2020 ASEE Research Leadership Institute

Research Development: Promising Practices

Ann McKenna
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Focus for today

- Context of ASU and the Fulton Schools of Engineering (FSE)
- Structure of research offices
- Services provided to support proposal development and project execution
## Fulton Schools Research – 2019

<table>
<thead>
<tr>
<th>Early stage discovery</th>
<th>Translational research</th>
<th>Mission-focused impact</th>
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</thead>
<tbody>
<tr>
<td><strong>35+ young investigator awards</strong> from NSF CAREER, AFOSR YIP, DARPA YFA, ONR YIP, NASA and NIH over past three years.</td>
<td><strong>NSF Engineering Research Centers:</strong> Leading QESST &amp; CBBG plus partnering on NEWT &amp; FREEDM</td>
<td><strong>$18 million from USAID</strong> to establish the U.S.-Pakistan Centers for Advanced Studies in Energy (USPCASE) to improve power production in Pakistan</td>
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<td><strong>More than $44M awards for 19 DARPA projects</strong> in last two years supporting areas such as biological technologies, microsystems, &amp; complex remote systems.</td>
<td><strong>NSF I/UCRCs</strong> (Industry/University Cooperative Research Programs): PSERC, Connection One, SenSIP, WET, Center for Embedded Systems, Efficient Vehicles and Sustainable Traffic Systems, BRAIN</td>
<td><strong>Lead DHS Center for Accelerating Operational Efficiency.</strong> CAOE develops and applies advanced analytical tools and technologies to enhance planning, information sharing and real-time decision-making in homeland security operations.</td>
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<td><strong>Launched new Clinical &amp; Industry collaborations:</strong> ASU-Mayo Center for Innovative Imaging</td>
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<td><strong>Lead DOT Tier 1 University Transportation Center - Teaching Old Models New Tricks (TOMNET)</strong></td>
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<tr>
<td>Science and Technology Demonstration Centers (Wearable devices, Blockchain)</td>
<td>Continued 20+ years SRP relationship with $2.5M annual funding</td>
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</table>

~350 tenured and tenure-track faculty + 50 research faculty + > 100 post-docs + > 1200 PhD students
FSE entrepreneurship and innovation

#3 Licenses and options
Behind only Purdue and Carnegie Mellon

#4 IP disclosures
Behind only Carnegie Mellon, Caltech and Purdue

#4 Startups
Behind only Purdue, Carnegie Mellon and Stanford

Responsible for 192 patents and 24 startups in the last three years

Comparative data per $10 million in research expenditures, based on the Association of University Technology Managers annual report of top national engineering schools.
## Evolution of the Fulton Schools of Engineering

| School of Engineering                                      | Students | Biomedical Engineering | Biological design | Computer engineering | Computer science | Computer systems engineering | Engineering management | Industrial engineering | Informatics | Robotics and autonomous systems | Software | Aerospace engineering | Chemical engineering | Materials Science and engineering | Mechanical engineering | Robotics and autonomous systems | Solar energy engineering and commercialization | Civil engineering | Construction engineering | Construction management | Environmental engineering | Sustainable engineering | Aviation Programs | Engineering programs | Environmental and resource management | Global technology and entrepreneurship | Graphic information technology | Human systems engineering | Information technology | Robotics and autonomous systems | Management of technology | User experience |
|------------------------------------------------------------|----------|------------------------|-------------------|----------------------|---------------------|-----------------------------|------------------------|------------------------|-------------|-------------------------------|----------|------------------------|------------------------|--------------------------------|------------------------|------------------------|------------------------------------------|------------------------|------------------------|------------------------|-------------------------------|------------------------|------------------------|------------------------|-------------------------------|------------------------|------------------------|------------------------|-------------------------------|------------------------|------------------------|
| School of Computing, Informatics, and Decision Systems Engineering | 6,735    | 918                   |                   |                      |                     |                             |                        |                        |              |                               |                     |                       |                         |                                  |                         |                        |                                                        |                        |                       |                         |                                 |                         |                        |                                                        |                        |                       |                         |                                 |                         |                        |                                                        |                        |                       |                         |                                 |
| School of Electrical, Computer and Energy Engineering          | 3,324    |                       |                   |                      |                     |                             |                        |                        |              |                               |                     |                       |                         |                                  |                         |                        |                                                        |                        |                       |                         |                                 |                         |                        |                                                        |                        |                       |                         |                                 |                         |                        |                                                        |                        |                       |                         |                                 |
| School for Engineering of Matter, Transport and Energy        | 3,820    |                       |                   |                      |                     |                             |                        |                        |              |                               |                     |                       |                         |                                  |                         |                        |                                                        |                        |                       |                         |                                 |                         |                        |                                                        |                        |                       |                         |                                 |                         |                        |                                                        |                        |                       |                         |                                 |
| School of Sustainable Engineering and the Built Environment   | 1,734    |                       |                   |                      |                     |                             |                        |                        |              |                               |                     |                       |                         |                                  |                         |                        |                                                        |                        |                       |                         |                                 |                         |                        |                                                        |                        |                       |                         |                                 |                         |                        |                                                        |                        |                       |                         |                                 |
| The Polytechnic School                                        | 5,454    | 5,454                 |                   |                      |                     |                             |                        |                        |              |                               |                     |                       |                         |                                  |                         |                        |                                                        |                        |                       |                         |                                 |                         |                        |                                                        |                        |                       |                         |                                 |                         |                        |                                                        |                        |                       |                         |                                 |

### The Global School

**Advancing engineering design on a global scale**

**“The Engineering and Design Institute: London (TEDI)”**

### Produce new kinds of graduates:
- Creators and innovators
- Entrepreneurs and problem solvers
- Global citizens who are the engineers and technologists of the future

### Attract new kinds of learners:
- Diverse
- International
- Attract students with the “engineering design mindset” and build skills along their learning path

<table>
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<tr>
<th>Interdisciplinary programs</th>
<th>Undergraduate programs</th>
<th>Graduate programs</th>
<th>Campuses</th>
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</thead>
<tbody>
<tr>
<td>6</td>
<td>25</td>
<td>46</td>
<td>2 + ASU Online</td>
</tr>
</tbody>
</table>
Touchpoints between ASU Units & FSE Research Services

- Knowledge Enterprise/Research
- ASU Colleges/Schools
- Bus. Engagement Catalyst Teams (KE and FSE)
- ASU Govt Affairs
- ASU DC Liaison
- Skysong Innovations
- ASUF
- ASURE

- Exec Admin
- VDRI
  - Director, Research Services
    - UG Students
    - Project Management Lead
      - Proposal Mgrs, Editors
        - KE Research Development
      - Project Mgr, Coordinators
        - KE Project Management Office
    - Pre-Award Lead
      - Pre-Award RAs (VDRI)
    - Post-Award Lead
      - Post-Award RAs (VDRI)
      - RA Leads in Schools (x6)
      - Research Administrators (x27)
      - KE Proposal & Negotiation Team
      - Accountants, Data Analysts
      - KE Grants & Contracts Officers, FSE Business Operations (VDRI & Schools)
Knowledge Enterprise Services (ASU)

- Opportunity Kick-Offs
- Competitive Intelligence
- Limited Submissions
- Graphics and Journal and proposal editing services
- Research Administrators, Grants and Contracts Officers
- Project Management Office
- Proposal Management: *Focus on support to Tier 2 and 3 opportunities*

<table>
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<tr>
<th>Annual budget</th>
<th>Opportunity Development</th>
<th>Proposal Planning</th>
<th>Proposal Production</th>
<th>Site Visit</th>
<th>Debrief</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Evaluation</td>
<td>Pursuit</td>
<td>Writing</td>
<td>Graphics</td>
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<tr>
<td>Tier 3 ≥$5 million</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Tier 2 ≥$1 million</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Tier 1 &lt;$1 million*</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
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</table>
Engineering Research Services

FSE resources complement what is offered by KE:

- Faculty workshops
- Pre- and Post-Award Research Administrators (x33 FTE)
  - Dedicated staff at each of the six Fulton schools to support faculty
- Project Management team (x2 FTE)
  - Ad hoc or dedicated support to multi-investigator/large teams
- Proposal Manager (x1 FTE)
  - Supports Tier 1/2 funding opportunities of $1M+
- Editor (x.5 FTE)
- Graphics
- Seed Funding Programs
- Internal collaboration point with ASA and Business Engagement Catalysts
ASU Charter

ASU is a comprehensive public research university, measured not by whom it excludes, but by whom it includes and how they succeed; advancing research and discovery of public value; and assuming fundamental responsibility for the economic, social, cultural and overall health of the communities it serves.