ASEE SOUTHEASTERN SECTION ANNUAL CONFERENCE

March 13-15, 2016

“Engineering for Sustainability”

The University of Alabama
Tuscaloosa, AL

Proceedings Editor:	Barbara Bernal Kennesaw State University
Paper Management Website Coordinator:	Tyson Hall Southern Adventist University
Technical Program Chair:	Priya Goeser Armstrong University
Site Chair and Coordinator:	Beth Todd The University of Alabama

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* This abstract is a presentation only abstract without a full manuscript in the conference proceedings.

THE UNIVERSITY OF ALABAMA | Office of the President

February 29, 2016

Dear 2016 ASEE Southeastern Conference Attendees:

On behalf of the faculty, staff, and students of The University of Alabama, we welcome you to the American Society of Engineering Education Southeastern Section Annual Conference. We are delighted to host the conference, and we hope that it is an enjoyable experience for you. The theme of this year's conference, "Engineering for Sustainability," is a timely topic and a major challenge for future engineers. How can we equip our students for the challenges that they will meet?

We will begin our time together with a reception at Mugshots – a time to become acquainted with old friends as well as to meet new ones. On Monday following a lively Keynote by Sarah Rajala as we learn about Proposed Changes to ABET Criteria 3 and 5, we will have technical sessions and student posters in the new facilities surrounding the Shelby Engineering and Science Quad. Monday will end with the Awards Banquet at the River Market down on the Black Warrior River. On Tuesday morning we will wrap up the conference with technical sessions and a box lunch.

Beyond the research and academic facilities, growth at The University of Alabama has led to many changes. We encourage you to check out our campus including our 5K running trail if you are a jogger, the Malone-Hood Plaza and the Autherine Lucy Clock Tower if you are a history buff of the Civil Rights era, or the Walk of Champions in front of Bryant Denny Stadium if you are a football fan.

We hope that you enjoy your brief stay in Tuscaloosa. We are glad you came to visit!

Sincerely,

Stuart R. Bell, Ph.D., P.E.
President

Charles L. Karr, Ph.D.
Dean

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president@ua.edu | http://www.ua.edu

Conference Welcome

Scott Schultz, ASEE SE Section President

Welcome to the 2016 ASEE Southeastern Section Annual Conference. I look forward to this conference each year for a chance to catch up with old acquaintances and make new friends. And making new friends is easy to do when we have the common bond of educating students to be the best engineers they can be.

I want to begin by thanking each of the authors for helping make this conference possible. Whether presenting a poster for the first time, or faithfully sharing a presentation year after year, your work helps motivate and enrich us, your peers. Please continue supporting this conference in the future by continuing to share your work.

I also want to thank the University of Alabama for hosting this year's conference, and in particular Beth Todd who is this year's host site coordinator. I also was to recognize Priya Goeser, this year's technical program chair. These two individuals performed the lion's share of the work necessary to hold this year's conference. I also want to thank all the other section officers, unit officers and division officers who play vital roles and make us one of ASEE's best sections.

What makes our section strong is our volunteer workforce. We encourage everyone attending the conference to become further involved with ASEE Southeastern by considering officer positions. If you have never been an officer before, you can start by volunteering as the Secretary for one of the Divisions. If you have worked your way through a Division chair and are interested in the Programs, Awards and Recognition, or Publications and Promotions Unit then seek out one of the current Unit officers and let them know you are interested. The Division and Unit officers are selected during the Monday and Tuesday breakfasts.

This time next year, in place of the Southeastern Section conference, we will be joining the other two sections in our zone for a Zone II Conference in San Juan, Puerto Rico. This looks to be a fantastic venue located near "Old San Juan". We look forward to meeting our section neighbors and anticipate several current and past leaders of ASEE national to join us for this exciting conference.

Thanks for coming,

Scott Schultz

President, ASEE-SE

Acknowledgements

Welcome to The University of Alabama. Please enjoy your time at the conference, and I hope you find the program sessions, posters, 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 90 registered conference attendees from over 35 educational institutions and corporations.
- All the students in the poster competition
- All the presenters in the technical sessions
- The session moderators
- Dean Chuck Karr for his leadership and guidance
- All my fellow conference planners
- Carol Sanders and Michelle Estes in the Dean's Office for their enormous help with conference logistics and financial management.
- Lucy Fonseca and Judy Skelton of the College of Continuing Studies for handling registration
- Lynn Hamric for arranging music.
- And to all the faculty, staff, and students of The University of Alabama who helped in the organizing and running of this conference.
- Priya Goeser, the Program Technical Chair, and all the Division Chairs
- Scott Schultz and Hodge Jenkins for answering questions about past conferences.

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 The University of Alabama and Tuscaloosa, Alabama.

Beth Todd
Site Coordinator
The University of Alabama

Conference Information

ASEE-SE Executive Board Meeting

Sunday, March 13, 3:00-5:15 PM 3030 SERC

Sunday Welcome Reception

Sunday, March 13, 6:00-9:00 PM

Mugshots, Upstairs 511 Greensboro Ave, Tuscaloosa, AL 35401
(205) 391-0572

There will be great conversation, food, and a cash bar all evening.

Directions: Mugshots is catty-corner across University Blvd from the Embassy Suites.

Monday Welcome and Keynote

Monday, March 14, 7:30-8:30 AM Embassy Suites Ballroom

Division and Unit Meetings and Breakfast

Monday, March 14, 8:45-9:45 AM Embassy Suites Ballroom

Welcome, Dr. Stuart R. Bell, P.E.
President of The University of Alabama

Keynote: Proposed Changes to ABET Criteria 3 and 5
Dr. Sarah Rajala,
Chair, Engineering Accreditation Council of ABET
Dean, College of Engineering, Iowa State University

Conference Information

Monday Thomas C. Evans Award Presentation

Monday, March 14, 12:15-1:30 PM 1013 SERC
Includes lunch

Monday Awards Banquet

Monday, March 14, 6:00-9:00 PM

Tuscaloosa River Market 1900 Jack Warner Pkwy, Tuscaloosa, AL 35401

Social hour lasts until 6:30. Dinner will begin 6:30, followed by the presentation of Awards. There will be live music and a cash bar.

Location: Along the Black Warrior River off of Jack Warner Pkwy

Tuesday Business Meetings

Tuesday, March 15, 7:30-8:30 AM Embassy Suites Ballroom

Division and Unit Meetings and Breakfast

Tuesday, March 15, 11:45AM-1:00 PM 1013 SERC

Lunch and Section Business Meeting


Google Maps
3/5/2016
Google Maps
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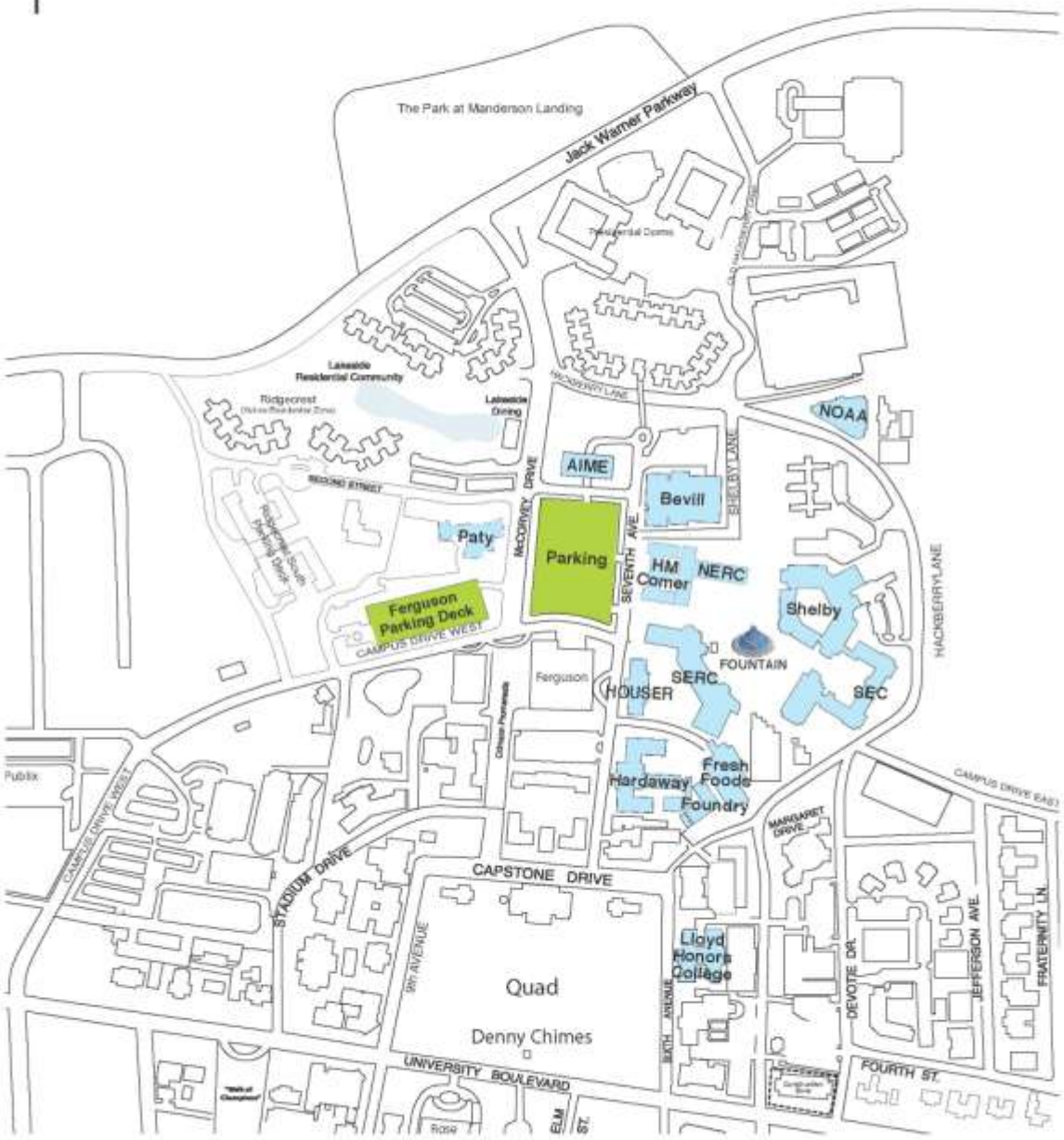
500 ft
Google Maps
1/1
https://www.google.com/maps/@33.2129414,-87.5574322,16z

Engineering Area Map




1st Floor SERC
1013
1014
1056
1059
SCIENCE & ENGINEERING COMPLEX - PHASE III


2nd Floor SERC
2009
2036
2039
SCIENCE & ENGINEERING COMPLEX - PHASE III


3027
3030
SCIENCE & ENGINEERING COMPLEX - PHASE III

Wireless Access for Guests on Campus

username: **engguest-wireless**

password: **Ke8yJapi** (case sensitive)

Security is **UA-WPA2**

Conference Overview

2016 ASEE-SE Conference Schedule				
Sunday				
2:30 PM	5:30 PM	3:00	Registration	SERC Alcove
3:00 PM	5:15 PM	2:15	Executive Board Meeting	SERC 3030
6:00 PM	9:00 PM	3:00	Reception at Mugshots	Mugshots Upstairs
Monday				
7:30 AM	10:00 AM	2:30	Registration	Embassy Suites
7:30 AM	8:30 AM	1:00	Breakfast	Embassy Suites
8:00 AM	8:30 AM	0:30	Division & Unit Meetings + Breakfast	Embassy Suites
8:45 AM	9:45 AM	1:00	Welcome & Keynote	Embassy Suites
9:45 AM	10:15 AM	0:30	Break -- Travel to SERC	
9:30 AM	5:30 PM	8:00	Registration	SERC Alcove
9:45 AM	10:45 AM	1:00	Student Poster Setup Time	SERC 3rd floor hallway facing Quad
10:15 AM	11:35 AM	1:20	Technical Session 1 (4 papers)	SERC 1014, 1056, 2009, 2036, 2039
10:45 AM	12:15 PM	1:30	Student Poster Judging	
11:30 AM	12:15 PM	0:45	Student Poster Session	
12:15 PM	1:30 PM	1:15	Lunch -- Attendees	1013 SERC
12:45 PM	1:30 PM	0:45	Presentation: Evans Best section paper Demonstrations for Class time for Flipped Statics, Anna Howard	1013 SERC
12:15 PM	1:30 PM	1:15	Lunch -- Students	1014 SERC
12:45 PM	1:30 PM	0:45	Presentation: Brian Jordon	1014 SERC
1:30 PM	1:40 PM	0:10	Transition time	
1:40 PM	3:00 PM	1:20	Technical Session 2 (4 papers)	SERC 1014, 1056, 2009, 2036, 2039
3:00 PM	4:00 PM	1:00	Break and Lab Tours	Break is 3rd floor near posters. Meet at Registration Table for Tours.
4:00 PM	5:20 PM	1:20	Technical Session 3 (4 papers),	SERC 1013, 1014, 1056, 1059
5:20 PM	6:00 PM	0:40	Travel to River Market for Dinner and Awards	
6:00 PM	9:00 PM	3:00	Awards Banquet with cash bar	River Market
6:30 PM			Dinner and Awards; cellist begins at 6:30	
7:15 PM	7:35 PM		Joe Rencis, President, ASEE	
7:35 PM	9:00 PM		Awards	
Tuesday				
7:30 AM	9:00 AM	1:30	Registration	Embassy Suites
7:30 AM	8:30 AM	1:00	Breakfast	Embassy Suites
8:00 AM	8:30 AM	0:30	Division & Unit Meetings + Breakfast	Embassy Suites
8:30 AM	9:30 AM	1:00	Break -- Travel to SERC -- Hotel checkout	
8:30 AM	10:30 AM	2:00	Registration	SERC Alcove
9:30 AM	10:30 AM	1:00	Technical Session 4 (3 papers)	SERC 1013, 1014, 1056, 1059
10:30 AM	10:40 AM	0:10	Break	1st floor hallway
10:40 AM	11:40 AM	1:00	Technical Session 5 (3 papers)	SERC 1014, 1056, 1059
10:40 AM	11:40 AM	1:00	Past Presidents Meeting	SERC 3027
11:45 AM	1:00 PM	1:15	Box Lunch and Business Meeting	SERC 1013
1:00 PM			Adjourn	

Conference Technical Sessions at a Glance

Monday, March 14, 2016

10:15 am–11:35 am	T1-A 1014 SERC	T1-B 1056 SERC	T1-C 2009 SERC	T1-D 2036 SERC	T1-E 2039 SERC
Technical Session 1	K-12 Division I	Electrical Engineering Division I	Instructional Division I	Mechanical Engineering Division I	Professional Skills Division I
Moderator	***Sally Pardue***	***Harry Powell***	***Seamus Freyne***	***Alta Knizley***	***Tanya Kunberger***
1:40 pm – 3:00 pm	**T2-A 1014 SERC**	**T2-B 1056 SERC**	**T2-C 2009 SERC**	**T2-D 2036 SERC**	**T2-E 2039 SERC**
Technical Session 2	Civil Engineering Division I	Research Division I	Instructional Division II / Bioengineering Division	Mechanical Engineering Division II	Administra-tive Division I
Moderator	***Veera Gnaneswar Gude***	***Rami Haddad***	***M. Karim***	***Mosfequr Rahman***	***Tanya Kunberger***
3:00 pm – 4:00 pm		**Afternoon Break and Lab Tours**			
4:00 pm – 5:20 pm	**T3-A 1014 SERC**	**T3-B 1056 SERC**	**T3-C 1013 SERC**	**T3-D 1059 SERC**	
Technical Session 3	Civil Engineering Division II	K-12 Division II	Instructional Division III	Mechanical Engineering Division III	
Moderator	***Bradley Striebig***	***Otsebele Nare***	***Charles Newhouse***	***Monika Bubacz***	

Tuesday, March 15, 2016

9:30 am – 10:30 am	T4-A 1013 SERC	T4-B 1014 SERC	T4-C 1056 SERC	T4-D 1059 SERC
Technical Session 4	Chemical Engineering and Engineering Technology Divisions	Software Engineering and Electrical Engineering Divisions II	Research Division II	Administrative and Professional Skills Divisions II
Moderator	***Sarah Lee***	***Anna Howard***	***Shih-Liang Wang***	***David Calamas***
10:30 am – 10:40 am	**Morning Break, 1st Floor Hallway**			
10:40 am – 11:40 am	**T5-A 1014 SERC**	**T5-B 1056 SERC**	**T5-C 1059 SERC**	
Technical Session 5	Civil Engineering and Professional Skills Divisions III	Computer Engineering and Technology Divisions II	Instructional Division IV	
Moderator	***Claire McCullough***	***Richard Stansbury***	***Chuck Margraves***	

10:40 – 11:40 am, Past President's Meeting, 3027 SERC

Technical Session Information

Session and Presentation Timing

Sessions are scheduled for 4 or 3 presentations. Some technical sessions have sections with a non-uniform number of papers. This is a result of late cancellations and attempting to theme sessions. In order to facilitate movement between sections in a technical section, each paper in a given technical section will be allotted the same amount of time. The presentation start times are listed in the grid below. This includes the introduction time and a 3 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	10:15	1:40	4:00	9:20	10:30
Presentation #2	10:35	2:00	4:20	9:40	10:50
Presentation #3	10:55	2:20	4:40	10:00	11:10
Presentation #4	11:15	2:40	5:00		

Instructions for Technical Session Moderator Chairs

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.

Keynote Speaker

Proposed Changes to ABET Criteria 3 and 5

Sarah Rajala, Ph.D.
Dean, College of Engineering, Iowa State University
James & Katherine Melsa Professor in Engineering

Dr. Sarah Rajala serves as Dean of the Iowa State University College of Engineering and holds the James & Katherine Melsa Professorship in Engineering. Prior to this, Rajala served as the named Dean of Mississippi State University's Bagley College of Engineering and Head of the Department of Electrical and Computer Engineering. She was a faculty member at North Carolina State University, and served as a center director, Associate Dean for Academic Affairs, and Associate Dean for Research and Graduate Programs. She is a Fellow of the American Association for the Advancement of Science and the Institute of Electrical and Electronic Engineers, and has served as President and is a Fellow of the American Society for Engineering Education. She served as the chair of the Global Engineering Deans Council and is currently Chair of the Engineering Accreditation Council of ABET. Rajala has received numerous awards for her contributions to engineering education, most recently the 2015 IEEE Harriett B. Rigas Award.

Awards Presentation: Major Initiatives of ASEE

Joseph J. Rencis, Ph.D., P.E.
Dean of Engineering,
Clay N. Hixson Chair for Engineering Leadership
2015-16 ASEE President
Tennessee Tech University

Dr. Joseph J. Rencis was born and raised in Northwestern New Jersey, attended Milwaukee School of Engineering (MSOE), where he received his A.A.S. and B.S. degrees in Architectural and Building Construction Engineering Technology. From there, Dr. Rencis went on to earn his M.S. from Northwestern University and Ph.D. from Case Western Reserve University in Civil Engineering. From 1985 to 2004 he served as Assistant, Associate, and Professor of Mechanical Engineering at the Worcester Polytechnic Institute (WPI). From 2004 to 2010 he was Department Head and the inaugural holder of the Twenty-first Century Leadership Chair in Mechanical Engineering from 2007 to 2010 at the University of Arkansas, Fayetteville. Since 2011, he has served as the Dean of Engineering, the inaugural holder of the Clay N. Hixson Chair for Engineering Leadership, and Professor of Mechanical Engineering at Tennessee Tech University.

He is a fellow of the American Society of Mechanical Engineers (ASME), American Society for Engineering Education (ASEE), and Wessex Institute of Great Britain. Rencis currently serves as ASEE President and on the ASEE Board of Directors. He is also a member of the ASEE Engineering Deans Council Public Policy Committee, and Board of Directors for Advancement Scientific and Engineering Technology of Tennessee. Rencis was the Chair and Vice Chair of the ASME Mechanical Engineering Department Heads Committee and a member of the ASME Center for Education Board of Directors.

TECHNICAL SESSIONS

Monday, March 14, 2016

10:15 am–11:35 am	T1-A 1014 SERC	T1-B 1056 SERC	T1-C 2009 SERC	T1-D 2036 SERC	T1-E 2039 SERC
Technical Session 1	K-12 Division I	Electrical Engineering Division I	Instructional Division I	Mechanical Engineering Division I	Professional Skills Division I
Moderator	***Sally Pardue***	***Harry Powell***	***Seamus Freyne***	***Alta Knizley***	***Tanya Kunberger***

T1–A: K-12 Division **1014 SERC**

Attracting Girls, Special Needs, Minority and Underserved Secondary Students to Computer Science Majors and Careers, *D. Marghitu, Y. Rawajfih, S. Taneja*

Codeit Day: Breaking Stereotypes and Feeding the STEM Pipeline, *J. Jones, N. Mack, T. Smith, J. Gilbert*

A Professional Development Model to Train 50 Alabama High School Teachers on the New CS Principles College Board AP Exam, *J. Gray, M. Boehm, C. Crawford*

Participatory Action Research as an Approach to Performing Research in Engineering Education with Native American Communities, *D. Frank, C. Crane, E. Douglas*

T1-B: Electrical Engineering Division I **1056 SERC**

A Breadth-first Approach to Electrical and Computer Engineering Curricula, *H. Powell, M. Brandt-Pearce, R. Williams, L. Harriott, R. Weikle*

Bamaspace: The University of Alabama's Student Space/Astronautics Programs, *J. Baker, R. Branam, P. Hubner, K. Ricks, P. Kung, B. Todd*

Practical Power Systems Protection—Course Model, *A. El Shahat, R. Haddad, Y. Kalaani*

Assessing Potential -- Impacts an Experimental Centric Approach can have in an Introduction to Digital Electronics Course, *O. Nare, Q Le, Z. Hayes, N. Halyo, Z. Sun*

T1-C: Instructional Division I **2009 SERC**

What a Smell! Lessons Learned from a Collaborative Compost Capstone, *C. Newhouse, P. Ackerman*

Observations from First Use of An Online Homework and Learning Management System, *H. Jenkins*

Characteristics of Training in Civil Engineering Firms, *B. Giltner, S. Freyne*

Effectiveness of Flipping an Undergraduate Thermodynamics Course, *N. Moore*

T1-D: Mechanical Engineering Division I **2036 SERC**

Digital Design for Centrifugal Fans, *J. Abbitt, S. Lowry*

An Inter-campus Capstone Design Project on Vtol, *S.-L. Wang*

Reinforcing Conceptual Content in Undergraduate Heat Transfer through the Use of CFD, *D. Calamas, G. Keten*

Student and Instructor Perceptions of a Supplemental Instruction Program, *C. Maier, A. Martin, R. Rabb*

T1-E: Professional Skills Division I **2039 SERC**

Professional Development: A Higher Education Challenge, *K. Plemmons, D. Fallon*

Implementing Student Enhancement Plans for Student Growth and Goal Attainment, *T. Kunberger, C. Geiger*

Graduate Students Working Towards an Engineering Education Community: A Case Study of the GT-ASEE Student Chapter, *S. Gillespie, M. Priddy*

Developing an Innovation and Entrepreneurship Culture at Tennessee Technological University: Documenting the Process, *V. Motevalli, M. Rao, H. Stretz, J. Biernacki, S. Canfield*

1:40 pm – 3:00 pm	T2-A 1014 SERC	T2-B 1056 SERC	T2-C 2009 SERC	T2-D 2036 SERC	T2-E 2039 SERC
Technical Session 2	Civil Engineering Division I	Research Division I	Instructional Division II / Bioengineering Division	Mechanical Engineering Division II	Administra-tive Division I
Moderator	***Veera Gnaneswar Gude***	***Rami Haddad***	***M. Karim***	***Mosfequr Rahman***	***Tanya Kunberger***

T2-A: Civil Engineering Division I **1014 SERC**

Student "micro" Teaching and Learning Experiences, *V. G. Gude*

Bim-based Estimating and its Applications in Support of Cost Estimation and Cost Planning, *M. Maghiar*

Civil Engineering Students' Viewpoints on Teaching, Learning, and Careers, *S. Freyne, D. Truax, V.G. Gude*

From Tensile Testing to Generating Crossword Puzzles, *S. Ghanat, J. Murden*

T2-B: Research Division I **1056 SERC**

Cost-effectiveness of the Combination of Solar Panel and Cooling System for Achieving Higher Efficiency, *C. Xu, F. Najafi*

Experimental Study of Fabric Wrapped Polyurethane Shafts under Triple Point Bending, *K. Yeomans, L. Zamora, A. Mitra*

Preparing for a Summer Research Project, *E. Smith, C. Seals, S. Bernadin*

T2-C: Instructional Division II / Bioengineering Division **2009 SERC**

Perceived Satisfaction and Assessment of Learning using Online Learning Management Systems with Undergraduate and Graduate Students, *D. Paulus, M. Reynolds*

A Sustainability Indicators Based Curriculum, *B. Striebig, S. Morton*

A Laboratory-based Approach for an Introduction to Biomolecular Engineering, *J. Rice, M. Bocci, P. Kent*

A Pedagogical Approach to Introduce Green's Functions to Engineering Students, *L. Loftis, P. Arce, J. Pascal*

T2-D: Mechanical Engineering Division II **2036 SERC**

Fluid Mechanics Laboratory Experiment: Calibration of a Semi Circular Weir, W. Janna, P. Palazolo

Development of a Small Scale Impact Erosion Test Apparatus, S. Hill, J. Barnes, B. Harrison, C. Yawn

Experimental Setup Design and Photostriction Effect Measurement Technique Learning of Photostrictive Optical Actuators, M. Rahman, M. Nawaz, G. Molina

T2-E: Administrative Division I **2039 SERC**

Redesign the STEM Gateway Courses with Evidence-based Pedago, *X. Zhao, M. Drabo, F. Majid, C. Glenn, M. Hasan, J. Stewart, X. Qian*

Engineering Foundations: Development of a Multidisciplinary Freshmen Course, *M. Minton*

Introducing a Tool for ABET Course Assessment (a.c.a.) for a New Engineering Program, *M. Bubacz, R. Rabb, J. Howison, K. Skenes*

An Evaluator's Perspective on Proposed Changes to ABET Criteria, *C. McCullough*

4:00 pm – 5:20 pm	T3-A 1014 SERC	T3-B 1056 SERC	T3-C 1013 SERC	T3-D 1059 SERC
Technical Session 3	Civil Engineering Division II	K-12 Division II	Instructional Division III	Mechanical Engineering Division III
Moderator	***Bradley Striebig***	***Otsebele Nare***	***Charles Newhouse***	***Monika Bubacz***

T3-A: Civil Engineering Division II **1014 SERC**

Learning of Environmental Engineering – On-line, Hybrid, or Face-to-face: A Case Study, M. Karim

Development of Green Engineering and Sustainability Curriculum for School of Engineering at Christian Brothers University, L. Y. Lin, C. Y. Chew

Comparing Sustainable Nutrient Reduction Strategies for Small Coastal Communities, K. Thomas, P. Ochs, L. Donston, K. Effler, J. McWilliams, W. Woodard, B. Striebig

Effects of Classroom Pedagogies used in a Freshmen Course on Students' Perception of the Sub-disciplines of Civil Engineering, D. Michalaka, S. Ghanat, M. K. Watson, K. Bower, R. Welch

T3-B: K-12 Division II **1056 SERC**

Middle School Outreach Program to Teach Programming Concepts with Mobile Application, *S. Islam, R. Shankar, M. Serrano, I. Minor*

Robotics as an Entrée to K-12 Computer Science for Underrepresented Students, *D. Marghitu, J. Gray, S. King, J. M. Wyss*

A Contribution to Building Sustainable and Diversified STEM Pipelines through Summer Programs, *O. Nare, Z. Hayes, T. Hayes, C. Abney*

Engineering for the Future: Mississippi State University's Cyber Summer Programs, *S. Lee, S. Kastner, R. Walker*

T3-C: Instructional Division III **1013 SERC**

Exam Preparation through Directed Video Blogging using Electronically-mediated Realtime Classroom Interaction, *R.F. DeMara, S. Salehi, S. Muttineni*

Integration of Interactive Print Media into Thermal Fluids Laboratory Equipment to Aid in Laboratory Instruction, *D. Spayde, A. Knizley, P. Mago*

Impact of Social Media and Technology on Student Engagement and Learning, *V. Batra, S. Kotru*

Humor in the Engineering Classroom, *P. Ludovice, W. Newstetter, D. MacNair, A. Peters*

T3-D: Mechanical Engineering Division III **1059 SERC**

Wind Turbine Design for Low Speed Wind Applications, *C. Roper, A. Khalid*

Insulation and Zero Energy Buildings – Development of a Small Scale Undergraduate Lab to Investigate the Effect of Insulation on Energy Transfer using Thermal Imaging Devices, *N. True, C. Margraves, T. Elliott*

Experimental Set-up Design and Testing of Vertical and Horizontal Axis Wind Turbine Models in a Subsonic Wind Tunnel, *M. Rahman, T. Salyers, E. Maroha*

CFD as a Visualization Tool in Undergraduate Fluid Mechanics, *D. Calamas, G. Keten*

Tuesday, March 15, 2016

9:30 am – 10:30 am	T4-A 1013 SERC	T4-B 1014 SERC	T4-C 1056 SERC	T4-D 1059 SERC
Technical Session 4	Chemical Engineering and Engineering Technology Divisions	Software Engineering and Electrical Engineering Divisions II	Research Division II	Administrative and Professional Skills Divisions II
Moderator	***Sarah Lee***	***Anna Howard***	***Shih-Liang Wang***	***David Calamas***

T4-A: Chemical Engineering and Engineering Technology Divisions **1013 SERC**

Integrating Biofuels Education into Chemical Engineering Curriculum – Project Evaluation and Dissemination, *Q. He, J. Wang*

Development and Implementation of an Interdisciplinary Course at the Interface of Chemical Engineering and Nursing, *J. Sanders, M. Geist*

Chemical Engineering Technology—Techniques for the Initial Development of an Online Technology Course, *C. Little, P. Hall*

T4-B: Software Engineering and Electrical Engineering Divisions II **1014 SERC**

Using a Visual Programming Language to Interact with Visualizations of Electroencephalogram Signals, C. Crawford, M. Andujar, F. Jackson, I. Applyrs, J. Gilbert

Fostering Agile Methodologies in Cross-disciplinary Capstone Design Course through Process Management Tools, K. Pedrosa, R. Tubbesing, R. Stansbury, J. Liu

An Introductory Course in Energy Efficient Power Regulator Design, H. Powell

T4-C: Research Division II **1056 SERC**

Economic Feasibility and Environmental Sustainability Analysis for Co-Location of Desalination Facilities in Power Plants using Renewable Energy, J. Walker, F. Najafi

Metal Impingement Erosion Laboratory Experience, S. Hill, G. Bodstein, A. Eggert, P. Rosa

Additive Manufacture of a Flux Focusing Magnetic Gear, W. Williams, J. Kadel, J. Warne, P. Sathe, J. Bird

T4-D: Administrative Division II and Professional Skills Division II **1059 SERC**

When Opportunity Knocks – an Alternative Summer Engineering Internship, S. Schultz, P. Biswas

New Intern, How are We Going to Use You?, A. Mills, R. Rabb

Mathematics Preparation and Performance in Graduate Level Engineering Courses with Distance and Local Students, C. O'Neill

10:40 am – 11:40 am	T5-A 1014 SERC	T5-B 1056 SERC	T5-C 1059 SERC
Technical Session 5	Civil Engineering and Professional Skills Divisions III	Computer Engineering and Technology Divisions II	Instructional Division IV
Moderator	***Claire McCullough***	***Richard Stansbury***	***Chuck Margraves***

T5-A: Civil Engineering and Professional Skills Divisions III **1014 SERC**

Student Perception of Professional Skills Development in the Undergraduate Civil Engineering Curriculum at The Citadel, *A. Ghanat, D. Michalaka, W. Davis*

Alternative Assembly Materials for Residential Cool Roofs, M. Maghiar, A. Patel, D. John

Flipped Learning: A Hybrid Classroom Approach that Turns Construction and Engineering Education Upside Down, P. Rogers, C. Martin

T5-B: Computer Engineering and Technology **1056 SERC**

Strengthening STEM Laboratory Assessment using Student-Narrative Portfolios Interwoven with Online Evaluation, R.F. DeMara, S. Salehi, N. Khoshavi, R. Hartshorne, B. Chen

A Second Language Acquisition Approach to Learning Programming Languages, R. Cunningham, P. S. Espejo, C. Frederick, L. Sun L. Ding

Results and Observations from Two Semesters of Implementing a Flipped Classroom Model in an Engineering Computation Course, S. Liu

T5-C: Instructional Division IV **1059 SERC**

Applying US EPA Sustainability Criteria to Capstone Design, B. Striebig

"Flipping" the Probability and Statistics Classroom: The Instructor's Experience, student Feedback, and Plans for Formal Assessment, L. Moody

"A Hybrid Lecture/Practice-based Model for Communication Systems," R. Haddad, A. El Shahat, Y. Kalaani

TOURS

Meet in the registration area at 3:05 for tours of the laboratory facilities at the University of Alabama.

Engines and Combustion Lab -- The Engines and Combustion Lab is a facility dedicated to the teaching and research of combustion. The ECL has two large work areas and six ballistic protected test cells. Each test cell has an instrument room to the side and control area at the back so that tests can be conducted in the cells without human presence. Four of the cells are used for various areas of combustion research, including alternative fuels, gas turbine, and internal combustion engine research. A fifth cell contains a large AC engine dynamometer capable of measuring engine power up to 650 hp and 2300 ft-lbf of torque. The sixth cell contains a research-grade two-roller chassis dynamometer. Vehicles weighing up to 14,000 lbs can be driven onto the chassis dyno rollers, and each roller can measure up to 350 hp of continuous power and up to 700 hp for short durations. The lab is equipped with numerous emissions instruments for both steady and transient measurements, particle image velocimetry (PIV), and planar laser induced fluorescence (PLIF) systems for measuring features of combustion flow fields, and a variety of high speed cameras. Lab safety systems include light and heavy gas detectors, a two stage fire suppression system, and a flexible high-level ventilation system.

Large Scale Structures Lab -- The LSSL, which was commissioned in January 2012, is equipped with a suite of large-capacity hydraulic actuators, a high-performance large-scale shake table, etc. Advanced control system, data acquisition system and dedicated real-time computation and communication platform are also available. LSSL can provide the capability of performing large- and full scale structure tests and (real-time) hybrid tests under earthquake, wind, and other extreme loading conditions."

Eco-CAR 3 -- EcoCAR 3 is a 4-year competition sponsored by The U.S. Department of Energy and General Motors and managed by Argonne National Laboratory. The University of Alabama and 15 other North American universities are competing to redesign a donated 2016 Chevrolet Camaro to reduce its environmental impact and increase fuel efficiency all while maintaining performance and safety standards. The UA EcoCAR 3 Team is an interdisciplinary group of 130+ undergrad and graduate students working to transform the 2016 Camaro into a P1/P3 series-parallel plug-in hybrid electric vehicle. The UA Camaro has been designed to maintain competitive acceleration performance, capable of getting from 0 to 60 mph in 5.5 seconds, while boasting an impressive overall fuel economy of 48 miles per gallon gasoline-equivalent. Year 2 of the competition is currently underway, and the vehicle build is in full swing.

STUDENT POSTERS

Student posters will be on display on Monday in the 3rd floor hallway of SERC.

1. Mobile Video Velocity Estimation (MoVVE), Matt Bowen, University of Alabama
2. Nanomedicine Entity Extraction System, J. Ryan Murphy, Nastassja Lewinski, Bridget McInnes, Virginia Commonwealth University
3. Video Traffic Prediction Models using Artificial Neural Networks, Collin Daly, Rami Haddad, Georgia Southern University
4. Porosity Analysis in Porous Brass using Dual Approaches, Ryan Yeargin, North Carolina A&T State University
5. Automated Linguistic Analysis of Patients with Dementia and Mild Cognitive Impairment, Ellen Korcovelos, Serguei Pakhomov, Bridget McInnes, Virginia Commonwealth University
6. Learning Programming Languages through Second Language Acquisition, Paula Sanjuan Espejo, Embry-Riddle Aeronautical University
7. Impact of Social Media and Technology on Student Engagement and Learning, Vaishali Batra and Sushma Kotru, University of Alabama
8. Integration of a Solar Thermal Collector System for an Eco Vehicle Transportation, Maria Betancourt, Enzo Cole, Mateo Diaz, Florida International University
9. Battery Electric Vehicle (BEV), Evelyn Mojica, Kaira Sanchez, Santiago Norena, Andres Caicedo, Jordi Gillio, Rick Vega, Florida International University
10. Humanly Realistic Prosthetic Limb, Chris Murdock, Preston Pittman, Tony Perella, Cameron Mobley, Mercer University
11. Patient-Specific 3D-Printed Partial-Hand Prosthesis, Alex Freehof, Dhruv Patel, Brandon Greene, Mercer University
12. Determining the Effectiveness of Oleophobic Gaskets, Heather Davidson, David Dawson, Aruoture Egoh, Daniel Elliott, Norris McMahon, Erik Spilling, FAMU-FSU
13. Autonomous Continuous Microalgae Photobioreactors, Kaelyn Badura, Tomas Solano, Yuri Lopes, Courtnie Garko, Benjamin Bazyler, Benalle Lemos, FAMU-FSU
14. Construction Marking Robot, Justin Gibbs, Derrick Portis, Brandon Roberts, Christian Baez, Kelsey Howard, FAMU-FSU
15. Creating a Clemson University Makerspace, Nolan Hoolachan, Owen Phillips, Brad Hord, Peter Weigman, Tyler Rodgers, Ben Banaszak, Mary Chayse, Hayden Clarke, Travis Drake, Robbie Levey, Colton Smith, Rachel Sundberg, Todd Schweisinger, Clemson University
16. Workstation for Testing Thermoelectric Generators, Daniel Barnes, Vatis Fongang, Georgia State Perimeter College