



Mechanics Division

NEWSLETTER

Spring 2009

Chair: Benson Tongue
Secretary: Phil Cornwell

Visit the Mechanics Division Website <http://comp.uark.edu/~jjrencis/aseemechanics/>

Message from the Chair

Dear Mechanics Division Members:

Welcome to Spring! The '08/'09 academic year is chugging to its end and the light of summer at the end of the tunnel is growing brighter. And where better to start your summer than in Austin Texas, at the 2009 ASEE Annual Conference and Exposition? Austin is the crown jewel of Texas cities and it's sure to be a great time.

First up at this year's conference will be a picnic on Sunday afternoon. It probably won't be as exciting as last year's, when the wind attempted to throw tables and participants from our rooftop encampment and then storms moved in to provide the coup de grace. But we can hope. Look for the Mechanics Division banner.

Gary Gray, this year's program chair, has assembled a collection of sessions that covers all the bases - from how to teach mechanics up close and personal to how to get your message across from a distance. I hope you'll take in as many of the sessions as you can.

Everyone loved Pittsburgh's boat cruise up the mighty Wallamazoo and Anna Dollar, next year's program chair, has labored tirelessly to improve upon it in Austin. I think she's arranged to have whales flown in to entertain us during the event but perhaps I misheard. This cruise will be the mobile venue for our Mechanics Division awards banquet. You'll want to make sure and order your tickets early and not have to berate yourself for missing such an outstanding time.

In addition to the technical sessions and the awards banquet, I encourage you to attend the Mechanics Division Executive Committee meeting (Room ML 10, 7:00-8:15 on Monday) and the Mechanics Division Business meeting (ML 5, 12:30-2:00 on Wednesday). This is the place to share your ideas for the division and to get involved in the division's activities.

Speaking of activities, the division needs a new secretary to start at Austin. Please email me at bht@saber.net if you're interested in being considered for this position for 2009-2010. Phil Cornwell has honed the job down to a science so it'll be easy to be up and running quickly.

I definitely want to thank all of the officers and volunteers who worked hard this last year to ensure that the Mechanics Division activities would be a success. It's your enthusiasm and efforts that make our group a success. It's been a fun year serving as the Mechanics Division Chair and I look forward to being a part of the division in the future.

I hope to see all of you in Austin!

Benson Tongue
Mechanics Division Chair, 2008-2009
bht@saber.net

Comments on the 2009 Mechanics Division Program

This year's conference will have 11 mechanics papers in three sessions as well as several other mechanics papers in sessions co-sponsored with the Mechanical Engineering Division. I want to thank all the division members who volunteered their time and energy as reviewers of abstracts and papers. Their comments and thoughtful criticisms helped to ensure that we'll have an excellent set of sessions and papers in the proceedings. I also want to thank those of you who have agreed to serve as session moderators. Finally, I want to thank Christine Masters and Benson Tongue for all their help during the past 9 months-- their assistance has been invaluable.

There is a lot to see and hear in the technical sessions this year and I hope that you can attend all them all to see what your colleagues have been up to in their classes and engineering education research. As is now required, all the presentations will have associated papers in the proceedings, so please come to the talks so that you can discover which papers you want to read later. In addition, much like we did last year in Pittsburgh, I am inviting everyone to bring along their favorite mechanics classroom demonstrations for showing in Session 1468 "Simple Engineering Mechanics Classroom Demonstrations" on Monday, June 15 at 12:30 PM. This session will give you the opportunity to show off and share some of your favorite in-class demos that you use in statics, dynamics, mechanics of materials, and vibrations (other mechanics courses are welcome). Please be sure to let me know well in advance what you are planning to demonstrate so I can appropriately allocate time for each presenter.

In addition to the technical sessions, please mark your calendars for the Mechanics Division Executive Committee Meeting at 7 a.m. on Monday, the annual Awards Banquet on Tuesday evening (the cruise boat for the banquet this year departs at 6:30 pm from Hyatt Regency Boat Dock), and the Mechanics Division business meeting on Wednesday at 12:30 p.m. These events are open to anyone interested in the Mechanics Division activities. No meals will be provided at the executive and business meetings so attendees are encouraged to bring breakfast or lunch purchased from a local vendor with them to the meeting. If you have any questions or comments about the program, please don't hesitate to contact me.

All the best,
Gary L. Gray
2008-2009 Mechanics Division Program Chair gray@engr.psu.edu

ASEE Annual Conference, Pittsbury, 2008 – Mechanics Division Events

Mechanics Division Awards Banquet – Tuesday, June 16

The Mechanics Division Annual Awards Banquet will take place Tuesday, June 16, aboard a Capital Cruises' boat. The boat departs at 6:30 pm from Hyatt Regency Boat Dock, 208 Barton Springs Road (about a 10 minute walk from Convention Center), and comes back at 9pm. Boarding begins at 6:15 pm with cast off at 6:30 pm.

The Congress Avenue Bridge is the home of the largest urban bat colony in North America. The cruise provides the best possible viewing for this incredible wildlife spectacle and major attraction of Austin! Catering will be provided by the Hyatt and will include Deluxe Fajitas with 1/2 lb of chicken and beef per person, flour tortillas, chips and salsa, guacamole, sour cream, pico de gallo, cheese, rice, beans, queso and ice tea. Veggie Fajitas are also available.

The cost per person is \$75. To register choose session **2768: Mechanics Division Awards Banquet**. If you want to bring your guest(s) on the cruise, you may purchase ticket(s) directly from Mechanics Division (since this is an off-site event). This can save you the cost of an ASEE conference guest registration. Please contact ASAP Anna Dollár, our Program Chair Elect, at dollara@muohio.edu for more details.

Great companion, wonderful food, fascinating conversation, and an exhilarating two and a half hour cruise all rolled into one. It's truly an event not to be missed. Please sign up early to help us planning this event.

Mechanics Division Award Recipients, 2009

The Mechanics Division is pleased to announce the following winners of its 2009 awards. Join us in congratulating these colleagues. Plan to attend the annual Awards Banquet on Tuesday evening, June.

Archie Higdon Distinguished Mechanics Educator Award

Ing-Chang Jong, University of Arkansas

The Ferdinand P. Beer and E. Russell Johnston, Jr. Outstanding New Mechanics Educator Award

Frank Fisher, Stevens Institute of Technology

Wei Cai, Stanford University

Meriam Service Award - Not awarded this year.

The Mechanics Division Best Paper Award (2009 Annual Conference)

Web-Based Statics Course used in an Inverted Classroom

Anna Dollar, Miami University

Paul Steif, Carnegie Mellon University

The Mechanics Division Best Presentation Award (2008 Annual Conference)

A Problem-Centered Approach to Dynamics

Gary L. Gray and Francesco Costanzo, Penn State University

and

Enhancing Lecture Pedagogy Through Targeted Breaks

Benson Tongue, University of California, Berkeley

ASEE Annual Conference, Austin, 2009 – Mechanics Division Events

Monday, June 15, 2009

1168: Mechanics Division Executive Committee Meeting

7:00-8:15 a.m. Neal Kocurek Memorial Austin Convention Center, ML 10

Moderator(s): Benson Tongue, University of California-Berkeley

Division(s): Mechanics Division

Annual Executive Committee Meeting of the mechanics division. All are welcome

1468: Simple Engineering Mechanics Classroom Demonstrations

12:30-2:00 p.m. Neal Kocurek Memorial Austin Convention Center, 19A

Moderator(s): Gary L. Gray, Pennsylvania State University

Division(s): Mechanics Division

This session will give instructors in engineering mechanics courses (e.g., statics, dynamics, mechanics of materials, vibrations, etc.) the opportunity to show off some of their favorite in-class demos.

1466: Thermodynamics, Fluids, and Heat Transfer I

12:30-2:00 p.m. Neal Kocurek Memorial Austin Convention Center, 18A

Moderator(s): Amir Karimi, University of Texas-San Antonio

Division(s): Mechanics Division

This is the first session that highlights innovations in energy systems instruction: thermodynamics, fluids, and heat transfer.

AC 2009-714: DON'T PANIC! HOW TO INCREASE STUDENT INVOLVEMENT AND UNDERSTANDING IN AN INTRODUCTORY THERMO-FLUIDS COURSE

Kathryn Marlor, Michigan Technological University

Nathan Manser, Michigan Technological University

Gretchen Hein, Michigan Technological University

Brett Hamlin, Michigan Technological University

AC 2009-1608: TEACHING CONTROL VOLUME SELECTION TO AVOID ENTROPY ACCOUNTING 'BOTTLENECKS' IN SECOND LAW ANALYSES.

Andrew Foley, U.S. Coast Guard Academy

Michael Plumley, U.S. Coast Guard Academy

AC 2009-1620: ENTHALPY IN A BOX. TEACHING OPEN V CLOSED SYSTEM WORK TERMS.

Andrew Foley, U.S. Coast Guard Academy

Michael Plumley, U.S. Coast Guard Academy

AC 2009-1772: AN INVESTIGATION OF WING MORPHING PHENOMENA IN THE EDUCATIONAL WIND TUNNEL

B. Terry Beck, Kansas State University

Bill Whitson, Kansas State University

Greg Payne, Kansas State University

Trevor Heitman, Kansas State University

AC 2009-2295: EXCEL IN ME: EXTENDING AND REFINING UBIQUITOUS SOFTWARE TOOLS

Kenny Mahan, University of Alabama

Jesse Huguet, University of Alabama

Joseph Chappell, The University of Alabama

Keith Woodbury, University of Alabama

Robert Taylor, University of Alabama

1568: Teaching Mechanics of Materials & General Mechanics Education

2:15-4:00 p.m. Neal Kocurek Memorial Austin Convention Center, 7

Moderator(s): Laura Ruhala, University of Southern Indiana

Division(s): Mechanics Division

This session will focus on innovations in the teaching of mechanics of materials and on the general practice of mechanics education.

AC 2009-1417: EFFICIENT TEACHING OF ELEMENTARY ENGINEERING MECHANICS COURSES

Henry Christiansen, Brigham Young University

Steven Benzley, Brigham Young University

Spencer Guthrie, Brigham Young University

Gaurab Paudel, Brigham Young University

AC 2009-2286: A METHODOLOGY FOR CURRICULUM MODIFICATION APPLIED TO CIVIL ENGINEERING MECHANICS

Bridget Wadzuk, Villanova University

David Dinehart, Villanova University

Edward Glynn, Villanova University

Shawn Gross, Villanova University

Frank Hampton, Villanova University

AC 2009-1437: TEACHING VON MISES STRESS: FROM PRINCIPAL AXES TO NON-PRINCIPAL AXES

Ing-Chang Jong, University of Arkansas

William Springer, University of Arkansas

AC 2009-2214: A NEW APPROACH TO TEACHING MECHANICS OF MATERIALS

Habib Sadid, Idaho State University

Richard Wabrek, Idaho State University

Tuesday, June 16, 2009

2166: Improving Mechanics & Structural Modeling Courses

7:00-8:15 a.m. Neal Kocurek Memorial Austin Convention Center, 14

Moderator(s): Raghu Echempati, Kettering University

Division(s): Mechanics Division

This session examines improvements in instructional methods for mechanics of materials and structural modeling courses.

AC 2009-19: INTRODUCTION OF SOME OPTIMIZATION AND DESIGN PROBLEMS INTO UNDERGRADUATE SOLID MECHANICS

Arnaldo Mazzei, Kettering University

Richard Scott, University of Michigan

AC 2009-1239: THE EFFECT OF ON-DEMAND INSTRUCTIONAL VIDEOS ON MEDIUM-TERM RETENTION OF MECHANICS SKILLS

James Ledlie Klosky, United States Military Academy

Elizabeth Bristow, United States Military Academy

AC 2009-1737: PREPARATION FOR INNOVATIVE STATICS AND SOLID MECHANICS COURSE SEQUENCE

Pramod Chaphalkar, Grand Valley State University

Shirley Fleischmann, Grand Valley State University

Janice Pawloski, Grand Valley State University

Hugh Jack, Grand Valley State University

AC 2009-2412: INTEGRATION OF MECHANISM AND FINITE ELEMENT ANALYSES CONCEPTS USING ADVANCED CAE TOOLS

Raghu Echempati, Kettering University

Andrew Fox, Kettering University

2368: Teaching Dynamics

10:30 a.m. -Noon Neal Kocurek Memorial Austin Convention Center, 8A

Moderator(s): Anna Dollar, Miami University

Division(s): Mechanics Division

This session will focus on innovations in the teaching undergraduate dynamics.

AC 2009-215: *DAMPEDBEAMS: A VERSATILE MATLAB SCRIPT FOR ANIMATION OF A VARIETY OF BEAM VIBRATION PROBLEMS*

Raymond Jacquot, University of Wyoming

Jeffrey Anderson, University of Wyoming

David Walrath, University of Wyoming

AC 2009-958: *VEHICLE DYNAMICS AS A CONCENTRATION: CAPITALIZING ON BREADTH AND DURATION*

Robert Hildebrand, Lake Superior State University

Wael Mokhtar, Lake Superior State University

Steve Bryan, Continental Automotive Systems

AC 2009-1466: *ON THE ANALYSIS AND DESIGN OF VEHICLE SUSPENSION SYSTEMS GOING OVER SPEED BUMPS*

Ali Mohammadzadeh, Grand Valley State University

Salim Haidar, Grand Valley State University

AC 2009-515: *ESTABLISHING REAL ENGAGEMENT IN LARGE MECHANICS LECTURES*

Benson Tongue, University of California-Berkeley

2468: Teaching Statics

12:30-2:00 p.m. Neal Kocurek Memorial Austin Convention Center, 6B

Moderator(s): Richard Ruhala, University of Southern Indiana

Division(s): Mechanics Division

This session will focus on innovations in the teaching of Statics.

AC 2009-533: *WEB-BASED STATICS COURSE USED IN AN INVERTED CLASSROOM*

Anna Dollar, Miami University

Paul Steif, Carnegie Mellon University

AC 2009-1387: *INTEL: PROMOTING LEARNING AND RETENTION IN A STATICS CLASS*

Sue Rosser, Georgia Institute of Technology

Laurence Jacobs, Georgia Institute of Technology

Janet Murray, Georgia Institute of Technology

Wendy Newstetter, Georgia Institute of Technology

Christine Valle, Georgia Institute of Technology

AC 2009-1555: *DEVELOPMENT OF AN ONLINE SYSTEM TO HELP STUDENTS SUCCESSFULLY SOLVE STATICS PROBLEMS*

John Dannenhoffer, Syracuse University

Joan Dannenhoffer, State University of New York, Morrisville

2566: Trends in Mechanical Engineering I

2:15-4:00 p.m. Neal Kocurek Memorial Austin Convention Center, 17B

Moderator(s): Laura L. Pauley, Pennsylvania State University

Division(s): Mechanics Division

This session is a first in the series which examines innovative methods to promote interest and research activity integration into mechanical engineering curriculum.

AC 2009-10: *DISTANCE LEARNING AND COGNITIVE LOAD THEORY TO IMPROVE TRADITIONAL AND NON-TRADITIONAL STUDENT LEARNING OF COMPUTER PROGRAMMING FOR MECHANICAL ENGINEERS: QUANTITATIVE ASSESSMENT*

Thomas Impelluso, San Diego State University

AC 2009-22: *SUSTAINABLE ASSESSMENT AND BEYOND*

Wayne Whiteman, Georgia Institute of Technology

AC 2009-297: INCORPORATING A TEACHER'S RESEARCH PROJECT INTO AN UNDERGRADUATE LEVEL COURSE

Jiang Zhou, Lamar University
Paul Corder, Lamar University
Hsing-wei Chu, Lamar University
Kendrick Aung, Lamar University

AC 2009-413: QUANTITATIVE ANALYSIS OF FIRST-YEAR EXPERIENCE MECHANICAL ENGINEERING LEARNING COMMUNITY

Freddie Davis, West Texas A&M University
Emily Hunt, West Texas A&M University
Kendra Campbell, West Texas A&M University

AC 2009-569: DEVELOPMENT AND IMPLEMENTATION OF AN INTEGRATED OUTCOMES-BASED ASSESSMENT PLAN FOR A NEW ENGINEERING PROGRAM.

Nidal Al-Masoud, Central Connecticut State University
Peter Baumann, Central Connecticut State University
Alfred Gates, Central Connecticut State University

AC 2009-815: USE OF THE KNOWLEDGE AND SKILL BUILDER (KSB) FORMAT IN A SENIOR MECHANICAL ENGINEERING LABORATORY

Charles Forsberg, Hofstra University

AC 2009-2076: A NOVEL ASSESSMENT METHODOLOGY FOR ACTIVE LEARNING MODULES TO EQUITABLY ENHANCE ENGINEERING EDUCATION

Ashland Brown, University of the Pacific
Kris Wood, University of Texas
Kristen Kaufman, Grad Student University of Texas
Daniel Jensen, US Air Force Academy
Joseph Rencis, University of Arkansas
Christina White, Graduate Student Columbia University

2666: Statics and Dynamics: What's New

4:30-6:00 p.m. Neal Kocurek Memorial Austin Convention Center, 3

Moderator(s): Douglas Spearot, University of Arkansas

Division(s): Mechanics Division

This session, jointly sponsored with the Mechanics Division, reviews pedagogical innovations in Statics and Dynamics.

AC 2009-575: ALTERNATIVE APPROACH FOR TEACHING MULTI-BODY DYNAMICS

George Sutherland, Rochester Institute of Technology

AC 2009-579: NO NUMBERS – CONCEPTS BASED TESTING IN ENGINEERING

Joseph Walchko, U.S. Military Academy

AC 2009-807: PROBLEM-SOLVING IN STATICS INVOLVES MENTAL SEARCH

Roman Taraban, Texas Tech University
Edward Anderson, Texas Tech University
Curtis Craig, Texas Tech University

AC 2009-1458: A STUDY OF THE IMPACT OF VISUOSPATIAL ABILITY, CONCEPTUAL UNDERSTANDING, AND PRIOR KNOWLEDGE UPON STUDENT PERFORMANCE IN ENGINEERING STATICS COURSES

Edward Anderson, Texas Tech University
Roman Taraban, Texas Tech University
Diana Hudson, Texas Tech University

AC 2009-2344: ADVANCED VEHICLE DYNAMICS: THEORY IN PRACTICE

Sangram Redkar, Arizona State University

2768: Mechanics Division Awards Banquet

6:30 p.m.-8:30 pm Offsite Division Events, Capital Cruises' boat departing from Hyatt Regency Boat Dock, 208 Barton Springs Road, Austin, TX

Moderator(s): Benson Tongue, University of California-Berkeley

Division(s): Mechanics Division

Ticketed Event - \$75 advanced/\$85 onsite. The Mechanics Division Annual Awards Banquet will take place aboard a Capital Cruises' boat. The boat departs at 6:30 pm from Hyatt Regency Boat Dock (about a 10 minute walk from Convention Center) and comes back at 9pm. The Congress Avenue Bridge is the home of the largest urban bat colony in North America. The cruise provides the best possible viewing for this incredible wildlife spectacle and major attraction of Austin!

Catering is provided by the Hyatt.

Wednesday, June 17, 2009

3468: Mechanics Division Business Meeting

12:30-2:00 p.m. Neal Kocurek Memorial Austin Convention Center, ML 5

Moderator(s): Benson Tongue, University of California-Berkeley

Division(s): Mechanics Division

Annual Business meeting of the Mechanics Division. All are welcome to attend.

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