Systems Connection

Volume XVI

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DEPARTMENT OF SYSTEMS ENGINEERING - USMA- WEST POINT, NY

Systems Connection

From the Department Head

I am privileged to serve such a dedicated, professional and outstanding group of staff, faculty and cadets as the Department Head. A year has flown by and they continue to excel in true Go Systems fashion!

As we do each year we experienced a large turnover of people this summer. We said a fond farewell to several leaders and educators who made a lasting impact on the Department. **COL Kent** and **Susan Miller** moved back to the DC area where Kent serves in the Army G1. **LTC Simon Goerger** left this summer for Kuwait where he is serving a one-year tour with Third Army. Fortunately for us, **Dr. Niki Goerger** decided to remain here in the Department while Simon is deployed. While we were sad to see these terrific leaders leave, we proudly welcomed nine new faculty members this summer. We welcomed back **COL Bob** and **Lita Powell** from Rhode Island where Bob completed the Naval War College program while also teaching. Bob is now our Deputy Department Head. We also welcomed back **Dr. Roger Burk** from his sabbatical at Princeton University. **Robin Burk** remained at West Point during Roger's sabbatical working both with us and the Department of Electrical Engineering and Computer Sciences. **LTC Kelly Ward** and sons Kendall and Kyle joined us from the National War College where Kelly was both a student and an instructor. **LTC Karen Ward** deployed to the Sinai in July for a one-year tour after which she will join the Department of Military Instruction. Karen and Kelly's daughter Katherine entered the Air Force Academy in July so this is a year of great transition for the Ward family. Kelly is doing great things as our new Systems Management Program Director. I am happy to report that the Korycinski family is back together again as **CW5 Rick Korycinski** returned from a tour in Korea in October and is now serving as the G3 Air for West Point.

DSE continues to excel on several fronts. Here are just a few of our recent notable achievements:

- Our first textbook, ***Decision Making in Systems Engineering and Management***, goes on sale to the

(Continued on page 16)

HONORING OUR HERITAGE

At the 16 November 2007 BOA meeting, COL Trainor presented a silver and gold version of the DSE coin to BG (Ret) Kays, first DSE Department Head, and new DSE BOA member.

Inside this issue:

Deputy Department Head

by COL Bob Powell

The department continues to successfully contribute to the Academy mission, "To educate, train, and inspire the Corps of Cadets so that each graduate is a commissioned leader of character committed to the values of Duty, Honor, Country and prepared for a career of professional excellence and service to the Nation as an officer in the United States Army."

This mission requires that we maintain a keen focus on pedagogy, our organizational structure, our administrative processes, our technical resources, and research thrusts.

The department is well postured in each area to adapt to and meet the demand of an ever-changing Army – our most valued constituent. As the department continues to evolve, changes are required to meet the needs of both the Army and the Academy.

This past year **COL Trainor** saw a need to make an organizational change that will have a long-term impact on the Department, the Academy and the Army. He created the position of Deputy Department Head. I have been assigned to this position and have the privilege of assisting **COL Trainor** in running the day-to-day operations of the department. As a team, we will work diligently to keep the Department moving in the right direction.

My primary role and responsibility is to serve in his absence; however, daily it is my duty to oversee budget administration, supervise the Department's internal committees, oversee Department personnel administration and serve as the Department's Internal Research Coordinator.

The role of Internal Research Coordinator is a new component within the Department. As the Internal Research Coordinator, I will focus on building a library of projects to resource the research needs of faculty and cadets. I am excited and grateful to be part of this team and look forward with **COL Trainor** in keeping you updated on the exciting and outstanding events that continue to occur within the Department. ♦

DSE Board of Advisors

16 November 2007: 14 members of the DSE Board of Advisors (BOA) attended the annual advisory meeting to discuss the current and future goals of the department. The BOA is a distinguished group of individuals which includes senior leaders from academia, government, and industry.

Systems Engineering (SE) & Operations Research (OR)

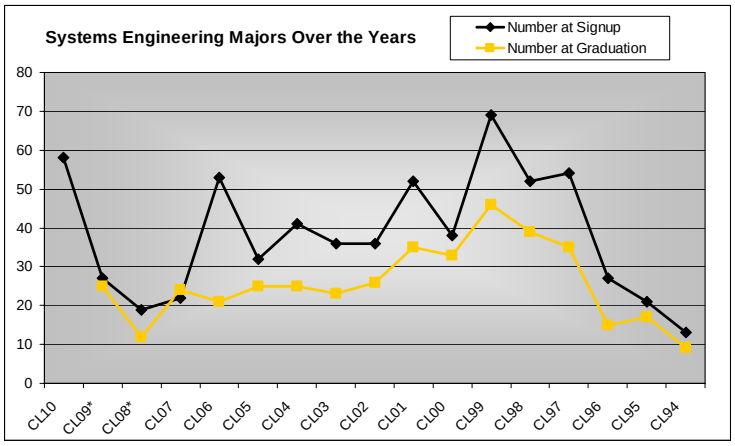
by LTC Mike Kwinn

Though some of you might call me a little biased, I am here to tell you that we continue to move in a great direction in the Systems Engineering program. Last year, we focused on updating the curriculum. We looked at the new book co-written by many of our faculty *(see related article on page 13)*, we considered the comments by our distinguished Board of Advisors and benchmarked against other SE programs around the country. As a result, with the class of 2010, we are now offering four three-course sub-disciplines: Human Systems, Mathematical Systems, Information Systems (based on our former Information Engineering major) and Simulation Systems. How do the cadets like the new offerings? Well, we signed up more cadets to be Systems Engineering majors from the class of 2010 than any other year except one!

This year, we are focusing on ABET preparation and aligning our courses – and we are doing it with a great team! We have **Dr. Roger Burk** back from his sabbatical and just in time. He is our resident ABET wizard and is preparing our Department and the Systems Engineering program for some serious ABET-kickin! **LTC Dan McCarthy** is now our Program Deputy mostly because the boss thought the program needed some talent at the top – good call. We also have **MAJ Ken Gilliam** on board and doing great things as our new statistics course director though he is starting to sag a little from carrying me as one of his instructors. We also have **Dr. Paul West** teaching our intro course and **MAJ Steve Gauthier** teaching combat modeling. Finally, our only new addition in the Department and the SE Program is **CPT(P) Julia Oh**. Julia teaches our discrete event simulation course having recently studied at Columbia University. She is a Signal Corps officer who received here undergraduate degree at UPenn. Julia also runs our new and improved Systems Club.

Our Systems Club is a cadet run club that serves the cadets from the Systems Engineering Program as well as those cadets (mostly Plebes) that are interested in Systems Engineering. The Systems Club combines our INFORMS, INCOSE and MORS clubs from years past. We hope to show our cadets in this club all the things that Systems Engineers and Operations Researchers do throughout the world. We want to go beyond the conferences and meetings that the former clubs usually attended. For example, **MAJ Steve Gauthier** is working on trips to see the Army Racing Team at a NASCAR event to look at how systems engineering is being used in auto racing. We are also planning to take members of the Systems Club down to visit the new Dallas Cowboys stadium to discuss stakeholder analysis with Cowboys owner Jerry Jones and others making the decisions on what will go into this magnificent new building. If you have other ideas, please let us know.

We continue to work to improve the Systems Engineering program. The curriculum and hard work should ensure our continued accreditation through ABET. The new sub-disciplines should improve the depth of the study in Systems Engineering and our new book should provide us with a renewed vigor. However, in the end it is the cadets and the faculty that make a difference in this program. So long as we continue to be blessed with a great faculty, great cadets will continue to return to the program as they did for years. We are in the midst of a great run. It is pretty exciting for me to be a small part of it! ♦



*current numbers vice graduation numbers

Prior to joining us in DSE, ***CPT(P) Julia Oh*** *was a graduate student at Columbia University where she earned an MS degree in operations research, and a 2nd MS degree in engineering management systems.*

Engineering Management (EM)

by LTC Donna Korycinski

As I begin my second year as the EM Program Director, I am awed daily by the tremendous efforts displayed by everyone, both faculty & cadets, in this awesome program! I am truly humbled to be working with the wonderful mix of professionals that make-up EM! This past summer, the EM program had the distinct privilege of welcoming four new instructors to its ranks (**MAJs Matt Dabkowski**, **Paul Krattiger**, **Marc Distefano** and **Nathan Minami**), with **Dr. Paul West**, **MAJ(P) Scott Crino**, **MAJ Rainey**, and **Mrs. Christy Gelineau** providing continuity and guidance to the program.

Dr. Paul West continues to integrate exchange students from France's St. Cyr Military Academy into his capstone projects, providing a rich cultural experience for both the U.S. and French students. Paul is also teaching SE 301 Foundations of Engineering Design & Systems Management and is conducting research on personality modeling and simulation which he recently presented in the U.K. Paul and Cheryl's son CPT Joshua West (USMA `03) is currently serving in Iraq as a BN A/S3 with the 101st DIV (AASLT) in Taji. Their daughter, Kelly, lives in Fredericksburg, VA, with her husband, Bill Fletcher.

MAJ(P) Scott Crino is in his second year with the department. He is the EM Deputy Program Director, Course Director for EM420 (Operations Management), a capstone research group advisor and the Department Social Officer. Additionally, Scott continues to perform funded research is support of the Program Executive Office for Soldier Systems and is the Head Officer Representative for the Army Men's Rugby Team. Scott is married to Kristen, and has three children (Lauren (9), Dominic (7) and Angelo (3)).

Mrs. Christy Gelineau is in her second year with the EM program and is providing great continuity for our new folks. She is teaching two sections and is the course director for EM384. She is working part time this semester so that she can spend more time with her and her husband Joe's 10 month old son Campbell. Christy recently participated in the West Point 10K and placed 1st among the women and 3rd overall! Wow! Great job Christy!

MAJ Michael Rainey remains within the EM program and begins his second year as an instructor for the department's project management course (EM411) along with working with the ASEM student chapter. This year Mike has the significant additional duty of S3 for the department. He also continues to find things to do outside of the department to occupy his time such as helping out with the Army Men's Basketball team, serving with the West Point BSU, and having ACL replacement surgery on his left knee. Even with all of that, his favorite thing to do while stationed at West Point is to hang out with his wife Lisa, son Jackson (21 months), and dog Indy (35 dog years).

MAJ Matt Dabkowski comes to EM from the University of Arizona's Systems Engineering Department. He is married to Nicole, and has 3 son's Issac (8), Elijah (6), and Gabe (4). Originally from Pittsburg, Matt is currently the course di-

(Continued on page 5)

Before joining Systems, ***MAJ Matt Dabkowski*** *was a graduate student at the University of Arizona where he earned an MS Degree in Systems Engineering.*

Prior to joining us in DSE, ***MAJ Paul Krattiger*** *was a graduate student at Northwestern University where he earned a Master of Engineering Management Degree.*

Engineering Management (EM) *continued*

(Continued from page 4)

rector for EM381 Engineering Economy and will be teaching SE385 Decision Analysis in the spring.

MAJ Paul Krattiger joined EM this summer from Northwestern University's IEMS Department. His wife Alison is pregnant with their first, and we are all eagerly awaiting the new Krattiger baby's arrival this spring. Originally from Albuquerque, Paul is currently teaching EM381 Engineering Economy and will be the EM381 course director in the spring.

MAJ Marc Distefano comes to EM from the University of Texas at Austin, Civil Engineering Department where he was part of the Construction Engineering and Project Management Program. Marc and his wife Clarissa have three sons Dominic (10), Gabriel (5), and Spencer (22 months). Originally from Morgan City, Louisiana, Marc is teaching EM411 Project Management this semester and will teach SE 370 Computer Aided Systems Engineering in the spring.

MAJ Nate Minami comes to EM from the Systems Design and Management program at MIT. He is married to Melissa and has two children, Selina (4) and David (1). Originally from San Diego, Nate is currently teaching EM384 Analytical Methods for Engineering Management and will teach EM420 Production Operations Management in the spring.

Lastly, I would like to welcome my husband, **CW5 Richard Korycinski**, home! He spent the last 12 months in Korea and reported to West Point in October as the G3 Air.

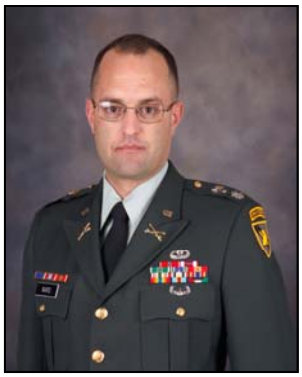
I am especially excited to report that EM had a near record-breaking 74 Cadets from the Class of 2010 select EM as their major! In addition, EM is preparing for and will be undergoing ABET reaccreditation this year. I continue to solicit your feedback and excellent ideas on how to improve this great program! ♦

*Prior to joining us in DSE, **MAJ Marc Distefano** was a graduate student at the University of Texas where he earned an MS Degree in Construction Engineering Project Management.*

*Before joining Systems, **MAJ Nate Minami** was a graduate student at MIT where he earned an MS Degree in Engineering & Management.*

At the 2007 national American Society of Engineering Management conference, the USMA Undergraduate Student Competition Team made up of **CDT Austin Hill (2008, B4)**, **CDT Bryan Adams (2008, B4)**, **CDT Jen Acojedo (2009, A1)** & **CDT Chris Molaro (2010, F3)** tied for **1st Place** with the team from the University of Missouri—Rolla in the First Annual Undergraduate Student Case Competition during the conference. The team did an awesome job of reviewing & analyzing an Engineering Management case study and presenting their findings and recommendations to a panel of judges. Four teams entered this first year of the competition: University of Arizona, University of South Carolina, University of Missouri-Rolla and West Point. The team was given a case study at 0900 and had to present their analysis and recommendations at 1630 to the judges. They could only use their laptops and any references they brought, but not the internet. The photo at left shows the winning teams with their faculty advisors and two of the judges (center of photo). The West Point faculty advisor was **MAJ Paul Krattiger**.

Systems Management (SM)



by LTC Kelly Ward

Let me begin by thanking **LTC Rod Roederer** for his outstanding service as SM Program Director last year, and for all of his assistance to the SM program, and myself, thus far this year. I am new to both the Systems Engineering Department and new to the Systems Management Program, and I am proud to be part of this great team we have in DSE and to be serving as the Program Director. Rod is assisting me in transitioning from my Graduate School program and the National War College back into the teaching, mentoring, and leadership role that we all relish as Academy Professors. We are also performing a formal program review of the Systems Management major and coursework, as part of the ongoing effort to keep the program as interesting and relevant for the cadets in our major as possible.

The continuity in the SM program will be **MAJ Guy Huntsinger**. Guy joined the SM program, and the department, in July 2006, and in only one year accomplished all of the following: led and directed two SM401 capstone design teams, taught and course directed EM484 (Dynamic Systems Analysis), and is again teaching and course directing the SM421 Systems Acquisition Management course. SM421 is a required course for both SM majors and Engineering Management majors, so with the increased enrollments the department is experiencing, the projected SM421 enrollments are also increasing. We continue to strive to make our courses challenging and relevant. To the SM421 course mentioned above, we added a course project that uses Lego® robotics software and hardware with which the cadets design and build an unmanned ground vehicle (UGV). The cadets are expected to design and test the vehicle configurations using 3D modeling software before the vehicle is actually constructed and tested. Along the way, they will be required to provide the usual documentation and analysis required by current Defense Acquisition policy. We culminate the project by having the cadets negotiate an obstacle course with their UGV's, and then analyze each team's vehicle in combat simulation models to assess its actual performance.

The members of the Class of 2007 were the first to graduate under the new SM major and curriculum. During Graduation Week 2007, we presented the first annual *General Donald R. Keith Memorial Award for Excellence in Systems Management* to **Cadet Chris Petrancosta** *(see separate article on page 12)*. The SM program members of the Class of 2008 are continuing the tradition of excellence that the Keith award allows us to appropriately recognize, and we are grateful for the generous support that they have provided.

This academic year the offering of SM401 – the single-semester, integrative capstone course in the final semester of the cadet SM experience – will include projects for both the Department of Military Instruction (DMI) and the Association of Graduates (AOG). We will have 21 Firsties working in three or four-person teams for these real-world clients. Using the systems management skills they have learned in the SM program, and the Systems Decision Process (SDP) taught to all of the Department's majors, the team's will be improving the processes and technology for actual organizations at USMA.

This is a quick rundown of all the exciting things occurring in the SM program. Guy and I hope all of you have a safe and happy holiday, and a successful New Year! ♦

Academic Individual Advanced Development (AIAD) 2007

CDT Barrett Rife poses with Army Chief of Staff GEN Casey during his AIAD work with Walter Reed Army Medical Center.

CDTs Sara and McNaul pose outside the White House while taking a break from their AIADs working for Congressmen Calvert and Gingrey, respectively.

CDT Rooney takes a hang-gliding break from his AIAD for the AFCARES program in Germany.

Information Engineering (IE)

by LTC Dale Henderson

Greetings to all wherever this newsletter finds you. I now have the privilege of stewardship over the Information Engineering Program.

LTC Rob Kewley has moved from directing the IE program to leading the ORCEN. I am managing the major as we graduate our remaining students, but we did not offer the class of 2010 the IE major as an option. The department has made a strategic decision to integrate information engineering into the broader curriculum, and to offer information systems as a sub-discipline under the Systems Engineering Major.

The work done by **LTC Kewley** in developing a Command and Control Systems course has carried forward into this term. Twenty five cadets are enrolled in the course, now called SE482, which proposes, explores, and challenges cadets with the hypothesis:

> *"that a trained and cohesive organization enabled by well-designed collaborative command and control systems will be able to apply decentralized command and control processes in order to increase unit agility and gain a tactical advantage as compared to units that are less collaborative and more centralized."*

Cadets study the theory, doctrine, and history of command and control, conduct case studies in command and control, develop a small scale command and control system, and experiment with computer games and the FBCB2 system to gain an appreciation of the value, advantages, disadvantages, and trade offs inherent in various command and control system implementations.

Our current information engineering cadets will graduate as a small cadre of systems thinkers who have a unique perspective on engineering information systems. The large number of new students whose curriculum integrates these concepts will take a relevant and valuable perspective with them into the Army.

Our lab facilities continue to grow and evolve in ways that support our pursuit of knowledge in the vast domain of information, systems, engineering, and management. Our technical staff is constantly innovating and totally dedicated to supporting teaching using our labs. **Mr. Wayne Batterson** *(photo below)* is on board now as our simulation manager and has done outstanding work updating our simulation capabilities and making them accessible within the teaching program.

We are proud of our students, graduates, faculty, and friends, past, present, and future, and pray for your safety, health, and good fortune. ♦

Suzanne DeLong *prepares her "shot" for the Gray Team during the 2nd Annual DSE Olympics! The annual DSE Olympics is a time of camaraderie and competition to welcome the new faculty to the DSE team.*

Hails:

LTC Suzanne DeLong
LTC Scott Nestler
LTC Kelly Ward
MAJ(P) Paul Kucik
MAJ Matt Dabkowski
MAJ Paul Krattiger
MAJ Nate Minami
MAJ Marc Distefano
CPT(P) Rob Dees
CPT(P) Julia Oh

Farewells:

COL Kent Miller
LTC Simon Goerger
MAJ Terry Barron
MAJ Tom Rippert
MAJ Greg Boylan
MAJ Greg Griffin
MAJ Chad Jagmin
MAJ Grant Martin
MAJ Ernie Wong
MAJ TJ Lindberg
Mrs. Heidi Hulst

Operations Research Center of Excellence (ORCEN)

by LTC Rob Kewley

This past summer the Operations Research Center bid farewell to a very talented team of analysts. **Simon Goerger** completed his tenure as ORCEN director and headed to Kuwait in order to provide information systems support to the Combined Forces Land Component Command's Operations Center. Under Simon's leadership, the ORCEN completed two years of valuable research in support of a variety of Army and Department of Defense leaders. I am working as hard as I can to try and fill his shoes. Fortunately for us, **Niki Goerger** has remained with us this year where she continues to do outstanding research work. In addition, **Greg Griffin** departed for the Telecom Systems Engineer Course at Fort Gordon. We wish Greg and Simon all the best in these challenging assignments. Closer to home, **Gary Kramlich** returned to the Math Department where he teaches Mathematical Modeling and Introduction to Calculus. Gary continues his collaboration with the ORCEN through continued small arms reliability research in support of Special Operations Command. Both **Dale Henderson** and **Paul Evangelista** have transitioned back to the classroom were Dale teaches Command and Control Systems and Paul teaches Deterministic Models.

This departing crew completed a very challenging slate of research that included, among other things, analysis of best practices and strategies in the counter-IED fight, simulation analysis to support design and throughput in Army battle command training centers, and support to Program Executive Office (PEO) – Soldier. I would like to highlight two projects in particular. **Gary Kramlich**, **Simon Goerger**, and **Dale Henderson** were awarded the Army's Wilbur Payne Memorial Award for Excellence in Analysis for their analysis of the effective life of small arms weapons. The Payne Award is given annually in order to recognize the highest quality operations research work from across the Army. In addition, **Simon Goerger**, **Niki Goerger**, **Paul Evangelista**, and **Ed Teague** were recognized at the Military Operations Research Society Symposium by having the best paper in their working group for their analysis of insurgent and counter-insurgent strategies in the vehicle-borne IED fight.

This summer, **Brian Sperling**, **Ed Teague**, and **Melanie Carlson** transitioned from the teaching program into the ORCEN. In addition, **Scott Nestler**, our Math analyst, has come to us by way of the University of Maryland. We also retain the outstanding administrative and programming support provided by **Nancy Higgins** and **James Cook**. We spent the summer trying to pick up where our talented predecessors left off and supporting over fifty cadets who traveled across the country and around the world doing summer internships. We are very grateful to the government and industry organizations that hosted our cadets this summer and provided them a first-hand experience in the practice of Systems Engineering and Engineering Management.

We are all beginning work on this year's slate of projects. We continue to work closely with PEO – Soldier, and new research clients include the Aviation and Missile Research Development and Engineering Center and Tank Automotive Command.

We look forward to other opportunities to apply systems thinking to some of the Army's challenging problems. All Systems Go! ♦

New ORCEN Team Members for Academic Year 2008
from left to right: ***LTC Sperling, LTC Nestler, MAJ Teague, MAJ Carlson,*** *and* ***Mr. Cook***

Core Engineering Sequence (CES)

by LTC John Halstead

The Core Engineering Sequence (CES) said farewell to department stalwarts last spring. **MAJ Greg Boylan** faced the greatest hardship. He, his lovely bride, **Colleen**, and children departed to Schofeld Barracks, Hawaii. Greg now serves as the 25th Infantry Division's Operations Research Analyst. **MAJ Grant Martin** continues his professional development in the Army G-8, Program Analysis and Evaluation. Grant always embodied the concept of "Iron Major," but is now the Army's premier example of it. He, **Wendy**, and Jackson happily live in Burke, Virginia and offer their hospitality to all visiting northern Virginia. **MAJ Ernie Wong** rejoined his branch, Military Intelligence. Military Intelligence Branch didn't miss the opportunity to place this talented officer into one of the Army's most critical duties. Ernie is currently training at Fort Riley, Kansas to become an embedded Iraqi Army Advisor. By the New Year, Ernie will reside on the knife's edge stabilizing and legitimizing the Iraqi nation and government. We dearly miss all these officers and families.

Last year the CES asked a simple question: "Could we redesign the CES to enhance the value delivered to major stakeholders?" We identified stakeholders as the Army, cadets, DSE faculty, and the humanities and social science departments. **Dr. Patrick Driscoll**, **Dr. Greg Parnell**, and I used the department's Systems Decision Process (SDP). The program required a new direction. Across the Academy's humanities and social science departments, the Department Heads view our process as significantly contributing to multidisciplinary education. Regardless if a cadet academically majors in law, management, psychology, or even history, the stakeholder comments resonated with one truth. The SDP significantly contributes with contextualizing large amounts of diverse content and language data. The contextualization enhances decision making in humanities and social sciences.

The analysis also revealed relevant change that would enable and encourage cadets to innovate. The CES was redesigned to deliver value to non-systems engineering majors in their academic discipline while adhering to general systems engineering principles. The sequence resembles three successive 40 hour workshops that walk, crawl, and run cadets through general systems engineering. The sequence uses systems thinking, systems modeling, and the SDP as binding agents to link SE300, SE350, and SE450. SE300 and SE450 place emphasis on systems thinking and the SDP *(see figure on next page)*. SE300 mirrors SE301 by conducting two iterations of the SDP. Sequence cadets first use the SDP in a decision role while analyzing their cow loan. The second iteration applies the SDP on an Army system. SE450 continues to use real world clients located at West Point. Due to customer satisfaction with cadet products, **LTC John Willis** (SE450 Course Director and Department XO) now has more projects than cadet teams. He is able to pick the most relevant projects, which enhances sequence cadet learning.

SE350 required the most change. The course teaches systems modeling in Excel. Cadets use Excel to build intuitive models, create random variables, create functions with random variables, build queuing and other stochastic models, conduct decision analysis, and build optimization models. Examples of the systems models cadets create by the end of the course include Monte Carlo simulations of life cycle costs and multi-objective decision making models.

Implementing the change is a talented group of professors and instructors. **Dr. Greg Parnell** course directs SE300. Greg's team consists of **COL Bob Powell**, Ph.D. (Deputy Department Chair), **LTC Kelly Ward**, Ph.D. (SM Program Director), and **MAJ(P) Paul Kucik**, Ph.D. Both Greg and COL Powell have extensive systems experience in the department. LTC Ward joined us from the National War College where he served as both a student and an adjunct faculty member. Prior to the War College, he earned his doctoral degree from Pennsylvania State University. MAJ Kucik is fresh from Stanford University in sunny Palo Alto, California where he earned a doctorate degree. **LTC Suzanne DeLong**, a returning DSE Alumni, leads SE350 and is responsible for implementing the most significant CES changes. Her previous assignment was with TRADOC at Fort Monroe, where she, in addition to simulation and modeling duties, pur-

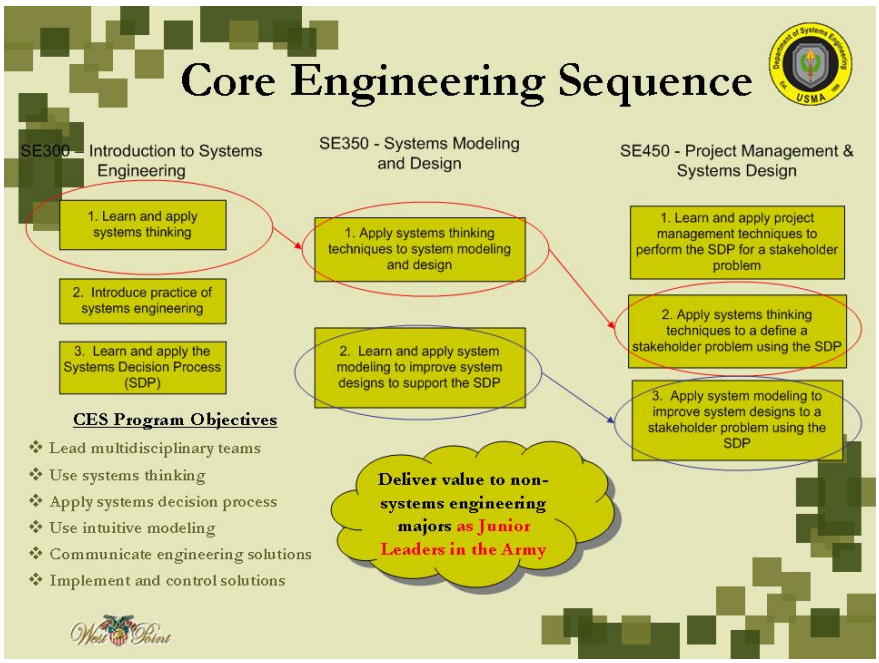
(Continued on page 10)

Core Engineering Sequence (CES) *continued*

(Continued from page 9)

sued a Ph.D. from the University of Virginia. **CPT(P) Rob Dees** is LTC DeLong's only team member in SE350 this semester. CPT Dees joins us from College Station, Texas where he attended Texas A&M and earned a masters degree. Next semester, **COL Trainor** joins the CES, teaching one section of SE350. **LTC John Willis** leads SE450 and employs systems veterans, **LTC Rod Roederer** and **LTC John Halstead**, Ph.D. (CES Program Director).

Our new faculty eagerly filled the gap left by the departure of our stalwarts. **LTC Suzanne Delong** returned to the department after gaining more Army experience applying systems engineering, which she pours into SE350. Suzanne's husband, **Vaughn**, instructs in the Department of Mathematics. They have two sons, Keagan and Ryan, who are delightful and a blessing. **MAJ Paul Kucik** saw the light and willingly drinks the SDP Kool-Aid. Paul was an instructor in the Department of Social Sciences and like many of our stakeholders, understood the value of systems engineering. But unlike many of the humanities stakeholders, Paul embraced systems enough to join our faculty. Paul's charming wife Lisa and two lovely daughters, Nicole and Lauren, are welcome new members to the Systems Engineering Family. **CPT(P) Rob Dees** is a legacy faculty member. Rob is the son of MG(Ret) Dees. Because this acorn didn't fall far from its tree, Rob fills his classroom with energy, insight, and relevant experiences. Cadets readily connect with Rob. He, like many of us, has a great team supporting him at home, Kristy and their darling children, Austen, Brennan, and Isabel. ♦



Prior to joining us in DSE, ***LTC Suzanne DeLong*** *was a PhD student studying Systems Engineering at the University of Virginia.*

Before joining Systems, ***MAJ(P) Paul Kucik*** *was a graduate student at Stanford University where he earned a PhD in Management Science and Engineering.*

Prior to joining us in DSE, ***CPT(P) Rob Dees*** *was a graduate student at Texas A&M where he earned an MS Degree in Industrial & Systems Engineering.*

USMA Chair for Transformation

by Dr. Tim Elkins

In the last Systems Connection newsletter we gave you the "10,000 foot view" of the Office of Force Transformation (OFT). Since then, OFT has itself continued to transform, including new leadership. Mr. Mark Gunzinger is the new Deputy Assistant Secretary of Defense (Forces Transformation and Resources) within the Office of the Under Secretary of Defense for Policy. Mr. Gunzinger previously served as the Director for Defense Transformation, Force Planning and Resources on the National Security Council. He is a graduate of USAFA and retired from active duty as a colonel in 2002.

All thirteen Force Transformation Chair positions have now been filled, which include: USAFA, USMA, USNA, ACSC, CGSC, JFSC, MCU, AFIT, AWC, NWC, NPS, NDU, and DAU. In addition, there are several allied nations actively participating in the program such as Sweden, Australia, and the UK. This network continuously expands as it reaches out to various organizations throughout DoD, other federal agencies, NGOs and civilian academia plus other allies and coalition partners. Some of these other partnering institutions include the Center for Homeland Security at UCCS, NATO, Center for Naval Analysis, Rutgers University, the Swedish National Defense College, and Cranfield University in the UK. The intent of the chairs program is to foster education and collaborative research within and between defense educational institutions.

There are resources available that have been developed by OFT and the Chairs. Some of the informational / educational instruments include Network-Centric Operations case studies, such as, "A Network-Centric Operation Case Study: Air to Air Combat with and without Link 16." These are Harvard Business Review-Like cases that have been peer reviewed, which a number of the USMA faculty, including several of our SE faculty, assisted with. The case studies are available on the OFT website (below). Also, OFT offers a Network-Centric Operations Short Course typically held at the National Defense University but it has also been conducted at other institutions, including the Command and General Staff College at Fort Leavenworth and the Swedish National Defense College. There is also a video brief available on-line.

Transformation related research has also been supported by grants made available through the Chairs. Several departments at USMA have received funding, including the Department of Military Instruction for new technology upgrades to their Warfighting Simulation Center (WARCEN). Behavioral Sciences & Leadership also received funding for technology to support on-going research. The Department of Law received funding to help stand up their new Law of Armed Conflict Center (LOAC) as well as support for two Law and Terrorism conferences held at USMA. Systems Engineering has also been successful in winning funding through the transformation research program. Dr. Pat Driscoll, Professor of Operations Research, was awarded one of the first grants for his research, "Information Product Quality and Network Centric Operations."

Current focus areas of the Chairs include developing a transformational leadership curriculum which could be exportable to the various PME institutions. There is also an emphasis on cyber warfare from both a technology standpoint as well as a legal standpoint. Other areas of interest include stability and reconstruction operations. Finally, what has been termed "trends and shocks" is receiving a great deal of focus from the OFT community.

Trends and shocks refer to those things that keep us up at night. Examples of these would include nuclear/radiological terrorism, loss of control of the global commons (sea, space, cyberspace), use of a nuclear weapon in a conflict, or a pandemic. The Chairs have been actively participating in not only identifying potential shocks but in quantifying (ranking) their impact as well as their likelihood. Additional work is underway to be able to identify trends leading to a potential shock, assess what mitigation approaches exist (or could be developed), and whether there are new technology needs in the areas.

Finally, along this vein, SE currently has a capstone team working on developing regional medical surge capability in the event of a mass casualty incident that might result from a shock like a pandemic.

Comments & feedback welcomed.

GO SYSTEMS! ♦

Additional information about the Office of Force Transformation (OFT) can be found online at: www.oft.osd.mil
There is also a Chairs community site at: www.TFXChairs.net

General Donald R. Keith Memorial Award

During Graduation Week 2007, the Department of Systems Engineering presented the first annual *General Donald R. Keith Memorial Award for Excellence in Systems Management* to **Cadet Christopher Petrancosta**, Class of 2007. The award was presented this year by General Keith's son, LTC (Ret.) Michael Keith (USMA 1977), to the overall best Systems Management major in recognition of his superior academic performance, military performance, and the demonstration of ethical conduct above reproach. The award is named in honor of the late GEN Keith (USMA 1949), a former AMC commander, whose family provided an endowment in October 2006 to our department in his name. The SM program members of the Class of 2008 are continuing the tradition of excellence that the Keith Award allows us to appropriately recognize, and we are grateful for the generous support that the Keith family has provided. ♦

Mr. Mike Keith (USMA 1977) presenting the first GEN Keith Award to CDT Petrancosta (USMA 2007)

US-Canada Operations Research Symposium Hosted in September

From 11-13 September 2007, the Department of Systems Engineering hosted the 2007 United States Canada Operations Research (OR) Symposium. Over 30 civilian and military personnel from US and Canadian Federal Defense Organizations *(see photo next page)* attended presentations and collaborated on OR initiatives. The US Center Army Analysis (CAA), a US Army research organization, sponsored the event. Other US representatives from the TRADOC Analysis Centers (TRAC) at White Sands Missile Range and Fort Leavenworth, KS, Army Material Systems Analysis Activity (AMSAA), and the USMA Operations Research Center of Excellence (ORCEN) attended the symposium. Canadian delegates represented the Defence Research & Development Canada Center, Operational Research & Analysis (DRDC CORA), and the Directorate of Land Concepts and Design. **Ms Pamela Blechinger**, SES, TRAC-WSMR (and DSE BOA member), presided over the symposium along with her Canadian counterpart Ms Maria Rey, Director General, DRDC CORA.

The US Canada OR Symposium is an annual event for OR practitioners to share and exchange methods, techniques, and experiences. This year, discussion topics included analysis in support of OIF and OEF, counter IED efforts, infrastructure development, personnel management, combat vehicles, command and control, information systems, and interoperability. The group also laid the ground work for more collaboration and exchange of information in the future. It was not all business, however. The participants enjoyed an evening cruise on the Hudson River and a historical tour of West Point fortifications. In all, the symposium renewed and strengthened a commitment to analysis excellence between two vitally important strategic partners.

DSE faculty presented current research as well. **COL Tim Trainor** and **LTC Dale Henderson** briefed USMA Infrastructure Management Capacity Building Mission for the Al Basrah Province of Iraq. **Dr Niki Goerger** and **MAJ Ed Teague** briefed Examining Insurgent Behavior and Traffic Flow Strategies in Suicide Vehicle Born Improvised Explosive Device Mission Outcomes. ♦

THANK YOU to our Distinguished Visitors and Guests (Since January 2007)

MG Richard Rowe, Deputy Director, ARCIC

Dr. Irving Wladawsky-Berger, VP, Technical Strategy & Innovation, IBM.

Mr. Mike Bauman, Director, TRADOC Analysis Center

MG Rick Lynch, Commander, 3rd Infantry Division

COL Don Hazelwood, PM, Unmanned Aircraft Systems

COL Darryl Paquette, PM, Attack Helicopters

Mr. Ron Rezek, Special Assistant to Deputy Under Secretary of the Army for Business Transformation

Dr. Sam Savage, Stanford University

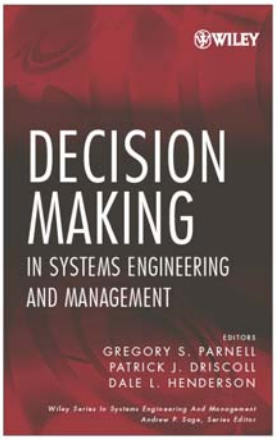
DSE Faculty Writes New Systems Engineering Textbook

by Dr. Greg Parnell

Our new textbook, "*Decision Making in Systems Engineering and Management*," is nearing completion and will be published in the Wiley Systems Engineering Series in February 2008. This book provides students and professionals with the concepts and tools to successfully deal with systems engineering challenges of the 21st century. The three major topics addressed are systems thinking, systems engineering, and systems decision making. All three topics are unified under a systems decision process (SDP) that provides a holistic methodology for addressing and resolving complex systems decision problems during any stage of a system life cycle. The book also includes exercises, examples, and case studies, and can be ordered online from several sources including Wiley, Amazon, and Barnes and Noble.

The purpose of the book is to provide a textbook for the first undergraduate course for systems engineers, and a resource for systems engineering and engineering management professionals. The textbook describes techniques the authors have found to be the most useful for systems problem solving. A prepublication edition of the book is currently being used for all Systems Engineering majors (SE301) and Systems Engineering sequencers (SE300), as well an introduction to systems engineering course at the University of Arkansas. The text will also be used as a reference for several additional courses including capstone research projects.

The 464 page hardcover book is edited by **Dr. Greg Parnell**, **Dr. Pat Driscoll** and **LTC Dale Henderson**. The book was researched and written by several DSE faculty members and colleagues from other universities. Contributing chapter authors include **Dr. Roger Burk**, **Dr. Pat Driscoll**, **LTC Simon Goerger**, **LTC Rob Kewley**, **LTC Mike Kwinn**, **Dr. Greg Parnell**, **COL Bob Powell**, **COL Tim Trainor**, and **Dr. Paul West** from the Department of Systems Engineering. Contributing chapter authors from other universities include **Dr. Ed Pohl** and Dr. Heather Nachtmann, University of Arkansas, **Dr. Bob Foote**, University of Oklahoma, and **Dr. John Kobza**, Texas Tech University. The foreword was written by **BG (Ret.) Mike McGinnis**. LTC Dale Henderson designed the illustrations and did the original typesetting of the first three prepublication editions. ♦



The cover of our new textbook.

Delegates from the 2007 US-Canada Operations Research Symposium

Army CARES Training

The Department of Systems Engineering's Operations Research Center of Excellence (ORCEN) spent the last two years developing software designed to conserve valuable resources within the casualty assistance system in order to maximize Family care during a time of bereavement.

This software, the Army Casualty Assistance Readiness Enhancement System [Army CARES], has gone through a number of revisions during its development and is now undergoing field testing. On Sept. 18 and 19, the ORCEN hosted individuals from 16 Casualty Assistance Centers (CACs) from Fort Lewis, Wash., to Heidelberg, Germany, and representatives from the Casualty Memorial Affairs Operation Center in Washington, D.C., to train them on the system in preparation for field testing.

The training seminar, conducted by LTCs **Brian Sperling**, **Dale Henderson** and programmer **James Cook**, included the development of metrics of success through group discussion and teaching the CACs how to install and use the software. All trainees were provided a laptop to bring back to their centers to ensure that at least one computer in each test center had the software properly installed and working.

The CACs were further charged to use the software for case management for 90 days and then provide feedback to the ORCEN through a collaboration portal developed specifically for this field test.

After the field testing and reporting period ends, an after action report will be completed and necessary changes implemented in the software, so that in February 2008, Army CARES can be distributed to the remainder of the Army casualty office personnel for their use.

The casualty assistance system has expanded rapidly with the Army's mobilization for the Global War on Terrorism. Casualties from the GWOT have approximately doubled the number of active duty Soldier casualties from the rate that existed throughout the 1990s.

In addition to a higher overall load on the system, the war has seen an expansion to the benefits and information routinely made available to the Families of service members who die on active duty. Policy on casualty assistance has also evolved as a consequence of the perception that the public demands a very high level of emphasis on casualty assistance and a high level of support to the Families of fallen Soldiers.

SE and the ORCEN will continue to work on this program to help ensure that the Families receive the best care the Army can provide. ♦

LTC Robert Amico, the chief of training at the Casualty Memorial Affairs Operation Center in Washington, D.C., takes the Army CARES training.

***MAJ Melanie Carlson** leads Army CARES training participants in a Group Systems session to develop metrics of success for the new software.*

Cadet Capstone Conference

On 3 May 2007, DSE hosted its seventh annual cadet capstone conference, which was recast this year as the First Annual General Donald R. Keith Memorial Cadet Capstone Conference, in conjunction with USMA Projects Day. For Cadets in DSE, the conference serves as a culmination point for their cadet academic career and allows them to present their findings to their instructor, client, a general audience and judges. The capstone program provides a senior design experience integrating the entire undergraduate program. The program combines elements of systems engineering and engineering management theory and practice allowing students to conduct design and experimental work for clients similar to that of practicing systems engineers. Incorporated into the design experience are: use of open-ended Army and DOD problems; use of a systems design methodology; synthesis and analysis of alternative solutions; and system modeling and simulation.

The conference was attended by over 200 participants and observers from USMA, George Mason University, the University of Virginia, the University of Arkansas, the US Air Force Academy and several DoD agencies. The day culminated with a banquet and award ceremony at the historic West Point Club. The keynote speaker was Mr. Vernon Bettencourt, Deputy Chief Information Operations Office, US Army G6.

Presentation tracks and winners included:

- Decision Analysis (sponsored by the INFORMS Decision Analysis Society) - *Small Unit Unmanned Weapon System for Today's Army* by CDT Julia Carier, CDT Earnest Smith, CDT Andrew Wade, CDT Paul Walker (USMA)

- Process Modeling and Analysis (sponsored by Omega Rho) - *Improving the Air Force Academy's "Operations Air Force" Summer Program Scheduling Process* by CDT Abby Barger, CDT Nick Hainsfurther, CDT Chris Kurtz, CDT Allison Wood (USAFA)

- Statistical Analysis and Stochastic Processes (sponsored by Alpha Pi Mu) - *Automated Anomaly Detection of Criminal Events* by Jeffrey Bordogna (Univ. of Virginia)

- Modeling and Simulation (sponsored by INFORMS) - *Fixed-Lot Parking System Design Using Multiple Objective Optimization* by Fred Denny, Sarah Pfeifer, Kelly Sullivan, Ronald Walker (Univ. of Arkansas)

- Project Management (sponsored by ASEM) - *CRAM Technology Assessment Team* by CDT Peter Gerboth, CDT Moo Lee, CDT Andrew Moore, CDT Matthew Visnovsky (USMA)

- Re-engineering Systems (sponsored by Epsilon Mu Eta) - *Army Studies Program Management Office Database Security* by CDT Joe Baumann, CDT John Free, CDT Edward Gibbons, CDT Joe McCarthy (USMA)

- Modeling and Simulation for Military Applications (sponsored by the INFORMS Military Applications Society) - *Identifying Critical Soldier Factors to Facilitate the Modeling of the Individual Soldier in Close Range Urban Environments* by CDT Zach Griffiths, CDT Seth Sanert, CDT Mike Snodgrass, CDT Sean Snook (USMA)

- Problem Solving in Systems Engineering (sponsored by INCOSE) - *Systems Analysis of an Army Reception Battalion* by CDT Lee Crain, CDT Michael Jensen, CDT Andrew Masone, CDT Sean Whaley (USMA)

- Poster competition (sponsored by MORS) – *Portfolio Analysis of Improvements to Army Assistance System* by CDT Michael Bradwick, CDT Matthew Brown, CDT Wan-Ting Hung, CDT Isaac Yancey (USMA) ♦

◄ ***COL Trainor*** *thanks Mr. Bettencourt for his remarks at the Capstone Banquet.*

Mr. Walt Hollis poses ► *with the cadet team that won the 2007 Walt Hollis Award for Excellence in Military Operations Research/Systems Analysis.*

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From the Department Head *continued*

(Continued from page 1)

general public by the Wiley Publishing Company in February 2008. Many thanks to the yeoman efforts of editors **Dr. Greg Parnell**, **Dr. Pat Driscoll** and **LTC Dale Henderson** in pulling this together.

- The Engineering Management Program was nationally recognized again with the Founders Award for Excellence in Undergraduate Engineering Management Education for the third year in a row by the American Society of Engineering Management.
- **Major Gary Kramlich**, **LTC Dale Henderson** and **LTC Simon Goerger** were honored with the Dr. Wilbur B. Payne Memorial Award for their work in performing the Small Arms Effective Life Study for PEO Soldier.
- **COL Bob Powell** graduated from the Naval War College in June.
- **LTC Donna Korycinski** graduated from the Army War College correspondence program in July.
- The ORCEN and project-lead **LTC Brian Sperling** launched The Army Casualty Assistance Readiness Enhancement System (Army CARES) out for a field test to the Army after training several people from Casualty Assistance Centers worldwide here at West Point.
- **Dr. Greg Parnell** was awarded the 2006 Koopman Prize from the Military Applications Society of INFORMS along with LTC Paul Ewing and COL(Ret) Bill Tarantino for their outstanding paper on the work they performed as part of the Army's BRAC 2005 analytical team.
- We welcomed 150 new majors to the Department from the class of 2010 after a tremendous effort by the Communications Committee, led by **LTC Rod Roederer**, and everyone in the department and our cadets – Go Systems!

I believe the Department remains firmly on track for fulfilling our vision as *'The Army's Systems Engineering Department'* educating cadets and developing faculty to lead teams that develop and implement high value solutions to future problems in a dynamic, uncertain, technologically complex world. A major focus area this year is reaccreditation of our academic programs. **LTC Mike Kwinn** has skillfully re-engineered the Systems Engineering program and **LTC Donna Korycinski** continues to lead our top Engineering Management program in our 'record year' for ABET reaccreditation of these programs. **LTC John Halstead** is implementing a revised Core Engineering Sequence Program that he and **Dr. Pat Driscoll** redesigned to make it even more relevant to our current cadets. **LTC Kelly Ward** with **Dr. Greg Parnell's** help is working to make the Systems Management major a unique program that will excite our non-ABET majors. We remain a source of intellectual capital for the Army and DoD through our ORCEN, faculty and cadet Capstone and Honors research programs. We recently taught an Executive Education course on the Systems Decision Process to leaders in Systems Engineering for the National Security Agency (NSA). Our cadets and faculty remain engaged with work to support our deployed forces in Iraq.

On a more personal note I wanted to share that **LTC Dale Henderson** and I spent the summer in Basrah, Iraq working with the British Provincial Reconstruction Team and the US Army Corps of Engineers on a capacity-building mission for the Iraqi utility sector leaders. Rest assured that our Soldiers, Sailors, Airmen and Marines on the 'front-lines' are performing brilliantly under tough conditions. Also remain assured that your Systems Engineering team continues to lead the way at USMA. Thank you for the opportunity to catch up with you. We hope you enjoy the newsletter, and we wish you and yours a blessed and fulfilling 2008! ♦

LTC McDonald (Dept of Civil & Mechanical Engineering), COL Meese (Department of Social Sciences), ***COL Trainor****, and* ***LTC Henderson*** *pose with GEN Petraeus (center) while deployed to Iraq over the summer.*