Program Committee

Dr. Bill Tseng, UTEP IMSE Department Chair, Director of the Systems Engineering Program, and Director of RIMES

Dr. Eric D. Smith, UTEP Assistant Professor

Dr. Amit Lopes, UTEP Research Assistant Professor

Mr. Oscar Salcedo, UTEP RIMES Director for Strategic Opportunities

Mr. Aditya Akundi, UTEP Ph.D. Research Assistant

Mr. Juan Pablo Fernandez, UTEP Graduate Research Assistant

Ms. Pamela Martinez, UTEP Under-graduate Research Assistant

On behalf of the Program Committee, we would like to recognize and thank all the UTEP-INCOSE and UTEP-IIE student members, as well as other individuals for their active involvement and participation in organizing this event. We really appreciate your help and support in making this event a great success!

- Dr. Paras Mandal
- Mr. Ricardo Robles
- Mr. Juan Saavedra
- Mr. Cristian Lopez
- Mr. Juan Carlos Armenta
- Mr. Luis Berumen
- Ms. Sofia Martin
- Mr. Hebin Luan
- Mr. Jose Jaime Lafon
- Mr. Arturo Martinez
- Mr. Alberto Guerrero
- Ms. Pamela Baca
- Ms. Karla Muro
Message from the Head of the Department

Welcome to the 6th Annual Industrial, Manufacturing and Systems Engineering Day at UTEP

It is my great pleasure and honor to welcome you to UTEP’s 1st Annual Industrial, Manufacturing and Systems Engineering (IMSE) Day in collaboration with the Green Energy Leadership Workshop Series sponsored by the U.S. Department of Education and National Science Foundation. We hope you will find this year’s event theme – “Engineering the FUTURE: The NEXT 100 YEARS” – relevant to UTEP Centennial Celebration as well as the ongoing and future development of green energy systems and the challenges in this field to create opportunities for innovation. Our academic work at UTEP is directed not only toward better educational experiences, but also towards being more responsive, adaptive and flexible to the student’s needs of El Paso - Cd. Juarez region. This annual event is important to develop the leadership skills amongst the students and strengthen the interactions and collaboration efforts between academia, government and industry.

At UTEP, the Department of Industrial, Manufacturing and Systems Engineering includes both the Bachelor of Science and Master of Science degrees in Industrial Engineering, a Master of Science degree in Manufacturing Engineering, and a Master of Science degree in Systems Engineering. We also participate in multidisciplinary PhD programs in Environmental Science and Engineering, Electrical and Computer Engineering and Material Science and Engineering with concentrations in Manufacturing and Industrial & Systems Engineering. Our Manufacturing systems PhD program conjoint with the Mechanical Engineering Ph.D. program is under review by the Texas Coordinating Board and is expected to be in place by Fall 2014.

The last two years have been very exciting for us with a very healthy growth of our academic programs, labs space and with almost three-fold increase in research awards as we strive to be a tier-one research university. Our current undergraduate enrollment figure averages 130 students and our graduate enrollment averages 120 students for a total enrollment of 250 every semester.

Our current research areas include: ergonomics, decision making using data mining, cognitive biases, quality control and reliability, model based systems engineering, renewable energy systems, next generation network centric systems, and decision support systems. We have aligned our research to regional and national needs in sustainability, energy systems, knowledge management and healthcare systems.

Thank you to all who helped to make this annual event possible and we also invite you to send us your comments and to participate in shaping our programs to meet the needs of future students.

Sincerely,
Dr. Tzu-Liang (Bill) Tseng
Chair- Department of Industrial, Manufacturing & Systems Engineering (IMSE)
Director- Research Institute for Manufacturing and Engineering Systems (RIMES)
The University of Texas at El Paso
<table>
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<tr>
<th>Time</th>
<th>Location</th>
<th>Description</th>
<th>Presenter</th>
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<tbody>
<tr>
<td>8:30 – 9:00am</td>
<td>Templeton Union Suite</td>
<td>Registration/ Networking/ Breakfast</td>
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<td>UNE 313</td>
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<tr>
<td>9:00 – 9:15am</td>
<td>Templeton Union Suite</td>
<td>Welcoming Remarks</td>
<td>Dr. Richard Schoephoerster</td>
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<td>UNE 313</td>
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<td>Dean, College of Engineering, UTEP</td>
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<tr>
<td>9:15 – 10:00am</td>
<td>Templeton Union Suite</td>
<td>EDGE Innovation Network - User-centric technology innovations accelerated</td>
<td>Brigadier General Pete Palmer</td>
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<td>UNE 313</td>
<td>development</td>
<td>Program Director, EDGE Innovation Network General Dynamic Corp.</td>
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<tr>
<td>10:00 – 10:05am</td>
<td>Templeton Union Suite</td>
<td>Break</td>
<td>Dr. Patrick Debroux &amp; Mr. Frank Lopez</td>
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<td>UNE 313</td>
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<td>Army Research Labs</td>
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<td>10:05 – 10:50am</td>
<td>Templeton Union Suite</td>
<td>Army Research Lab - Idea Incubator at UTEP</td>
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<td>10:50 – 11:00am</td>
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<td>Break / Networking</td>
<td>Dr. James Kwon</td>
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<td>UNE 313</td>
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<td>Associate Dean for Research Ajou University, South Korea</td>
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<tr>
<td>11:00 – 11:45am</td>
<td>Templeton Union Suite</td>
<td>Vision-Guided Robot - Placement Accuracy Enhancement</td>
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<td>11:45 – 12:00pm</td>
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<td>Associate Dean for Research Ajou University, South Korea</td>
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<td>12:00 – 1:00pm</td>
<td>Templeton Union Suite</td>
<td>Keynote Speaker – Lunch</td>
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<td>UNE 313</td>
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<td>Mission Effective Analysis of Armed Helicopter-Defense Modeling and Simulation</td>
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# WORKSHOP SCHEDULE

## THURSDAY, APRIL 24, 2014

<table>
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<tr>
<th>Time</th>
<th>Location</th>
<th>Description</th>
<th>Presenter(s)</th>
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<tbody>
<tr>
<td>1:00 – 2:30pm</td>
<td>Templeton Union</td>
<td>Development of Agent Based Simulation for Building Systems</td>
<td>Dr. Teresa Wu, Associate Professor, School of Computing, Informatics, Decision Systems Engineering, Arizona State University</td>
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<tr>
<td>2:30 – 4:00pm</td>
<td>Templeton Union</td>
<td>The Role Leadership Competency in the Development of a New Professional Workforce</td>
<td>Dr. Arturo Olivarez, Associate Professor, Teacher Education, COEd, UTEP</td>
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<td>4:00 – 5:30pm</td>
<td>Templeton Union</td>
<td>Green Lean Manufacturing</td>
<td>Mr. Jesus Reverol, Field Engineer, TMAC, UTEP</td>
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## FRIDAY, APRIL 25, 2014

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<th>Time</th>
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<tr>
<td>8:30 – 10:00am</td>
<td>Templeton Union</td>
<td>Essential Ethics for Leadership</td>
<td>Dr. Louis Everett, MacGuire Distinguished Professor, Mechanical Engineering Dept., UTEP</td>
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<td>10:00 – 10:45am</td>
<td>Templeton Union</td>
<td>Interactive Activity</td>
<td>Dr. Eric Smith, Assistant Professor, Industrial Manufacturing &amp; Systems Engineering Department, UTEP</td>
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<tr>
<td>10:45 – 12:15pm</td>
<td>Templeton Union</td>
<td>Manufacturing Energy Efficiency for Future Engineers</td>
<td>Drs. Richard Chiou &amp; Raiden Belu, Associate/Assistant Professors, Department of Engineering Technology, Drexel University</td>
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<tr>
<td>12:15 – 1:05pm</td>
<td>Templeton Union</td>
<td>Lunch &amp; Closing Event</td>
<td>Juan Pablo &amp; Pamela Martinez</td>
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**Seminar – 1**

**Title:** EDGE Innovation Network – user centric technology innovations to be rapidly developed at industries and academia

**Presenter:** Brigadier General (Ret) PETER J. PALMER  
Program Director, EDGE Innovation Network, General Dynamic Corp

**Biography:** Pete is the Director of the EDGE Innovation Network that enables user-centric technology innovations to be rapidly developed at industry and academia expense and made available to War fighters and First Responders in an expedited manner. Prior to joining General Dynamics C4 Systems, Pete performed over 32 years of active service as a commissioned officer in the United States Army, retiring in 2008 as a Brigadier General serving as the Director of Accelerated Capabilities Development for the Army Capabilities Integration Center (ARCIC) at Fort Monroe, Va. He managed a broad capabilities development portfolio with responsibility for the development and integration of Department of the Army future and current fight capabilities documents as well as Science and Technology capability documents for the Army and Joint and Multi-National forces. Pete holds BS from USMA and three Masters Degree’s.

**Workshop Abstract:** The seminar will focus on an innovative process to respond to war fighter needs in a highly accelerated way. The EDGE Innovation Network brings hundreds of high technology companies, government agencies, and academic institutions together to rapidly review and respond to urgent war fighter needs. Capabilities available to war fighters and to EDGE members include Warrior Systems, Federal/Civil, Cyber, Cloud Computing, Radios, Mission Command, Vehicle C4ISR, Networks, Cyber and Intelligence C4ISR User Center Testing and Training, Space, Vehicle Design and Manufacturing, Emergency Informatics, Network Integration Evaluation Mission Command User Center, Defense and C4ISR Technology Centre, C4ISR Technology Centre, Mobile Tactical Communications, Human Dimension, Health and Medical.

**Seminar – 2**

**Title:** Army Research Lab – Idea Incubator at UTEP

**Presenter:** Dr. Partick Debroux & Mr. Frank Lopez  
Army Research Labs

**Biography:** Mr. Lopez received his B.S.EE from Cornell University in 1983. Mr. Lopez joined TRW’s Very High Speed Integrated Circuit (VHSIC) team in 1983. After helping develop some of the first high density VHSIC chips at TRW, Mr. Lopez joined the Office of Missile and Electronic Warfare (OMEW) at White Sands Missile Range in 1985. At OMEW Mr. Lopez became the system leader for the Line-Sight-Forward Heavy and served in that position until the system’s cancellation in 1988. From 1989 to 2002, after OMEW became the Vulnerability Assessment Office and finally the Survivability/Lethality Analysis Directorate of the Army Research Lab, Mr. Lopez served as the system leader for the Medium Extended Air Defense System (MEADS) and the Non Line-of-Sight Launch System (NLOS-LS). Additionally Mr. Lopez served as a liaison to the Office of the Assistant Secretary of the Army for Acquisition Logistics and Technology (ASAALT) under Dr. Hank Dubin. In 2007 Mr. Lopez also served as the assistant to the director SLAD under Dr. Paul Tanenbaum. During this timeframe Mr. Lopez also served as technical advisor to SLAD’s System-of-systems analysis effort and SLAD’s Future Combat System (FCS) analysis team. Currently Mr. Lopez is SLAD’s team lead for unmanned autonomous systems (UAS) survivability analysis and has served on TRMC’s Unmanned and Autonomous Systems Test Technology area working group for the past 5 yrs. Mr. Lopez also shared in a group ARL patent (US patent # 8,217,826) for Genetic Algorithm Enhancement of Radar System Survivability granted on Jul 2012.

**Workshop Abstract:** The potential alignment between ARL and UTEP research capabilities incorporating graduate and undergraduate students in the research. They will discuss current research trends and programs within ARL that focus on undergraduate, graduate, and doctoral, students as well as post-doc opportunities.
**Keynote Speaker**

**Presenter:** Dr. Yongjin (James) Kwon  
*Associate Dean of College of Engineering at Ajou University, Suwon, South Korea*

**Biography:** Dr. Yongjin (James) Kwon, Associate Dean of College of Engineering at Ajou University, Suwon, South Korea has many years of engineering experience in industrial and academic settings. He has extensive experience & practical knowledge in current design, manufacturing and quality control. His work has been cited a number of times in high profile journals. He is also a professor in the Department of Industrial and Information Systems Engineering at the same school. Prior to joining Ajou, he was on the faculty of Drexel University, Philadelphia, USA.

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**Topic 1 - Placement Accuracy Enhancement for the Vision-Guided Robot**

**Abstract:** Vision calibration inherently contains many variables that are difficult to quantify and control. Among the variables, lens distortion signifies the most serious alteration, which can be only corrected through the use of software. However, some industrial vision sensors have no programmatic access, which prohibit the implementation of customized vision solutions. As a result, the calibration accuracy can be greatly hampered. This study addresses the problem by automatically aligning the lens optical center with the image target center, and creating a Grid Map that precisely represents the robot coordinates within the vision field of view. With the Grid Map, the positioning accuracy is significantly enhanced, as opposed to other methods that are examined in this study. The calibration is also carried out with the use of custom-designed image patterns that are printed on a piece of white paper. Such approach represents the ease of adaptation on the factory floor. The optical alignment is conducted automatically, because the process is composed in the form of robot program. The approach proposed in this study is better suited for a today’s production environment, where a dynamically changing, competitive marketplace dictates a fast changeover and a frequent vision calibration.

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**Topic 2 - Mission Effective Analysis of Armed Helicopter-Defense Modeling and Simulation**

**Abstract:** The Korean Army is currently developing an armed helicopter and its mission effectiveness needs to be evaluated. In this research, we are using the agent-based modeling and simulation technology to create a computer model, and test the mission effectiveness of the helicopter under varying combat situations. Each major component is modeled as an agent, and its hit probabilities as well as the combat survivability are built into the model. Engagement rules and other combat entities are modeled in order to carry out the simulated engagement. We also developed a full-scale, static helicopter simulator, which can accurately depict the combat helicopter missions. Using the simulator, we investigated the impacts of changing environmental factors on pilots by implementing the effective flight procedures that we found from our previous study. During the experiments, camcorders were used to monitor and analyze the tasks and physical exhaustion of the pilot. NASA-TLX was also used to collect the workload data. Through this experiment, we were able to assess the optimally assigned pilot workload.
Workshops Information

Workshop – 1
Title: Development of Agent Based Simulation for Building Systems
Presenter: Dr. Teresa Wu
Associate Professor of Industrial Engineering Program, School of Computing, Informatics, Decision Systems Engineering at Arizona State University


Workshop Abstract: This workshop covers basics of simulation and agent based simulation. The participant will use Netlogo® as an implementation tool. Basically, how to use the software to implement a multi-building energy system will be demonstrated. Participants will download Netlogo software and the test-case setup and learn how to develop the simulation model and setup the parameters for the building system. The participants will learn about fundamentals of agent based simulation and building energy systems.

Workshop – 2
Title: The Role Leadership Competency in the Development of a New Professional Workforce
Presenter: Dr. Arturo Olivárez
Associate Professor of Teacher Education at UTEP

Biography: He has been a university professor for more than 25 years. He holds a secondary mathematics teaching certificate. Currently, he is a professor in the area of educational research with emphasis on quantitative methods and the application of univariate and multivariate statistics, measurement issues with diverse populations, educational assessment, and evaluation of educational programs. Some of his more general research areas of interest include self-efficacy and motivation research, school-age and college students’ persistence, reading research, mathematics education research, and teacher preparation research. He has been able to complete more than 40 refereed research articles in the above areas of interest and more than 100 international, national and regional research presentations. Recently, he concluded several program evaluations across Texas. Three of the most recent evaluations include study on middle school students writing, an evaluation of the impact of technology in schools, Reading First Grants, and an innovative nursing student training program funded by the NSF. Currently he is director of the Research and Evaluation Laboratory in the College of Education. He has been selected as Research Fellow at the Educational Testing Service at Princeton for two consecutive summer terms. Currently he holds the Patricia Daw Yetter Endowed Professorship in the College of Education at University of Texas at El Paso.

Workshop Abstract: Today’s competitive worldwide market and fluctuating work atmosphere demand that engineers possess leadership competencies in addition to mathematical, methodological and technical skills, and they must be able to understand project goals and have the ability to accomplish them with the ever plummeting availability of resources.
For the most part, engineers learn leadership skills and dispositions while at work. In order to meet the demands of this changing world, most engineering programs are confronted with a myriad of barriers and challenges to generate innovative ways for instructional effectiveness so their program graduates are fully prepared to take on the many challenges twenty-first century engineers face. This presentation provides an overview and summary of leadership competencies that have been produced over the last 75 years and its relationship to engineering education. Some suggestions as to how these needed competencies may be implemented in engineering programs will be discussed.

Workshop – 3
Title: Green Lean Manufacturing
Presenters: Mr. Jesus E. Reverol (TMAC)
Engineers of the Texas Manufacturing Assistant Center at UTEP

Biography: For the last 6 years Mr. Reverol has been studying industrial systems with a focus on floor implementation in order to provide small and mid-size manufacturing organizations sustainable results. Mr. Reverol holds a MBA from UTEP with a concentration in supply chain management. His interests lie in educating mid-level management in cost accounting literacy with the intention of developing better supply chain awareness.

Workshop Abstract: This 90-minute workshop will introduce participants to the systems of systems attributes of Lean Manufacturing. The participants will be led to a comprehensive approach to sustainable manufacturing that will also prepare them for a leadership role in sustainable manufacturing and environmental stewardship. In general, the following objectives will be achieved after this workshop – (1) Introduce Lean Manufacturing concepts, (2) Use Lean Manufacturing to identify environmental waste and (3) Apply Value Stream Mapping (VSM) as a systems of systems approach to analysis.

Workshop – 4
Title: Essential Ethics for Leadership
Presenter: Dr. Louis Everett (NSF/UTEP)
MacGuire Distinguished Professor
Professor of Mechanical Engineering at UTEP

Biography: Dr. Louis Everett is the MacGuire Distinguished Professor of Mechanical Engineering at the University of Texas El Paso. Dr. Everett a registered Professional Engineer is an expert in Automation, Control and Dynamics and Engineering Education. Dr. Everett holds several patents and has experience in Patent Litigation. His technical interests lie in the area of automation and sensor redundancy having research experience with NASA, Department of the Army the Navy and several other Federal organizations and industry and involve hardware design and construction as well as modeling and prediction. His work in education includes collaborative methods, technology enabled education, design techniques, and catching student attention through counter-intuitive problems. He is also active in Faculty Development and holds regular workshops on the subject. At present he has a half time appointment with the National Science Foundation where he serves the Division of Undergraduate Education as a Program Officer.

Workshop Abstract: This workshop covers the common ethical standards and some basic tools for making ethical decisions. Participants will identify ethical problems and use the tools to make decisions based on an ethical standard.
Workshop – 5
Title: Interactive Activity
Presenter: Dr. Eric D Smith
Assistant Professor,
ASEP: Associate Systems Engineering Professional
IMSE Department, UTEP

Biography: Dr. Eric D. Smith is currently an Assistant Professor at the University of Texas at El Paso (UTEP), working within the Industrial, Manufacturing and Systems Engineering Department. He earned a B.S. in Physics in 1994, an M.S. in Systems engineering in 2003, and his Ph.D. in Systems and Industrial Engineering in 2006 from the University of Arizona in Tucson, AZ. His dissertation research lay at the interface of systems engineering, cognitive science, and multi-criteria decision making.

Workshop Abstract: “Please gather for Interactive Activity”

Workshop – 6
Title: Manufacturing Energy Efficiency for Future Engineers
Presenters: Dr. Richard Chiou and Dr. Radian Belu (DU)
Associate/Assistant Professors of Department of Engineering Technology, College of Engineering at Drexel University

Biography: Dr. Richard Chiou is Associate Professor within the Engineering Technology Department at Drexel University, Philadelphia, USA. He received his Ph.D. degree in the G.W. Woodruff School of Mechanical Engineering at Georgia Institute of Technology. His educational background is in manufacturing with an emphasis on mechatronics. In addition to his many years of industrial experience, he has taught many different engineering and technology courses at undergraduate and graduate levels.

His tremendous research experience in manufacturing includes environmentally conscious manufacturing, Internet based robotics, and Web based quality. In the past years, he has been involved in sustainable manufacturing for maximizing energy and material recovery while minimizing environmental impact. He has conducted many experimental studies on dry machining for human exposure and health hazard analysis in green manufacturing. He incorporates his online graduate course sustainable and green manufacturing with industrial energy efficiency. He has secured many research and education grants from the National Science Foundation, the US Department of Education, the Society of Manufacturing Engineers Education Foundation, and industries. Techniques developed from his research projects have been extended to the educational activities involving green energy manufacturing with life cycle assessment.

Biography: Dr. Radian Belu is Assistant Professor within the Engineering Technology Department at Drexel University, Philadelphia, USA. He holds a Ph.D. degree in electrical power engineering and the other one in physics. Before joining to the Drexel University Dr. Belu hold faculty and research positions at universities and research institutes in Romania, Canada and United States.

His research interests included power system control and protection, renewable energy system analysis and design, smart micro grids, power electronics, control and electric machines for wind and solar energy, wave and turbulence, numerical modeling, electromagnetic compatibility and engineering education. During his career Dr. Belu published eight book chapters, several papers in referred journals and in conference proceedings in his areas of the research interests. He has also been PI or Co-PI for various research projects United States and abroad in power systems analysis and protection, load and energy demand forecasting and analysis, renewable energy, micro grids, turbulence and wave modeling, radar and remote sensing, instrumentation, atmosphere physics, electromagnetic compatibility, and engineering education.
Workshop Abstract: Within the broad paradigm of sustainable manufacturing, the issue of energy efficiency and conservation are addressed specifically in the workshop. We are focusing on increasing the efficiency of energy flows in manufacturing and industrial facilities with certain impact on both economic as well as environmental target variables. Inefficient energy use in manufacturing and industrial facilities is both increasingly expensive and unsustainable. Energy efficiency relates to reducing wasted energy, hence reducing energy consumption. Utilization of fossil fuels adversely affects the greenhouse gases released into the atmosphere and results in undesirable quantities of emissions. Increase energy efficiency will reduce the unwanted environmental effects produced by manufacturing and industrial processes. Controlling energy use is important, but it is also important to assess or estimate it, and to understand methods and approaches for reduction its use and for assessing the cost effectiveness of these measures. The workshop also includes an improvement of resource efficiency as well since these energy flows are typically directly or indirectly connected with the depletion of critical resources (oil, gas, coal). The topic “energy efficiency in manufacturing” is of major relevance from a nation as well as a single company. On a national scale, industry is a major consumer for 33% of the national electricity in US. There is a strong need of appropriate methods and tools to support fostering energy efficiency in manufacturing companies. The student training for manufacturing energy efficiency improvement has become a workforce development initiative for creating the next generation of engineers. The main objective of this workshop aims at contributing towards the improvement of energy efficiency in manufacturing and providing training for undergraduate students in industrial processes, energy assessment procedures, and energy management principles.
We would like to extend a warm welcome and special thanks to the Advisory Board for joining us for the 6th Annual Industrial and Systems Engineering Day. This elite group meets once a year and we are delighted to have them in our midst. The RIMES Advisory Board was established in 2009 comprising of leaders from the industry and academia. We appreciate the continuous support, dedication, and contribution of each individual member. The members of the RIMES Advisory Board are as follows:

- **Mr. Jerry Fasano** - (*Vice President Operations, Leviton Industries*)
- **Dr. Jesus Jimenez** - (*Assistant Professor, Texas State University, Ingram School of Engineering*)
- **Dr. Alexander Eksir** - (*LM AERO, Vice President Quality & Mission Success*)
- **Tim Conn** - (*URS Chief Engineer, National Radar Cross Section Test Facility (NRTF]*)
- **Bob Kirch** - (*General Dynamics Corporation*)
- **Dr. Shawn Smith** - (*Engility Corporation*)
- **Mr. Jesus Reverol** - (*TMAC, University of Texas at El Paso*)
# Department of Industrial, Manufacturing & Systems Engineering

**http://imse.utep.edu/**

## Mission/Scope of Work:
The ISEL strives to graduate industrial, manufacturing, and systems engineers of the highest quality and to conduct state-of-the-art research for the end-to-end enterprise.
- Academics
- Research
- Service

## Expertise/Capability:
- Cyber-Quality Management Systems
- Data Mining, Pattern Recognition & Knowledge Management
- Engineering Education
- Ergonomics and human factors engineering. Application of ergonomics principles for bilingual/bicultural (Anglo-Hispanic) populations.
- Evolutionary Game Theory
- E-Manufacturing Processes
- Model Based Systems Engineering (MBSE)
- Multiple Objective Optimization
- Multistate network reliability
- Network Centric Systems
- Non-destructive Testing
- Power & Energy Forecasting Systems
- Smart Grids/Intelligent applications in Power Systems
- System of Systems Risk Analysis
- SoS Modeling and Simulation
- Sustainability Engineering

## Funders/Partners:
- NASA, NSF, US DoED, USDA
- Fort Bliss
- Lockheed Martin-Aeronautics, Raytheon, Inc.
- Sandia National Laboratories

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**The University of Texas at El Paso**

Dr. Bill Tseng, (915) 747-7990, btseng@utep.edu
Research Institute for Manufacturing & Engineering Systems (RIMES)  [http://rimes.utep.edu/](http://rimes.utep.edu/)

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<tr>
<th>Mission/Scope of Work:</th>
<th>Expertise/Capability:</th>
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<tr>
<td>• Research and promote the use and deployment of current and future systems engineering methodologies, processes, and technologies (MPT) in the design, development, manufacturing, implementation and life cycle management of end-to-end enterprise systems.</td>
<td>• Architectural Frameworks</td>
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<td>• Become the El Paso del Norte Center of expertise for the SME Manufacturing Extension Programs</td>
<td>• Application of Service Oriented Architecture to Systems</td>
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<td>• UTEP executive agent for Intelligence Community Intern/Co-Op Programs</td>
<td>• Energy Systems Modeling &amp; Simulation</td>
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<td>• Formal Requirements Engineering/Analysis</td>
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<td>• Integration, Verification &amp; Validation Methodologies (IV&amp;V)</td>
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<td>• Lean Manufacturing, Six-Sigma, Value Stream Mapping</td>
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<td>• MBSE and SysML</td>
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<td>• Multi-objective Optimization</td>
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<td>• Network Centric Systems (NCS)</td>
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<td>• Prognosis Health Management (PHM): Multistate Reliability</td>
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<td>• Quality Engineering &amp; Quality Management Systems (ISO-9000, AS9100, ISO14000, etc)</td>
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<td>• Safety Engineering</td>
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<td>• Smart Grids Security Frameworks</td>
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<td>• System of Systems Reliability and Risk Analysis</td>
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<td>• Tradeoff Analysis</td>
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**Funders/Partners:**
- AFRL, NRO, NIST
- Boeing
- Clarkson Aerospace
- Fort Bliss
- General Dynamics-C4 Systems
- Hamilton Sundstrand
- Jacobs Engineering
- Los Alamos National Labs/Sandia National Labs
- Lockheed Martin Aeronautics
- Raytheon, Inc.-IDS
- WSMR

The University of Texas at El Paso  Dr. Bill Tseng, (915) 747-7990, btseng@utep.edu
## Texas Manufacturing Assistance Center (TMAC)

### Mission/Scope of Work:
- TMAC is partially funded by the Manufacturing Extension Partnership (MEP) program through the National Institute for Standards and Technologies (NIST). The mission of TMAC is to improve the competitiveness of manufacturers in Texas. TMAC is part one of 60 affiliated centers throughout the 50 states and Puerto Rico.
- TMAC aggressively expands its manufacturing service capabilities by creating partnerships in areas such as training, financing, international trade, environmental, and information systems to complement TMAC’s core technical support service.
- Our goal is to understand the needs of the customer, provide the customer the right information, develop plans, apply the knowledge and any technology that is considered suitable, be a "one-stop-shop" for manufacturers seeking to become more productive and competitive not only locally but internationally, to name a few.

### Capabilities:
- Lean Enterprise
- Quality Systems
- Strategic
- Workforce Development
- Market Innovation

### Expertise:
- Leadership and Management
- Expert Development & Workforce Practices
- Product Material Logistics
- AS9100, ISO 9000, TS-16949, ISO 14000
- Energy Conservation
- Supply Chain Management
- Finance, Planning and Assessment
- Mentor-Protégé
- Product Development
- Innovation

### Funders/Partners:
- MEP and NIST
- University of Texas at El Paso
- University Medical Center, Boeing, Raytheon, MIRATEK, METI, Lucchese,

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<th>Hilario Gamez, 915-747-6272, <a href="mailto:hgomez@utep.edu">hgomez@utep.edu</a></th>
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## Training & Education:
- Training Within Industry (TWI)
- Team Building
- Problem Solving
- Supervision courses and programs
THANK YOU SPONSORS!

We would to express our sincere thanks and special appreciation to this year’s sponsors for their support and for helping to make this event possible:

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NSF Award No: DUE-TUES-1246050
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