



**Center for Research in Engineering & Technology Education (CREaTE)**  
**MASE 6390-16172–Fall 2014**  
**“Practice in Engineering Education”**  
**Course Syllabus**

**Welcome to our class!** Engineering education prepares you to change the world. When asked why they are doing engineering, many students declare that it is “to make a difference.” One way you can really impact others is through the practice of engineering education.” Remember the proverb believed to have originated in China in the 4<sup>th</sup> century, which is about the time of Confucius – circa 551-479 BC (also known as K’ung Fu-tzu, K’ung-tzu, Kong Zi, Kong Qiu, Zhong Ni), though we don’t know that it was he who coined it (and for today’s world I have made an appropriate adaptation):



***“If you give a woman a fish, you feed her for a day. If you teach a woman to fish, you feed her for a lifetime. If you teach a woman to learn, you feed her for a lifetime and she doesn't have to only eat fish.”***

Impacting lifetimes. That is what we are all about, is it not? To influence the future, we can influence others who create the future. (We believe in you!). In the professoriate, you are certainly making a difference by doing ground-breaking research, supporting (\$) and leading research teams, creating businesses, and serving our community. And can also “be the difference you want to see in the world” by teaching engineering. And you can do a great job of it!

**Experiential Learning Practicum** In this course we explore the practice of teaching through doing, what we might call experiential learning. Experiential learning is the process of making meaning from direct experience, i.e., “learning from experience”. At two extremes, the experience can be highly scaffolded or completely open-ended.

Aristotle once said, “For the things we have to learn before we can do them, we learn by doing them.”

This works for us, since in engineering education emphasis is traditionally centered more-or-less upon hands-on experiences. Traditionally it is the activity of becoming learned in engineering principles and practices, ultimately related to the fields of professional practice of engineering. So how does the education of engineers proceed in the 21<sup>st</sup> century, as we participate in a learning revolution?

“Wherever you began this journey, you’ve reached a really important milestone: You’ve completed whatever was required to get to this point and you’ve been successful at that. So successful that you believe that you can achieve even more. And we believe that we’re here first and foremost to help you achieve that,” our President, Diana Natalicio said at the recent New Miner Convocation. Pedro concurs!



This semester we will continue our journey in Doctoral education and engage in teaching by learning. Again, our engineering education is an on an old branch of learning. It is not a new endeavor. It is as old as Engineering. How we transpose practice and advance learning of new generations of engineers is key to the success of our US’ and global future’ society. In this doctoral-level class we begin a fascinating adventure of practicing an age-old profession and how we learn it and go about it in the modern era.

**Goals and Description** In this course, we will explore the intersections between theory and practice in providing excellent, outcomes-based, engineering education. Specifically, we will investigate the correlation between theories of learning, educating, and teaching engineering and your own experience – gained through all your formative educational experiences. You will articulate how you have learned

yourself, and how you see others learning, through coursework and the practice of engineering education, and as you implement it through your own teaching.

Over the course of the semester, in the classes you are learning in and teaching, you'll have a chance to assess, review, and implement your own philosophy of education; at the same time, in this class you'll have a chance to reflect on, refine, and enhance your philosophy as you build a teaching portfolio. This can be a great tool to add to your professional toolbox.

**Achieving Outcomes that Support Your Success** In particular, having successfully completed this course, you will be able to:

- Articulate correspondences and differences between the theory and practice of engineering education – between education theory and education practice in our region.
- Productively reflect on your own learning and teaching practices to enhance or improve the student learning environment, and some key parameters that impact learning.
- Draw on your own classroom experiences to assess the value of a variety of teaching and learning tools, and be able to apply those tools in your own sharing (aka teaching).
- Perform peer reviews of other instructors and constructively discuss approach, impact, effectiveness, and evaluate performance.
- Create and develop a teaching portfolio that articulates and illustrates your teaching philosophy.

The course is modeled after the Virginia Tech engineering education doctoral fundamentals course, the first such course to be taught in the US. The pedagogical aim of the course is to contribute to your development as a scholar and to get you to start thinking critically about engineering, education, and learning. For instance, although we will discuss engineering curriculum design, we will also focus on how to go beyond that and think in terms of designing a learning environment of which curriculum is just one component. We hope you will be able to use the knowledge from this course in your future teaching and research – as a student and as a professional

The course will operate as a seminar, with your own teaching experiences (particularly as documented in your teaching journals) forming the primary “text” for the semester, along with a few key articles we'll read at different points in the semester to guide our thinking. Although you will not read one another's journals you should come, upon each occasion we meet, prepared to discuss your reflections with the class; your contributions to the discussion are central to our collective success.

**Rewarding Your Experiential Learning Achievements** The final grade achievement for this course includes the following components:

<b>Opportunity</b>	<b>Weight</b>	<b>Review / Due Dates</b>
A Learning and Teaching Journal	20%	Weeks 4, 8, 12 & 16
A Learning and Teaching Portfolio	30%	Final Exam Week
A Teaching Project	30%	Throughout the semester
Peer Review	10%	Gaining from feedback
Readings & Participation	10%	Throughout Semester

**A Note on the Importance of High Expectations, and the Value of Quality** We will emphasize quality in the course of our learning. The quality of our work is critical to achieving our ultimate success in increasing learning (of others and for ourselves). Since we are acting upon our opportunity to become influential in teaching and learning, we need to set high standards in achieving our goals. At UTEP, this is our joint opportunity and responsibility; it pertains to both faculty and students. It is through this integrity that we maintain a culture of continued learning, as well supporting the ongoing reputation we are building in engineering education scholarship and practice.

**A Note on Grammar and Writing** We will actively work to communicate effectively, including the use of active voice. A good resource site for promoting clear, concise sentences is The Writing Center at The University of Wisconsin – Madison:

**Grammar and Punctuation** - Common Mistakes from the University of Wisconsin -Madison (<http://www.wisc.edu/writing/Handbook/GramPunct.html>) Last sited 2/1/2014.

Writing across media, and across the curriculum is available thanks to the comprehensive work of The Center for Writing Studies at the University of Illinois at Urbana-Champaign:

**Grammar Handbook** - University of Illinois at Urbana-Champaign (<http://www.cws.illinois.edu/workshop/writers/>) Last sited 2/1/2014.

**Quizzes, tests, exercises and puzzles** to help us learn English as a Second Language (ESL) are provided through The Internet TESL Journal:

**Self-Study Grammar Quizzes** – Online grammar quizzes designed for ESL students (<http://a4esl.org/q/h/grammar.html>). Last sited 2/1/2014.

**Citation Styles**, including the APA and MLA style guides:  
Summarizing the commonly used style guides (<http://www.cws.illinois.edu/workshop/writers/citation/>). Last sited 2/1/2014).

**Academic Integrity** The integrity of our work is critical to why we are all at UTEP, both as students and as faculty. It is through this integrity that we maintain a culture of continued learning, as well as personal and professional growth and development. To preserve the quality of education offered to students, the university is responsible for maintaining academic integrity and for protecting all those who depend on it, including UTEP's community partners and institutional affiliates.

Our objectives – above all – involve fairness, clarity and accountability. All members of the university community share the responsibility for creating conditions where violations of academic integrity are curtailed.

Please review the resources available on the UTEP Provost's website, read the Academic Integrity Policy, or ask for additional guidance.

Thanks for joining our learning community this semester, and I look forward to supporting your ongoing success in advanced doctoral studies.

- Peter/"Pedro"
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