

ASEE Southeastern Section  
**Annual Conference**

Daytona Beach, FL | March 4-6, 2018

*EDUCATING THE ENGINEER OF THE*  
**FUTURE**



**EMBRY-RIDDLE**  
Aeronautical University

# ASEE SOUTHEASTERN SECTION ANNUAL CONFERENCE

March 4 – 6, 2018

## **“Educating the Engineer of the Future”** *Program Booklet*

Embry-Riddle Aeronautical University  
Daytona Beach, FL

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# Notes

## Table of Contents

Host Institution Welcome .....	4
Section President’s Welcome .....	5
Site Coordinator’s Welcome & Acknowledgements.....	6
Conference at a Glance .....	7
Conference Technical Sessions at a Glance .....	8
Shores Resort and Spa to Embry-Riddle Campus .....	9
Embry-Riddle Aeronautical University Campus Map.....	10
Lehman Engineering and Technology Center, First Floor Classrooms.....	11
The Shores Resort and Spa, Meeting Rooms.....	12
Technical Session Information.....	13
Conference Workshops.....	14
Keynote Address, Donna Riley .....	17
Luncheon Address, Louis Martin-Vega .....	18
Luncheon Address, Courtney Faber.....	19
Banquet Address, Nicole Stott .....	20
2017–2018 ASEE SE Officers .....	21
Call for Papers, 2019 ASEE SE Conference .....	22
Sponsors .....	23

## Host Institution Welcome



On behalf of Embry-Riddle Aeronautical University, welcome to the ASEE Southeastern Section Meeting, *Educating the Engineer of the Future*.

We have an outstanding collection of papers, posters and technical sessions to share with you, as well as thought-provoking speakers and the chance to network with peers.

I hope you come away with a recharged spirit of innovation that you will apply to new curricula; best practices and tools; online, blended and cross-disciplinary programs; and ideas to create stronger industry partnerships that lead to ambitious research and co-op and internship opportunities for your students.

This event would not be possible without the contribution of our sponsors: ERAU, ERAU Daytona Beach Office of Undergraduate Research, ERAU Daytona Beach College of Engineering, MiSUMi USA, and NSF Florida Advanced Technological Education Center.

Thanks also to Conference Chair Lulu Sun and the organizing committee: Jeff Brown, Hongyun Chen, Keith Garfield, Richard Stansbury, Heidi Steinhauer, Yan Tang, and Tim Wilson.

We cannot guarantee beach weather in early March, but Daytona Beach extends a warm welcome to all of you.

P. Barry Butler, Ph.D.  
President  
Embry-Riddle Aeronautical University

The College of Engineering at Embry-Riddle Aeronautical University is excited to host the 2018 conference of the ASEE's Southeastern Section. We hope you will have a wonderful time in Daytona Beach and enjoy all it has to offer.

The College of Engineering at Daytona Beach is known for its innovative hands-on curriculum, focus on experiential learning, and undergraduate research opportunities. We embrace evidenced-based pedagogy and putting into practice research on how best to teach engineering. That translates into more hands-on activities and other forms of active learning that take students out of the lecture hall and into the lab. We are proud to host this event and to hear and learn about your best practices and share ours with you.

I wish you a great and successful conference.

Maj Mirmirani, Ph.D.  
Interim Senior VP of Academic Affairs and Research  
Dean, College of Engineering  
Embry-Riddle Aeronautical University



## Section President's Welcome



Welcome to the 2018 ASEE Southeastern Section Annual Conference. It's wonderful to have the conference at the Shores Resort & Spa in beautiful Daytona Beach, Florida, hosted by Embry-Riddle Aeronautical University, and to have so many ASEE Southeastern Section members attend. This year's theme of "Educating the Engineer of the Future" focuses our attention on a significant educational responsibility of preparing engineering students for careers extending to near the 22<sup>nd</sup> century mark. By attending this conference and participating in the workshops and technical sessions, presenting your own educational developments, and discussing best practices with your peers from other Southeastern colleges and universities, you are helping to provide our future engineers with effective engineering education. I am certain that during this conference you will discover new approaches and techniques that will better prepare the engineers of the future.

The Southeastern Section has a long history of active participation of members at our conferences. I would like to encourage everyone to not only attend the technical sessions, but to become more involved in the Section by attending the breakfast meetings on Monday and Tuesday. Division and unit meetings are held each morning at breakfast, with the general interest divisions (Administrative, Instructional, Research, Professional Skills, and K-12) meetings on Monday morning and the discipline specific divisions meetings on Tuesday morning. These meetings are where division officers are elected and where you can learn more about how each division operates.

This conference would not be possible without the effort of many volunteers. I would particularly like to thank the Conference Site Coordinator, Lulu Sun, and the team at Embry-Riddle Aeronautical University for arranging this conference; Sally Pardue, the Technical Program Coordinator, for arranging and coordinating the technical program; Tyson Hall for his efforts in creating and updating the paper management system; all of the authors, workshop presenters, session moderators, and student poster presenters who provide the technical content for the conference; the division chairs and reviewers who work behind the scenes to make the conference possible; the Awards and Recognition Unit and reviewers for recognizing engineering education excellence; the Research Division for conducting the student poster session; the new Proceedings Editor, John Brocato, for organizing the conference proceedings; and the campus representatives for disseminating information about the section locally and encouraging people to participate.

It has been an honor to serve as the Section President of ASEE-SE during the past year. I am very thankful for all of the officers who have spent many hours supporting the Southeastern Section. It has truly been a pleasure working with each of you. Hope to see you all again in 2019 when the ASEE-SE conference will be held at Auburn University in Auburn, Alabama.

Hodge Jenkins, Ph.D., P.E.  
ASEE SE Section President  
Associate Professor of Mechanical Engineering  
Mercer University

## Site Coordinator's Welcome & Acknowledgements

Welcome to Embry-Riddle Aeronautical University (ERAU). Please enjoy your time at the conference. I hope you find the program sessions, workshops, and other events fun and rewarding. The planning and execution of any conference such as this involves the dedication and hard work of many people.

I want to express my sincerest thanks to the following:

- The over 170 registered conference attendees from over 50 educational institutions and corporations;
- All the students in the poster competition;
- All the presenters in the technical sessions;
- The session moderators;
- Our generous sponsors: The ERAU Daytona Beach College of Engineering; MiSUMi USA; NSF Florida Advanced Technological Education Center; ERAU Daytona Beach Office of Undergraduate Research; and Embry-Riddle Aeronautical University;
- President P. Barry Butler, Dean Maj Mirmirani, and associate Dean, Yi Zhao for their leadership and guidance;
- All my fellow conference planners: Jeff Brown, Hongyun Chen, Keith Garfield, Richard Stansbury, Heidi Steinhauer, Yan Tang, and Tim Wilson;
- ERAU Scholarly Commons, and financial systems teams for their enormous help with the conference website and financial management;
- ERAU Creative Services for designing our program cover and call for papers flyer;
- FAA's Florida NextGen test bed and ERAU's Eagle Flight Research Center for the Sunday tours;
- ERAU student musicians for their excellent performance at Sunday reception and Monday award banquet;
- Hodge Jenkins, ASEE SE Section President, for answering numerous questions about past conferences;
- Sally Pardue, the Program Technical Chair, and all the Division Chairs; and
- The faculty, staff, and students of ERAU who helped make this conference a reality.



It has been a pleasure to serve as site coordinator over the last year in preparing for the conference. If I can help you during the conference, just let me know. Enjoy the conference and your time here at Embry-Riddle Aeronautical University and Daytona Beach, FL.

Lulu Sun, Ph.D.  
ASEE SE Conference Site Coordinator  
Associate Professor of Engineering Fundamentals  
College of Engineering  
Embry-Riddle Aeronautical University

## Conference at a Glance

### *Saturday, March 3, The Shores Resort and Spa*

Start Time	End Time	Event	Location
1:00 p.m.	4:00 p.m.	Registration	Lobby

### *Sunday, March 4, The Shores Resort and Spa*

Start Time	End Time	Event	Location
9:00 a.m.	5:00 p.m.	Registration	Lobby

### *Sunday, March 4, Embry-Riddle Aeronautical University*

Start Time	End Time	Event	Location
9:00 a.m.	4:00 p.m.	Workshops	Lehman Engineering and Technology Center
1:00 p.m.	3:00 p.m.	Executive Board Meeting	Lehman Engineering and Technology Center
3:15 p.m.	5:15 p.m.	Tours	Lehman Engineering and Technology Center
6:00 p.m.	8:00 p.m.	Cash Bar	Henderson Welcome Center
6:00 p.m.	9:00 p.m.	Welcome Reception	Henderson Welcome Center

### *Monday, March 5, The Shores Resort and Spa*

Start Time	End Time	Event	Location
8:00 a.m.	5:00 p.m.	Registration	Lobby
7:00 a.m.	8:30 a.m.	Breakfast & Division Meetings	Atlantic
8:40 a.m.	9:45 a.m.	Welcome and Keynote	Richard Petty
8:45 a.m.	9:30 a.m.	Student Poster Setup	River
9:30 a.m.	12:00 noon	Student Poster Session	River
9:45 a.m.	10:00 a.m.	Break	River
10:00 a.m.	11:20 a.m.	Technical Sessions 1	Bill France A, B, C; Richard Petty, Dolphin, Coastal
12:15 p.m.	1:30 p.m.	Luncheon	Atlantic
1:45 p.m.	3:05 p.m.	Technical Sessions 2	Bill France A, B, C; Richard Petty, Dolphin, Coastal
3:05 p.m.	3:45 p.m.	Break	River
3:45 p.m.	5:05 p.m.	Technical Sessions 3	Bill France A, B, C; Richard Petty, Dolphin, Coastal
6:00 p.m.	7:00 p.m.	Cash Bar	Atlantic
6:30 p.m.	9:00 p.m.	Awards Banquet	Atlantic

### *Tuesday, March 6, The Shores Resort and Spa*

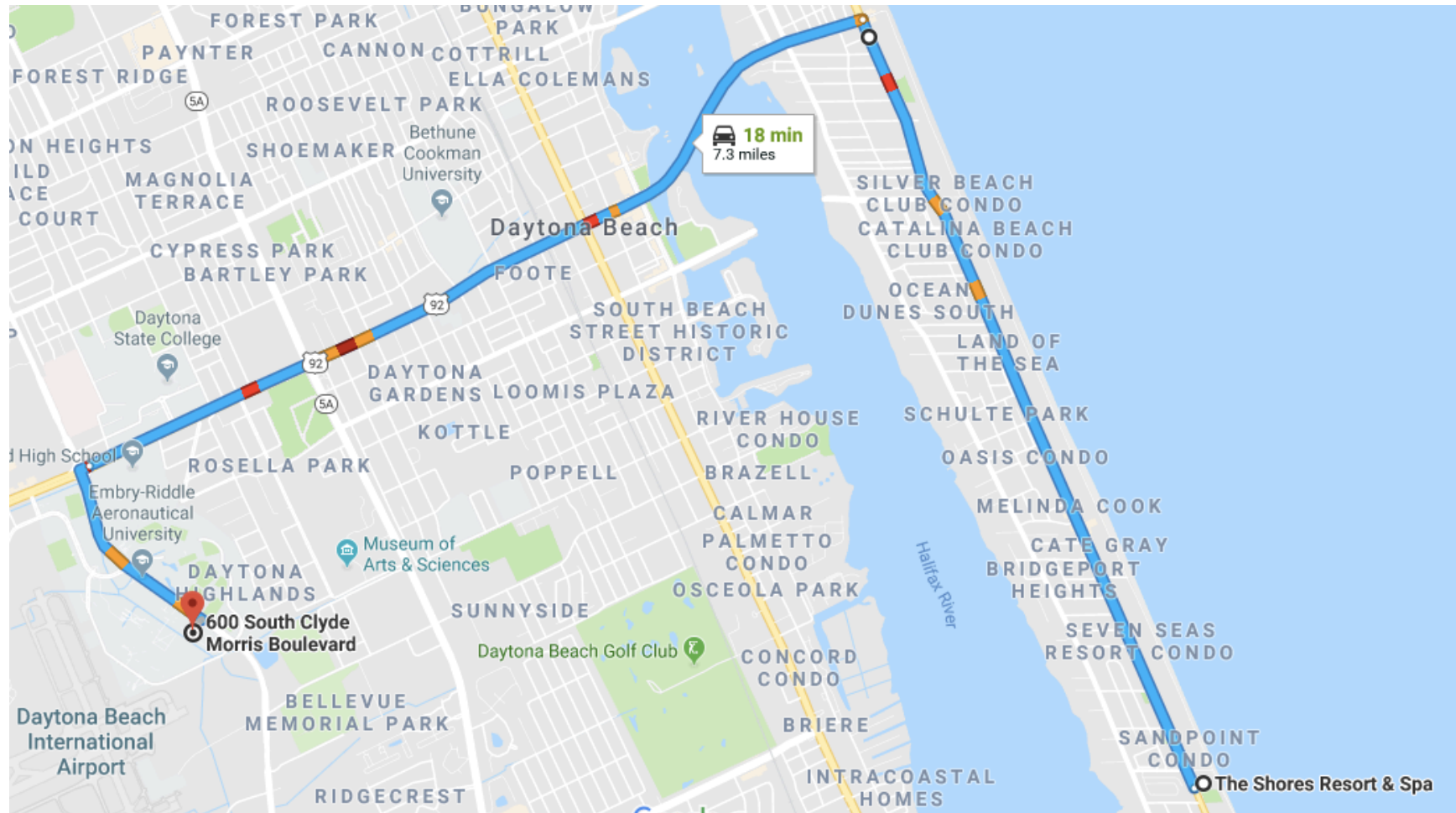
Start Time	End Time	Event	Location
8:00 a.m.	1:00 p.m.	Registration	Lobby
7:30 a.m.	8:30 a.m.	Breakfast & Unit Meetings	Atlantic
8:40 a.m.	10:00 a.m.	Technical Sessions 4	Bill France A, B, C; Richard Petty
10:00 a.m.	10:20 a.m.	Break	River
10:20 a.m.	11:40 p.m.	Technical Sessions 5	Bill France A, B, C; Richard Petty
11:45 a.m.	1:00 p.m.	Lunch and Business Meeting	Atlantic



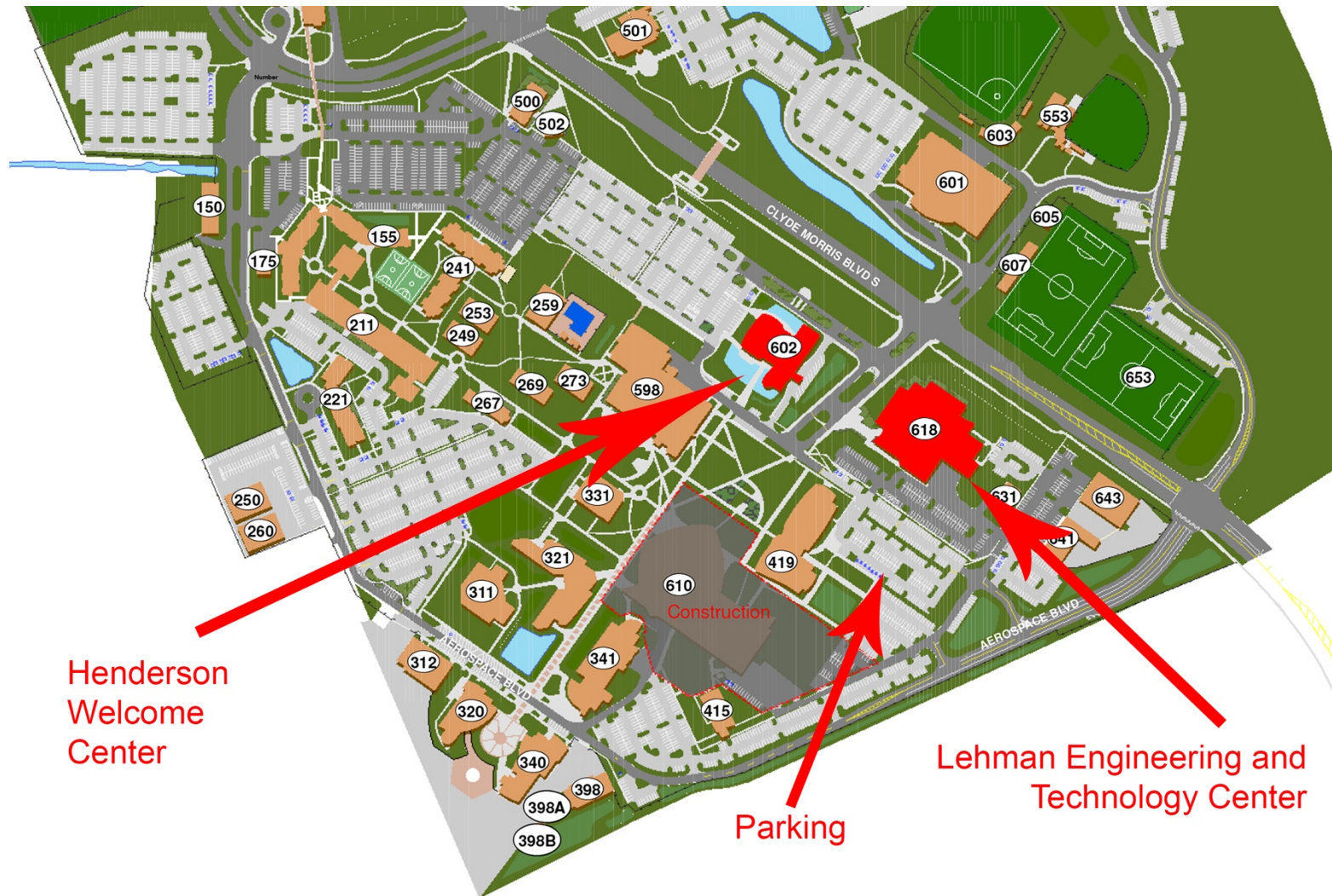
## Conference Technical Sessions at a Glance

Monday 10:00 a.m. – 11:20 a.m.	<b>T1-A</b>	<b>T1-B</b>	<b>T1-C</b>	<b>T1-D</b>	<b>T1-E</b>	<b>T1-F</b>
	Bill France A	Bill France B	Bill France C	Richard Petty	Dolphin	Coastal
Technical Session 1	Mechanical Engineering I	K-12 I	Administrative I	Industrial Engineering I	Electrical Engineering I	Computer Engineering I
Monday 1:45 p.m. – 3:05 p.m.	<b>T2-A</b>	<b>T2-B</b>	<b>T2-C</b>	<b>T2-D</b>	<b>T2-E</b>	<b>T2-F</b>
	Bill France A	Bill France B	Bill France C	Richard Petty	Dolphin	Coastal
Technical Session 2	Mechanical Engineering II	K-12 II	Administrative II	Industrial Engineering II	Electrical Engineering II	Computer Engineering II
Monday 3:45 p.m. – 5:05 p.m.	<b>T3-A</b>	<b>T3-B</b>	<b>T3-C</b>	<b>T3-D</b>	<b>T3-E</b>	<b>T3-F</b>
	Bill France A	Bill France B	Bill France C	Richard Petty	Dolphin	Coastal
Technical Session 3	Mechanical Engineering III	K-12 III	Professional Skills I	Civil Engineering I	Industrial Engineering + Biomedical Engineering + Chemical Engineering	Engineering Technology + Engineering Design and Graphics
Tuesday 8:40 a.m. – 10:00 a.m.	<b>T4-A</b>	<b>T4-B</b>	<b>T4-C</b>	<b>T4-D</b>		
	Bill France A	Bill France B	Bill France C	Richard Petty		
Technical Session 4	Mechanical Engineering IV	Research I	Administrative III	Industrial Engineering III		
Tuesday 10:20 a.m. – 11:40 a.m.	<b>T5-A</b>	<b>T5-B</b>	<b>T5-C</b>	<b>T5-D</b>		
	Bill France A	Bill France B	Bill France C	Richard Petty		
Technical Session 5	Mechanical Engineering and Professional Skills	Research II	Professional Skills II	Civil Engineering II		

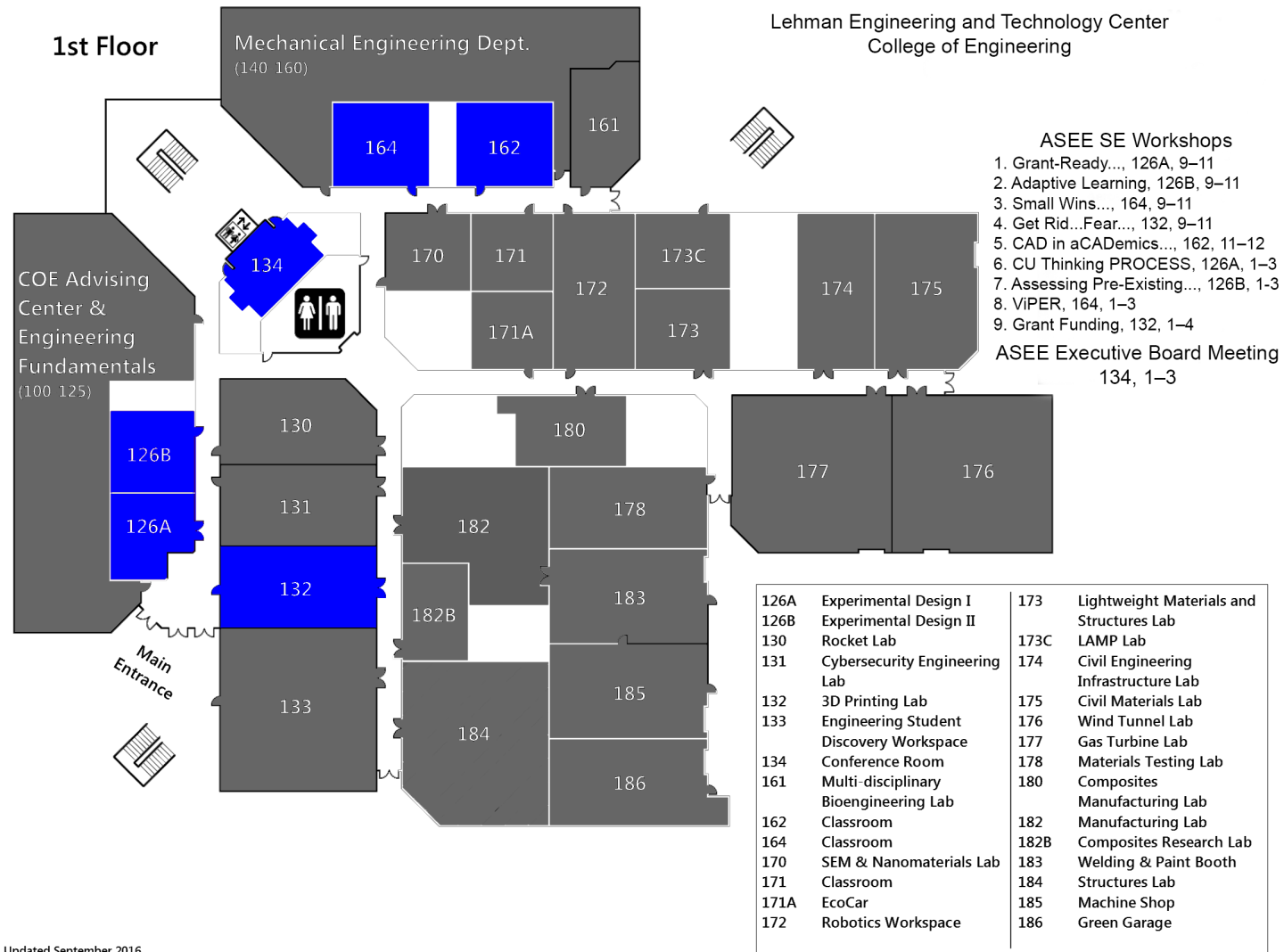
## Shores Resort and Spa to Embry-Riddle Campus



## Embry-Riddle Aeronautical University Campus Map

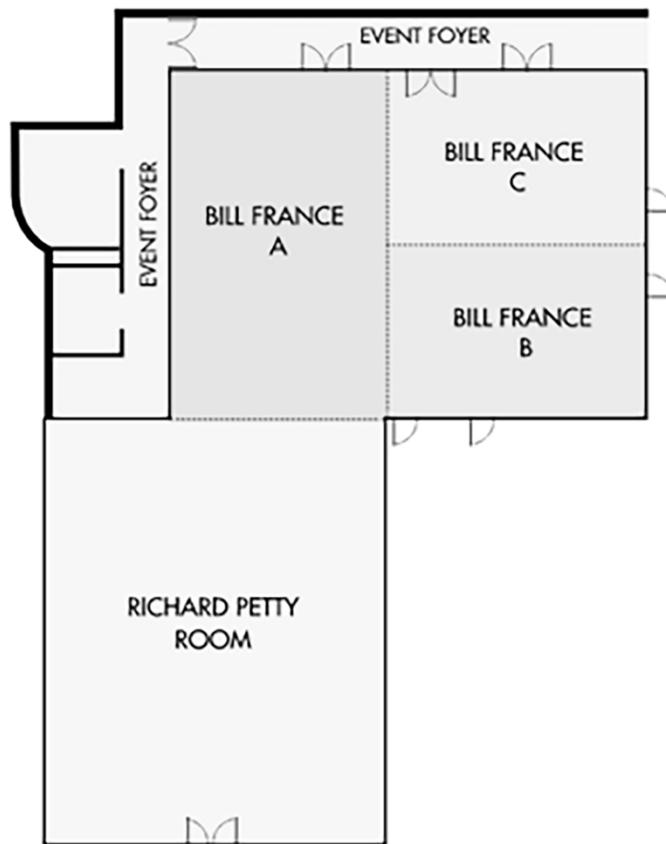


# Lehman Engineering and Technology Center, First Floor Classrooms

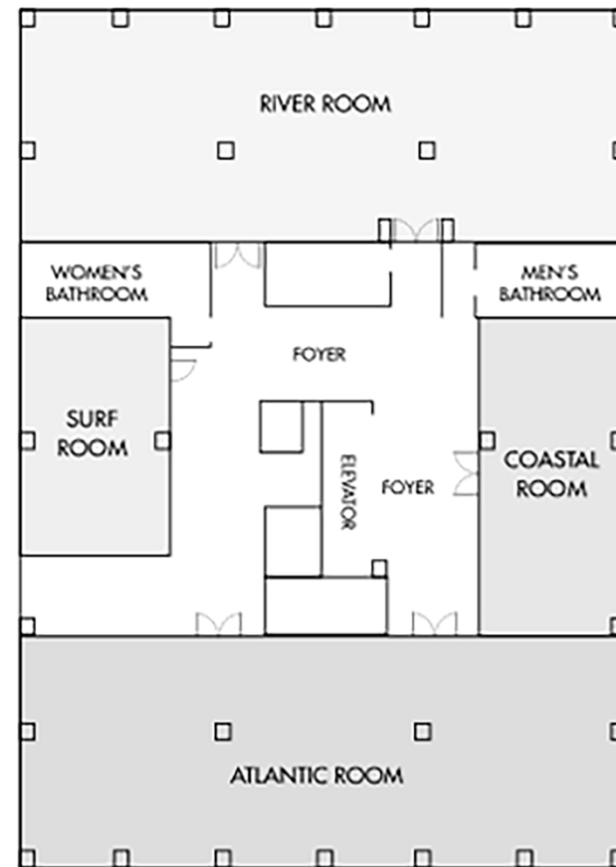


Updated September 2016

## The Shores Resort and Spa, Meeting Rooms



Lobby Level



Roof Level

**Note:** The Dolphin Room is on the second level.

## Technical Session Information

### ***Session and Presentation Timing***

Sessions are scheduled to accommodate four twenty-minute presentations. There are six concurrent sessions on Monday (T1 A–F, T2 A–F, T3 A–F) and four concurrent sessions on Tuesday (T4 A–D, T5 A–D). In order to facilitate movement between sections in a technical section, each paper in a given technical section is allotted the same amount of time. The presentation start times are listed below. This includes the introduction time and a three-minute question/answer period. If there is a no-show author in a session, a break will be called. **Papers should not be moved up or rearranged in sessions.**

	Session T1	Session T2	Session T3	Session T4	Session T5
Presentation #1	10:00	1:45	3:45	8:40	10:20
Presentation #2	10:20	2:05	4:05	9:00	10:40
Presentation #3	10:40	2:25	4:25	9:20	11:00
Presentation #4	11:00	2:45	4:45	9:40	11:20
Session End	11:20	3:05	5:05	10:00	11:40

### ***Instructions for Technical Session Moderators***

#### **Be prepared to moderate the session.**

Arrive 10 minutes early to the room where the session you are moderating is being held. Meet the presenters as they enter the room and go over the pronunciation of their name. Make sure all presentations are loaded and ready to go *before* the session starts. Bring a watch.

#### **Provide presentation guidelines at the beginning of the session.**

Introduce yourself at the beginning of the session. Remind presenters of the time limitations and that you will give a hand signal to warn that there are 5 minutes and then 2 minutes remaining.

#### **Introduce each presenter or presenters prior to their presentation.**

At the end of each presentation, the next speaker should come up and ready their slide show. Introduce the presenter when ready.

#### **Maintain the presentation schedule.**

One primary responsibility of the moderator is to ensure that the presenters begin and finish their presentations on time according to the technical program. Maintaining the presentation schedule within the session allocated time helps to have fair treatment for all presenters. In the event that a presenter, who is not last in the hour, is not present or has canceled, please wait to begin the next paper at the scheduled time, so that all who planned to attend the remaining paper(s) can. The moderator has the authority to stop a presentation that is about to run overtime in a respectful manner. It is also the job of the presenter to prepare to fit the presentation in the allotted time. Try your level best to not let a presentation and Q&A overrun the allotted time.

## Conference Workshops

*All workshops will be held on Sunday in the Lehman Engineering and Technology Center.*

### **Workshop 1: Grant-Ready and Beyond: Using logic modeling to define program success and how to measure it**

**Presenter:** Sarah Boyd and Brandi Villa, Belay Consulting

**Start time:** Sunday, March 4, 9:00 a.m. – 11:00 a.m.

**Location:** Lehman Engineering Building, Room 126A

**Goals:** Learn basic logic modeling to define program success.

**Description:** This training is designed to cultivate sustainability and improve overall effectiveness of engineering education programs. Participants will: (i) practice basic logic modeling; (ii) form measurable goals; (iii) define program success; and (iv) identify baseline data needs and future data collection opportunities. Through roundtable discussions and brainstorming sessions, this interactive workshop will help emerging programs determine if they are grant-ready and challenge existing programs to think about metrics and benchmarks. Dr. Sarah Boyd and Dr. Brandi Villa, co-Directors of Belay Consulting, an educational research and evaluation firm specializing in STEM education and outreach programming, offer the tools necessary for programs to become grant-ready.

### **Workshop 2: Adaptive Learning: Background, Applications and Lesson Building**

**Presenter:** Autar Kaw and Eleonora Delgado, University of South Florida

**Start time:** Sunday, March 4, 9:00 a.m. – 11:00 a.m.

**Location:** Lehman Engineering Building, Room 126B

**Goals:** Learn how to build your adaptive lesson on one of popular adaptive learning platforms.

**Description:** In 2006, NSF sponsored a grant to the National Academy of Engineers to “create a list of the grand challenges and opportunities for engineering facing those born at the dawn of this new century”. A committee of experts from around the world proposed 14 challenges that were thought to be attainable as well as sustainable. These challenges were reviewed by subject-matter experts, and opinions were sought from the public, including engineers and scientists. One of the grand challenges proposed was in the field of education called “Advance Personalized Learning”. One of the ways to do so is by incorporating adaptive learning where the key question is “Given what we understand about a student’s current knowledge, what should that student be working on right now?” - Knewton. Adaptive platforms do this in one place by “consolidating data science, statistics, psychometrics, content graphing, machine learning, tagging, and infrastructure”- Knewton. In this workshop on adaptive learning, we will discuss the background and terminology, examine costs and benefits, demonstrate its application and effectiveness in a STEM course, and most importantly interactively teach you on how to build your first adaptive lesson on one of the popular platforms.

### **Workshop 3: Small Wins, Big Impacts: Narratives from inside the Classroom**

**Presenter(s):** Kelsey Joy Rodgers, Leroy Long III, James J. Pembridge, and Heidi Steinhauer, Embry-Riddle Aeronautical University

**Start time:** Sunday, March 4, 9:00 a.m. – 11:00 a.m.

**Location:** Lehman Engineering Building, Room 164

**Goals:** The interactive workshop is to disseminate successes for teaching strategy adoption and adaptation.

**Description:** All students, instructors, and researchers that have participated in, taught, developed, or revised an engineering course have a story to tell about their successes and struggles. This workshop presents a well-structured environment for participants to share their own stories and listen to other stories. In this workshop, we use narrative inquiry to listen to participants’ stories about curricular design. Based on the analyses of these stories and deduced patterns, a few key struggles will be teased out to



guide this interactive workshop. All participants will then further tell their stories of success relevant to the identified struggles. Our goal is to disseminate successes for adoption and adaptation. Our goal is that all attendees will leave this workshop with a better understanding of their own stories and key takeaways that they can apply at their own institutions.

**Workshop 4: Get Rid of Your Students' Fear and Intimidation of Learning a Programming Language By Applying Second Language Acquisition in a Blended Learning Environment**

**Presenter(s):** Lulu Sun, Christina Frederick, Caroline Liron, and Li Ding, Embry-Riddle Aeronautical University; Lei Gu, Georgia State University

**Start time:** Sunday, March 4, 9:00 a.m. – 11:00 a.m.

**Location:** Lehman Engineering Building, Room 132

**Goals:** Apply second language acquisition to facilitate a blended learning of programming languages (SLA-aBLE)

**Description:** Knowledge of computer programming is very beneficial and often required for engineering students. Unfortunately, students frequently experience fear and intimidation regarding introductory programming language courses. Second language acquisition (SLA) has shown promise as a means of content delivery in second language learning courses. Blended learning environment is also becoming increasingly popular in course frameworks. This workshop will discuss the application of second language acquisition to facilitate a blended learning of programming languages (SLA-aBLE) and will examine the effectiveness of using SLA to teach introductory programming language, MATLAB. The proposed workshop will also share instructor, and student experience(s), review student outcomes from this three-year study, and provide participants course materials.

**Workshop 5: Capitalizing CAD in aCADemics**

**Presenter(s):** Christopher Morris and Brook Bartos, Misumi USA

**Start time:** Sunday, March 4, 11:00 a.m. – 12:00 noon

**Location:** Lehman Engineering Building, Room 162

**Goals:** Overview the CAD tools provided by MISUMI that streamline our customers' design cycle.

**Description:** While these tools offer many mutual benefits in the professional environment, they have also proven an asset once adapted for the classroom. Thus, I plan to overview some ways these tools have been translated for use in academia. This will be formatted as a presentation lecture, though could transition into an open discussion to help foster new ideas.

**Workshop 6: Developing problem solving skills in cornerstone courses using the CU Thinking PROCESS**

**Presenter(s):** Sarah Grigg and Elizabeth Stephan, Clemson University

**Start time:** Sunday, March 4, 1:00 p.m. – 3:00 p.m.

**Location:** Lehman Engineering Building, Room 126A

**Workshop Goals:** Introduce an approach to learning and assessment in promoting problem solving.

**Description:** This workshop will introduce an approach to learning and assessment that has been helpful in promoting problem solving in our program; review the system, scaffolding, and rubric used by our program; and discuss future opportunities to expand the use of the structure into other STEM cornerstone courses. The CU Thinking PROCESS was developed for use in a first-year engineering fundamentals course to promote strong problem solving skills and strategies. The system fosters the growth of cognitive and metacognitive skills associated with successful problem solving solutions while providing structure for communication between student and instructor.



**Workshop 7: Assessing Pre-Existing Student Knowledge: How to Identify Foundational Misconceptions**

**Presenter(s):** Heidi Steinhauer and Kaloki Nabutola, Embry-Riddle Aeronautical University

**Start time:** Sunday, March 4, 1:00 p.m. – 3:00 p.m.

**Location:** Lehman Engineering Building, Room 126B

**Goals:** Get better understanding of the impact of student prior knowledge-in particular incorrect knowledge and how to identify and correct them.

**Description:** All students bring to the classroom pre-existing knowledge. This prior knowledge can often be deeply held misconceptions. These misconceptions can be based upon incorrect understanding, teacher induced confusion, or "common sense". These misconceptions can be deeply held and interfere with students learning key new concepts. In this workshop, we will provide participants with the opportunity participate in the process of identifying foundational concepts, ranking these foundational concepts (in reference to difficulty and importance), creating conceptual questions, and generating the appropriate distractors. All participants will also be provided with an overview into the structure and purpose of a Delphi panel on the identification and ranking of key concepts. Participants will also be provided statistical overview as to identify the most impactful questions. Through an NSF supported grant the authors have generated a concept inventory (a criterion referenced assessment) for engineering graphics and will use their research process/experience as a framework.

**Workshop 8: The VIPeR Method of Circuit Analysis**

**Presenter(s):** Bob Scoff

**Start time:** Sunday, March 4, 1:00 p.m. – 3:00 p.m.

**Location:** Lehman Engineering Building, Room 164

**Goals:** Introduce a circuit analysis approach VIPeR (Voltage, Current, Power, Energy, and Resistance)

**Description:** This workshop is to present the VIPeR (Voltage, Current, Power, Energy, and Resistance), an effective pedagogical strategy on teaching circuit analysis. The VIPeR Method of Circuit Analysis is a way to systematically organize known and unknown quantities in a way that makes it very easy to keep track of these quantities (Voltage, Current, Power, and energy). It organizes circuits in an intuitive manner and enables students to more easily understand the concepts of circuit analysis. The topics to be covered in the workshop include some history, basic definitions of the various circuit quantities, and then, a detailed explanation of how to use "The VIPeR Method". The workshop will cover Direct Current Circuits, Alternating Current Circuits, and Three Phase Circuits.

**Workshop 9: Grant Funding: Where to Find It and How to Get It**

**Presenter(s):** Evelyn Brown and Fiona Baxter, North Carolina State University; Elizabeth Gombash, Seminole State College

**Start time:** Sunday, March 4, 1:00 p.m. – 4:00 p.m.

**Location:** Lehman Engineering Building, Room 132

**Goals:** Get familiar with grant development process and writing a winning proposal

**Description:** Across the country, state funding for institutions of higher education is being cut. One result of these budget cuts is that faculty at state institutions are facing increasing pressure to secure grant funding. This three-hour workshop will guide the participant through the grant development process, starting with how to find grant funding opportunities and ending with how to ensure the proposal includes key components reviewers are expecting.

## Keynote Address

### On Creating a Collaborative and Inclusive Environment

*Donna Riley, Ph.D.*

*Kamyar Haghighi Head of the School of Engineering Education*

*Professor of Engineering Education*

*Purdue University*

In October 2017, ABET finalized its revisions to student outcomes in Criterion 3 of its Engineering Accreditation Criteria. Among other changes is an enhancement to desired teamwork abilities, adding a capacity to “create a collaborative and inclusive environment.” What does this mean? How can we support student learning and development in this area? How can this ability be assessed?

In this talk I will review recent engineering education research to identify pedagogy and curricular strategies that support student learning and assessment around diversity, inclusion, and social justice. What unique contributions can ASEE’s SE region bring to our educational and faculty development efforts around ABET’s new outcome? How can we draw upon Southern knowledge and experience, shaped by the region’s historical struggles for justice, to deepen and strengthen this effort?



Donna Riley is Kamyar Haghighi Head of the School of Engineering Education and Professor of Engineering Education at Purdue University. Dr. Riley joined Purdue in 2017 from Virginia Tech, where she was Professor and Interim Head in the Department of Engineering Education. From 2013-2015 she served as Program Director for Engineering Education at the National Science Foundation (NSF). Riley spent thirteen years as a founding faculty member of the Picker Engineering Program at Smith College, the first engineering program at a U.S. women’s college. In 2005 she received a NSF

CAREER award on implementing and assessing pedagogies of liberation in engineering classrooms. Riley is the author of two books, *Engineering and Social Justice* and *Engineering Thermodynamics and 21<sup>st</sup> Century Energy Problems*, both published by Morgan and Claypool. Riley served a two-year term as Deputy Editor of the *Journal of Engineering Education* (2012-2014), rotated through the leadership of the Liberal Education/Engineering and Society (LEES) Division of the American Society for Engineering Education (ASEE) (2007-2011), and currently serves on the ASEE Diversity Committee. She is the recipient of the 2016 Alfred N. Goldsmith Award from the IEEE Professional Communications Society, the 2012 Sterling Olmsted Award from ASEE, the 2010 Educator of the Year award from the National Organization of Gay and Lesbian Scientists and Technical Professionals (NOGLSTP), and the 2006 Benjamin Dasher Award from Frontiers in Education. Riley earned a B.S.E. in chemical engineering from Princeton University and a Ph.D. from Carnegie Mellon University in Engineering and Public Policy. She is a fellow of the American Society for Engineering Education.

## Luncheon Address

### Engineering Education and the NAE Grand Challenges

***Louis Martin-Vega, Ph.D.***

***Immediate Past President***

***American Society for Engineering Education***

This brief presentation will illustrate how the NAE Grand Challenges can provide an excellent platform for advancing innovation, excellence and access at all levels of engineering education and enhancing the education of the engineer of the future.



Dr. Louis A. Martin-Vega has served as Dean of the College of Engineering at North Carolina State University in Raleigh, North Carolina since 2006. With over 10,000 students, 750 faculty and staff and \$200M in annual research expenditures, NC State's College of Engineering is internationally recognized for the excellence of its research and educational programs. Prior to joining NC State, he spent five years as dean of engineering at the University of South Florida in Tampa, Florida. He has also held several prestigious positions at the National Science Foundation (NSF) including acting head of its Engineering Directorate and director of its Division of Design, Manufacture and Industrial Innovation. His research and teaching interests are in the areas of industrial engineering, manufacturing, logistics and distribution, operations management and production and service systems. He is the author or co-author of more than 100 journal articles, book chapters and other publications and has made over 200 keynote and related presentations at national and international forums.

Martin-Vega is a Fellow of the Institute of Industrial Engineers (IIE) and the Society of Manufacturing Engineers (SME). His numerous awards include the 1999 IIE Albert Holzman Distinguished Educator Award, the 2000 HENACC-Hispanic Engineering National Education Achievement Award, the 2007 National Hispanic Scientist of the Year Award from the Tampa Museum of Science and Industry, the 2008 Outstanding Engineer in North Carolina Award from the NC Society of Engineers, the Industrial and Systems Engineering Alumni Leadership Award from the University of Florida in 2009, and the 2012 Frank and Lillian Gilbreth Industrial Engineering Award, IIE's highest honor. He is a past president of IIE, a member of the Pan American Academy of Engineering and the HENACC Hall of Fame and was named as one of the 50 Most Influential Hispanics in the US by *Hispanic Business* magazine in 2014. He is a former member of the executive board of the National GEM Consortium and former chair of the ASEE Engineering Deans Council. He is currently the Immediate Past President of ASEE, past Chair of the Advisory Committee for the Engineering Directorate at NSF and current Vice-Chair of NSF's Foundation-Wide Committee on Equal Opportunities in Science and Engineering (CEOSE).

Martin-Vega holds a B.S. in industrial engineering from the University of Puerto Rico at Mayaguez, an M.S. in operations research from New York University and M.E. and Ph.D. degrees in industrial and systems engineering from the University of Florida.

## Luncheon Address

### **Thomas C. Evans Engineering Education Paper Award Engineering Students' Epistemic Cognition in the Context of Problem Solving**

***Courtney Faber, Ph.D.***

***Research Assistant Professor and Lecturer  
Cook Grand Challenge Engineering Honors Program  
Department of Chemical and Biomolecular Engineering  
University of Tennessee, Knoxville***

One method to address calls to improve engineering education and produce graduates capable of approaching real-world problems and working in rapidly changing, multi-disciplinary environments is by including more open-ended problems throughout students' undergraduate training. When tackling these open-ended problems, we want students to be critical consumers and creators of knowledge with the skills to interpret resources, build arguments, solve complex problems, and work in multi-disciplinary environments. In order to support students to develop these skills, it is critical that we explore students' epistemic cognitions, which concerns how people acquire, understand, justify, and use knowledge within the context of open-ended engineering problems. In this presentation, I will describe a mixed-methods study that investigated the relationship between engineering students' approach to solving an open-ended homework problem and their epistemic cognitions. The outcomes of this work provide an initial framework that identifies factors that influence students' epistemic cognitions within the classroom and specific elements for engineering instructors to consider within their own classrooms.

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Dr. Courtney Faber is a Research Assistant Professor and Lecturer in the Cook Grand Challenge Engineering Honors Program at the University of Tennessee. She completed her Ph.D. in Engineering & Science Education at Clemson University. Prior to her Ph.D. work, she received her B.S. in Bioengineering from Clemson University and her M.S. in Biomedical Engineering from Cornell University. Prior to starting at University of Tennessee in January 2017, she was an Assistant Professor in the Technological Studies Department at The College of New Jersey where she taught preservice K-12 engineering and integrative STEM teachers. At University of Tennessee, she teaches Honors Physics for Engineers I & II and has developed an Engineering Education Practicum course for graduate and undergraduate engineering teaching assistants. Her research focuses on developing formal and informal education practices to foster epistemic cognition and identity development in undergraduate engineering students. Her current research is supported by multiple National Science Foundation grants.



## Banquet Address

### eARTh from Space ~ Educating the Engineer of the Future

*Nicole Stott, "The Artistic Astronaut"*



### ***Artist ~ Astronaut ~ Earthling***

Nicole has explored from the heights of outer space to the depths of our oceans. In awe of what she experienced from these very special vantage points, she has dedicated her life to sharing the beauty of space ~ and Earth ~ with others. She believes that sharing these orbital and inner space perspectives has the power to increase everyone's appreciation of and obligation to care for our home planet and each other.

A veteran NASA Astronaut, her experience includes two spaceflights and 104 days living and working in space on both the Space Shuttle and the International Space Station (ISS). She performed one spacewalk, was the first person to fly the robotic arm to capture the free flying HTV cargo vehicle, she was the last crew member to fly to and from their ISS mission on a Space Shuttle, and she was a member of the crew of the final flight of the Space Shuttle Discovery, STS-133. A personal highlight of Nicole's spaceflight was painting the first watercolor in space.

Nicole is also a NASA Aquanaut, who in preparation for spaceflight and along with her NEEMO9 crew, lived and worked during an 18-day and longest saturation mission to date on the Aquarius undersea habitat.

As an Artist, and now retired from NASA, Nicole combines her artwork and spaceflight experience to inspire creative thinking about solutions to our planetary challenges, to raise awareness of the surprising interplay between science and art, and to promote the amazing work being done every day in space to improve life right here on Earth.



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# Call for Papers, 2019 ASEE SE Conference



## ASEE Southeastern Section Conference

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### ***DELIVERING STUDENT-CENTERED ENGINEERING EDUCATION***

The ASEE-SE Conference is open to everyone interested in improving the Engineering Education Experience. Participants will include faculty, students, department chairpersons, college deans, and industry leaders in engineering and engineering technology. The conference is an excellent opportunity to interact and reflect with colleagues over a plethora of engineering education issues and topics, as well as chart new directions and collaborations.

### **CALL FOR PAPERS AND PRESENTATION ABSTRACTS**

Authors are invited to submit full-length manuscripts for presentation at the conference and inclusion in its proceedings. Papers addressing the conference theme will have first priority and may include topics related to the following:

- Innovative Curricula or Courses
- First Year Engineering Programs
- Cross-Discipline Practices
- Online, Distance, and Blended Approaches
- Effective Learning Technologies
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- K-12 Outreach Programs
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- Experiential Learning
- ABET Accreditation Projects
- Recruitment and Retention
- Industry Partnerships
- Engineering Common Cores
- Teaching/Learning Practices
- Capstone Design Courses or Projects
- Ethics and Professional Development

Authors may also address other topics of interest to the engineering education community. Guidelines for manuscript preparation are available via the Author Instructions at <http://www.asee-se.org> at the Conference page.

Papers will be accepted based on a peer review of manuscripts. Authors are expected to present their papers at the conference to facilitate the transfer of knowledge through discussion and debate. All accepted papers presented by a timely-registered author will be included in the conference proceedings.

A limited number of abstracts may be accepted for presentation. These abstracts will be neither peer-reviewed nor included in the conference proceedings.

An author/co-author can be associated with as many papers/presentations as is appropriate, but a registrant can serve as the presenter of record on a maximum of three papers or presentations.

The conference will include a student program, including poster presentations for lower- and upper-division design and for undergraduate research. Details will be announced in fall 2018.

### **SCHEDULE FOR SUBMISSION OF PAPERS AND ABSTRACTS**

Friday, September 7, 2018	Abstracts submitted by authors for consideration
Friday, September 11, 2018	Authors notified regarding acceptance
Friday, November 9, 2018	Manuscripts due from authors for review
Friday, December 7, 2018	Reviewed manuscripts returned to authors
Friday, January 4, 2019	Final manuscripts and extended abstracts due from authors
Friday, January 18, 2019	Deadline for presenters to register for conference

**Submit a 250-300 word abstract in doc, docx, or pdf file format by September 7, 2019**

Conference paper submission site is accessible at <http://papers.asee-se.org/>

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# Notes