ORAL PRESENTATION SCHEDULE
Listed by Track and Daily Schedule

ADMINISTRATION

Thursday, November 7, 2019 11:00 AM - 11:25 AM Governor Room 3

The use of Applied Engineering in an Engineering-Dominant Culture

As of 2018, ATMAE has accredited seven degree programs that include the terms “Applied Engineering” in their program name. None of these programs are administered at colleges/universities with existing ABET-accredited (EAC) engineering programs. This research discusses efforts made, roadblocks encountered, lessons learned, and future recommendations for making one such program name change at a university already offering ABET-accredited engineering programs.

Dr. John Haughery, Iowa State University
Dr. Gretchen Mosher, Iowa State University

Thursday, November 7, 2019 11:30 AM - 11:55 AM Governor Room 3

State-of-the-Art of Applied Engineering Undergraduate Programs

This research analyzes trends in the adoption of the terms “Applied Engineering” by ATMAE-accredited programs over the past 10 years. Additionally, definitions and curricula of these programs are synthesized to provide a characterization of the state-of-the-art of “Applied Engineering” undergraduate programs in the United States.

Dr. John Haughery, Iowa State University
Mr. Saxon Ryan, Iowa State University
Dr. Gretchen Mosher, Iowa State University
ORAL PRESENTATION SCHEDULE
Listed by Track and Daily Schedule

CONSTRUCTION
Thursday, November 7, 2019 8:00 AM - 8:25 AM  Cardinal Room 2

Solar Pavement, Reality and Future

Using solar panels as built-in items in construction projects has a lot of merits. One example is the development of solar shingles that cover pitched roofs and help with building electrical needs. Another promising or at least intriguing application is the use of solar panels as replacement for some layers of the road pavement, which is the subject of this presentation. This application has been tried in several areas and although it has merits, there are concerns over financial feasibility and the structural stability of the roads in addition to other safety risks related to the materials used in producing the solar panels. This proposed presentation will offer some information on the advantages and disadvantage of this application and some highlights of the future in this area.

Dr. Sherif Attallah, Ball State University
Dr. Tamer Breakah, Ball State University
Prof. Janet Fick, Ball State University

Thursday, November 7, 2019 8:30 AM - 8:55 AM  Cardinal Room 2

Designing Net-Zero Energy Buildings for the Future

Reflecting on the climate change, this study will focus on net-zero energy buildings (NZEB), which are buildings with zero net energy consumption. NZEB is a product of combining cutting-edge technologies that can contribute not only to reducing greenhouse gas emissions but also providing healthy living environment for people. However, many people are not yet familiar with this emerging technology. In order to enable the public to gain understanding of such technology, the technology acceptance model (TAM) will be applied in this study. TAM is a model that focuses on the factors and decision processes an individual uses when deciding whether or not to accept or utilize a technology. Among various factors, perceived usefulness and perceived ease-of-use are seen as key determinants. Furthermore, environmental issues and four main strategies of NZEB will be introduced, for instance, renewable energy generation, high-level insulation material, geothermal system, and high-performance envelope. To increase the reliability and validity of this study, an experimental research methodology will be adopted, which enable the results to be checked and verified. With the help of Autodesk Ecotect, multiple weather conditions or natural disasters can be set up to test whether the building in this study can meet the standard of NZEB under harsh conditions.

Mr. Yang Ge, Eastern Michigan University
Dr. Shinming Shyu, Eastern Michigan University
CONSTRUCTION - continued

Thursday, November 7, 2019 10:00 AM - 10:25 AM  Cardinal Room 2

Energy Auditing for Residential Projects

Home energy auditing is a systematic approach to identify and address the deficiencies in residential projects during the operation phase with the objective of reducing energy consumption. Carrying out this task requires minimum knowledge of building envelop and structure in addition to the electrical, mechanical and plumbing systems that consumes most of the energy. This presentation will describe the process, the steps taken to have a successful audit and the type of training, licensing and certifications that are available and should be pursued by the person interested in this area.

Dr. Sherif Attallah, Ball State University
Dr. Jennifer Warrner, Ball State University
Prof. Gary Birk, Ball State University

Thursday, November 7, 2019 10:30 AM - 10:55 AM  Cardinal Room 2

Promoting Students Learning Experience through Mathematical Modelling in Facade Design Process.

Over the past decade, a responsive facade as a high-performance facade system have emerged to improve user comfort, energy consumption, and cost efficiency since the system is capable of responding and adapting to environmental stimuli. Designing a responsive facade system requires intersection of various fields such as electronic, fabrication, architecture, robotic, geometry, material science, structure, and physics involved in the process of design.

Prof. Shinming Shyu, Eastern Michigan University

Thursday, November 7, 2019 11:00 AM - 11:25 AM  Cardinal Room 2

Bricklaying Robotics: Quality, Efficiency, Safety and Health: Perceptions of Managers and Skilled Workers

The Semi-Automated Mason (SAM) robot is a new and powerful tool currently available to the construction industry and has already been used on a limited basis. This study explores the perceptions that practitioners have towards the use of SAM on recent trial projects. Specifically, it investigates the effectiveness of SAM as measured through the opinions of both management and the skilled trades on projects. Furthermore, interviews and surveys are analyzed to gather insight regarding quality, efficiency, safety and health with this new innovation. The collected information is used to gauge perceived advantages and pitfalls.

Mr. Sai Jashwanth Panuganti, Eastern Michigan University
CONSTRUCTION - continued

Thursday, November 7, 2019   2:00 PM - 2:25 PM   Cardinal Room 2

Proposed Material Model for Shock Wave Propagation at Nanoscale Level

In this study, Molecular Dynamics (MD) computational techniques were developed to study the material behavior subject to huge rates of pressure change such as explosions or high-speed collisions.

Dr. Ahmed Mohamed, Indiana State University
Prof. Randell Peters, Indiana State University

Thursday, November 7, 2019   2:30 PM - 2:55 PM   Cardinal Room 2

Selecting an Asphalt Mix based on its Environmental Cost

The use of asphalt concrete is very common for pavements worldwide. Asphalt concrete has an environmental cost that cannot be neglected. Several researchers started evaluating this environmental burden. In this study, the environmental burden will be used as a comparison tool in the selection of the mix to be used. The analysis will also include a parametric study which evaluates the effect of each of the factors influencing the environmental cost to be able to focus on the most significant factors.

Dr. Tamer Breakah, Ball State University
Dr. Sherif Attallah, Ball State University
Dr. James Jones, Ball State University
Dr. Tarek Mahfouz, Ball State University

Thursday, November 7, 2019   3:30 PM - 3:55 PM   Cardinal Room 3

3D Printing in Architecture Design: An Integration Between The Profession And Education

The literature in the 3D printing domain highlights the ability of the technology to create models from computer designs without any waste and in a time saving manner. Thus, allowing professionals to better utilize their time by focusing it on value adding tasks. Thus, the current presentation provides a real-life example of using 3D printing (Prototyping) to create an innovative architecture cohousing modular design. The design process integrated (1) converting modular design of co-housing units to 3D printed prototypes, (2) examining different orientations of the units, circulation areas, and constructability using the aforementioned prototypes, (3) and creating an optimum design based on the users' needs.

Dr. Tarek Mahfouz, Ball State University
Dr. Tamer Breakah, Ball State University
Dr. James Jones, Ball State University
CONSTRUCTION – continued

Thursday, November 7, 2019 4:00 PM - 4:25 PM  
Cardinal Room 2

Using Drone technology and GIS to develop drainage projects in Construction Education

The use of technology on construction projects continues to escalate and students in CM programs, who will be the driving force for the industry, must become familiar with the tools that are making projects more efficient. One area of drone technology that is finding expanded applications is found in the surveying and topo arena concerning drainage and its’ layouts (Ayemba, 2019). As drainage becomes a focal point for projects, faculty developed a “virtual project” that is meant to introduce Drone Technology in conjunction with Geographic Information Systems (GIS), Topographic Data Investigation, and Stormwater Pollution Prevention Programs (SWPPP) to gather and analyze site data in which students utilize in a project-based learning application. The project is designed to better develop competencies in advancing technologies and engage students in a team environment where they have the ability to develop a cohesive plan for a selected project.

Dr. Richard Miller, Ohio Northern University  
Prof. Douglass Degen, Ohio Northern University

Thursday, November 7, 2019 4:30 PM - 4:55 PM  
Cardinal Room 2

Synergies and Conflicts Between Sustainability and Resilience in Residential Home Construction in Hurricane Zones

Climate change has become an issue of tremendous concern to many homeowners in the path of annual Atlantic storms. In 2017 and 2018, several major hurricanes caused unprecedented damage to residential buildings in the Caribbean region and the Southern United States. In 2016, the International Monetary Fund estimated that the average annual hurricane damage in the Caribbean could increase by 22 to 77 per cent by 2100 due to global warming and increased levels of carbon dioxide emissions. These statistics have implications for constructing residential housing that is climate-resilient, while also supporting the sustainability goals articulated in the national plans of the countries at risk. This paper discusses the synergies and conflicts between sustainability and resilience with reference to the residential housing sector in the Eastern Caribbean. Using the example of an island impacted during the 2017 hurricane season, a framework is presented to demonstrate how sustainability and resilience can be integrated to improve home building while simultaneously contributing to the global sustainability goals.

Jeanne-Marie Lawrence, East Carolina University
CONSTRUCTION - continued

Thursday, November 7, 2019  5:00 PM - 5:25 PM  Cardinal Room 2

Bridging Sustainable Design with Building Resiliency: A Strategic Framework for the Built Environments

It is a known fact that global climate change, characterized by intensified disasters is the consequence of greenhouse gases emissions of various human activities. According to United Nations Intergovernmental Panel on Climate Change (IPCC), "Warming of the climate system is unequivocal.....The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen, and the concentrations of greenhouse gases have increased (Fifth Assessment Report, 2013). Facing the severe challenges while pursuing resources efficiencies to achieve sustainable building performance through energy efficiency, water conservation, and environmental quality, resiliency of building and its associated community have to be taken into consideration to address the fundamental purposes of the built environments. Considering the costs of property damage and the tragic human losses, the present study examines the financial incentive and benefit-cost ratio (BCR) based on the Mitigation Saves model MSv2, developed by the National Institute of Building Science’s Multi-hazard Mitigation Council (MMC). Further, attempting to formulate a framework bridging sustainable design with building resiliency, the study looks into I-code adoption, ASHRAE GreenGuide, and Fortified Commercial Requirements issued by the Insurance Institute for Business & Home Safety (IBHS).

Dr. Shinming Shyu, Eastern Michigan University

Thursday, November 7, 2019  5:30 PM - 5:55 PM  Cardinal Room 2

Reaccreditation of the Construction Management Program under the New Criteria of American Council for Construction Education: Process, Challenges and Opportunities

The Construction Management (CM) program at Eastern Michigan University (EMU) was developed in 1974 and currently part of the School of Visual and Built Environments in the College of Technology. In 1991, the program was accredited by the American Council for Construction Education (ACCE). The next visit for reaccreditation is schedule for the fall of 2020. The ACCE has changed the accreditation criteria. A major component of the new criteria is based on evaluating each of 20 Student Learning Outcome using at least two assessment methods. The standards call for a minimum of one direct method and second may be either direct or indirect. The presentations will be highlight the transition between the old and the new method of assessment, the summary of the steps taken by CM program to achieve this goal, samples of the direct and indirect assessment measures, how the program used assessment measures to improve the program and list the challenges of opportunities going through this process.

Dr. Suleiman Ashur, Eastern Michigan University
CONSTRUCTION - continued

Friday, November 8, 2019  8:30 AM - 8:55 PM  Cardinal Room 2

Computational Simulation Model for Calcium Silicate Hydrate (CSH) under Shock Wave Propagation

Concrete (cement-based material) is the most widely used construction material on earth. At Nanoscale level, Calcium Silicate Hydrate (CSH) can represent concrete. CSH is the responsible component of the concrete strength. In this study, Molecular Dynamics (MD) computational simulations techniques were employed to study the behavior of CSH Jennite subject to huge rates of pressure change such as explosions or high-speed collisions.

Dr. Ahmed Mohamed, Indiana State University
Prof. Randell Peters, Indiana State University

Friday, November 8, 2019  9:00 AM - 9:25 AM  Cardinal Room 2

Why wait beyond concrete maturity? Use sensors.

Concrete is used in the construction of many structures. Some of the projects that include these structures are critical project that require acceleration. The use of concrete maturity sensors and Micro-Electro-Mechanical System (MEMS) can be used and implemented in schedule acceleration. The project time schedule must be a dynamic schedule that will be changed based on the results from the sensors used. Whenever the concrete matures, it will be the point when dependent activities can be executed without having to wait for a preset duration.

Dr. Tamer Breakah, Ball State University
Dr. Tarek Mahfouz, Ball State University
Dr. James Jones, Ball State University
CONSTRUCTION - continued

Friday, November 8, 2019 9:30 AM - 9:55 AM  Cardinal Room 2

“Win-Win-Win Community Build”

It started with a gigantic gift. BASF sent a team into its Geismar plant site, the largest BASF facility in the US, to disassemble a 3-story tall working distillation unit, pack it up, and send it to RPCC’s Gonzales campus. This Process Equipment Training (PET) Plant is becoming the heart of a Process Technology, Instrumentation, and Drafting programs giving students life-sized operation and maintenance experience, including the ability to troubleshoot and solve process problems. Instructors can introduce experiences, malfunctions, problems and improvement projects with real-world, Industry 4.0 cross-curricular scenarios. River Parishes Community College focuses on building the workforce of today and tomorrow through specific skill training and providing transferable courses and curricula leading to certification and associate degrees. RPCC works closely with its communities to provide programs for personal, professional and academic growth.

Mr. John Sluder, River Parishes Community College
Mr. Chris Chrisman, River Parishes Community College

Friday, November 8, 2019 10:00 AM - 10:25 AM  Cardinal Room 2

Impact of Michigan Highway Construction Work on Traffic Crashes Rates

Roads and Infrastructure in the US is severely aged and outdated. This presents a seemingly paradoxical problem in the field of construction management: In order to fix and maintain safety on US roads and highways, construction zones must become inherently less safe in the process. There is a high cost to taxpayers and drivers, as work zones experience a significant amount of crashes and fatalities each year. To mitigate some of the factors that contribute to these crashes, this paper attempts to deliver guidelines on how to update relevant crash data, identify relevant factors, and create recommendations accordingly. The research focused particularly on data from 2016 and closely observed data from the year preceding and following isolate variables affecting to work zone safety: the crash rate during construction compared to the time before construction and to the time after construction. Descriptive statistics (mean, histogram), a paired t-test, and an ANOVA test were used to test the crash rate differences. In addition, this study tested the impact of the type of work on the crash rate frequency. The study found with 95% confidence level that there is no significant difference in mean crash rates between construction time and non-construction time. Additionally, the study attempts to corroborate these data with external factors such as population and environment type and ultimately determine whether these factors are indeed significant to work zone safety.

Dr. Suleiman Ashur, Eastern Michigan University
CONSTRUCTION - continued

Friday, November 8, 2019 10:30 AM - 10:55 AM  Cardinal Room 2

An Evaluation of Social Media’s Potential to Demonstrate Knowledge Transfer in Construction Management Online Courses

Twitter has been found as an effective way to engage students in university classrooms. Through short “tweets” of 140 characters or less, information is shared with others and creates conversations (Forgie, Duff, & Ross, 2013). By using social media, students can share insight spontaneously and on their own time when they encounter something that they learned about in class. Students studying the built environment may be uniquely advantaged to connecting theory with application by means of social media since the built environment surrounds them daily. Although numerous studies have been done investigating the use of social media platforms in higher education, there are been little research about how social media is either used or integrated into construction management courses. Much of the research focuses on classroom engagement, creating a strong classroom community, or the ability to assess outcomes. This paper will evaluate how social media could be integrated into an online construction management course, and how social media could help connect the dots between theory and application.

Stacy Kolegraff, California Polytechnic State University

Friday, November 8, 2019 11:30 AM - 11:55 AM  Cardinal Room 2

Assistant Lecturer

Attitudes about ethical issues in construction management can be wide-ranging. Since students are joining the conversation with varied moral and ethical foundations, there is room for a discussion about what they may be subject to in construction management and what consequences they might encounter. Bid shopping is prevalent in the industry. It may be viewed as something that comes with the territory or it might approach illegal behavior.

Mr. Gary Birk, Ball State University
Dr. James Jones, Ball State University
Mrs. Janet Fick, Ball State University
DISTANCE LEARNING

Thursday, November 7, 2019 2:00 PM - 2:25 PM  Governors Room 3

A mixed method research: The effects and benefits of using online tools in the face-to-face classroom

The communication among our students has changed. Therefore, our research takes a look at how online tools can be used in the classroom. Our students today are more familiar with communicating on Facebook, message systems, emails, or texts. Therefore, these students and educators need to find a way to bring that world into the classroom. This in turn will allow us to combine instructional practices to receive a better outcome from the learning objectives which are exhibited for the course.

Dr. Angelia Yount, Ball State University

Friday, November 8, 2019 9:00 AM - 9:25 AM  Governors Room 3

Teaching Programmable Logic Controllers Online in an Applied Engineering Program

The authors will share the best practice experiences and student feedback of teaching programmable logic controllers in an online and hybrid format compared to a traditional in-person class. The methods presented will be a hybrid method of lectures presented online and students completing a lab on campus with a flexible format, online students with simulated labs, and online students that make a low cost PLC trainer and complete their labs with the trainer. A brief overview of the trainer will also be presented.

Mr. Jake Hildebrant, Murray State University

Friday, November 8, 2019 9:30 AM - 9:55 AM  Governors Room 3

Quality Matters Approach to Course Design Quality: QM Reviewers’ Perspective

There are a lot of factors that affect the quality of an online course. One of the factors is course design which is an integral part of Quality Matters (QM) process. The standards of the QM Rubric address only course design aspect of online course quality. When a course is designed to meet QM Rubric, one has to submit the course for review either by internal reviewers or QM. This ensures that the course has met the QM standards and the quality of course design is assured. The presenters will discuss their experience working as QM reviewers and offer best practices for designing an online course to meet QM standards.

Dr. Mahmoud Al-Odeh, Bemidji State University
DISTANCE LEARNING - continued

Friday, November 8, 2019 10:00 AM - 10:25 AM  Governors Room 3

Students Opinions about Online Courses versus Web-Enhanced Face-to-Face Courses

There is fierce competition among educational institutions to recruit and retain students. More students work either part-time or full-time. Educational institutions face challenges of physical space. It is expensive to purchase and maintain physical spaces, such as classrooms and labs. As a result, there is a need to offer online courses. It has been always a challenge to deliver instructions online effectively, to engage students, to motivate students, to monitor students’ work, and to maintain ethical standards. Some graphics courses are hands-on in which operations of pre-press, press, and post-press equipment are required. These types of courses are difficult to convert to an online format. On the other hand, there are lecture-based or software-dependent courses that can be taught online or transformed into online teaching from the traditional face-to-face teaching. There are issues associated with online teachings, such as communication, student engagement, student motivation, study ethics, plagiarism, and so on. This research study investigates students’ opinions about online learning versus web-enhanced face-to-face learning.

Dr. Devang Mehta, North Carolina A&T State University

Friday, November 8, 2019 10:30 AM - 10:55 AM  Governors Room 3

Network Security Labs Delivered in AWS: A Case Study of Student Experiences

Creating, supporting, and administering online laboratory experiences has become important in the pedagogy of learning environments for online networking courses. A case study is presented for an online laboratory environment used in a fundamental network security course that covers the competencies of the CompTIA Security+ certification. The online lab environment consists of various instances of operating systems accessed through Amazon Web Services. This online laboratory environment is used for online courses offered during the semester. The emphasis in this case study is the support provided to the students and the continuous improvement cycle used by instructors to improve the educational experience. Challenges facing the students include both problems with the technical aspects of the virtual environment (e.g. login issues using Remote Desktop to access Windows Server 2016 in AWS, Issues remotely configuring Kali Linux), and also questions about the academic material being taught (e.g. why an error message is being given after a specific instruction). Several methods are used to provide support to the students including discussion boards, online video conferencing, announcements and instructions provided via the learning management system, individual emails, phone calls, and face-to-face meetings. Each of these methods of communication will be examined and feedback from students via a survey will be presented. The challenges of keeping laboratory exercises working and up-to-date in AWS versus a campus environment will be examined and a list of suggested best practices for providing online support for students completing labs via AWS will be given.

Dr. Karla Varnell, East Carolina University
DISTANCE LEARNING - continued

Friday, November 8, 2019 11:30 AM - 11:55 AM  Governors Room 3

Wearable Technology, Employee Rights, and Data Tracking in the Construction Industry

The productivity of crews on construction sites is being monitored more closely so companies can quickly and efficiently complete installations. Additionally, safety first has become a mantra within the industry. With advances in technology, construction companies are looking at wearable devices to both monitor productivity and increase safety on the construction site. Start-up technology companies like Triax offer wearable safety solutions by offering real-time head counts, productivity tracking, and safety alerts that can sync to any smart device. However, construction companies may be ill equipped to manage the technology and protect personal data since less than 50% of companies have a dedicated IT department, with 49% outsourcing some or all of their IT needs. (JBKnowledge, 2018), and only 50% of companies train less than one quarter of its employees on data security (JBKnowledge, 2018). By outsourcing IT needs, companies may have gaps when developing policies, procedures, and best practices for implementation of new technology, and these gaps might cause a data breach.

The purpose of this study is to determine ways can implement wearable technology into their organization so they can monitor productivity and safety while still safeguarding employee’s personal data.

Stacy Kolegraff, California Polytechnic State University
5G: A Revolutionary Infrastructure for Next Generation Mobile Networks

The current 4G wireless technology provides communications with good data rates and video streaming. However, the requirement for data speed and network capacity will grow dramatically in the near future. Relying on incremental improvements on current 4G networks will not satisfy the ever-increasing user and application demands. 5G mobile technology is going to address many critical issues in today’s wireless communications. 5G will establish an extensive and reliable network with the ability to provide security. There are already 5G networks built for testing and early deployment. It is anticipated that service providers will make large 5G networks available from 2020. In this presentation, we will explain what 5G network is and its key features. We will introduce top 5G applications, including enhanced mobile broadband, fixed wireless, robotic surgery, smart cars, and virtual reality/augmented reality. Prominent challenges in designing and establishing 5G networks will be discussed, and important technology trends for 5G networks and their requirements will be reviewed.

Dr. Rendong Bai, Eastern Kentucky University
Dr. Vigs Chandra, Eastern Kentucky University
Dr. Ray Richardson, Eastern Kentucky University

A Commercial GPS Clock for Image Time Registration

Aerial surveillance is used for military, law enforcement, mapping, and border security. One application is Google Earth. An aerial image is recorded along with the location and attitude of the camera. The image comes from a camera. The camera position and attitude, collectively known as the pose, come from an integrated GPS IMU. The image and the pose are collected simultaneously from two different sources. The image and the pose are combined on a one-to-one relationship, such that each image is attached to a pose. Since the projection of the image depends on the pose, if there is a misalignment of the pose, and the image, the projection will be off. If the pose is recorded at a slightly different time than the image, there will be an error in the projection. To detect and correct these timing errors, the GPS clock was developed. By recording the GPS clock in the image the time of the image is measured. The time of the image can then be compared with the time recorded in the pose.

Curtis Cohenour, Ohio University
Reducing Energy Cost Through the Use of Smart Home Devices and Historical Pricing Data

Illinois utility companies have launched a residential real-time pricing program that can benefit both consumers and energy providers. The purpose of this program is to compensate energy demands during peak hours where the demands for electricity threatens to be greater than those the utility companies can supply. This program helps customers to be aware of their energy consumption and, if they are willing to adjust energy consumption, lower their utility bills. The implementation is supposed to be straightforward for smart home users who can easily adjust their usage by changing the settings of their devices. However, utility companies can only provide rates one day ahead. Thus, the current pricing information may not be sufficient for consumers to plan their large appliance usage, such as the optimal timing for operating washing and drying machine, or dishwasher, which may benefit from longer pricing forecasts. This study focuses on developing database using historical pricing data from utility companies to provide future rate projections that can help smart home users create better plans for their energy usages.

Dr. Wutthigrai Boonsuk, Eastern Illinois University

Cloud and IoT-based renewable energy management for adaptive MPPT tracking system of solar panels

We have developed a cloud-based renewable energy management system to control and monitor the electricity that solar panels generate. More specifically, we have used IBM Bluemix and a microcontroller, such as a raspberry pi, to control and monitor the solar panel set-up. With the use of the schedule function of IBM Bluemix, we can track the maximum power point of the sun with the photovoltaic cells and send commands at certain times to the microcontroller to adjust efficiently. The monitoring function of IBM Bluemix will allow us to be able to watch the input being received from the photovoltaic cells and adjust my algorithm for finding the maximum power point efficiently.

Dr. Ni Wang, Eastern Kentucky University
Dr. Yuqiu You, Ohio University
ORAL PRESENTATION SCHEDULE

Listed by Track and Daily Schedule

ELECTRICITY, ELECTRONICS, COMPUTER TECHNOLOGY & ENERGY ISSUES - continued

Thursday, November 7, 2019 11:00 AM - 11:25 AM Governors Room 6

Design and Development of a Portable SCADA Laboratory for Automation and Control Course and Forensics Research

The goal was to meet the full functionality of the lab’s original intentions. To achieve the goal, it was necessary to implement several updates and enhancements with an emphasis on hardware to expand the lab’s functionality and improve its capabilities for SCADA forensics research. The aim is to provide the lab with additional equipment and protocols that may contain security vulnerabilities that can be further studied in hopes to find a solution to such threats. Another purpose was to utilize this new hardware as a means of collecting additional data to be available for interpretation for a better forensic analysis. This enhancement of the SCADA lab would ultimately improve research for students, security practitioners, and forensics investigators who wish to conduct forensic studies on industrial control systems.

Dr. Faruk Yildiz, Sam Houston State University

Thursday, November 7, 2019 11:30 AM - 11:55 AM Governors Room 6

A Study on Real-Time Database Technology and Its Applications

The database architecture has taken a new form, from relational to non-relational databases. Relational databases like MySQL store their data in tables, using rows and columns. The non-relational or NoSQL databases like Google Firebase, MongoDB use different database architectures like JSON, or key-value. According to the data handling methodology, these NoSQL databases are divided into four major categories. A certain application or an organization shall select the desired type of the database, depending on the type and nature of the data it will be handling. For this research, a ride sharing application will be used as the case study to evaluate and analyze the features of different types of databases and their applicability for a ride sharing application.

Ms. Geethmi Dissanayake, Eastern Illinois University

Thursday, November 7, 2019 2:00 PM - 2:25 PM Governors Room 6

Implementing Mobile Solar and Wind system Designed By Technology Students

Faculty in the Department of Technology combined studies of alternative energy with energy consumption audits to teach students and community about the importance of this subject. Building a mobile solar and wind system helps to bring this concept to larger audiences and outside the classroom setting.

Dr. Gholam Massiha, University of Louisiana at Lafayette
Mr. Joseph Kelly, University of Louisiana at Lafayette
ORAL PRESENTATION SCHEDULE
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**ELECTRICITY, ELECTRONICS, COMPUTER TECHNOLOGY & ENERGY ISSUES - continued**

**Thursday, November 7, 2019**

**2:30 PM - 2:55 PM**

**Governors Room 6**

*Data Acquisition and Monitoring of a Wind Turbine’s Speed and Power Control using a Wind Tunnel*

A safe and precise instrumentation and data acquisition module of a wind turbine plays a significant role in wind power development. The first objective of this paper is to report how the National Instrument (NI)’s LabVIEW™ along with a Vernier™ anemometer, and a NI myDAQ data acquisition module were used to simulate a wind turbine operation for low, normal, and fast wind speed conditions. The second objective is how to obtain power curve of a wind turbine using variable wind speed values. Finally, the last objective is to run the wind turbine for NI LabVIEW™ based monitoring and recording data for normal operation and multiple contingency cases.

Faruk Yildiz, Sam Houston State University

**Thursday, November 7, 2019**

**3:30 PM - 3:55 PM**

**Governors Room 6**

*Uncovering Meaning in Human-Machine Interactions: Why Robotics Motivated Students*

The presentation of this study will include a background of the quantitative literature linking hands-on robotic experience with student motivation, an overview of the study’s research design and data analysis methods, the thematic analysis results, and the implications to researchers and educators.

Dr. John Haughery, Iowa State University

**Thursday, November 7, 2019**

**4:00 PM - 4:25 PM**

**Governors Room 6**

*Economic and Policy Opportunities in Sustainable Energy to Address Energy challenges in Sub-Saharan Africa*

Sub-Saharan Africa has the highest sustainable energy potential which remains untapped but still has the lowest energy access with 600 million people with access to unreliable energy while 800 million has no access to electricity yet. The region has high solar irradiation with solar energy potential of 10000GW, wind energy at 110 GW, Geothermal at 25GW and hydro energy potential of 350GW. There is also an estimated 115.34 billion barrels of oil and 21.05 trillion cubic metres of gas that is undiscovered. The primary goal of this research is to identify the various economic and policy opportunities the region can take advantage of to achieve economic growth and move towards the sustainable development goals in a timely manner.

Ms. Christine Mugure Kariuki, Eastern Illinois University
Thursday, November 7, 2019 4:30 PM - 4:55 PM  Governors Room 6

Development of a Mobile Ride Sharing Application Using NativeScript, Google Firebase & Google Cloud Platform

The purpose of developing a ride-sharing application is to satisfy the basic traveling needs of people by utilizing the resources in hand. This application will help people to share the ride if they are traveling and has room for others to drop on their way. To offer the defined features a mobile application will be developed by the integration of Google Firebase (Cloud technology), Google Maps SDKs/APIs & NativeScript Angular (development platform).

Ms. Geethmi Dissanayake, Eastern Illinois University

Thursday, November 7, 2019 5:00 PM - 5:25 PM  Governors Room 6

Optimum Share of Regenerative and Mechanical Braking in a Solar Powered Electric Go Kart at Slower Speeds

Center for Clean Energy Research and Education at Eastern Illinois University is doing research in electric vehicles with a goal of mainstreaming electric vehicles in rural communities of Illinois. This research is the continuation of the EV research that is being conducted at CENCERE, EIU. We have fabricated a solar powered electric go-cart and the next step is add a regenerative braking system to it. We will study the ways to optimum share of mechanical and regenerative brake for the EV in this research. The introductory segment of the presentation will include the above-mentioned background and objectives of the projects. The second segment will include literature review, methodology and system design. The final segment of the presentation will have experimental study, data analysis, results, discussions, limitations and conclusion.

Mr. Manjil Puri, Eastern Illinois University
Dr. Jerry Cloward, Eastern Illinois University

Thursday, November 7, 2019 5:30 PM - 5:55 PM  Governors Room 6

Introducing the Internet of Things (IoT) to Engineering Technology Students

Engineering Technology and Managements (ETM) students are introduced to the IoT in an electronics survey course. The students use their phones to control a motor driven by an Arduino. The electronics course is based on the Arduino. First students complete a lab to drive a variable speed motor. Once the lab is working the program their phone to operate the motor.

Curtis Cohenour, Ohio University
ORAL PRESENTATION SCHEDULE  
Listed by Track and Daily Schedule

ELECTRICITY, ELECTRONICS, COMPUTER TECHNOLOGY & ENERGY ISSUES - continued

Friday, November 8, 2019  8:30 AM - 8:55 AM  Cardinal Room 1

**Immersive Simulation Training in Virtual Reality: A Case Study of Climbing Cell Tower**

Virtual reality (VR) technology has been utilized in many applications including gaming interactions, entertainments, advertisements, medical treatments, and skill trainings. This technology allows users to immerse in a simulation (virtual environment) as it really exists in real time. This study utilizes VR technology to help the screening process for hiring tower climbers. The hiring companies will be able to reduce the time and cost that they invest in the hiring and training processes.

Dr. Wutthigrai Boonsuk, Eastern Illinois University

Friday, November 8, 2019  9:00 AM - 9:25 AM  Cardinal Room 1

**Big Data Analytics in Internet of Things**

IoT can be sensors, radio frequency identification (RFID) devices, or smart objects with the Internet connectivity over physical IP for transmitting data to the network. IoT generates big data with noise, variety, heterogeneity, high redundancy, and unstructured features. There are challenges in processing the IoT data. Big Data analytics is a powerful tool for analysing complicated data generated from IoT. This presentation will introduce IoT, Big Data analytics (BDA), challenges of BDA, and the progress of BDA in IoT.

Dr. Lidong Wang, Mississippi State University

Friday, November 8, 2019  9:00 AM - 9:25 AM  Governors Room 6

**Designing and Testing Sensors to Monitor Coral Restoration Growth**

Students and faculty from Berea College have worked with the Reef Renewal Foundation Bonaire to develop quantitative measuring systems to monitor coral reef growth in their reef restoration projects. A system for monitoring coral growth in-place and underwater sensors that data log light and temperature have been implemented and tested.

Dr. Gary Mahoney, Berea College

Friday, November 8, 2019  9:30 AM - 9:55 AM  Governors Room 6

**An Arduino Based Programmable Logic Control (PLC)**

A PLC is implemented on the Arduino platform using the freeware package SoapBox Snap. The PLC emulator from SoapBox Snap is uploaded to the Arduino using the Arduino IDE. This converts the Arduino into a PLC. The SoapBox Snap application allows the student to program the Arduino using ladder logic. The ladder logic is stored in the Arduino EEPROM. The result is a realistic PLC experience for the students.

Dr. Curtis Cohenour, Ohio University
**ELECTRICITY, ELECTRONICS, COMPUTER TECHNOLOGY & ENERGY ISSUES - continued**

**Friday, November 8, 2019**

**9:30 AM - 9:55 AM**

Cardinal Room 1

*Engaging student’s in cyber security activities through student organization*

Cyber security is one of the upcoming areas in the field of Information Technology, the growth in this area is expected to create an estimated 300,000 jobs in the next five years. Cyber security is a very complex concept where students need to know the length and breadth of information technology areas. As per the new studies the students who are graduating out of the universities are not well equipped to work in this area and thus reducing the overall retention rate of the students in the industry. As per the industry experts there is a strong need for students to be part of student organizations that align to their global interest. Keeping this in mind, faculty need to develop student organizations to equip them with all the necessary tools to excel when they transition into their professional careers. The presentation will provide an insight into cyber security and the need for student organizations in information technology. The presentation also provides details on how the technical components, pedagogical activities (content for the three cyber security levels: Entry, Medium and Expert) are developed, and how the students are involved as part of the organization. Apart from these activities the presentation also provides how they are involved in ethics, working in the groups, project handling, and leadership. We will also discuss the outcomes of activities (3 levels of cyber security) and final projects simulating a cyber-attack. We also provide details on how students get certifying themselves from a standard organization.

Dr. David Hua, Ball State University  
Dr. Biju Bajracharya, Ball State University

**Friday, November 8, 2019**

**10:30 AM - 10:55 AM**

Governors Room 6

*Effect of Shape Parameters on Turbine Efficiency of a Horizontal Axis Logarithmic Spiral Wind Turbine*

The presentation will begin with the background and objectives of the research in the introductory section. The potential of spiral turbines in a distributed energy generation setting will be explained in the first part along with the basics of this technology. It will be followed by a literature review. The historical progress of this technology will be discussed in this section. The methodology section will be about the series of procedures that we employed while conducting this research. The working of the turbine, its design, details of numerical analysis and details of the experimental study will be presented afterward. Finally, the presentation will be concluded by talking about results, discussions, limitations, and conclusions of the research.

Mr. Manjil Puri, Eastern Illinois University  
Dr. Jerry Cloward, Eastern Illinois University
ELECTRICITY, ELECTRONICS, COMPUTER TECHNOLOGY & ENERGY ISSUES - continued

Friday, November 8, 2019       10:30 AM - 10:55 AM       Cardinal Room 1

Ivy Tech’s Advanced Automation and Robotic Technology Program

Ivy Tech's Advanced Automation and Robotics program in Fort Wayne, Indiana is meeting the demand for highly skilled workers. A 75 credit hour program resulting in an associate degree prepares students for successful careers immediately upon graduation. Students are learning complex systems through the use of project and discovery based learning as they master PLC's, robotics, and vision equipped systems. With excellent industry partnerships, the student learning experience is enhanced. All of this and more will be shared on how this exceptionally successful program is training the workforce for high tech careers.

Mr. Glen Roberson, Ivy Tech Community College

Friday, November 8, 2019       11:00 AM - 11:25 AM       Governors Room 6

Digital Watermarking Techniques for Digital Image Protection

The objective of this presentation is to discuss digital watermarking, a technique to provide content protection, copy prevention, fingerprinting, source tracking, and authenticity of the image, methods used in digital watermarking of images, its scope, and challenges. Digital watermarking technologies are used to embed the owner’s intended information usually copyright information and unique identity in the image without explicitly revealing its presence thus providing imperceptibility and unique enough to detect the tampering of the image. These methods are used by image owners to claim their ownership or copyright while criminals or cyber attackers exploit the weakness of these methods resulting in image infringement, image forgery and tampering, and copyright violations. Opportunities and threats posed by these methods will be explored in this presentation.

Dr. Biju Bajracharya, Ball State University
Dr. David Hua, Ball State University
ELECTRICITY, ELECTRONICS, COMPUTER TECHNOLOGY & ENERGY ISSUES - continued

Friday, November 8, 2019 11:00 AM - 11:25 AM

Performance Study of a Low-cost Brain-Machine Interfacing System
Cardinal Room 1

Using brain wave signals to control a robot or a computer has been seen in many fictions, such as Star Wars. Although hand-free brain signal controlled systems are still not common in real-life applications, electroencephalogram (EEG)-based systems have been implemented in lab settings. Brain-machine interface (BMI) or brain-computer interface (BCI) using EEG signals has gained great interests recently because of its noninvasive signal recording procedure. In this research we studied the brain-machine interface. An Emotiv’s EEG system was utilized to control robot navigation. How to use the facial expressions, such as frown, blink, wink left/right, smile, and mental commands to control the robot was studied. It was also investigated if the average band powers from different brain wave channels can be used as a better indicator for various mind command and facial expressions.

Jin Zhu, University of Northern Iowa

Friday, November 8, 2019 11:30 AM - 11:55 AM

Transactive energy for energy access
Cardinal Room 1

Mini-grid has been established as the most cost-effective solution to bring energy access in rural areas however it is facing many obstacles along the road. In this presentation, I will expose the benefit of adopting green mini-grids for accelerating energy access, the different business models available today in the market, the barriers of this solution and propose a new business model that will accelerate mini-grid deployment.

Mrs. Yasmine Ben Miloud, Eastern Illinois University
ELECTRICITY, ELECTRONICS, COMPUTER TECHNOLOGY & ENERGY ISSUES - continued

Friday, November 8, 2019 11:30 AM - 11:55 AM  Governors Room 6

Quality mindset in IT: Communicating the importance of quality to computer networking technology students

A 2014 Gartner survey reported that unplanned IT related outages at peak hours cost organizations on average $5,600 per minute. Of the organizations they surveyed, 98% reported that even an hour of downtime could cost them over $100,000. With such high costs involved, it is important for students in computer networking technology programs to recognize the impact of quality. They need an understanding of how quality relates to IT equipment, processes, customers, and in fact to the entire organization, since most systems are now interconnected using IP technology. With new open-source and proprietary hardware and software systems ranging from smartphones to IoT devices and IT packages entering the market before they have been tested extensively, quality issues can be pervasive. The presentation will discuss the role of statistical thinking in controlling variability to improve quality, and how this can be beneficial to students from all majors working together as part of cross-functional teams. Ideas identified for connecting quality with the coursework in the computer networking technology curriculum, as suggested by the industrial advisory committee, will be discussed.

Dr. Dennis Field, Eastern Kentucky University
Dr. Ni Wang, Eastern Kentucky University
Dr. Ray Richardson, Eastern Kentucky University
Dr. Vigs Chandra, Eastern Kentucky University
ORAL PRESENTATION SCHEDULE
Listed by Track and Daily Schedule

GRAPHICS

Thursday, November 7, 2019       8:00 AM - 8:25 AM       Cardinal Room 1

Developing A Eye-Tracking Research Model For Web Development And UX Curriculum As Guide To Improve The User Experience

What are the benefits of Eye-tracking to the UX/UI (User Experience / User Interface) design process? Eye tracking provides researchers with information that is impossible to collect without the technology. Knowing rather than estimating exactly where people are looking when using your app or website is crucial to a UI (User Interface) designer, and UX (User Experience) researchers. In this presentation, the presenter will outline the benefits of incorporating eye-tracking technologies into your web/app development curriculum as part of UI/UX (User Interface/ User Experience) research and analytical process. The goal of the presentation is to outline a practicum for exploring the roles of UI/UX research professionals through eye-tracking technologies and analyzing data.

Dr. Carl Blue, University of Southern Maine

Thursday, November 7, 2019       8:30 AM - 8:55 AM       Cardinal Room 1

Colorimetric Analysis of Scanned Continuous-tone Color Images in a Color Managed Digital Photo Printing Workflow (CMDPPW)

The purpose of this study is to determine the influence of Color Managed Workflow (CMW) on digital color photo printing. In a CMW, a device profile represents the color characteristics of a device (monitor, scanner, and printer) to be used in the printing workflow. The experiment analyzed the effect of device profiles on scanned and printed continuous-tone color images. The guiding objectives of this study allowed testing of an accepted color management practice to gain a better understanding of the presumptions associated with the application of device profiles. The experiment examined two groups of images [scanned (K1) and printed K2 (K = 2)]. The conclusions of this study are based upon an analysis of colorimetric data, visual assessment, and associated findings. The data from the experiment revealed that very minor color differences were found between the two groups of photos. The colorimetric data suggests that integration of device profiles is important in a CMW as it allows the process to obtain accurate output colors for a desired purpose.

Dr. Haji Naik Dharavath, Central Connecticut State University
GRAPHICS - continued

Thursday, November 7, 2019  10:00 AM - 10:25 AM  Cardinal Room 1

Exploring Design of Nominal Geometries for Large Wind Turbine Segmented Blades.

Several solutions for connecting wind turbine blade segments to one another including but not limited to threads, welds, and rivets have been suggested. Numerous economic endeavors have proposed and patented several ways of securing wind turbine segment joints. Threaded joints at blade segments offer a viable solution. The literature, however has not suggested options for explicitly describing nominal geometry and its allowable variation at joints connecting segments of wind turbine blades. This presentation will report on the findings of an initial study, which focuses on explicitly describing nominal geometry and its allowable variation at joints connecting segments of wind turbine blades.

Dr. Ranjeet Agarwala, East Carolina University

Thursday, November 7, 2019  10:30 AM - 10:55 AM  Cardinal Room 1

An Investigation of the Internship Course in the Graphics Field

Usually, students enroll in an internship course in their junior or senior year. Juniors are generally done with the core graphics courses. Whereas, seniors are better prepared than juniors because they have taken more graphics courses. Students are encouraged to prepare their resume and portfolio from the freshmen year. The internship course was investigated on different criteria in order to serve students better, find out their needs, and discover what they learn. The data were collected from students and analyzed.

Dr. Devang Mehta, North Carolina A&T State University
MANAGEMENT

Thursday, November 7, 2019  8:00 AM - 8:25 AM  Governors Room 5

Growing and Hiring Administrators: Processes, Challenges, and Successes

Changes in leadership can have significant impact on technology programs, and so the processes used to select administrators of these programs must be selected deliberately and carefully. The many options available can make the process daunting and at times overwhelming those tasked with the search and resulting in sub-optimal results. Understanding different approaches and their potential advantages and challenges can help those tasked with hiring administrators understand the risks and rewards of these various processes.

James Jones, Ball State University
Tarek Mahfouz, Ball State University

Thursday, November 7, 2019  8:00 AM - 8:25 AM  Governors Room 4

A Conceptual framework for Calculating the Return on Investment for Continuous Improvement Activities

Measuring the effectiveness of continuous improvement (CI) efforts is important for organizations success. A new framework is developed to measure the effectiveness of CI efforts. This research aims to explain a three-segment framework that can be used to link financial with performance measures. The framework can be used to determine the impact of continuous improvement (CI) activities. This framework will help managers understand the process of calculating return on investment (ROI) to CI events.

Dr. Mahmoud Al-Odeh, Bemidji State University

Thursday, November 7, 2019  8:30 AM - 8:55 AM  Governors Room 5

Trend and Prediction Profitability: A Case of Missouri’s Casinos

Casino Industry is one of the businesses that invest billions in the community and provide many job opportunities for local people. A major part of funding for education, veterans, and community programs are from the gaming tax revenues. Since the inception of having riverboat casinos within Missouri there has been marketing tactics and propaganda to persuade the public of the benefits of casinos. It is no illusion that many advocacy groups from both sides of the argument produce valid information. The casino regulation body called the Missouri gaming commission produces a yearly report to record, document, and make available to the public the casinos financial wellbeing. These reports give proper insights to the casino’s operation, and how casinos influence the surrounding community. However, there is very few studies in forecasting the trend and level of profitability of Missouri’s casinos. The purpose of this study is to collect data from these annual reports, consolidate and march through a prediction algorithm. The data analysis will provide enough evidence to predict how this business will act for the upcoming years.

Mr. Robert Miner, University of Central Missouri
MANAGEMENT – continued

Thursday, November 7, 2019     8:30 AM - 8:55 AM     Governors Room 4

*What are you a Professor of?: Why Academic Appointment Matters.*

The presentation will cover why it is important to clearly define a faculty member’s academic appointment and how to do so in a manner that is fair, explainable, and strategic.

Dr. Randy Peters, Indiana State University
Dr. Michael Hayden, Indiana State University

Thursday, November 7, 2019     10:00 AM - 10:25 AM     Governors Room 4

*Strategic planning in healthcare systems using the SIMILAR process*

A systems engineering process will be presented to provide a better understanding of the core values in healthcare systems. The SIMILAR process approach is used to assist healthcare systems with the strategic planning process. Values in healthcare organizations reflect what is important for both patients and the healthcare personnel and stakeholders. Value in healthcare is the improvement in health outcomes achieved for patients relative to the money spent. Values are significantly important in strategic planning. Factors such as cost, quality, flexibility, and trained staff will be discussed along with other factors and their relationships that impact the strategic planning process in healthcare systems.

Dr. Misagh Faezipour, Middle Tennessee State University

Thursday, November 7, 2019     10:00 AM - 10:25 AM     Governors Room 5

*Micro-Credentialing Badges, Certificates and Challenges*

This presentation is an overview of the experiences of a mid-size mid-western university and the path and challenges experienced when beginning to offer micro-credentials. A view of the current state and decisions that need to be made by an institution when preparing to offer micro-credentials will be presented.

Dr. Todd Myers, Ohio University, Russ College of Engineering and Technology

Thursday, November 7, 2019     10:30 AM - 10:55 AM     Governors Room 4

*Surviving the New ATMAE 2019 Accreditation Standards: What is New and How it Must Be Addressed*

The new ATMAE accreditation standards have made some minor changes in their standards that have a significant impact on the way programs must now collect data to validate their effectiveness. This presentation will focus on what changed and how to effectively address these changes.

Dr. Mark Miller, The University of Texas at Tyler
Dr. Heshium Lawrence, The University of Texas at Tyler
Mrs. RaeJean Griffin, The University of Texas at Tyler
MANAGEMENT - continued

Thursday, November 7, 2019 10:30 AM - 10:55 AM  
Governors Room 5

The most common misconceptions of employers about Asian females, searching for a position in engineering fields in the United States.

Every year there are many international students that are admitted into Science, Technology, Engineering, and Math (STEM) programs in different universities in the United States. Out of which there is a good number of Asian females entering the STEM programs. However, the number of Asian females entering the industry to work and sustain is drastically less. The Author presents the data and a systematic approach to overcome these misconceptions of the employers regarding the Asian women entering STEM fields. This minimizes the ratio of Asian women entering the field and sustains in the field.

Miss Manaswini Bhamidipati, Pittsburg State University

Thursday, November 7, 2019 11:00 AM - 11:25 AM  
Governors Room 4

Applying DOE in Performance Optimization of an Automated Position Control System

The proposed project is to identify the key factors in affecting the system performance of an automated electrohydraulic position control system. The process studied here is the position control of a hydraulic cylinder through a PID controller. The system is composed of a hydraulic cylinder, a servo valve, a PID controller, and a position sensor. The performance measures of the system are response time of the cylinder to a target setpoint position, and positioning errors that reflect the deviation of current cylinder position from the target position. The controllable process parameters are identified as the control gains of the PID controller and the system pressure. The control gains of the controller include the P value (proportional gain), the I value (integral gain), and the D value (differential gain). The study objective is to answer the questions: Which parameter(s) affect the system performance and to what extent? And can optimal settings be identified for the system to perform consistently?

Dr. Yuqiu You, Ohio University  
Dr. Mustafa Shraim, Ohio University
ORAL PRESENTATION SCHEDULE
Listed by Track and Daily Schedule

MANAGEMENT - continued

Thursday, November 7, 2019  11:30 AM - 11:55 AM  Governor's Room 4

The ATMAE Faculty Demographics and Salaries: Trends, Salaries and Characteristics of ATMAE Accredited Faculty in 2019.

This presentation will provide ATMAE professionals with an accessible, relevant, and recent database regarding the key characteristics and qualifications of faculty members who currently teach in ATMAE accredited programs. The data will assist administrators to make informed decisions regarding the future of the profession.

Dr. Ahmad Zargari, Morehead State University
Mrs. Caitlin Schwab-Falzone, ATMAE Accreditation Director
Dr. Fatemeh Davoudi Kakhki, San Jose State University

Thursday, November 7, 2019  11:30 AM - 11:55 AM  Governor's Room 5

Building a High-Performance Academic Department of Technology Team: One University’s Perspective

In today’s complex, competitive institutional environments, academic departments are essential in helping organizations achieve their missions. This presentation will share techniques on team building in a department of technology. The presentation will explore current issues in the team building process and highlight some challenges and techniques in leveraging team expertise, trust and performance effectiveness.

Dr. Jeenson Sheen, Norfolk State University
Mr. Charles Hunt, Norfolk State University
Dr. Shao-Hui Chuang, Norfolk State University
Dr. Munir Sulaiman, Norfolk State University

Thursday, November 7, 2019  2:00 PM - 2:25 PM  Governor's Room 5

App-ealing to Applied Engineering with Industry 4.0

The technologist industry forecasts show continual expansion into the future with myriad opportunities for highly skilled graduates of technology programs. With these opportunities comes the expectation that educational institutions will either expand their existing programs or initiate new ones. The window of opportunity is at hand. Tennessee State University has not only the opportunity, but an obligation to ensure that our graduates have a share in the opportunities of the future in the rapidly expanding technology profession.

Dr. Ivan Mosley Sr., Tennessee State University
Dr. Carlos Beane, Tennessee State University
Waste Reduction and Lean Six Sigma Implementation in Call Center

To achieve and sustain competitive advantage companies should fulfill and satisfy the customer needs by supplying the required products or services. In the era of globalization, the business environment gets competitive each day because the number of competitors is increasing rapidly due to technological advances. It is essential first to understand how the call center and how critical it is for the CRM (Customer Relation Management). This study focuses on increasing the customer satisfaction, loyalty, profit, and to reduce any source of wastes such as customer waiting time.

Mr. Ahmed Aldakrouy, University of Central Missouri
Mr. Mshari Alshrari, University of Central Missouri
Dr. Suhansa Rodchua, University of Central Missouri

The role of debt and equity in profitability of American manufacturing firms

The objective of this study is to investigate the relationship between debt-equity ratios and profitability of companies in the manufacturing industry. Historical data (2009-2018) is collected from the audited financial reports of a sample of 15 U.S. manufacturing companies for this study. Applying the panel analysis techniques, the regression models of various debt-equity ratios and profitability ratios are empirically constructed. The result reveals that the debt vs. equity financing considerations play an important role in overall profitability of the underlying organization.

Dr. Nilesh Joshi, Morehead State University

Exam Room Utilization Study to drive business decisions in a healthcare setting

This presentation will cover findings from the research study that focuses on utilization study conducted in a healthcare setting and how it can help management and leadership to make business decisions. Literature review and case study is also documented and will be shared as a part of this presentation.

Mr. Pawan Bhandari, Mayo Clinic
MANAGEMENT - continued

Thursday, November 7, 2019  4:30 PM - 4:55 PM  Governors Room 4

Faculty Recruitment and Retention: Challenges and Solutions

Many scholars, educators, and administrators have identified recruiting and retaining talented faculty as a challenge in public universities. At a time where these institutions are faced with mandatory budgetary cuts, the aforementioned challenge adds another level of hindrance to achieving their educational mission. Thus, the current presentation discusses the experience of a Midwest public institution and provides lessons learned from efforts and initiatives to address such a dilemma. These include, but are not limited to, (1) restructuring of institutional departments and administrative roles; (2) readjusting the sponsored/grant office priorities and responsibilities; (3) initiatives employed from within the governance system; and (4) institutional initiatives of inclusion and diversity.

Dr. Tarek Mahfouz, Ball State University
Dr. Tamer Breakah, Ball State University
Dr. James Jones, Ball State University
Dr. Jennifer Warrner, Ball State University

Thursday, November 7, 2019  5:00 PM - 5:25 PM  Governors Room 4

Application of quality improvement tools in healthcare industry those are widely used in manufacturing industry to improve customer satisfaction, reduce waste and increase efficiencies

This presentation covers the application of quality improvement tools in healthcare industry that are widely in practice in manufacturing industry for decades to improve quality and processes. The information presented will be beneficial for emerging technology leaders, operations managers, leaders in academia, and quality enthusiasts to refresh the importance for quality improvement tools and how it can be applied to any industry to improve various quality and process metrics.

Mr. Pawan Bhandari, Mayo Clinic
Dr. Marion Schafer, Indiana State University
Dr. Christopher Kluse, Bowling Green State University
ORAL PRESENTATION SCHEDULE
Listed by Track and Daily Schedule

MANAGEMENT - continued

Thursday, November 7, 2019
5:00 PM - 5:25 PM  Governors Room 5

A Historical Overview of the ATMAE's Purpose: Establishing and Enhancing Visibility in the 21st Century

Considering the significant mission and demographics developments in our discipline that resulted in changes the organization’s name to ATMAE, this presentation attempts to provide ATMAE professionals with research-based historical data regarding the socio-economic purpose for which ATMAE (Industrial Technology) programs were developed. The main thrust is to learn from our past experiences, strengthen our present position, and continually improve our practices in order to not only stay competitive but also take a leadership role in the development of the national economy.

Dr. Ahmad Zargari, Morehead State University

Thursday, November 7, 2019
5:30 PM - 5:55 PM  Governors Room 4

Deployment of an ATMAE Accredited 4+1 Program

In response to the North Carolina General Assembly’s concerns for the University of North Carolina’s timely degree completion rates, student debt, rising costs for students and families, and public perception about value, The University of North Carolina Undergraduate Degree Completion Improvement Plan was developed to help address GA's concerns and others contained in earlier legislation. In the spirit of the Plan, an accelerated or 4+1 program was deployed. The purpose of the program was to facilitate student completion of an ATMAE accredited master’s degree while concurrently fulfilling graduation requirements for an ATMAE accredited undergraduate degree. The program is intended for motivated students and is designed to reduce what would normally be about six years of study into five. Key to the development of the program was the alignment of master’s level courses with the undergraduate courses feeding the graduate program so courses could be double counted. In addition to the aforementioned, overall benefits to the students include completing the degrees in less time; completing a master’s degree without a pause and the extra effort need to make an application; and continuation of their research and project work with the same faculty to which they are accustomed.

Dr. Robert Chin, East Carolina University
Dr. Merwan Mehta, East Carolina University
Dr. Kanchan Das, East Carolina University
MANAGEMENT - continued

Thursday, November 7, 2019  5:30 PM - 5:55 PM  Governors Room 5

Streamlining of Scrap Management for a manufacturing plant in Bangalore, India

The logistics and material management team from a large manufacturing facility in Bangalore, India were tasked with streamlining scrap management in their new facility. The team observed and monitored the production process and used Quality tools to develop a proposal for a scrap management system. Value stream mapping was used to streamline scrap management, including damaged parts and rejects from the workstations. Value stream mapping identifies and defines the steps to be performed before sending the scrap to the scrapyard, such as handling damaged and rejected parts from the assembly line. 5S methodology was implemented for streamlining production waste. Production waste was estimated for different work stations and collected in separate bins by type. Size of the bins for collecting wastes was determined by the rate of waste formed in each workstation. The scrap management proposal integrated Quality tools and employed an integrated approach to scrap management. The proposal encouraged scrap reduction through improved manufacturing processes and recycling and reuse of scrap through local scrap dealers.

Mr. Arjun Chorakode Jayakrishnan, University of Central Missouri
Ms. MariEtta Byerline, University of Central Missouri

Friday, November 8, 2019  8:30 AM - 8:55 AM  Governors Room 3

Optimizing Reusability in Manufacturing Systems

Green manufacturing is environmentally conscious design and manufacturing products that has been studied in the recent years. The most environmentally conscious strategy in green manufacturing systems is reusing discarded products and recovery operations that lead to additional profits for manufacturer. The purpose of this study is to report a model which estimates the remaining life time of discarded products as reusability measures. This model applies an innovative method to test reusability of returned products, which is applicable to products that are mature in technology. Using reliability measures, newly developed stochastic supply chain (SCM) model determines if the used product has to be refurbished, remanufactured, or recycled.

Dr. Kouroush Jenab, Morehead State University and Spring Hill College
The Critical First Year: Integrating, Mentoring, and Setting New Faculty Up for Success

Integrating new members into a team of technology faculty is a key function of organizational success. The technology program technology administrator must lead this process and enlist the support of faculty and staff to assist the new faculty member not only on the first day or first week, but throughout the entire first, critical year. From selecting an appropriate course load to pairing the new member with a mentor to helping them find a new place to live, this transitory year is an important period for all involved.

Dr. James Jones, Ball State University
Dr. Tarek Mahfouz, Ball State University
Dr. Tamer Breakah, Ball State University
MANUFACTURING
Thursday, November 7, 2019  11:00 AM - 11:25 AM   Governors Room 5

The Merging of Innovation and Workforce Development- A Critical partnership for Sustaining Manufacturing Competitive Advantage

Innovation is critical to manufacturing's competitive advantage. It is this word—innovation—that catches my attention as we consider future technologies, processes, and products. I was struck by the scale of innovation at a recent trade show. This causes me to ask the question, “Are we innovating fast enough?” This question is important, not just to get to the “yes” or “no” answer, but to the ongoing challenge to business and technology leadership within various manufacturing and research environments. Why is this important? The world of manufacturing ever changing. The economic outlook projects improvement in manufacturing conditions, but thousands of jobs in the U.S. go unfulfilled because of a skills gap. As such, the skills gap has challenged workforce developers nationwide. As the McKinsey Global Institute points out in a recent study, “Workforce availability threatens to reduce economic growth by 40%, despite continuing productivity from automation and other elements of supply-chain optimization.

Dr. Vincent Howell, Society of Manufacturing Engineers (SME) Board of Directors

Thursday, November 7, 2019  4:00 PM - 4:25 PM   Governors Room 3

Virtual reality-based path planning for industrial robot programming: A preliminary study

The tedious effort required by using a teach pendant to program an industrial robot, or the high cognitive workload appeared in a desktop environment for robot path planning could be quite daunting for novice learners. Consequently, they could pay much attention to minor details instead of thinking holistically. This presentation will discuss a preliminary study on whether or not the use of a virtual reality (VR) add-on in the computer-aided environment would help novice learners overcome these known issues, and thus develop a robot path in a quick-turnaround manner. A post-experiment survey on participants' preference, and the finding on how they utilize VR for path planning in other projects will also be reported.

Dr. Yi-hsiang Chang, Illinois State University
Mr. Gunnar Klitzing, Illinois State University

Thursday, November 7, 2019  4:30 PM - 4:55 PM   Governors Room 3

Automated Surface Defect Detection and Recognition using Artificial Neural Networks on Automobile Production

This presentation will cover an automated defect detection process in an automobile assembly line to increase quality of the vehicle’s surfaces.

Dr. Kouroush Jenab, Morehead State University
ORAL PRESENTATION SCHEDULE

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MANUFACTURING - continued

Thursday, November 7, 2019
5:00 PM - 5:25 PM
Governors Room 3

Using IMTS Field Trip to Support Learning for Manufacturing Engineering Technology Program

IMTS, International Manufacturing Technology Show, is a trade show organized by the international manufacturing community once in every two years in Chicago. IMTS covers manufacturing in full spectrum from large equipment to small accessory supplies, hardware and software, and many more, etc. It has become a tradition in the past decade that the local SME chapter organizes one day field trip to visit IMTS, including SME members from local industry (mainly John Deere engineers), professional and students members from University of Northern Iowa and Hawkeye Community college. Students and even faculty greatly benefit from this excursion, not only by being exposed to the advanced technologies, seeing the dynamically growing trend, but also networking with manufacturing professionals in industries and peer schools. Some students even used this venue to conduct survey that helps their class projects.

Dr. Ali Kashef, University of Northern Iowa

Thursday, November 7, 2019
5:30 PM - 5:55 PM
Governors Room 3

An Internet-based Real-time Control Application for Automated Electrohydraulic Systems

The development and implementation of such systems involves various hardware and software applications. The proposed presentation will demonstrates the development of a remote real-time human-machine interface (HMI) for an electrohydraulic system over position/velocity control. The purpose of the system is to implement position/velocity control on a hydraulic cylinder with a remote real time HMI that could be accessed through the Internet. The hardware of the system includes a hydraulic linear cylinder, an electrohydraulic servo valve, a Compax3F fluid servo drive, and a Parker Automation Controller (PAC). The communication between the servo drive and PAC controller will be implemented through EtherCAT protocol. And PAC controller will be configured and programmed in CoDeSYS to develop a core control program as well as a web-based visualized HMI interface. The proposed paper will illustrate the system hardware, system structure, device configuration, device communication, programming, and implementation. It explores the current technologies for digital manufacturing solutions, especially in the area of motion control involving hydraulic systems, and provide a case for system study and optimization for future research.

Dr. Yuqiu You, Ohio University
Dr. Jesus Pagan, Ohio University
MANUFACTURING - continued

Friday, November 8, 2019 9:00 AM - 9:25 AM  Governors Room 5

3D Printing: An Opportunity for Sustainable Manufacturing

Today, 3D printing technologies are capable of printing parts using stainless steel, titanium, aluminum, ABS, PLA and many other industrial materials. 3D printing is becoming a feasible alternative to traditional manufacturing processes when various business strategies such as custom design, low volume production, distributed manufacturing, occupational safety and sustainability are prioritized. This study presents the current state of research and findings on sustainable applications of metal 3D printing processes. The focus will be on the quantification of environmental sustainability and major factors affecting the sustainability of metal 3D printing processes.

Dr. Mehmet Bahadir, Southeastern Louisiana University

Friday, November 8, 2019 9:30 AM - 9:55 AM  Governors Room 5

What Engineering Technology Management Programs are Missing by Not Recognizing Print Production as a Manufacturing Process

This presentation will discuss the opportunity to reach out to other, unrecognized, job opportunities for ETM program graduates. ETM programs so often concentrate mainly on automotive manufacturing and never consider that printing is manufacturing. In fact, printing employs nearly as many people as the automotive industry and utilizes many of the same things such as pneumatics, hydraulics, quality control, workflow, and project management to name a few.

Dr. Michelle Surerus, Chowan University
The Value of Predictive Maintenance for Increased Machine Up-time - A Case Study in Manufacturing

In keeping pace with the 4th Industrial Revolution, predictive maintenance is a tool that if properly applied may assist in providing maximum use and uptime in machine operations. In the use of this tool, manufacturers must have a clear understanding of where their weak spots are located in their equipment to properly place the necessary sensors and monitor stations. This is to ensure the correct points are studied to prevent unnecessary data collection and excessive cost. This case study shows the impact predictive maintenance can have on the output of finished goods by utilizing a manual method in preparation for a digitization of the data for real time monitoring. Digitizing the data can provide additional sensing such as tonnage load monitoring and vibration sensitivity to further the analytics for prevention of catastrophic failures not easily obtained manually. Costs are explored for implementation of this technology including capital investment and return on investment (ROI). With these understandings, payback is calculated including the time value of money. In today’s competitive market, understanding machine down-time and up-time is critical to managing the capital investment to produce at its maximum. Utilizing predictive maintenance can assist in staying ahead of the competition in this global economy. Managing the expectation will assist in determining if investing in this technology is worth the investment.

Mr. Ken Jurgensmeyer, MiTek USA, Inc.

Integration of Change Management and Concurrent Engineering in Asset Life-cycle Management: A perspective on Process Plants

Process facilities pass through a life-cycle that begins with conceptual design and ends with decommissioning. It is expected for changes such as simple (or major) engineering modifications or expansion to occur during the lifespans of these plants. It is also common to have such changes occurring simultaneously within the facility. A notable challenge is how to monitor and record the latest as-built and as-is status for quality documentation of an asset. This is particularly important in planning equipment inspection and periodic turn-around maintenance of the facility in order to ensure safety, reliability, and integrity of assets. This study presents the deployment of culture mapping, flow-charting, and force-field analysis in ensuring synchronization of concurrent engineering activities with an organization’s established change management process. Review of specific case studies in industry is employed for validating the effectiveness of the change management integration model with checklist utilized for analyzing findings.

Dr. Suhansa Rodchua, University of Central Missouri
Mr. Olakunle Akande, University of Central Missouri
MANUFACTURING - continued

Friday, November 8, 2019  11:00 AM - 11:25 AM  Governors Room 5

Apparel, Textile, and Merchandising Programs: Required Curriculum Changes to meet the Market Needs due to Technology Shift in the Industry

The textile and apparel world is changing rapidly. According to U.S. government statistics, the U.S. textile and apparel soft goods industries are one of the largest sectors of manufacturing, employing over 227,000 workers in 2017 and generating in the apparel and home furnishing sectors alone, approximately $3.6 to $5.6 billion annually. However, there has been some disruption within this industry resulting in a precipitant decline of 23% in the workforce. This presentation addresses the skills gap due to the latest trends and developments in technology and workforce retirements/decline.

The research will present a survey that captures the skill needs of the industry to match the emerging occupations that may be due to technological advances in the textile and apparel soft goods industries. The focus of this research is to highlight the needs of the industry and how to modify the current academic programs at US colleges and universities to meet the emerging needs of knowledge and skills.

The presentation will present an old curriculum, a survey that was developed, the results of the survey and how the results were utilized to develop a new program at public regional universities in southeast Michigan.

Dr. Julie Becker, Eastern Michigan University
**Micro/Nanotechnology**

**Thursday, November 7, 2019**

**2:00 PM - 2:25 PM**

**Governors Room 4**

*Microfabrication applied on Gas Sensors*

Symmetric piezoresistive microcantilever beams have been demonstrated in previous research to be capable of sensing the presence of surrounding gas. This occurs as the damping effect of the gas changes the beam resonance behavior. Device sensitivity has been increased dramatically after changing the symmetric beam base to an asymmetric beam base. This presentation will focus on procedures of microfabrication of cantilever beams as gas sensor. An entire wafer was fabricated in far less time compared to the previous approach. Advantages of the new method will be discussed and future challenges would be discussed as well. A number of challenges remain before the devices can be reliably fabricated and operated in a consistent and repeatable manner in a gas environment. The ultimate goal of this device development is to create an integrated high-sensitivity system for gas detection, with an intended application towards the early positive identification of terrorist threats and hazardous materials. This presentation will focus on fabrication part.

Dr. Ni Wang, Eastern Kentucky University

**Friday, November 8, 2019**

**9:30 AM - 9:55 AM**

**Governors Room 4**

*Support Center for Microsystems Education*

The session will provide the attendees an opportunity to learn more about the rapidly growing field of Microsystems fabrication. Dr. Pleil has over a dozen years experience in micro manufacturing and over fifteen years teaching educators and students. Attendees will be provided samples of small devices, access to online educational materials and short courses and the opportunity to find out more about the hands-on cleanroom experiences provided by the Support Center for Microsystems Education.

Prof. Matthias Pleil, University of New Mexico
Pallavi Sharma, University of New Mexico

**Friday, November 8, 2019**

**10:00 AM - 10:25 AM**

**Governors Room 4**

*Student Journey in the Micro Manufacturing of a Bi-Morph Cantilever Device*

This student presents the process, lessons learned and characterization results of making a micro bi-morph cantilever device.

Pallavi Sharma, University of New Mexico
Dr. Matthias Pleil, University of New Mexico
MICRO/NANOTECHNOLOGY - continued

Friday, November 8, 2019

Available for Immediate Integration: MEMS Foundations and BioMEMS Asynchronous Online Short Courses with ATMAE Certifications

This presentation will provide the participants with a review and access to the Support Center for Microsystems Education’s (SCME) twenty on line short course offerings in MEMS Foundations and BioMEMS. These asynchronous short courses allow educators to pick and choose which topics are appropriate for the courses they teach. Students receive badges upon completion of each individual course and are prepared to take the ATMAE certification exams upon completion of the nine MEMS Foundations and/or twelve BioMEMS courses; there are two certification exams for each of these topics.

Prof. Matthias Pleil, University of New Mexico

Friday, November 8, 2019

Aerodynamic Effects on Nano and Submicron Respiratory Drug Particles Flow and Deposition Efficiency

This presentation will demonstrate the quantification of the electrostatic charge and aerodynamic size distribution of the drug particles inhaled through an in-vitro mouth-throat (MT) in order to compare the amount of drugs can be delivered to the human lung while the patient is either sitting or lying. The aerosolized submicron- and nano-particles generation and inhalation from the metered dose inhalers (MDIs) reached a milestone in the late 1980s when Montreal protocol was signed to discourage production of CFC propellant, a widely used aerosolization component in the popular MDIs. Montreal protocol on controlling ozone depleted CFC chemicals became a major driver for adopting hydrofluoroalkanes (HFAs) as a major ingredient of the MDI. The successful delivery of drugs into the deep lung depends various aerodynamic and electromechanical properties of inhaled particles.

Dr. Mohammed Ali, The University of Texas at Tyler
SAFETY

Thursday, November 7, 2019 11:00 AM - 11:25 AM  Cardinal Room 1

Laboratory Access - Safety and MakerSpaces

What makes a Makerspace safe? The trends for open-access labs has been embraced nationally over the past decade. Small innovation laboratories have opened in all sorts of communities and campuses to allow individuals access to equipment previously reserved for the professional artist, craftsperson, designer, engineer, and/or manufacturer. However, these industrious spaces come with an inherent risk - one that if not ignored is not openly discussed - safety. Safety is a broad term and encompasses many areas and aspects of a laboratory. This presentation intends to address these areas and bring a topic that (though, seemingly addressed) should be at the forefront of such innovative and easily accessible spaces. This presentation does not intend to be a critique of particular spaces - rather a highlight of laboratories that are excelling in addressing safety and equipment maintenance for the sake of their users. Additionally, such a review should provide any interested participants a foundation for establishing (improving) their own spaces.

Dr. Mark Mahoney, Berea College

Thursday, November 7, 2019 11:30 AM – 11:55 AM  Cardinal Room 1

Emerging Technologies Used to Produce the New Cohort of Emergency Management Experts

Emergency Management is in high demand due to disasters, both natural and man-made, continuing to escalating. According the Bureau of Labor Statistics (2018), employment of emergency management directors is projected to grow 8 percent from 2016 to 2026. However, gender diversity remains an issues. Stienstra (2017) stated that only 8% of those employed held director-level positions within the field. In promoting gender diversity; it is vital that Emergency Managers have high proficiency in Technology. To incorporate Technology into a program concentration, such as Emergency Management Technology (at a premier Urban Research University), it is essential in impacting society by forecasting and mitigating potential disasters. This further assists in preparedness and response to natural and man-made disasters. Technology can be effective in Emergency Management as its function is charged with creating the framework within which communities reduce vulnerability to hazards and cope with disasters (Buck, 2011).

Dr. Jessica Murphy, Jackson State University
SAFETY - continued

**Thursday, November 7, 2019**

*2:00 PM - 2:25 PM*  
**Cardinal Room 1**

**Hazardous Material Technology for Emergency Planning and Response**

Computer-Aided Management of Emergency Operations (CAMEO) is a system of software applications that assists emergency responders in the development of safe response plans. CAMEO can be used to access, evaluate, and store information critical in emergency response. Wireless Information System for Emergency Responders (WISER) brings a wide range of information to the emergency responder such as chemical identification support, characteristics of chemicals and compounds, health hazard information, and contaminant advice.

Dr. HuiRu Shih, Jackson State University

**Thursday, November 7, 2019**

*3:30 PM - 3:55 PM*  
**Cardinal Room 1**

**Safety and Health of 3D Printing**

3D Printing technologies and systems are becoming more prevalent in manufacturing facilities, laboratories, schools and office areas. Nano-particle emissions during printing activity is a major health concern. This study presents the current state of research and findings on actual and potential health problems associated with 3D printing of plastic and metal components.

Dr. Mehmet Bahadir, Southeastern Louisiana University

**Thursday, November 7, 2019**

*4:00 PM - 4:25 PM*  
**Cardinal Room 1**

**Reducing Arc Flash Hazards via Identification and Control Measures: Special Reference to Power Distribution Systems in Manufacturing**

Arc flash hazards are the conditions which cause worker injuries, deaths and asset damage. This presentation provides an overview of arc flash hazardous events. It will cover arc flash injury statistics, safety issues, basic electrical concepts, and control techniques. Examples will be addressed in the presentation.

Dr. Shao-Hui Chuang, Norfolk State University  
Dr. Munir Sulaiman, Norfolk State University  
Mr. Charles Hunt, Norfolk State University  
Jeenson Sheen, Norfolk State University
SAFETY - continued

Thursday, November 7, 2019 4:30 PM - 4:55 PM  Cardinal Room 1

What factors affect medical costs in occupational disease-related injuries in bulk storage facilities operations?

This research sought to identify the contributing factors that affect the medical expenses of occupational disease-related injuries in agribusiness section. Out of a large workers’ compensation claims data set, those injuries that were categorized as occupational disease in nature (N=379 claims) were extracted. A least square regression model was develop to find out the most important injury details that can affect the medical costs of injuries. In the next step, the details of the regression model were used to develop a predictive model of future medical costs of similar injuries. The predictive regression model has an R² of 0.95 and an adjusted R² of 0.81. The regression and the predictive models are explained in details with the view that the results contribute to better understanding of specific occupational disease injuries and might lead to improving or developing safety procedures to reduce the frequency of such incidents.

Dr. Fatemeh Davoudi Kakhki, San Jose State University
Dr. Gretchen Mosher, Iowa State University

Thursday, November 7, 2019 5:00 PM - 5:25 PM  Cardinal Room 1

Enforcing safety rules: a scientific review

Organizations quite often report difficulty in enforcing safety rules, resulting with employees taking unnecessary risks, and ignoring these rules. Variation, or lack of consistency in responses to rule violations, can lead to further violations. Under certain circumstances these violations stem from employee retaliation, a counter effective and undesired event.

presentation will introduce a scientific perspective for rule enforcement and features that will lead to an effective framework of rule enforcement. Various examples will be reviewed and reflected upon. Attendees will leave with guiding principles for designing effective rule enforcement systems.

Mr. Matthew Harvey, Iowa State University
Dr. James Wright, Iowa State University
TEACHING INNOVATIONS
Thursday, November 7, 2019  8:00 AM - 8:25 AM  Governors Room 1

Utilizing Operational Excellence Principles to Improve Baccalaureate Graduation Rate

This presentation will cover the journey and actions taken at East Carolina University (ECU) to tackle the issue of students not graduating in four years. A team was chartered by the Provost and Senior Vice Chancellor with the author as the coordinator to achieve improved graduating numbers. The other team members included the Executive Director for the Office of Student Transitions, the University Registrar, the Director of Assessment, Research and Retention, the Director of Institutional Research, the Chair of the Faculty, the Associate Provost of Institutional Planning, Assessment, and Research, the Executive Director of Student Services in the College of Nursing, the Executive Director, Academic Advising and Support Center, the Associate Dean for Undergraduate Studies in the College of Arts and Sciences, the Vice Provost for Academic Success and the Director of Financial Aid. The team that was named the “Finish in Four Committee,” worked over a period of 2 years to pursue several projects. On analysis it was found that two thirds of this problem can be attributed to student matters, and one third to institutional issues. It was decided to pursue projects with the most potential for substantial benefits in both areas, with extra emphasis on institutional issues. An important finding after conducting the analysis of the problem was the lack of awareness among faculty and staff of even the existence of students not graduating on time as an issue that can substantially affect a university. A massive effort to create awareness on campus, and with students and parents was undertaken.

Dr. Merwan Mehta, East Carolina University
TEACHING INNOVATIONS - continued

Thursday, November 7, 2019 8:00 AM - 8:25 AM  Governors Room 2

Course on a Card: Summarizing core learning content in technology management courses

Technologists working in the field often have access to information on their mobile devices and use these to solve specific technical issues. A thoughtfully created 3x5-inch index card permits a limited version of this methodology by allowing students to access selected information, often in combination with charts or specification sheets provided during the assessment. It is a scaffolded version of how technologists may solve problems or make decisions relying on their experiences and information. The index cards students create can also provide information and insight into the topics students think are going to be important on the exam, and topics where they may be less confident about their comprehension. Strategies for developing effective index cards that reflect both the technical course competencies and the facts they may need to know will be discussed in the presentation. Regardless of how the assessments in the course are structured -- unit exams, mid-terms, comprehensive finals, hands-on performance exams or projects -- developing this type of bird's eye view of the course on a card can be beneficial for extracting out key information, facts, ideas, and procedural competencies needed for solving technical problems. The process used for filling up the index card itself requires the use of critical and metacognitive skills by having students reflect on the different parts of the course and on their ability to recall specific portions. Following the assessment students may be asked to reflect and self-report on the usefulness of their index cards. The presentation will highlight how the process of creating the index card in various applied engineering management courses can be immensely helpful in having students organize their class notes, create a 1-2 page synopsis, and then position these creatively for ready access on an index card. This multi-step process serves as a review tool and is likely to increase their confidence in their exam preparation for technology courses.

Prof. Vigs Chandra, Eastern Kentucky University
Dr. Dennis Field, Eastern Kentucky University

Thursday, November 7, 2019 8:00 AM - 8:25 AM  Governors Room 3

A Creditable Model of Advising STEM Majors for Retention to Graduation and Career

A creditable 2 plus 2 advising model which addresses salient practices to enhance student retention and persistence is critical for reducing the attrition rate. This presentation will highlight the role of academic and faculty advisors (coaches/mentors). Relevant issues related to academic addressing, retention, and student persistence will be emphasized.

Dr. Munir Sulaiman, Norfolk State University
Dr. Jeenson Sheen, Norfolk State University
Mr. Charles Hunt, Norfolk State University
Dr. Shao-Hui Chuang, Norfolk State University
TEACHING INNOVATIONS - continued

Thursday, November 7, 2019  8:30 AM - 8:55 AM  Governors Room 1

Solar Powered Light Electric Vehicles

Our Electric Bike Technology combines Light Electric Vehicle Association, Energy Storage Technologies and STEMCycle Challenge programs. Our text is a chip based ever expanding Electric Bicycle Maintenance Manual. We were approached by the United Nations Industrial Development Organization (UNIDO) to provide Electric Drive Training for the Research and Development Center for Bicycles and Sewing Machines in India. We expanded our material (from Appalachian State University) and developed a 5 year plan using Voice of the Customer interviews with major bicycle and component manufacturers.

Dr. John Martin, Appalachian State University

Thursday, November 7, 2019  8:30 AM - 8:55 AM  Governors Room 2

Students Learning the Importance of Professionalism in the Workplace

Many programs are known for their distinctive approach to learning, with students engaging in a variety of real and simulated classroom and laboratory activities with instructor involvement. With more females entering traditionally male dominated occupations, it is becoming more important that students are aware of how important professional etiquette has become in today's job market.

Mr. Gary Birk, Ball State University
Dr. Jennifer Warnner, Ball State University
Mrs. Valerie Birk, Ball State University
Let’s Not Forget About Maintenance

Some students have no aspirations of becoming engineers. Let us not discount them. For students who do wish to go further in their education and pursue engineering, let us also give them a practical, how-it-works approach to basic operating / troubleshooting knowledge. These students love the math and science and all the engineering theory. So do I. However, may we present to them the maintenance side as well so they can become even better engineers.

Teaching is NOT a display of knowledge; it is the transfer of knowledge! Everything has maintenance. Family relationships, business associations, our vehicles, even our personal health all require maintenance. It is not just an industrial concept. The better understanding we have of how to maintain the different aspects of our lives, the greater success we will have in each of these areas. Likewise, the more practical, hands-on approach we can present to our students, the greater success they will have as mechanics, technicians, and yes, even engineers. Many companies have high expectations of their maintenance departments. Generally speaking, any maintenance is overhead costs. They do not contribute directly to the company’s profits. Therefore, as educators, we should be training the greatest generation of maintenance personnel ever! Let us employ all the technology available to increase their logic skills, their thinking processes, and their problem-solving abilities. And for those students who aspire to go even further, perhaps into engineering, this approach will benefit them greatly also. Educators should lead the students toward reaching their highest potentials. Let us not overlook the maintenance aspect of technology. Of course it would be impossible to teach how to maintain everything a student may face in his career; however, we can supply them with enough basic knowledge that will enable them to be better equipped.

William Allen, Northeast State Community College
Learning Flight Plan (LFP): Critically reading chapter objectives for charting ones path through the text

In this presentation we propose the Learning Flight Plan (LFP), a methodology for critically reading the objectives in the textbook in order to anchor one's understanding along the guidelines provided by the author. It offers a new way to engage with the readings in any given chapter. When students are able to explain, in their own words, what each of the stated objectives in the chapter is about, this tacitly means they have developed more familiarity with new discipline-specific keywords and core concepts which connect these together. This is a considerable learning milestone in itself. Since chapters in typical textbooks link sequentially, students documenting their understanding of successive chapter objectives are likely to observe recurring themes emerge. These may relate to the importance of safety, standard operating procedures, statistical analysis, and so on. Additionally, students may be asked to provide examples from outside the textbook, possibly those related to personal experiences for illustrating specific chapter objectives. Learning technology related industries is largely contextual and being able to find personally meaningful examples related to key chapter objectives will allow students to simultaneously build an abstract and tangible understanding about various topics covered as part of a course. The presentation will provide examples of practice using this methodology from classes in multiple subject areas.

Mr. Kyle Knezevich, Eastern Kentucky University
Prof. Vigs Chandra, Eastern Kentucky University

Closing the gap: incorporating lab activities when math skills don’t add up

It is observed that many students struggle to understand some of the core concepts in Communication Systems, Wireless Systems, and Electromagnetics courses. These classes usually require high level mathematics and physics theory. Laboratories or simulations are often used to help students understand the subject better. However these hardware and software tools are quite expensive and take some time to learn to use properly. We propose a simple antenna design laboratory using ZigBee, Arduino and a LCD display to be used by students in electronics technology or electrical engineering technology programs. By using this simple laboratory, students can see the transmitted and received power from the antenna they design. The students can quickly adjust and optimize their antenna design using the laboratory procedures and equipment. This will help them to understand the antenna design process and communication link system.

Dr. Kiyun Han, University of Arkansas Fort Smith
TEACHING INNOVATIONS - continued

Thursday, November 7, 2019 10:00 AM - 10:25 AM  Governors Room 3

**Sustainable Learning through Virtual Reality-based Speech-language Pathology Training**

Experienced speech-language pathology (SLP) practitioners in the field constantly refine their treatment plan based on the patient’s need. However, graduate SLP students have limited opportunities to gain experiences in a range of clinical skills until they are practicing in the field. To address this issue, an interdisciplinary research team has been working on a virtual reality-based simulation that will provide graduate SLP students additional exposure to training opportunities in diverse environments, expanding their skill in generalization of the therapeutic process. Further, this will allow students to gain a greater understanding of their patient’s diverse challenges and their impact on quality of life for activities of daily living. We will report the current development of this VR platform, including its conceptual framework, sample scenarios, and instrument for assessing students’ gain of knowledge and skill after the treatment.

Dr. Yi-hsiang Chang, Illinois State University

Thursday, November 7, 2019 10:30 AM - 10:55 AM  Governors Room 1

**Program Outcomes and Secondary School Credentials**

Linking Program Outcome Assessment to Credentialed Teachers in Secondary Schools

An Outcome Assessment process requires a program to define Program Outcomes, Learning Outcomes and associated learning measures which are parts of ATMAE accreditation. After defining these, how they apply to secondary school programs and how they correlate to the requirements of having properly credentialed teachers in secondary school programs are explained. In other words, how a program is set up and how to staff it.

Darnell Austin, Fresno State University

Thursday, November 7, 2019 10:30 AM - 10:55 AM  Governors Room 2

**Making Advising an Action Verb: Changing from Faculty-Led to Professional Advising in Technical Fields**

This presentation draws from the experiences of a department in a technical discipline that underwent a mandatory transition from faculty-led to professional advising of students. The advantages and challenges of each approach, as well as how to undertake a successful transition from one approach to another, are presented from the viewpoints of the administrator, faculty advisor, and professional advisor involved. Approaches and solutions that this department implemented are offered so that attendees may consider them for implementation in their own organizational units.

Dr. James Jones, Ball State University
Mrs. Janet Fick, Ball State University
Mrs. Karen Spangler, Ball State University
TEACHING INNOVATIONS – continued

Thursday, November 7, 2019  
10:30 AM - 10:55 AM  
Governors Room 3

The Vision for Shared Administration of a Mechatronics MS Degree

The proposed Mechatronics MS has a vision for shared administration. The curriculum plan for the MS degree is very flexible, offering three options to complete graduation requirements: a coursework with internship path; a research option with thesis, and a report. The research option allows students to work with MET, EET, EE, and ME graduate faculty members on various applied research projects, with the goal of enhancing their knowledge in practical applications. Considering the interdisciplinary nature of this degree across four departments, certain resources need to be shared. While the home EET department for MS degree is in the College of Computing, the respective unit will garner the resources to support projects when faculty advisors are from outside of the College of Computing. Resources that can be provided are in the form of GTA positions allotted to that particular unit, F&A return on funded graduate student research, lab space, and/or additional faculty hires. This MS degree in Mechatronics bridges several units on campus to provide an improved educational experience for students and enhanced faculty collaboration opportunities.

Dr. John Irwin, Michigan Technological University

Thursday, November 7, 2019  
11:00 AM - 11:25 AM  
Governors Room 1

Student Motivation: Do Midterm Grade Notifications Motivate Students to Earn Higher Final Course Scores?

A study of 228 undergraduate midwestern college students was assessed for potential student increased motivation after a midterm grade notification in comparison to their final course grades. The study revealed that students earning less than an 80% score at the notification did statistically significantly increase their final course grade (p = 0.000, N = 52) as tested by the non-parametric Wilcoxon Signed-Rank Test. This level of statistical significance was also evidenced for students earning 80% through 100% scores (p = 0.000, N = 176). Although when these same students were aggregated together, the statistical significance was not present (p = 0.242, N = 228). A combination of intrinsic and extrinsic motivation factors appears to be apparent when students are assessed for a given midterm grade notification category.

Prof. Joe Long, University of Central Missouri
TEACHING INNOVATIONS - continued

Thursday, November 7, 2019  11:00 AM - 11:25 AM    Governors Room 2

Sharing a New Dialogue About Accessibility in the Campus Environment

While technology programs lead students with a “hands-on” approach to learning, students would benefit by having actual examples of how they could participate in improving their campus settings. Students and faculty could actively engage in the learning environment that could foster change in the attitudes of the administrators and facilities personnel responsible for improving a campus. ADA standards must be met in the construction and renovation of educational facilities. Within this process, faculty can educate their students on campuses that are leading with advancements in disability requirements to create the optimal environment for everyone by effective, and thoughtful planning.

Mr. Gary Birk, Ball State University
Mrs. Valerie Birk, Ball State University
Dr. James Jones, Ball State University

Thursday, November 7, 2019  11:30 AM - 11:55 AM    Governors Room 1

Retrofitting as a Class Project

Students in an upper level automotive engineering technology course were teamed in groups of three, and given a proposal (as part of the exercise) to retrofit a 5 horsepower Briggs and Stratton engine such that compression, ignition timing, and fuel delivery could be independently controlled. The proposal also contained provisions for the placement sensors and a means of engine loading. Ostensibly, the end item would be a portable CFR (cooperative fuel research) engine, otherwise known as a "knock engine". Along with the proposal students were given a rubric, specifying the adoption of existing technology, simplicity, and ease of adapting. Students were not permitted to purchase kits, which already exist on go-karting and junior dragster websites. As part of the exercise the teams had to make a presentation, which required that they explain the existing system and their proposed retrofit. Additionally, students had to structure sensor and control compatibility, addressing questions about what signals are needed by the electronic control units they selected. Are those signals analog or digital, and can the outputs serve several functions? Thus far the level of student engagement is quite high. Students are importing their knowledge of motorcycles, go-karts, and automotive coursework into this exercise, thus the term capstone project might be informally applied. The students’ design proposals will be vetted by a faculty team; the Applied Engineering and Technology Management department has agree to fund the top proposal to include parts and fabrication, are expected to be completed by the end of the semester. The presentations and working material will be analyzed for compatible with course objectives and performance indicator. However, the student surveys may provide insight into student engagement.

Dr. Phillip Cochrane, Indiana State University
TEACHING INNOVATIONS - continued

Thursday, November 7, 2019  11:30 AM - 11:55 AM  Governors Room 2

*LEED® Lab™: Success, failure and everything in between*

Ball State University was one of the inaugural universities to establish a LEED Lab course, which began at our university in 2015. LEED Lab is a multi-disciplinary immersive course facilitated by the United States Green Building Council (USGBC) and is currently offered at 34 universities around the world. In LEED Lab, students assess the performance of an existing building on campus, for which they will facilitate the LEED for Building Operations and Maintenance (LEED O+M) process with the goal of certifying the building. The intent is to provide students with the opportunity to learn more about the LEED green building rating systems and then apply that knowledge to an actual certification. Working with campus facilities personnel and industry professionals, students completed the process for one building, but were unsuccessful in achieving certification. The students then completed a second building, which has been submitted for certification. We are in the process of working through clarifications with GBCI (Green Business Certification Institute) and should learn our results soon. We are confident that this attempt will result in success. This year the students began the process of making recommendations and compiling data for a third building. Our challenges have been in the limitations of students’ skill sets, coupled with the availability of information. We rely on the university’s Facilities personnel, but have to work around their other responsibilities. So what is the answer to providing a successful LEED Lab? What have we learning from over four years of implementing LEED Lab?

Mrs. Janet Fick, Ball State University  
Dr. James Jones, Ball State University

Thursday, November 7, 2019  2:00 PM - 2:25 PM  Governors Room 1

*Assessing the Professional Development of Technology Managers*

This presentation offers a perspective on an ATMAE accredited 4-year technology, management, and applied engineering program’s use of ATMAE’s CTM certification exam results to assess the professional development of its seniors and to monitor the program’s ability to develop the professional potential of its seniors.

Dr. Robert Chin, East Carolina University
TEACHING INNOVATIONS - continued

Thursday, November 7, 2019 2:00 PM - 2:25 PM  Governors Room 2

Transforming a manufacturing laboratory for Industry 4.0 in an ATMAE accredited Technology Department

The presentation will cover how the Industry 4.0 based advanced manufacturing laboratory is being integrated and cross-woven among various ATMAE accredited programs in the department such as Design, Industrial Engineering Technology, Industrial Distribution and Logistics, Information Technology and Computer Networking.

Dr. Ranjeet Agarwala, 200 Science and Technology Building
Dr. Tijjani Mohammed, 200 Science and Technology Building

Thursday, November 7, 2019 2:30 PM - 2:55 PM  Governors Room 1

Leveraging Project Management Methodology for College Degree Success

The National Center for Education Statistics has published data which indicates that of all first time undergraduate students who began their degree program at a four year college or university in 2010, only 60 percent successfully completed their program in six years. This presentation will share how providing students with an understanding of basic project management methodology can be leveraged to support an improved four year graduation rate. In addition to graduating on time, a sound project management strategy can also support successful budget management of the total cost associated with a four year degree, as well as achieving the level of quality outcome the student desires as measured by the Grade Point Average (GPA) and other associated quality metrics.

Mr. David Towley, Bemidji State University
Mr. Lyle Meulebroeck, Bemidji State University
Dr. Timothy Brockman, Bemidji State University

Thursday, November 7, 2019 2:30 PM - 2:55 PM  Governors Room 2

Strengths, Leadership, and Success: Technology and Engineering Student Perceptions

This presentation will provide an overview of the interview process used to gather student perceptions on their strengths and academic success. A grounded qualitative analysis will be described to identify reoccurring themes and patters of student perceptions. Implications for students, educators and advisers will conclude the presentation.

Saxon Ryan, Iowa State University
Dr. Gretchen Mosher, Iowa State University
ORAL PRESENTATION SCHEDULE
Listed by Track and Daily Schedule

TEACHING INNOVATIONS - continued

Thursday, November 7, 2019  3:30PM - 3:55 PM  Governors Room 2

Ready, Set, Learn!: Strategies to Engage Students in the Classroom

“Tell me and I forget. Teach me and I remember. Involve me and I’ll learn.” As that quote by Benjamin Franklin highlights, hands on learning is critical to effective learning and for retaining information. According to the United States Census, approximately 16 million students are enrolled in colleges across the nation. With that many students, it is imperative that faculty engage students in learning. Learning activities are one strategy to engage students in the classroom. However, developing learning activities can be challenging. How long will it take to create the activity? How long will the activity take in class? Will students enjoy participating in the activity? Will the activity be effective? This session will highlight the importance of actively engaging students in learning. Attendees will have the opportunity to practice hands on learning activities and innovative teaching strategies. Best practices from classroom activities to engage students in learning will be highlighted that could be incorporated into the curriculum of all technology related disciplines.

Dr. Jennifer Warrner, Ball State University
Dr. Sherif Attallah, Ball State University

Thursday, November 7, 2019  4:00 PM - 4:25 PM  Governors Room 1

Innovative Approach for Offering the Graduate Certificate in Mechatronics

Existing graduate certificates (~15 credits) are designed around advanced controls, digital electronics and mechatronics systems with little or no emphasis on automation or industrial robotics. The pending graduate certificate in Mechatronics at Michigan Tech is designed to address this by focusing on industrial robotics, automation and controls. The graduate certificate is available to students from EET, EE, ME, and MET disciplines as long as they complete required courses in Mechanical, Electrical, and Cybersecurity. Job descriptions from Tesla, Ford, Fanuc, GM, and many other automation companies call for a specific knowledge of Fanuc robots and PLCs. Thus, the core courses for the certificate are Real-time Robotics Systems and Advanced PLC. Additional certificate courses emphasize electrical, mechanical and cybersecurity aspects.

Prof. Aleksandr Sergeyev, Michigan Technological University
TEACHING INNOVATIONS - continued

Thursday, November 7, 2019  4:00 PM - 4:25 PM  Governors Room 2

**Applying LEAN to All Collars: Increasing Student Interest and ROI in LEAN Instruction**

The incorporation of artificial intelligence via robotics and highly technical data systems calls for a shift in the skills of the workforce. While many low-skilled entry level positions are rendered obsolete, more demand is created for mid-skill and high-skilled specialists. This is true across a number of industries including manufacturing, healthcare and green industries. Providing students in non-technical programs the foundational knowledge of LEAN via project-based learning is a step in the right direction.

The principles of LEAN have long been touted as a cornerstone of efficient manufacturing organizations and thus are incorporated into many technical training programs. Yet the value of a LEAN approach is replicable to nearly every process and in any environment. Moving LEAN instruction beyond the technical programs into health sciences and business provides students in those disciplines the opportunity to learn, apply and adopt LEAN practices. These additional skills increase students job readiness which can in turn help students differentiate themselves in the job market.

This presentation will recap key goals of transformative learning and critical theory. It will link both concepts to LEAN instruction and to student-led project-based learning. This presentation will include evidence of interest in LEAN applications from a variety of untraditional parties including healthcare providers, environmental projects, as well as manufacturers who in turn sponsored student projects.

Dr. Kim Gordon, University of Arkansas - Fort Smith

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Thursday, November 7, 2019  4:30 PM - 4:55 PM  Governors Room 1

**Innovation in capstone course with industry-university partnership to enhance students learning outcome**

Undergraduate programs in the Science Technology Engineering and Math (STEM) help students to learn and be ready for working in rapidly-evolving fields upon graduation. These students receive rigorous training in analyzing a problem and providing viable solutions. Most of the problem solving is very structured; however, upon graduation students will be tasked to solve unstructured problems with many viable or unachievable solutions. Senior capstone projects help students to simulate these unstructured problems while practicing problem-solving skills in team environments. Each STEM program has a different approach toward the capstone experience. This presentation will describe best practices for designing successful capstone projects which can be used by faculties to teach senior capstone course with industry focused.

Dr. Zaki Kuruppalil, Ohio University
The Effect of Using Recorded Lecture Videos in Classes on Student Success

In this study, the advantages and disadvantage of using these Recorded lecture videos will be discussed. Development of an analytical theoretical model based on case studies for different classes will be the method used in this research.

Dr. Ahmed Mohamed, Indiana State University
Prof. Randell Peters, Indiana State University
Prof. Michael Hayden, Indiana State University

Characterization of Technology and Engineering Student Strengths and Leadership Domains

This presentation will provide an overview of the student strengths characterization process. The top 5 strengths of each student were analyzed for reoccurring patterns. Students leadership domains were analyzed to identify dominant domains. Implications for educators and advisers will conclude the presentation.

Saxon Ryan, Iowa State University
Dr. Gretchen Mosher, Iowa State University

Teaching Construction in Different Cultures

Students in different cultures have different experiences. The differences in high school degrees and work experience affects the way a course is designed. The depth of course coverage varies with the students’ backgrounds and the degree requirements. In this presentation, a comparison between the design of a construction course offered in a construction engineering program offered in Egypt to a similar course offered in a construction management one in the USA will be performed.

Dr. Tamer Breakah, Ball State University
Dr. Sherif Attallah, Ball State University
Dr. Tarek Mahfouz, Ball State University
Lean Tools to Better Align Student and Faculty Expectations for Engagement

While many faculty prioritize student success in their courses, conflicting priorities associated with being a faculty member can make it difficult to engage with their students in a meaningful manner. However, literature has shown that student motivation at a collegiate level is greatly impacted by faculty engagement. The engagement of faculty has shown to impact not only course completion but also graduation rates, student satisfaction and overall program enrollment. Additionally, not all students have the same expectations of potential faculty interactions; with factors such as age, gender, program of study and course delivery format all playing key roles in student expectations. Therefore, for institutions to be successful, student expectations must be understood and prioritized in a way that optimizes the interactions between students and faculty to increase success factors for both the student and the program as a whole. This case study examines undergraduate students in technical programs utilizing traditional and alternative instructional formats, to better understand how student expectations vary and identify emerging themes. Lean tools are used to analyze the qualitative student responses in an effort to determine critical factors of faculty engagement from a undergraduate student perspective. A framework for assisting faculty in continuously improving in the area of student engagement is also proposed.

Dr. Susan Ely, University of Southern Indiana

Student Perceptions of Dynamic Visual Simulation to Learn About Global Logistics

The use of technology-based simulation to enhance pedagogy has increased in the last decade. Simulation-based learning provides many advantages, including the opportunity to acquire knowledge and skill in an engaging and immersive environment, the chance to create unique scenarios or adapt existing ones and receive immediate feedback, and the ability to replicate a situation multiple times, thereby improving retention of concepts learned. Simulations are now widely used in a variety of fields to teach various skills from risk management to customer care. Since industrial technology students learn best when given challenges that are supported by kinesthetic and visual learning methods, the use of simulation can be helpful in teaching logistics concepts. In the supply chain field, simulation games have been used to develop an understanding of core concepts, such as the Bullwhip effect. However, many of the simulation games currently available for supply chain and logistics pedagogy are not designed for visual learners. This paper describes the use of a dynamic, visual simulation that allows students to participate in the design of a supply chain and envision the operation against a real-world backdrop. The simulation augments teaching and learning in a global logistics course. The paper discusses student perceptions of the simulation in learning about global logistics.

Jeanne-Marie Lawrence, East Carolina University
TEACHING INNOVATIONS - continued

Friday, November 8, 2019  9:00 AM - 9:25 AM  Governors Room 1

Technology Industry Collaboration Initiative: A Suggestive Model

This presentation will highlight key steps and procedures employed to identify Silicon Valley Technology-related companies, sources of key information about them, how the information was collected, and how the information was used, shared and stored for future use of the faculty, staff and students. The presentation will also highlight how the information is being used by the faculty, staff and students for their professional and academic successes.

Dr. Samuel Obi, San Jose State University
Dr. Fatemeh Davoudi, San Jose State University

Friday, November 8, 2019  9:00 AM - 9:25 AM  Governors Room 2

Building a “Homebrew” wind turbine

Solar Village Institute offered renewable energy installations (solar, wind, hydro, biodiesel). However small wind was a problem which required a team to install and maintain. But the bigger problem was with warranties and the exit of manufacturers. Jack Martin and Chris Carter thought a coop arrangement might alleviate the team problem. Deborah Amaral and Chris attended trainings at the Center for Alternative Technology in Wales and wanted to offer similar trainings here in the US and the Handy Village Institute was born. We took the Midwest Renewable Energy Association’s Homebrew Wind Turbine Workshop with Dan Bartman of Otherpower, attended the MREA Energy Fair and Small Wind Conference. We erected our turbine from that workshop and planned and executed our first workshop. We build from scratch using locally generated Renewable Energy. Attendees learn theory and the skills (steel fabrication-cutting, welding, grinding, electrical- coil winding and magnets, fiberglassing and woodworking for blades and tails). Our second turbine operates on an organic farm which is partnering with the local energy coop (Randolph Electric Coop). A blade of that machine was damaged by a cow while on display. We repaired that within a few days. Our wind coop owns six homemade machines which our team services. Our workshops have had attendees from eastern Europe, the Caribbean, Africa and the United States. We have built up our team of instructors, craftspeople/makers, and maintainers. Last year with the help of the Lowlander Institute we had six people representing three tribes from Louisiana build a machine. It will power their tribal center. We hope to be offering workshops for all six tribes of the region in the near future. One tribe is in the process of relocating due to rising waters which has covered 98% of their homeland in the past 2 decades. This year we built a refined model for use at the Handy Village Institute. We all desire local Renewable Energy.

Dr. John Martin, Appalachian State University
TEACHING INNOVATIONS - continued

Friday, November 8, 2019 9:30 AM - 9:55 AM  Governors Room 2

Preparing Your Students for Industry

We do our best to educate our students on their technical skills, their logic skills, and even their soft skills. However, they can still fail when they enter industry unless we also teach them how to succeed in industry. We should also teach them what to expect: more training, stress, pressure, and perhaps even expenses (PPE, tools, etc.). They should know how to get along with co-workers who may be difficult at times. They may face lack of training from older, more experienced, but fearful staff.

New hires also may lack of job security as more companies are utilizing internships and co-ops. They must prepare for Work-Keys exams, or similar industry entrance tests. Job entry level expectations have risen. Therefore, industry as well as the students depend on their instructors to teach them how to be a success in their career.

More applicants for choice jobs means better overall training is a must! This means more demands on instructors. It is becoming more and more imperative that we train our students in more areas than just their respective technical fields.

Present the seriousness of industry, the responsibilities. Stress the safety requirements. Convey how they will be expected to work as a team and how to become a team member with sometimes difficult co-workers. Also teach them how to maintain their jobs and how to continue making themselves more valuable as employees (continue learning, tool investment, company cost-saving ideas, etc.) Make them thirsty for their dream job but prepare them for what to expect.

William Allen, Northeast State Community College

Friday, November 8, 2019 10:00 AM - 10:25 AM  Governors Room 1

The effect of project-based learning pedagogical approach on improving students’ learning outcomes in manufacturing technology

Project-based learning (PBL) includes creating a learning environment in which the problem drives learning. It encourages student-centered collaborative learning efforts, which helps students gain theoretical knowledge and hands-on experience to address a real-world problem. This presentation outlines the PBL pedagogical model used in teaching an upper division manufacturing facility layout-planning course with emphasis on lessons learned in improving students’ cross-functional skills, self-esteem and problem solving capabilities.

Dr. Fatemeh Davoudi Kakhki, San Jose State University
TEACHING INNOVATIONS - continued

Friday, November 8, 2019  10:00 AM - 10:25 AM  Governors Room 2

READY...SET...4, 3, 2, 1: Using Stackable Programs to Increase Enrollment

This presentation will explore one university’s approach to awarding stackable credentials. Using stackable programs, such as certificates of proficiency, technical certificates, associate degrees, and completer bachelor’s degrees, the university is able to recruit students from multiple demographics and validate qualifications through awarding degrees.

Ms. Justina Buck, University of Arkansas Fort Smith
Mrs. Monique Bracken, University of Arkansas Fort Smith

Friday, November 8, 2019  10:30 AM - 10:55 AM  Governors Room 1

Who Gives the Best Advice? The Influencing Factors in a Student’s Career Path

Students all begin with the dream of becoming an astronaut etc. when they are first asked about careers. Nobody starts off by saying "I want to work in advanced manufacturing”. As the student makes their way through the K-12 system, they are being given, either directly or subliminally, advice on what they should do when they leave school. This advice comes from many areas such as parents, school counselors, and peers etc. This study is utilizing data collected from the high school longitudinal study of 2009 database. This study tracked 25,000 participants through high school into post-secondary and eventually the workforce. From these data we are trying to decipher who is the most influential "advisor" in career choice at what stage of the students progress.

Dr. John Wyatt, Mississippi State University

Friday, November 8, 2019  10:30 AM - 10:55 AM  Governors Room 2

Student Engagement: Small Projects, Big Impacts

Fourteen student volunteers applied 5S methodology over three days to improve a student lounge area. Learning and engagement goals were achieved even though the project was short and uncomplicated. 100% of students participated more than one day and 42% participated all three days. The goal for the 5S project was to learn and apply the 5S tool, a far different goal from 5S projects in industry where the primary goals are profit driven. Spending unprofitable amounts of time and effort on small projects results in students capable of successfully applying the 5S method to more practical situations later in their careers. Small projects are the perfect size for learning concepts and practicing leadership skills; they leave the instructor unincumbered with tasks and able to give students feedback on performance.

Ms. MariEtta Byerline, University of Central Missouri
Incorporating Blockchain Concepts into Student Learning of an ERP Classroom

In today's competitive marketplace, companies are continuously tapping into technological advances to gain a competitive advantage, as well as increase efficiency throughout their supply chain. One area of innovative technology adaption has been in relation to Blockchain or distributed ledger technology. The market for jobs related to “Blockchain” have grown over 200% between 2017 and 2018 and is expected to rise. It is predicted that by the year 2024 the Blockchain market will be worth around $20 billion. Due to the possible advantages of using Blockchain, both industry and academia have been fast tracked on trying to find ways to adopt Blockchain technology into their respective compartments. However, at this time there is little research that has been conducted regarding effective ways of teaching Blockchain concepts into higher education courses. This presentation details a prospective curriculum change involving a current ERP (Enterprise Resource Planning) course as a baseline to introduce students to Blockchain technology. Expectations of the change are that students will be able to relate how Blockchain assists ERP management in industry by using gamification. Methods of evaluation related to the introduction of Blockchain into the course are also explored.

Dr. Scott Abney, East Carolina University

Use of 3D Simulations to Train Energy Industry Technicians

Develop 3D simulations for electrical safety, blueprint reading, electrical troubleshooting, and machine operation safety. Simulations provide students the ability to practice proper procedure in a safe environment, test out multiple scenarios to determine an optimal outcome, and repeat practice to solidify learning.

Dr. Bei Liu, Excelsior College
TEACHING INNOVATIONS - continued

Friday, November 8, 2019  11:30 AM - 11:55 AM  Governors Room 2

Scaling course sizes for quality and instructional productivity: One size does not fit all!

The presentation will cover examples of proven practices to deliver instruction, with the intended quality and efficiency, in a fair and consistent manner (to students and faculty) while optimizing the intended balance and productivity of teaching, service, and scholarship.

Dr. Randy Peters, Indiana State University
Dr. Michael Hayden, Indiana State University
Both a Nest and a Launchpad: Ideas for recruiting women and underrepresented minorities in tech programs

A diverse workforce makes for a more resilient, productive, profitable, culturally aware, engaged and globally competitive one, with fairness and respect for everyone's unique competencies providing the foundation from which to take flight. While we know that a more diverse workforce can only grow out of educational programs that have a proportionally diverse student body, the pathway for getting more women and also minorities into the higher educational pipeline is far from clear. So how do technology program invite and make welcome everyone who is interested to the party? The presentation aims to address this need, basing it on specific strategies used by a program that have resulted in sustained recruitment successes across the board. Informing prospective students know about the opportunities that exist through specific program initiatives, and opening up new educational pathways whenever possible, can be very helpful for welcoming progressively broader spectrum of students to the program. The presentation will provide information about the active role in recruitment and student organizations being taken by faculty in one program which has resulted in overwhelming student growth.

Dr. Ni Wang, Eastern Kentucky University
Mr. Kyle Knezevich, Eastern Kentucky University
Dr. Vigs Chandra, Eastern Kentucky University