Corporate Development Council (CDC) Fall 2019 Meeting

Hosted by: Office of the Vice Chancellor of Student Affairs
Welcome & Overview

> Debra Robinson, Vice Chancellor, Student Affairs and CDC Executive Director

> Dave Sextro, Vice President of Engineering at Emerson and CDC Chair

CDC Mission: Engaging Alumni and Employers to prepare S&T students for success in the corporate world.
Brief Introductions

CDC Member Introductions
- Name
- Company
- Association with Missouri S&T (Alumni, Advisory Board(s), etc.)
- Interesting fact about yourself
1,152 first-time freshmen

286 transfer students

- Average ACT = 28.8 (top 10% nationally)
- Average GPA = 3.95
- 28 states
- 15 countries
- 15% minority students
NEW LEADERSHIP

Stephen Roberts
Interim Provost and Executive Vice Chancellor for Academic Affairs

Richard Brow
Interim Deputy Provost for Academic Excellence

Kate Drowne
Interim Vice Provost and Dean, College of Arts, Sciences, and Business

Neil Outar
Chief Diversity Officer

Positions to be filled
- Chief Financial Officer
- Chief Information Officer
- Vice Provost for Enrollment Management
CHANGING CAMPUS

Fitness Center open

Kummer Student Design Center Expansion underway
BUILDING FOR THE FUTURE

Clayco Advanced Construction and Materials Laboratory at Butler-Carlton Civil Engineering Hall

Classroom Learning Center, an addition to the Computer Science Building
ELEVATING S&T

Become the destination of choice for faculty, staff and students

FROM VISION TO REALITY
Characteristics of a university on the rise

- Excellent Faculty
- Excellent Students
- Excellent Support and Services
- Excellent Infrastructure
FROM VISION TO REALITY

Monitoring Progress: 10 key indicators

- Undergraduate Student Recruitment
- Student Success
- Graduate Student Recruitment
- Faculty Recruitment & Development
- Research & Entrepreneurship
- Finances
- Development & Alumni Relations
- Marketing & Communications
- Physical Infrastructure
- Information Technology

Elevating S&T

MISOURI S&T
## Monitoring Progress: Student Success

### Career Success Metrics (2017-18 data)

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career Outcomes Rate</td>
<td>88%</td>
</tr>
<tr>
<td>Undergraduate Starting Salary</td>
<td>$62,873</td>
</tr>
<tr>
<td>Graduate Starting Salary</td>
<td>$73,842</td>
</tr>
<tr>
<td>Employee Satisfaction with Hires</td>
<td>100%</td>
</tr>
<tr>
<td>Number of Unique Employers</td>
<td>6,972</td>
</tr>
</tbody>
</table>
FROM VISION TO REALITY

Research, Innovation, Entrepreneurship

Proposal Generation
Need Recognition
Critical Challenges
Vision
Teams
Plans
Research
Experiments
Hypothesis Driven
Solution Inspired
Knowledge Generation & Transformation
Research Innovation
New SKAs
Scholarly Pub.
Invention, IP
Technology
Licensing
Critical Contribution to
Critical Challenges
Economic Development
Innovation
Brand Recognition
National Standing
Technology
Transformation
Incubation
NEW RESEARCH INITIATIVES

> Center for Science, Technology, and Society (CSTS)
> Laser Interferometer Gravitational-wave Observatory (LIGO)
> Traumatic Brain Injury (TBI) research
  > Partnership with Acute Effects of Neurotrauma Consortium (AENC)
  > Partners include UMKC, MU, Washington University
  > $5.1M Army Research Lab funding through Leonard Wood Institute (LWI)
RECORD ROYALTY INCOME

Monitoring Progress: Research, Innovation, Entrepreneurship

Royalty Income (in Thousands)

- FY17: $559
- FY18: $519
- FY19: $689
Technology Transfer and Economic Development

FOCUS AND EXPERTISE

> Technology commercialization/transfer
> Entrepreneurship – faculty/student
> Lean LaunchPad/Business Model Canvas
> Intellectual property
> Patents, copyrights, trademark
> Financing – debt, equity
> Communications, social media and marketing
Technology Development Center

> Building in Innovation Park
> Designed to have a low environmental impact, certified as a LEED silver building
> Facilitates collaborations between S&T and industry partners
TECHNOLOGY DEVELOPMENT CENTER

- 22,000 square feet
- Flexible/short-term leases available
- 24-hour access to building and offices
- Custodial, maintenance and utilities included in lease
- Fully furnished and client-furnished private offices
- Conference room with 12-person seating capacity
- Break room and kitchenette
- Wireless internet access
- Convenient parking
TECHNOLOGY DEVELOPMENT CENTER

BUSINESS PARTNERS
> The Boeing Company
> Garmin International
> Talema Group
> Missouri Enterprise
> Fidelity Communication
> HaxApps LLC
> Butcher Law LLC
> Bara Geophysical LLC
> Rolla Regional Economic Commission

STUDENT-LED BUSINESSES
> BrakeSpace LLC
> Engineered Terrain LLC
> Nextage Tek LLC

UNIVERSITY PRESENCE
> Office of Technology Transfer and Economic Development (TTED)
> MU Extension
> Missouri College Advising Group
> National Public Radio (St. Louis Public Radio)
Needs are unique for each business relationship.

In general, companies are able to leverage talented S&T students for workforce by placing full-time employees in center.

Boeing: the company has engaged with graduate students as employees of the company to work on company research projects as part of the students’ master or doctoral theses.
THANK YOU! QUESTIONS?
Research Activities at Missouri S&T: Focus on Industry

Costas Tsatsoulis
Vice Chancellor of Research and Dean of Graduate Studies
Why do we do research?

> Focus on students: (under-) graduate education requires research and discovery

> Focus on service: as a state institution we serve the State and the Nation through the expertise of our faculty and students

> Focus on economic development: patents, business spin-offs, job creation

> Focus on faculty: the best faculty will go where they can perform cutting edge research

> Focus on ranking: research and graduate education are very important metrics

> Focus on the future: our reputation will drive our future
Research Awards

- 2015: $34,336,180
- 2016: $33,519,721
- 2017: $35,150,121
- 2018: $37,273,151
- 2019: $49,825,501

Increase: +34%
Some Major Successes

> B. McMillin and team, $963K, NSF
> R. Bo, $1M, DoE
> P. Whitefield, $1.2M, anonymous industry
> J. Fan and team, $1.5M, NSF I/UCRC
> J. Smith and team, $1.9M, GUST
> J. Kimball and team, $2.9M, DoE
> L. Bartlett, $3.9M, ARO
> G. Chen and team, $3.9M, US DOT
> Various PIs & Departments, $4.2M, GAANN fellowships
> $5.1M in TBI research, 8 investigators
Research Proposals by Source

- **2015**: 4.7%
- **2016**: 4.6%
- **2017**: 5.8%
- **2018**: 3.7%
- **2019**: 4.4%
How can we work together?

> Be part of Federal projects
  - DoE $2.9M grant matched by industry - share in the results, Dr. J. Kimball
  - “Engineering Research Center for Integrative Manufacturing and Remanufacturing Technologies to Spur Rural Development”, Dr. Frank Lieu

> I/UCRC
  - NSF support
  - Industry membership
  - Project selection

> Consortia
  - Membership
  - Project selection

> SBIR/STTR
How do we start?

> Faculty quad charts

DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING

Ceramics for Extreme Environments

Ultra-high temperature ceramics
  • Processing, microstructure-property relations, oxidation of boride and carbide ceramics
  • Unique combination of facilities for characterization of thermal, electrical, and mechanical properties at temperatures up to at least 2000°C

Rare-earth based coatings for corrosion protection
  • Cerium-based conversion coatings for corrosion protection of light metal alloys
  • Corrosion mechanisms, deposition, electrochemical characterization

Ceramic materials expertise
  • Reactive processing, traditional ceramics, ceramic-metal composites, joining, and thermodynamic analysis

PoC: Bill Fahrenholtz
  Curators’ Distinguished Professor
  billf@mail.missouri.edu, 573-882-6343

Funding
  • National Science Foundation
  • Air Force Office of Scientific Research
  • Office of Naval Research
  • Strategic Environmental Research and Development Program

Missouri State University

DEPARTMENT Electrical and Computer Engineering

Applied Computational Intelligence Laboratory

Mechanisms and Applications of Unsupervised Learning
  • Information theoretic and growing regions clustering
  • Collaborative Filtering
  • Data Mining
  • Parallelization

Reinforcement Learning in Autonomous Systems
  • Autonomous vehicles and robot swarms
  • Human interactions with intelligent systems
  • Robust nonlinear controls under uncertainty and delay

Brain Science and Mental Health
  • Autism gene expression and functionality studies
  • Cognitive aging neuroimaging

PoC: Donald C. Wunsch II
  Mary K. Finley Missouri Distinguished Prof.
  dwunsch@missouri.edu
  573-884-6521

Funding
  • NSF
  • Dept. of Education
  • Nvidia

Keywords
  • Neural, learning, intelligence, clustering, reinforcement, fuzzy, evolution, cyber, robot

Recognitions
  • International Neural Networks Society (INNS) Fellow
  • IEEE Fellow
  • INNS Gabor Award 2015

CEC Research
> We can do things fast:  
  – Unique facilities, expert technical staff
> Some problems in your backburner  
  – Senior designs & competitions
> We can look at longer-term R&D problems, too  
  – Technical staff, faculty, students, postdocs
> We know how to protect industry IP
> We also know how to patent  
  – New steel licensed non-exclusively at no-cost to ArcelorMittal, MetalTek International, and Nucor Steel.
Missouri S&T is open for business
QUESTIONS?
Faculty Panel

- Laura Bartlett; Associate Professor, Material Science
- Stephen Gao; Professor, Geology & Geophysics
- Garry Grubbs; Assistant Professor, Chemistry
- Kathleen Sheppard; Associate Professor, History and Political Science
Winners of the 3 Minute Thesis Competition

- Sherif Fakhar, Petroleum Engineering
- Yasser Darwish, Civil Engineering
**Impact Protection of Bridges Using Metamaterial Revolved Shell Panels**

**Problem**
- Collision is the 2nd highest cause of bridge failures in USA
  - **Human Toll**
    - 7,833 deaths in 2017
  - **Huge Losses**
    - 163 failed bridges

**Solution**
- **Meta-material Panels**
  - Dissipate 70% of the impact energy by changing its initial shape

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Minneapolis, June 2003.

Texas, July 2016.
Luncheon

> St. Pat’s A&B
> 12:30 p.m. – 1:30 p.m.
> Topic: Benefits of industry & university collaboration

> Following the luncheon is the Student Leaders Roundtable Discussions (1:45 p.m. – 2:30 p.m.)
  – Enhancing employability
  – Career progression
  – Finding best culture/fit
  – Adapting to company culture
Fall Career Fair
  - September 24th
  - New Registration Process
    > Skip the Line Pilot Ended
  - Full Fair
    > Looking for options for expansion next Fall

Miner Mingle
  - New Networking Event

Focused Recruiting Efforts
  - Graduate Studies
  - CASB Majors
Reporting Timeline

> Reporting at 6 months post-graduation

> Additions to At-A-Glance report
  – Comprehensive Report by Major and Industry
  – New dashboard with filters and historical data
  – New Data Analyst on Staff

> Data available upon request
New COER Projects and Focus Areas

> Mentor a Miner Program
> NACE core competencies mapping
> Increased workshops for unique populations
> New opportunities for employer engagement
> Leveraging contacts for research
Mission: Engaging Alumni and Employers to prepare S&T students for success in the corporate world.

Fall & Spring Meetings on Campus

Member Engagement Opportunities
- Leadership programs
- Student organizations

Financial Support for Programs & Projects Available to All Students
CDC Sponsored programs in last 10 years

- Student Leadership Conference
- National Collegiate Leadership Conference Scholarships
- Backpack to Briefcase Program
- Peer Involvement Advisor Expansion
- Greek Academy
- Miner Challenge (Spring Break Service Trips)
- Alternative Weekend Breaks
- Suit Closet
- Miner Treks
- Etiquette Dinners
- COER Student Guides
- Career Fair Boot Camp Program
Student Affairs Leadership Development Programs

> Chancellor’s Leadership Academy
> Greek Academy
> Greek Retreat
> Stand Up Stand Out
> RSO summit
> Organization specific retreats
> Intramural Leadership Meetings
> Life Skills Workshop
> NRHH Fall Leadership Retreat and Spring Leadership Summit
> Resident Assistant (RA) Training
> Residence Hall Government Executive Officer Training
New CDC Programs & Initiatives

> Community Values in Action

> Pre-Miner Mingle
  – Networking Skill Development

> Mental Well-Being Ambassador Training

> Wellness Certification Program
Missouri S&T Corporate Development Council

Next CDC Meeting is: Thursday, February 27, 2020

Thank you for attending!

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