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Hello all,

Welcome to the first edition of MMEM News, an annual newsletter that will keep you connected to your undergraduate alma mater. You are a powerful resource for our department and I want to stay in touch with you.

By way of introduction, I am the chair of the Department of Mechanical and Mechatronic Engineering and Sustainable Manufacturing. Since accepting the role as chair, there have been many changes within our department. We have hired new faculty members over the last two years and will hire one more in 2015, we have had several retirements and changes in the number of lecturers and instructors. The department is expanding with a record number of students.

Several professors completed exciting research in bioplastics, mechatronics, and solar power engineering. The MMEM student clubs are as active as ever with competitions and projects. In fact, the senior project class is busy with 16 projects this year, many of which will produce very interesting electro-mechanical mechanisms by the end of the spring semester.

If there are additional features you would like to see with each annual issue, please send me an email (jgreene@csuchico.edu) or give me a call (530-898-4977). It will be a pleasure to hear from you.

Sincerely,

Joseph P. Greene, PhD
Department Chair and Professor
Department of Mechanical and Mechatronic Engineering and Sustainable Manufacturing
California State University, Chico
**DEPARTMENT NEWS**

**New Faculty**
We are very pleased to share that we have hired four new faculty members in the last two years and we have hired another professor in 2015. The department is brimming with new energy and new ideas.

CSU, Chico alumnus David Alexander joined the MMEM faculty in fall 2014. He holds a BS in physical science from CSU, Chico, and both a MS and PhD in mechanical engineering from the University of Idaho. He teaches thermal fluids classes and lends expertise in the areas of sustainable energy systems, hybrid electric vehicle systems modeling and energy use, entrepreneurship, product development and commercialization, intellectual property, and technology transfer. He is currently conducting research on solar panel active cooling design for maximum efficiency.

Assistant Professor Daisuke Aoyagi joined the MMEM faculty in fall 2013. He holds a PhD in mechanical and aerospace engineering from UC Irvine. He teaches a variety of mechanical and mechatronic engineering classes and is working on a prototype wheelchair device that will help manual wheelchair users improve their wheelchair handling skills.

Longtime MMEM faculty member and College of Engineering, Computer Science, and Construction Management alumnus Daren Otten holds a BS in industrial technology a MS in interdisciplinary studies (manufacturing engineering) from CSU, Chico, and a Doctorate of Education (EdD) from Sacramento State University. He was hired as an assistant professor in 2013. He teaches a variety of courses in the Sustainable Manufacturing Program (SFMG).

CSU, Chico Mechatronic Engineering in Sustainable Manufacturing alumnus Matt Simkins joined the MMEM faculty as an assistant professor in fall 2014 and is working on a research project to control robotic serial manipulators without the need to calculate forward or inverse kinematics. Matt received a PhD in computer engineering (with emphasis in robotics) from UC Santa Cruz and has experience working in the medical device industry where he earned a six sigma black belt. He teaches courses in our Sustainable Manufacturing Program.
Retirements
In the last two years, we have bid farewell to several members of the faculty who have served our students for many years. Nick Repanich, Ron Roth, Ray Rummel, Jimmy Tananichat, Dirk Vanderloop, and Mike Ward retired in recent years. This semester Leonard Fallscheer is teaching his final classes in our Sustainable Manufacturing program. Though not teaching classes for us any longer, many still lend their expertise to our programs and stay in touch with us. After retirement from the College of ECC, Mike Ward served a term as interim dean of the College of Natural Sciences and has worked with the provost on budgeting and assessment initiatives. Leonard, Dirk, and Ray can still be found here on campus from time to time helping with student projects.

Working Together
Each member of the MMEM faculty adds unique perspective and expertise to our students’ educational experience. In addition to the four new faculty that we’ve already introduced, I’d like to recognize:

- MMEM Lecturer Nathan Anderson, who reaches physics, mechanical engineering, technology, and SMFG courses.
- Lecturer Scott Brogden, who teaches in the SMFG program.
- Professor Chuen (Dick) Hsu, who is currently serving as the interim associate dean for the College of ECC. He plans to return to teaching in fall 2015.
- Lecturer Web Johnson, who teaches classes in the Mechanical Engineering Program.
- Professor Greg Kallio, who has returned from a 2014 sabbatical and is teaching in the Mechanical Engineering Program.
- Lecturer Charlie Pooler, who teaches in the Mechanical Engineering and SFMG Programs. Professor Ramesh Varahamurti, who teaches in Mechanical and Mechatronic Engineering Programs.
- Professor Greg Watkins who teaches in the Mechanical Engineering Program.

I would also like to recognize Administrative Support Coordinator Martha Layne, who keeps everything running smoothly and helps our students navigate through their educational experience here at Chico State.
Unit Counts for MMEM Degrees Stand

In 2013, the CSU Chancellor’s Office informed its 23 campuses that degree programs that required completion of more than 120 units would be scrutinized and exceptions granted only if clear justification for higher unit counts were warranted.

Within the MMEM department, the BS degrees for both Mechanical and Mechatronic Engineering Programs are higher than the 120 unit cap. Students seeking degrees in mechanical engineering must complete 127 units of coursework, and students seeking degrees in mechatronic engineering must complete 128 units of coursework. Students pursuing a degree in sustainable manufacturing must complete 120 units of coursework (a degree option that replaced the manufacturing technology degree several years ago).

Faculty across all campuses within the CSU expressed concern about the degradation of program quality if courses were eliminated to meet the 120 unit cap. In the MMEM department, faculty argued that all courses currently included in the Mechanical
CLASSROOMS, COURSES, AND LABS

Modeling and Simulation Technical Elective. Taught by Professor Greg Watkins, this senior level course studies the practical application of commercial simulation software, with emphasis on the underlying assumptions and limitations of the tools. Advanced techniques in finite element analysis and computational fluid dynamics are applied to open-ended analyses problems.

Polymer Composites Technical Elective. The students in this class taught by Dr. Joe Greene explore automotive and aerospace composites while working with glass fiber, carbon fiber, epoxy, polyester, and polyurethanes.

Solar Energy Engineering Technical Elective. Offered in spring 2015 by Dr. Greg Kallio, students will download solar and thermal data from their laptops and evaluate the efficiency and performance of the solar panels in a “live-site” web page.

Revised Capstone Design Program

The senior project capstone class provides students with hands-on experience as they complete comprehensive design projects. The students completing this class in spring 2015 will produce 16 student projects. Last year’s projects included a six-axis robot, drone-assisted field mapping, biodegradable plastics sporting pigeon, freezer for agriculture, truck-lift system, waste-cleaning system, and mechatronic project, to name a few.

In 2014, the department initiated a new component of the senior project sequence in mechanical and mechatronic engineering. The capstone design program now incorporates externally funded projects from industrial sponsors. Students work in teams to design, build, and test a solution to a real-world design problem. Current and past sponsors include Micro-Vu, NASA JPL, Lundberg Family Farms, Sierra Nevada Brewing Company, Owens Illinois, and Lawrence Livermore National Labs. More details about the program can be found here: http://www.csuchico.edu/mmem/capstone_design/.

Engineering and Mechatronic Engineering degree programs are critical. Eliminating courses would reduce the assurance that students would have the skills and knowledge they need to be well-qualified professionals in the field after graduation. In 2014, the faculty requested exceptions for the 120-unit cap for both programs, and received permission to allow the existing program unit counts to stand.

New MMEM Courses

Students are working just as hard in the classroom and labs as you once did. Students are still building the hoist winch in the Introduction to Manufacturing Processing class, still completing 5-S projects in the “Introduction to Plastics” class, still measuring the hardness of red-hot steel with the Jominy End-Quench experiment in the “Materials Engineering” class, and still making 3D printed parts in the “Graphics II” class. While these all continue, students now take new classes that provide additional opportunities for skill building.
Upgrades
The Department of MMEM maintains and manages nearly a dozen lab facilities. In recent months, the department has facilitated a number of lab upgrades that provide students with an optimum educational experience. In the computerized numerically controlled (CNC) lab, new HAAS vertical and horizontal CNC lathes and mills were installed along with a coordinate measuring machine (CMM).

We replaced the broken Stratsys 3D printer with a MakerBot 3D printer. The printer was used in Graphics II, Mechanical Design, and Senior Project Capstone Design classes. We currently have $1,000 in the 3D printer fund and hope to grow the fund to $4,000 to allow purchase of a new 3D printer. We are incorporating 3D printing in several classes and several club projects.

ABET and ATMAE Re-Accreditation
The Mechanical Engineering and Mechatronic Engineering Programs maintain the high standards required for accreditation by the Accreditation Board for Engineering and Technology (ABET). Both programs undergo periodic evaluation by external ABET reviewers to ensure ABET’s rigorous standards are continuously met.

The Mechanical Engineer and Mechatronic Engineering Programs will be evaluated for ABET re-accreditation in 2015. Self-study reports are currently being prepared to precede external review in fall 2015.

The Sustainable Manufacturing Program was accredited for six years by the Association of Technology, Management, and Applied Engineering (ATMAE) in 2014 with a two-year report due in September of 2016.

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Annual Student Enrollment By Program
Fall Semesters

<table>
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<tr>
<th>Program</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
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<td>Mechanical Engineering</td>
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<td>Sustainable Manufacturing</td>
<td>54</td>
<td>57</td>
<td>78</td>
<td>95</td>
<td>96</td>
</tr>
</tbody>
</table>

PERCENT INCREASE

- Mechanical Engineering: 48%
- Mechatronic Engineering: 72%
- Sustainable Manufacturing: 77%
Dave Alexander is researching solar panels with active cooling design for improved efficiency. Solar panels are known to have higher efficiency when cooled. Dr. Alexander will measure the watts produced by the solar panels after providing cooling water to the backside.

Ramesh Varahamurti is researching the use of automated drone devices for the agricultural industry.

Web Johnson is researching biomaterials, vascular prostheses, thermodynamics of bubbles and surfaces, CAD, and computational geometry.

Joe Greene is researching bioplastics and the use with natural fibers like hemp, rice straw, and walnut shells. He has made sporting pigeons from rice straw, walnut shells, and PHA bioplastic to replace the current clay and calcium carbonate pigeons that hurt the environment. He is also working with the chemistry department to produce PHA plastic from waste glycerol in the biodiesel process. Joe published a book in 2014 entitled, *Sustainable Plastics: Environmental Assessments of Biobased, Biodegradable, and Recycled Plastics*. It is available at Amazon.com and at Wiley.com. He also published a paper at the SPE ANTEC conference in 2014.

Daisuke Aoyagi is researching a prototype device that is designed to help manual wheelchair users learn to perform a wheelie; it is one of critical skills for negotiating curbs and bumps on a wheelchair, yet so many wheelchair users fail to master it. The idea is to present a decelerated version of wheelchair dynamics to the user, so that he or she can safely explore it and then exploit it.

Matt Simpkins is researching robotic biomimicry of muscle control. This investigation builds on research in neuroscience. It has two goals. First, it provides a way to control robotic serial manipulators without the need to calculate forward or inverse kinematics. Second, it provides explanation that ties together seemingly disparate experimental results in neurophysiology.

Greg Kallio, with the help of Steve Eckart, Scott Vanni, and Dave Gislon, installed a 1.6 kWdc solar panel on the roof outside of the fourth floor near the O’Connell 438 lab. The “living lab” is one of two solar projects on campus. The other is on the Normal Avenue parking structure. The solar labs allow students to study solar energy and the thermal analysis associated with it. Dr. Kallio uses the two solar labs in his energy systems course and more thoroughly in his new solar energy engineering elective course in the spring of 2015. Dr. Kallio feels that, “the planned activities associated with the new course in solar energy engineering will be challenging, hands-on, open-ended, and will prepare students for the real world system design that they will see as engineers in the solar energy field.”
SAE Baja
The SAE Baja group is excited to build a vehicle that will compete in Portland, Oregon in May 2015. They look forward to driving the vehicle over tough terrain and hope to win the race.

Engineers for Alternative Energy
The club elected new officers for spring 2015 who are working on several projects. The first project is construction of framing for liquid-cooled solar panels. The second project is entry into the Solar Regatta to build and race a boat powered by solar panels in May 2015.

Formula SAE
The Formula SAE group is busy building a vehicle that will compete in June 2015 in Lincoln, Nebraska. The group will build a formula-style race car for competition and prove that their vehicle is viable for production.

Human Powered Vehicle
The HPV student club will compete in the HPV race in San Jose in April 2015. They will build either a two- or three-wheeled bike to compete in two events: time trial and endurance races.

Society of Plastics Engineers
The plastics student club has new officers for spring 2015 and is working on two new tooling projects. The first is a golf disk made from recycled plastics and the second is a Chico State license plate made from recycled plastics.

SME Westec Manufacturing
In April 2015, the SME group will compete in Sante Fe Springs. They will work on a project for a compound archery bow, producing the tooling systems and all critical components of the bow by combining the efforts of both engineering and manufacturing majors to complete the project.

Tau Beta Pi
Tau Beta Pi is very active providing tutoring for MMEM students. Several members of Tau Beta Pi attended the Tau Beta Pi national convention in Spokane, Washington in 2014 and the district conference in Berkeley. This year, the meetings are in Reno, Nevada and Providence, Rhode Island.

Students within the Department of MMEM are incredibly productive both inside and outside the classroom. They regularly participate in regional and national leadership workshops, and are strong competitors alongside students from the most prestigious schools in the nation.
**Gifts**
We are fortunate to have received many generous donations to the department’s annual fund in 2014. Several of the donations were earmarked for the senior project class to help offset project costs. We thank the following donors very much:

- Ms. Monica L. Acosta
- Mr. and Mrs. Michael G. Adams
- Mr. Scott Fulenwider and Ms. Kari Bianchini
- Mr. Douglas W. Buchanan
- Mr. and Mrs. William A. Gelonek
- Mr. Marvin T. Jones
- Mr. Eric R. Manley
- Mr. and Mrs. Mark W. Myers
- Mr. and Mrs. James S. Nepomuceno
- Mr. and Mrs. David L. Read
- Mr. Brendan E. Reitz
- Mr. William D. Ricketts, Jr.
- Mr. and Mrs. Aaron J. Ruch
- Mr. James W. Tackitt, Sr.
- Mr. and Mrs. Fred H. Teeters
- Mr. Matthew T. Whalen
- PG&E Corporation Foundation
- Wizard Manufacturing, Inc.
- Maquet GmbH Surgical Workplaces Company

**Scholarships**
The MMEM Department is grateful for the many scholarships provided each year to deserving students, including:

- Bill Wesley Brown and Kiwanis Industrial Tech Scholarship
- Arthur Coggins Engineering Scholarship
- Carroll Curtis Memorial Scholarship
- Jeanette A. Hauser Memorial Scholarship
- Carl A Kountz Engineering Scholarship
- Dale Newton Engineering Scholarship
- Mitch Padula Memorial Scholarship
- C. Bradley Page Industrial Technology Scholarship
- John P. Pawek Computer-Aided Design Award Scholarship
- Dave and Frances Ramme Scholarship
- Dr. Ray Rummell Scholarship
- Dr. Savio & Mrs. Pattie Woo Outstanding Engineering Student Scholarship

Additionally, the following awards are presented each year to exemplary students in the department:

- MECH Outstanding Senior Award
- MECA Outstanding Senior Award
- MECH Alumni Award
- MECA Alumni Award
- MECH Service Award
- MECA Service Award
- MECH Faculty Award
- MECA Faculty Award
- SMFG Faculty Award
MMEM alumni are among the most successful professionals in the industry, staying in touch with one another and with the department through LinkedIn groups for Sustainable Manufacturing, Mechanical and Mechatronic Engineering, and Senior Capstone Design Project. Please keep in touch with us on LinkedIn. Listed here are some of the recent accomplishments of our alumni.

MIKE BRIONES Employed by Corrosion Engineering Supervisor at PG&E. Married to his college sweetheart. Purchased his first home in Livermore.

ARTHUR FORMOSO An operations manager with Ferguson Waterworks in San Jose. Married to Heidi, Chico State Business alumni, has two beautiful girls, Alani and Ashlyn. He is very active with veterans affairs.

NICHOLAS GNIADEK Employed as a gas transmission service technician for Gas Transmission Systems Inc. in Walnut Creek. He enjoys racing karts at Sonoma Raceway.

RICKY GROSSMAN Is a manufacturing engineer for Bio-Rad Laboratories in Santa Rosa. He is busy getting new products launched.

BLAS TENORIO Is a senior hardware quality engineer at Lockheed Martin Space Systems in Sunnyvale. He is married to his college sweetheart and has two boys, Diego and Gael. His wife is expecting their third child in June.

ALEX WARD Employed as a manufacturing engineer at FAFCO in Chico. He is happily married and enjoys working in Chico.

JASON LAROCCHI Is general manager of Costa Rica Plant at SMC Ltd. Received his master's in engineering management from Cal Poly San Luis Obispo in 2008.

CHRIS MAYS Employed as a Compounding process manager at Metabolix Company in Boston, MA. Responsible for all compounding activities in the company. Working on an MBA.

GRANT DOUGLAS Employed by Composites Engineer at Easton Baseball/Softball in Van Nuys, California. Engaged to a lovely lady and living in Santa Monica.

MATTHEW VELLA Is a process sustaining engineer for Tesla Motors in Freemont. He just returned from Europe to lead a project in Holland. He is leading the implementation of a new way for assembly at Tesla.

JOSH MIRANDA Is employed as a controls engineer for Norfield Company in Chico. Builds race cars and hopes to drive them in a national event in 2015.

PETER NATALE Employed as a manufacturing engineer for Tesla Motors in Freemont. Married to Alison with one child, Eva, and expecting a second one in April, 2015.

JOSH SOMBERG Is an instrumentation technician for Hussman Refrigeration in Los Angeles. He works on refrigerator/freezer/hot cases and systems that go in supermarkets everywhere.

TODD SWAGERTY Is an engineering manager at Springboard Biodiesel Company in Chico. He is married to his sweetheart, Ana, and has two wonderful boys.

LARRY THOMPSON Is an operational excellence execution manager for RTI Metals. Married to Christina, has a six sigma black belt and is leading lean efforts at his worldwide company.

RYAN GREENE Is a manufacturing engineer for Springboard Biodiesel in Chico. He is engaged to a lovely lady, Zoe, and has a newborn son, Bodie.
WAYS TO GIVE...

Online Giving
Make a gift using our secure server. Go to www.csuchico.edu/ecc/giving.

In-Kind Gifts
Noncash gifts can include computer hardware, equipment, and expendable supplies for laboratories. Call 530-898-3012 for more information.

Planned Giving
Leave a legacy for generations of future students while meeting your personal financial objectives. Select from a variety of gift plans.

Gifts of Stocks and Securities
This tax-wise method allows you to give appreciated stock to the University and receive a charitable deduction for the full fair market value of the gift.

Matching Gifts
Double the impact of your personal gifts to the college through an employer matching gifts program. Check here to see if your company will match your gift: www.matchinggifts.com/csuchico.

Gifts by Mail or Phone
Call 530-898-3012 or send your gift to University Foundation—0999 CSU, Chico
400 W. First Street, Chico, CA 95929-0999
[Please note MMEM Dept. on memo line]

AREAS TO SUPPORT
Laboratory equipment to help us maintain state-of-the-art facilities
Program and research support to help us continue to provide exceptional academics
Support for attracting and retaining energetic and innovative faculty members
Scholarships to attract and retain bright and hardworking students

Questions?
Please contact Advancement Director Hope Shapiro at 530-898-3012 or heshapiro@csuchico.edu.

THANK YOU
VERY MUCH
FOR MAKING
A DIFFERENCE!