teams cannot collaborate on the answer and must stay quiet while the ‘Coxswains’ is writing their answer to the question. The only person to speak is the ‘Speaker’. The first team to get the paper to their “Speaker” will be called on to read their answer. If the answer is correct the team will get the points! After each (each 2) turn, we will shift both the “Speaker” and “Coxswain” to our left. If you are the first one on the left, then the right first one will take your job in the next turn.

If your team answers incorrectly, your team will lose the points.

Any questions?

[wait for questions]

Today we have xx TAs here, so we will have y teams of #TAs/y TAs. So let’s get started!!

Please quickly find your seats.

[I will transition to the next slide that shows the seat assignments, then once all are seated we will start the game.]

<table>
<thead>
<tr>
<th>PART #3:</th>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Play the Jeopardy Game</td>
<td></td>
<td></td>
<td>30min</td>
</tr>
</tbody>
</table>

NARRATIVE: Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

Alright, this is our Jeopardy Game. We have four categories here: TA work, TA roles, TA responsibilities and how to interact with the instructors.

Let’s just quickly get warm up with one question. When I show you the question, the “Coxswain” needs to write down your answer, and pass your answer to the “Speaker” via the “crews”. The first speaker gets the answer and ring the bell will have the right to present it to the class. Okay, ready, go ...

[Click the warm up question and let them practice the team work and answer it and call on the quickest respondent]

Practice Question: What does TAPDP stand for?

Answer: Teaching Assistant Professional Development Program!

Comments: "TAP DAP" is a day-and-a-half series of discipline-specific, interactive workshops designed to provide new TAs with skills and information that will help them to begin their instructional careers at UCI. TAPDP will help you to better understand your TA duties and responsibilities and to prepare you for them. During the training, you will also begin to develop a community with your cohort of other new TAs. Since experienced TAs, like Sarah and me, also participate as facilitators for the training, you will have someone who has been in your shoes who can help you to navigate your way through being a graduate student in your department as well as helping you to TA effectively. Having this kind of support in
graduate school is critical to success.
Reference: http://www.tltc.uci.edu/taTraining.html

Now we are really ready to play! So the next question is for real! Get ready, here we go...

[Let the group answered the warm up question choose a question. Put up the first question and let the game begin. Have either myself or Sarah watch for the first responder]

**Question 1:** What is the main role of most Engineering TAs? (this responsibility includes actual teaching!)

[call on the fastest responding team for the reader to call out the team’s answer. Reveal the answer on the ppt after they read out their answer]

**Answer:** Holding discussion/lab sections

[If the question was answered correct, give the team their scores]

**Comments:** Well, this is where you actually TEACH. If you are spitting the class with another TA, you may be responsible for certain discussion sessions or only the lab sessions. Depending on the size of the class, there may be anywhere from 1 to 3 discussion or lab sessions per week. This information can usually be found in the course catalogue.

[After commenting, add / subtract the points for the answering team. Let the answering team pick up the next question]

**Question 2:** What is the best way to know what the course instructor has taught, what he/she thinks is important, and to prepare for your discussion section?

**Answer:** Attend lectures (or talk to the professor before the quarter or weekly)

**Comments:** You don’t have to attend lectures but you do have to spend time preparing your discussion material, an easy way to do this is to know what the professor has taught and what he/she thinks is important. So in this sense, attending lecture is a way to prepare for your discussion. Also, attending the first lecture might be required by the professor.

**Question 3:** What should you do if there are multiple TA’s for the course you are TAing?

**Answer:** Attend weekly TA meetings and/or coordinate with other TA’s (either answer is acceptable)

**Comments:** You will probably have to coordinate with the other TA either on your own or through the professor. This will depend on the course professor and how they would like the tasks divided between the multiple TA’s. Its more common in larger classes and the split of duties might entail splitting discussion sessions, homework, or proctoring/grading/preparing exams.

**Question 4:** What might you have to provide for students in cases where the professor assigns non-textbook problems?

**Answer:** Detailed solution sets

**Comments:** Even though text book solution manuals exist, you may need to prepare your own solutions of homework problems for the students. A common way of distributing the solutions (and only distribute on a broad scale if the professor permits) it to post it to the class webpage.

**Question 5:** If students are given weekly homework assignments, whose responsibility is it
to grade them?
Answer: The course reader
Comments: As a TA, you will typically grade quizzes, you can be asked to grade exams and projects, but usually, homework is not your responsibility. Larger courses are assigned a reader position whose job is solely to grade homework.

Question 6: What essential role does the TA have that will take up one to two hours of your week?
Answer: Holding regular office hours
Comments: This essential duty will be covered in more depth, but at this point know that it will take up 1 to 2 hours per week.

Question 7: What can you do to help students prepare for exams, but is not a requirement of TAing?
Answer: Conduct review sessions before exams
Comments: This is not required but is really appreciated by students. An important thing to remember is that you might have to reserve a room to accommodate all your students for an extra review, so try to do that as soon into the quarter as possible (mention CASA office)

Question 8: What online tool is available for you to maintain and distribute homework, quiz, and exam grades?
Answer: EEE Gradebook
Comments: Maintaining the gradebook is the TA’s responsibility. You may choose to keep an excel file of all student grades- be sure to back up the files!, or you can use the EEE online gradebook which can store grades and distribute grades to students. We will learn more about EEE in the workshop tomorrow.

Question 9: What might you have to do if the class instructor has to miss class?
Answer: Give a guest lecture
Comments: Since the quarter is only 10 weeks long, it’s very important to not have to cancel lectures. In the case when the instructor can’t be there, you may have to sub in. Be sure to ask the instructor for his/her lecture notes so that you cover the appropriate material. You may also want to ASK if you can give the lecture one day so that you can get valuable practice!!

Question 10: What are some “end-of-the-quarter” tasks the TA is responsible for?
Answer: Recording grades, computing final grades, reading final evaluations, help proctor final exam, etc.
Comments: The end of the quarter is a busy time for all, and when the students go home, there is usually still more work for the TA- grading finals, compiling final grades, and reading your evaluations.

Question 11: Where should you be able to find the professor’s policies on late assignments, plagiarism, and make-up exams?
Answer: The course syllabus or ask the professor at the beginning of the quarter.
Comments: It’s a good idea to meet with the course instructor at the beginning of the
quarter to determine exactly what will be expected of you. You will also want to ask them and make sure there is a written reference for students regarding their policies on homework, exams, and plagiarism.

---------

**Question 12:** Whom should you report common student difficulties, errors, and special concerns to?

**Answer:** The course professor and other TA’s

**Comments:** As a TA you are the liaison between the students and the professor. Students can be intimidated by professors and can have a hard time expressing their concerns to the professor. The students tend to feel more comfortable talking to you so you need to make sure any major concerns are discussed by you with the professor.

---------

Here is our final Jeopardy question. If you get this question right, your team’s points will be doubled; otherwise, you will lose 500 points.

**Final Jeopardy Question:** Based on the video clip (TLTC Welcome Video) what services does the TLTC provide for TA’s?

**Answer:** (1) Online midterm feedback, (2) one on one consulting appointments, (3) video recording of teaching, (4) workshops through out the quarter, and (5) TAPDP

**Comments:** Since TAPDP is the only formal training you will get at TA’s at UCI, I encourage all of you to check out the TLTC for continuing your teaching education. If you want someone to go over your final evaluations with you and help you develop ways to improve your teaching for the next year, come to the TLTC! You can also attend workshops like “Classroom speaking skills”, “Teaching with Video Games and Virtual Environments”, and many more to help you become a better TA. All the services are free. The TLTC is located on the 3rd floor of the TLTC, so stop by sometime!

[After the final jeopardy question has been answered, the game is over. The team with the highest points is the winner. They will have a fabulous prize for the great teamwork. I will then pass the two handouts about (1) Summary of TA Duties and (2) Guide for your first meeting with your professor.]

Notes:
Timing is a critical part of this game. So if time is not allowed, we do not need to finish all the questions. Just end the game with the final jeopardy which provides more information about TLTC to the TAs.

<table>
<thead>
<tr>
<th>PART #4:</th>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summarize TA roles and responsibilities</td>
<td></td>
<td></td>
<td>5min</td>
</tr>
</tbody>
</table>

**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.
Congratulations to team x! You are the winner for the jeopardy game. I hope all of you enjoyed this game and get some idea about the TA roles and responsibilities here in UCI. Although we are still students, we need to perform professionally as the teaching assistants for undergraduate courses.

The handouts are a summary of what we have talked about throughout the game. Do you have any questions about TA roles and responsibilities?

[Pause for questions]

To bring this workshop to an end, I would like to point out that the game we just played could be a great way to get students to actively participate in a review session. The questions can be kept simple or can be more complex engineering problems. You could have students work in teams to answer each question rather than playing “Coxswain/Speaker” style.

Here is a website where they have different PowerPoint templates for classroom activities: [Pull up the website and show some templates: http://facstaff.uww.edu/jonesd/games/games_parade_jeopardy.html]

We are going to have a break for about 15 minutes. You can use the restroom and stretch a little bit. We also have some coffee in ... Let’s go back before 11:14am.
What do TA's do?

**Weekly**
Attend Lectures
Read ahead of the students
Plan and conduct 1-2 discussion sections
Hold office hours
Answer student email
Providing written feedback (individual comments, detailed solution sets)
Grade assignments.
Recording attendance (many classes have some grade value attached to attendance)

**During the quarter**
Grading (usually only 2 or 3 large assignments, midterms and/or papers)
Meeting with the professor, as needed.
Meeting with fellow TAs as needed
Optional: Make charts/ handouts
Optional: use IRCs midterm evaluation
Optional: get a section videotaped
Sometimes: Run a review session
Sometimes: Make study questions and / or contribute to writing exam questions
Reporting to the instructor on common student errors or difficulties
Giving guest lectures if the professor is not available
Proctoring exams
Maintaining on-line resources for students (online gradebook, noteboard, etc.)
Maintaining off-line resources for students (reference material in the library, etc.)

**End of quarter:**
End of quarter evaluations
help proctor the final exam
Grade finals
Compute grades
Read Grades into record

Originally created by Riju Lavanya, Engineering, PF 2005
<table>
<thead>
<tr>
<th>What to ask in the first meeting with the course instructor?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Have a copy of the syllabus ready. Or ask, Do you have a copy of the syllabus?</td>
</tr>
<tr>
<td>2. Ask if there are multiple TAs for the class. If so, are their responsibilities different? How so?</td>
</tr>
<tr>
<td>3. Are you expected to build a class webpage? If so, will it be a “functional” webpage (just syllabus and class info published online) or will it more involved (class assignments published, notebook, etc.)?</td>
</tr>
<tr>
<td>4. What will be the grading criteria for the class? What are the professor’s views on awarding partial credit? How much control do you have on granting homework extensions and makeup exams?</td>
</tr>
<tr>
<td>5. Are you expected to attend all lectures?</td>
</tr>
<tr>
<td>6. In the discussion section, how much “help” should you give to students on their homework? Are you expected to just solve problems or to also lecture briefly on the contents of the professor’s last class?</td>
</tr>
<tr>
<td>7. If you are a lab assistant what are your duties?</td>
</tr>
<tr>
<td>8. How many office hours are you expected to hold per week? When and where? If this time clashes with your schedule, make sure you apprise the instructor of this situation ASAP.</td>
</tr>
<tr>
<td>9. Will you be having meetings with the instructor to discuss the progress of the course? If so, try to set up some convenient time and place for these meetings.</td>
</tr>
<tr>
<td>10. What is the instructor’s policy of plagiarism?</td>
</tr>
<tr>
<td>11. What should the students know beforehand, or should be able to do from past courses?</td>
</tr>
<tr>
<td>12. In general, about what policies, if any do TAs have authority to make decisions about? For what issues do you want them to refer the questions to the instructor?</td>
</tr>
</tbody>
</table>
WORKSHOP04 “Learning Styles and UCI Students”

**NAMES:** Weiwei Chen

**DEPARTMENT(S) THAT THIS WORKSHOP IS AIMED AT:** Henry Samueli School of Engineering

**TOPIC:**
Learning Styles and UCI Students

**ABSTRACT:** If you were a new PF looking for a workshop on the above topic, what kind of a description of this workshop would help you to get a good sense of what this workshop entails?

In this workshop, the TAs will assess their own learning styles, get to understand that students are learning in different ways, and design their classes to accommodation different learning preferences. This workshop will also go over the undergraduate profile to show the diversity of the UCI students.

**LEARNING OUTCOMES:** What should the TAs be able to do & know by the end of this workshop? Note that TAs wbat = TAs will be able to... (Suggestion: Try to have only 1-3 outcomes.)

| TAs wbat... | Describe different categories of learning styles in the Felder-Silverman model and assess their own learning preferences |
| TAs wbat... | Identify 1~2 approaches to help the students with different learning styles |
| TAs wbat... | Build an inclusive lesson plan with the consideration of various learning preferences |

**STEPS TOWARD TAs ACHIEVING LEARNING OUTCOME # 1:** What will the TAs do to help them to achieve the learning outcome, above? (Suggestion: you can have as many steps along the way as you feel appropriate.)

| TAs will... | Finish the index of learning style (ILS) questionnaire |
| TAs will... | Assess their learning style from their score of the ILS questionnaire |
| TAs will... | Compare their learning style with those of the undergraduate students’ and figure out the differences. |

**STEPS TOWARD TAs ACHIEVING LEARNING OUTCOME # 2:** What will the TAs do to help them to achieve the learning outcome, above? (Suggestion: you can have as many steps along the way as you feel appropriate.)

| TAs will... | Learn the four learning style categories of the Felder-Silverman learning style inventory |
| TAs will... | Identify 1~2 teaching approaches to accommodate different learning styles in category |
| TAs will... | Discuss their thoughts in pairs |
**STEPS TOWARD TAs ACHIEVING LEARNING OUTCOME # 3:** What will the TAs do to help them to achieve the learning outcome, above? (Suggestion: you can have as many steps along the way as you feel appropriate.)

<table>
<thead>
<tr>
<th>TAs will...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in groups to design an inclusive lesson plan to accommodate different learning styles</td>
</tr>
</tbody>
</table>

**RESEARCH SUPPORTING THIS WORKSHOP:** What research has been done in this area? List two articles that (preferably) offer research-backed conclusions about best practices in this area. At least one of the articles should have some disciplinary commonality with your TA groups(s).

<table>
<thead>
<tr>
<th>Article One (w/ summary)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The article that originally defined the Felder-Silverman model and identified teaching practices that should meet the needs of students with the full spectrum of styles. The paper is preceded by a 2002 preface that states and explains changes in the model that have been made since 1988.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Article Two (w/ summary)</th>
</tr>
</thead>
<tbody>
<tr>
<td>An exploration of differences in student learning styles, approaches to learning (deep, surface, and strategic), and levels of intellectual development, with recommended teaching practices to address all three categories.</td>
</tr>
</tbody>
</table>

**SUPPLIES NEEDED:**

<table>
<thead>
<tr>
<th>QUANTITY:</th>
<th>ITEM NAME:</th>
<th>COLOR/SPECIFICS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>#TAs +2 for each color</td>
<td>yellow and green index cards (cheap clickers)</td>
<td>Yellow and green</td>
</tr>
<tr>
<td>#TAs +2</td>
<td>White index cards with numbers</td>
<td></td>
</tr>
<tr>
<td>#TAs +2</td>
<td>ILS questionnaire</td>
<td></td>
</tr>
<tr>
<td>Ceiling(#TAs /4) for each color</td>
<td>“How to help our students with different learning styles?” handouts in different colors</td>
<td>Green/blue/yellow/orange</td>
</tr>
<tr>
<td>1</td>
<td>Iclicker for demonstration</td>
<td></td>
</tr>
</tbody>
</table>

**ROOM CONFIGURATION:** (Describe/show how the room will be set up. The set up below is just a sample to be moved as you like.)

Students sit around the tables and face toward the podium and screen.
Have some room on the wall for flip chart paper posting.
(Assume that we will use EH2430)
**PREPARATION**: (What needs to be done by you in advance?)

1. Prepare the index cards with statistic numbers
2. Print the ILS questionnaire
3. Prepare the PowerPoint Slides
4. Print the handouts
5.

**WORKSHOP SCHEDULE**: Indicate when each portion of the workshop will begin and end.

<table>
<thead>
<tr>
<th>Stage</th>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Introduction to the workshop</td>
<td></td>
<td>3min</td>
<td></td>
</tr>
<tr>
<td>2. Introduction to learning styles</td>
<td></td>
<td>5min</td>
<td></td>
</tr>
<tr>
<td>3. Index of Learning Style (ILS) questionnaire and scoring</td>
<td></td>
<td>15min</td>
<td></td>
</tr>
<tr>
<td>4. How to help our student with different learning styles?</td>
<td></td>
<td>10min</td>
<td></td>
</tr>
<tr>
<td>5. Lesson plans for inclusive classroom teaching</td>
<td></td>
<td>15min</td>
<td></td>
</tr>
<tr>
<td>6. Let’s know something about UCI engineering students</td>
<td></td>
<td>12min</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL TIME FOR WORKSHOP</strong>:</td>
<td></td>
<td><strong>60 min</strong></td>
<td></td>
</tr>
</tbody>
</table>

**WORKSHOP SEGMENTS**: (Break down each part of the workshop:)

<table>
<thead>
<tr>
<th>PART #1:</th>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to the workshop</td>
<td></td>
<td></td>
<td>3min</td>
</tr>
</tbody>
</table>

**NARRATIVE**: Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

Welcome back from the break!

The workshop we are going to have is about “Learning styles and UCI students”. The main theme for this workshop is “diversity”. We are going to focus on the diverse ways in which our students may learn and discuss about what can we do to for teaching to accommodate this learning style diversity.

In addition to the discussion of learning styles, we will also spend some time on reviewing
the UCI engineering student demographics together in the second part of this workshop. We hope that this workshop will provide you an idea about whom are you going to teach and prepare you for the diversity you may face during your TA career here in UCI.

Here is some learning objectives for this workshop, after this workshop:

1. You will be able to describe different learning styles in the Felder-Silverman inventory and assess their own ways of learning
2. You will be able to identify 1~2 approaches to help your students with different learning styles
3. You will be able to build an inclusive lesson plan with the consideration of various learning preferences
4. You will be able to describe the UCI engineering student demographics

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<th>PART#2:</th>
<th>BEGIN TIME:</th>
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<tbody>
<tr>
<td>Intro to learning styles</td>
<td></td>
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<td>5min</td>
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**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

In the first part of this workshop, we will discuss something about learning styles.

Students have different levels of motivation, different attitudes about teaching and learning, and different responses to specific classroom environments and instructional practices. The more thoroughly instructors understand the differences, the better chance they have to meet the diverse learning needs of their students.

In Richard M. Felder and Linda K. Silverman’s paper ”Learning and Teaching Styles In Engineering Education” that was published in Journal of Engineering Education, they mentioned three categories of diversity that have been shown to have important implications for teaching and learning. They are:

1. differences in students’ learning styles (characteristic ways of taking in and processing information)
2. approaches to learning (surface, deep, and strategic),
3. and intellectual development levels (attitudes about the nature of knowledge and how it should be acquired and evaluated).

We don’t have time to investigate all the three categories today but will explore the very first category, learning styles.

Students are characterized by different learning styles, preferentially focusing on different types of information and tending to operate on perceived information in different ways. There are several dozen of learning models have been developed for learning style evaluation. We are going to use one model, which is formulated by Richard Felder, Linda Silverman and Barbara Soloman for use by college instructors and students in engineering and science. The model is sometimes referred as Felder-Silverman model.
The Felder-Silverman model assesses learning styles in four dimensions. They are:

1. Active vs. Reflective learners, where active learners prefer doing something active with it, e.g. discussing, applying, explaining to the others while reflective learners prefer to think about it quietly first.
2. Sensing vs. Intuitive learners, where sensing learners tend to learn facts while intuitive learners tend to discover possibilities and relationships.
3. Visual vs. Verbal learners, where visual learners learn better by seeing things like pictures, diagrams, flow chars, demonstrations while verbal learners learn better by words, i.e. written and spoken explanations.
4. Sequential vs. Global learners, where sequential learners tend to gain understanding in linear steps while global learners learn in large jumps and suddenly “getting it”.

**PART #3:**

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<tr>
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<tr>
<td></td>
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<td>15min</td>
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**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

[Hand out the ILS questionnaire]

In front of you is the Index of Learning Style (ILS) questionnaire. There are 44 questions in this questionnaire with 11 questions for each of the four learning style dimensions for the Felder-Silverman model. I will give you about 10 minutes to finish this questionnaire and tally the scores on the last page of the questionnaire to assess your own learning styles.

OK, you should have tallied your score. Now let’s take a look what types of learner we are. If you have higher score for “A” than “B” in one category, then you are mostly a type A learner than type B. For example, if your score for “active” is higher than “reflective”, then you are mostly an “active” learner; otherwise, you are mostly a “reflective” learner. If your scores for “active” and “reflective” are the same, then you are of both types.

So let’s see How many of you are mostly active learners? Reflective learners? Please raise the yellow index card if you are mostly “active”, green card if you are mostly “reflective”, both cards if you are of both types.

How many of you are mostly sensing learners? Intuitive learners? (Yellow: sensing; Green: intuitive)

How many of you are mostly visual learners? Verbal learners? (Yellow: visual; Green: verbal)

How many of you are mostly sequential learners? Global learners? (Yellow: sequential; Green: Global)

[Write down the numbers for each style on the whiteboard.

It would be good to ask the TAs to vote for their learning styles by using the iClicker. It helps to show them how to use iClicker in the classroom. But if there are too many TAs and we do not have enough iClickers to play with, I can ask them to vote by using red/green cards.]
Very good. The numbers here show we do have various learning styles as graduate students. One thing I would also like to point out is that people have characteristics of all learners, they just tend to be more heavily weighted in one area versus another.

Now you might be interested in knowing the learning preferences for the engineering undergraduate students. Dr. Richard Felder conducted a survey on the learning styles of engineering students and faculties in 2005 and reported the results in his paper named “Understanding Students Differences”. It was shown in the paper 64% of the students are active learners, 63% are sensing, 82% are visual and 60% are sequential; while for faculty members, 45% are active, 41% are sensing, 94% are visual and 44% are sequential. (We can also tell from our results here that the learning styles of most of the graduate students are somehow similar to faculty members and different from undergraduate students.)

We just had an in-class voting with color index cards. Here in UCI, a lot of faculties are using iClickers like this to get quick responses in the classroom. You may need to setup the iclicker system if the professor needs to use it for the lecture or if you need to use it in your discussions or labs. The students can buy this device and register for classroom participation. It costs about $30. The students can use it for different classes. Or we can also use color index cards as “cheap clickers” for getting the answers to multiple choices questions in the classroom from the students.

Note: The ILS questionnaire has 44 questions. It may take longer time for the TAs to finish. I worked on the questionnaire myself, and ask some of my friends to finish the questionnaire and tell me how long does it take for them to finish it. It took about 10 minutes for most of us to answer the questions and get the score. That’s why I assign 15 minutes for this part.

<table>
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<tr>
<th>PART #4:</th>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
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</thead>
<tbody>
<tr>
<td>How to help our student with different learning styles?</td>
<td></td>
<td></td>
<td>10 min</td>
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</table>

NARRATIVE: Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

As you can see, our own way of learning could be very different from our students’. Although the engineering undergraduates may tend to favor one learning style, and although there may be consistent trends for learning style preferences in engineering, the reality is that the students in your classroom will likely have a diversity of learning styles. It is very important for us to be aware of this learning style diversity and adjust our teaching to help different types of learners.

Now we are going to figure out how we as TA’s can improve our students’ learning by helping them better adjust their note taking, study methods, and test-taking skills to their learning style.
I will ask you to try to find some suggestions for the learners in one Felder-Silverman category. I will give each of you one paper with the descriptions of the characteristics of the two learning styles in your category. I will first give you about 3 minutes to come up with some suggestions for those learners on your own.

[Hand out the “How to help our students with different learning styles?” Wait for 3 minutes. TAs work on their own to provide suggestions. Give 1 minute notice.]

Okay, I see most of you have had some ideas to help our students. Now please find one TAs in your group to share your suggestions. I will give you 3 minutes for the sharing.

Okay let’s see what can we do to help different types of learners:

**Active learners:**
- participate in class discussion.
- Study in a group and take turns to explain different topics to each other.
- Try to find ways to actually do sth. so as to retain information better.

**Reflective learners:**
- stop periodically to review what you’ve learned and think of possible questions or applications.
- Write short summary of readings or class notes in your own words.
- Take some time to think.

**Sensing learners:**
- Ask instructors for specific examples of concept and procedures
- Find out how the concepts apply in practice.
- If the teachers does not provide enough specifics, try to find some in the textbook or references or brainstorm with friends or classmates.

**Intuitive learners:**
- Most college classes are aimed at intuitions, good!
- If not, ask instructor for interpretations or theories that link the facts.
- Try to find the connections.
- Take time to read entire question before you start answering and be sure to check your results.

**Visual learners:**
- Try to find diagrams, sketches, schematics, photographs, flow charts or any other visual representation of course material.
- Use videotapes or CD-ROM displays of the course material if available
- Prepare concept map by listing key points, draw lines with arrows between concepts to show connections, highlight key points in boxes or circles.

**Verbal learners:**
- Write summaries or outlines of course material in your own words.
- Work in groups can be particularly effective by gaining understanding of material by hearing
classmates’ explanation.

**Sequential learners:**
Ask instructors to fill in the skipped steps.
Take time to outline the lecture material in logical order
Try to strengthen global thinking skills by relating each new topic

**Global learners:**
Skim through the entire chapter that is covered in one lecture to get an overview first.
Immerse yourselves in individual subjects for large blocks.
Try to relate subjects and make connections

[Some comments if time permits:
• Most of your students learn differently than you do.
• Each of your students learns differently from your other students.
• No one teaching method will effectively reach all of your students.
• You cannot address all of your students' learning styles all of the time.
]

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<th>PART #5:</th>
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<th>END TIME:</th>
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</thead>
<tbody>
<tr>
<td>Lesson plans for inclusive classroom teaching</td>
<td></td>
<td></td>
<td>15min</td>
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**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

[Adapted from Sarah Hernandez, “Learning Preferences”, TAPDP 2011]

So we now know what kind of study and note taking skills we can recommend to our students based on how they prefer to learn. On the other hand, we shall also think about what can we do when creating our lesson plans for teaching each learning style?

Now let’s work in groups to create inclusive lesson plan for different learning styles. Let’s count off by 4’s in each group worked for the same dimension previously. Now all 1’s over here, 2’s over here ....

Now we have groups with experts on all the four learning style categories.
You have about 10 minutes to come up with a lesson plan on the assigned topic that will incorporate all the four learning styles categories. Please write down your plan on the flipchart paper and post it on the wall when you finish.

[Give students a handout of the lesson plan assignment to write their responses on.]

Would any group like to share their lesson plan?
[Continue with sharing if time permits; otherwise proceed to the next part.]
Great plans! It is great to see that all of you are taking the learning styles into consideration
while designing your teaching plan.

**Lesson Plan Handout**

**Lesson Plan #1:** Develop a lesson plan in which you explain what you as a TA can offer your students throughout the course.

**Lesson Plan #2:** Develop a lesson plan in which you explain to new students how to use a software tool in a lab.

**Lesson Plan #3:** Develop a lesson plan in which you explain to new students how to approach an engineering design problem.

**Lesson Plan #4:** Develop a lesson plan in which you explain academic dishonesty to your students.

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<th>PART #6:</th>
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<tbody>
<tr>
<td>Number card activity for review of UCI Engineering student demographics</td>
<td></td>
<td></td>
<td>12min</td>
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</table>

**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

[Adapted from Sarah Hernandez, “Diversity”, TAPDP 2011]

In the last part of this workshop, we are going to discuss more generally about the diversity of the student population. We already know that our students learn in different ways and what can we do to help each of them. Now let us have a general picture of our students. We are going to have the review of the UCI student profile by playing a number card activity.

Each of you has a card with a number. I will read through the demographics questions and if you think the number on your card is the within 5 of the true value, hold it up.

Note that some of you have the same numbers on your cards, so sometimes more than one card will be held up and sometimes your card will not have a number that is close. The purpose is to compare what you guess to the actual statistic, so it is okay if it feel like you are just guessing. In this activity I want to demonstrate to you the difference between what you may have thought the students would be like and who the students actually are. I hope by having you make this comparison we can deconstruct any stereotypes we may have and see that we need to teach to a diverse population.

For instance, if I asked What percent of undergraduate engineering student should be treated with respect? You would hold up (100%)

**Note: Need to double-check the most recent numbers for engineering students**

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Just to boost our egos a little... what is the ranking of the Henry Samueli School of Engineering according to the US New and World Reports as of 2012?</td>
<td>39th</td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>What is the size of the undergraduate student body in engineering?</td>
<td>2,777</td>
</tr>
<tr>
<td>What percentage of the undergraduate engineering population at UCI is African American?</td>
<td>2%</td>
</tr>
<tr>
<td>What percentage of the undergraduate engineering population at UCI is Hispanic?</td>
<td>19%</td>
</tr>
<tr>
<td>What percentage of the undergraduate engineering population at UCI is Caucasian?</td>
<td>21%</td>
</tr>
<tr>
<td>What percentage of the undergraduate engineering population at UCI is Native American?</td>
<td>0.5%</td>
</tr>
<tr>
<td>What percentage of the undergraduate engineering population at UCI is Asian American?</td>
<td>50%</td>
</tr>
<tr>
<td>Follow-up: The Asian American population at UCI does make up the majority, but this group is itself very, very diverse. Asian American students can be Chinese, Thai, Vietnamese, Korean, etc. Each of these students has different cultural perspectives and values. We can’t really just lump them all into one category!</td>
<td></td>
</tr>
<tr>
<td>What is the average age of the UCI undergraduate population? Follow up: 5% of the population is over 25 years old</td>
<td>21</td>
</tr>
<tr>
<td>What percentage of the undergraduate population at UCI are (a) out of state? (b) international?</td>
<td>1% 6%</td>
</tr>
<tr>
<td>What percentage of the undergraduate engineering population at UCI are women?</td>
<td>24%</td>
</tr>
<tr>
<td>What percent of undergraduate students are on need-based financial aid?</td>
<td>57%</td>
</tr>
<tr>
<td>What is the average Math SAT score for incoming freshmen?</td>
<td>Between 560 and 680</td>
</tr>
<tr>
<td>What percentage of the incoming engineering class are transfer students?</td>
<td>22%</td>
</tr>
<tr>
<td>Currently 198 transfers, 721 freshmen.</td>
<td></td>
</tr>
<tr>
<td>What percent of undergraduate engineering student should be treated with respect, cultural sensitivity, care, and concern? (it’s a little cheesy, but brings me to the next points)</td>
<td>100%</td>
</tr>
</tbody>
</table>

Facts taken from:
http://colleges.usnews.rankingsandreviews.com/best-colleges/rankings/engineering-doctorate/spp+50
http://www.admissions.uci.edu/campus_life/glimpse_anteaters.html
http://today.uci.edu/facts/engineering.php
http://www.admissions.uci.edu/admissions/profile_admitted.html
Now we can see that the student population is diverse in a number of different ways: Race/ethnicity, immigrant status, class, sexuality, age, and gender. We also learned something about our engineering student population. I’d like to point out that diversity is very common thing that everyone is facing in higher education. And diversity is good to have in many ways, e.g. it enriches our educational experience, promotes personal growth, strengthens community connections, etc. As TAs, it is important for us to respect and appreciate the diversity of our students.

To conclude our workshop, now you should be able to identify your own learning styles, give advices to your students with different learning styles, design an inclusive lesson plan to accommodate different learning preferences, and have a general idea of the UCI student demographics.

The in classroom teaching strategy we implemented and practiced in this workshop is using small group work. It is a good way to engage students into discussion and share their solutions by using the flipchart paper with the rest of the class. This activity can be used in a more traditional lecture and discussion to encourage in-classroom participations.

Now, it’s time for lunch! See you back here at exactly 1pm!
Index of Learning Styles Questionnaire
(Felder-Silverman Model)

1. I understand something better after I
(a) try it out. (b) think it through.

2. I would rather be considered
(a) realistic. (b) innovative.

3. When I think about what I did yesterday, I am most likely to get
(a) a picture. (b) words.

4. I tend to
(a) understand details of a subject but may be fuzzy about its overall structure. 
(b) understand the overall structure but may be fuzzy about details.

5. When I am learning something new, it helps me to
(a) talk about it. (b) think about it.

6. If I were a teacher, I would rather teach a course
(a) that deals with facts and real life situations. 
(b) that deals with ideas and theories.

7. I prefer to get new information in
(a) pictures, diagrams, graphs, or maps. (b) written directions or verbal information.

8. Once I understand
(a) all the parts, I understand the whole thing. 
(b) the whole thing, I see how the parts fit.

9. In a study group working on difficult material, I am more likely to
(a) jump in and contribute ideas. (b) sit back and listen.

10. I find it easier
(a) to learn facts. (b) to learn concepts.

11. In a book with lots of pictures and charts, I am likely to
(a) look over the pictures and charts carefully. (b) focus on the written text.

12. When I solve math problems
(a) I usually work my way to the solutions one step at a time. 
(b) I often just see the solutions but then have to struggle to figure out the steps to get to them.

13. In classes I have taken
(a) I have usually gotten to know many of the students. 
(b) I have rarely gotten to know many of the students.

14. In reading nonfiction, I prefer
(a) something that teaches me new facts or tells me how to do something. 
(b) something that gives me new ideas to think about.

15. I like teachers
(a) who put a lot of diagrams on the board. 
(b) who spend a lot of time explaining.

16. When I'm analyzing a story or a novel
(a) I think of the incidents and try to put them together to figure out the themes.
(b) I just know what the themes are when I finish reading and then I have to go back and find the incidents that demonstrate them.

17. When I start a homework problem, I am more likely to
   (a) start working on the solution immediately.
   (b) try to fully understand the problem first.

18. I prefer the idea of (a) certainty. (b) theory.

19. I remember best (a) what I see. (b) what I hear.

20. It is more important to me that an instructor
   (a) lay out the material in clear sequential steps.
   (b) give me an overall picture and relate the material to other subjects.

21. I prefer to study (a) in a study group. (b) alone.

22. I am more likely to be considered
   (a) careful about the details of my work.
   (b) creative about how to do my work.

23. When I get directions to a new place, I prefer
   (a) a map. (b) written instructions.

24. I learn
   (a) at a fairly regular pace. If I study hard, I'll "get it."
   (b) in fits and starts. I'll be totally confused and then suddenly it all "clicks."

25. I would rather first
   (a) try things out. (b) think about how I'm going to do it.

26. When I am reading for enjoyment, I like writers to
   (a) clearly say what they mean. (b) say things in creative, interesting ways.

27. When I see a diagram or sketch in class, I am most likely to remember
   (a) the picture. (b) what the instructor said about it.

28. When considering a body of information, I am more likely to
   (a) focus on details and miss the big picture.
   (b) try to understand the big picture before getting into the details.

29. I more easily remember
   (a) something I have done.
   (b) something I have thought a lot about.

30. When I have to perform a task, I prefer to
   (a) master one way of doing it.
   (b) come up with new ways of doing it.

31. When someone is showing me data, I prefer
   (a) charts or graphs.
   (b) text summarizing the results.

32. When writing a paper, I am more likely to
   (a) work on (think about or write) the beginning of the paper and progress forward.
   (b) work on (think about or write) different parts of the paper and then order them.

33. When I have to work on a group project, I first want to
   (a) have "group brainstorming" where everyone contributes ideas.
(b) brainstorm individually and then come together as a group to compare ideas.

34. I consider it higher praise to call someone
   (a) sensible. (b) imaginative.

35. When I meet people at a party, I am more likely to remember
   (a) what they looked like. (b) what they said about themselves.

36. When I am learning a new subject, I prefer to
   (a) stay focused on that subject, learning as much about it as I can.
   (b) try to make connections between that subject and related subjects.

37. I am more likely to be considered (a) outgoing. (b) reserved.

38. I prefer courses that emphasize
   (a) concrete material (facts, data). (b) abstract material (concepts, theories).

39. For entertainment, I would rather
   (a) watch television. (b) read a book.

40. Some teachers start their lectures with an outline of what they will cover. Such outlines are
   (a) somewhat helpful to me. (b) very helpful to me.

41. The idea of doing homework in groups, with one grade for the entire group,
   (a) appeals to me. (b) does not appeal to me.

42. When I am doing long calculations,
   (a) I tend to repeat all my steps and check my work carefully.
   (b) I find checking my work tiresome and have to force myself to do it.

43. I tend to picture places I have been
   (a) easily and fairly accurately.
   (b) with difficulty and without much detail.

44. When solving problems in a group, I would be more likely to
   (a) think of the steps in the solution process.
   (b) think of possible consequences or applications of the solution in a wide range of areas.
## Index of Learning Styles Questionnaire Scoring Chart

Use the following scoring chart to find the Felder-Silverman category that each of your answers corresponds to. Circle the letters that correspond to your answer, e.g. If you answered a for question 3, circle active in the question 3 row.

<table>
<thead>
<tr>
<th>Question</th>
<th>a category</th>
<th>b category</th>
</tr>
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<tbody>
<tr>
<td>3</td>
<td>active</td>
<td>reflective</td>
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<table>
<thead>
<tr>
<th>Question</th>
<th>a category</th>
<th>b category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>active</td>
<td>reflective</td>
</tr>
<tr>
<td>2</td>
<td>sensing</td>
<td>intuitive</td>
</tr>
<tr>
<td>3</td>
<td>visual</td>
<td>verbal</td>
</tr>
<tr>
<td>4</td>
<td>sequential</td>
<td>global</td>
</tr>
<tr>
<td>5</td>
<td>active</td>
<td>reflective</td>
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<tr>
<td>6</td>
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<td>intuitive</td>
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<td>7</td>
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<td>sequential</td>
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<tr>
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<td>active</td>
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<td>sequential</td>
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<tr>
<td>44</td>
<td>sequential</td>
<td>global</td>
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</tbody>
</table>

### Calculating your scores

Count the number of each of the learning styles you have circled to get your score for each category.

- Total number of **actives** circled = ______
- Total number of **reflectives** circled = ______ (11 - #actives)
- Total number of **sensing**s circled = ______
- Total number of **intuitive**s circled = ______ (11 - #sensing)
- Total number of **visual**s circled = ______
- Total number of **verbal**s circled = ______ (11 - #visual)
- Total number of **sequential**s circled = ____
- Total number of **global**s circled = ______ (11 - #sequential)
How to help our students with different learning styles?

Here are some descriptions about active and reflective learners.

ACTIVE AND REFLECTIVE LEARNERS:

- Active learners tend to retain and understand information best by doing something active with it—discussing or applying it or explaining it to others. Reflective learners prefer to think about it quietly first.
- "Let's try it out and see how it works" is an active learner's phrase; "Let's think it through first" is the reflective learner's response.
- Active learners tend to like group work more than reflective learners, who prefer working alone.
- Sitting through lectures without getting to do anything physical but take notes is hard for both learning types, but particularly hard for active learners.

Please think about some advices you may give to these two different types of learners to improve in the following categories:

1. Take in information
2. Study
3. Perform well in tests and examinations
How to help our students with different learning styles?

Here are some descriptions about sensing and intuitive learners.

SENSING AND INTUITIVE LEARNERS

- Sensing learners tend to like learning facts, intuitive learners often prefer discovering possibilities and relationships.
- Sensors often like solving problems by well-established methods and dislike complications and surprises; intuitors like innovation and dislike repetition. Sensors are more likely than intuitors to resent being tested on material that has not been explicitly covered in class.
- Sensors tend to be patient with details and good at memorizing facts and doing hands-on (laboratory) work; intuitors may be better at grasping new concepts and are often more comfortable than sensors with abstractions and mathematical formulations.
- Sensors tend to be more practical and careful than intuitors; intuitors tend to work faster and to be more innovative than sensors.
- Sensors don't like courses that have no apparent connection to the real world; intuitors don't like "plug-and-chug" courses that involve a lot of memorization and routine calculations.

Please think about some advice you may give to these two different types of learners to improve in the following categories:

1. Take in information
2. Study
3. Perform well in tests and examinations
How to help our students with different learning styles?

Here are some descriptions about visual and verbal learners.

**VISUAL AND VERBAL LEARNERS**

Visual learners remember best what they see--pictures, diagrams, flow charts, time lines, films, and demonstrations. Verbal learners get more out of words--written and spoken explanations. Everyone learns more when information is presented both visually and verbally.

Please think about some advices you may give to these two different types of learners to improve in the following categories:

1. Take in information
2. Study
3. Perform well in tests and examinations
How to help our students with different learning styles?

Here are some descriptions about sequential and global learners.

SEQUENTIAL AND GLOBAL LEARNERS

- Sequential learners tend to gain understanding in linear steps, with each step following logically from the previous one. Global learners tend to learn in large jumps, absorbing material almost randomly without seeing connections, and then suddenly "getting it."

- Sequential learners tend to follow logical stepwise paths in finding solutions; global learners may be able to solve complex problems quickly or put things together in novel ways once they have grasped the big picture, but they may have difficulty explaining how they did it.

Please think about some advice you may give to these two different types of learners to improve in the following categories:

1. Take in information
2. Study
3. Perform well in tests and examinations
Lesson Plan Design

Please design a lesson plan that incorporates students with different learning styles, e.g. active/reflective, sensing/intuitive, visual/verbal, sequential/global.

**Lesson Plan #1:** Develop a lesson plan in which you explain what you as a TA can offer your students throughout the course.
Lesson Plan Design

Please design a lesson plan that incorporates students with different learning styles, e.g. active/reflective, sensing/intuitive, visual/verbal, sequential/global.

Lesson Plan #2: Develop a lesson plan in which you explain to new students how to use a software tool in a lab.
Lesson Plan Design

Please design a lesson plan that incorporates students with different learning styles, e.g. active/reflective, sensing/intuitive, visual/verbal, sequential/global.

**Lesson Plan #3:** Develop a lesson plan in which you explain to new students how to approach an engineering design problem.
Lesson Plan Design

Please design a lesson plan that incorporates students with different learning styles, e.g. active/reflective, sensing/intuitive, visual/verbal, sequential/global.

**Lesson Plan #4:** Develop a lesson plan in which you explain academic dishonesty to your students.
Learning Style Inventories

1. Witkin’s Field Independence
   http://www.personality-project.org/perproj/others/heineman/efi.htm

2. Kolb’s Learning Style Inventory
   http://www.nwlink.com/~donclark/hrd/styles/kolb.html

3. VARK Learning Style Inventory

4. The Myers-Briggs Type Indicator
   http://www.myersbriggs.org/my-mbti-personality-type/mbti-basics/

5. Felder-Silverman Learning Style Model
WORKSHOP05 “Active Learning”

**NAME:** Weiwei Chen

**DEPARTMENT(S) THAT THIS WORKSHOP IS AIMED AT:**
Henry Samueli School of Engineering

**TOPIC:**
Active Learning

**ABSTRACT:** If you were a new PF looking for a workshop on the above topic, what kind of a description of this workshop would help you to get a good sense of what this workshop entails?

This workshop will introduce the concept of active learning and teaching strategies for student-centered learning. The TAs will appreciate the effectiveness of active learning by jigsaw literature reading on peer reviewed research paper for engineering education. The TAs will actively participate in build a concept map to express their understanding on active learning.

(Adapted from Sarah Hernandez, “Active Learning”, TAPDP 2011)

**LEARNING OUTCOMES:** What should the TAs be able to do & know by the end of this workshop? Note that TAs wbat = TAs will be able to… (Suggestion: Try to have only 1-3 outcomes.)

| TAs wbat... | Articulate 2~3 active learning teaching strategies that they can use in the classroom |
| TAs wbat... | State the importance and effectiveness of active learning for teaching engineering courses in college |
| TAs wbat... | Connect ideas by using the concept map |

**STEPS TOWARD TAs ACHIEVING LEARNING OUTCOME # 1:** What will the TAs do to help them to achieve the learning outcome, above? (Suggestion: you can have as many steps along the way as you feel appropriate.)

| TAs will... | Watch two video clips for teaching without and with evolving students to learn actively in the classroom |
| TAs will... | Reflect their understand on active learning during a pause of the lecture |
| TAs will... | Identify some learning activities they have practiced in the previous workshops |

**STEPS TOWARD TAs ACHIEVING LEARNING OUTCOME # 2:** What will the TAs do to help them to achieve the learning outcome, above? (Suggestion: you can have as many steps along the way as you feel appropriate.)

| TAs will... | Read peer reviewed journal paper about active learning in engineering |
| TAs will... | List 2~3 take-away points from the research paper |
**STEPS TOWARD TAs ACHIEVING LEARNING OUTCOME # 3**: What will the TAs do to help them to achieve the learning outcome, above? (Suggestion: you can have as many steps along the way as you feel appropriate.)

<table>
<thead>
<tr>
<th>TAs will...</th>
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</thead>
<tbody>
<tr>
<td>Discuss about the take-away points of the paper they read</td>
</tr>
<tr>
<td>Have a jigsaw discussion on the four active learning articles</td>
</tr>
<tr>
<td>Draw a concept map to show the relationships of the articles they’ve read</td>
</tr>
</tbody>
</table>

**RESEARCH SUPPORTING THIS WORKSHOP**: What research has been done in this area? List two articles that (preferably) offer research-backed conclusions about best practices in this area. At least one of the articles should have some disciplinary commonality with your TA groups(s).

<table>
<thead>
<tr>
<th>Article One (w/ summary)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michael Prince, “Does active learning work? A review of the research”, Journal of Engineering Education, July 2004. This study examines the evidence for the effectiveness of active learning. It defines the common forms of active learning most relevant for engineering faculty and critically examines the core element of each method. It is found that there is broad but uneven support for the core elements of active, collaborative, cooperative and problem-based learning.</td>
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</table>

<table>
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<tr>
<th>Article Two (w/ summary)</th>
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</thead>
<tbody>
<tr>
<td>Kirsten B. Diederich, “The Evolutionary Conformation from Traditional Lecture to Active Learning in an Undergraduate Biology Course and Its Effects on Student Achievement”, Ph.D. Dissertation, North Dakota State University, 2010. Active learning provides the students with the opportunity to work cooperatively while developing the skills required for critical inquiry. A qualitative and quantitative study addressed the level of student learning and satisfaction in an introductory vertebrate biology class at a small liberal arts college. The evolutionary confirmations from Traditional Lecture to Problem-based Learning and ultimately the adoption of Case-based Learning as the method of choice are discussed from the view of both the faculty member and the students.</td>
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</table>

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<tr>
<th>Article Three (w/ summary)</th>
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<tbody>
<tr>
<td>Steven R. Hall, Ian Waitz, Doris R. Brodeur, Diane H. Soderholm, and Reem Nasr, “Adoption of active learning in a lecture-based engineering class”, ASEE/IEEE frontier in education conference, November 2002. The Department of Aeronautics and Astronautics at MIT expanded its repertoire of active learning strategies and assessment tools with the introduction of muddiest-point-in-the-lecture cards, electronic response systems, concept tests, peer coaching, course web pages, and web-based course evaluations. This paper focuses on the change process of integrating these active learning strategies into a traditional lecture-based multidisciplinary course, called Unified Engineering. The description of the evolution of active learning in Unified Engineering is intended to</td>
</tr>
</tbody>
</table>
underscore the motivation and incentives required for bringing about the change, and the support needed for sustaining and disseminating active learning approaches among the instructors.

**Article Four (w/ summary)**


**Article Five (w/ summary)**

Robert Leamnson, “Learning as biological brain change”, Change: The Magazine of Higher Learning, March 2010. This article presented the biological perspective on learning as an active exercise. The article makes some reference to active learning being in accordance with the way we learn, biologically.

<table>
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<th>SUPPLIES NEEDED:</th>
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<tr>
<td><strong>QUANTITY:</strong></td>
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<td>#Groups</td>
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<td>#TAs/4 + 1 for each article</td>
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<td>#Groups + 2</td>
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<td>#TAs +2</td>
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<td>#TAs +2</td>
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</table>

**ROOM CONFIGURATION:** (Describe/show how the room will be set up. The set up below is just a sample to be moved as you like.)

The room will be set up in ‘pods’ so that each group will sit together.

Jigsaw Pre-rotation:
Jigsaw Post-rotation (seats might have to move to accommodate group size):

<table>
<thead>
<tr>
<th>PREPARATION: (What needs to be done by you in advance?)</th>
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</thead>
<tbody>
<tr>
<td>1. PowerPoint Slides</td>
</tr>
<tr>
<td>2. Seating assignments</td>
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<tr>
<td>3. Print the literature for reading</td>
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<td>4. Add animations to the PowerPoint Slides</td>
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WORKSHOP SCHEDULE: Indicate when each portion of the workshop will begin and end.

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<thead>
<tr>
<th></th>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
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<tbody>
<tr>
<td>1. Introduction to active learning</td>
<td></td>
<td></td>
<td>15min</td>
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<tr>
<td>2. Active learning literature reading</td>
<td></td>
<td></td>
<td>12min</td>
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<tr>
<td>3. Jigsaw literature discussion</td>
<td></td>
<td></td>
<td>18min</td>
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</table>

**TOTAL TIME FOR WORKSHOP:** 45 min

**WORKSHOP SEGMENTS:** (Break down each part of the workshop:)

<table>
<thead>
<tr>
<th>PART #1:</th>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
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</thead>
<tbody>
<tr>
<td>Introduction to active learning</td>
<td></td>
<td></td>
<td>15min</td>
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</table>

**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

Welcome back from lunch! Thank you all for being on time!

In this workshop, we are going to talk about active learning, what is active learning, why is it important, and what we can do to incorporate active learning into our teaching.

Before we start, I’d like to show you two video clips about two teachers who teach differently in their classroom.

The first video clip is from the *1985 movie Ferris Bueller’s Day off with Ben Stein* ([http://www.youtube.com/watch?v=uhiCFdWeQfA](http://www.youtube.com/watch?v=uhiCFdWeQfA))

What did those student look like in this class? *(bored, tired, clueless)* Were they engaged in the classroom? *(No)* Did the teacher try to engage them in the classroom? *(No)*

Now let’s take a look at the second video clip from the *1989 movie Dead Poets Society with Robin Williams.* ([http://www.youtube.com/watch?v=U91Wt2YpkD8](http://www.youtube.com/watch?v=U91Wt2YpkD8))

In this video, did the teacher get the students engaged in his classroom? *(Yes)* What did he do to engage the students? *(Let them stand on the podium to experience the different view so as to write a poem later, or more generally, let the student do something and then think about it)*

For these two teachers, I personally really prefer the second one since the way he taught is very active and engaging. I believe it is a very efficient way for teaching and learning. Just as a saying captures the potential power of get the students evolved in the class. That is “Tell me and I’ll forget. Show me and I may not remember. Involve me and I’ll understand”.

Now let us see what is active learning.

“Learning which engages students with the concepts and material presented in the course.”

“Active learning is students doing, and then thinking about what they’re doing.”
And the benefits for active learning are:

- Addresses attention span
- Improves retention of underrepresented groups
- Accelerates acquisition of higher order thinking skills
- Improves attitudes
- Leads to higher performance

This answers our question why active learning is important.

Then let’s see what we can do to facilitate active learning. There are many different and effective strategies for active learning. Here is a handout for the active learning strategy continuum.

[Pass the “Active Learning Strategy Continuum” handout, adapted from C. O’Neal lecture handout (April 11th, 2011)]

From the handout, we can do very complex learning activities like inquiry learning or simulation which may take long time and need substantial preparations. But we also have some simple strategies that we can use even in a big class and those strategies will only take 2~3 minutes. For example, “Pause for reflection”.

- A “Pause for reflection” involves pauses throughout a lecture, particularly after stating an important point or key idea, then allow students some time to think about the information, and ask if anyone needs clarification after the waiting.

In fact, let’s try out “pause for reflection” right now. Please write down on the back of the handout about your understanding on active learning and reflect on this concept.

If you feel compelled to incorporate active learning into your teaching, please write down why you think it helps your teaching; Otherwise, write down your concerns about why you do think it won’t work. I’ll give you 2 minutes for writing and reflection.

Okay, anyone think active learning is good to have? Anyone has concerns about active learning?

[Briefly discuss the TAs’ apprehensions of active learning]

Very good. We just practiced “Pause for reflection” strategy together and I hope you have better understanding on active learning.

Beside “Pause for reflection”, we also have many other strategies we can try, and in fact we have already practiced some in our previous workshops. For example:

- **“Minute paper”**: a writing activity that you state the topic to review or question to address and let the students write down their answers on the paper. It is could be like “pause and reflection” which includes writing and reflection. It could also take the form of having your students solve an equation in the way that you just demonstrated, for example.

- **“Think-pair-share”**: have students work individually on a problem or reflect on a passage. Students then compare their responses with a partner and synthesize a joint solution to share
with the entire class.

- **“Fishbowl activity”**: have each of the student come up with an idea and then shared it anonymously as a group, this could be a good way to go over review questions. Just like what we did in the “Welcome and Buy-in” workshop to share our concerns about the schedule of TAPDP.

- **“Small group brainstorm / discussion”**: ask students to collaborate for group projects or learning cooperatively.

- **“Muddiest point”**: a monitoring technique in which students are asked to take a few minutes to jot down what the most difficult or confusing part of a lesson was for them. It gives the teacher a quick picture of misconceptions and confusion that still exists in the student’s mind.

- **“Class discussion”**: can take the form of a Jigsaw discussion, which we will demonstrate in a moment. Learners should be prepared to discuss materials in class and this would be a good follow up activity given the unit has been sufficiently covered already.

<table>
<thead>
<tr>
<th>PART#2:</th>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
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</thead>
<tbody>
<tr>
<td>Active learning literature reading</td>
<td></td>
<td></td>
<td>12min</td>
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</table>

**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

We have discussed about what active learning is, why it is important, and some strategies you can use while you are teaching. However, it was pretty much me standing here trying very hard to preach the idea to you. We are all engineers and scientists and we value research results reported in peer reviewed journal articles. So now, I would like to show you the research support of our topic for this workshop.

In the next 12 minutes or so, I will ask each of you read one journal article about active learning in engineering. Please take some notes while you are reading and prepare to share what you have learned from the article in your group.

[Give notice of 5 minutes and 1 minute]


  **Summary:** *This paper examines the evidence for the effectiveness of active learning. It defines the common forms of active learning most relevant for engineering faculty and critically examines the core element of each method. It is found that there is broad but uneven support for the core elements of active, collaborative, cooperative and problem-based learning.*

  **TA take-away points:**
  - Active learning is an instructional method that engages students in the learning process.
  - There are three different types of active learning that are frequently discussed in engineering literature: collaborative learning, cooperative learning, and problem-based
– Considerable support exists for the core element of active learning, i.e. student activity and engagement in the learning process.
– Collaboration “works” for promoting a broad range of student learning outcomes, e.g. academic achievement, student attitudes, and student retention.
– Cooperation is more effective than competition for promoting a range of positive learning outcomes and enhances interpersonal skills.
– Problem-based learning develops more positive student attitudes and enhanced problem-solving and life-long learning skills.
– Active learning is not a cure for all educational problems. Different approaches may address different problems but not always promise the same improvements.


  Summary: This paper discusses the faculty and student attitudes about active learning and types of active learning methods (both successful and less than successful). The study took place at MIT in a yearlong multi-disciplinary engineering course.

  TA take-away points:
  – Changing how we teach is more difficult than changing what we teach
  – Building a teaching community brings peer pressure and peer support which becomes effective incubator of change
  – Addresses the reasons for not implementing active learning: coverage problem, increased preparation time, large classes, limited resources, risk of disapproval but states that active learning some arguments aren’t well-founded and some are out-weighted by the benefits in student learning.
  – Examples of student evaluations show positive experience
  – Faculty perspectives show willingness to continue with newly implemented techniques
  – Understand learning and adopting best practices can be very beneficial


  Summary: The study compares the long term effects of active learning. The same professor taught two courses on the same subject, one using passive lecture, and the other using active methods. Results show that active learning improved the long term learning of average and below average students.

  TA take-away points:
  – Active learning can encourage deeper learning which enhances long-term memory
  – Cooperative learning helps to engage students into the learning process, especially for those who are shy, more passive, or less confident.
  – Active learning class was more labor intensive to prepare
  – Active learning class is enjoyable but may not get high rates since students may fell hurried about the course material
  – Active learning helps the mediocre students the most.


  Summary: This article presented the biological perspective on learning as an active exercise. The article makes some reference to active learning being in accordance with the way we learn,
biologically.

**TA take-away points:**
- The things we remember are “reconstructed” in the brain during the process of remembering
- It is important to understand learning in biological perspective
- Learning is a matter of using pre-existing synapses to make them stable and hard-wired
- Learning is an active process
- Learning is aided with an emotional response to the material; fear is useful, but enthusiasm is better
- Learning occurs when synapses are built and maintained-so practice with course material is important
- Active learning methods are a useful pedagogy that aligns greatly with how the brain functions. Teaching and teacher enthusiasm is important too.

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<tr>
<th>PART #3:</th>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
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</thead>
<tbody>
<tr>
<td>Jigsaw literature discussion</td>
<td></td>
<td></td>
<td>18min</td>
</tr>
</tbody>
</table>

**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

Now let us discuss about what we have just read about active learning. We will practice the jigsaw discussion activity for this part. I will first give you about 5 minutes to discuss in your group about the important points in the article that you’ve read. In this part, all of your group members should just read the same article. You can compare your notes and find three most important points of the article that you all agree with.

Then I will swap you into different groups in which each of you read a different article. Since you are the expert of your article, you need to teach your group members about you study.

Now let us have the same article group discussion first. Please compare your notes and write down three important points on the handouts.

[Hand out the “Active Learning Literature Important Point” (Handout adapted from C. O’Neal 4/4/2011 “Day 2-Creating Environments for Learning, Step One.”)

Give notice of two minutes]

Okay, now let us regroup. Please count off in each group. Group 1: 1, 2, 3, …; Group 2: 1, 2, 3 …; Group 3: 1, 2, 3, …; Group 4: 1, 2, 3, … Please form a group if you have the same numbers. “Number 1”s, please come to table 1; “Number 2s”, table 2; …

Now let’s do the second part of the jigsaw discussion. Please tell your group member about the three important points of your article. I will give each group a flipchart paper. You need to draw a concept map for the four articles as a group.

A **concept map** is a diagram showing the relationships among concepts. It is a graphical tool for organizing and representing knowledge. For example, we have TAs, TAPDP and
Now, please go for discussion. You will have 9 minutes. [Give 2 minutes notice]

Any group would like to share their concept map? [Allow TA groups to show off their concept map to the whole class]

Excellent work!

Now we come to the end of this workshop. In this workshop, you have learned what is active learning, why it is important and how to facilitate active learning in our teaching. I think now each of you can articulate 2~3 active learning teaching strategies that you can use in the classroom; from the literature reading, you can now state the importance and effectiveness of active learning in engineering.

And there are three take-home active learning strategies that we just practiced in this workshop:

1. Pause and reflection: takes very short amount of time and good for lecture-based class
2. Jigsaw discussion: let students teach each other; make everyone responsible for one part so that everyone need to study; saves time for the instructor to talk in the class
3. Concept map: a nice and easy tool for finding out the connections between different concepts.

We also have a comprehensive handout for active learning techniques that you can use in your class here. I would strongly recommend you to take a look at it if you are also considering to incorporate active learning into your class.

Notes:

I cut the art project from this workshop although I think it is very cool and fun to have in TAPDP. The reasons I dropped it are:

1. Mostly timing issue. It will probably take at least 25 minutes to do the art project which will make this workshop 70+ minutes long. It is hard to fit into my TA schedule without cutting the energizers.
2. The engineering TAs probably will not need to design art projects for their future teaching. We might as well not waste their time for something they will probably not use.
3. From last year's feedback, some TAs complained about being treated like kids for the art project assignment.
4. It relieves my pressure of planning all the art project supplies and taking care of cleaning them after the workshop.

Sarah and I discussed about the jigsaw discussion. We plan to introduce concept map into the jigsaw discussion as the result of the group work. Concept map could be very useful for students in engineering to make connections of different concepts. This is something the TAs
can use to help their students in the future.

Now the workshop will take about 45 minutes. We can have a long energizer to ask the engineering TAs to build something interesting (e.g. marshmallow & spaghetti construction). Engineering grad students should love building things. It will refresh our mind and mood by doing something we enjoy in a long day of learning.
Active Learning Strategies Continuum
[from C. O'Neal lecture handout (April 11th, 2011)]
• **“Minute paper”:** a writing activity that you state the topic to review or question to address and let the students write down their answers on the paper. It is could be like “pause and reflection” which includes writing and reflection. It could also take the form of having your students solve an equation in the way that you just demonstrated, for example.

• **“Think-pair-share”:** have students work individually on a problem or reflect on a passage. Students then compare their responses with a partner and synthesize a joint solution to share with the entire class.

• **“Fishbowl activity”:** have each of the student come up with an idea and then shared it anonymously as a group, this could be a good way to go over review questions. Just like what we did in the “Welcome and Buy-in” workshop to share our concerns about the schedule of TAPDP.

• **“Small group brainstorm / discussion”:** ask students to collaborate for group projects or learning cooperatively.

• **“Muddiest point”:** a monitoring technique in which students are asked to take a few minutes to jot down what the most difficult or confusing part of a lesson was for them. It gives the teacher a quick picture of misconceptions and confusion that still exists in the student’s mind.

• **“Class discussion”:** can take the form of a Jigsaw discussion, which we will demonstrate in a moment. Learners should be prepared to discuss materials in class and this would be a good follow up activity given the unit has been sufficiently covered already.
TECHNIQUES OF ACTIVE LEARNING

Donald Paulson and Jennifer Faust, California State University, Los Angeles

URL: http://www.calstatela.edu/dept/chem/chem2/Active/

Exercises for Individual Students

Because these techniques are aimed at individual students, they can very easily be used without interrupting the flow of the class. These exercises are particularly useful in providing the instructor with feedback concerning student understanding and retention of material. Some (numbers 3 and 4, in particular) are especially designed to encourage students’ exploration of their own attitudes and values. Many (especially numbers 4 - 6) are designed to increase retention of material presented in lectures and texts.

The "One Minute Paper" - This is a highly effective technique for checking student progress, both in understanding the material and in reacting to course material. Ask students to take out a blank sheet of paper, pose a question (either specific or open-ended), and give them one (or perhaps two - but not many more) minute(s) to respond. Some sample questions include: "How does John Hospers define "free will"?", "What is "scientific realism"?", "What is the activation energy for a chemical reaction?", "What is the difference between replication and transcription?", and so on. Another good use of the minute paper is to ask questions like "What was the main point of today's class material?" This tells you whether or not the students are viewing the material in the way you envisioned.

Muddiest (or Clearest) Point - This is a variation on the one-minute paper, though you may wish to give students a slightly longer time period to answer the question. Here you ask (at the end of a class period, or at a natural break in the presentation), "What was the "muddiest point" in today's lecture?" or, perhaps, you might be more specific, asking, for example: "What (if anything) do you find unclear about the concept of 'personal identity' ('inertia', 'natural selection', etc.)?".

Affective Response - Again, this is similar to the above exercises, but here you are asking students to report their reactions to some facet of the course material - i.e., to provide an emotional or valuative response to the material. Obviously, this approach is limited to those subject areas in which such questions are appropriate (one should not, for instance, inquire into students’ affective responses to vertebrate taxonomy). However, it can be quite a useful starting point for courses such as applied ethics, particularly as a precursor to theoretical analysis. For example, you might ask students what they think of Dr. Jack Kevorkian's activities, before presenting what various moral theorists would make of them. By having several views "on the table" before theory is presented, you can help students to see the material in context and to explore their own beliefs. It is also a good way to begin a
discussion of evolutionary theory or any other scientific area where the general public often has views contrary to current scientific thinking, such as paper vs. plastic packaging or nuclear power generation.

**Daily Journal** - This combines the advantages of the above three techniques, and allows for more in-depth discussion of or reaction to course material. You may set aside class time for students to complete their journal entries, or assign this as homework. The only disadvantage to this approach is that the feedback will not be as "instant" as with the one-minute paper (and other assignments which you collect the day of the relevant lecture). But with this approach (particularly if entries are assigned for homework), you may ask more complex questions, such as, "Do you think that determinism is correct, or that humans have free will? Explain your answer.", or "Do you think that Dr. Kevorkian's actions are morally right? What would John Stuart Mill say?" and so on. Or you might have students find and discuss reports of scientific studies in popular media on topics relevant to course material, such as global warming, the ozone layer, and so forth.

**Reading Quiz** - Clearly, this is one way to coerce students to read assigned material! Active learning depends upon students coming to class prepared. The reading quiz can also be used as an effective measure of student comprehension of the readings (so that you may gauge their level of sophistication as readers). Further, by asking the same sorts of questions on several reading quizzes, you will give students guidance as to what to look for when reading assigned text. If you ask questions like "What color were Esmerelda's eyes?" (as my high school literature teacher liked to do), you are telling the student that it is the details that count, whereas questions like "What reason did Esmerelda give, for murdering Sebastian?" highlight issues of justification. If your goal is to instruct (and not merely to coerce), carefully choose questions which will both identify who has read the material (for your sake) and identify what is important in the reading (for their sake).

**Clarification Pauses** - This is a simple technique aimed at fostering "active listening". Throughout a lecture, particularly after stating an important point or defining a key concept, stop, let it sink in, and then (after waiting a bit!) ask if anyone needs to have it clarified. You can also circulate around the room during these pauses to look at student notes, answer questions, etc. Students who would never ask a question in front of the whole class will ask questions during a clarification pause as you move about the room.

**Response to a demonstration or other teacher centered activity** - The students are asked to write a paragraph that begins with: I was surprised that ... I learned that ... I wonder about ... This allows the students to reflect on what they actually got out of the teachers' presentation. It also helps students realize that the activity was designed for more than just entertainment.
Questions and Answers

While most of us use questions as a way of prodding students and instantly testing comprehension, there are simple ways of tweaking our questioning techniques which increase student involvement and comprehension. Though some of the techniques listed here are "obvious", we will proceed on the principle that the obvious sometimes bears repeating (a useful pedagogical principle, to be sure!). **The "Socratic Method"**

Taking its namesake from the most famous gadfly in history, this technique in its original format involved instructors "testing" student knowledge (of reading assignments, lectures, or perhaps applications of course material to a wider context) by asking questions during the course of a lecture. Typically, the instructor chooses a particular student, presents her with a question, and expects an answer forthwith; if the "chosen" student cannot answer the question presented, the instructor chooses another (and another) until the desired answer is received. This method has come under criticism, based on claims that it singles out students (potentially embarrassing them), and/or that it favors only a small segment of the class (i.e., that small percentage of the class who can answer any question thrown at them). In addition, once a student has answered a question they may not pay much attention as it will be a long time before the teacher returns to them for a second question. In spite of these criticisms, we feel that the Socratic method is an important and useful one; the following techniques suggest variations which enhance this method, avoiding some of these pitfalls.

**Wait Time**

Rather than choosing the student who will answer the question presented, this variation has the instructor **WAITING** before calling on someone to answer it. The wait time will generally be short (15 seconds or so) - but it may seem interminable in the classroom. It is important to insist that no one raise his hand (or shout out the answer) before you give the OK, in order to discourage the typical scenario in which the five students in the front row all immediately volunteer to answer the question, and everyone else sighs in relief. Waiting forces every student to think about the question, rather than passively relying on those students who are fastest out of the gate to answer every question. When the wait time is up, the instructor asks for volunteers or randomly picks a student to answer the question. Once students are in the habit of waiting after questions are asked, more will get involved in the process.

**Student Summary of Another Student's Answer**

In order to promote active listening, after one student has volunteered an answer to your question, ask another student to summarize the first student's response. Many students hear little of what their classmates have to say, waiting instead for the instructor to either correct or repeat the answer. Having students summarize or repeat each others' contributions to the course both fosters active participation by all students and promotes the idea that learning is a shared enterprise. Given the possibility of being asked to repeat a classmates' comments, most students will listen more attentively to each other.

**The Fish Bowl**

Students are given index cards, and asked to write down one question concerning the course material. They should be directed to ask a question of clarification
regarding some aspect of the material which they do not fully understand; or, perhaps you may allow questions concerning the application of course material to practical contexts. At the end of the class period (or, at the beginning of the next class meeting if the question is assigned for homework), students deposit their questions in a fish bowl. The instructor then draws several questions out of the bowl and answers them for the class or asks the class to answer them. This technique can be combined with others (e.g., #8-9 above, and #2).

**Quiz/Test Questions** - Here students are asked to become actively involved in creating quizzes and tests by constructing some (or all) of the questions for the exams. This exercise may be assigned for homework and itself evaluated (perhaps for extra credit points). In asking students to think up exam questions, we encourage them to think more deeply about the course material and to explore major themes, comparison of views presented, applications, and other higher-order thinking skills. Once suggested questions are collected, the instructor may use them as the basis of review sessions, and/or to model the most effective questions. Further, you may ask students to discuss the merits of a sample of questions submitted; in discussing questions, they will significantly increase their engagement of the material to supply answers. Students might be asked to discuss several aspects of two different questions on the same material including degree of difficulty, effectiveness in assessing their learning, proper scope of questions, and so forth.
Immediate Feedback

These techniques are designed to give the instructor some indication of student understanding of the material presented during the lecture itself. These activities provide formative assessment rather than summative assessment of student understanding. Formative assessment is evaluation of the class as a whole in order to provide information for the benefit of the students and the instructor, but the information is not used as part of the course grade; summative assessment is any evaluation of student performance which becomes part of the course grade. For each feedback method, the instructor stops at appropriate points to give quick tests of the material; in this way, she can adjust the lecture mid-course, slowing down to spend more time on the concepts students are having difficulty with or moving more quickly to applications of concepts of which students have a good understanding.

Finger Signals - This method provides instructors with a means of testing student comprehension without the waiting period or the grading time required for written quizzes. Students are asked questions and instructed to signal their answers by holding up the appropriate number of fingers immediately in front of their torsos (this makes it impossible for students to "copy", thus committing them to answer each question on their own). For example, the instructor might say "one finger for 'yes', two for 'no'" and then ask questions such as "Do all organic compounds contain carbon [hydrogen, etc.]?". Or, the instructor might have multiple choice questions prepared for the overhead projector and have the answers numbered (1) through (5), asking students to answer with finger signals. In very large classes the students can use a set of large cardboard signs with numbers written on them. This method allows instructors to assess student knowledge literally at a glance.

Flash Cards - A variation of the Finger Signals approach, this method tests students’ comprehension through their response to flash cards held by the instructor. This is particularly useful in disciplines which utilize models or other visual stimuli, such as chemistry, physics or biology. For example, the instructor might flash the diagram of a chemical compound and ask "Does this compound react with H$_2$O?". This can be combined with finger signals.

Quotations - This is a particularly useful method of testing student understanding when they are learning to read texts and identify an author’s viewpoint and arguments. After students have read a representative advocate of each of several opposing theories or schools of thought, and the relevant concepts have been defined and discussed in class, put on the overhead projector a quotation by an author whom they have not read in the assigned materials, and ask them to figure out what position that person advocates. In addition to testing comprehension of the material presented in lecture, this exercise develops critical thinking and analysis skills. This would be very useful, for example, in discussing the various aspects of evolutionary theory.
Critical Thinking Motivators

Sometimes it is helpful to get students involved in discussion of or thinking about course material either before any theory is presented in lecture or after several conflicting theories have been presented. The idea in the first case is to generate data or questions prior to mapping out the theoretical landscape; in the second case, the students learn to assess the relative merits of several approaches.

The Pre-Theoretic Intuitions Quiz - Students often dutifully record everything the instructor says during a lecture and then ask at the end of the day or the course "what use is any of this?", or "what good will philosophy [organic chemistry, etc.] do for us?". To avoid such questions, and to get students interested in a topic before lectures begin, an instructor can give a quiz aimed at getting students to both identify and to assess their own views. An example of this is a long "True or False" questionnaire designed to start students thinking about moral theory (to be administered on the first or second day of an introductory ethics course), which includes statements such as "There are really no correct answers to moral questions" and "Whatever a society holds to be morally right is in fact morally right". After students have responded to the questions individually, have them compare answers in pairs or small groups and discuss the ones on which they disagree. This technique may also be used to assess student knowledge of the subject matter in a pre-/post-lecture comparison. The well-known "Force Concept Inventory" developed by Hestenes to measure understanding of force and motion is another good example of this.

Puzzles/Paradoxes - One of the most useful means of ferreting out students' intuitions on a given topic is to present them with a paradox or a puzzle involving the concept(s) at issue, and to have them struggle towards a solution. By forcing the students to "work it out" without some authority's solution, you increase the likelihood that they will be able to critically assess theories when they are presented later. For example, students in a course on theories of truth might be asked to assess the infamous "Liar Paradox" (with instances such as 'This sentence is false'), and to suggest ways in which such paradoxes can be avoided. Introductory logic students might be presented with complex logic puzzles as a way of motivating truth tables, and so forth. In scientific fields you can present experimental data which seems to contradict parts of the theory just presented or use examples which seem to have features which support two opposing theories.
Share/Pair

Grouping students in pairs allows many of the advantages of group work students have the opportunity to state their own views, to hear from others, to hone their argumentative skills, and so forth without the administrative "costs" of group work (time spent assigning people to groups, class time used just for "getting in groups", and so on). Further, pairs make it virtually impossible for students to avoid participating thus making each person accountable.

**Discussion** - Students are asked to pair off and to respond to a question either in turn or as a pair. This can easily be combined with other techniques such as those under "Questions and Answers" or "Critical Thinking Motivators" above. For example, after students have responded to statements, such as "Whatever a society holds to be morally right is in fact morally right" with 'true' or 'false', they can be asked to compare answers to a limited number of questions and to discuss the statements on which they differed. In science classes students can be asked to explain some experimental data that supports a theory just discussed by the lecturer. Generally, this works best when students are given explicit directions, such as "Tell each other why you chose the answer you did".

**Note Comparison/Sharing** - One reason that some students perform poorly in classes is that they often do not have good note-taking skills. That is, while they might listen attentively, students do not always know what to write down, or they may have gaps in their notes which will leave them bewildered when they go back to the notes to study or to write a paper. One way to avoid some of these pitfalls and to have students model good note-taking is to have them occasionally compare notes. The instructor might stop lecturing immediately after covering a crucial concept and have students read each other's notes, filling in the gaps in their own note-taking. This is especially useful in introductory courses or in courses designed for non-majors or special admissions students. Once students see the value of supplementing their own note-taking with others', they are likely to continue the practice outside of class time.

**Evaluation of Another Student's Work** - Students are asked to complete an individual homework assignment or short paper. On the day the assignment is due, students submit one copy to the instructor to be graded and one copy to their partner. These may be assigned that day, or students may be assigned partners to work with throughout the term. Each student then takes their partner's work and depending on the nature of the assignment gives critical feedback, standardizes or assesses the arguments, corrects mistakes in problem-solving or grammar, and so forth. This is a particularly effective way to improve student writing.
Cooperative Learning Exercises

For more complex projects, where many heads are better than one or two, you may want to have students work in groups of three or more. As the term "cooperative learning" suggests, students working in groups will help each other to learn. Generally, it is better to form heterogeneous groups (with regard to gender, ethnicity, and academic performance), particularly when the groups will be working together over time or on complex projects; however, some of these techniques work well with spontaneously formed groups. Cooperative groups encourage discussion of problem solving techniques ("Should we try this?", etc.), and avoid the embarrassment of students who have not yet mastered all of the skills required.

Cooperative Groups in Class - Pose a question to be worked on in each cooperative group and then circulate around the room answering questions, asking further questions, keeping the groups on task, and so forth. After an appropriate time for group discussion, students are asked to share their discussion points with the rest of the class. (The ensuing discussion can be guided according to the "Questions and Answers" techniques outlined above.)

Active Review Sessions - In the traditional class review session the students ask questions and the instructor answers them. Students spend their time copying down answers rather than thinking about the material. In an active review session the instructor poses questions and the students work on them in groups. Then students are asked to show their solutions to the whole group and discuss any differences among solutions proposed.

Work at the Blackboard - In many problem solving courses (e.g., logic or critical thinking), instructors tend to review homework or teach problem solving techniques by solving the problems themselves. Because students learn more by doing, rather than watching, this is probably not the optimal scenario. Rather than illustrating problem solving, have students work out the problems themselves, by asking them to go to the blackboard in small groups to solve problems. If there is insufficient blackboard space, students can still work out problems as a group, using paper and pencil or computers if appropriate software is available.

Concept Mapping - A concept map is a way of illustrating the connections that exist between terms or concepts covered in course material; students construct concept maps by connecting individual terms by lines which indicate the relationship between each set of connected terms. Most of the terms in a concept map have multiple connections. Developing a concept map requires the students to identify and organize information and to establish meaningful relationships between the pieces of information.

Visual Lists - Here students are asked to make a list--on paper or on the blackboard; by working in groups, students typically can generate more comprehensive lists than they might if working alone. This method is particularly effective when students are asked to
compare views or to list pros and cons of a position. One technique which works well with such comparisons is to have students draw a "T" and to label the left- and right-hand sides of the cross bar with the opposing positions (or 'Pro' and 'Con'). They then list everything they can think of which supports these positions on the relevant side of the vertical line. Once they have generated as thorough a list as they can, ask them to analyze the lists with questions appropriate to the exercise. For example, when discussing Utilitarianism (a theory which claims that an action is morally right whenever it results in more benefits than harms) students can use the "T" method to list all of the (potential) benefits and harms of an action, and then discuss which side is more heavily "weighted". Often having the list before them helps to determine the ultimate utility of the action, and the requirement to fill in the "T" generally results in a more thorough accounting of the consequences of the action in question. In science classes this would work well with such topics as massive vaccination programs, nuclear power, eliminating chlorofluorocarbons, reducing carbon dioxide emissions, and so forth.

**Jigsaw Group Projects** - In jigsaw projects, each member of a group is asked to complete some discrete part of an assignment; when every member has completed his assigned task, the pieces can be joined together to form a finished project. For example, students in a course in African geography might be grouped and each assigned a country; individual students in the group could then be assigned to research the economy, political structure, ethnic makeup, terrain and climate, or folklore of the assigned country. When each student has completed his research, the group then reforms to complete a comprehensive report. In a chemistry course each student group could research a different form of power generation (nuclear, fossil fuel, hydroelectric, etc.). Then the groups are reformed so that each group has an expert in one form of power generation. They then tackle the difficult problem of how much emphasis should be placed on each method.

**Role Playing** - Here students are asked to "act out" a part. In doing so, they get a better idea of the concepts and theories being discussed. Role-playing exercises can range from the simple (e.g., "What would you do if a Nazi came to your door, and you were hiding a Jewish family in the attic?") to the complex. Complex role playing might take the form of a play (depending on time and resources); for example, students studying ancient philosophy might be asked to recreate the trial of Socrates. Using various sources (e.g., Plato's dialogues, Stone's *The Trial of Socrates*, and Aristophanes' *The Clouds*), student teams can prepare the prosecution and defense of Socrates on the charges of corruption of youth and treason; each team may present witnesses (limited to characters which appear in the Dialogues, for instance) to construct their case, and prepare questions for cross-examination.

**Panel Discussions** - Panel discussions are especially useful when students are asked to give class presentations or reports as a way of including the entire class in the presentation. Student groups are assigned a topic to research and asked to prepare presentations (note that this may readily be combined with the jigsaw method outlined above). Each panelist is then expected to make a very short presentation, before the floor is opened to questions from "the audience". The key to success is to choose topics carefully and to give students sufficient direction to ensure that they are well-prepared for their presentations. You might
also want to prepare the "audience", by assigning them various roles. For example, if students are presenting the results of their research into several forms of energy, you might have some of the other students role play as concerned environmentalists, transportation officials, commuters, and so forth.

**Debates** - Actually a variation of #27, formal debates provide an efficient structure for class presentations when the subject matter easily divides into opposing views or 'Pro'/"Con’ considerations. Students are assigned to debate teams, given a position to defend, and then asked to present arguments in support of their position on the presentation day. The opposing team should be given an opportunity to rebut the argument(s) and, time permitting, the original presenters asked to respond to the rebuttal. This format is particularly useful in developing argumentation skills (in addition to teaching content).

**Games** - Many will scoff at the idea that one would literally play games in a university setting, but occasionally there is no better instructional tool. In particular, there are some concepts or theories which are more easily illustrated than discussed and in these cases, a well-conceived game may convey the idea more readily. For example, when students are introduced to the concepts of "laws of nature" and "the scientific method", it is hard to convey through lectures the nature of scientific work and the fallibility of inductive hypotheses. Instead, students play a couple rounds of the Induction Game, in which playing cards are turned up and either added to a running series or discarded according to the dealer's pre-conceived "law of nature". Students are asked to "discover" the natural law, by formulating and testing hypotheses as the game proceeds.
REFERENCES ON ACTIVE AND COOPERATIVE LEARNING


Silberman, M. 1996. Active Learning, Allyn and Bacon, Boston.


Active Learning Literature Important Points
As a group, distill the three most important points from the reading you just completed. In other words, if you took only three things (ideas, concepts, or facts) from this reading, what would they be? Everyone in the group should write down the same three things on this handout.

1.

2.

3.

[Handout adapted from C. O'Neal 4/4/2011 "Day 2-Creating Environments for Learning, Step One."]
**WORKSHOP06 “Problem Solving Skills”**

**NAMES:** Weiwei Chen

**DEPARTMENT(S) THAT THIS WORKSHOP IS AIMED AT:**
Henry Samueli School of Engineering

**TOPIC:**
Problem Solving Skills

**ABSTRACT:** If you were a new PF looking for a workshop on the above topic, what kind of a description of this workshop would help you to get a good sense of what this workshop entails?

This workshop will introduce problem solving strategies that the TAs can use to help their students to learn the course subjects and build the ability to solving problems. The TAs will do pair roleplaying activity in which one will act as the TA and the other as the students to solve a mathematic or logic problem by using the IDEAL model. After the roleplaying activity, the TAs will do a small jigsaw activity to debrief their problem solving process. (Adapted from Hernandez, Flynn, & Ross, “Problem solving workshop 2011”; Button & Chen, “Problem Solving Skills”, US390A PF workshop 2012)

**LEARNING OUTCOMES:** What should the TAs be able to do & know by the end of this workshop? Note that TAs wbat = TAs will be able to... (Suggestion: Try to have only 1-3 outcomes.)

<table>
<thead>
<tr>
<th>TAs wbat...</th>
<th>TAs will be able to articulate 1 or 2 problem solving strategies.</th>
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<tbody>
<tr>
<td>TAs wbat...</td>
<td>TAs will be able to break down problem solving into a presentable and manageable process to their students.</td>
</tr>
<tr>
<td>TAs wbat...</td>
<td>TAs will be able to facilitate the problem solving process of their students using one or more problem solving strategies.</td>
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</tbody>
</table>

**STEPS TOWARD TAs ACHIEVING LEARNING OUTCOME # 1:** What will the TAs do to help them to achieve the learning outcome, above? (Suggestion: you can have as many steps along the way as you feel appropriate.)

<table>
<thead>
<tr>
<th>TAs will...</th>
<th>TAs will be introduced to several problem solving strategies by PPT slides and get handouts of those strategies.</th>
</tr>
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<tbody>
<tr>
<td>TAs will...</td>
<td>TAs will be introduced to IDEAL problem solving and will practice it in a roleplaying exercise.</td>
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<tr>
<td>TAs will...</td>
<td>TAs will...</td>
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</table>

**STEPS TOWARD TAs ACHIEVING LEARNING OUTCOME # 2:** What will the TAs do to help them to achieve the learning outcome, above? (Suggestion: you can have as many steps along the way as you feel appropriate.)

| TAs will... | TAs will practice using the IDEAL solver to teach problem solving through... |
the pair roleplaying activity.

TAs will... TAs will discuss with their roleplaying partner to figure out the important aspects of their way of teaching problem solving.

**RESEARCH SUPPORTING THIS WORKSHOP:** What research has been done in this area? List two articles that (preferably) offer research-backed conclusions about best practices in this area. At least one of the articles should have some disciplinary commonality with your TA groups(s).

**Article One (w/ summary)**
The Ideal Problem Solver offers a sound, methodical approach for resolving problems based on the IDEAL (Identify, Define, Explore, Act, Look) model. The authors suggest new strategies for enhancing creativity, improving memory, criticizing ideas and generating alternatives, and communicating more effectively with a wider range of people.

**Article Two (w/ summary)**
This paper discussed about the need to teach problem solving, defined problem solving skills, and proposed some principles for teaching problem solving.

**Article Three (w/ summary)**
Improving individuals' and groups' abilities to solve problems and make decisions is recognized as an important issue in education, industry, and government. Recent research has identified a prescriptive model of problem solving, although there is less agreement as to appropriate techniques. Separate research on personality and cognitive styles has identified important individual differences in how people approach and solve problems and make decisions. This paper relates a model of the problem-solving process to Jung's theory of personality types (as measured by the MBTI) and identifies specific techniques to support individual differences.

**SUPPLIES NEEDED:**

<table>
<thead>
<tr>
<th>QUANTITY</th>
<th>ITEM NAME:</th>
<th>COLOR/SPECIFICS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>#TAs</td>
<td>Problem solving strategy handouts</td>
<td>White</td>
</tr>
<tr>
<td>#TAs</td>
<td>Pair roleplaying IDEAL worksheets</td>
<td>Orange</td>
</tr>
<tr>
<td>#TAs</td>
<td>Instruction sheet, with questions, for pair roleplaying</td>
<td>Green</td>
</tr>
<tr>
<td>#TAs/2+2</td>
<td>TA answer sheets</td>
<td>Yellow. These will only be given to the TAs.</td>
</tr>
</tbody>
</table>
**ROOM CONFIGURATION:** (Describe/show how the room will be set up. The set up below is just a sample to be moved as you like.)

Students sit around the tables and face toward the podium and screen. Have some room on the wall for flip chart paper posting. (Assume that we will use EH2430)

<table>
<thead>
<tr>
<th>Podium</th>
<th>Table</th>
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</table>

**PREPARATION:** (What needs to be done by you in advance?)

1. Prepare the complete PowerPoint slides.
2. Print the handouts.
3. Bring a timer to the workshop.
4. Add animation to the PowerPoint slides
5. 
6. 

**WORKSHOP SCHEDULE:** Indicate when each portion of the workshop will begin and end.

<table>
<thead>
<tr>
<th>Part</th>
<th>Begin Time</th>
<th>End Time</th>
<th>Total Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Introduce problem solving strategies</td>
<td></td>
<td>15 min</td>
<td></td>
</tr>
<tr>
<td>2. Pair roleplaying</td>
<td></td>
<td>15 min</td>
<td></td>
</tr>
<tr>
<td>3. Jigsaw pair discussion and debriefing</td>
<td></td>
<td>10 min</td>
<td></td>
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</table>

**TOTAL TIME FOR WORKSHOP:** 40 min

**WORKSHOP SEGMENTS:** (Break down each part of the workshop:)

<table>
<thead>
<tr>
<th>Part #1:</th>
<th>Begin Time</th>
<th>End Time</th>
<th>Total Time</th>
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<tbody>
<tr>
<td>1. Introduce Problem Solving Strategies</td>
<td></td>
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<td>15 min</td>
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**NARRATIVE:** Describe each part of the workshop as though someone else would have to
Welcome back and thanks for coming back on time. Our next workshop is about “Problem Solving”. We are going to talk about problem solving skills and how to teach them.

As graduate students, I believe that we are all good at solving problems. As a TA, we need not only to be a good problem solver, but also need to know how to teach problem solving. When I was a TA, some students came to me and said, “Hey, Weiwei, I have no idea on this homework or this problem. Can you help me?” This request sounds very broad. I felt clueless about how to answer it at the beginning. I think instead of showing them what are the answers to those specific questions, it will be more helpful if we can facilitate them solving problems by themselves and help them to develop their problem solving skills.

So here come the learning outcomes for our today’s workshop. After the workshop, you will be able to articulate 1~2 problem solving skills; you will be able to break the problem into a manageable process and be able to present it to your students; and moreover, you will be able to facilitate your students solve the problems by using some of the strategies.

First, please allow me to make a brief introduction to problem solving. Problem solving is “... a process in which we perceive and resolve a gap between a present situation and a desired goal, with the path to the goal blocked by known or unknown obstacles.” [from William Huitt, “Problem Solving and Decision Making: Consideration of Individual Differences Using the Myers-Briggs Type Indicator”, Journal of Psychological Type, 24, 33-44, 1992]

It is a complex mental activity engaging a variety of cognitive skills and actions, e.g. generalization, reasoning, comprehension, analysis, etc. It can also be affected by a lot of factors, e.g. some internal factors like the learner’s experiences; some cognitive factors like background knowledge, cognitive styles; some non-cognitive factors like self-confidence, motivation, enjoyment; and some external factors like the structure and context of problem solving.

Here, we listed several general strategies we may use for problem solving. To name some of them, we can use abstraction to first work on a model than apply the solution to real systems; or we can use brainstorming to come up with several ideas, then evaluate them to pick up the proper one or integrate some of them for a final solution. Here is a handout with a brief description about these strategies. [Handout: Problem solving strategies]

Now let’s watch a video clip demonstrating problem solving from the 1995 movie “Apollo 13” http://www.youtube.com/watch?v=C2YZnTL596Q

This video clip from the Apollo 13 epitomizes problem solving. The NASA engineers perceived and resolved a gap between the present situation of no proper air filter to cause imminent death of the astronauts and the desired goal of returning the astronauts safely to Earth. While none of the problem solving tasks you will encounter as TA’s will be matters of life or
Let’s take a look what did the NASA engineers do to solve this problem.

• They started by identifying their problem: a broken air filter, CO2 level is getting toxic
• Then they define their problem: to make a square cartridge compatible with a round one. “We gotta find a way to make this...fit into the hole for this...usin’ nothin’ but that”
• They evaluated the different strategies - what could they make from the collection of odds and ends thrown on the table?
• Implemented their plan - creating instructions for the astronauts,
• And finally completed the process by looking back and verifying the ability of their new air filter design.

This problem solving process can be described by a five-step general problem-solving model which we are going to introduce in this workshop. The model is called “IDEAL”. It is developed by John Bransford and it can be applied to a variety of problem-solving situations.

The five letters of “IDEAL” are the first letters of the five-steps of this model.

• “I” stands for identify the problem, state the question. e.g. “a broken air filter, CO2 level is getting toxic”
  In this stage, you try to find the problem. You can ask questions like “What is wrong?”, “Did it work?”, “Do you understand the instructions?”

• “D” for define the problem, “This is where you look deeper to see what you know and do not know about the problem. It is a fact gathering phase. You can also reevaluate your goals.” e.g. Previous problem: “a broken air filter”; Now the problem is to “make a square cartridge compatible with a round one”
  You can ask questions like “What do I know?” or “What is my goal to solve this?”

• “E” for explore possible strategies, look at ways to solve the problem given the information presented, brainstorm the possible solutions. e.g the NASA engineers evaluated the different strategies - what could they make from the collection of odds and ends thrown on the table
  The various strategies on the handout I just passed out to you can be used in this stage for solution exploration. In this stage, do not judge or evaluate, just look at ways to solve the problem given the information presented.
  “What can I do to fix this?”, “What is possible to help for this question?”

• “A” for apply or act the strategy, just chose approach and carry it through to a solution, don’t worry about evaluating the approach, Just Do it!
  “What if we try this?”, “Did you try it?”

• “L” for look back and check, evaluate now, let the student check their work or check against the answers.
  “Did it work?”, “Why not?”, “What happened instead?”, “why did that fix it?”

Here is a handout with more details about the IDEAL solver.
[Handout: IDEAL Problem Solver]
PART #2:  \hspace{1cm} BEGIN TIME: \hspace{1cm} END TIME: \hspace{1cm} TOTAL TIME:
2. Pair roleplaying  \hspace{1cm}  \hspace{1cm}  \hspace{1cm} 15 min

**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

Now we are going to break into pairs to practice applying IDEAL to a problem.

We will do the TA-student role-play activity. When you find a partner, decide which of you will be the TA and which of you will be the student. The student’s job will be to try to solve the problem, while the TA’s job will be to guide them through the IDEAL problem solving process without giving them the answer. Both the TA and the student will get the question on a worksheet, but only the TA will get the answer on their worksheet.

You may begin once I give both of you your worksheets. Make sure that both the TA and student have the question sheet, which is green, and only the TA has the yellow worksheet. You both will have the orange IDEAL worksheet that you can use for solving the problem. If you finish early, please use the time to discuss how well both of you did at solving the problem using IDEAL. You will have about 15 minutes to do this.

[Handout: *Teaching Problem Solving (Pair Roleplaying)*, 8 different problems]

PART #3:  \hspace{1cm} BEGIN TIME: \hspace{1cm} END TIME: \hspace{1cm} TOTAL TIME:
3. Jigsaw pair discussion and debriefing  \hspace{1cm}  \hspace{1cm}  \hspace{1cm} 10 min

**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

Ok I would now like everyone to stop and find a new partner. In the next ten minutes, I want you to discuss with your new partner what your problem was, how you used the IDEAL problem solving strategy to solve it, and how useful IDEAL was. You will have about 5 minutes for the sharing.

Any groups would like to share their problem and their comments on the IDEAL process with us?
[Solicit some sharing from the TAS]

Thanks for the great sharing.

There are a number of things we can do to best help students learn this (and other) problem solving strategies:

• One first step is to do the kind of exercises that we did today--get students to reflect on their own approaches (what they are currently doing that may or may not be working), and to
articulate that. I’ve often found that students have simply forgotten some key step in a process (particularly in programming), and getting them to walk through what they’ve done can often trigger them to remember.

- Along these lines, you can challenge your students' assumptions: maybe they're skipping the "identify" step by assuming they know what the problem is. By challenging the basis for their potentially faulting strategy ("is that really the issue? "are you sure?" "is that your final answer?"), it can help them to reflect on the process.
- But as you're questioning their assumptions, you also want to offer lots of praise and reassurance to your students. Because problem solving is hard, and so we want to give positive support to keep them from getting frustrated. Similarly, reward solutions other than one you were expecting, especially on ill-defined problems that likely have multiple answers.
- Finally, give your students lots of opportunities to practice problem solving, particularly on the kinds of problems you want them to be able to solve! This practice can move from simple to more complex problems, so they can build up the skills and get used to applying the strategy and adapting it to different situations.

One more thing I would like to point out is that although most of the problems we are solving today are toward quantitative which we will very likely have in engineering, the “IDEAL” problem solving model can also apply to non-quantitative problems, e.g. how to handle difficult situations in teaching. You can find the problem like “having quiet students in discussion”; define the problem as “students do not participate in the classroom, they are too shy, not prepared, etc.”; explore solutions “have small group discussion, speak with them to emphasis the importance of class participation, talk with them in the classroom discussion group, etc.”; then you can try to apply these strategies in the classroom; and evaluate them by seeing whether you can get those “quiet students” evolved in the classroom. “IDEAL” may helps to solve many academic problems but also some real-life problems as well.

Of course, “IDEAL” is just one of many strategies. I think one important thing for teaching problem solving is: "being reflective about (any) process is the first step towards teaching it to others." As graduate students and intelligent people, we do magic in our heads when solving problems, but we need to be able to articulate this magic to our students. So the goal is to think about how you solve problems, and then be able to explain it to others.

To conclude this workshop, let’s take a look at the pedagogical techniques that we used to learn problem solving and how to teach it:

- Role-playing: “a learning activity in which participants act out a set of defined role behaviors (sic) or position with a view to acquiring desired experiences. A role-playing scenario could be mimicking, demonstrative or illustrative of specific concepts, problems or situations”.
- Small jigsaw pair sharing: work in one group and share your solutions or comments in the other group, thus helps to learn from different perspectives.
Problem-solving Strategies

- **Abstraction**: solving the problem in a model of the system before applying it to the real system.

- **Analogy**: using a solution that solved an analogous problem.

- **Brainstorming**: (especially among groups of people) suggesting a large number of solutions or ideas and combining and developing them until an optimum is found.

- **Divide and conquer**: breaking down a large, complex problem into smaller, solvable problems.

- **Hypothesis testing**: assuming a possible explanation to the problem and trying to prove (or, in some contexts, disprove) the assumption.

- **Lateral thinking**: approaching solutions indirectly and creatively.

- **Means-ends analysis**: choosing an action at each step to move closer to the goal.

- **Method of focal objects**: synthesizing seemingly non-matching characteristics of different objects into something new.

- **Morphological analysis**: assessing the output and interactions of an entire system.

- **Reduction**: transforming the problem into another problem for which solutions exist.

- **Research**: employing existing ideas or adapting existing solutions to similar problems.

- **Root cause analysis**: eliminating the cause of the problem.

- **Trial-and-error**: testing possible solutions until the right one is found.

- **Proof**: try to prove that the problem cannot be solved. The point where the proof fails will be the starting point for solving it.

- etc.

[source: http://en.wikipedia.org/wiki/Problem_solving]
**IDEAL Problem Solving Method**  
*(developed by John Bransford)*

**I** = Identify the problem. This is straightforward for homework type problems given by professors. Usually the problem states the question at the end.

**D** = Define the problem. This is where you look at what you have identified the problem to be and see what is known and unknown. This is also where you could present the problem visually.

**E** = Explore possible solution strategies. This is where you would want to have students brainstorm various ways they could solve the problem. At this point, you would want to accept all solution strategies student come up with, even if you know they are wrong. You could guide really off the mark solution strategies by focusing on the problem definition.

**A** = Apply or Act on one solution strategy. Now you have several possible solution strategies suggested by your students, select one that the students agree is the best approach and carry it through to a solution. Don’t yet worry if it isn’t going to lead to the correct solution. Make sure the students walk you through the steps as you write them on the board.

**L** = Look back and check that your solution fits the original problem. The final part of IDEAL involves checking the solution against the original question, or plugging in the solution into the original equation or concept to see if it makes sense. If you discover that it is illogical, you would go back and select a different solution strategy. Make sure to explain why an incorrect solution is incorrect - maybe some assumptions were not satisfied, or the concept was misunderstood.
Teaching Problem Solving (Pair Roleplaying)

• Use the IDEAL problem solving strategy to solve the problem with your partner.
• One of you will act as the TA and one of you will act as the student.
• The “TA” should examine the problem and solution, facilitate problem solving by helping the “student” work through IDEAL.
• The “student” should try to find the answer, working with the “TA” as she or he guides them through the IDEAL process.
• Please use the “IDEAL Problem Solver” worksheet to go through the IDEAL process.

Problem 1: You can paddle your canoe seven miles per hour through still water. The stream flows at three miles per hour. The moment you start to paddle upstream a child loses his beach ball in the water fourteen miles upstream of you. How many hours does it take for you and the beach ball to meet?
Teaching Problem Solving (Pair Roleplaying)

- Use the IDEAL problem solving strategy to solve the problem with your partner.
- One of you will act as the TA and one of you will act as the student.
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- Please use the “IDEAL Problem Solver” worksheet to go through the IDEAL process.

Problem 2: To number the pages of a thick book, the printer used 2889 digits. How many pages does the book have?
Teaching Problem Solving (Pair Roleplaying)

- Use the IDEAL problem solving strategy to solve the problem with your partner.
- One of you will act as the TA and one of you will act as the student.
- The “TA” should examine the problem and solution, facilitate problem solving by helping the “student” work through IDEAL.
- The “student” should try to find the answer, working with the “TA” as she or he guides them through the IDEAL process.
- Please use the “IDEAL Problem Solver” worksheet to go through the IDEAL process.

Problem 3: Sara has 12 miles of fencing that she can divide any way she chooses. She would like to use this to create a completely fenced in pasture for her cows. She wants this pasture to cover as much land as possible and it must be shaped in a rectangle. What the dimensions of her pasture be?
Teaching Problem Solving (Pair Roleplaying)

- Use the IDEAL problem solving strategy to solve the problem with your partner.
- One of you will act as the TA and one of you will act as the student.
- The “TA” should examine the problem and solution, facilitate problem solving by helping the “student” work through IDEAL.
- The “student” should try to find the answer, working with the “TA” as she or he guides them through the IDEAL process.
- Please use the “IDEAL Problem Solver” worksheet to go through the IDEAL process.

**Problem 4:** A bear, starting from the point P, walked one mile due south. Then she changed direction and walked one mile due east. Then she turned again to the left and walked one mile due north, and arrived exactly at the point P she started from. What was the color of the bear?
Teaching Problem Solving (Pair Roleplaying)

- Use the IDEAL problem solving strategy to solve the problem with your partner.
- One of you will act as the TA and one of you will act as the student
- The “TA” should examine the problem and solution, facilitate problem solving by helping the “student” work through IDEAL.
- The “student” should try to find the answer, working with the “TA” as she or he guides them through the IDEAL process.
- Please use the “IDEAL Problem Solver” worksheet to go through the IDEAL process.

Problem 5: How many sneezes occur in the United States on an average day?
Teaching Problem Solving (Pair Roleplaying)

- Use the IDEAL problem solving strategy to solve the problem with your partner.
- One of you will act as the TA and one of you will act as the student.
- The “TA” should examine the problem and solution, facilitate problem solving by helping the “student” work through IDEAL.
- The “student” should try to find the answer, working with the “TA” as she or he guides them through the IDEAL process.
- Please use the “IDEAL Problem Solver” worksheet to go through the IDEAL process.

**Problem 6:** If a stock increases in value by 10%, and then decreases in value by 10% the next day, is the stock worth more, less, or the same amount as it was before both changes occurred?
**Teaching Problem Solving (Pair Roleplaying)**

- Use the IDEAL problem solving strategy to solve the problem with your partner.
- One of you will act as the TA and one of you will act as the student.
- The “TA” should examine the problem and solution, facilitate problem solving by helping the “student” work through IDEAL.
- The “student” should try to find the answer, working with the “TA” as she or he guides them through the IDEAL process.
- Please use the “IDEAL Problem Solver” worksheet to go through the IDEAL process.

**Problem 7**: Ring road at UC Irvine is one mile in circumference. You always jog around it and in an hour you can jog around ring road three times. Instead of jogging around ring road, you decide to jog in a straight line through the center of Aldrich park to the other side of ring road, and then back the exact same way to your original spot. Does this take you more or less time than running around ring road once?
Teaching Problem Solving (Pair Roleplaying)

- Use the IDEAL problem solving strategy to solve the problem with your partner.
- One of you will act as the TA and one of you will act as the student.
- The “TA” should examine the problem and solution, facilitate problem solving by helping the “student” work through IDEAL.
- The “student” should try to find the answer, working with the “TA” as she or he guides them through the IDEAL process.
- Please use the “IDEAL Problem Solver” worksheet to go through the IDEAL process.

**Problem 8:** Richard is wearing a utilikilt with 10 pockets. He has 44 silver dollars. He would like to put his dollars in his pockets so that each pocket has a different number of dollars in it. Can he do it? If so, how?
Problem 1 Solution and Discussion

REMEMBER not to give out the answer. Try to get your student towards the answer themselves. Feel free to give a hint if the student is entirely stuck.

Problem 1: You can paddle your canoe seven miles per hour through still water. The stream flows at three miles per hour. The moment you start to paddle up stream a child loses his beach ball in the water fourteen miles up stream of you. How many hours does it take for you and the beach ball to meet?

Solution and Discussion

Try to figure out the relative speed between the canoe and the beach ball. Divide the distance by the relative speed to get the hours that it will take to catch the ball.

Apply the strategy:
You are paddling at 7mile/h in still water. Your canoe is in the water. It flows down at 3miles/h. Then your paddling speed is (7 - 3) = 4 miles/h.
The beach ball is in the water. It flows at the same speed as the water, i.e. 3miles/h. The beach ball is flowing towards you while you are paddling up stream.
The relative speed between you and the ball is (4 - (-3)) = 7 miles/h.
It will take 14miles / 7miles/hour = 2 hours for you to get the beach ball.
Problem 2 Solution and Discussion

Remember not to give out the answer. Try to get your student towards the answer themselves. Feel free to give a hint if the student is entirely stuck.

Problem 2: To number the pages of a thick book, the printer used 2889 digits. How many pages does the book have?

Solution and Discussion

Here is a related problem: If the book has exactly 9 numbered pages, how many digits are used? (9 of course) Here is another related problem: If the book has exactly 99 numbered pages, how many digits are used?

Pages 1 to 9 need one digit each, for a total of $1 \times 9 = 9$ digits.

Pages 10 to 99 need two digits each, for a total of $2 \times 90 = 180$ digits.

Pages 100 to 999 need three digits each.

Pages 1000 to 9999 need four digits each.

After accounting for the first 99 pages, there are 2700 left. Dividing this by three will tell us how many additional pages we need to get to 2889, assuming we don't go over 999 page.

$2700 / 3 = 900$ pages. This puts us at exactly 999 pages, which is the correct answer here.

Checking gives: $9 + 2 \times 90 + 3 \times 900 = 2889$
Problem 3 Solution and Discussion

REMEMBER not to give out the answer. Try to get your student towards the answer themselves. Feel free to give a hint if the student is entirely stuck.

Problem 3: Sara has 12 miles of fencing that she can divide any way she chooses. She would like to use this to create a completely fenced in pasture for her cows. She wants this pasture to cover as much land as possible and it must be shaped in a rectangle. What the dimensions of her pasture be?

Solution and Discussion

The answer is a perfect square. In this case each side has 3 miles, which adds up to 12 miles. The area of this is $3 \times 3 = 9$ square miles

Remember that the area of a rectangle is equal to the length times the width.

Here are two possible solutions:

**Trial and Error:** Try drawing rectangles and squares that use 12 miles of fencing. See which one has the largest area. For example, a long rectangle with length 5 and width 1 uses all the fencing but only has area $5 \times 1 = 5$. Changing the length to 4 and the width to 2 gives $4 \times 2 = 8$.

**Calculus** (don’t use this unless your partner knows calculus): Let $x$ be the length of the pasture, and let $y$ be the width. We need to maximize the area $(xy)$ subject to the constraint that we use exactly 12 miles of fencing, so $2x + 2y = 12$. So $y = 6 - x$. So we can pick $x$ to maximize $x(6 - x) = 6x - x^2$. Taking the derivative with respect to $x$ to get the first order condition gives $6 - 2x$. Setting this equal to zero gives the possible solution $x = 3$. Taking the derivative again to get the second order condition gives $-2$, which is negative. Therefore $x = 3$ represents a maximum. So the length should be 3 miles. As for the width, $y = 6 - x = 3$. So we have a square with sides of 3 miles.
Problem 4 Solution and Discussion

REMEMBER not to give out the answer. Try to get your student towards the answer themselves. Feel free to give a hint if the student is entirely stuck.

Problem 4: A bear, starting from the point P, walked one mile due south. Then she changed direction and walked one mile due east. Then she turned again to the left and walked one mile due north, and arrived exactly at the point P she started from. What was the color of the bear?

Solution and Discussion

The bear is white (it’s a polar bear) and P is the North Pole. Even if this is obvious it needs to be proven, so help the student find out why this is the case even if she already found the answer.

This quirky situation lies in the fact that earth is basically a sphere, so we can’t necessarily think of movement along a flat area. That would give us the situation on the right, where the bear doesn’t return to point P. In this case, after the bear turns left and walks east, she is moving parallel to the equator along a meridian. This gives us something similar to the drawing on the left, although this would look better in three dimensions.
Problem 5 Solution and Discussion

REMEMBER not to give out the answer. Try to get your student towards the answer themselves. Feel free to give a hint if the student is entirely stuck.

Problem 5: How many sneezes occur in the United States on an average day?

Solution and Discussion

There isn’t really an answer, so don’t worry about that. How would you get one? Perhaps break down the problem into parts.

How many people are in the United States? 308,745,538 as of the 2010 Census, but that’s not super important.

How often does an average person sneeze in a day? Apparently the average is 200 per year, according to some news article, so that’s just over half a sneeze a day. This seems low. Some random person from Yahoo answers said 2 or 3 per day, but Yahoo answers is super sketchy. It is good for comedic value only.
Problem 6 Solution and Discussion

REMEMBER not to give out the answer. Try to get your student towards the answer themselves. Feel free to give a hint if the student is entirely stuck.

Problem 6: If a stock increases in value by 10%, and then decreases in value by 10% the next day, is the stock worth more, less, or the same amount as it was before both changes occurred?

Solution and Discussion

It’s worth less. The instinct is to think that the 10%’s cancel each other out so that there is no change. This is wrong.

Let x be the starting value. If the stock increases by 10%, then we now have 1.1x. If it decreases by 10% we have 1.1x multiplied by 0.9 which gives 0.99x, which is less than x, what we started with.

In numbers, if we started with $100, the stock goes up to $110, then drops down 10%. 10% of $110 is $11, so we get $99.
Problem 7 Solution and Discussion

REMEMBER not to give out the answer. Try to get your student towards the answer themselves. Feel free to give a hint if the student is entirely stuck.

Problem 7: Ring road at UC Irvine is one mile in circumference. You always jog around it and in an hour you can jog around ring road three times. Instead of jogging around ring road, you decide to jog in a straight line through the center of Aldrich park to the other side of ring road, and then back the exact same way to your original spot. Does this take you more or less time than running around ring road once?

Solution and Discussion

The way the problem is described, it’s pretty clear that the jogger would be running along the diameter of the circle that ring road creates. The hints that would lead you to that are “straight line” and “through the center).

The circumference (c) of a circle is equal to pi (π) (approximately 3.14) times the diameter (d). C = πd, so d = C/π = 1/3.14 = 0.318 miles.

If you can run the circumference three times in an hour, then 1 mile takes 20 minutes. So 0.318 miles takes 0.318 x 20 = 6.36 minutes or about 6 minutes and 22 seconds. Doing that twice (as in the question) takes about 12 minutes and 43 seconds. This is clearly faster than running around ring road.
**Problem 8 Solution and Discussion**

REMEMBER not to give out the answer. Try to get your student towards the answer themselves. Feel free to give a hint if the student is entirely stuck.

**Problem 8:** Richard is wearing a utilikilt (a kilt with cargo pockets) with 10 pockets. He has 44 silver dollars. He would like to put his dollars in his pockets so that each pocket has a different number of dollars in it. Can he do it? If so, how?

**Solution and Discussion**

I: Write/state the question in your own words:

“Can Richard put a different number of dollars in each pocket?” or

“How many dollars (or pockets) does Richard need so that each pocket has a different number of dollars?”

D: What are the knowns? 10 pockets; 44 dollars; each pocket must have a unique number of dollars; each pocket can have at most 44 dollars and at least zero dollars.

What are the unknowns? If Richard can do this with 10 pockets and 44 dollars?

E: 1) Draw out or use coins and pockets to simulate via trial-and-error.

2) See if it’s possible with a smaller amount or larger amount of dollars.

3) Determine the minimum number of dollars needed for this to work.

A: From earlier we know that a pocket can have at minimum zero dollars. So let’s put zero in pocket one.

The next pocket needs a different number. Let’s add one dollar. So pocket two has one dollar.

Repeating this: pocket three has two dollars, etc. until pocket 10, which has 9 dollars.

The total number of dollars is: 0 + 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 = 45.

If this is the minimum amount of dollars necessary, then 44 isn’t enough. Therefore Richard cannot do it.

L: Did this answer the question? We determined that at least 45 dollars are needed. This rules out 44, so it answers the question indirectly. Does the solution make sense?
Teaching Problem Solving (Pair Roleplaying)

**IDEAL Problem Solver Worksheet**

[source: 162.127.6.150/esu6/Gems/Ivermaas/IDEALsteps.doc]

<table>
<thead>
<tr>
<th>Identify the problem to be solved. Write the problem in your own words.</th>
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<tbody>
<tr>
<td>Define the problems. What do you know and don’t know. Gather the information and reevaluate your goals..</td>
</tr>
<tr>
<td>Explore possible strategies. Which strategy is used and why.</td>
</tr>
<tr>
<td>Estimate and predict a reasonable solution.</td>
</tr>
<tr>
<td>Act on your chosen strategy. Show all work to arrive at answer.</td>
</tr>
<tr>
<td>Look back, reflect, and evaluate. Does this solution make sense? Does it work? Is it reasonable?</td>
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Energizer 2 “Spaghetti Tower”

**NAME:** Weiwei Chen

**DEPARTMENT(S) THAT THIS WORKSHOP IS AIMED AT:** Henry Samueli School of Engineering

**TOPIC:**

Energizer 2

**ABSTRACT:** If you were a new PF looking for a workshop on the above topic, what kind of a description of this workshop would help you to get a good sense of what this workshop entails?

The TAs will construct a tower as high as possible with spaghetti and marshmallows.

**LEARNING OUTCOMES:** What should the TAs be able to do & know by the end of this workshop? Note that TAs wbat = TAs will be able to... (Suggestion: Try to have only 1-3 outcomes.)

| TAs wbat... | Relax and have some fun in groups |

**STEPS TOWARD TAs ACHIEVING LEARNING OUTCOME # 1:** What will the TAs do to help them to achieve the learning outcome, above? (Suggestion: you can have as many steps along the way as you feel appropriate.)

| TAs will... | Build a spaghetti tower. |

**RESEARCH SUPPORTING THIS WORKSHOP:** What research has been done in this area? List two articles that (preferably) offer research-backed conclusions about best practices in this area. At least one of the articles should have some disciplinary commonality with your TA groups(s).

| Article One (w/ summary) | No Research Needed |

**SUPPLIES NEEDED:**

<table>
<thead>
<tr>
<th>QUANTITY:</th>
<th>ITEM NAME:</th>
<th>COLOR/SPECIFICS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 * #Groups</td>
<td>Spaghetti sticks</td>
<td></td>
</tr>
<tr>
<td>8 * #Groups</td>
<td>Marshmallows</td>
<td>white</td>
</tr>
<tr>
<td></td>
<td>Prizes (chocolates, candy, or small office supplies)</td>
<td>white</td>
</tr>
<tr>
<td></td>
<td>Table number holder</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Scratch pad paper and pen for recording the height of the tower; measuring tape</td>
<td></td>
</tr>
</tbody>
</table>
**ROOM CONFIGURATION:** (Describe/show how the room will be set up. The set up below is just a sample to be moved as you like.)

Each group will need a desk to build the tower. Assume that we will use EH2430

![Diagram of room setup]

**PREPARATION:** (What needs to be done by you in advance?)

1. Get spaghetti and marshmallows

**WORKSHOP SCHEDULE:** Indicate when each portion of the workshop will begin and end.

<table>
<thead>
<tr>
<th></th>
<th>BEGIN TIME</th>
<th>END TIME</th>
<th>TOTAL TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Build a spaghetti tower with marshmallows</td>
<td>8min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Tower height measurement, prizeing and cleaning</td>
<td></td>
<td>2min</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL TIME FOR WORKSHOP:** 10 min

**WORKSHOP SEGMENTS:** (Break down each part of the workshop:)

<table>
<thead>
<tr>
<th>PART #1:</th>
<th>BEGIN TIME</th>
<th>END TIME</th>
<th>TOTAL TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Build a spaghetti tower with marshmallows</td>
<td></td>
<td></td>
<td>8min</td>
</tr>
</tbody>
</table>

**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

Okay, this afternoon is very intense. So before we continue to next workshop, let’s do something fun to energize ourselves. We are all engineers and we engineers love building things. So I would like you to form a
group of 5 first, and find a desk.
What we will do in the next 7 minutes is to build a structure with spaghetti and marshmallows. You will have only 20 spaghetti sticks and 8 marshmallows for each group. You can break the spaghetti and marshmallows. But try to build a structure/tower as high as possible. The group who build the highest tower will be the winner(s).
Any questions about the task?
Now go!

[Give notice for 5min and 2min left]

<table>
<thead>
<tr>
<th>PART #2:</th>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Tower height measurement, prize giving and cleaning</td>
<td></td>
<td></td>
<td>2min</td>
</tr>
</tbody>
</table>

**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

Okay, time’s up. Please stop building! And we will start measuring. When we finish measuring the height of your tower, please clean the table and dispose of the waste in the trashcan.

Our winner for today is XXX. Here is a prize for your great construction. Congratulations!

Let put our construction wastes in the bag and throw them to the trash can.
# WORKSHOP07 “Grading”

**NAME:** Weiwei Chen

**DEPARTMENT(S) THAT THIS WORKSHOP IS AIMED AT:** Henry Samueli School of Engineering

**TOPIC:** Grading

**ABSTRACT:** If you were a new PF looking for a workshop on the above topic, what kind of a description of this workshop would help you to get a good sense of what this workshop entails?

This workshop prepares the TAs for efficient and effective grading. (Adapted from Sarah Hernandez “Grading”, TAPDP 2011)

**LEARNING OUTCOMES:** What should the TAs be able to do & know by the end of this workshop? Note that TAs wbat = TAs will be able to... (Suggestion: Try to have only 1-3 outcomes.)

<table>
<thead>
<tr>
<th>TAs wbat...</th>
<th>Prepare and apply grading rubrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAs wbat...</td>
<td>Assess the difficulties in grading, e.g. being fairly and consistently, time management, etc.</td>
</tr>
</tbody>
</table>

**STEPS TOWARD TAs ACHIEVING LEARNING OUTCOME # 1:** What will the TAs do to help them to achieve the learning outcome, above? (Suggestion: you can have as many steps along the way as you feel appropriate.)

<table>
<thead>
<tr>
<th>TAs will...</th>
<th>Prepare rubrics for grading</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAs will...</td>
<td>Practice grading sample homework</td>
</tr>
</tbody>
</table>

| TAs will... | Discussion for grading difficulties and comparing grading to other groups. |

**RESEARCH SUPPORTING THIS WORKSHOP:** What research has been done in this area? List two articles that (preferably) offer research-backed conclusions about best practices in this area. At least one of the articles should have some disciplinary commonality with your TA group(s).

**Article One (w/ summary)**

This paper describes the development of rubrics that help evaluate student performance and relate that performance directly to the educational objectives of the program.

**SUPPLIES NEEDED:**

<table>
<thead>
<tr>
<th>QUANTITY:</th>
<th>ITEM NAME:</th>
<th>COLOR/SPECIFICS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceiling(#TAs/4)</td>
<td>White boards / flipchart paper</td>
<td></td>
</tr>
<tr>
<td>#TAs * 2</td>
<td>Sample homework for grading</td>
<td></td>
</tr>
<tr>
<td>Ceiling(#TAs/4)</td>
<td>Markers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tapes for posting flipchart paper</td>
<td></td>
</tr>
</tbody>
</table>

**ROOM CONFIGURATION:** (Describe/show how the room will be set up. The set up below is just a sample to be moved as you like.)

Students sit around the tables and face toward the podium and screen. Have some room on the wall for flip chart paper posting. (Assume that we will use EH2430)

![Room Configuration Diagram]

**PREPARATION:** (What needs to be done by you in advance?)

1. Add animations to the PowerPoint Slides
2. 
3. 

**WORKSHOP SCHEDULE:** Indicate when each portion of the workshop will begin and end.

<table>
<thead>
<tr>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Introduce grading issues and use of rubrics</td>
<td>5min</td>
<td></td>
</tr>
<tr>
<td>2. Grading activity</td>
<td>20min</td>
<td></td>
</tr>
<tr>
<td>3. Grading comparison and discussion</td>
<td>15min</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL TIME FOR WORKSHOP:** 40 min
NARRATIVE: Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

In this workshop, we are going to discuss one of the biggest TA responsibilities outside of the classroom: grading.

I know that I mentioned previously that we have readers/graders who will take care of the grading work for each course. However, in engineering TAs are usually responsible for the “high stakes” grading—exams, projects, and quizzes. And you will also probably have to provide solutions to the homework to your grader.

BRAINSTORM: Can you all tell me what you think makes grading difficult?
[Solicit responses from the TAs and write them on the board. They should say things like being consistent, time consuming, boring, being fair, and pressure from instructor and students, etc.]

That’s right! Grading can be a difficult task. It certainly is the most time consuming task and gets especially more time consuming for large classes. For the programing class I TAed there were 200+ students. I’d need to read 200+ programs and provide comments if there were problems with the program. Even though I use automatic grading scripts (I program for grading), it took me at least two full days to grade. Please make a note to yourself that you will need to set aside a handful of days around the midterm and final exam time or after the deadline of a big homework to do nothing but grade. Try to arrange your schedule in advance to accommodate this necessary task.

BRAINSTORM: We are all aware of the importance of consistency. What happens when we are not consistent in our grading?
[Solicit responses from the TAs and write them on the board. They should say things like fairness, less complaints from students, look good to your professor and ABET]

Good points, you do want to minimize the number coming for grade complaints. The difficult part in grading is that you typically have more than 50 exams/homework/lab reports, usually closer to 100 or more for engineering courses. Grading consistently becomes a major issue for classes this large. As you grade more and more, you will start to realize the common mistakes and errors. Without a plan for how to deduct points, you will have to go back and re-grade all the exams to be sure you were consistent! The key idea here is that you need some kind of outline of how many points you will award each step of the solution. The outline is commonly called a Rubric.

BRAINSTORM: What kinds of things should you be looking for when grading?
[Solicit responses from the class. They should say things like correct answer, solution process, understanding of concepts, handwriting and neatness of solution?, copying or cheating, etc.]
So this is our list of what to look for when grading, the actual rubric will depend on the problem and can be very specific to maintain grading consistency.

Usually, we can take the following steps to develop the rubrics:

- **Step 1:** Determine the Areas You Want to Assess: refer to the SLOs, what are the key points?
- **Step 2:** Establish Standards for Each Performance Area: what do different levels look like? Define precisely!
- **Step 3:** Develop a Scoring Scale: how many score levels? Be consistent for different key components.
- **Step 4:** Adjust the Rubric as Needed

[Handout: How to develop a rubric]

<table>
<thead>
<tr>
<th>PART #4:</th>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Grading Activity</td>
<td></td>
<td></td>
<td>20min</td>
</tr>
</tbody>
</table>

**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

We are going to practice some grading right now in small groups.

Let’s form groups of 4 TAs. (Make an assignment for the group so as to vary the TAs with different disciplines)

In the next 20 minutes, I will give you two sets of student’s work: a biomedical engineering project report, and a homework exercise. As a group, you will decide how to award points to the student’s work.

**Sample Student Assignment and Solutions**

[Grading Worksheets]

**Example #1:** Project report (CEE)

Let’s first work on one Civil Engineering project report. I am not handing out the report with the suggested general rubrics for lab/project report on the first page. Please discuss as a group to refine the rubrics for this work, e.g. how many points for each category, what makes it different in each category. I will give you 6 minutes to design your group rubrics and I will ask the group member who has the most recent birthday to write down your rubrics on the flipchart paper.

Now, please use the group rubrics you just develop and apply it on grading the project report. Now I will ask each of you to work on your own. Once you have the scores, please write them on the flipchart too. (4 minutes)

When you finish, please post the flipchart paper on the wall on the right side of this room. At the end of the activity we will compare and discuss the grade you have assigned.

**Sample Student Assignment and Solutions**
Example #2: Homework (physics exercise)

The second assignment is student homework for solving a physics problem. It is an example of the regular homework that you may need to grade. This time, I will ask you work as a group to come up your rubrics for this assignment from scratch.

Keeping in mind those things we should be looking for while grading, e.g. correct answer, solution process, understanding of concepts, handwriting and neatness of solution, etc.

You will have about 7 minutes to design your group rubrics. Please write down your rubric and the grade for each student’s work on the flip chart paper as a group first.

Now, please use the group rubrics you just develop and apply it on grading the project report. Now I will ask each of you to work on your own. Once you have the scores, please write them on the flipchart. (3 minutes)

When you finish, please post the flipchart paper on the wall on the left side of this room.

We will then compare and discuss the grade you have assigned.

Note: I am not sure how long will it take for the new TAs to come up with the rubric and grade the assignment. I will adjust the discussion and comparison time accordingly if they need more / less than 5 minutes to grade each assignment. Also, I need to make sure the consistency point gets across with this activity since they only see two response samples of each question.

<table>
<thead>
<tr>
<th>PART #4:</th>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Grading Discussion</td>
<td></td>
<td></td>
<td>15min</td>
</tr>
</tbody>
</table>

**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

Let’s now compare our results. Will anyone please reveal your scores to assignment 1? [I will go through each assignment and ask some or all of the questions below.]

1. How did you divide the points for this assignment? What was your rubric?
   a. Why did you feel that (such and such) deserved the points you gave it?
   b. Was your group in agreement or did you notice a large difference in how each of you felt about point values?
2. What type of mistake did this student make, calculation, conceptual, lack of justification?
3. Did any group divide it differently/same?
4. What was tough about grading this assignment?

5. Where can you see problems arising?

6. What will you do to let the student know the kind of mistakes they made and/or why points were deducted?

Are there any questions you all have about grading?

You may have very different grading responsibilities as being a TA. Some courses will have the reader/grader grade student’s homework and TAs grade the exams; others will do vice versa.

The homework can have different forms, e.g. lab report, paper writing, computer programs, or homework exercises, etc.

If the course has a big enrollment, say more than 100 students, there could be multiple TAs and you need to collaborate with each other to design the rubric so as to be consistent with grading.

Sometimes, the instructor may have his/her own rubric. Then you need to communicate with the instructor to make sure you understand their requirements.

Moreover, you can also use some tools to help you grade efficiently, e.g. EEE online quiz/exams, write computer script to automate grading. The purpose of this workshop is to make you aware that grading is hard. You need to assign a decent amount of time and adopt some strategies when grading.

As a conclusion of this workshop, we discussed the major TA responsibilities outside of the classroom: grading.

We practiced creating our grading rubrics to help for consistency and efficiency. We also practice grading assignments according to the rubrics. We compared our grading work, and discussed some important things we need to take care of.

You all did very good so far. Let’s take a 15 minutes break and come back before 3:30 for the last two workshops for today. Please take some breath, stretch yourself, use the restroom and come back on time!!
Grading Exercise I

For this exercise we will grade a lab/final report. Decide as a group how to distribute the points among the following sections, and establish standards for each performance area.

Once finishing the group rubric refinement, please grade the report individually and write down your grading result on the group flipchart paper (If there are five TAs in the group, there will be five scores from each of the TAs).

Lab/final Report (100 points):
**Introduction**: stating the goal of the experiment/design

**Theory**: describing the theory behind the experiment

**Methodology**: describing the methods that are used to complete the goal and analyze the results

**Calculations**: showing the process of how to get the results, and tables/equations showing the results.

**Presentation**: writing quality, correct grammars, clear organization, etc.

**Conclusion**: summary of the results; some reflections on other techniques can be used instead or in addition; future work.

Score for the lab report: __________________________
Grading Exercise II
For this exercise we will grade a homework assignment. Decide as a group the grading rubric for this assignment.
Here are some suggestions on the steps for developing a rubric:

1. Determine the area you want to assess
2. Establish standards for each performance
3. Develop a scoring scale

Once finishing the group rubric development, please grade the 2 homework assignments individually and write down your grading results on the group flipchart paper (If there are five TAs in the group, there will be five sets of scores from each of the TAs).

Homework Assignment (50 points):

Student 1’s score: ______________________

Student 2’s score: ______________________
### WORKSHOP08 “Leading Discussion Sessions and Office Hours”

<table>
<thead>
<tr>
<th>NAMES: Weiwei Chen</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEPARTMENT(S) THAT THIS WORKSHOP IS AIMED AT:</td>
</tr>
<tr>
<td>Henry Samueli School of Engineering</td>
</tr>
</tbody>
</table>

### TOPIC:
Lead discussion sessions and Office Hours

### ABSTRACT: If you were a new PF looking for a workshop on the above topic, what kind of a description of this workshop would help you to get a good sense of what this workshop entails?

In this workshop, the TAs will figure out what a discussion session is and what makes for a successful one. They will exercise designing one Student Learning Outcome(SLO) for a future discussion session and learning activity they can use to achieve that SLO. They will also work together to build draft syllabi that they can use in their first session, and discuss how to handle some difficult situations in the discussion session.

(Adapted from Sarah Hernandez “Leading discussion” and “Diversity”, TAPDP 2011)

### LEARNING OUTCOMES: What should the TAs be able to do & know by the end of this workshop? Note that TAs wbat = TAs will be able to... (Suggestion: Try to have only 1-3 outcomes.)

<table>
<thead>
<tr>
<th>TAs wbat...</th>
<th>TA will be able to identify what a discussion session is and the important factors for a successful discussion session</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAs wbat...</td>
<td>TA will be able to design 1 student learning outcome (SLO) and incorporate 1~2 active learning activities into their discussion session as a mini plan for one of their discussion sessions</td>
</tr>
<tr>
<td>TAs wbat...</td>
<td>TA will be able to build syllabi for their discussion sessions</td>
</tr>
</tbody>
</table>

### STEPS TOWARD TAs ACHIEVING LEARNING OUTCOME # 1: What will the TAs do to help them to achieve the learning outcome, above? (Suggestion: you can have as many steps along the way as you feel appropriate.)

<table>
<thead>
<tr>
<th>TAs will...</th>
<th>Get to know what a discussion session is and what are expected to do</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAs will...</td>
<td>Brainstorm the important factors for a successful discussion session</td>
</tr>
<tr>
<td>TAs will...</td>
<td></td>
</tr>
<tr>
<td>TAs will...</td>
<td></td>
</tr>
</tbody>
</table>

### STEPS TOWARD TAs ACHIEVING LEARNING OUTCOME # 2: What will the TAs do to help them to achieve the learning outcome, above? (Suggestion: you can have as many steps along the way as you feel appropriate.)

<table>
<thead>
<tr>
<th>TAs will...</th>
<th>Choose one undergraduate course that they expect to teach or were taught in college</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAs will...</td>
<td>Choose one topic/chapter that can be taught in one discussion</td>
</tr>
<tr>
<td>TAs will...</td>
<td>Design the learning outcomes for the chosen discussion session</td>
</tr>
<tr>
<td>TAs will...</td>
<td>Come up with 1~2 learning activities and explain how to incorporate into the discussion session</td>
</tr>
<tr>
<td>TAs will...</td>
<td>Critique their discussion plan with fellow TAs in the same discipline</td>
</tr>
</tbody>
</table>

**STEPS TOWARD TAs ACHIEVING LEARNING OUTCOME # 3:** What will the TAs do to help them to achieve the learning outcome, above? (Suggestion: you can have as many steps along the way as you feel appropriate.)

| TAs will... | Pick up important things from a pool/database and add to syllabi templates |
| TAs will... | Debrief together for the syllabi they created |

**RESEARCH SUPPORTING THIS WORKSHOP:** What research has been done in this area? List two articles that (preferably) offer research-backed conclusions about best practices in this area. At least one of the articles should have some disciplinary commonality with your TA groups(s).

**Article One** *(w/ summary)*  
Gloria B. Wright, “Student-Centered Learning in Higher Education”, International Journal of Teaching and Learning in Higher Education, 2011. The article reports the innovations that are used by teachers across the academic and professional spectrum for the practices of student-centered college teaching. Student-centered classroom provides a more effective learning environment.

**Article Two** *(w/ summary)*  
C. Roland Christensen, “Premises and Practices of Discussion Teaching”, chapter 2 in *Education for Judgment: The Artistry of Discussion Leadership.* This chapter discussed four basic premises and accompanying suggestions for teaching discussions. First, both the teachers and students must modify their traditional roles and responsibilities to form a partnership in discussion for learning. Secondly, a community dedicated to learning emerges. Thirdly, a primary alliance between the instructor and the students helps to effective discussion leadership. And last, the author suggests a dual instructional competency, i.e. mastery of process and content, as the central element in effective discussion leadership.

**SUPPLIES NEEDED:**

<table>
<thead>
<tr>
<th>QUANTITY</th>
<th>ITEM NAME</th>
<th>COLOR/SPECIFICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>#TAs</td>
<td>Index card</td>
<td>White</td>
</tr>
<tr>
<td>#TAs</td>
<td>Markers</td>
<td>Different colors</td>
</tr>
<tr>
<td>#TAs</td>
<td>Discussion design handouts</td>
<td>Orange</td>
</tr>
<tr>
<td>#TAs</td>
<td>The Bloom's Taxonomy handouts</td>
<td>Yellow</td>
</tr>
<tr>
<td>#TAs</td>
<td>Sample syllabi handouts</td>
<td>White</td>
</tr>
<tr>
<td>#Groups</td>
<td>Flipchart paper for discussion scenarios</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>#Groups</td>
<td>Envelopes for discussion roles</td>
<td></td>
</tr>
<tr>
<td>#TAs</td>
<td>Index cards for discussion roles</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Facilitator: red</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Writer: green</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Responder: yellow</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(or all white)</td>
<td></td>
</tr>
</tbody>
</table>

**ROOM CONFIGURATION:** (Describe/show how the room will be set up. The set up below is just a sample to be moved as you like.)

Students sit around the tables and face toward the podium and screen. Have some room on the wall for flip chart paper posting. (Assume that we will use EH2430)

![Room Configuration Diagram]

**PREPARATION:** (What needs to be done by you in advance?)

1. Make scenario posters
2. Prepare the discussion roles card and questions (for facilitators) and put them in different envelopes (one envelopes/group)
3. Add animation to the PowerPoint slides
4. 
5. 

**WORKSHOP SCHEDULE:** Indicate when each portion of the workshop will begin and end.

<table>
<thead>
<tr>
<th>WORKSHOP SCHEDULE</th>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Introduction and brainstorm for successful discussion sessions</td>
<td></td>
<td></td>
<td>12min</td>
</tr>
<tr>
<td>2. Introduction to discussion session, student learning outcome, and how to use active learning in discussion.</td>
<td></td>
<td></td>
<td>5min</td>
</tr>
<tr>
<td>3. Minute paper to design 1 SLOs and design learning activities.</td>
<td></td>
<td></td>
<td>10min</td>
</tr>
</tbody>
</table>
4. Think-pair-share to critique the plan | 8 min
5. Prepare a draft syllabus. | 10 min
6. Handle difficult situations | 25 min

**TOTAL TIME FOR WORKSHOP:** 70 min

**WORKSHOP SEGMENTS:** (Break down each part of the workshop:)

<table>
<thead>
<tr>
<th>PART #1:</th>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Introduction and brainstorm for successful discussion sessions</td>
<td></td>
<td></td>
<td>12 min</td>
</tr>
</tbody>
</table>

**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

In this workshop we will talk about “How to lead a discussion/lab session”. Here at UCI, we usually have discussion/lab sessions for undergraduate courses and these sessions are usually led by TAs. It is one of the main responsibilities of being a TA when you have to actually teach. We have discussed about active learning strategies which address the question of “how to teach?”, and different learning style our students may have which shows us “who are we teaching”. In this workshop, we are going to apply what we have just learned to design a teaching plan of our discussion sessions.

By the end of this workshop you should be able to:

1. You will be able to identify what a discussion session is and the important factors for a successful discussion session
2. You will be able to design 1 student learning outcome (SLO) and design 1~2 active learning activities to achieve the SLO as a mini plan for one of their discussion sessions
3. You will be able to build syllabi for discussion / lab sessions
4. You will be able to know some difficult situations you may encounter and how to handle them in the class and out of the class.

To start off, let’s do a brainstorming session in groups about what leads to a successful discussion. To do this, let’s have form groups of 5 TAs (by counting off or make assignments).

Each group will have a flip chart and one envelope for discussion roles. Each of you, please get one card from the “roles envelope”, and take the role that is designated on that card for the specific question.

If yours has a discussion question on it, you will be the “facilitator”. You need to ask that question to your group, lead the discussion of your group for that question, and keep an eye on the time. If yours says “responder”, you will need to participate in the brainstorming by speaking. If your card says “writer”, you will be writing your group responses on the board as well as the question, and present it to the class later.

You will have 5 minutes to answer the question for your group. Any questions about this activity?

Once everyone in your group has a card, get started.
Give envelopes, flipchart paper, and markers to each group. The TAs will pickup their roles. The “facilitator”s will reading the questions on the cards and have the “Responder”s while the “Writer”s write the responses on the board.

Questions:

1. What does the ideal discussion session look like?
   - Go over homework;
   - Address questions regarding the lecture or concepts;
   - TA demonstration on problem solving;
   - Prepare for /review quizzes or exams;
   - “An ideal discussion section makes each student feel like a vital part of the intellectual fabric of the class. Participation should be expected and your guidance of the discussion should be subtle and responsive to students’ ideas.”
   ...

2. What makes a discussion session successful?
   - Prepare the discussion agenda;
   - Get students evolved in discussion;
   - Clarify confusions;
   - Help the student to develop skills to master the course content;
   - “Discussions are not ideal for delivering information; this is the function of lectures. Discussions are, however, an extremely efficient means for students to learn skills, generate ideas, solve problems, consolidate knowledge, criticize arguments, develop insight, and gain confidence in handling new concepts. Good discussions also allow students to formulate the principles of the subject in their own words.”
   ...

3. What do you need to do as a TA to assure a successful discussion?
   - Set up the goal for the discussion;
   - List the topics to be covered and the points that the students are expected to know;
   - Assemble an arsenal of discussion questions, anecdotes, and analogies;
   - Create visual aids to help students understand difficult concepts;
   - Facilitate and promote discussion;
   - Keep students engaged and the section on track;
   - Handle problematic behavior;
   - “First think about the material in light of your students’ knowledge and experience.
   Second, think of questions that will stimulate them to think about the topics at hand in new and significant ways.
   Third, set objectives and share them with your students. Do you want your students to apply new skills, explore the significance of scholars’ different points of view, learn to analyze the arguments in secondary sources, or become motivated to do research?”
   ...

4. What challenges and difficulties might you run into when leading a discussion?
   - Explain difficult concepts efficiently and effectively;
Connect discussion to the lecture;
A room full of blank stares;
Work with talkative, shy, hostile students;
Late-comers, cell phones, other interruptions;
Emergencies (broken equipment, melting down students, earthquake, fire, etc.);
...

5. How to make the discussion session engaging and productive?
   *Begin the session with an anecdote, a controversy, or a question that grabs the students' attention;*
   *Outline the topics in chronological order;*
   *Use white board / chalk board to demonstrate problem solving;*
   *Go over homework, if appropriate;*
   *Ask questions that students should be able to answer;*
   *Make sure the students are prepared (give pre-discussion assignments);*
   *Summarize the main points of the discussion at the end;*
   ...

Alright, looks like every group have good answers to the question of what an ideal discussion looks like. Now please return to your seats. And let’s take a look at your responses on the flipcharts.

[Handout: Suggestion for Leading Discussion Session Harvard College,
Elements of Effective Class Preparation]

<table>
<thead>
<tr>
<th>PART #2:</th>
<th>BEGIN TIME:</th>
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<tbody>
<tr>
<td>2. Introduction to student learning outcome</td>
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</table>

**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

Okay, now we know what makes a successful discussion session. Let’s move to next part of the workshop to figure out how to make a plan for teaching successful discussion sessions. In this workshop we are going to design a mini teaching plan for the discussion session.

In our previous discussion, we all agree that TAs need to do some preparation to lead a good discussion session. One of the things that we can prepare is to design the student learning outcomes (SLOs) that we wish to achieve in our teaching. Having a well-defined SLO helps us to figure out how to facilitate student learning and how to assess and provide feedback to them. It also helps our students to be able to explain what they can do and what they know.

So what are Student Learning Outcomes? Student learning outcomes or SLOs are statements that specify what students will know, be
able to do or be able to demonstrate when they have completed or participated in a program / activity / course / project. They are usually expressed as knowledge, skills, attitudes or values.

What are the characteristics of a well-defined SLO?

- Make sure the SLO is **student centered**: What is the student doing? Any learning activities can be used? Are those activities aligned with SLOs?
- Keep the SLO’s **concrete and clear**: How specific and active is the SLO?
- **Observable and measurable**: avoid verbs whose meanings are open to a wide range of interpretations like “know, understand, be aware of, and appreciate”. Use specific "action" words in overt behavior that are easy to measure.

The Bloom’s Taxonomy provides some action verbs you can use and instructional strategies to produce the outcome. [Pass out the Bloom’s Taxonomy Table.]

Let’s take a look some examples of SLOs:

1. **TAs will be able to know what student learning outcome (SLO) is and learn how to use it for design a successful discussion session.**
   - Is it student centered? TAs WBAT …
   - Is it concrete and clear? NO, Know, learn, weak words, not specific
   - Is it observable and measurable? NO, How to measure know and learn?

2. **TAs will be able to design 1 student learning outcome (SLO) and design 1~2 learning activities to achieve the SLO as a mini plan for one of their discussion sessions.**
   - Is it student centered? TAs WBAT …
   - Is it concrete and clear? Design the teaching plan
   - Is it observable and measurable? Design a mini teaching plan with 1 SLO and 1~2 learning activities.

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<th>PART #3:</th>
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<tr>
<td>3. Minute paper to design 1 SLOs and design learning activities.</td>
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<td></td>
<td>10min</td>
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</table>

**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

Now that you know what an SLO is, let’s get some practice in writing our own. [Handout: Creating Student Learning Outcomes (SLO)]

In the following 10 minutes, I’d like to first ask you think about one undergraduate course
you wish to teach or one undergraduate course you have taken in your discipline, and think about one concept that you wish to teaching in a discussion session. Please choose one course and one topic for that course which may take 15~20 minutes to teaching in the discussion session.

Then Please develop one SLO for carrying out the discussion topic you’ve just chosen and think about 1~2 learning activities you can use for this SLO. You will have about 10 minutes to complete this on your own.

[Allow TAs 9 minutes to complete the handout. Give notice of “5 minutes left”, “1 seconds left”, “You should work on the SLO now”]

Note: If the TAs cannot come up with the topic for teaching, we can provide them according to their disciplines.

- Topics
  - Biomedical: Neurons (as cables and computers)
  - Chemical and Materials Science: the first law of thermodynamics.
  - Civil and Environmental: Monte Carlo Simulation
  - Electrical Engineering and Computer Science: recursion (programming)
  - Mechanical and Aerospace: Equilibrium of a particle and free body diagrams

### PART #4:

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<tr>
<td>4. Think-pair-share to critique the plan</td>
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<td>8min</td>
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</table>

**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

Okay, now try to pair up with one other TA who is also in your discipline. Let us have a think-pair-share to critique our plans. Please share your SLO and learning activities and assess your partner’s work by filling the SLO feedback handout. You’ll have about 5 minutes to critique each other’s plan.

[Handout: SLO Feedbacks]

Anyone think his or her partner’s plan is awesome? Please share it with us!!

### PART #5:

<table>
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<th>BEGIN TIME</th>
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<tbody>
<tr>
<td>5. Prepare a draft syllabus</td>
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<td>10min</td>
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1 Topics were taken from the 2009-2010 UCI Engineering Course Outlines: [http://undergraduate.eng.uci.edu/handbook/degree/courseoutlines09-10#CBEMS](http://undergraduate.eng.uci.edu/handbook/degree/courseoutlines09-10#CBEMS)
NARRATIVE: Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

You all did a good job to create your SLOs. SLO is a very valuable tool you can use for preparing each discussion session. It makes your time with the students count for as much as possible.

Next, we are going to discuss what we should prepare for the discussion as a quarter long instructional practice instead of the details of specific sessions. What we will do is to have a syllabi that we can present to our students at the beginning of the class to set a tone or give a general picture of the discussion session.

First, on your index card, please write down one thing you think your students should know about your discussion session.

[Hand out index cards to each TA. Give them one minute to write something down.]

Now I will give you a set of sample syllabi that I have created for the class I TAed this summer. Please form a group of four to share your opinions about the syllabi with each other. Try to answer these questions:

1. Do the syllabi have the things you think are important for syllabus?
2. Would you like to add anything else?
3. How do you like the syllabi? Tones, length, comprehensiveness, clarity, etc.

[Handout: Sample TA Syllabus Handout, pass out the handout of the sample TA syllabi.]

[Some additional things that a syllabus can have:

- Attendance Policy
- Late homework policy
- Communication methods: email to the TAs, course messageboard
- Information about Quizzes: how often? Graded or not? Impromptus or scheduled?
- Grading policy
- Lab policy
- Office hours: scheduled or by appointment? Where is the office?
- How to get prepared for discussion / lab sessions?
- …
]

Okay, now let’s see if any group can share their comments and suggestions with us.

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<tr>
<td>7. Handle difficult situations</td>
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<td>25min</td>
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NARRATIVE: Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can
have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

Now we’ve discussed about the syllabus that we can use for the discussion session. We also had a mini teaching plan for discussion. These are the things that you will need to prepare before the discussion.

As TAs, we need to interact with our students both in the classroom, i.e. teach discussion/lab, and outside of the classroom, i.e. office hours.

Office hours are when students can have the opportunity to ask in-depth questions and to explore points of confusion or interest that cannot be fully addressed in class. Although different courses may have different office hour requirements, most of the TAs will be asked to hold about 2~3 office hours every week.

Most of the time for office hours will be taken up by handling the most common issues, that is students coming in with questions about the lecture or homework and us helping them with their questions. The problem solving skills that we’ve practiced in the previous workshop will be the super tool that we will use most commonly during office hours.

However, besides helping students with their questions regarding lectures or homework, we may have some other issues to deal with during office hours. For example, handling grading disputes and even some personal issues from the students. Please realize that office hours are also an opportunity for students to have a more personal interaction with the TAs. We are supposed to be their friends to help them learn better. However, it is also very important for us to be professional. It helps us to work more efficiently and also protect us from getting into trouble.

In the next 25 minutes, we will talk something about the situations you may encounter both in the classroom and out of the classroom. You may not encounter any of the situations that we will discuss here. But we think it would be good to expose you with some of these possible situations so that you can be aware of some ways to handle them appropriately.

I can tell that you are very exhausted for this long day of training. So for this part of the workshop, let’s do something physically active. We posted several difficult situation scenarios on the wall. These situations may happen both in the classroom or outside of the classroom. Please take one marker, walk around the room, write down on the poster what you will do to handle 3~4 of those situations.

In the classroom:

**Scenario #1:**
While leading a discussion, you see and hear two students in the back of the class, giggling. You think they’re making fun of your speaking.

Ask them to move to the front in the classroom.
Engage them into the classroom discussion.
Separate them into different groups for group work.
Speak with them in private to figure out if you said anything wrong or they have any concerns about you leading the discussion. Be polite and try to find an agreeable solution.
Scenario #2:
You’re presenting some information. A student whom you know to be very bright monopolizes the classroom discussion (talkative students)
Be polite, thank them for their contribution, then ask other students to join in the discussion.
Ask the other students to comment on the points raised by the talkative students.
Let students answer questions with speaking tokens.
Speak to the talkative student in private that while their contributions are welcome, it is also important to give other students chances to participate in the discussion. Try to find an agreeable solution together.

Scenario #3:
A student comes to the discussion without preparation and the equipment he/she needs for the class. The student tells you that he/she is having a hard time financially. The student works part-time on work-study and still can’t afford the course materials (book, clicker, lab notebook, etc.)
Place course materials on reserve: Reserve Services houses course-related materials selected by faculty as required or recommended reading for their courses. Materials placed on Course Reserves are available in print or electronic format and include books, journal or newspaper articles, book chapters, and lecture notes.
Check out online versions of the textbook or post course material to the course website.

Scenario #4:
A student comes to you with the following concern, “I need to get into your discussion section, even though it is full, because the only other available one is in the afternoon. I have religious services in the afternoons that I cannot skip.”
From the UCI registrar:
In accordance with California State Education Code section 92640, it is the policy of the Irvine campus that an instructor will make a reasonable attempt to accommodate student needs in the case of serious incompatibility between a student’s religious creed and a scheduled test or examination.
1. Accommodation for alternative examination dates will be worked out directly and on an individual basis between the student and the instructor involved.
2. Students should make such requests of the instructor during the first two weeks of an academic term, or as soon as possible after a particular examination date is announced by the instructor.
3. Students or faculty with questions may contact the associate dean of the appropriate school.

Scenario #5:
Some students are extremely shy or unprepared, and refuse to take part in the class discussion.
Some shy students may not feel comfortable to talk or speak in front of the class. You can break the class into small groups where it is not that intimidating to share opinions or comments.
See if you can encourage them to participate in the discussion. Ask them to comment on another student’s statements, or ask them to lead discussion of a particular topic.
Remind them in private that participation is an important component in their final course grade.
Talk to them to see if there are any special reasons that they don’t get prepared for the discussion.

Scenario #6:
You have your students work in groups. One group is extremely faster that others.
Go over /check their answers / solutions / comments with them while the others are still working.
Ask them to take some additional time to prepare for presenting their work to the class.
Let them join the other groups to help them.
Design small tasks for group work in the classroom.

**Scenario #7:**
While having group discussion or work, some students always stick together in the same group because they are friends.
Tell the students that diversity is good for their academic performance. They should try to work with more people and learn from each other.
Make random groups arrangements: counting off, handing out colored index cards randomly and ask the students who have the same color to be a group.
Still have some group assignment or activity to allow students work with their friends, because they may feel more comfortable and perform better.

**Scenario #8:**
In your discussion session, you find out that some students are facebooking or online chatting or sending text message instead of listening and participating the discussion.
State the policy of laptop / cellphone usage at the beginning of the class.
Ask students with laptops to sit in the back of the classroom so as not to interfere the other students.
Have learning activities to engage them into the discussion and make them use their laptop for learning.

Outside of the classroom:

**Scenario #1: Disturbed Student**
Student is mentally disturbed, agitated, overwhelmed, upset, etc. when they come to talk to you. TA feels threatened or like the student may harm them or themselves.

1. Leave the office door open.
2. Show cares to the disturbed student. Ask if anything is bothering him/her, too much academic/financial pressure, family issues, etc.
3. Guide the student to seek for help, e.g. walk the student to the counseling center, talk with academic advisor about academic difficulties, etc...
4. Inform the instructor if possible.
5. ...

**Scenario #2: Cheating Student**
You are talking with a student who has cheated on her/his midterm exam. The student denies or does not admit any wrong doing whatsoever, but you have proof (you have their exam and the one they copied from). The TA requests that the student come to office hours to discuss his or her exam.

1. Emphasis the importance of academic honesty in the first day of class. Make the students know that there is zero tolerance for academic cheating.
2. I think it is not a good idea to handling cheating students by the TA alone. It is better to inform the instructor about the situation and let him/her talk with the student.

**Scenario #3: TA Crush**
You’re a nice, sweet guy/gal and very warm and open with your students. You feel your students like you, both as a teacher and as a person. There’s a student in your class who comes religiously to all your office hours even if they have no problems. You feel the student wants to have a personal relationship with you outside of class, i.e. be close friends and hang out together.

1. University policy: Individuals in authority are expected to be aware of their professional responsibilities and avoid apparent or actual conflict of interest, favoritism, or bias.
2. Be friend with the students inside of class to facilitate their learning. Don’t hang out with them while you are their TA (in my opinion).
3. If you start a relationship with your student, inform the instructor and try to avoid any possible conflicts of interest.
4. ...

Scenario #4: Last minute “tutoring”
You have a student who always comes to the office hours but only to get help for the homework that is due the next day. He/she never asks for explanation about ideas or concepts but just want to finish the homework.

1. Tell the students to start their homework and seek for helps early.
2. Encourage them to use the course message board or other online tools for questions regarding homework or lectures for efficient communication.
3. Don’t spoon feed the students with the answers of the homework or exams. Instead of telling them how to do, try to help them to figure out the answers by themselves. Help them to develop their problem solving skills.
4. If possible, don’t hold office hours right before the deadline of the homework.

Scenario #5: Grading Dispute
A student comes to every office hour session to contest his/her grade and wants to debate about every little grading point using up too much time, other students are waiting.

1. Be fair and consistent when grading.
2. The TAs may not grade homework. Try to go over the important points but not all the details.
3. ...

Scenario #6: Late Project

1. state the late submission policy in the first day of class
2. talk with the instructor and other TAs for consistency in submission policies.
3. Have one TA or the instructor to accept late submissions.
4. Follow the policy and make sure the students who submit late be aware of it.
Scenario #7: Personal Issues

A student comes to you with a personal problem. She is pregnant and not sure what to do.

1. Make sure the student is OKAY.
2. Try to help them find helps, e.g. go to the counseling center, etc.
3. Walk them to the places where they can find help.

[Allow the TAs to write down their solutions on the poster for about 8 minutes. If they finish earlier, ask them to try one more. Go over with their answers briefly together afterwards.]

Excellent job!

Holding office hours is an important responsibility of being a TA. It is good to be prepared for the course material, be aware of the student needs, and be professional to use the office hour time efficiently and appropriately. Here is a handout for some good practices of office hours that you may refer to.

[Handout: Good Practices for Office Hours]

As the conclusion of this workshop, we had a nice discussion about how to lead a discussion session. We have address the questions about what makes a discussion session successful, what shall we do to prepare for the discussion session, how to make our teaching efficient and effective, and how to handle some difficult situations both in and out of the classroom.

As always, a refresher on what activities you can take away from this workshop:

1. “Brainstorming or discussing with Speaking Tokens”: that was the index cards with roles on them, alternatively you could use coins that each student has to turn in by talking. It’s also a good way to limit over active speakers and encourage quiet students
2. “Think-Pair-Share”: come up with your own idea first and share with a partner to complete it.
3. “Peripatetic activity”: ask students to take a walk in the classroom, answering questions or make comments on posters that are taped on the walls. It is a good way to energize the students and get them more evolved as a class.
TAPDP 2012 Discussion Design I (Minute Paper)

In this workshop, you will work on and refine plans for a discussion that you will be able to lead one day. In preparation for this process, please answer the questions below.

Your Name: __________________________________________________

1. What is a tentative title for the undergraduate course you intend to work on?

2. What level of student will the course be aimed at (check all that apply)?
   - First years
   - Majors
   - Sophomores
   - Non-majors
   - Juniors
   - Seniors

3. Please write down one concept / topic you think that is important for this course and can be discussed in no more than 20 minutes.

[Adapted from C O'Neal “Course Design Pre-assignment” US390A, Spring 2012]
Creating Student Learning Outcomes (SLO)

Imagine that you are covering the topic / concept in “TAPDP 2012 Discussion Design I” in your next discussion section. Please develop one SLO for carrying out that discussion.

- List SLOs that you would like students to come away with after participation in a discussion about the above topic:

  Make sure your SLOs are:
  - Concrete
  - Specific
  - Phrased in terms of observable behaviors
  - Aligned with activities

SLO: ____________________________________________________________

  Observable behavior:

Aligned activity 1:

Aligned activity 2:
TAPDP 2012 Discussion Design III (Think-pair-share)

SLO Feedback
Give feedback about whether the SLO is in line with the topic, is observable, and if the activity would help the students achieve the outcome.

Feedback:
• In line with topic?

• Observable and measurable behaviors? What are they?

• Activity will help student achieve outcome? How?
### The Bloom's Taxonomy of the Cognitive Domain - Educational Objectives

[source: www.google.com]

<table>
<thead>
<tr>
<th>LEVEL</th>
<th>DEFINITION</th>
<th>SAMPLE VERBS</th>
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<tbody>
<tr>
<td>REMEMBERING</td>
<td>Student is able to recall or recognize ideas, information, and principles that were learned.</td>
<td>Write, List, Label, Describe, State, Find, Define</td>
</tr>
<tr>
<td>UNDERSTANDING</td>
<td>Student is able to explain and comprehend ideas and concepts based on prior learning.</td>
<td>Summarize, Paraphrase, Compare, Illustrate, Infer, Interpret</td>
</tr>
<tr>
<td>APPLYING</td>
<td>Student is able to select, transfer, and use data and principles to complete a task or solve a problem in another familiar situation.</td>
<td>Compute, Solve, Implement, Demonstrate, Apply, Construct</td>
</tr>
<tr>
<td>ANALYZING</td>
<td>Student is able to break down knowledge into parts to explore understandings and relationships; sees how parts relate to each other and an overall structure/purpose.</td>
<td>Analyze, Deconstruct, Compare, Contrast, Distinguish, Differentiate, Organize</td>
</tr>
<tr>
<td>EVALUATING</td>
<td>Student is able to justify a decision or course of action through assessing and critiquing ideas and concepts using specific standards and criteria.</td>
<td>Recommend, Critique, Judge, Hypothesize</td>
</tr>
<tr>
<td>CREATING</td>
<td>Student is able to develop, integrate, and combine ideas into a product, plan or way of viewing things that is new to him or her.</td>
<td>Construct, Design, Theorize, Invent, Synthesize</td>
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Adapted from
EECS 10
Computational Methods in Electrical and Computer Engineering
Summer Session I 2012

Teaching Assistant: Weiwei Chen
Email: weiwei.chen@uci.edu
Office Hours: Tuesday, 1:00 – 1:50 pm or by appointment

Discussion Syllabus

Discussion Time: Tu, Th 1:00 - 1:50 pm
Discussion Location: PSCB 140

What will be covered in the discussion session?
1. How to design the homework program
2. Address questions regarding lecture or concepts

At the end of each discussion session, students should be able to...
1. Identify the input and output of the homework program
2. List the concepts that will be used in the homework program
3. Construct the control flow of the homework program

Guidelines
1. Come prepared! Read the homework assignment!
2. We will focus on the homework in discussion sessions. I will not repeat the concepts in the lecture.
3. We will have a lot learning activities to help you develop the critical thinking ability of how to design a program. Classroom participation is highly encouraged and expected!
4. Attendance is not mandatory!
Lab Syllabus

Lab Time: Tu, Th 2:00 - 2:50pm
Lab Location: MSTB 224

By the end of each lab session, students will be able to...
1. Write their homework program
2. Discover the bugs in their program and identify the ways to fix them

Guidelines
1. No food or drink in the lab!
2. Facebook, gmail, and twitter are not to be used during lab!
3. You will write your own program but discussion with your fellow students is encouraged.
4. Try to keep quiet as a courtesy to the other students in the lab.
5. No additional assignments for the lab! There may be some lab practices to facilitate active learning but will not be graded at all.
6. Attendance is not mandatory!

Homework Policies
1. Submission deadline is strict: Monday 11pm. Late submission will not be accepted.
2. The C source file should state your name and exercise number as a comment at the top of the file.
3. Use the exact file names as what is stated in the homework assignments
4. Homework must be turned in electronically by using the “turnin” script for EECS10.

Other Policies
1. Please post course or homework related questions to the course messageboard. We will monitor it and try to respond as often as possible.
2. Please send grading concerns or other administrative issues to the email account: eecs10@eecs.uci.edu, which will notice both the professor and the TA.
3. Email is an acceptable form of communication. However, emails sent over the weekend may not be answered until Monday and emails sent after 9pm may be answered the next morning.
4. Please email me if you need help out of the discussion / lab sessions.

Have fun for C programing!
Good Practices for Office Hours

- Encourage students to make time for office hours.
- Hold office hours at the same location and time each week.
- Bring paper, pen, markers, text book, calculator, and supplemental texts or manuals with you to your office hours.
- Anticipate the questions you will get and think of solutions in advance.
- Assist students with their understanding by asking them which specific portion of the problem they are having trouble with.
- Keep track of common student mistakes and errors so you can address them with the whole class during discussion or post it to the EEE Message board.
- Politely inform student who run into you at non-office hour times (at the ARC or Starbucks, for example) that you prefer if they come to your office hours or send you an email instead.
- Refer emotionally distressed students to the UCI Counseling Center, (http://www.counseling.uci.edu/) or (949) 824-6457).
- Refer students seeking tutoring beyond what you can or are willing to provide to the Learning and Academic Resource Center (LARC) (http://www.larc.uci.edu/) or (949) 824-6451).
- Refer suspected cheating cases to the course instructor and be familiar with the UCI Academic Honesty Contract (http://honesty.uci.edu/).

What NOT to do...

- Do NOT show up late or leave early even if students do not show up.
- Do NOT hold office hours at the same time, i.e. if your hours are 2-3pm on Tuesday make the second set from 4-5pm on Wednesday to give students who may have a scheduled class at one of the times an opportunity to come talk to you.
- Do NOT devote an entire office hour to a single student. Be mindful of other students waiting for your help. Ask if any have the same question so you can address it at one time.
- Do NOT hold office hours in “threatening” locations such as Anthill Pub or the back corner of the library. Keep your office door open. Be mindful of your officemates if you decide to hold your office hours at your desk.
- Do NOT put down or insult the professor in front of the students. Do NOT agree with student complaints about the instructor. This is unprofessional.
- Do NOT try to counsel an emotionally distressed student beyond what you feel comfortable with. You can console the student but for real advice and emotional support, the student should go to the counseling center.
- Do NOT engage in a romantic relationship with your students (UCI Faculty Code of Conduct, Article II, Section A, 6).
**WORKSHOP09 “Microteaching”**

| NAMES: | Weiwei Chen |
| DEPARTMENT(S) THAT THIS WORKSHOP IS AIMED AT: | Henry Samueli School of Engineering |

**TOPIC:**
Microteaching

**ABSTRACT:** If you were a new PF looking for a workshop on the above topic, what kind of a description of this workshop would help you to get a good sense of what this workshop entails?

In this workshop, the TAs will practice teaching a topic in 5 minutes and use one active learning strategy. The TAs will be divided into groups. While on TA is teaching, the rest of them will play as the students and give feedback to the teaching one afterwards.

**LEARNING OUTCOMES:** What should the TAs be able to do & know by the end of this workshop? Note that TAs wbat = TAs will be able to... (Suggestion: Try to have only 1-3 outcomes.)

| TAs wbat... | Apply and incorporate active learning method into their teaching |
| TAs wbat... | Practice teaching in front of their fellow TAs |
| TAs wbat... | Identify their strength and weakness in teaching |

**STEPS TOWARD TAs ACHIEVING LEARNING OUTCOME # 1:** What will the TAs do to help them to achieve the learning outcome, above? (Suggestion: you can have as many steps along the way as you feel appropriate.)

| TAs will... | Randomly pickup on teaching topic and one active teaching strategy |
| TAs will... | Make a teaching plan to teach the topic in 5 minutes using the selected teaching strategy |

| TAs will... | Do microteaching in front of their peers |

**STEPS TOWARD TAs ACHIEVING LEARNING OUTCOME # 1:** What will the TAs do to help them to achieve the learning outcome, above? (Suggestion: you can have as many steps along the way as you feel appropriate.)

| TAs will... | Write down their critiques and praises about their fellow TA’s teaching |
| TAs will... | Read the feedback from their fellow TAs and reflect on their teaching |
RESEARCH SUPPORTING THIS WORKSHOP: What research has been done in this area? List two articles that (preferably) offer research-backed conclusions about best practices in this area. At least one of the articles should have some disciplinary commonality with your TA groups(s).

**Article One (w/ summary)**

http://findarticles.com/p/articles/mi_qa3673/is_2_127/ai_n29321093/?tag=content;col1

This paper studies 74 prospective teacher’s perspectives on Microteaching Lesson Study (MLS) over four sections of the course. The prospective teachers work in cooperative groups in cycles of planning, teaching, reflecting, and revising lessons. Data shows that MLS is a worthwhile learning experience, in particular, the prospective teachers felt it is important to connect theory to practice, collaboration, and reflection. They valued the alternate points of view and feedback resulting from collaboration with their peers and recognized the benefits of reflection in learning to teach.

**Article Two (w/ summary)**

http://findarticles.com/p/articles/mi_qa3673/is_4_121/ai_n28860296/

Quantitative and qualitative feedback is provided by pre-service teacher education students toward microteaching. Survey rating results show strong support and appreciation for this hands-on learning approach, while individuals indicated that the microteaching experience was a very effective method of Earning. Included in the findings are perceptions on the use of videotaping as an evaluation tool, using peer evaluation to provide feedback to students, the effects of microteaching on planning and teaching future lessons, and identified teaching strengths and weaknesses.

SUPPLIES NEEDED:

<table>
<thead>
<tr>
<th>QUANTITY:</th>
<th>ITEM NAME:</th>
<th>COLOR/SPECIFICS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Envelopes for microteaching assignments (1 for the topics, 6 for teaching strategies)</td>
<td></td>
</tr>
<tr>
<td>#TAs/6 +2 for each topic</td>
<td>Handouts for microteaching topic assignment</td>
<td>Blue for topic 1 Yellow for topic 2 Green for topic 3 Orange for topic 4 Purple for topic 5 Grey for topic 6</td>
</tr>
<tr>
<td>#TAs + 2</td>
<td>Handouts for microteaching strategy assignment</td>
<td>White</td>
</tr>
<tr>
<td></td>
<td>Table label holders</td>
<td></td>
</tr>
</tbody>
</table>
#TAs

<table>
<thead>
<tr>
<th>#TAs</th>
<th>Index cards for feedback</th>
<th>white</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Bell rings for timing notification / colored index cards</td>
<td>Red, yellow</td>
</tr>
<tr>
<td>6</td>
<td>Timers</td>
<td></td>
</tr>
<tr>
<td>#TAs * #Group members</td>
<td>Peer evaluation paper</td>
<td>white</td>
</tr>
</tbody>
</table>

**ROOM CONFIGURATION:** (Describe/show how the room will be set up. The set up below is just a sample to be moved as you like.)

Rows of desks facing the front, unless there is a request from a TA to change the set-up for their microteaching.
We need computers and projector in each classroom for the TAs who will “use technology” in their teaching.

**PREPARATION:** (What needs to be done by you in advance?)

1. Divide TAs in groups with color stickers
2. Write down feedback guidelines on flip chart paper
3. 
4. 

**WORKSHOP SCHEDULE:** Indicate when each portion of the workshop will begin and end.

<table>
<thead>
<tr>
<th>WORKSHOP SCHEDULE</th>
<th>BEGIN TIME</th>
<th>END TIME</th>
<th>TOTAL TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Microteaching assignment and closing for Day1</td>
<td>20min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Welcome to Day2, form microteaching groups and walk to the new room</td>
<td>10min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Microteaching in groups</td>
<td>80min</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL TIME FOR WORKSHOP:** 10 + 90 min

**WORKSHOP SEGMENTS:** (Break down each part of the workshop:)

<table>
<thead>
<tr>
<th>PART #1</th>
<th>BEGIN TIME</th>
<th>END TIME</th>
<th>TOTAL TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Microteaching assignment and closing for Day1</td>
<td></td>
<td></td>
<td>20min</td>
</tr>
</tbody>
</table>

**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

In the last 20 minutes, let us prepare something for tomorrow. Here is the schedule for tomorrow, we are going to have workshops for microteaching, EEE tools, Campus Resources, Wrap up for TAPDP and TA Union.

As you can see, tomorrow we are going to be devoting a good portion of our time to Microteaching. From previous year’s feedback, it seems that the microteaching workshop
has been the most rewarding for TAs.

Microteaching means that you will be teaching your fellow TA’s on a topic of your choosing for 5 minutes. So tonight, you will need to do a bit of homework but I would like to give you a head start right now.

Here is an envelop with some college level mathematic topics. Please pass the envelop around. Each of you please take one piece of paper from it. If you have a blue paper please come to table blue (1), yellow to table yellow (2), green to table green (3), orange to table orange (4), purple to table purple (5), and grey to table grey (6).

Now you are sitting with the TAs who have the same topic in the same table. Please pick up one paper from this envelop. You will be asked to use the active learning method that is described on the paper in your teaching. Once you have the active learning method paper, please take about 3~4 minutes to read the your topic and think about the question on the white paper.
[Let the TAs work for about 3~4 minutes]

Okay, we give you the topics for microteaching since it may be difficult and time consuming for you to come up with a topic that fits to 5 minutes. However, we don’t want to tie your hands. If you have something you really love and feel it is great for teaching in 5 minutes, you are more than welcome to use your own topics. But, please use the active learning strategy you have just picked.

So if you have not finished designing your teaching plan, please take sometime tonight to prepare for the microteaching. Tomorrow, you should be ready to present!

Lastly, let’s take a few minutes to reflect on what we have covered today with some Muddiest Card. On the index card, write down one question you still have about something we went over today. Tomorrow morning I will address the concerns as best I can.

Before you leave, please write down the number of the topic and name of the active learning method that you picked up on the back of your nametag.

When you finished muddiest card, please give your card and nametag to me and I’ll see you tomorrow!

Note: In last year’s TAPDP we asked the TAs to come up one topic about their research for microteaching. I feel that actually it is a little bit difficult to discuss research in 5 minutes with learning activities. Even the TAs come from the same department, it could be also difficult for them to understand the research topic in different areas in just 5 minutes. So we plan to provide the topics to the TAs for microteaching to save their pain in thinking about what to teach. The topics we chose are simple college level math problems which engineering grad students should be familiar with. Moreover, the TAs have the freedom to use their favorite topic if they have one.
Also in last year’s TAPDP, most of the TAs use interactive lecture as the active learning method in their teaching. We hope that they can try the other methods that are also very suitable for 5-minute teaching, e.g. think-pair-share, minute paper, etc. So we decide to push them a little bit by assigning the active learning strategy. We will put the TAs with the same topic in the same group. It would be interesting to see them teach the same topic with different teaching strategies.

The TAs may feel difficult to use the assigned learning method in their teaching. We can help them when they work on the teaching plan paper or after the workshop.

<table>
<thead>
<tr>
<th>PART#2:</th>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Welcome to Day2, form microteaching groups and walk to the new room</td>
<td></td>
<td></td>
<td>10min</td>
</tr>
</tbody>
</table>

**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

Welcome back for TAPDP. Today, we are going to do a lot of practical things including microteaching, implementing EEE tools, and exploring campus resources.

The first workshop for this morning is microteaching. The purpose of the microteaching session is to give you all a chance to practice your teaching since “Practice Makes Perfect!”

Due to the limited time we have, we are going to do the microteaching in groups. Today we have our utility PFs here to help us with the microteaching. They all have great experience of TAing and have been taking an intensive training on teaching. Let’s first have them make an introduction to themselves.

[We will put the TAs in different groups to do the microteaching. Preferably, there are 8~9 TAs in one group. Then we will need about ceiling(#TA/(8~9)) utility PFs for help.]

Before we move to the classroom for microteaching, I would like to make a remark on the scheduling of today. After this workshop, we will have a 15 minutes break from 10:30 to 10:45. We will have our next workshop in the computer lab instead of being here. So please go to the computer lab before 10:45 so that we can start on time.

Now please take a look at the color sticker on your nametag and go to the room assigned for your group with your PF.

[In each microteaching group]
You have been assigned a topic and one active learning method to use in your microteaching. We will practice our teaching one by one here. While one is teaching, the rest of us will play as the students to interact with the teacher and give our feedbacks afterwards.

We will be rotating the timekeeper positions, after your presentation you will become the time keeper. The timekeeper needs to indicate when 1 minute, 30 sec, and times-up. We
need to be really strict with keeping time, so we don’t run over, the timekeeper will have to cut you off if you go over. Please don’t take it personally.

After each presentation we will fill out the feedback paper for the presenter.  
[Optional: I listed several points for good feedback here on the flip char paper:  
  Feedback should be…..
  1. Facts based on observation- Use words like, “I saw...” or “I noticed...”
  2. Specific- give examples or quotations
  3. Focused on changeable behaviors- for example, being on time, making eye contact, speaking slowly
  4. Simple and to the point.
  5. Helpful!- when you give feedback, ask yourself, “Am I bring helpful?”
  6. Addressed by the recipient- to share reactions about what was helpful and what wasn’t.
]

Let us practice teaching and giving feedback to each other to sharpen our ability to teaching together.

While we are completing the cards, I will ask the presenter to reflect on how they think they did- giving one thing they think they did well and one way they think they can improve.

I will be the timekeeper first. And now let’s welcome our first presenter.

<table>
<thead>
<tr>
<th>PART #3:</th>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microteaching</td>
<td></td>
<td></td>
<td>80min</td>
</tr>
</tbody>
</table>

**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

**Note:** Please remind the TAs to meet in the computer lab after the break at the end of the workshop!!

[Run through each presentation and feedback, rotating the timekeeper role]  
10 TAs x (5 mins presentation + 2 mins feedback + 1 min transition) = 80 mins

Pass the feedback paper to the presenter.

Micro-teaching Peer Evaluation Handout
Microteaching

Please design a plan for teaching the following topic in 5 minutes. Try to incorporate the teaching strategy that you picked up today. You will practice your teaching in front a group of fellow TAs and the PF tomorrow in the microteaching workshop.

**Topic 1:**

**How to square numbers ending in 5?**

**Solution:**

\[
\begin{align*}
5 \times 5 &= 25 = (0 \times 1)25 \\
15 \times 15 &= 225 = (1 \times 2)25 \\
25 \times 25 &= 625 = (2 \times 3)25 \\
35 \times 35 &= 1225 = (3 \times 4)25 \\
105 \times 105 &= 11025 = (10 \times 11)25
\end{align*}
\]

1. The square always ends with 25.
2. Assume we want to get the square of \(a \times 10 + 5\) (\(a = 0, 1, \ldots\)), the square of it will be \(a(a+1)*100 + 25\).

**Proof:**

\[
(a \times 10 + 5) \times (a \times 10 + 5) = a^2 \times 100 + 2 \times a \times 10 \times 5 + 25 = a(a+1) \times 100 + 25 = a(a+1)25
\]

More details can be found from: [http://www.wikihow.com/Square-Numbers-Ending-in-5](http://www.wikihow.com/Square-Numbers-Ending-in-5)
**Microteaching**

Please design a plan for teaching the following topic in 5 minutes. Try to incorporate the teaching strategy that you picked up today. You will practice your teaching in front a group of fellow TAs and the PF tomorrow in the microteaching workshop.

**Topic 2:**
**How to determine a prime number?**

**Solution:**
Definition of a prime number: A number is prime if it has no divisors other than itself and one.

**Trial division**

1. Let $n$ be the number you want to test.
2. Divide $n$ by 2. If the result is an integer, then $n$ is not prime because 2 is a factor of $n$. Look at the last digit and if it's an even number, it's divisible by 2. If not, continue.
3. Divide $n$ by 3. If the result is an integer, then $n$ is not prime because 3 is a factor of $n$. If not, continue.
4. Continue dividing $n$ by each number between 2 and $n-1$ inclusive. If any of them divide evenly, then $n$ is not prime because you found a factor. If $n$ has no factors less than its square root, then $n$ is prime.
5. It is sufficient to check only for divisors less than or equal to $n^{(1/2)}$ because if $n = a*b$, then $a$ and $b$ can't both exceed the square root of $n$.

Maybe you can also show/ask the students how to write a computer program to check the primality.

More details can be found from: [http://www.wikihow.com/Square-Numbers-Ending-in-5](http://www.wikihow.com/Square-Numbers-Ending-in-5)
Microteaching

Please design a plan for teaching the following topic in 5 minutes. Try to incorporate the teaching strategy that you picked up today. You will practice your teaching in front a group of fellow TAs and the PF tomorrow in the microteaching workshop.

**Topic 3:**
**How to solve a system of two linear equations?**

**Solution:**

In a two variable case of a linear equation system, it looks like:

\[ ax + by = e \text{ (eq1)} \]
\[ cx + dy = f \text{ (eq2)}, \]
where a, b, c, d, e, f are given numbers, and x and y are the unknowns. Assume that a, b are both not zero, and c, d are not both zero.

**Method 1:**

1. To solve for x, multiply the first equation by d and the second equation by b, then subtract, to get \((ad - bc)x = de - bf\).
2. To solve for y, multiply the first equation by c and the second equation by a, then subtract, to get \((ad - bc)y = af - ce\).
3. If \(ad - bc \neq 0\), divide both equations by \(ad - bc\) to get \(x = (de - bf)/(ad - bc)\), and \(y = (af - ce)/(ad - bc)\).
4. If \(ad - bc = 0\), and \(c \neq 0\), let \(k = a/c\), so \(a = ck\). Substitute into \(ad = bc\) to get \(cdk = cb\), or \(dk = b\) (since \(c \neq 0\)). If \(c = 0\), \(d \neq 0\) by assumption above, so let \(k = b/d\), or \(b = dk\).

Substitute into \(ad = bc\) to get \(ad = cdk\), or \(a = ck\). If \(k = 0\), then \(a = b = 0\), contrary to assumption. So \(k \neq 0\). Multiply Eq. 2 by \(k\), to get \(ckx + dky = kv\), or \(ax + by = kv\).

If \(u = kv\), then this is the same as Eq. 1, in which case the system has **infinitely many solutions** \((x, y)\) that satisfy the first equation.

If \(u \neq kv\), then \((x, y)\) satisfying the first equation will not satisfy the second, and the system has **no solution**.

5. **Summary:**

If there is no number \(k\) such that \(a = ck\) and \(b = dk\), then the system of 2 linear equations has a unique solution, given by \(x = (du - bv)/(ad - bc)\), and \(y = (av - cu)/(ad - bc)\). This is analogous to two straight lines intersecting at one point.

If there is a number \(k\) such that \(a = ck\) and \(b = dk\), and \(u = vk\), then the system of 2 linear equations has infinitely many solutions. This is analogous to two straight lines that coincide.

If there is a number \(k\) such that \(a = ck\) and \(b = dk\), and \(u \neq vk\), then the system of 2 linear equations has no solution at all. This is analogous to two straight lines parallel to each other.

**Method 2: Cramer’s Rule**
Cramer’s rule (source: http://en.wikipedia.org/wiki/Cramer%27s_rule) is a theorem in linear algebra devised by Gabriel Cramer to calculate the solution of a system of linear equations by using determinants.

In a two variable case:

\[ ax + by = e \]
\[ cx + dy = f, \]

which in matrix format is

\[
\begin{bmatrix}
    a & b \\
    c & d
\end{bmatrix}
\begin{bmatrix}
    x \\
    y
\end{bmatrix} =
\begin{bmatrix}
    e \\
    f
\end{bmatrix}
\]

\[
x = \frac{\begin{vmatrix} e & b \\ f & d \end{vmatrix}}{\begin{vmatrix} a & b \\ c & d \end{vmatrix}} = \frac{ed - bf}{ad - bc}
\]

\[
y = \frac{\begin{vmatrix} a & e \\ c & f \end{vmatrix}}{\begin{vmatrix} a & b \\ c & d \end{vmatrix}} = \frac{af - ec}{ad - bc}
\]

And

\[
\begin{vmatrix} a & b \\ c & d \end{vmatrix} = 0,
\]

Finally, there is an exception in Cramer’s rule when the determinant \( \begin{vmatrix} a & b \\ c & d \end{vmatrix} \), the Cramer’s rule cannot be applied (The denominator is 0 and the division is meaningless).

**Note:** You can decide which method to teach. You can use the other method as contingency plan. Or you can teach your own method to solve this problem.

More details can be found from: http://www.wikihow.com/Solve-a-System-of-Two-Linear-Equations
Microteaching

Please design a plan for teaching the following topic in 5 minutes. Try to incorporate the teaching strategy that you picked up today. You will practice your teaching in front a group of fellow TAs and the PF tomorrow in the microteaching workshop.

Topic 4:
How to solve quadratic equation?

Solution:
A quadratic equation is a type of mathematical equation where the highest power of $x$ (degree of the equation) is two.
It looks like: $ax^2 + bx + c = 0$ $(a \neq 0)$.

Method 1: Using factoring
1. Factoring the expression
2. Set each factor equal to zero as separate equations
3. Solving each equation independently.

For example: $3x^2 - 11x - 4 = 0$
1. $3x^2 - 11x - 4 = (3x + 1)(x - 4)$
2. $3x + 1 = 0; x - 4 = 0$.
3. $x = -1/3$ and $x = 4$.

Method 2: Using the Quadratic Formula
The root of the quadratic equation $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$, where $b^2 - 4ac \geq 0$.

For example: $3x^2 - 11x - 4 = 0$
$a = 3, b = -11, c = -4 \ \Rightarrow \ x = \frac{-(11) \pm \sqrt{(-11)^2 - 4\times3\times(-4)}}{2\times3} = \frac{11 \pm \sqrt{121}}{6} = \frac{11 \pm 13}{6} = -1/3$ or $4$

Note: You can decide which method to teach. You can use the other method as contingency plan. Or you can teach your own method to solve this problem.

More details can be found from: [http://www.wikihow.com/Solve-Quadratic-Equations](http://www.wikihow.com/Solve-Quadratic-Equations)
Microteaching

Please design a plan for teaching the following topic in 5 minutes. Try to incorporate the teaching strategy that you picked up today. You will practice your teaching in front a group of fellow TAs and the PF tomorrow in the microteaching workshop.

**Topic 5:**
**How to do matrices multiplications?**

**Solution:**

1. Check that the matrices can actually be multiplied together. For a product of two matrices to exist the number of columns of the first matrix must be equal to the number of rows of the second matrix.
2. Imagine that the rows of the first matrix and the columns of the second matrix have been replaced with lines (note that these are lines, not line segments, and so should extend beyond the matrix) and then placed one on top of the other.
3. Select one of the points where the lines cross. This will be one of the elements of the product of the two matrices.
4. Multiply the first element in the corresponding row by the first element in the corresponding column, the second element in the row by the second element in the column and so on.
5. Add the resulting products together to give the value of that element.

\[ \begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \end{bmatrix}_{2x3} \times \begin{bmatrix} b_{11} \\ b_{21} \\ b_{31} \end{bmatrix}_{3x2} = \begin{bmatrix} a_{11} \times b_{11} + a_{12} \times b_{21} + a_{13} \times b_{31} \\ a_{21} \times b_{11} + a_{22} \times b_{21} + a_{23} \times b_{31} \end{bmatrix}_{2x2} \]

For example:

\[ \begin{bmatrix} 1 & 1 & 1 \\ 2 & 2 & 2 \end{bmatrix}_{2x3} \times \begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{bmatrix}_{3x2} = \begin{bmatrix} 9 & 12 \\ 18 & 24 \end{bmatrix}_{2x2} \]

**Note:** You can use any examples to demonstrate or ask the students to do an exercise.

More details can be found from: [http://www.wikihow.com/Solve-Quadratic-Equations](http://www.wikihow.com/Solve-Quadratic-Equations)
Microteaching

Please design a plan for teaching the following topic in 5 minutes. Try to incorporate the teaching strategy that you picked up today. You will practice your teaching in front of a group of fellow TAs and the PF tomorrow in the microteaching workshop.

Topic 6:  
What is recursion?

Answer:

Recursion is the process of repeating items in a self-similar way.

The most common application of recursion is in mathematics and computer science, in which it refers to a method of defining functions in which the function being defined is applied within its own definition.

Specifically this defines an infinite number of instances (function values), using a finite expression that for some instances may refer to other instances, but in such a way that no loop or infinite chain of references can occur. The term is also used more generally to describe a process of repeating objects in a self-similar way.

In mathematics and computer science, a class of objects or methods exhibit recursive behavior when they can be defined by two properties:

1. A simple base case (or cases), and
2. A set of rules which reduce all other cases toward the base case.

For example, the following is a recursive definition of a person's ancestors:

One's parents are one's ancestors (base case).
The parents of one's ancestors are also one's ancestors (recursion step).

The Fibonacci sequence is a classic example of recursion:

\[ \text{Fib}(0) = 0 \] [base case]
\[ \text{Fib}(1) = 1 \] [base case]
For all integers \( n > 1 \): \( \text{Fib}(n) = (\text{Fib}(n-1) + \text{Fib}(n-2)) \) [recursive definition]

Note:

Another recursion example: get the factorial of non-negative integer \( n \)

\[
\text{factorial}(0) = 1; \\
\text{factorial}(1) = 1; \\
\text{For all integers } n > 1: \text{factorial}(n) = n * f(n-1);
\]

A more humorous illustration goes: "To understand recursion, you must first understand recursion."

More details can be found from: [http://en.wikipedia.org/wiki/Recursion](http://en.wikipedia.org/wiki/Recursion)
Microteaching

Please use incorporate the following active learning teaching strategy into your teaching on the topic you have picked up.

**Think-Pair-Share:** have students work individually on a problem or reflect on a concept. Students then compare their responses with a partner and synthesize a joint solution to share with the entire class.

How would you carry out this active learning method in the context of the topic you are going to teach?
Microteaching

Please use incorporate the following active learning teaching strategy into your teaching on the topic you have picked up.

**Minute Paper:** a writing activity that you state the topic to review or question to address and let the students write down their answers on the paper. It is could be like “pause and reflection” which includes writing and reflection.

How would you carry out this active learning method in the context of the topic you are going to teach?
Microteaching

Please use incorporate the following active learning teaching strategy into your teaching on the topic you have picked up.

Technology in the Classroom: Teach by using technologies, e.g:

- Use digital educational tools
  For example, you can find a lot of tools from Google Apps in Higher Education [https://docs.google.com/present/view?id=ddv49vkt_237c3m4brcc](https://docs.google.com/present/view?id=ddv49vkt_237c3m4brcc)

- Use learning management systems
  For example, EEE tools of UCI [https://eee.uci.edu/](https://eee.uci.edu/)

- Use Web-based teaching material

- Teaching with “Clickers”

- PowerPoint presentation
  Remember to have the slides which are helpful for both visual and verbal students

- etc.

How would you carry out this active learning method in the context of the topic you are going to teach?
Microteaching

Please use incorporate the following active learning teaching strategy into your teaching on the topic you have picked up.

**Small group brainstorm / discussion:** ask students to collaborate for group projects or learning cooperatively.

How would you carry out this active learning method in the context of the topic you are going to teach?
Microteaching

Please use incorporate the following active learning teaching strategy into your teaching on the topic you have picked up.

**Interactive Lecture:** engage students by finding ways for them to interact with the content, the instructor, and their classmates, e.g. asking questions and solicit answers from the students while teaching.

How would you carry out this active learning method in the context of the topic you are going to teach?
Microteaching Peer Evaluation Paper

Instructor’s Name: _______________ Observer’s Name: __________________

What is the teaching strategy did the instructor use? Is it effective?

Please write down 1~2 strengths of the instructor’s teaching (something you particularly liked):
1. 

2. 

Please write down 1~2 constructive critiques for the instructor’s teaching (a concrete suggestion for the instructor):
1. 

2. 

WORKSHOP10 “EEE Tools and Campus Resources”

**NAME:**  Weiwei Chen

**DEPARTMENT(S) THAT THIS WORKSHOP IS AIMED AT:** Henry Samueli School of Engineering

**TOPIC:** EEE tools and Campus Resources

**ABSTRACT:** If you were a new PF looking for a workshop on the above topic, what kind of a description of this workshop would help you to get a good sense of what this workshop entails?

The TAs will sit in a computer lab for this workshop. They will practice using the EEE tool for course management and play an online scavenger hunt to figure out the campus resources that they can use in the future. 
(Adapted for Sarah Hernandez “EEE tools” and “Campus Resources”, TAPDP 2011.)

**LEARNING OUTCOMES:** What should the TAs be able to do & know by the end of this workshop? Note that TAs wbat = TAs will be able to…  (Suggestion: Try to have only 1-3 outcomes.)

<table>
<thead>
<tr>
<th>TAs wbat...</th>
<th>Practice using the EEE tools to manage the course</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAs wbat...</td>
<td>Recognize the variety campus resources available to help students and direct the students to the campus resource website or office locations.</td>
</tr>
<tr>
<td>TAs wbat...</td>
<td>List and describe the campus resources available to help TAs.</td>
</tr>
</tbody>
</table>

**STEPS TOWARD TAs ACHIEVING LEARNING OUTCOME # 1:** What will the TAs do to help them to achieve the learning outcome, above? (Suggestion:  you can have as many steps along the way as you feel appropriate.)

<table>
<thead>
<tr>
<th>TAs will...</th>
<th>Work in pairs to implement 5 EEE tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAs will...</td>
<td>Play an Internet campus resources scavenger hunt</td>
</tr>
<tr>
<td>TAs will...</td>
<td>Play an Internet campus resources scavenger hunt</td>
</tr>
</tbody>
</table>
RESEARCH SUPPORTING THIS WORKSHOP: What research has been done in this area? List two articles that (preferably) offer research-backed conclusions about best practices in this area. At least one of the articles should have some disciplinary commonality with your TA groups(s).

| Article One (w/ summary) | Susan Manning, Kevin Johnson, “The Technology Toolbelt for Teaching”, Jossey-Bass, An Imprint of Wiley, 2011. Instructors are under pressure to integrate technology into their traditional or online instruction, but often they aren't sure what to do or why they should do it. This book offers instructors a down-to-earth guide to common technologies, explains the pedagogical purposes they serve, and shows how they can be used effectively in online or face-to-face classrooms. |
| Article Two (w/ summary) | Kamla Ali Al-Busaidi, Hafedh Al-Shihi, “Key Factors to Instructors’ Satisfaction of Learning Management Systems in Blended Learning”, Journal of Computing in Higher Education, v24 n1 p18-39 Apr 2012. Learning Management System (LMS) enables institutions to administer their educational resources, and support their traditional classroom education and distance education. This study examined the key factors that influence the instructors' satisfaction of LMS in blended learning, and how this satisfaction is related to their intention to continuously use LMS in blended learning and purely for distance education. |

SUPPLIES NEEDED:

<table>
<thead>
<tr>
<th>QUANTITY</th>
<th>ITEM NAME:</th>
<th>COLOR/SPECIFICS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEE tool implementation task handouts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EEE tool implementation screen shots</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online campus resources scavenger hunt handouts</td>
<td>Green</td>
<td></td>
</tr>
<tr>
<td>Online campus resources scavenger hunt solutions</td>
<td>white</td>
<td></td>
</tr>
</tbody>
</table>

ROOM CONFIGURATION: (Describe/show how the room will be set up. The set up below is just a sample to be moved as you like.)

TAs will sit in the computer lab and work in pairs. Each pair will share one computer.

PREPARATION: (What needs to be done by you in advance?)

1. Create the mock course for the TAs to practice using EEE
2. Compile handouts with different week emphasis for EEE tool implementation for different groups [so that EEE will not freeze up.]
3. Put the EEE tool implementation task handouts and sceen shots doc to the drop box
4.  
5.  
**WORKSHOP SCHEDULE:** Indicate when each portion of the workshop will begin and end.

<table>
<thead>
<tr>
<th></th>
<th>BEGIN TIME</th>
<th>END TIME</th>
<th>TOTAL TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Introduction to EEE</td>
<td></td>
<td></td>
<td>2min</td>
</tr>
<tr>
<td>2. Practice EEE tools implementations</td>
<td></td>
<td></td>
<td>38min</td>
</tr>
<tr>
<td>3. Introduction to Campus Resources</td>
<td></td>
<td></td>
<td>5min</td>
</tr>
<tr>
<td>4. Internet Scavenger Hunt</td>
<td></td>
<td></td>
<td>20min</td>
</tr>
<tr>
<td>5. Discussion and Prizes</td>
<td></td>
<td></td>
<td>10min</td>
</tr>
<tr>
<td><strong>TOTAL TIME FOR WORKSHOP:</strong></td>
<td></td>
<td></td>
<td><strong>75 min</strong></td>
</tr>
</tbody>
</table>

**WORKSHOP SEGMENTS:** (Break down each part of the workshop:)

<table>
<thead>
<tr>
<th>PART #1:</th>
<th>BEGIN TIME</th>
<th>END TIME</th>
<th>TOTAL TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Introduction to EEE</td>
<td></td>
<td></td>
<td>5min</td>
</tr>
</tbody>
</table>

**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

In this workshop, we are going to work in this computer lab to explore the learning management system that we are using here in UCI for course management and the variety campus resources that we can use to help our students as well as ourselves.

Here are the learning objectives for this workshop:

1. The TAs WBAT practice using the EEE tools to manage the course.
2. The TAs WBAT recognize the variety campus resources available to help students and direct the students to the campus resource website or office locations.
3. The TAs WBAT list and describe the campus resources available to help themselves.

Let’s first take a look at the learning management system or LSM that we are using in UCI for course administrations. The system is called EEE, which is short for electronic educational environment. EEE is home-grown online course management system that is developed by our university. It offers a variety of tools to enhance learning and manage course administration.

So how many of you have seen or heard of EEE? How many had something similar at their previous school?

By the end of this workshop you will be able to access your class roster, create a gradebook and class webpage, post messages to the class message board, prepare and grade online quizzes, and access your evaluations.
have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

Now we are now going to figure out What can EEE do for us? EEE has 16 different tools available for assessment, administration, and collaboration. If you make the effort to try out and use the tools in your class, you can save a lot of time-especially for administrative tasks like entering grades, answering and sending emails, and creating websites.

To get to all these tools in the 35 allotted minutes we have, we have broken the tools into a super quick quarter. We will go through the quick quarter one week at a time, each week discovering a new tool we can use on EEE.

Now I would like each of you to find a fellow TA and pair up. You will work together on one computer to go through the handout and try out the suggested tools. I will go though “Week 0” with you all. If you have any questions, please interrupt me at any time.

[Pass out handout and allow pairs to work for 35 minutes to evaluate the various features of EEE.

Handout: EEE tool implementation worksheet, EEE Tools Screen Shots.

Give notice of 10 and 5 minutes.]

Did everyone find all of the EEE tools?
Are there any questions or thoughts about how to use each tool?
Do you think you will need some tools other than what was suggested on the handout?
How many of you see yourselves using these tools?

PART #3:

<table>
<thead>
<tr>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Introduction to Campus Resources</td>
<td></td>
<td>5min</td>
</tr>
</tbody>
</table>

NARRATIVE: Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

In the next part of the workshop we are going to explore the bountiful resources UCI has to offer its undergrad students, grad students, and faculty members. In the following 30 minutes, you will find the campus programs you can recommend to students, discover which services are available to help yourselves as TAs and graduate students.

I will still ask you to work in pairs, but how about we switch our partners? Please find another fellow TA whom you didn’t work with for the EEE tool implementation. You will still have one computer to work on for this part.

As a brief side note, how many of you will be teaching in a computer lab? Computers can cause a huge distraction for students. Instead of listening to your lab instructions or lecture, many students will be checking their email, facebooking, or just surfing the internet. And one or two students doing this may also affect the other students from concentrating on the teaching.

When teaching in a computer lab, you want your students to participate and focus on the
teaching instead of being distracted by their computers. I was TAing computer programming courses. It is impossible for me to ban using computers in my discussion session, and we have to use computers all the time in the lab. Although I don’t want to be a policeman to oversee every movement of my students in the class and punish them for not being focused, I do want them to make good use of their time in the discussion / lab session by participating and learning.

I thought one easy way to combat this computer distraction would be to pair our students up on the computers. Therefore they would be less likely to check their mail or Facebook in front of a random partner. This is what we will demonstrate today while we are in the lab, and you can think of how being paired at a computer might change your distraction level.

**PART #4:**

<table>
<thead>
<tr>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Internet Scavenger Hunt</td>
<td></td>
<td>20min</td>
</tr>
</tbody>
</table>

**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

Alright, in order to explore the resources we are having on campus, we are going to compete in a scavenger hunt! However this is not just an old, run around campus scavenger hunt. This is an online scavenger hunt by finding the “treasures” with the help of the Internet! In your pairs you will have about 20 minutes to find the answers to scavenger hunt questions. At the end, we will see which pair reigns supreme, and we will give out some prizes! So let’s get going. You have 20 minutes!

[Pass out the **Campus Resources Online Scavenger Hunt**. Allow pairs 20 minutes to complete the hunt. Try to remind them to switch control of the computer about half way through.]

Note: The TAs may not be able to finish all the questions in the allotted time. It makes this activity a competition. The TAs will get a **handout** for all the questions the answers later.

**PART #5:**

<table>
<thead>
<tr>
<th>BEGIN TIME:</th>
<th>END TIME:</th>
<th>TOTAL TIME:</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Discussion and Prizes</td>
<td></td>
<td>10min</td>
</tr>
</tbody>
</table>

**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

Alright, TIME IS UP! Let’s go through the questions and tally up the points. Please exchange your responses.

[If time is allowed, discuss the solution together as a class. Otherwise, handout the solutions and have the groups grade accordingly.]

So who has more than 15 points?

[Keep going to get highest score, then give prize to winning pairs(s).]

This brings us to the conclusion of this workshop, we implemented some EEE tools which can
help us manage the administration of the courses, and play an internet scavenger hunt to explore the campus resources that we can use to help our students and ourselves. We have this workshop in the computer lab. You may need to teach in a computer lab too. This workshop gives you a feeling about how it looks like and what you can try to get your students’ attentions. The take-home teaching strategy we practiced is pair working. It helps to keep the students from being distracted by using the computers for non-course/non-session related things.
EEE Week-by-Week (EEE Tools Implementation Worksheet)
Try to come up with a way to solve each of the problems stated below by using an EEE tool. Once you select the EEE tool to use, follow up with the additional listed tasks. The practice course is listed as “to be filled”. You will have to login with your UCNetID to see the tools. You have been added to the course as an assistant, which is what you will be when you TA a class.
Please try to implement the tools for your assigned weeks, e.g. week 0, 2, 4, 6, 8, 10 or week 1, 3, 5, 7, 9.

Week 0: Your professor asks you to create a course website.
   EEE tool: _____________________ (WebsiteManager)
   Make a page/tab for General Information, Lectures, and Resources.

Week 1: You need to bring a list of all the enrolled students to the first lecture.
   EEE tool: _____________________ (Rosters)
   Create a seating chart for the next week’s quiz which will be in Bren Hall 1600.

Week 2: You want to have an online math primer quiz.
   EEE tool: _____________________ (Quiz)
   Create a new quiz and add one multiple choice question worth 10 points.

Week 3: Students have submitted their first homework, you need to record the grades.
   EEE tool: _____________________ (GradeBook)
   Create a gradebook and add a category for homework.

Week 4: You noticed a lot of students are emailing you the same questions, you want to host a web-based forum to facilitate communication.
   EEE tool: _____________________ (MessageBoard)
   Make a new MessageBoard about ‘Exams’ and create an anonymous forum for your ‘Math Questions’.

Week 5: Its midterm time! You want to get feedback from your students about the wonderful active learning methods you have implemented.
   EEE tool: _____________________ (Surveys)
   Create a new survey and add one free response question about active learning methods.

Week 6: You need to remind the entire class to submit their lab assignments next week.
   EEE tool: _____________________ (ClassMail Manager)
   Send a class-wide email to your students with a reminder.

Week 7: Students need to turn in their excel lab files, but you don’t want a full email inbox.
   EEE tool: _____________________ (DropBox)
   Make a DropBox for a single assignment called ‘Final Lab Projects’. Make the DropBox for Assignment Submission only.
Week 8: You need to meet with each lab group to discuss their project grades. You want to make groups sign-up for meeting times with you.
   EEE tool: ____________________ (SignupSheet)
   Select a date and two hour time block to schedule five 15 minute group appointments.

Week 9: It’s the night before the exam and you want to hold online office hours.
   EEE tool: ____________________ (Chat)
   Set-up a live chat session with your students from 4-6pm tomorrow. Enter the chat room and welcome the students.

Week 10: You want to see how many students gave you feedback as part of your Final Evaluation.
   EEE tool: ____________________ (Evaluations)

When you finish this part, please submit this worksheet to EEE Dropbox. Rename this file to be “TA1UCINetID_TA2UCINetID_EEE_TAPDP2012.docx”.
Campus Resources Online Scavenger Hunt
Use the computer and the Internet to find. For each question, write down the center or program supplying the service.

1. When is the next Engineering, Science, and Technology Career Fair at UCI?
   Answer: Center/Program:

2. Name at least one group therapy group for graduate students.
   BONUS: How can I make an appointment for mental health issues?

3. How should students register for tutorials with the LARC and how much do they charge for peer tutoring?

4. What five services are located on the corner of Pereira and East Peltason Drives in Building #5?

5. What is the UCI Safe Zone program?

6. How do graduate students make a teaching and learning consultation appointment?

7. How can students contact the Ombudsman?
   BONUS: What is the purpose of the Ombudsman?

8. What number should you call for guidance on dealing with a student who seems to be emotionally distressed or a potential danger to themselves or others?

9. What should a TA do if they find themselves in a romantic relationship with one of their students? Cite the UCI policy section number (including its URL) in addition to describing the proscribed course of action.

10. What is your primary responsibility if a student makes you aware of a sexual assault, according to UCI CARE?

11. Locate the URL for the collective bargaining agreement between the University and its TAs. List the URL. According to this agreement, how many hours maximum may a TA with a 50% appointment work in one quarter? Cite the Article of the agreement that lists this answer as well.

12. Name two outreach and retention programs hosted by UCI CCC.

13. When is the last day to add a course for the Fall 2012 quarter?

14. According to this campus service, what is the first step you can take to reduce your stress? (Hint: located in the Student Center)

15. Where can you (i.e. Faculty) find teaching tips for working with disabled students? List one teaching tip for working with a student who has attention deficit disorder.

16. How many scholarships are available to current undergraduate students at UCI that have online applications?
Campus Resources Online Scavenger Hunt SOLUTIONS

Use the computer and internet to find answers to the following questions about UCI campus resources. For each question, write down the center or program supplying the service. Remember, you are playing for prizes!

1. When is the next Engineering, Science, and Technology Career Fair at UCI?
   
   Answer: October 13, 2011
   
   Center/Program: UCI Career Center (http://www.career.uci.edu/)

2. Name at least one group therapy group for graduate students.
   
   Answer: Graduate Women’s Therapy Group, LGBT Graduate Students Group, Understanding yourself and others.
   
   Center/Program: UCI Counseling Center (http://www.counseling.uci.edu)

   BONUS: How can I make an appointment for mental health issues?
   
   Answer: Call the Counseling Center at (949) 824-6457

3. How should students register for tutorials with the LARC and how much do they charge for peer tutoring?
   
   Answer: Webreg, the online registration tool; peer tutorials cost 0~2 session $25, 3 or more $100.
   
   Center/Program: Learning and Academic Resource Center
   Learning and Academic Resource Center (http://www.larc.uci.edu)

4. What five services are located on the corner of Pereira and East Peltason Drives in Building #5?
   
   Answer: Mental health and counseling, eye clinic, dental clinic, and specialty doctors.
   
   Center/Program: Student Health Services (http://www.shs.uci.edu/)

5. What is the UCI Safe Zone program?
   
   Answer: Safe Zone is a symbol of the University of California, Irvine’s commitment to diversity and the lesbian, gay, bisexual, transgender, and queer (LGBTQ) community on campus.
   
   Center/Program: UCI Lesbian, Gay, Bisexual, Transgender Resource Center (www.lgbtr.uci.edu)

6. How do graduate students make a teaching and learning consultation appointment?
   
   Answer: Go to this page: http://www.tltc.uci.edu/consultation.html and click on “Request a Teaching Consultation”
   
   Center/Program: Teaching Learning and Technology Center (http://www.tltc.uci.edu/)

7. How can students contact the Ombudsman?
   
   Answer: Contact by phone at (949) 824-7256 or (714) 456-5605. Maintain impartiality, listen to complaints and concerns, maintain confidentiality of visitors...
   
   Center/Program: Office of the Ombudsman (http://www.ombuds.uci.edu/)

   BONUS: What is the purpose of the Ombudsman?
   
   Answer: Provides a safe and comfortable environment to discuss complaints, concerns or problems confidentially

8. What number should you call for guidance on dealing with a student who seems to be emotionally distressed or a potential danger to themselves or others?
   
   Answer: UCI help line, Suicide help line, Counseling center, 911. Don’t leave the student alone!
9. What should a TA do if they find themselves in a romantic relationship with one of their students? Cite the UCI policy section number (including its URL) in addition to describing the proscribed course of action.

   Answer: Avoid conflict of interests. UCI Policy Sec 700-16: Policy on Conflicts of Interest Created By Consensual Relationships.
   http://www.policies.uci.edu/adm/pols/700-16.html

10. What is your primary responsibility if a student makes you aware of a sexual assault, according to UCI CARE?

   Answer: Remain supportive of the victim while referring the student to campus or community agencies.
   Center/Program: UCI Campus Assault Resources and Education (CARE) (http://www.chs.uci.edu/CARE)

11. Locate the URL for the collective bargaining agreement between the University and its TAs. List the URL. According to this agreement, how many hours maximum may a TA with a 50% appointment work in one quarter? Cite the Article of the agreement that lists this answer as well.

   Answer: 220 hours/quarter. Article 31 workload from "THE REGENTS OF THE UNIVERSITY OF CALIFORNIA AND THE INTERNATIONAL UNION, UNITED AUTOMOBILE, AEROSPACE AND AGRICULTURAL IMPLEMENT WORKERS OF AMERICA (UAW), AFL-CIO ACADEMIC STUDENT EMPLOYEES UNIT"
   http://atyourservice.ucop.edu/employees/policies_employee_labor_relations/collective_bargaining_units/academicstudentemployees_bx/complete_contract09.pdf

12. Name two outreach and retention programs hosted by UCI CCC.

   Answer: New Ethnic Minority and Women Faculty Welcome, REACH Program, Student initiated outreach programs, ethnic graduations,
   Center/Program: UCI Cross Cultural Center (http://www.ccc.uci.edu/)

13. When is the last day to add a course for the Fall 2012 quarter?

   Center/Program: Registrar (http://www.reg.uci.edu/)

14. According to this campus service, what is the first step you can take to reduce your stress? (Hint: located in the Student Center)

   Answer: honestly identify what the sources of stress are in your life
   Center/Program: Health Education Center (http://www.healtheducation.uci.edu)

15. Where can you (i.e. Faculty) find teaching tips for working with disabled students? List one teaching tip for working with a student who has attention deficit disorder.

   Answer: Keep instructions as brief and uncomplicated as possible, assist the student with finding an effective not-taker or lab assistant from the class.
   Center/Program: Disability Services Center (http://www.disability.uci.edu/)

16. How many scholarships are available to current undergraduate students at UCI that have online applications?

   Answer: 32! (at least two are specific to engineering,
   http://www.ofas.uci.edu/content/TypesOfAid.aspx?nav=3&id=scholarships)
   Center/Program: Office of Financial Aid (http://www.ofas.uci.edu)
UCI Campus Resources Quick Reference Handout
The following is a list of selected campus offices that provide support for undergraduate and graduate students at UCI. Additional information on the functions of these offices is available on the listed Web sites.

Classroom and Computer Support (http://classrooms.uci.edu/)

Disability Services Center (http://www.disability.uci.edu/)

Health Education Center (http://www.healtheducation.uci.edu)

Learning and Academic Resource Center (http://www.larc.uci.edu)

Office of Financial Aid (http://www.ofas.uci.edu)

Office of the Ombudsman (http://www.ombuds.uci.edu/)

Registrar (http://www.reg.uci.edu/)

UCI Campus Assault Resources and Education (CARE) (http://www.chs.uci.edu/CARE)

UCI Career Center (http://www.career.uci.edu)

UCI Counseling Center (http://www.counseling.uci.edu)

UCI Cross Cultural Center (http://www.ccc.uci.edu)

UCI Lesbian, Gay, Bisexual, Transgender Resource Center (www.lgbtr.uci.edu)

Student Health Services (http://www.shs.uci.edu)

Teaching Learning and Technology Center (http://www.tltc.uci.edu)
**WORKSHOP11 “TAPDP Wrap-up”**

| NAMES: | Weiwei Chen |
|**DEPARTMENT(S) THAT THIS WORKSHOP IS AIMED AT:** | Henry Samueli School of Engineering |
|**TOPIC:** | TAPDP Wrap-up |
|**ABSTRACT:** | If you were a new PF looking for a workshop on the above topic, what kind of a description of this workshop would help you to get a good sense of what this workshop entails? The TAs will review the topics that have been discussed in TAPDP. They will watch a video clip about teaching from the students’ perspective. They will finish the TAPDP evaluation. (Adapted from Robert Campbell, “Wrap up Workshop 2011”, TAPDP 2011) |
|**LEARNING OUTCOMES:** | What should the TAs be able to do & know by the end of this workshop? Note that TAs wat = TAs will be able to... (Suggestion: Try to have only 1-3 outcomes.) |
| TAs wat... | Review the TAPDP topics |
| TAs wat... | Identify what the students want from teaching |
| TAs wat... | Give their feedbacks to TAPDP |

**STEPS TOWARD TAs ACHIEVING LEARNING OUTCOME # 1:** What will the TAs do to help them to achieve the learning outcome, above? (Suggestion: you can have as many steps along the way as you feel appropriate.)

| TAs will... | Review the TAPDP topics. |
| TAs will... | |

**STEPS TOWARD TAs ACHIEVING LEARNING OUTCOME # 2:** What will the TAs do to help them to achieve the learning outcome, above? (Suggestion: you can have as many steps along the way as you feel appropriate.)

| TAs will... | Watch a 10-minute video of students’ opinions on what makes a good TA. |
| TAs will... | |

**STEPS TOWARD TAs ACHIEVING LEARNING OUTCOME # 3:** What will the TAs do to help them to achieve the learning outcome, above? (Suggestion: you can have as many steps along the way as you feel appropriate.)

| TAs will... | Finish an online evaluation for TAPDP |
| TAs will... | |

**RESEARCH SUPPORTING THIS WORKSHOP:** What research has been done in this
area? List two articles that (preferably) offer research-backed conclusions about best practices in this area. At least one of the articles should have some disciplinary commonality with your TA groups(s).

**Article One**  
(w/ summary)  
The Derek Bok Center for Teaching and Learning, Harvard University, “What Student Want: Teaching From a Student’s Perspective”, Video, 1993.  
We often make assumptions about what motivates, excites or frustrates students. But how do students themselves view teaching? What Students Want presents spontaneous, unscripted comments of students from various backgrounds on many aspects of academic life, including their preferred styles of lecturing and discussion leading; amount and organization of workloads; relations among students, professors and Teaching Fellows; personal issues of identity, race, and gender; and their own definitions of good and bad teaching.

**Article Two**  
(w/ summary)  
Research not needed

### SUPPLIES NEEDED:

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### ROOM CONFIGURATION:  
(Describe/show how the room will be set up. The set up below is just a sample to be moved as you like.)

The TAs will sit in the computer lab so as to finish the online evaluation of TAPDP.

### PREPARATION:  
(What needs to be done by you in advance?)

1. Check the EEE TAPDP evaluation setup
2. Make sure the video can be displayed in the computer lab
3. Prepare the PowerPoint slides
4.
5.
**WORKSHOP SCHEDULE:** Indicate when each portion of the workshop will begin and end.

<table>
<thead>
<tr>
<th>BEGIN TIME</th>
<th>END TIME</th>
<th>TOTAL TIME</th>
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<tbody>
<tr>
<td>1. TAPDP Review and Conclusion</td>
<td>15min</td>
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<tr>
<td>2. Feedback and Farewell</td>
<td>10min</td>
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<tr>
<td>3. Extra time to reach next event</td>
<td>5min</td>
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**TOTAL TIME FOR WORKSHOP:** 30 min

**WORKSHOP SEGMENTS:** (Break down each part of the workshop:)

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<tr>
<th>PART #1</th>
<th>BEGIN TIME</th>
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<td>1. TAPDP Review and Conclusion</td>
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<td>15min</td>
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**NARRATIVE:** Describe each part of the workshop as though someone else would have to conduct it for you. Include what you’ll say, what you’ll do, and how you’ll do it. You can have as many parts as you need. If you need more than 4, just cut-and-paste the tables.

Now we have a breadth of knowledge about being a TA. To have a summaries for what we have had in TAPDP, I put our workshops into three categories:

- **TA knowledge**
  - Welcome and Buy-in
  - TA roles and responsibilities
  - UCI Students
  - Campus Resources

- **Pedagogical skills**
  - Learning Styles
  - Active Learning
  - Problem solving skills

- **TA practices**
  - First day in class
  - Lead a discussion session
  - Office hour and grading
  - Microteaching
  - EEE tools

Seemingly it is too much to process right now. So what should we focus on now? Please start with these points:

- Be enthusiastic. A TA enthusiastic about the material will inspire their students to be the same.
- Be opportunistic. Take advantage of the opportunities presented to you to improve teaching, enhance communications with students, and explore research opportunities.
- Be aware. The school has been in flux for the last few years. The students come first, so be mindful of them.
o Be professional. This is a job after all.

Let’s finish up by looking at a video from Harvard. The video is about students’ opinions on what makes a TA ‘good.’ To clear up any confusion, the students use the term Teaching Fellow or TF, that is Harvard’s equivalent of a TA.”

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<th>PART #2:</th>
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“Any last questions from the video or TAPDP in general?” Answer any last questions the TAs may have. Also address any outstanding concerns/fears/wants from TAPDP that have not yet been addressed on the board. (This is from workshop 1)

We have reached the end of TAPDP! I really hope you all enjoyed your time in TAPDP and found it to be a valuable experience. Before you go, we kindly ask that you log on to your email and follow the link to complete the TAPDP Feedback/Evaluation on EEE. Your comments and feedback are important for the services that are provided during the year and in future TAPDPs.

[Let the TAs work on their evaluations]

If you were unable to finish the survey, please finish the survey this evening. The deadline is 9pm tonight.

It was great to meet all of you. We wish you all have a successful graduate career! And remember that we are here throughout the year to help you, all you have to do is email!

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Allow sometime for the TAs to relocate so as to attend the union meeting on time.